

FIFTH BIENNIAL REPORT
OF THE
STATE MINE INSPECTORS,

TO THE
GOVERNOR OF THE STATE OF IOWA,

For the two Years Ending June 30, 1891.

THOMAS BINKS, Dist. No. 1, JAMES GILDROY, Dist. No. 2,
MORGAN O. THOMAS, Dist. No. 3, Inspectors.

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BIENNIAL REPORT.

TO HIS EXCELLENCY, HORACE BOIES, *Governor of Iowa:*

SIR: In compliance with the requirements of the mining laws of Iowa, I have the honor to submit my third biennial report of coal mines for the First District for the two years ending June 30, 1891.

The following report gives the usual tabulated statements, showing the number of mines shipping, and local, and the kind of power used, also the method of working and how ventilated. The number of miners and other employees. The number of new mines and mines abandoned, the number and kind of improvements, the price paid for mining and the value of coal at the mines, the total tonnage for each county and for the district, and the aggregate value of total product, the number and kind of coal mining machines. A record is also made of fatal and non-fatal accidents.

The First Inspection District comprises twenty-one counties, ten of which are coal producing, namely, Appanoose, Adams, Davis, Lucas, Monroe, Page, Taylor, Wapello, Warren and Wayne.

During this biennial term the mines in the First District have been visited as often as the conditions seemed to require. The sanitary condition of the mines being greatly improved as will be shown by reference to the table of improvements. There have been twenty-eight air shafts, ten brakes on drums, eleven fans, fourteen stairways, twenty-six second openings, thirteen safety catches, eight safety gates, fifteen furnaces, ten covers on cages, total, one hundred and thirty-five improvements during this term, and it affords me great pleasure to state that the above named improvements have been made without a resort to legal proceedings. With very few exceptions, where orders have been given they have been complied with in reasonable time. The air shafts sunk this term are considerably larger than previous ones. The fans are from nine to twenty feet in diameter. The furnaces are also larger which will give greater volumes of air if proper splits and overcasts

are made. The shipping mines in this district are well provided with fans and furnaces for supplying a good volume of air, and if the mine bosses in charge see that it is properly conducted into the miner's rooms and not let it all pass along the entries, there is no reason why the mines in this district should not be well ventilated. The greatest impediment to good ventilation in quite a number of mines are poorly constructed doors and stoppings, small contracted airways, single doors where they should be double and left to be opened and shut by the driver when they should have trappers. Doors should fit tight and fall with the air, stoppings on main air-course should be built of brick and plastered. With the double entry and long wall system of mining, the working places of the miners can be well supplied with plenty of fresh air, but if the doors and stoppings are neglected and not kept air tight, and break throughs in the entries and rooms are not kept clear of rock timber and other obstructions, it will avail but little after having gone to the expense of making larger air shafts and fans and furnaces wherewith to supply larger volumes of air. The management and ventilation of the mine depends largely on the ability of the inside manager. He should be a man of good judgment and should be firm and decided, but at the same time kind and ready to impart that knowledge he possesses to the workmen in his employ. It is a well known fact that no mine can altogether be successful without an intelligent colliery official, both as regards a practical and theoretical knowledge relative to mining. I believe that it would be for the best interest of all those concerned, both operators and miners, if all mine managers in charge of mines that employ twenty or more miners, be compelled to obtain a certificate of competency from the State board of examiners which meets biennially for the purpose of examining candidates for mine inspectors.

THOMAS BINKS, *Inspector District No. 1.*

TABLE No. I.

Showing number of mines, annual output, number of miners and other employees, value of product, etc., in District No. 1, for the year ending June 30, 1890.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employees.	Average price per ton of coal.	Total amount paid miners.	Total amount paid all other employees.	Average selling price per ton of mine.	Total value of product at mine.
Anderson.....	45	288,725	1,167	148	9	256,429.00	52,201.00	1.27	308,630.00
Adams.....	14	31,286	61	9	1.31	18,097.00	2,700.00	2.19	21,797.00
Dayle.....	3	5,500	19	3	1.00	3,192.00	320.00	1.56	4,560.00
Greene.....	3	202,134	904	121	7.75	204,100.00	103,500.00	1.31	432,872.01
Monroe.....	11	303,057	636	128	7.75	221,373.00	60,238.00	1.26	301,140.18
Shelby.....	3	2,229	9	5	1.50	2,480.00	275.00	1.38	3,800.00
Wayne.....	3	8,129	27	15	1.30	13,600.00	250.00	3.00	15,500.00
Franklin.....	12	2,428	77	12	1.30	237,204.00	49,016.00	1.34	306,111.00
Franklin.....	12	2,428	77	12	1.30	237,204.00	49,016.00	1.34	306,111.00
Wayne.....	3	207,436	674	92	3.00	13,600.00	3,243.00	1.73	31,083.00
Wayne.....	3	17,925	63	17	1.13	21,671.00	1,450.00	1.52	23,900.00
Wayne.....	3	21,309	66	11	1.01	10,600.00			
Total.....	130	1,314,560	9,319	1,248		791,028,000.00	256,207.00		1,341,740,007.11

TABLE No. II.

Showing number of mines, annual output, number of miners and other employees, value of product, etc., in District No. 1, for the year ending June 30, 1891.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employees.	Average price per ton of coal.	Total amount paid miners.	Total amount paid all other employees.	Average selling price per ton of mine.	Total value of product at the mine.
Adams.....	16	44,827	86	14	1.31	20,031.42	2,200.00	1.64	22,231.42
Anderson.....	56	303,236	1,193	219	3.05	308,924.81	62,256.00	1.37	549,707.10
Franklin.....	12	2,428	77	12	1.30	237,204.00	49,016.00	1.34	306,111.00
Jarvis.....	1	1,715	17	5	1.01	2,072.00	180.00	1.56	2,252.00
Franklin.....	12	198,272	197	26	7.76	103,460.00	6,700.00	1.26	110,160.00
Shelby.....	14	353,477	606	102	7.75	252,773.84	66,508.00	1.52	599,172.38
Shelby.....	14	2,700	9	5	1.50	4,480.00	500.00	3.41	5,980.00
Franklin.....	12	2,428	77	12	1.30	237,204.00	49,016.00	1.34	306,111.00
Franklin.....	12	15,430	63	24	1.37	18,400.00	4,913.00	1.62	217,737.28
Franklin.....	12	189,250	358	125	7.76	170,373.27	44,404.11	1.33	217,737.28
Wayne.....	3	31,578	101	30	1.00	28,232.00	10,875.00	1.40	44,172.00
Wayne.....	3	15,604	60	15	1.04	16,303.61	2,797.25	1.80	17,800.50
Wayne.....	3	15,604	60	15	1.04	16,303.61	2,797.25	1.80	17,800.50
Total.....	130	1,138,190	7,731	967	3.13	628,828.75	227,430.27		1,321,507,012.06

TABLE No. III.

Showing average number of mines in operation, output of coal, average number of miners and other employes, compensation of employes, value of product, etc., in District No. 1 for the biennial period ending June 30, 1891.

NAME OF COUNTY.	Average number of mines in operation.	Number of tons of coal produced.	Average number of miners employed of all other emp.	Average number of employes.	Average price per ton paid for labor.	Total amount paid miners.	Total amount paid all other emp.	Average selling price per ton at mines.	Total value of product at mines.
Appanoose.....	32	661,984	1,176	196	.93	\$27,350.61	\$13,617.98	1.27	\$47,129.46
Adams.....	15	24,152	92	12	1.24	98,934.42	5,086.00	2.08	60,627.24
Davis.....	18	6,472	17	15	.95	6,154.00	538.00	1.54	9,660.50
Lucas.....	18	488,866	346	77	.76	267,520.00	130,190.00	1.24	695,062.01
Monroe.....	18	664,879	617	156	.72	477,748.84	175,340.05	1.35	875,721.78
Page.....	18	5,920	35	4	1.97	7,880.00	875.00	3.30	13,000.00
Taylor.....	18	31,540	87	25	1.35	29,965.00	6,313.00	3.01	43,300.00
Wapello.....	21	408,749	616	107	.76	357,280.37	69,420.11	1.22	616,848.28
Warren.....	22	30,527	83	16	1.11	37,374.61	6,140.23	1.76	58,861.60
Wayne.....	8	52,778	78	20	.90	47,343.00	12,525.00	1.45	78,472.00
Total.....	165	2,450,951	3,917	618		\$2,819,966.53	\$524,327.37		\$3,283,297.40

The foregoing tables show the value of all coal product and a partial expenditure of the receipts in the way of compensation to miners and other employes, but we have no method of obtaining anything like an accurate account of the expense or outlay for props, tracking, machinery, mules, horses, taxes, royalties, interest on capital invested, etc., which amounts to a very large sum annually:

COAL OUTPUT OF THE COUNTIES COMPRISING DISTRICT No. 1 FOR THE PAST SIX YEARS.

COUNTY.	1886.	1887.	1888.	1889.	1890.	1891.
Appanoose.....	150,000	160,350	210,250	246,634	288,720	393,255
Adams.....	9,841	19,851	18,817	13,569	14,860	14,872
Davis.....	1,000	1,800	1,800	1,640	3,500	3,272
Lucas.....	330,750	472,998	364,999	268,851	302,134	136,772
Monroe.....	117,700	183,303	253,600	234,742	309,402	353,477
Page.....	1,550	1,780	3,430	2,480	2,320	2,790
Taylor.....	8,283	12,160	8,962	12,711	8,120	13,429
Wapello.....	237,111	272,673	380,285	273,302	297,459	169,250
Warren.....	20,335	24,736	17,613	18,863	17,823	18,604
Wayne.....	34,000	28,684	24,283	20,840	31,500	31,578
Total.....	1,113,618	1,177,417	1,322,878	1,178,561	1,314,767	1,136,199

The foregoing tables show the total output of coal in the first mining district to be 2,450,955 tons for the biennial term ending June 30, 1891.

This district is composed of the ten coal producing counties, five of these, namely, Adams, Davis, Page, Taylor and Warren, sell

their product almost exclusively for local consumption, except about six thousand tons from New Market, Taylor county, and about five thousand tons from Somerset, Warren county, that is shipped to markets outside the county.

For the year 1891, the counties of Appanoose, Adams, Davis Monroe, Page, Taylor and Wayne, show an increase over year previous of 167,313 tons, while the counties of Lucas, Wapello and Warren, show a decrease for the present year of 178,587 tons. But the same ten counties now composing this district show a net increase of 14,428 tons over the previous biennial report.

This increase would have been much larger had it not been for what is known as the eight hour strike that occurred the first day of May, 1891, and continued through May and June, leaving most of the mines idle for about two months, as the strike was very general throughout the First District.

We have had a very perceptible decrease in the list of accidents this term, as there has been but nine total and forty-two non-total, against twenty-six totals and sixty-nine non-totals for the preceding term, a difference of seventeen totals and twenty-seven non-totals in favor of the present, or a decrease of sixty-five per cent on totals and thirty-eight per cent on non-totals. None of the accidents reported in this district have occurred for the want of appliances, such as escape ways, safety catches, covers on cages, etc.

We find that in the first district during the present biennial period there were 272,328 tons of coal mined for each life lost, 58,356 tons of coal mined for each non-fatal accident, and taking into consideration the number of men employed in and around the mines of the district that a life was lost for every 404 men employed, or that an accident occurred for every 86 men employed.

The four non-fatal accidents that are marked with a star denoting that they finally proved fatal were only reported to us as non-fatal, we afterwards learned that they died from their injuries but our information in regard to their death was not official, consequently had to record them as reported.

It will be seen by referring to the non-total tables that four of the miners were burned by an explosion of powder, this happened in the Sugar Creek mine, near Ottumwa, and was caused by carelessly placing the kegs of powder too near the working places, some of the kegs being left uncovered were ignited from the shots, one man being so badly burned that he will never be able to perform manual labor.

IMPROVEMENTS MADE IN THE MINES—CONTINUED.

WAPELLO COUNTY.

NAME OF MINES.										
	Air shafts.	Brake on drum.	Furnace.	Fans.	Stairways.	Second opening	Safety catches.	Safety gates.	Cover on cages.	
Whitebreast Fuel Co.....	1	1	1	1	1	1	1	1	1	1
Phillips' Fuel Co.....	1	1	1	1	1	1	1	1	1	1
Appanoose Coal and Fuel Co., No. 6.....	1	1	1	1	1	1	1	1	1	1
Black Diamond Coal Co.....	1	1	1	1	1	1	1	1	1	1
Ottumwa Co-operative Coal Co.....	1	1	1	1	1	1	1	1	1	1
Birch Brothers.....	1	1	1	1	1	1	1	1	1	1
Jacob Ream.....	1	1	1	1	1	1	1	1	1	1
Total.....	7	3	9	2	4	7	4	3	3	3

WAYNE COUNTY.

Chicago Coal Co.....	1	1	1	1	1	1	1	1	1	1
Seymore Coal Co.....	1	1	1	1	1	1	1	1	1	1
Baty & Jones.....	1	1	1	1	1	1	1	1	1	1
Total.....	1	1	1	1	1	1	1	1	1	1
Grand total.....	27	9	14	10	14	26	12	8	10	10

LIST OF FATAL ACCIDENTS.

STATE OF IOWA, }
Lucas County. } ss.

An inquisition holden at the Whitebreast Fuel Company's Mine, Cleveland, Lucas county, Iowa, on the 4th day of September, 1889, before a justice of the peace, in the absence of the coroner of said county, upon the body of David W. Powell, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say that the said David W. Powell came to his death at or about 1 o'clock, P. M., September 3, 1889, at the Whitebreast Fuel Company's Mine in Cleveland, Lucas county, Iowa while in the employ of said company by means of falling slate from side of entry, killing him instantly.

JOHN VENER,
JOHN EVANS,
JOHN R. EVANS,
Jurors.

STATE OF IOWA, }
Wapello County. } ss.

An inquisition holden at Moses Northway's residence, in Center township, Wapello county, Iowa, on the 8th day of January, 1890, before E. M. Arenschild, coroner of said county, upon the body of Wm. Northway, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say that the said Wm. Northway came to his death by the premature explosion of a blast in mine No. 1, of Phillips Coal Company, situated in Center township, Wapello county, Iowa.

In testimony whereof the said jurors have hereunto set their hand the day and year aforesaid.

D. D. CALHOUN,
JAS. D. GRAY,
C. MYERS,
Jurors.

Attest:

E. M. ARENSCHILD, *Coroner of Wapello County.*

STATE OF IOWA, }
Monroe County. } ss.

An inquisition holden at Jack Oak Mines in Monroe county, Iowa, on the 25th day of January, 1890, before H. C. Eshbach, coroner of said Monroe

county, State of Iowa, upon the body of James Cullinane there lying dead by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say: We do find that said deceased, came to his death by falling from the top of Jack Oak shaft down to the bottom below. We further find that deceased came to his death purely accidental and not through the carelessness or negligence of any person or persons connected with the management of said coal mines. We further find that due and proper diligence was exercised by the operators of said coal mines for the prevention of accidents of a similar character, and that no blame is attached to anyone.

W. E. RENDALL,
GEO. B. HARRIS,
CLARK N. BONE,

Jurors.

Attest:

H. C. ESCHBACH, *Coroner Monroe County, Iowa.*

STATE OF IOWA }
Wapello Co. } ss.

An inquisition holden before me, E. M. Arenschiold, coronor of said county, at Ottumwa, Iowa, March 2d, A. D. 1891, upon the body of Moses Northway, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say that the said Moses Northway came to his death about 12:30 o'clock, P. M., March 2, 1891, as a result of injuries received from falling slate in Phillip's mine No. 2, at about 10 A. M., March 2, 1891, from accident and no one to blame.

A. L. PEDSICK,
LEWIS LAMAN,
HIRAM EDWARDS.

Attest:

E. M. ARENSCHIELD, *Coroner Wapello county, Iowa.*

STATE OF IOWA }
Appanoose County. } ss.

At an inquisition holden at Centerville, in said county on the 2d day of March, 1891, before R. H. Easton, coroner of said Appanoose county, State of Iowa, upon the bodies of Thos. and Wm. Sullivan, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say, we do find that said deceased came to their death by being crushed by a fall of "black bat" on them in their room which they were working at the Centerville Coal mines. That in our judgment, from the inspection of the mine where the accident occurred and from the testimony before us, the fall of the "black bat" occurred on account of negligence of the deceased in not sufficiently placing props in their room. Whereof the said jurors have hereunto set their hands this 3d day of March, 1891.

T. L. ALLEN,
JOHN HARPER,
W. C. MARTIN,

Jurors.

Attest:

R. H. EASTON, *Coroner Appanoose County.*

STATE OF IOWA }
Appanoose County. } ss.

At an inquisition holden at Mystic, Appanoose county, on the 6th day of March, 1891, before Robert H. Easton, coroner of said Appanoose county, State of Iowa, upon the body of William Harrison, there lying dead by the jurors whose names are hereunto subscribed. The said jurors upon their oaths, do say: We do find that said deceased came to his death by a fall of coal falling on him while working in the mine of Seddon Brothers without permission. And that the deceased came to his death through his ignorance of mining and his own carelessness. We, the jury, exonerate Seddon Brothers from all blame and we also exonerate all persons whomsoever from any blame attached to the death of the deceased.

JOHN M. ELGIN,
SAM'L KATE,
J. N. MAY,

Jurors.

Attest:

ROBERT H. EASTON, *Coroner.*

STATE OF IOWA }
Monroe County. } ss.

At an inquisition holden at Hiteman, in said county, on the 11th day of March, 1891, before H. C. Eschbach, coroner of said Monroe county, State of Iowa, upon the body of John Swanson, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths do say, we do find that said deceased came to his death by falling of slate while working in the mine at Hiteman.

In testimony whereof the said jurors have hereunto set their hands this 11th day of March, 1891.

CHAS. A. SANDSTROM,
DAVID COALSON,
M. A. COALSON,

Jurors.

Attest:

H. C. ESCHBACH, *Coroner of Monroe County, Iowa.*

STATE OF IOWA }
Wapello County. } ss.

An inquisition holden before me, E. M. Arenschiold, coroner of said county at Keb, Iowa, at 8:30 A. M. April 19, 1891, upon the body of Wm. Benton, there lying dead by the jurors whose names are hereunto subscribed. The said jurors upon their oaths do say that the said Wm. Benton came to his death at Keb, Richland township, Wapello county, Iowa, about 6 P. M., April 18, 1891, as a result of injuries received by a fall of slate at about 4:15 P. M. same day. As a result of unforeseen accident.

ANTHONY BURNS,
S. B. CARR,
N. D. WRIGHT,

Jurors.

Attest:

E. M. ARENSCHIELD, *Coroner Wapello County, Iowa.*

TABLE

Showing the number of all Fatal Casualties reported in District No. 1, for the two years ending June 30, 1891.

DATE.	NAME OF DECEASED.	CAUSE OF CASUALTY.	NAME OF COMPANY OR MINE.	WHERE LOCATED.
September 4, 1889	David W. Rowell	Falling slate	Whitebreast Fuel, No. 2	Cleveland
January 8, 1890	William Northway	Premature explosion of blast	Phillips Coal Company, No. 1	Ottumwa
January 25, 1890	James Cullinane	Falling from top of shaft	Jack Oak Mine	Albia
March 2, 1891	Moses Northway	Falling slate	Phillips Coal Company, No. 2	Ottumwa
March 2, 1891	Thomas Sullivan	Fall of black bat	Centerville Coal Company	Centerville
March 2, 1891	William Sullivan	Fall of black bat	Centerville Coal Company	Centerville
March 6, 1891	William Harrison	Fall of coal	Sheldon Brothers	Mystic
March 11, 1891	John Swanson	Falling coal	Wapello Mine, No. 1	Hiteman
April 19, 1891	William Benton	Fall of coal	Whitebreast, No. 22	Keb.

NON-FATAL CASUALTIES OF FIRST MINING DISTRICT.

DATE.	NAME AND OCCUPATION.	CHARACTER OF INJURIES.	CAUSE OF ACCIDENT.	RESIDENCE.
1889.				
July 13	W. J. Bothers, miner	Leg broken	Falling of prop stone	Albia
September 25	Ruby Miller, miner	Back, face and body injured	Falling black jack	Avery
October 2	R. Phillips, jr., machinist	Finger mashed off	Caught in machinery	Ottumwa
October 7	Morgan James, miner	Arm broken	Falling slate	Kirkville
1890.				
January 6	Moses Northway, miner	Badly burned	Premature discharge of shot	Ottumwa
January 8	A. Bradshaw, miner	Leg broken in three places	Mining out coal loosened by shot	Albia
January 10	A. Peterson, driver	Slightly injured	Pit car run over him	Albia
January 13	W. H. Burt, miner	Slightly injured	Falling coal	Albia
January 28	G. Briggs, miner	Leg broken in two places	Falling coal	Kirkville
January 30	C. Holman, miner	Face and arm bruised	Explosion of shot	Albia
February 13	Thos. Molne, miner	Arm broken	Falling slate	Ottumwa
February 24	O. Lawton, miner	Leg broken	Falling coal	Brazil
March 22	Neal Beck, miner	Seriously injured	Falling slate	Foster
June 3	Pete Burt, miner	Back injured	Falling slate	Foster
June 4	C. Frostburg, miner	Leg broken	Falling coal	Ottumwa
June 17	Mat. Mier, miner	Back injured	Falling slate	Ottumwa
July 10	P. F. Lof, miner	Back injured	Falling slate	Foster
August 22	Joseph Wilson, miner	Collar bone and ankle injured	Falling coal	Jerome
September 21	J. Mathews, driver	Ankle broken	Pit car	Avery
September 22	J. Thomas, miner	Five ribs broken	Falling coal	Mystic
November 12	C. Ericson, miner	Slightly injured	Falling slate	Cedar
November 13	*G. Durland, miner	Seriously injured	Crushed by cage	Cedar
November 19	Levi Nobu, miner	Face and arms burned	Powder explosion	Ottumwa
November 19	F. Bowers, miner	Face and arms burned	Powder explosion	Ottumwa
November 19	Howard Lee, miner	Face and arms burned	Powder explosion	Ottumwa
November 19	T. Donaldson, miner	Face and back burned	Powder explosion	Ottumwa
November 20	John Lee, miner	Foot badly crushed	Falling coal	Brazil
1891.				
January 8	*L. Berry, miner	Two ribs broken	Fall of coal	Brazil
January 12	L. Johnson, cager	Toe cut off	Caught by cage	Hiteman
January 22	S. Williams, miner	Back injured	Fall of slate	Hiteman
January 22	L. Williams, miner	Eye put out	Flying coal, premature explosion	Hiteman

NON-FATAL CASUALTIES OF FIRST MINING DISTRICT—CONTINUED.

DATE.	NAME AND OCCUPATION.	CHARACTER OF INJURIES.	CAUSE OF ACCIDENT.	RESIDENCE.
February	4 W. H. Peterson, miner	Back and shoulders hurt.	Falling slate.	Hiteman.
February	18 W. Banks, miner	Badly burned.	Explosion of shallow shot.	Hiteman.
February	18 B. Evans, miner	Badly burned.	Explosion of shallow shot.	Hiteman.
February	18 G. Devol, miner	Badly burned.	Explosion of shallow shot.	Hiteman.
February	18 C. Nightingale, miner	Badly burned.	Explosion of shallow shot.	Hiteman.
March	13 C. E. Adams, driver	Cut on scalp.	Between mule and car.	Hiteman.
March	13 D. Eves, miner	Cut on scalp.	Falling slate.	Hiteman.
March	14 M. Hurd, tapper	Face, breast and hand burned.	Coal oil explosion.	Hiteman.
March	14 F. Gibsonwell, miner	Back sprained.	Falling slate.	Mystic.
April	3 C. McPhee, miner	Two ribs broken.	Falling slate.	Ottumwa.
April	13 A. Johnson, miner	Hips seriously hurt.	Falling slate.	Albia.

RECAPITULATION.

RESIDENCE.	Number.	CASUALTIES.	Number.	PER CENT.
Albia	6	By falling slate	15	35.71
Avery	2	By machinery	1	2.38
Ottumwa	10	Premature explosion of shot	3	7.14
Kirkville	2	Falling coal	9	21.43
Brazil	3	Pit car	3	7.14
Foster	3	Crushed by cage	3	4.76
Jerome	1	Dust explosion	4	9.52
Mystic	2	Powder explosion	4	9.52
Cedar	2	Coal oil explosion	1	2.38
Hiteman	11			
Total	42		42	100.00

NEW MINES OPENED UP AND OLD ONES ABANDONED.

There have been fifteen new commercial mines opened up during the two years ending June 30th, 1891, in the following named counties:

In Appanoose county; Whitebreast Fuel Co. shaft number 19, at Forebush; Walnut Block Coal Co. shafts number 5 and 6, at Mystic; Brown and Bowers drift mine, at Mystic; Frank Silknetters drift mine, at Mystic; Tipton Coal Co. slope, at Brazil; Anchor Coal Co., shaft at Centerville; Pearl Coal Co., shaft Cincinnati; Darby Coal Co., shaft, Darby; Black Diamond Block Coal Co., shaft, Mystic.

In Wapello County: Whitebreast Fuel Co., shaft number 22, at Keb; Phillips Fuel Co., shaft number 3, at Willard; Appanoose Coal and Fuel Co., shaft at Appanoose.

In Monroe County: Wapello Coal Co., No. 1 shaft at Hiteman; Soap Creek Coal Co., slope No. 2, at Foster; Wilson and Baxter's shaft at Fredric; the Thatcher mine at Seymour.

Wayne County has been re-opened by the Seymore Coal Co. This mine was closed in 1887, for non-compliance with the mining law.

Eight commercial mines have been permanently abandoned.

In Wapello County, slopes number 1, 3 and 5 of the Wapello Coal Co., at Kirkville. Phillips Fuel Co., shaft number 1, at Ottumwa.
 In Lucas County, Whitebreast Fuel Co., shaft number 2 and 3, at Cleveland.
 Lumsden Bros. shaft, Somerset, Warren County.
 Many new local mines are opened and old ones abandoned during the biennial term.

LOCATION OF MINES, NAME OF SUPERINTENDENT, POST-OFFICE ADDRESS, KIND OF MINE, PLAN OF WORKING, ETC., IN DISTRICT No. 1.

APPANOOSE COUNTY.

NAME OF COMPANY, FIRM OR OPERATOR.	SUPERINTENDENT.	P. O. ADDRESS.	Kind of mine.	Thickness of vein—feet and inches.	PLAN OF WORKING—LONGWALL OR ROOM AND PILLAR.	HOW VENTILATED.	power of pump	depth of shaft
Diamond Coal Company	A. Durgaveli	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
National Coal Company	T. N. Baker	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Standard Coal Company	G. W. Merritt	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
E. J. Richardson	E. J. Richardson	Centerville	Shaft	2.9	Room and pillar	Grate	Horse	Local
Lane Coal Company	L. C. Lane	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Scandinavian Coal Company	T. J. Green	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Anchor Coal Company	James Wilson	Centerville	Shaft	2.9	Room and pillar	Furnace	Horse	Shipping
Centerville Coal Company	F. C. Drake	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Eldon No. 2	Geo. Morris	Centerville	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Star Coal Company	James Wilson	Centerville	Shaft	2.9	Room and pillar	Furnace	Horse	Local
Cincinnati Coal Company	J. C. McDonnell	Cincinnati	Shaft	2.9	Room and pillar	Stove	Horse	Shipping
Appanoose Coal Company	E. S. Marsh	Cincinnati	Shaft	2.9	Room and pillar	Steam jet and stove	Steam	Shipping
Thistle Coal Company	David Steele	Cincinnati	Shaft	2.9	Room and pillar	Stove	Horse	Shipping
Pearl Coal Company	J. Jones	Mendota	Shaft	2.9	Room and pillar	Grate	Horse	Local
B. B. Parker	B. B. Parker	Livingston	Shaft	2.9	Room and pillar	Grate	Horse	Local
Rock Island Block Coal Company	N. A. Jones	Numa	Shaft	2.9	Room and pillar	Furnace	Steam	Shipping
Gladstone Coal Company	Peter Marsden	Jerome	Shaft	2.9	Room and pillar	Furnace	Steam	Shipping
Whitebreast	T. J. Phillips	Forebush	Shaft	2.9	Room and pillar	Fan	Steam	Shipping
Phillips Fuel Company, No. 4	Wm. Foulks	Diamond	Shaft	2.9	Room and pillar	Steam jet	Steam	Shipping
Phillips Fuel Company, No. 5	Wm. Foulks	Diamond	Drift	2.9	Room and pillar	Furnace	Mules	Shipping
B. F. Silknetter	James Boyd	Brazil	Slope	2.9	Longwall	Grate	Mules	Shipping
Phoenix Coal Company	Joseph Turner	Brazil	Slope	2.9	Room and pillar	Furnace	Mules	Shipping
Tipton Coal Company	Thos. Phillips	Brazil	Slope	2.9	Room and pillar	Furnace	Mules	Shipping
B. F. Silknetter	James Boyd	Mystic	Slope	2.9	Room and pillar	Grate	Mules	Shipping
Lone Star Coal Company	John Seddon	Mystic	Drift	2.9	Longwall	Furnace	Mules	Shipping
Brown & Bowers	D. Napier	Mystic	Drift	2.9	Longwall	Furnace	Mules	Shipping
Mystic Coal & Mining Company	James Seddon	Mystic	Slope	2.9	Longwall	Furnace	Mules	Shipping
Iowa & Missouri Coal Company	Gust. Peterson	Mystic	Slope	2.9	Longwall	Furnace	Steam	Shipping
Lodwick & Bros., No. 1	David Lodwick	Mystic	Drift	2.9	Longwall	Furnace	Mule	Shipping
Lodwick & Bros., No. 2	David Lodwick	Mystic	Slope	2.9	Longwall	Furnace	Mule	Shipping

LOCATION OF MINES, NAME OF SUPERINTENDENT, POST-OFFICE ADDRESS, KIND OF MINE, PLAN OF WORKING, ETC., IN DISTRICT NO 1.

APPANOOSE COUNTY—Continued.

NAME OF COMPANY, FIRM OR OPERATOR.	SUPERINTENDENT.	P. O. ADDRESS.	Kind of mine.	Thickness of vein—feet and inches.	PLAN OF WORKING—LONGWALL OR ROOM AND PILLAR.	HOW VENTILATED.	Kind of power used.	Shipping or local trade.
Clark & Sons	A. Clark	Mystic	Shaft	2.9	Room and pillar	Furnace	Mules	Shipping.
Henrietta Coal Company	James Barrett	Mystic	Drift	2.9	Longwall	Furnace	Mules	Shipping.
Mystic Block Coal Company	J. E. Milburn	Mystic	Drift	2.9	Longwall	Furnace	Mules	Shipping.
Chas. Knight	Chas. Knight	Plano	Shaft	2.9	Room and pillar	Natural	Horse	Local.
N. H. Nash	N. H. Nash	Walnut City	Shaft	2.9	Room and pillar	Natural	Horse	Local.
R. Campbell	R. Campbell	Brazil	Slope	2.9	Room and pillar	Grate	Mule	Local.
Fenton & Bros	J. Fenton	Milledgeville	Shaft	2.9	Room and pillar	Grate	Horse	Local.
R. L. Darrah	R. L. Darrah	Dennis	Shaft	2.9	Room and pillar	Natural	Horse	Local.
John Raney	John Raney	Dennis	Shaft	2.9	Room and pillar	Grate	Horse	Local.
Sam'l Glick	Sam'l Glick	Dennis	Drift	2.9	Room and pillar	Grate	Horse	Local.
Monitor Coal Company	Bernard B. Stuff	Centerville	Shaft	2.9	Room and pillar	Grate	Horse	Shipping.
J. J. Young	J. J. Young	Milledgeville	Shaft	2.9	Room and pillar	Grate	Horse	Local.
Batey & Jones	Batey & Jones	Milledgeville	Shaft	2.9	Room and pillar	Grate	Horse	Local.
Robert Farris	R. Farris	Milledgeville	Drift	2.9	Room and pillar	Grate	Horse	Local.
Edward Mosby	E. Mosby	Milledgeville	Drift	2.9	Room and pillar	Grate	Horse	Local.
Philby Coal Company	David Philby	Brazil	Drift	2.9	Longwall	Grate	Mule	Shipping.
Matthew Ralston	Matthew Ralston	Plano	Shaft	2.9	Room and pillar	Grate	Horse	Local.
S. G. Houser	S. G. Houser	Seymore	Shaft	2.9	Room and pillar	Grate	Horse	Local.
Darby Coal Company	W. R. Williams	Mystic	Shaft	2.9	Room and pillar	Furnace	Steam	Shipping.
Walnut Block Coal Co., No. 1	J. E. Lee	Centerville	Slope	2.9	Longwall	Furnace	Mules	Shipping.
Walnut Block Coal Co., No. 2	J. E. Lee	Centerville	Slope	2.9	Longwall	Furnace	Mules	Shipping.
Walnut Block Coal Co., No. 3	J. E. Lee	Centerville	Slope	2.9	Longwall	Furnace	Mules	Shipping.
Walnut Block Coal Co., No. 4	J. E. Lee	Centerville	Shaft	2.9	Room and pillar	Furnace	Mules	Shipping.
Walnut Block Coal Co., No. 5	J. E. Lee	Centerville	Shaft	2.9	Room and pillar	Furnace	Mules	Shipping.
Walnut Block Coal Co., No. 6	J. E. Lee	Centerville	Shaft	2.9	Room and pillar	Furnace	Mules	Shipping.
Black Diamond Block Coal Co.	William Orr	Mystic	Drift	2.9	Longwall	Furnace	Mules	Shipping.
Black Diamond Block Coal Co.	William Orr	Mystic	Shaft	2.9	Room and pillar	Furnace	Steam	Shipping.

ADAMS COUNTY.

R. Briscoe	R. Briscoe	Brisco	Shaft	14	Longwall	Grate	Horse	Local.
E. E. Elenwood	E. E. Elenwood	Eureka	Shaft	14	Longwall	Grate	Horse	Local.
Robinson & Gough	J. Robinson	Eureka	Shaft	14	Longwall	Grate	Horse	Local.
James Hartshorn	James Hartshorn	Eureka	Shaft	14	Longwall	Grate	Horse	Local.
B. F. Spurrier	B. F. Spurrier	Eureka	Shaft	14	Longwall	Grate	Horse	Local.
Wm. Hill	William Hill	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Jno. Wilds	Jno. Wilds	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Cullen, Reeds & McKee	Cullen	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Gibson & Bros	J. W. Gibson	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Jacob Amon	J. Amon	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Gibbie & Kaws	Thomas Gibbie	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
Warren Hunter	W. Hunter	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
George Hardin	George Hardin	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
William Chaffee	William Chaffee	Carbon	Shaft	14	Longwall	Grate	Horse	Local.
William Ruth	William Ruth	Carbon	Shaft	14	Longwall	Grate	Horse	Local.

DAVIS COUNTY.

Ely Dye	Ely Dye	Eldon	Slope	4	ft. Room and pillar	Natural	Hand	Local.
Thomas Dial	Thomas Dial	Eldon	Slope	3 to 4	ft. Room and pillar	Natural	Hand	Local.
J. B. Flite	J. B. Flite	Eldon	Slope	3 to 4	ft. Room and pillar	Natural	Hand	Local.
Tip Dotson	Tip Dotson	Eldon	Drift	3 to 4	ft. Room and pillar	Natural	Hand	Local.
W. O. Quigley	W. O. Quigley	Thorle	Drift	4 to 5	ft. Room and pillar	Natural	Hand	Local.
M. J. Graham	M. J. Graham	Belknap	Drift	2	ft. Room and pillar	Natural	Hand	Local.

WAYNE COUNTY.

NAME OF COMPANY, FIRM OR OPERATOR.	SUPERINTENDENT.	P. O. ADDRESS.	Kind of mine.	Thickness of vein—feet, inches.	PLAN OF WORKING MINES.	HOW VENTILATED.	Kind of power used.	Shipping or local trade.
Chicago Coal Company	Phillip Gill	Seymore	Shaft.	2.6	Longwall	Fan	Steam	Shipping
Seymore Coal Company	George Elmore	Seymore	Shaft.	2.6	Longwall	Steam jet	Steam	Shipping
Fry Brothers	L. Fry	Confidence	Shaft.	2.6	Longwall	Grate	Steam	Local
J. Hayhurst	J. Hayhurst	Confidence	Shaft.	2.6	Room and pillar	Grate	Steam	Local
J. L. Atwell	J. L. Atwell	Confidence	Shaft.	2.6	Room and pillar	Grate	Horse	Local
R. Davis	R. Davis	Confidence	Shaft.	2.6	Room and pillar	Grate	Horse	Local
Wm. Reauseau	Wm. Reauseau	Confidence	Shaft.	2.6	Room and pillar	Grate	Horse	Local
James A. Winger	James A. Winger	Harvard	Shaft.	2.6	Room and pillar	Grate	Horse	Local

WARREN COUNTY.

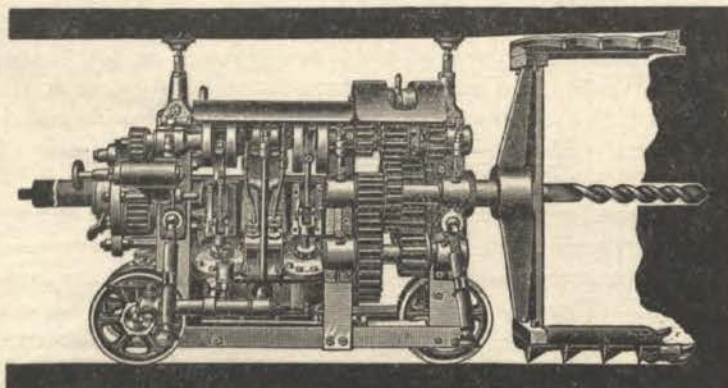
Lumsden & Brothers	James Lumsden	Summerset	Shaft.	3.0	Room and pillar	Fan	Steam	Shipping
D. K. Jones	D. K. Jones	Summerset	Shaft.	3.0	Longwall	Furnace	Horse	Local
Wm. Bemmen	Wm. Bemmen	Summerset	Shaft.	3.0	Room and pillar	Grate	Horse	Local
D. N. Simmons	D. W. Simmons	Summerset	Shaft.	3.0	Room and pillar	Grate	Horse	Local
Lumsden & Son	Wm. Lumsden	Summerset	Slope	3.0	Room and pillar	Grate	Horse	Local
Edward Lord	E. Lord	Summerset	Drift	2.0	Room and pillar	Natural	Hand	Local
Joseph Mitchell	J. Mitchell	Milo	Drift	1.8	Longwall	Natural	Hand	Local
L. Hehan	L. Hehan	Milo	Shaft.	2.6	Longwall	Natural	Horse	Local
Nathan Bales	N. Bales	Milo	Shaft.	1.8	Longwall	Natural	Horse	Local
M. Sneider	M. Sneider	Milo	Drift	1.8	Longwall	Natural	Hand	Local
E. Richmond	E. Richmond	Milo	Drift	1.8	Longwall	Natural	Hand	Local
S. C. Bryant	S. C. Bryant	Milo	Shaft.	1.8	Longwall	Natural	Horse	Local
J. W. Brown	J. W. Brown	Milo	Shaft.	1.8	Longwall	Natural	Horse	Local
Andy Connors	A. Connors	Milo	Drift	1.8	Longwall	Natural	Hand	Local
James Gilbert	James Gilbert	Milo	Drift	1.8	Longwall	Natural	Hand	Local
R. Miller	R. Miller	Lacoma	Slope	1.8	Longwall	Natural	Hand	Local
H. Miller	H. Miller	Lacoma	Drift	1.8	Longwall	Natural	Hand	Local
H. Fogle	H. Fogle	Lacoma	Slope	1.8	Longwall	Natural	Hand	Local
Wm. Johnson	Wm. Johnson	Lacoma	Drift	1.8	Longwall	Natural	Hand	Local
L. Hickman	L. Hickman	Lacoma	Drift	2.0	Longwall	Natural	Hand	Local
George Myers	Geo. Myers	Lacoma	Drift	1.8	Longwall	Natural	Hand	Local

APPANOOSE COUNTY.

There are fifty-seven mines in this county. Forty-two are commercial mines. Eighteen of them are situated on the Chicago, Milwaukee & St. Paul railroad, fourteen on the Keokuk & Western railroad, five on the Chicago, Rock Island & Pacific railroad, and three on Chicago, Burlington & Kansas City railroad. The rest are local mines operated in different parts of the county. Of the above number twenty-three are shafts. Eight have steam for hoisting. Three have the tail rope system of underground haulage. Six are ventilated by fans. The remainder have furnace ventilation. There is but one slope or drift mine using steam power to bring the coal to the surface, which is the Iowa & Missouri Coal Co., at Mystic. There are only four mines using coal mining machines in the first district, and all are in Appanoose county. The following are the companies using them: Diamond Coal Co., at Centerville, use the Legg and Harrison machines; Centerville Coal Co., at Centerville, use the Legg and Harrison machines; Whitebreast Fuel Co., at Forebush, are using the Letchner machines, the Chouteau machine and the Stanley header. The above named machines are all operated with compressed air. The Phillips Fuel Co. operate the Letchner machines, which are run by electric power. The vein of coal in this county is suitable for machine mining, having a fire-clay bottom and a good slate roofing, and needs but little timbering, and need not be set nearer than ten feet from the face, which gives plenty of room to move the machines. The mining is done in the fire clay under the coal. There is but one vein of coal worked in this county, and is the lower vein of the middle coal measures. Its average thickness is about two feet nine inches, and is very uniform, underlying nearly three-fourths of the county, and is found at a depth nowhere to exceed 150 feet. The coal is of excellent quality for steam and domestic purposes and is finding a ready market in Northern Iowa, Minnesota, Dakota and Nebraska. There were shipped out of the state from this county 339,538 tons of coal. The principal places where coal is shipped from are centerville, Cincinnati, Brazil and vicinity, Mystic and Forebush. There is no powder used in mining the coal in this county.

The number and kind of machines in use in this county are as follows: Harrison, eight; Legg, six; Letchner, five; Chouteau, three; Stanley headers, two. Total—Twenty-four.

THE STANLEY HEADING MACHINE FOR CUTTING ENTRIES INTO COAL MINES.



The accompanying cut shows the header at work in an entry, its cutting arms just entering the coal. This machine possesses great advantage in time and expense over ordinary methods of driving entries by hand. It makes more rapid progress, reduces the cost per foot of entry driven, leaves a firmer roof while driving it forward and reduces the cost of explosives.

This machine is doing excellent work at Forebush mines, where two of them are now in use. They have made fifteen feet per day of ten hours, which however they expect to surpass when the men become more familiar with the machine. The work at Forebush has been in a vein of thirty inches of coal separated by a band of slate two inches thick, and cutting into a slate roof eighteen inches and the same distance into fire clay bottom. In some parts of the entry the cut ran up two or three inches into the limestone or cap rock above the slate roof. But by a simple device for easing the work when cutting in particularly hard formations such as coal containing sulphur, or with a very hard roof or floor, the machine will do the work without difficulty. This machine cuts a circular entry five feet in diameter, the core is wedged or blasted down as required.

Other important and economical improvements are being brought into use, such as self-dumping cages. The Ramsey box car loader and the Mitchell patent coal tippie, which is one of the best arrangements for dumping coal ever contrived. It is so constructed that the loaded car tips over automatically, its speed being regulated by a brake, the handle of which is in easy reach of the dumpman.

After the car is empty it falls back in place and the advancing loaded car strikes a spring which throws the tip outward. The loaded car then strikes the empty one standing on the tippie and pushes it forward out of the way, the tip iron then springs back in place and holds the loaded car which is dumped in turn. Only one man is required to do the dumping and he could easily manage a thousand mine cars a day. The empty cars are switched back out of the way by gravity.

ADAMS COUNTY

Has fifteen mines in operation during the winter season. They are all shaft mines and are from forty to one hundred feet in depth. There is but one being worked in this county which is eighteen inches thick. Horse power is used exclusively to bring the coal to the surface which is all sold at local sales. The principal points where mining is done are Carbon, Eureka and Briscoe. The nearest railroad town is Corning, on the Chicago, Burlington and Quincy Railroad. It is believed by experts that there are other veins underlying this one, but the prospecting that has been done have never reached sufficient depth to determine the matter satisfactorily. The coal measures are no doubt from six hundred to one thousand feet thick in southwestern Iowa.

DAVIS COUNTY

Has six mines in operation, they are located in the northeastern part of the county and are operated in the middle vein which is from three to four feet thick and of excellent quality both for steam and domestic purposes. The coal is mined for local consumption.

LUCAS COUNTY

Has no commercial mines since the Whitebreast Fuel Company's mines at Cleveland were abandoned in May, 1891. There are four small mines in operation near Chariton for local in the winter season. There is no doubt but that large coal fields exist north and south of Chariton, but are some distance from railroads.

MONROE COUNTY

Has eighteen mines in operation in the winter season. Of these ten are shafts and eight are slopes, fourteen of them are commercial mines, ten have railroad facilities for shipping their coal,

four haul their product to the railroads with teams, nine use steam power to bring their coal to the surface, six are ventilated by fans, the remainder by furnace. The principal points where mining is done are, Albia, Hiteman, Coalfield, Hickory, Fredric, Avery and Foster. The deepest shaft is at Foster, being one hundred and ninety-six feet. There are three mines operating in the middle vein, which is about three feet thick and of excellent quality. Two of these are at Fredric and one at Foster. The other commercial mines are operated in the lower vein, which is from four to six feet thick and excellent coal for steam purposes. The mines in this county are generally dry, some of them quite dusty and have to be sprinkled.

PAGE COUNTY.

The mines in this county are operated for local trade. The vein is from eighteen to twenty-four inches thick, and is worked both by shafts and slopes. There is a good demand for the coal in the winter season. It is claimed that there are other veins underlying this one.

TAYLOR COUNTY.

There are twelve mines in this county and all are shaft, from twenty-five to one hundred and thirty feet deep. Horse power is used at them all. The vein is eighteen inches thick. The principal mining point is Newmarket. There are four mines here that have facilities for shipping their coal on the Humeston & Shenandoah railroad; the remainder are operated for local trade.

WAPELLO COUNTY

Has twenty mines in operation in the winter season. The production of coal in this county has been greatly reduced since the abandonment of the Wapello Coal Co. mines at Kirkville, and the Phillips Fuel Co. No. 1 Mine at Ottumwa. There have been three new commercial mines opened up in this county in 1891 namely: The Whitebreast Fuel Co., Mine No. 22 at Keb; Phillips Fuel Co., Mine No. 3 at Willard; The Appanoose Coal and Fuel Co., Mine at Appanoose, which makes six commercial mines in the county, all use steam power and are operated in the lower vein which is from four to six feet thick. Fans are used for ventilation at all of the commercial mines with the exception of the new mine at Willard. The local mines use horse power, with the exception

of three namely: The Baker, Sugar Creek, and Stires mine which use steam power. There is considerable prospecting being done in this county, and the prospect is good for more mines being opened the coming year. The shipping facilities from this county are excellent and there are no reasons why the production of coal should not again come up to and exceed former years. There is no question but there are large fields of coal both in the southern and western parts of the county which only needs developing.

WAYNE COUNTY

Has eight mines in operation; two are commercial mines, the Chicago Coal Company and the Seymour Coal Company, and are located at Seymour. The Chicago Coal Company has facilities for shipping coal on the Chicago, Rock Island & Pacific and the Chicago, Milwaukee & St. Paul railroads. The Seymour Coal Company has facilities for shipping their coal on the Chicago, Rock Island & Pacific railroad. These two shafts are now the deepest mines in the First district, being 244 feet deep. Five of the local mines are located in the northeast part of the county and one near Harvard. All are worked in the lower vein of the middle coal measures and the coal is about two feet six inches thick, and is a good coal for both steam and domestic purposes.

WARREN COUNTY

Has twenty-four mines in operation in the winter season. They are located in the vicinity of Summersett, Milo and Lacona. They are small local mines employing from two to ten men each in the winter season. The mine at Ford, on the Chicago, Burlington & Quincy railroad, is being cleaned up and put in order for a shipping mine, which is the only one now in this county.

NAMES AND DESCRIPTION OF MINES IN DISTRICT NO. 1.

APPANOOSE COUNTY.

DIAMOND.

Is a shaft mine owned and operated by the Diamond Coal Co., is located at Centerville, on the Chicago, Rock Island & Pacific railroad. Entries are driven double and a new fan 14 feet in diameter has lately been erected, which will give them a large volume of air; roads are clean and dry. They have safety catches and covers on cages and brake on drum. The Legg & Harrison Mining machines are in use at this mine, and are run by compressed air. They have escape shaft 300 feet northeast of main shaft. The tail rope system of underground haulage is used. Ninety per cent of the output of this mine is machine coal.

W. W. OLIVER,
President.

A. DARGAVEL,
Superintendent.

JAMES STEVENS,
Mine Boss.

NATIONAL.

This shaft is located at Centerville, on the Chicago, Rock Island & Pacific railroad, is owned and operated by the National Coal & Mining Co. Is ventilated by steam jet. They have safety catches and covers on cages and brake on drum and ladders in escape shaft. This is the oldest commenced mine in the county.

GEORGE BAKER,
General Manager.

E. J. Richardson operates a shaft mine at Centerville, for local trade. The equipments of this mine are in good order and comply with the law. They have second opening with horse power and cable attached.

STANDARD.

Is owned and operated by the Standard Coal Co., and is located at Centerville, on the Chicago, Rock Island and Keokuk & Western railroads. Entries are driven double, ventilated by fan, have safety catches and covers on cages and brake on drum, have escape shaft with horse power and cable attached. Tail rope system of underground haulage is used.

GEORGE MERRITT,
General Manager.

BROUGH,
Mine Superintendent.

HICKORY.

Is a shaft mine operated by the Lone Coal Co., is situated at Hickory Hill, on the Keokuk & Western railroad. They have escape way by slope, is ventilated by furnace.

S. S. LANE,
General Superintendent.

SCANDINAVIAN.

Is a shaft situated at Centerville, on the Keokuk & Western railroad, is owned and operated by the Scandinavian Coal Co. Entries are driven double is ventilated by fan 12 feet in diameter. They have safety catches and covers on cages and brake on drum. Escape way is by shaft with horse and cable attached.

T. J. GREEN,
General Superintendent.

ELDON, No. 2.

Is owned and operated by the Eldon Coal Co., and located at Shawville, on the Chicago, Rock Island & Pacific Railroad; entries are driven double; is ventilated by fan; they have safety catches and covers on cages and brake on drum; have escape with horse power attached; roads are clean and dry; the equipments are all new and in good order.

GEORGE DAUM,
General Manager.

JOHN MORRIS,
Mine Superintendent

CINCINNATI.

Is situated at Cincinnati; is owned and operated by the Cincinnati Coal Co.; is ventilated by grate; the product of this mine is hauled with teams to Cincinnati and shipped on the Burlington & Kansas City Railroad; they have safety catches and covers on cages and ladders in escape shaft.

C. C. CALKER,
Superintendent.

APPANOOSE.

Is owned and operated by the Appanoose Coal Co.; is situated at Cincinnati, on the Chicago, Burlington & Kansas City Railroad; is ventilated by steam jet; they have escape shaft with horse power attached; safety catches and covers are on cages and brake on drum.

E. S. MARSH,
Superintendent.

STAR.

Is owned and operated by James Wilson and located at Centerville; coal is sold at local sales; the equipments are in order; they have escape shaft with step ladders in it and safety catches on cages.

ANCHOR.

Is located at Centerville, on the Keokuk & Western Railroad, and operated by the Anchor Coal Co.; is ventilated by furnace; they have second opening stairway in it; the equipments are in good order; safety catches and covers are on cages and brake on drum.

JAMES WILSON,
Superintendent.

CENTERVILLE.

Is owned and operated by the Centerville Coal Co. and is situated at Relay, on the Keokuk & Western and Iowa Central Railroads; entries are driven double and ventilated by fan, which is fourteen feet in diameter and has lately been erected; they have safety catches and covers on cages; brake on drum; have second opening with horse power and cable attached. The Legg and Harrison mining machines are in use at this mine and are operated by compressed air.

F. C. DRAKE,
President.

J. C. LEE,
General Manager.

WM. PHILLIPS,
Mine Superintendent.

THISTLE.

Is a shaft mine, located at Cincinnati, on the Chicago, Burlington & Kansas City Railroad; is owned and operated by the Thistle Coal Co., and is worked on the double entry system and ventilated by furnace; they have escape shaft with horse power and cable ready for use; the equipments are in good order.

DAVID DINNEY,
President.

DAVID BOWIE,
Secretary.

DAVID STEELE,
Superintendent.

PEARL.

Is owned and operated by the Pearl Coal Company, and is situated three miles south of Cincinnati, on the Chicago, Burlington and Kansas City railroad; is ventilated by furnace; horse power is used to bring the coal to the surface.

ROCK ISLAND.

Is situated at Numa, on the Chicago, Rock Island and Pacific railroad, and is owned and operated by the Rock Island Block Coal Company. Entries are driven double and ventilated by furnace. They have safety catches and covers on cages and brake on draw. They have horse power and cable at escape shaft.

W. A. JONES,
Superintendent.

GLADSTONE.

Is a shaft mine owned and operated by the Gladstone Coal Company; is situated at Jerome, on the Chicago, Milwaukee and St. Paul railroad. Entries are driven double and ventilated by furnace. They have a good escape shaft with step-ladders in it.

ROBERT MARSDEN,
Superintendent.

PARKER.

Is a local mine located at Livingstone, and operated by B. B. Parker; is ventilated by furnace. They have horse power and cable at escape shaft.

PHILLIPS FUEL COMPANY, No. 4.

Is a shaft mine located at Diamond, on the Chicago, Milwaukee and St. Paul railroad, and is owned and operated by the above-named firm; is ventilated by steam jet. Three Letchmer electric mining machines are in use at this mine. The estimate of the number of tons of coal mined by these machines could not be given without doing them an injustice, owing to the difficulties which the company have experienced in the past few months. They have an escape way by slope.

WILLIAM FOULKES,
General Superintendent.

J. RYAN,
Mine Boss.

PHILLIPS FUEL COMPANY, No. 5.

This mine is also the property of the Phillips Fuel Company, and operated by them; is located near Diamond. The product of this mine is shipped on the Keokuk and Western railroad. The air-shaft at this mine is 6x6 feet, and lined with brick the whole depth; is ventilated by furnace.

WILLIAM FOULKES,
General Superintendent.

FRANK FOLBERT,
Mine Boss.

PHENIX.

Is a slope mine, situated at Brazil, on the Keokuk and Western railroad; is owned and operated by the Phoenix Coal Company. They have escape with stairway in it; is ventilated by furnace. Mules are used to bring the load to the surface.

JOSEPH TURNER,
Superintendent.

TIPTON.

Is a slope mine owned and operated by the Tipton Coal Co. Is situated at Brazil, on the Keokuk & Western railroad. They have escape way by adjoining mine, is ventilated by furnace.

THOMAS PHILLIPS,
Superintendent.

SILKNETTER No. 1.

Is situated at Brazil on the Keokuk & Western railroad. Is owned and operated by B. F. Silknetter, has an escape shaft and is ventilated by furnace. Mule power is used.

B. F. SILKNETTER,
Superintendent.

SILKNETTER No. 2.

Is a slope mine located near Mystic, on the Chicago, Milwaukee & St. Paul railroad, is owned and operated by B. F. Silknetter, and ventilated by furnace.

LONE STAR.

Is located within the city limits of Mystic, and has facilities for shipping coal on the Chicago, Milwaukee & St. Paul railroad. Is owned and operated by the Lone Star Coal Co. Entries are driven double, is ventilated by furnace, have escape way by adjoining drift.

JOHN SEDDON,
Superintendent.

BROWN & BOWERS.

Is a new drift mine situated at Mystic, on the Chicago, Milwaukee & St. Paul railroad. Is owned and operated by Brown & Bowers. They have escape by shaft and stairway. Ventilation is by furnace.

MYSTIC.

This mine is within the city limits of Mystic, and is owned and operated by Mystic Coal & Mining Co. Main entries are driven double, is ventilated by furnace. They have escape shaft with ladders in it. The air shaft at this mine is 6x6 feet and is lined with brick the whole depth.

JAMES SEDDON,
General Manager.

IOWA.

This mine is within the city limits of Mystic. Is a slope using steam power to bring the coal to the surface. Is owned and operated by the Iowa and Missouri Coal Co. The air shaft at this mine is 7x7 feet, furnace is 4x6 feet and the largest in the county. Have an escape way by slope.

THOMAS WOODSON,
Mine Superintendent.

LODWICK No. 1.

This slope mine is located at Mystic, on the Chicago, Milwaukee & St. Paul railroad. Is owned and operated by Lodwick & Bros., has an escape shaft and is ventilated by furnace.

LODWICK BROS.,
Managers.

DRIFT, No. 2.

Is owned and operated by the same officials; is located at Mystic, on the Chicago, Milwaukee & St. Paul Railroad; have second opening and is ventilated by furnace; mules are used to bring the coal to the surface.

CLARK.

Is a shaft mine, situated two miles east of Mystic, on the Chicago, Milwaukee & St. Paul Railroad; is owned and operated by Clark & Sons; entries are driven double; is ventilated by furnace; has escape shaft with ladders in it; equipments are in good order.

MYSTIC BLOCK.

This drift mine is located at Mystic, on the Chicago, Milwaukee & St. Paul Railroad; they have second opening and ventilated by furnace; is owned and operated by the Mystic Block Coal Co.

WALNUT BLOCK, No. 1.

Is a slope mine, situated at Brazil, on the Keokuk & Western Railroad; is owned and operated by the Walnut Block Coal Co.; has lawful escape-way, and is ventilated by furnace.

WALNUT BLOCK, No. 2.

Is a slope mine and the property of the same company and managed by the same officials, and situated at Brazil, on the Keokuk & Western Railroad; has escape-way by slope, and is ventilated by furnace.

WALNUT BLOCK, No. 3.

Is a slope mine and is owned and operated by the same company; is located one-half mile west of Brazil, on the Keokuk & Western Railroad; entries are driven double; has escape shaft with step-ladders in it; ventilation is by furnace.

WALNUT BLOCK, No. 4.

Is a shaft mine, situated one mile east of Mystic, on the Chicago, Milwaukee & St. Paul Railroad; is owned and operated by the Walnut Block Coal Co., and ventilated by furnace; has an escape-way by slope; equipments are in good order.

WALNUT BLOCK, No. 5.

Is a new shaft mine, owned and operated by the Walnut Block Coal Co.; is situated one mile west of Mystic, on the Chicago, Milwaukee & St. Paul Railroad.

WALNUT BLOCK, No. 6.

Is a new shaft mine, owned and operated by the above named firm. Is situated one mile west of Mystic, on the Chicago, Milwaukee and St. Paul railroad. Shafts No. 5 and 6 have just been sunk, and entries are being

driven towards each other; when connected will make escape way for both shafts. Horse power is used to bring the coal to the surface.

WALNUT BLOCK, No. 7.

Was formerly owned by the Henrietta Coal Company, but is now owned and operated by the Walnut Block Coal Company. Is a drift mine, located at Mystic, on the Chicago, Milwaukee and St. Paul railroad. They have secured opening by slope. Ventilation is by furnace.

J. E. LEE,

General Manager for the Walnut Block Coal Company.

BLACK DIAMOND, No. 1.

Is a drift mine, owned and operated by the Black Diamond Block Coal Company. Is situated at Mystic, on the Chicago, Milwaukee and St. Paul railroad. Has an escape way by adjoining slope. Ventilation is by furnace.

A. ORR,

President.

WM. ORR,

Superintendent.

NO. 2.

Is a new shaft mine owned and operated by the same company and managed by same officials. Is situated two miles east of Mystic, on the Chicago, Milwaukee and St. Paul railroad. The equipments of the mine are all new. Second opening will be made as soon as the entries are driven the proper distance from Main Shaft.

PHILBY.

Is a drift mine situated at Brazil, on the Keokuk and Western railroad. Has an escape way by drift. Ventilation is by furnace. Mules are used to bring the coal to the surface.

DAVID PHILBY,

Superintendent.

MONITON.

This shaft is located at Centerville; is owned and operated by the Monitor Coal Company. Part of the product of this mine is hauled to the railroad with teams and shipped to Western markets; the remainder is sold at local sales. They have safety catches and covers on cage. Have second opening by adjoining shaft.

B. STUFFS,

Superintendent.

DARBY.

Is a new shaft mine, situated at Darby, on the Chicago, Milwaukee & St. Paul Railroad; the equipments of this mine are all new; has safety catches and covers on cages and brake on drum; will make second opening soon as the entries are driven the proper distance from main shaft.

W. R. WILLIAMS,

Superintendent.

Charles Knight, N. H. Nash, R. Campbell, Fenton & Bros., R. L. Darrah, John Raney, Samuel Glick, J. J. Young, Batey & Jones, Robert Faries, Edward Mosby, Mathew Rolston, and S. G. Howser, operate local mines in this county. Location and postoffice address are given in the tabulated statements of this report.

WHITEBREAST FUEL CO., No 19.

Is a new shaft mine, owned and operated by the above named company; is situated at Forebush, on the Iowa Central Railroad; entries are driven eighty feet wide and in pairs, and the roofing is taken down to the cap-rock, which makes large, roomy air-ways and hauling roads; the ventilation is by a double Murphy fan; they have a good escape shaft with stairway in it; the equipments are complete, having safety catches and covers on cages and brake on drum; the cages are self-dumping, of the Ramsey patent; the Letchner and Clowteau mining machines are in use at this mine, also the Stanley Header, and all are operated by compressed air; these machines have been in use but a short time by this company, and the amount of work they can do has not as yet been definitely determined by this company.

J. T. PHILLIPS,

General Superintendent.

JAKE HOLLAND,

Mine Superintendent.

ADAMS COUNTY.

BRISCOE.

Is owned and operated by Richard Briscoe for local trade. Is situated at Briscoe, near the north line of the county. Vein is sixteen inches thick. Horse power is used to bring the coal to the surface. They have an escape shaft with step-ladders in it.

WINDY HILL.

Is a shaft mine operated by E. E. Ellenwood & Company for local trade. Vein is sixteen inches thick. They have an escape shaft with horse power attached, and horse power is used to bring the coal to the surface. Located near Eureka.

EUREKA.

Is a shaft mine operated by Robinson & Cough, near Eureka, for local trade. Vein sixteen inches thick. Horse power is used.

James Hartshorn operates a small shaft mine near Eureka for local trade. Vein sixteen inches thick. Horse power.

LIPPERT.

Is a shaft mine operated by B. F. Spurrier for local trade. Located four miles northeast of Cubon. Horse power is used to hoist the coal.

 ADAMS COUNTY.

HOUCK.

Is a shaft mine located at Carbon, and operated by John Wilds for local trade. They have escape shaft with ladders in it. Vein is sixteen inches thick. Horse power.

CARBON.

This shaft is operated by the Carbon Coal Company for local trade. Is located at Carbon. Vein is sixteen inches thick. Horse power is used to bring the coal to the surface.

J. W. GIBSON,
Superintendent.

JONES.

Is a new shaft mine operated by William Ruth for local trade; is located at Carbon. Horse power. Vein sixteen inches thick. They have an air shaft already sunk to the coal. Will make the connection soon as possible.

CHURCH MINE.

This is a shaft mine located at Carbon. Has been in operation three years. Coal is sold at local sales. Vein is sixteen inches thick. Worked on the long wall system. Ventilated by grate. They have an escape shaft with ladders in it.

WILLIAM HILL,
Superintendent.

 ADAMS COUNTY.

Jacob Armon operated a shaft mine at Carbon for local trade but it was worked out and abandoned a short time ago.

Karns & Gebbin operates a shaft mine at Carbon for local trade, vein sixteen inches thick. Horse power is used to hoist the coal; ventilated by grate.

CHAFFEE.

Is a shaft mine located near Carbon and operated by William Chaffee for local trade. Horse power is used to bring the coal to the surface.

NEIL.

□ Is a shaft mine operated by Warren Hunter for local trade, located three miles southeast of Carbon. Have an escape way by adjoining shaft. Horse power is used.

HAZEL DELL.

This shaft is operated for local trade by George Harden. Horse power is used to hoist the coal. Vein sixteen inches thick; have an escape way by adjoining shaft.

 DAVIS COUNTY.

ELY DYE.

This slope is located four miles southwest of Eldon. It does a local trade in the winter season.

THOMAS DIAL.

This slope is located four miles west of Eldon. Is operated for local trade.

J. B. FITE.

This mine is located three miles southwest of Eldon. Is operated for local trade in the winter season.

Tip Dotson operates a drift mine for local trade three miles southwest of Eldon.

W. C. Quigley operates a drift mine near Floris for local trade in the winter season.

W. J. GRAHAN.

Is a drift mine located four miles north of Belknap, and operated for local trade.

LUCAS COUNTY.

WHITEBREAST.

The Whitebreast Fuel Company's Shaft No. 2 was operated on the double-entry plan with tail rope haulage. Was worked out and abandoned May —, 1891. Located at Cleveland, on the main line of the Chicago, Burlington and Quincy railroad.

The No. 3 mine of the same company was worked on the same system. Was abandoned —, 189—. The plant of this mine has all been removed to the last named company's new mine, No. 2, at Keb, in Wapello county.

L. J. PHILLIPS,
General Superintendent.

WILLIAMSON BROS.

This shaft mine is located near Chariton and does a local business in the winter season.

John Wilson operates a drift mine north of Chariton for local trade in the winter season.

THOMAS SMITH.

This drift mine is located near Chariton; is operated for local trade.

James Hall operates a drift mine near Chariton for local trade.

MONROE COUNTY.

SMOKEY.

Is a slope mine owned and operated by John Evans. Is located at Avery, and has a standard-gauge track laid to the mine and a locomotive is used to haul the coal to the main line of the Chicago, Burlington and Quincy

railroad. Steam power is used to bring the coal to the surface. Entries are driven double. Ventilation is by furnace. Has escape shaft with ladders.

JOHN EVANS,
General Manager.

P. HYNES,
Mine Boss.

CREDLEBAUGH.

Is a slope mine operated by Joseph Moyle; is located near Avery. Coal is hauled to Avery with teams and shipped on the Chicago, Burlington and Quincy railroad. Is ventilated by furnace.

J. Brewer, Frank White and David King operate a small drift mine near Albia for local trade.

ENTERPRISE.

This is a shaft mine owned and operated by the Enterprise Coal Company. The south side of this mine is being rapidly worked out. They are opening the north side as fast as possible. Entries are driven double. They have second opening with stairway in it. Is ventilated by a ten-foot Brazil fan. Safety catches and covers are on cages and brake on drum.

THOMAS LEWS,
General Superintendent.

PLEASANT VALLEY.

Is a slope mine situated at Coalfield, on the Iowa Central railroad. Entries are driven single. Is ventilated by furnace. Steam power is used to bring the coal to the surface.

D. A. MATER,
Superintendent.

SOAP COAL COMPANY.

Shaft No. 1 is located at Foster, on the Chicago, Milwaukee and St. Paul railroad. Is worked on the double-entry system and ventilated by a force and exhaust fan twelve feet in diameter. They have an escape shaft with stationary engine. Draws and cable ready for use in case of accident at main shaft. The equipments are all in order and comply with the mining laws.

O. H. FUGLE,
General Manager.
ROBERT HUGHES,
Mining Supt.

SLOPE No. 2.

Is owned and operated by the same company and managed by the same officials, and has facilities for shipping coal on the same railroad, is worked on the long wall system and ventilated by furnace. Vein of coal is three feet thick.

PROSPECTING CO.

Is a shaft mine located near Foster. Is operated for local trade by the Monroe Coal & Prospecting Co. Vein of coal is from four to five feet thick

JACK OAK.

This shaft mine is owned and operated by the Iowa and Wisconsin Coal Co., and situated two miles west of Albia, on the Chicago, Burlington & Quincy railroad, is worked on the double entry system and ventilated by a forcing fan ten feet in diameter. The fan at this mine was removed in June and set up at quarter shaft, with expansion casing, which greatly increased the volume of air. They put on new iron cages with safety catches and covers on them. A tunnel has been made from top of escape the lawful distance from the buildings. The equipments of this mine are all in good order.

J. D. McMILLAN,
General Manager.
JOHN WHITE,
Mine Superintendent.

AKERS.

Is a shaft mine operated by Charles Akers, is located near Fredric, and worked on the long wall system; is ventilated by furnace. Coal is hauled to Fredric with teams and shipped on the Chicago, Burlington & Quincy railroad to western markets.

Wilson & Baxter are opening a new shaft mine near Fredric. Coal is hauled with teams to the Chicago, Burlington & Quincy railroad and shipped to western markets.

CHISHOLM.

Is a shaft mine located at Chisholm, and has been idle several months. It is expected the mine will be in operation again soon. Is ventilated by fan; has second opening.

HICKORY.

This mine is located at Hickory, on the Iowa Central railroad. They have an escape shaft with winding stairway in it, is ventilated by fan and worked on the room and pillar system.

CHARLES BLOOMFIELD,
Superintendent.
WILLIAM JAMISON,
Mine Boss.

CHICAGO.

Is a shaft mine situated at Cedar, on the Chicago, Burlington and Quincy railroad. Entries are driven double and ventilated by furnace. They have second opening with ladders in it. Safety catches and covers are on cages, and brake on drum.

WILLIAM RICHARDSON,
Superintendent.

WAPELLO, No. 1.

Is a new shaft mine located at Hiteman, on the Chicago, Burlington and Quincy railroad. Is owned and operated by the Wapello Coal Company. The equipments of this mine are all first class and comply with the mining laws. Entries are driven double and ventilated by fan fourteen feet in diameter. Air shaft is 7x14 feet in clear. They have escape shaft with hoisting engine and cable ready for use.

H. L. WATERMAN,
General Manager.
WM. HAINES,
Superintendent.
HARRY PLASTERS,
Mine Superintendent.

RULES AND REGULATIONS OF WAPELLO COAL AND MINING COMPANY.

CODE OF BELL AND WHISTLE SIGNALS.

I.

- 1 Short Ring Hoist
- 1 Long Ring Stop
- 2 Short Rings Cage not Landed
- 3 Short Rings Empty Cage
- 4 Short Rings Men on
- 5 Short Rings Mules on

II.

The hoisting engine is at all times in charge of a competent engineer, and under no circumstances whatever must anyone besides the regular engineer in charge attempt to hoist or lower the cages, or to handle the engine in any manner without instructions to that effect from the superintendent.

III.

The engine room, offices, and shops of the company are erected for business purposes only, and are not to be used as loafing places.

IV.

All inside tools when needing sharpening or repairing should be brought to the bottom of the shaft. From there they will be hoisted, sharpened and returned to the bottom. Tools will be hoisted at 11 a. m. and 4 p. m.

V.

Men will be hoisted at the following hours :

- 6:45 a. m. to 7:00 a. m.
- 11:45 a. m. to 12:00 a. m.
- 12:35 p. m. to 12:50 p. m.
- 5:45 p. m. to 6:00 p. m.

SATURDAYS.

- 4:45 p. m. to 5:00 p. m.

VI.

No one except the cagers at the bottom and the dumpers at the top are allowed to use the hoisting signals.

VII.

No more than eight men shall be hoisted or lowered on one cage at one time.

VIII.

No one except the cagers, and they only when their duty requires it, must cross the shaft, on the cages or otherwise. There is a manway around the shaft for that purpose.

IX.

At least one cager should remain at the bottom until the men are all hoisted, but this does not require him to remain at his post an unreasonable time after the regular quitting hour.

X.

When the last cage of men is hoisted the cager should, as soon as he is on top, report to the hoisting engineer so that he may know that the men are all out.

XI.

All of the entries in the mines of this company are to be driven by sights, and not by guess. If from any cause sights should be shot out, or in any manner moved, it is the duty of the men working in that entry, or anyone knowing of the fact, to report the same to the mining engineer in charge whose duty it is to replace them at once.

XII.

It is the duty of employes to report at once any defect in the working of machinery signals, etc., to the superintendent.

XIII.

All employes must obtain permission of the person under whom they are working before "laying off" on a regular working day.

XIV.

Each day's time is posted in the time case at the shaft and each day man must each day see that his time for the preceding day is correct, and if not, report the same to his time-keeper and have it corrected then and there. The company will not be responsible for any mistakes in the time unless reported within 48 hours from the time it is posted.

XV.

The co-operation of all employes is necessary that the best results may be attained.

Approved.

Superintendent.

General Manager.

PAGE COUNTY.

FULK.

Is a shaft mine operated by C. G. Fulk, near Shambaugh for local trade. Horse-power is used to bring the coal to the surface.

PEARSON.

This shaft mine is operated by Pearson & Bro. for local trade, is located two miles southeast of Clarinda.

Charles Hain operates a shaft mine at Shambaugh for local trade in the winter season.

TAYLOR COUNTY.

ANDERSON No. 1.

Is owned and operated by Benjamin Anderson and located at New Market on the Humeston & Shenandoah railroad and has facilities for shipping coal on said line. Is worked on the longwall system and ventilated by furnace. Horse power is used to bring the coal to the surface. Depth of shaft 132 feet.

ANDERSON No. 2.

Is a shaft owned and operated by the same parties and has facilities for shipping on the above named railroad and is worked on the longwall system and ventilated by furnace. Horse power is used at this mine.

ANDERSON No. 3.

Is a shaft mine adjoining No. 2, and is owned and operated by the same parties and worked on the same system and ventilated by furnace. These shafts are about of the same depth; the vein of coal is sixteen inches thick in each shaft.

BEN ANDERSON,
General Manager.

CAMPBELLS

Is a shaft owned and operated by Campbell & Sons, located two miles east of Newmarket, vein sixteen inches thick; coal sold at local sale; horse-power is used.

Lathrop & Easter operate a shaft two miles east of Newmarket for local sales; vein sixteen inches thick; horse-power is used.

ADAMS

Is a shaft mine, operated by Roderick Campbell, Jr., for local trade; vein sixteen inches thick; horse-power is used.

BEAN

Is a shaft mine, operated by Rhoderick Campbell, Jr. Part of the output of this mine is shipped on the Humeston and Shenandoah railroad, the remainder sold at local sales; vein sixteen inches thick; horse-power.

GUS MINE.

This shaft is operated by Nathan Wilcox for local trade; is situated twelve miles south of Villisca; vein sixteen inches thick; horse-power.

MACKLEY

Is a shaft Mine, operated by H. C. Mackley for local trade; located ten miles south of Villisca; vein sixteen inches thick.

Isaac Ankeny operates a shaft mine, for local trade, twelve miles south of Villisca. John Bomar, and Burnside & Conlough operate small shaft mines for local trade in the winter season; vein sixteen inches thick; located twelve miles south of Villisca.

WAPELLO COUNTY.

ELDON No. 1.

Is owned and operated by the Eldon Coal and Mining Company. Is situated four miles west of Eldon, on the Chicago, Milwaukee & St. Paul Railroad. Entries are driven double, and ventilated by a forcing fan fourteen feet in diameter. They have safety catches and covers on cages, and brake on drum. Second opening is by shaft, with horse power and cable.

GEORGE DUNN, *General Manager.*
SAMUEL SMITH, *Superintendent.*

HAWKEYE.

This shaft is owned and operated by the Hawkeye Coal and Mining Company. Is situated on Chicago, Milwaukee & St. Paul Railroad, one and one-half miles northwest of Ottumwa. Entries are driven double; is ventilated by a forcing fan. They have second opening, with stairway in it. Safety catches and covers are on cages, and brake on drum.

A. C. CAUGHLAN, *General Manager.*
CHARLES GRANT, *Mine Superintendent.*

BLACK DIAMOND

Is a new shaft mine, owned and operated by Sumsden & Bro.; located one mile northwest of Ottumwa. Entries are driven double, and ventilated by furnace. Safety catches and covers are on cages. They have second opening with stairway in it.

PHILLIPS FUEL CO. No. 2

Is a shaft mine owned and operated by the Phillips Fuel Company, and situated one and one-half miles northwest of Ottumwa on the Chicago, Milwaukee & St. Paul Railroad; is worked on the double entry system, and ventilated by fan; have second opening, with ladders in it. Safety catches and covers are on cages, and brake on drum. The tail system of underground haulage is in use at this mine

WM. FOULKES, *General Superintendent.*
J. J. EVANS, *Mine Boss.*

No. 3

Is a new shaft owned and operated by the same company; is situated at Willard, on the Chicago, Milwaukee & St. Paul Railroad; is worked on the double entry system. The equipments of this mine are all new, and comply with the mining law; have second opening, with horse power and wire cable attached.

WM. FOULKES, *General Superintendent.*
CHARLES ROCKEFELLER, *Mine Boss.*

No. 6

Is a shaft mine, owned and operated by the same company; is situated at Appanoose, on the Chicago, Milwaukee & St. Paul Railroad. Entries are driven double; ventilation is by a force and exhaust fan. They have escape shaft with stairway in it. The equipments are all in order, and comply with the mining laws.

WM. FOULKES, *General Superintendent.*
H. B. REED, *Mining Boss.*

WHITEBREAST No. 22

Is a new shaft mine owned and operated by the Whitebreast Fuel Co., and is situated five miles northwest of Ottumwa on a branch road of the Chicago, Burlington & Quincy railroad. The equipments of this mine are in good order. Entries are driven double; ventilation is by a forcing fan

twenty feet in diameter, set with expansion casting. Safety catches and covers are on cages and brake on drum. They have escape shaft with stairway in it.

T. J. PHILLIPS, *Gen'l Supt.*
JOHN LUKES, *Mine Supt.*

BAKER.

Is a shaft mine operated by Baker & Adams for local trade. Is located four miles northwest of Ottumwa. Entries are driven double; is ventilated by fan. They have escape shaft with ladders in it.

FARMERS

Is a new shaft mine owned and operated by John Daniels for local trade. Is situated five miles northwest of Ottumwa. Will make second opening when entries are driven the proper distance. Horse power is used.

BIRCH

Is a new shaft mine operated by Birch & Bros. Is situated three miles southeast of Ottumwa and operated for local trade. They are sinking a new and larger hoisting shaft, and will use the present one for escape shaft. Entries are driven and ventilated by furnace.

CO-OPERATIVE

Is a shaft mine owned and operated by the Ottumwa Co-operative Coal & Mining Co. for local trade. They have second opening with stairway in it.

STIRES.

This shaft is situated three miles southeast of Ottumwa and operated for local trade. Steam power is used. They have second opening with stairway in it; ventilated by steam jet.

G. W. STIRES, *Supt.*

J. Vanderpool, John Rivers, Frank Waddel, Jacob Ream, Gideon Dotts, W. McGlothlin, A. L. Gooden, Ab Majons, operated local mines in this county. Location and post-office address are given in the tabulated statements of this report.

WARREN COUNTY.

Ford Coal Co., operates a drift mine at Ford; has facilities for shipping coal on the Albia & Des Moines branch of the Chicago, Burlington & Quincy railroad. This mine remained idle for two years previous to the company taking charge of it. Steam power is used and is ventilated by furnace.

JONES.

Is a shaft mine located two and one-half miles east of Summerset, and operated for local trade; has escape shaft with step ladders in it. Ventilated by grate.

D. K. JONES, *Superintendent.*

BENNUM.

Is a shaft mine operated for local trade, is located two and one-half miles east of Summerset; has second opening with step ladders in it.

WILLIAM BENNUM, *Superintendent.*

SIMMONS.

Is a shaft mine operated for local trade in the winter season, is situated three miles east of Summerset; has escape way by a going shaft.

SIMMONS, *Superintendent.*

William Lumsdenson operates a slope mine for local trade near Summerset.

Edward Lord operates a slope mine near Summerset for local trade.

Joseph Mitchell, Lambert Heenan, Nathan Bales, M. Sneider, Eugene Richmond, S. C. Bryant, J. W. Brown, Andy Connors and James Gilbert, operate local mines in the vicinity of Milo, the vein is from eighteen to twenty-four inches thick. From two to five men are employed in each mine in the winter season.

Randolph Miller, Harrison Miller, Huston Fogle, Wm. Johnson, Lemuel Hickman and George Myers all operate small county mines in the vicinity of Lacona. The vein of coal is eighteen inches thick. From two to five men are employed in each mine in the winter season.

WAYNE COUNTY.

CHICAGO.

This is a shaft mine located at Seymour, between the Chicago, Rock Island & Pacific and Chicago, Milwaukee & St. Paul railroads and has facilities for shipping coal on both roads. Is owned and operated by the Chicago Coal Co. Is worked on the longwall system and is ventilated by fan which can be used either to force or exhaust the air. They have an escape shaft with step ladders in it. Safety catches and covers on cages and brake on drum. They have enlarged and timbered their entries and have greatly improved the ventilation of the mine.

PHILLIP GILL,
Superintendent.

SEYMOUR.

Is a shaft mine owned and operated by the Seymour Coal Co. They have facilities for shipping coal on the Chicago, Rock Island & Pacific railroad. Is operated on the longwall system and ventilated by steam jet. The above-named company bought the property in 1890, and have put new curbing in the shaft from top to bottom, 244 feet from the surface to the coal. They have enlarged and timbered their entries from the shaft to the face of working and put the mine in good order. They have put up good machinery and the equipments comply with the mining laws.

GEORGE GILMORE,
Superintendent.

FRY.

Is a shaft mine owned and operated by Fry & Bro. Is located two miles south of Confidence. Coal is sold at local sales. Steam power used.

John Haghurst operates a shaft mine near Confidence, for local trade. Horse power.

J. L. Attwell operates a drift mine three miles south of Confidence, for local trade in the winter season.

Richard Davis operates a drift mine four miles south of Confidence, for local trade in the winter season.

HAPPY HOLLOW.

Is a shaft mine operated by James A. Winger. Location, two miles east of Howard. Coal sold at local sales.

William Rousseau operates a shaft mine four miles southeast of Confidence for local trade.

The present mining law makes it obligatory upon the State Mine Inspector when called upon by parties interested in the mining of coal to go and test the scales in use at the mine where complaints are made. I have been notified in writing in regard to eighteen different sets of scales during the two years ending June 30th, 1891. I found fifteen of these all right and correct, the other three set were properly adjusted and made to weigh correct. *Recommendations* respectfully submitted.

Recognizing the growing need of more accurate surveys and maps of many of our mines, and our inability as Inspector to compel mine owners and agents to have proper surveys and plats made of their mines, and

Recognizing that the economic mining of our coal fields depends in a large measure upon maintaining a correct and accurate plat of the mine, and that the safety of the miners is often dependent upon the correctness and accuracy of said mine maps and surveys, and

the recording or filing of such maps in the office of the State Inspector.

We would therefore recommend to your Excellency that Section 7 of our mining laws be revised to read as follows:

The agent or owner of every coal mine shall make or cause to be made, an accurate map or plan of the workings of such mine on a scale not smaller than one hundred feet to the inch, showing the direction and extent of all entries and the present workings as well as the area mined out and abandoned. The map must also show correctly position and depth and size of all shafts, size of entries, direction of air currents, location of doors, regulators, man escapes, etc. Also quantity of air the mine with the appliances in use is capable of passing.

Said map must be submitted to the Mine Inspector of the district for his approval once during the year and must bear his signature.

Said map must be kept in the office of the mine and open to the inspection of all parties interested therein, upon written order from the Mine Inspector.

The Mine Inspector for any district disapproving of any mine map in his district, or deeming the survey or platting of any mine to be inaccurate, incomplete or not correct, is empowered to employ a competent Mining Engineer to make such survey or plat of said mine, the service of said engineer to be paid for by the State from an appropriation for that purpose, and recoverable against the owner or owners of said mine in the name of the State.

Said maps of mines to become the property of the State and must be placed on file in the office of the State Mine Inspector at Des Moines within sixty days after the final abandonment of said mine.

We would also recommend that the following, relative to boys or females being employed in coal mines, be submitted for Section 13, Chapter 21, Laws 1884.

No person under the age of fourteen years, nor females of any age, shall be permitted to enter any mine to work therein; and before any boy shall be permitted to work in any mine he shall be required to produce an affidavit from his parent or guardian, sworn and subscribed to before a justice of the peace, or notary public, that said boy is fourteen years of age. Such affidavits of all the boys employed in any mine shall be produced upon the demand of the Inspector.

BIENNIAL REPORT
OF THE
SECOND DISTRICT,

EMBRACING

KEOKUK, MAHASKA, JASPER, JEFFERSON, SCOTT, AND
VAN BUREN COUNTIES.

JAMES GILDROY, INSPECTOR,

BIENNIAL REPORT.

TO HIS EXCELLENCY, HORACE BOIES, *Governor of Iowa.*

HON. SIR—In compliance with Section 3, Chapter 140, Laws 1886, on mines and mining, I have the honor to present to you herewith my second biennial report from this department in which I will endeavor to give all such information and suggestions for future legislation as the meaning and intent of the law require.

I am pleased to state that my official duties between operators and miners during this term, as a rule, have been most satisfactory.

Referring to Section 3, which requires that the inspectors report to the governor of their proceedings and the condition and operation of the mines of this State. The general condition and operation of the mines you have received in each monthly report, as required by Section 2, Chapter 140, 1886, and are on file in mine inspector's office, where they are to be found. In the following pages a summary of the inspector's work will be found, for the term ending June 30, 1891.

There are thirty-two railroad and sixty-six local mines operating in the 2d district, and two hundred and fifty-one visits and reports of same have been recorded; many other visits have been made to different mines, when it was found necessary to do so, the nature of which did not require any especial reports.

There have been fifteen scales tested, four of which were found to be incorrect and were, therefore, overhauled and adjusted at once. The remaining eleven were found to be correct.

There have been seventy-three non-fatal accidents, and twelve fatal accidents during the two years.

The table of accidents will show that 61.64 per cent of the non-fatal accidents were caused by falls of slate, and 11.15 per cent by falls of coal; 77 per cent of the accidents occurred in the face of the workings, and 23 per cent from other causes.

If we take 2,800 miners and 400 mule drivers as an average for each working day, we find from the tables 2 per cent of accidents

for the miners, and 3 per cent for the mule drivers; thus showing that the occupation of the mule driver to be the most dangerous in the mines. We have no report of mule accidents; no doubt their name would be legion.

Here is a fair field for some good pit boss to evolve a more economic and safer method of hauling in the mines than the present barbarous tail-chain system; if it should be only for the sake of the mule.

In many of our mines we find a dangerous and treacherous roof to contend with; and many accidents would be avoided if the miner himself would make a practice to carefully inspect the roof at the face of his room; especially before and after firing shots. He is responsible for his own safety in his working room, at noon he may have from one to three shots to explode, the roof may have smooth slippery cross seams or faces, and the nature of the rock may be dense, doughy, and wet, lacking the brittleness necessary to snap and give warning; he may have every available spot filled with props, he lights the shots and runs for shelter. Tons of coal may have smashed and driven out the props, and the room may be filled with an atmosphere of dense powder smoke, and he is unable to see the burning lamp in his own hand; yet he stumbles and scrambles endeavoring to find the other match, he may find and light it, and be able to get into the entry and out of the smoke. But look at the chances he is taking going blind under a mass of rock ready to drop at any moment. There is no question but that there should be unremitting, and intelligent inspection by the miners themselves in all such cases, and they should also be prevented from firing any shots until the smoke has been expelled from the rooms. And every miner should be furnished with an ax and saw, by which to cut and square their timbers to the proper requirements, and thereby give the props all the bearing surface, so as they may be set on a firm foundation.

There is no doubt but many accidents have occurred which could have been avoided; and many tons of coal have been lost which could have been saved had the timbering been done in a workman-like manner and the men kept out of their places until the smoke was cleared away.

An accident occurred by three miners attempting to descend a shaft on a broken cage while the gearing of the engine was out of place. The engineer had previously warned them not to interfere with the engine until he returned with material to mend the broken

parts. They forgot the warning given them, and one man started the engine with three men in the cage who were precipitated nearly to the bottom of the shaft before the brake could be applied. They were all injured more or less, but all recovered.

One fatal accident occurred by a boiler bursting, the boiler being used for driving a pump. Cause unknown.

Two winding ropes have broken with the load in both cases, the parties had been previously warned not to hoist men on these ropes.

It is worthy of notice that approximately 525,000 hoists have been made in raising and lowering 5,000 persons in and out of the mines for the two years ending 1891, without an accident occurring. This speaks volumes for the efficiency of our hoisting engineers.

JAMES GILDROY.

THE FOLLOWING TABLE SHOWS THE NUMBER AND CAUSE OF ALL FATAL CASUALTIES REPORTED IN DISTRICT No. 2 FOR THE TWO YEARS ENDING JUNE 30, 1891.

DATE.	NAME OF DECEASED.	CAUSE OF CASUALTY.	NAME OF COMPANY OR MINE.	WHERE LOCATED.
1889.				
July	3 Gust. Leof.....	Falling slate.....	Consolidation No. 5.....	Muchachinock.
September	14 B. Ball.....	Struck by coal.....	Excelsior No. 2.....	Excelsior.
October	23 Robert Carswell.....	Falling slate.....	Excelsior No. 2.....	Excelsior.
December	6 Harry Lawrence.....	Falling slate.....	Beacon mine.....	Beacon.
1890.				
January	20 Peter Frank.....	Falling slate.....	What Cheer No. 1.....	What Cheer.
January	21 Ned Rhodes.....	Caught by shot.....	Consolidation No. 6.....	Muchachinock.
August	30 Thomas Glassell.....	Falling coal.....	What Cheer No. 2.....	What Cheer.
September	5 J. H. Pauley.....	Crushed under railroad car.....	.....	What Cheer.
October	3 J. A. Morris.....	Falling slate.....	Excelsior No. 2.....	Excelsior.
November	13 W. B. Johnson.....	Pit cars running over him.....	Consolidation No. 7.....	Muchachinock.
1891.				
March	8 Fred. A. Garrison.....	Falling slate.....	Fishville Mine.....	Fishville.
January	18 Daniel Perry.....	Falling slate.....	American.....	Oskaloosa.

NON-FATAL CASUALTIES OF SECOND MINING DISTRICT.

For the biennial period ending June 30, 1891.

DATE.	NAME AND OCCUPATION.	CHARACTER OF INJURIES.	CAUSE OF ACCIDENT.	RESIDENCE.
1889.				
July	10 J. Berkman, miner.....	Back and internal.....	Fall of slate.....	Muchachinock.
August	16 M. A. Coalson, track layer.....	Bruised.....	Fall of slate.....	Excelsior.
August	16 Chas. Seiger, night fireman.....	Badly burned.....	Trying to start air compresser.....	Excelsior.
September	7 C. W. Anderson, miner.....	Injured.....	Mining off a shot.....	Muchachinock.
September	11 Joseph Allen, miner.....	Face bones broken.....	Mining off a shot.....	Oskaloosa.
September	11 Fred Noland, miner.....	Shoulder and ankle.....	Fall of slate.....	Muchachinock.
September	12 Ned Rhodes, miner.....	Bruised.....	Mining off shot.....	Muchachinock.
September	14 W. H. Hughes, miner.....	Bruised.....	Mining off shot.....	Muchachinock.
September	17 F. Henderson, miner.....	Injured.....	Falling slate.....	Muchachinock.
September	18 Ed. Henderson, trapper.....	Crushed.....	Caught between car and door.....	Muchachinock.
September	27 J. Stocomb, driver.....	Finger broken.....	Between coal and car.....	What Cheer.
September	29 J. Neiman, miner.....	Arm broken.....	Coal falling from car.....	What Cheer.
October	9 A. Anderson, miner.....	Hand injured.....	Fall of slate.....	Muchachinock.
October	19 C. W. Anderson, miner.....	Back injured.....	Fall of slate.....	Muchachinock.
November	1 Isaac Cobbs, miner.....	Leg broken.....	Fall of slate.....	Muchachinock.
November	6 C. M. Anderson, miner.....	Injured.....	Fall of slate.....	Muchachinock.
November	12 M. Atwood, miner.....	Injured.....	Fall of slate.....	Farmington.
November	14 D. Yates, miner.....	Severely injured.....	Helping lift car on track.....	What Cheer.
November	26 J. L. Smith, miner.....	Injured.....	By a fall of slate.....	Muchachinock.
November	28 Adam Spurr, miner.....	Both legs broken.....	By a fall of slate.....	Knoxville June
November	28 F. Marnburg, miner.....	Injured.....	By a fall of slate.....	What Cheer.
December	12 Henry Percil, miner.....	Arm broken.....	By a fall of slate.....	What Cheer.
December	16 B. Mosely, miner.....	Injured.....	Falling slate.....	Muchachinock.
December	20 Lee Bishop, driver.....	Crushed.....	Between pit cars.....	What Cheer.
December	24 N. G. Samuels, miner.....	Slightly injured.....	By fall of slate.....	Muchachinock.
December	29 O. Demerille, miner.....	Slightly injured.....	By fall of slate.....	What Cheer.
1890.				
January	9 D. Thomas, miner.....	Head and shoulders.....	By fall of slate.....	Muchachinock.
January	10 Lee Brown, miner.....	Head and back.....	By fall of slate.....	Muchachinock.
January	11 L. Busley, miner.....	Ankle sprained.....	By fall of slate.....	Muchachinock.
January	12 A. Bills, miner.....	Burned face and neck.....	By powder.....	Douds.

*Proved fatal. No inquest.

NON-FATAL CASUALTIES OF SECOND MINING DISTRICT—CONTINUED.

DATE.	NAME AND OCCUPATION.	CHARACTER OF INJURIES.	CAUSE OF ACCIDENT.	RESIDENCE.
1890.				
February	1 W. Roberts, miner	Injured	By fall of slate	Muchachinock.
February	15 P. Osblom, miner	Crushed	By fall of slate	Oswalt.
March	3 A. Anderson, miner	Leg fracture	Fall of slate	What Cheer.
March	5 D. Yancey, driver	Leg broken	By loaded car	Muchachinock.
March	8 M. Frem, miner	Injured back and leg	Falling slate	Excelsior.
March	10 J. Colling, miner	Injured back and hip	Mining off shot	Oskaloosa
March	13 J. Pethero, driver	Ankle sprained	By coal car	Muchachinock.
March	23 D. James, driver	Foot crushed	By coal car	Muchachinock.
March	25 A. Fleming, miner	Ankle bruised	Falling slate	Excelsior.
March	27 T. Curry, driver	Collar bone fracture	Caught between car and roof	What Cheer.
March	28 H. Ferguson, driver	Arm broken	By pit car and roof	What Cheer.
*March	29 John Hoff, miner	Serious spinal injury	Fall of slate	What Cheer.
March	29 P. Mattson, miner	Scalp wound	Falling stone	What Cheer.
April	26 P. Osblom, miner	Leg broken	Falling stone	Oswalt.
June	23 J. Carthom, miner	Slightly injured	Falling stone	Excelsior.
June	24 J. Bedford, miner	Slightly injured	Falling stone	Excelsior.
June	24 P. Wren, miner	Hurt in head	Flying rock	Excelsior.
June	24 W. Ashman, miner	Crushed	Falling slate	Excelsior.
July	30 H. Young, driver	Both legs broken	Caught between car and entry	Muchachinock.
August	5 Wm. Muck, driver	Leg broken	Caught between car and entry	Muchachinock.
August	6 A. P. Johnson, miner	Back injured	Falling slate	Oswalt.
September	18 A. W. Stodgel, miner	Leg broken	Mining off shot	Fishville.
September	26 J. Chambers, miner	Injured	Fall of slate	Muchachinock.
September	29 —, Chambers, miner	Injured	Fall of slate	Muchachinock.
September	30 W. Bowen, miner	Injured	Mining off shot	Oskaloosa.
October	11 J. P. Swanson, cager	Slightly injured	Dropping from cage	Muchachinock.
October	21 Wm. Bothers, miner	Leg broken	Fall of slate	Oswalt.
October	21 Dan. Bothers, miner	Leg broken	Fall of slate	Oswalt.
November	20 James Cooley, miner	Injured	Falling coal	What Cheer.
December	5 Pat Murphy, miner	Breast hurt	Falling slate	Beacon.
December	19 J. Vangasko, miner	Back injured	Falling slate	Carbonado.
December	20 E. Fitzgerald, driver	Leg broken	Mule kick	What Cheer.
December	23 C. Alexander, miner	Shoulder broken	Falling slate	Oskaloosa.
1891.				
January	13 Thomas Ford, miner	Seriously injured	Fall of slate	Carbonado.
February	7 Wm. Braxton, miner	Leg broken	Fall of coal	Muchachinock.
February	14 C. Coleman, miner	Arm broken	Fall of slate	Muchachinock.
February	25 Wm. Bales, miner	Hips bruised	Fall of slate	What Cheer.
February	26 Thomas Currey, miner	Leg broken	Fall of slate	What Cheer.
March	7 Frank Garrison, miner	Back and internal injuries	Fall of slate	Leighton.
March	14 Samuel Capel, miner	Leg broken in two places	Fall of slate	Oskaloosa.
*March	17 Wm. Strong, miner	Seriously injured	Fall of slate	Oskaloosa.
March	19 Charles Wilson, miner	Leg broken	Mining off shot	Oskaloosa.
May	19 B. Logan, miner	Scull fracture	Fall of coal	Muchachinock.

RECAPITULATION.

RESIDENCE.	Number.	CASUALTIES.	Number.	PER CENT.
Muchachinock.....	25	Falling slate.....	45	61.64
Excelsior.....	8	Falling coal.....	11	15.07
Oskaloosa.....	8	Air compressor.....	1	1.37
What Cheer.....	16	Pit car.....	12	16.44
Farmington.....	1	Powder explosion.....	1	1.37
Knoxville Jet.....	1	Mule kick.....	1	1.37
Doud.....	1	Falling rock.....	1	1.37
Oswalt.....	5	Dropping from cage.....	1	1.37
Fishville.....	1			
Carbonado.....	1			
Leighton.....	1			
Total.....	73		73	100.00

Many of our miners are incapable of protecting themselves in their working places, from the lack of skill and experience, and ignorance of their dangerous situation. There are circumstances to encounter and contend with in a dangerous roof that will tax the skill, ability and coolness of the best and most experienced timber men to secure and make safe. Many accidents occur through the lack of promptitude, by neglecting to take down loose, hanging roof, or to prop the same in due time. At least three fatal accidents are directly due to the men persisting in going into their rooms before the smoke had been cleared, after firing their shots. And no doubt but many of the non-fatal accidents have occurred in a similar manner.

As a partial preventive for this class of accidents we would respectfully suggest or recommend that a competent person (one company has already acted upon this suggestion) be designated by the manager of each mine to examine all the working rooms of the mine at least once every working day, and said person shall direct that each and every working place be properly secured by props or other suitable timber; and shall direct that all loose rocks or coal be taken down or safely secured, and that no person shall be permitted to work in an unsafe place unless it be for the purpose of making it secure.

TABLE No. I.

Showing the number of mines, annual output, number of miners and other employes, value of product, etc., in District No. 2, for the year ending June 30, 1890.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mine.
Jasper.....	16	156,003	314	73	.91	141,565.00	34,574.00	1.41	230,935.32
Jefferson.....	5	4,909	30	4	.96	4,909.00	480.00	1.85	9,850.00
Keokuk.....	20	398,948	887	228	.78	312,146.00	167,212.00	1.46	581,734.00
Mahaska.....	37	990,325	1,414	292	.76	748,890.00	217,027.00	1.40	1,373,979.16
Scott.....	4	8,369	70	15	1.10	9,215.00	1,300.00	1.75	14,645.75
Van Buren.....	6	40,405	102	24	.81	33,050.00	9,261.00	1.31	52,937.04
Total.....	88	1,598,950	2,817	606	.78	\$1,249,436.00	\$29,856.00	1.41	\$2,233,299.27

TABLE No. 2.

Showing number of mines, annual output, number of miners and other employes, value of product, etc., in District No. 2, for the year ending June 30, 1891.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at the mine.
Jasper.....	16	146,091	283	70	.85	125,134.25	30,328.07	1.43	208,587.96
Jefferson.....	7	2,932	18	6	.93	2,714.49	555.36	1.80	5,247.30
Keokuk.....	20	363,617	665	240	.74	269,102.04	37,290.95	1.40	509,230.03
Makaska.....	40	963,558	1,105	416	.75	719,976.14	214,440.06	1.25	1,307,999.08
Scott.....	7	10,534	47	4	.97	10,195.32	1,180.00	1.75	18,444.50
Van Buren.....	7	46,764	93	18	.85	39,506.00	6,940.00	1.31	61,388.00
Total.....	97	1,533,496	2,211	754	.76	\$1,166,716.24	\$20,715.04	1.32	\$2,009,914.77

TABLE No. 3.

Showing average number of mines in operation, output of coal, average number of miners and other employes, compensation of employes, value of product, etc., in District No. 2, for the biennial period ending June 30, 1891.

NAME OF COUNTY.	Average number of mines in operation.	Number of tons of coal produced.	Average number of miners employed.	Average number of other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mines.
Jasper	16	302,004	299	72	.88	266,000.25	64,904.67	1.42	429,523.28
Jefferson	6	7,832	24	8	.92	7,314.49	1,036.36	1.83	14,297.20
Keokuk	20	762,565	776	234	.76	581,248.04	204,481.95	1.43	1,090,984.03
Mahaska	30	1,953,883	1,290	330	.75	1,468,836.14	431,467.06	1.32	2,581,078.24
Scott	6	18,903	58	10	1.63	19,416.32	2,480.00	1.75	33,090.25
Van Buren	6	87,137	98	21	.83	72,646.00	16,201.00	1.31	114,225.04
Grand total	96	3,132,444	2,515	684	.78	\$2,416,154.24	720,571.04	1.36	\$4,263,198.04

Output of coal of the counties comprising District No. 2 for the past five years.

COUNTIES.	1887.	1888.	1889.	1890.	1891.
Mahaska	805,548	855,981	841,762	990,325	963,558
Keokuk	600,007	541,966	364,664	398,948	363,617
Jasper	142,030	275,179	217,012	156,003	146,091
Scott	8,634	9,080	7,940	8,269	10,534
Jefferson	10,397	9,387	7,445	4,900	2,932
Van Buren	26,333	25,900	40,556	40,405	46,764
Hardin	450	1,000	136	.....	.....
Total	1,682,408	1,716,453	1,509,515	1,598,960	1,531,496

It will be seen by referring to table No. 3, that there is a decrease in the output of coal in Jasper county of 220,097 tons less than the previous report. There are three visible causes for this deficit: 1st, the Jasper County coal and mining Co., at Draper, having suspended indefinitely; 2nd, the strike of four weeks in October, 1889; 3d, the strike in the months of May and June, 1891. It will also be seen that Keokuk county has a decrease of 144,065 tons, this is accounted for by the large amount of work being done in developing new mines. Mahaska county has a net increase of 276,140 tons and Scott County 1879 tons over the previous report. The whole number of tons of coal produced in the second district for the present biennial period is 3,124,724 tons.

Average number of miners and other employes, 3199, the number of fatal accidents, 12, the number of non-fatal, 73, showing one fatal casualty for each 260,394 tons of coal mined, and one non-fatal for each 42,805 tons or one fatal casualty for each 266 men employed and one non-fatal to 44 employes. This shows a decrease of fatal casualties of 41.4 per cent less than the previous biennial report.

LIST OF ABANDONED MINES.

KEOKUK COUNTY.

- April, 1890, What Cheer Standard Coal Co. shaft, railroad mine. Map of mine received.
- June 19, 1890, What Cheer Coal Co's and railroad mine. Map of mine received.
- February, 1891, Keystone Coal Co's shaft, railroad mine, What Cheer. Map of mine received.
- April, 1889, Chew & Cohran's shaft, local, What Cheer. Map of mine not received.

JASPER COUNTY.

- 1889, Valeria Coal Co's Black Heath Slope railroad mine at Oswalt. Map of mine received.
- 1890, Scott Slaughter Drift mine, local, Colfax. Map of mine not received.

JEFFERSON COUNTY.

- 1889, McGregor shaft, local mine, Lockridge. Map of mine not received.

NUMBER OF ABANDONED MINES.

Keokuk county, four; Jasper county, two; Jefferson county, one; total, seven.

MAPS OF ABANDONED MINES.

Section 7, Chapter 21, Laws 1884, provides that the owner or agent of all coal mines hereafter wrought out and abandoned, shall deliver a correct map of said mine to the inspector, to be filed in his office.

In most of cases this requirement of the law has been complied with, but in some cases the law has been violated, as several mines have been abandoned and the companies have been disbanded without delivering a map of abandoned mines as the law requires.

In such cases as these it is impossible for the inspector to collect required maps. There are, to our knowledge, at least three of such abandoned mines from which no maps have been received; and there are other maps which have been received which shows clearly to be incorrect. Any of such abandoned mines referred to may prove a source of great danger in future mining operations which may be conducted near or adjacent to their boundary lines.

In view of these facts we would respectfully recommend that Section 7, Chapter 21, Laws 1884, be so amended that the inspector would be enabled to collect a correct map prior to the abandoning of any mine.

NEW MINES.

Thomas Webster opened a new mine on Stillwater Creek, near Buffalo, Scott county, 1890.

Mahaska, new mines, seven; Keokuk, new mines, five; Jasper, new mines, three; Jefferson, new mines, one; Scott, new mines, two; total number of new mines, eighteen; total number of abandoned mines, seven; increase, eleven.

LIST OF NEW MINES OPENED.

What Cheer Coal Co. opened a new shaft, No. 4, at What Cheer, Keokuk county, 1890. Ship on N. W. R. R.

Pioneer Coal Co. opened a new shaft at Thomburg, Keokuk county, 1890. Haul to B., C. R. & N. R. R.

Samuel Pasco opened a new slope mine at What Cheer, Keokuk county, 1890. Ship on C. & N. W. R. R.

Charles Blanquart opened a new slope at What Cheer, Keokuk county, 1890. Local.

Valeria Coal Co. opened a new shaft, No. 3, at Oswalt, Jasper county, 1889.

Diagonal Coal Co. opened a new shaft, No. 4, at Oswalt, Jasper county, 1891. Ship on N. R. R.

J. S. Magregor opened a new shaft near Lockridge, Jefferson county, 1889. Local.

Samuel James opened a new shaft at Jamestown, Scott county, 1889. Local.

NEW MINES.

Thomas Webster opened a new shaft on Stillwater Creek, near Buffalo, Scott county, 1890. Local.

Carbonacle, No. 4 and 5, Excelsior Coal Company's mines. Ship on C. R. I. & P. and Iowa Central Railroad, Mahaska county, 1889 and 1890.

Fishville Shaft, H. A. Foster, lessee, Mahaska county, 1890. Ship on C., R. I. & P. R. R.

Long Bros. shaft, Oskaloosa, Mahaska county, 1890. Ship on Burlington & Northwestern R. R.

Oskaloosa Coal Company's shaft, No. 2, at Beacon, Mahaska county, 1890. Ship on Iowa Central Railroad.

William Oldham opened a new shaft at Oskaloosa, Mahaska county, 1890. Local.

William N. Hoover opened a new shaft at Carbonade, 1890. Local.

Garfield Coal Company opened a new slope at Beacon, Mahaska county, 1890. Ship on C., R. I. & P. R. R. and Iowa Central.

MINING PLANTS DESTROYED BY FIRE.

August 24th, 1882, What Cheer Coal Co.'s shaft G. Total loss of plant with fourteen mules lost in the mine; valued \$45,000. Two hundred men and boys were in the mine at the time fire occurred. One mule was taken out safely but when the second one was near the top some of the arrangements gave way and it fell to the bottom, and no further attempt was made to extricate the remainder.

Some of the men after being out of the mine stated that it was very difficult for them to find the right passage to the escape shaft, many of them not knowing where to go and no one left to direct them. In all escape ways leaving from the entry it would be well to have the door or entrance-way whitewashed, or some other device placed there as an index to point the way to escape shaft, and the

pit boss ought to see the last man out before leaving himself. Fire commenced in boiler house while the engines were hoisting.

April, 1890, Chew & Cochran's shaft was totally destroyed by fire; loss, \$7,000, at What Cheer, Keokuk county. Cause unknown.

May 16, 1890, What Cheer Coal Co.'s No. 1 shaft, What Cheer, Keokuk county, head gear with tower, screens, scales and one railroad flat; loss, \$7,000. Two hundred and five men and boys were in the mine at the time of the fire. No one hurt. Cause unknown.

American Coal Co.'s barn, with twenty-two mules and harness, corn and hay, all destroyed; loss, \$4,000, June 9, 1890, at Knoxville Junction, Mahaska county. Cause unknown.

Crescent Coal Co.'s No. 4 air shaft, What Cheer, Keokuk county, one engine, two boilers and house, all destroyed; one of the boilers burst. The shaft was used for tail rope, air, and escape way, June 25, 1890; loss, \$2,000. Insured, \$1,000. Cause unknown.

What Cheer Coal Co.'s No. 1. Fan house caught fire Dec. 20, 1890, but was soon extinguished. Cause unknown.

F. M. Whitacre's shaft at Oskaloosa, the top plant with engine all destroyed (loss \$1,000) Jan. 16, 1891. Cause unknown.

Crescent Coal Co.'s No. 4 air and pump shaft electric motor, fan and house all destroyed (loss \$1,000) at What Cheer, Keokuk county, April 17, 1891. Caused by electric motor firing some part of the fan house.

May 1, 1891, Consolidation Coal Co., No. 7 shaft, Mahaska county. The whole of top plant consisting of tower scales, five engines, etc., all destroyed by fire. Loss \$50,000. Cause unknown.

Total number of accidents by fire, nine; total loss by fire, \$117,000.

STRIKES SECOND DISTRICT.

A strike of four weeks occurred at the Valeria; and Jasper County Coal & R. R. Co.'s mines at Colfax, Jasper county, October 23, 1889, the cause of the strike being a misunderstanding between the operators and miners concerning the fall prices for mining coal. The matter being satisfactorily settled the men again resumed their work.

A strike of one week occurred at the Armstrong Coal Co.'s mine, What Cheer, Keokuk county, November 16, 1890. The trouble commenced by the manager hanging a swinging door near

the top of the screen. The door was taken off and the men again resumed their work.

May 1, 1891, a strike commenced at all the large mines in the district, except the Consolidation Coal Co.'s No. 6 mine, and the American Coal Co.'s mine at Knoxville Junction, both of which continued to work. The trouble commenced by the miners demanding eight hours for one day's labor. On or about the first of July the men resumed their work again. Two companies conceded the eight hours per day, but all other mines commenced work on the same terms they had before the strike commenced.

Mahaska county continues to be the greatest coal producing county in the district and probably will be for many years, Oskaloosa being situated in the midst of immense coal fields, some of which lay undeveloped, but are proven to be quite extensive by borings and small openings. There are fourteen railroad and twenty-five local mines in the county.

Keokuk county continues to decrease in the production of coal. There has been but little prospecting for some time in this county; coal will be mined here for many years yet but it is doubtful whether the output will ever be obtained as in previous years. There are ten railroad and ten local mines in the county.

Jasper county no doubt contains a large area of coal fields but the operations have been hampered by a poor roof and much water in some of the mines. There are four railroad and twelve local mines in the county.

Jefferson county contains quite a large area of coal but the seams, as a rule, are small and in pockets. There are seven local mines in the county.

Van Buren county coal mines are situated in close proximity to the Des Moines river. The area or extent of the coal fields are not well defined. There are four railroad and three local mines in the county.

Scott county mines are situated within a radius of four miles of Buffalo, excepting a small mine near Muscatine. The coal area of this county is not well defined. In every county of the Second district there exists an abundance of good clays, etc., which could be utilized in the manufacture of brick, tile, etc., much of the coal in Scott county being utilized for this purpose. There are seven local mines in this county.

We believe that the time has arrived for a more extended knowledge of the economic resources of the State. M. G. Thomas, Inspector Third district, fully explains this matter.

LIST OF MINES IN MAHASKA COUNTY.

(Postoffice Address, Muchachinock, Mahaska County.)

At Muchachinock the Consolidated Coal Company operates two shafts; No. 6 and No. 7. No. 6 shaft is 130 feet. The coal is hoisted by steam power. The bed of coal will average six feet thick and is worked on the most approved methods of double-entry system. The air at the shaft bottom and again a short distance from there, thereby considerably reducing the friction or drag of the air in the mine. A double horizontal engine has been placed well up to the fan, and the fan is driven with a belt. The last observation of the work of the fan was taken July 5, 1891, when 85,000 cubic feet of air was found to be passing in the mine, the water-gauge indicating 1.4 inches depression. 325 miners and 25 mules were at work. This would be equivalent to 455 men in the mine. A good self-dumping cage has been running here for nearly two years and gives good satisfaction. The patentee is Mr. Carlson, chief mechanic at the mines. The capacity is 1200 tons per day. The coal is all shipped on the Chicago and Northwestern railroad. Too much credit cannot be given to the managers of these mines, as every report of the mines will show the good order in which they have always been found.

DANIEL REESE,
Under-Ground Manager.

No. 7 shaft is forty-five feet deep. The coal will average about six and a half feet thick. Otherwise the two mines are nearly identical. Unfortunately on or about the first day of May, 1891, the whole of the plant at this mine was destroyed by fire, but now the mine is about ready for work again.

JOHN ROBERTS,
Under-Ground Manager.
J. W. McMILLIN,
Assistant Superintendent.
J. E. BUSTON,
Superintendent.

The Excelsior Coal Company's No. 2 and No. 3 shafts at Excelsior are still in operation but will soon be finished. These two mines have been classed with the most successful mines in the State.

JOHN CROOKSHANK,
Under-Ground Manager.
GEORGE H. RAMSEY,
Assistant Superintendent.
BENJAMIN WHIGHTMAN,
Superintendent.

Excelsior Coal Company's No. 4 shaft, located at Carbonado, has a capacity of 800 tons per day. The coal is six feet thick and ninety feet below the surface. The roof is not as good as desired. However, this has been proven to be more firm and solid under the shallow surface than under the thicker covering, and they are doing a good business. The air is split at bottom of the down cast, and the south current is again split some distance from here, the air being well divided with 42,800 cubic feet of air circulating per minute, showing a water-gauge of 0.7 inches at the fan. A new invention of self-dumping cage is in operation at these mines, which is especially commendable for its simplicity, safety, economy, and reliability of action. There are other improved methods for quick and economic loading of box cars. Coal is shipped on the Iowa Central railroad.

BENJAMIN WHITMAN,
General Manager.
GEO. H. RAMSEY,
Assistant Superintendent.
ROBERT STORY,
Pit Boss.

Postoffice, Oskaloosa.

Postoffice, Oskaloosa. At Beacon the Oskaloosa Coal Co. operates their No. 2 shaft. This shaft was opened 1890, and is forty-five feet deep. The coal is from six to seven feet thick, worked by double entry system and hoisted by steam power, with a capacity of from 6,000 to 10,000 tons. Is ventilated by a fan. The coal is shipped on Iowa Central R. R.

JOHN RAMSEY,
Superintendent.

Postoffice, Beacon. The Beacon Coal Co. operates two slopes at Beacon, hoisting by steam. The coal is from five to six feet thick, worked room and pillar; ventilated by a furnace; employs twenty-six men; capacity 100 tons. The coal is shipped on C., R. I. & P. R. R.

SIMON PHILLIPS,
Superintendent.

Postoffice, Oskaloosa. At Beacon the Garfield Coal Co. operates their slope mine. This mine was opened 1890, and will have a capacity of from 600 to 1,000 tons per day. Coal is shipped on the C., R. I. & P. R. R. and Iowa Central R. R.

JOHN H. RAMSEY,
Superintendent.

Post-office, Oskaloosa. Excelsior's Coal Co.'s No. 5 shaft was opened in 1890 and is equipped similar to No. 4, with a capacity of 800 tons per day. The coal is shipped on Iowa Central and C., R. I. & P. R. R.

GEO. H. RAMSEY,
Ass't Sup't.
JOHN CROOKSHANK,
Pit Boss.

Postoffice, Oskaloosa. Thomas Long & Bros. operate a shaft which was opened in 1890, and is ninety feet deep. The coal is six and one-half feet thick and is worked by double entry system and ventilated by steam, employing ten men in summer and twenty in winter. The coal is shipped on B. & N. W. and Narrow Gauge R. R., and have also local trade. Capacity, 100 tons.

Postoffice, Oskaloosa. The Oskaloosa Coal Co. operates their No. 1 shaft, eighty feet deep. The coal is from six to seven feet thick, worked by double entry system and hoisted by steam, and has a capacity of 350 tons. Employing one hundred and twenty-five miners and twenty day hands. Ventilated by fan. The coal is shipped on Iowa Central R. R.

JOHN RAMSEY,
Superintendent.

Postoffice Fishville. At Fishville H. A. Foster operates a shaft opened in 1890, forty-nine feet deep. The coal is from five to six feet thick and is worked by double entry system; hoisting by steam power and ventilated by a fan; employing fifty men. The coal is shipped on C., R. I. & P. R. R.

JENKIN DAVIS,
Pit Boss.

Postoffice Rose Hill. At Rose Hill Thomas SeEVERS operates the Superior Coal Co.'s shaft. The coal is from four to five and one-half feet thick, worked, room and pillar and hoisted by a small steam engine. The coal is hauled by wagons and shipped on C., R. I. & P. R. R. Is ventilated by a furnace and employs eight men.

JOHN CASIDY,
Pit Boss.

Postoffice Oskaloosa. At Kirkville Junction the American Coal Company operates a slope. The coal is from five to six feet thick and worked by double entry system. The coal is hauled from stations in the mine by an endless rope nearly one mile; and the mine is ventilated by an exhaust fan; the air enters the mine at three separate openings and returns to the upcast by two distinct currents, the air shaft having an area of seventy-two square feet, and the fact that 33,000 cubic feet of air was found to be passing with a water gauge of 0.4 inches, shows that the air courses were in excellent order. It also shows the worthless condition of a ten-foot fan running a speed of one hundred and fourteen revolutions per minute. The immense extent of the air courses, and those being taken through productive entries where the rooms have been worked too close back on the entries is the cause of much trouble to the pit bosses, as it requires constant vigilance and much labor to keep so many stoppings air or gas tight. Such mines as these requires a much greater volume of air to keep them reasonably clean, more so than others that have the winning entries for the air to travel in, as there are fewer stoppings to care for, and those can be permanently closed off. This mine has a capacity of 1,000 ton; ships on C., R. I. & P. R. R.

W. A. McNIEL,
Gen'l Manager.
ROBERT WILSON,
Pit Boss.

Postoffice, New Sharon. Robert Evans operates a drift mine four miles east of New Sharon. The coal is from four and one-half to five feet thick, worked room and pillar and ventilated by a furnace; employs — miners. Sales are local.

ROBERT EVANS, *Owner.*

Postoffice, New Sharon. William Evans operates a slope mine three miles northeast of New Sharon. The coal is three and one-half to four feet thick, worked room and pillar and ventilated by a furnace; employs — miners. Sales are local.

WILLIAM EVANS, *Owner.*

Postoffice, New Sharon. William Williams operates a shaft mine three miles east of New Sharon. Coal is four and one-half to five feet thick, worked, room and pillar, ventilated by furnace, employs — miners.

WILLIAM EVANS,
Owner.

Postoffice, Oskaloosa. At Oskaloosa Daniel Reigel operates a shaft. Coal is hoisted by steam power, employs — miners and is ventilated by a fan. Sales are local.

Postoffice, Leighton. At Leighton A. A. Hoover operates a slope mine. The coal is five feet thick and ventilated by furnace. Sales are local.

Postoffice, Springfield. At Rose Hill, William Topham and Joseph Barton operates a horse and gin shaft. The coal is five feet thick, worked, room and pillar and employs three men. The sales are local.

Postoffice, Muchachinock. James Newell operates two slopes three miles south of Muchachinock; the coal is five and one-half feet thick; worked, room and pillar and ventilated by a furnace. Employs — miners. Sales are local.

JAMES NEWELL,
Manager.

Postoffice, Eddyville. O. H. Vance operates a horse and gin shaft five miles south of Muchachinock. Coal is five feet thick; worked, room and pillar; ventilated by a furnace. Employs — mines. Sales are local.

O. H. VANCE,
Owner.

Postoffice, Eddyville. Three miles southwest of Given, W. P. Chilton operates a small mine to supply local trade.

W. P. CHILTON,
Owner.

Postoffice, Given. At Given A. C. Elles operates a small mine to supply local trade.

Postoffice, What Cheer. J. G. White & Sons operate a horse and gin shaft two and one-half miles west of Rose Hill. Coal from four and one-half to five feet thick. Sales are local.

Postoffice, Rose Hill. Michael Cary operates a horse and gin shaft two miles west of Rose Hill. Coal six feet thick; good roof. Sales are local.

Postoffice, Oskaloosa. At Oskaloosa L. C. Guthenes; shaft, — deep; coal is from five to six feet thick; worked, room and pillar, and ventilated by a fan. Employs — miners. The trade is local.

W. B. RODGERS,
Manager.

Postoffice, Oskaloosa. At Oskaloosa F. M. Whiticker operated a shaft, but the engine and house, with all the wood work were burnt out on 16th January, 1891. He has operated a slope adjacent to the shaft which is retained as an air shaft. Coal is five and one-half feet thick; worked, room and pillar. Employs — miners; trade is local.

Post-office, Carbonado. At Carbonado Andy Love & T. Carr operates a shaft mine. Coal is six feet thick, worked room and pillar. The trade is local. This mine was formerly owned by J. Barrowman, but now owned by Sheppard & Bros.

Post-office, Carbonado. At Carbonado W. W. Hoover operates a shaft opened 1890, and is fitted up in good form, with a new double hoisting engine. Shaft is — deep and coal is six feet thick, worked by double entry system and ventilated by a fan. Employs — miners. Trade is local.

Post-office, Feny. At Feny Henry Richardson operates a small mine to supply local trade.

Post-office, Eveland. At Eveland James Greenfield operates a small mine to supply local trade.

Post-office, Tracy. At Tracy S. Hallowell operates a small mine to supply local trade.

Post-office, Tracy. At Tracy Samuel Ream operates a small mine to supply local trade.

Post-office, Beacon. At Beacon Moses Lewellen operates a small mine to supply local trade.

Post-office, Oskaloosa. At Beacon W. Hull operates a small slope mine to supply local trade.

Post-office, Olivet. At Olivet J. G. Davis operates a small mine to supply local trade.

Post-office, Oskaloosa. At Oskaloosa James Logne operates a small mine to furnish coal for the brick yard.

Post-office, Oskaloosa. At Oskaloosa B. F. Evans operates a shaft — feet deep; coal is five and one-half feet thick, worked room and pillar; ventilated by a fan. Employs — miners. Local trade.

R. R. Mines	14
Local Mines	26

LIST OF KEOKUK COUNTY MINES.

Post-office What Cheer. At What Cheer the What Cheer Coal Co. operates three shafts, Nos. 1, 2 and 4. At No. 1 the coal is from four to six feet thick, worked by double entry system. The main hoisting shaft is fifty-five feet deep, hoisting by steam power. The entries are all driven by the Harrison mining machines, worked by air compressors, but most of the rooms are being worked by miners. The mine is ventilated by a fan. Employs men. Capacity three hundred tons; ships on C. & N. W. R. R.

W. TOWARD, *Pit Boss.*

No. 2. This shaft is one hundred and twenty-six feet deep; the coal is from four to six feet thick, worked on the double entry system by the Harrison air compressor machine. A few pick miners have been employed. The mine is ventilated by a fan. Employs men. Capacity three hundred tons; ships on C. & N. W. R. R.

WILLIAM DEMPSTER, *Pit Boss.*

No. 4. This is a new opening, the shaft is 136 feet deep. The coal for some distance from shaft bottom did not prove very good. But good coal six feet thick is now developed, and in a short time this mine will have a capacity of from 300 to 600 tons. The air and escape way is completed. The Harrison Mining Machines are used in driving the entries. Ships on C. & N. W. R. R.

JOHN BONSTEAD, *Pit Boss.*

E. M. FRESCOTT, *Superintendent.*

Post-office What Cheer. At What Cheer. The Armstrong Coal Co. operates a shaft which is 45 feet deep, the coal is hoisted by steam power and is from 4 to 6½ feet thick; worked by the double entry system, and is ventilated by a fan. Employs miners, has a capacity of 400 tons per day. Ships on the B. C. R. & N. R. R.

JOHN DONAVAN, *Pit Boss.*

W. B. ARMSTRONG, *Manager.*

Post-office, What Cheer. At What Cheer, the Pascoe Brothers operate the Keystone coal mine, it is a slope; the coal is hoisted by horse power, it is 6 feet thick and is worked by the double entry system, and ventilated by furnace. Employs men. The capacity is 50 tons per day. Ships on C. & N. W. R. R.

Post-office What Cheer, the Crescent Coal Co. operates two mines, No. 1 and 2. At No. 1, the shaft is 78 feet deep. The coal is hoisted by steam power, the coal is from 5 to 7 feet thick, worked by double entry system, is ventilated in an ordinary way by two fans. The Smith and Stine Electric Mining Machine Co. experimented with their machine at this mine; but the results were not satisfactory and the experiments were abandoned. 130

miners were employed. has a capacity of 500 ton. Ships on C. & N. W. R. R.

No. 2 is a shaft 109 feet deep, the coal is hoisted by steam power. The coal is from 5 to 6 feet thick, worked by entry system, is ventilated by fan driven by electric motor.

WILLIAM GREEN HALSH, *Pit Boss.*

Post-office, Cory. At Cory, Fred Carl operates a shaft one hundred and sixteen feet deep. The coal is six feet thick and is hoisted by steam power. Employs from five to fourteen miners. Coal is worked by double entry system, and ventilated by furnace. Capacity, 150 tons. Sales are local.

Post-office, What Cheer. At What Cheer, Job Smith & Rowley operates a horse and gin shaft. The coal is six feet thick and is worked by room and pillar system. Employs three to five miners and is ventilated by furnace. Capacity, forty tons. Sales are local.

Post-office, Cory. At Cory, John Farly & Co. operates the North Star mine. The coal is hoisted by steam power from a depth of ninety feet; it is six feet thick, worked by double entry system and is put on the cars of the B., C. R. & N. R. R. at Thornburg. Ventilated by steam and employs from four to eight men. Capacity, 150 tons per day.

Post-office, What Cheer. At What Cheer, John E. Morgan operates a slope mine. The coal is five and one-half feet thick; ventilated by a fan; worked by room and pillar. Employs three to five men. Sales are local. Capacity, forty tons.

Post-office, What Cheer. At What Cheer Chas. Blanckguart operates a slope mine. The coal is five and one-half feet thick; is ventilated by furnace; worked room and pillar. Employs three to four men. Capacity, thirty tons. Sales are local.

Post-office, Thornburg. At Thornburg Michael Kelly operates the Pioneer Coal Co.'s mine. The coal is hoisted by steam power from a depth of one hundred and ten feet. The coal is from six to eight feet thick, worked double entry system and is ventilated by a steam jet. There is a good country trade at this place, and some coal is hauled one-quarter of a mile by wagon, to B., C. R. & N. R. R. Capacity, fifty tons. This company has sunk a new shaft through seven feet of coal one-half mile north from the present working shaft, which is intended to be the main hoisting shaft.

Post-office Richland. Near Richland, Chas. Cordis operates a small horse and gin shaft. The coal is four feet thick. Employs men; sales are local.

Post-office Packwood. Near Richland, Thomas Turnbull operates a horse and gin shaft. The coal is four feet thick. Employs men. Sales are local.

Post-office Packwood. Near Packwood, George Rambo operates a horse and gin shaft. The coal is four feet thick. Employs men; sales are local.

Post-office Delta. Near Delta, Hickman & Chandler operates a shaft and slope. The coal is hoisted by horse power and is from four to five feet thick; employs from five to seventeen miners. Ventilated by a furnace; worked

room and pillar. The coal is hauled two miles by wagon and shipped on C., R. I. & P. R. R. Capacity sixty-five tons.

Post-office, Delta. At Delta Martin Fisher operates a horse and gin shaft. The coal is four feet thick, worked room and pillar; ventilated by a furnace. Employs three to four miners. Capacity, twenty tons. Sales are local.

Post-office, Sigourney. At Sigourney Ben Rowley operates a horse and gin shaft. The coal is five and one-half feet thick, worked room and pillar; ventilated by a furnace. Employs five to ten miners. Capacity, forty tons. Sales are local.

Post-office, What Cheer. At What Cheer John Blatt operates the Black Diamond mine. The coal is six feet thick, is hoisted by horse and gin from a depth of seventy feet; coal is worked by room and pillar; ventilated by furnace. Employs from five to ten miners. Capacity, forty tons. Ships on B., C. R. & N. R. R.

JASPER COUNTY MINES.

Post-office, Oswalt. At Oswalt the Diagonal Coal Co. operates the mines which were operated, until recently, by the Valeria Coal Co., No. 3 and No. 4 shafts. No. 3 is a shaft seventy-six feet deep. The coal is hoisted by steam power and is from four to six feet thick, worked by the double entry system and is ventilated by a fan. Employing one hundred and twenty-three miners and twenty day hands, and has a capacity of 400 tons. The coal is shipped on St. P. & K. C. R. R.

GUSS JOHNSON,
Pit Boss.

No. 4 shaft is forty-five feet deep. The coal is hoisted by steam power and is from five to six feet thick, worked by double entry system and is ventilated by a fan. Employs fifty miners and ten day hands. This is a new opening and not as yet fully developed.

CALEB JOHN,
Superintendent.
C. G. KLOFF,
Manager.

Post-office, Colfax. At Colfax, D. S. Couch operates the Jasper County Coal and R. R. Co's. shaft which is 55 feet deep, the coal is hoisted by steam power and is from 5 to 6 feet thick, worked by the double entry system, and is ventilated by a fan. Employs 60 miners, 25 day hands and has a capacity of 300 tons. Ships coal on C., St. P. & K. C. R. R.

HENRY THOMAS, *Pit Boss.*

D. S. COUCH, *Manager.*

Post-office, Draper. At Draper, John Gilchrist operates the Jasper Coal Mining Co's shafts. But very little work has been done at those mines the last year. The coal is shipped on the C. R. I. & P. R. R.

Post-office, Draper. At Draper, E. E. Edwards operates a slope in winter to supply local trade.

Post-office, Draper. At Draper, Robert Marshall operates a slope in winter to supply local trade.

Post-office, Draper. At Draper, F. J. Danks operates a slope in winter to supply local trade.

Post-office, Colfax. At Colfax, W. W. Allen operates a slope to supply local trade.

Post-office, Mitchellville, the Cook shaft is operated in winter to supply local trade.

Post-office, Newton. At Newton, William Snooks operates a shaft to supply local trade.

Post-office, Newton. At Newton, W. Conn and Murdock operates a shaft to supply local trade.

Post-office, Newton. At Newton, Robert Carson operates a shaft to supply local trade.

Post-office, Newton. At Newton, Henry Walker operates a shaft to supply local trade.

Post-office, Newton. At Newton, Robert Davidson operates a shaft to supply local trade.

Post-office, Newton. At Newton, Alfred Lester operates a shaft to supply local trade.

Post-office, Prairie City. At Prairie City, Lou Greenleaf operates a shaft 30 feet deep to supply local trade.

WILLIAM BURDESS, *Leasee.*

Post-office, Draper. T. J. Danks operates a slope mine. Sales are local.

JEFFERSON COUNTY MINES.

Post-office Lick Creek. At Lick Creek, John Beal operates a horse and gin shaft located three miles south of Libertyville. The coal is three feet thick, worked room and pillar. From eight to ten men are employed and has a capacity of forty tons per day. The coal is hauled five miles by wagons and shipped on F., M. & N. W. R. R.

Post-office County Line. One and one-half miles south of county-line John Clock operates a horse and gin shaft. The coal is four and one-half feet thick. Employs four to five miners. Sales are local.

JOHN CLOCK, *Manager.*

Post-office Fairfield. At Fairfield, four and one-half miles south, the Crawford Shaft is operated by Geo. Bates. Coal is four feet thick, hoisted

by horse and gin; from four to eight miners are employed. The sales are local.

Post-office Libertyville. Three miles south of Libertyville, A. J. Zimmerman operates a slope mine. The coal is three feet thick; employs three miners. Sales are local.

A. J. ZIMMERMAN, *Owner.*

Post-office Fairfield. Near Fairfield Thomas Russel operates a horse and gin shaft, coal four feet thick. Sales are local.

THOMAS RUSSELL, *Owner.*

Post-office Lockridge. Near Lockridge the Brown coal shaft is operated by J. S. McGregor; employs from three to five men. Coal is three and one-half feet thick. Sales are local.

J. S. MCGREGOR, *Manager.*

Post-office Fairfield. At County Farm, J. Williamson operates a small mine to supply local trade. Owned by the county.

J. WILLIAMSON, *Manager.*

Two miles south of county line Amos Taylor owns a coal shaft. Not mining.

VAN BUREN COUNTY MINES.

Post-office Farmington. At Farmington, a slope mine is operated by Ketchem Bros. The coal is hoisted by steam power and is from four to five and one-half feet thick; worked by double entry system and ventilated by a furnace. I have in all my visits found this mine in very fair condition with good supplies of props and the escape way in good order. Employs from fifty to seventy-five miners and has a capacity of two hundred and fifty tons per day. Ships on C., R. I. & P. R. R.

E. R. ALBRIGHT, *Superintendent.*

Post-office Farmington. At Farmington, the Farmington Coal Co. operates a shaft thirty feet deep; coal four feet thick, worked on longwall system and is hoisted by horse power. Employs from six to ten miners and has a capacity of forty tons per day. The coal runs from the mine by a horse tramway and shipped on the C., R. I. & P. R. R.

JAMES CARR, *Superintendent.*

Postoffice, Farmington. Stoddard & Turner operates a small horse and gin shaft, located northeast of Farmington two miles; employ three or four men in the winter.

Postoffice, Hillsboro. David Cox operates a small mine near Hillsboro for local trade in the winter.

Postoffice, Douds. E. S. Green operates a shaft mine for local trade in the winter; located four miles northwest of Douds.

Postoffice, Douds. At Douds Carson & Walker operates a slope mine. The coal is three feet thick, worked, room and pillar; ventilated by a fur-

nace; and employs ten miners, and has a capacity of forty tons per day. Ships coal on C., R. I. & P. R. R.

MATTHEW WALKER,
Superintendent.

Postoffice, Douds. At Douds George Findlay operates a slope mine. Coal is 3 to 5 feet thick; worked, room and pillar; ventilated by a furnace, and employs ten miners, and has a capacity of forty tons per day. From both of these mines the coal is hauled by wagons two miles to Douds and shipped on the C., R. I. & P. R. R.

GEO. FINDLAY,
Manager.

SCOTT COUNTY MINES.

Postoffice, Jamestown. At Jamestown, Bennett & Flair operate two shafts. The coal is hoisted by steam power. The shafts are eighty-six feet deep; coal two feet eight inches thick; worked room and pillar; ventilated by furnace. Employ thirty men in winter and ten in summer, and haul the coal to Davenport and Blue Grass.

Postoffice, Buffalo. Near Buffalo, C. G. Rowan operates a horse and gin shaft. The coal is two feet eight inches thick; worked room and pillar. Employs fourteen miners in winter and four in summer. Ventilated by furnace. Sales are local.

C. G. ROWAN, *Owner.*

Postoffice, Jamestown. At Jamestown, Felix Mactin operates a horse and gin shaft. The coal is two feet, eight inches thick; worked room and pillar; ventilated by furnace. Employs ten miners in winter and three in summer. Sales are local.

FELIX MACTIN, *Operator.*

Post-office, Buffalo. Near Buffalo on Stillwater Creek, Thomas Webster operates a horse and gin shaft and employs 3 men in winter. The sales are local.

Post-office, Buffalo. Near Buffalo on Stillwater Creek, Fridley operates a horse and gin shaft and employs 3 men in winter. The sales are local.

□ Post-office, Jamestown. Robert Williams operates a horse and gin shaft and employs 3 miners. Sales are local.

HARDIN CONUTY MINES.

There are two small mines operated in this county.

COMPLAINTS.

We have frequently received complaints from both miners and pit bosses that the fan is often slowed down at the time when it should be run at the greatest speed, viz.: at noon or firing time. In all such cases as these the pit boss has no control of the ventilating motors. It seems that the management of this important part of the mine, ventilation, is intrusted to a person who seldom ever goes into the mine, and therefore has no knowledge or conception of the requirements therein, or the derivement to the successful working of such mine, or the injury inflicted on employes. We have happened to come when not expected and found the fan merely moving; and where the furnace was used; there have been no fire at all. It is needless to say that the men were suffering for want of air; of course the fires were started and steam applied to the fan engine. But what remedy is there to prevent the recurrence of such a practice?

There are no men in a mine that are better able to know what is required in their respective mines than the manager or pit boss, if they be worthy of the position. At all of our large mines they have entire control of ventilating motors, but with few exceptions; all material necessary for the working are kept on hand, and if this rule was complied with all around there would be an end to all such practices complained of.

But I am sorry to say that some of our pit bosses are entirely ignorant of the principles of mine ventilation, or the effect on the animal system when the noxious gases of the mine are inhaled, and which they are expected to dilute and render harmless. What can be expected from persons who will tell us that there is no air outside, and how can we expect to find it in the mine. And another will suggest the brilliant idea that the fan house should be painted to get more air into the mine. Supposing an ordinary seaman was sent to sea in command of a ship instead of a qualified commander, nothing but disaster could be expected, neither can

success be attained in mining without able, intelligent management of the mine.

We have endeavored to avoid all personalities, but if the accusations contained herein should meet the eye of any one who may feel the thrust, our object will have been obtained when they have decided to improve and try to befit themselves for a position, where the health and safety of so many people are depending thereon.

There are many valuable works in circulation, written by able men, on the subject of mines and mining, which ought to be carefully studied by all mine bosses, especially the subject of ventilation.

Halls of audience, such as churches, halls of legislature, schools, theaters, factories and prisons present many obstacles to successful ventilation. Yet how insignificant do they appear when compared with the various sizes, forms and lengths, amounting to many thousands of feet of air passages, presenting many inconceivable obstructions to be encountered, day after day, in the coal mine. When the proper system be once applied successfully to the former the object is accomplished, because the conditions are nearly constant. But it is the reverse in the coal mine, as the conditions are changing with every ton of coal extracted, as the drag or resistance increases as the length of the passage or rubbing surface encountered by the moving air; also every bend and square turn where the air strikes against the face, rebounding and baffling the current, also the dips, raises, area, perimeter, form, density and velocity are all involved in the problem of mine ventilation.

The evil effects of lack of ventilation are made only too evident by such facts as that the death rates have been reduced by the introduction of efficient ventilating systems, in children's hospitals, from 50 to 5 per cent; in surgical wards of general hospitals, from 44 to 13 per cent; in army hospitals, from 23 to 6 per cent; in prisons, from 80 to 8 per cent; among horses in army stables, from 19 to 1.5 per cent, and in stables during epidemics the rate has been reduced 80 per cent.—*Notes on ventilation by Prof. S. H. Woodbridge, Massachusetts Institute Teacher, Boston, Mass.*

We must concede that the ventilation of some of our mines do not at all times attain the standard required by law.

There are many reasons for this defection, as some mines will be much better ventilated with a small quantity of air than some others would be with a large quantity. A new mine where the air courses are kept clean and open, and no black damp permitted to enter into the air current, there will be little trouble to be apprehended. But in some old mines where the air travels into old

entries for thousands of feet, and a slow combustion has been in action in the grooves for some time, the numerous stoppings are liable to be leaking more or less black damp, and the air becomes more and more polluted, and will in some cases require more than double the quantity of air to render the noxious gases harmless, than would be required in some other mines.

Another and greivous reason is that it some times happens that the person in charge of the ventilation and ventilating motors, is deplorably ignorant of what is required of them, and are therefore an unnecessary evil around a coal mine, and cannot be anything else but a failure under any conditions.

On the other hand, the person in charge of the ventilation, etc., may be a good, competent, practical man, but he is often governed by another person who has no knowledge or conception of what is required down in the mine, thus rendering the ability and experience of the pit boss nugatory or worthless.

In view of these facts, we would therefore recommend, that the control of all ventilating motors and modes of ventilation be intrusted in the hands of the pit "boss"* at each and every coal mine.

We would also recommend that Section 10, Chapter 21, Laws of 1884, be so amended to read that whenever the inspector shall find men working without sufficient air, or under any unsafe conditions, he shall at once take out the men, and keep them out until said mine shall be put in proper and safe condition to work.

REMARK.—We have frequently taken the men out when they have been found working without sufficient air, and other unsafe conditions, without giving any notice whatever to the agent or operator.

At the Valeria coal mines, May 29, 1890, two men were ordered out of their place. The room was driven up about sixty-five yards from the entry without any holing. There was a deep depression half way in the room, where the track lay under twelve inches of water. There was no chance for air to enter the room, and the roof was all resting on the props. Less than thirty minutes after the men were taken out the room closed from the entry to the face. Many other cases could be cited to show where it would be almost a criminal act for the inspector not to act promptly and at once, without further notice, take the men out of danger. In many cases

* Pit boss or superintendent.

where the men have been ordered out of their places, for lack of air, some of these men have returned to their places before any improvement had been made; and in some of the cases they were overcome by the foul air, and had to be carried outside of the mine to recover.

For such reasons as these, we ask for a remedy to prevent men from returning to their rooms until said rooms have been put in proper and safe working order.

The following pages will contain a few notes and quotations on the principles of mine ventilation, which may be of some interest to those engaged in the business of mining.

PRINCIPLES OF VENTILATION.

Heat is a mode of motion. A wind, either upon the surface of the earth or within the confined passages of a coal mine, results from a difference of pressure. The wind or air will pass from the place where the temperature is low to the place where the temperature is high. Hence the air will flow from where the pressure is high to the place where the pressure is low. Supposing a tunnel running east and west through a portion of land, in the morning the sun's first rays will fall on the east side opening, and will raise the temperature higher, so will the air become lighter, and the heavier air from the west side will pass through the tunnel and will continue to do so until the sun has attained its highest altitude at noon, when the temperature will have become equal at both ends of the tunnel; the pressure will be equal also, and no air will pass either way until the sun has declined to the west side of the hill. But should a wind be blowing into the mouth of the tunnel at either side, it is evident that it could act to assist or retard or equalize all the former physical or natural agencies. Those agencies can be assisted artificially by a wind cowl placed to direct the current, or as the vans of a windmill are rotated and kept facing the wind. And those are the physical agencies, termed natural ventilation when applied to ventilate mines. However, it is clear that natural agencies are not reliable.

Various devices have been in use to procure ventilation in mines. But the furnace in deep mines and the fan at any mine are the only efficient motors as yet invented. What is wanted to give the best results, with due regard to economy, is a motor that will produce the maximum amount of pressure with a minimum of expense.

The following comparison between the furnace and fan is given by Mr. R. How, in a paper printed in the "Transactions of the Chesterfield and Derbyshire Institute of Engineers," England:

Two shafts were ventilated by furnace, the first shaft being 200 feet deep. The barometer indicated 30.3 and temperature at down cast 55°, and at up cast 240°. This would give a pressure in down cast of 20.31 pounds, and in

the up cast a pressure of 14.93 pounds; equal to a ventilating pressure of 5.37 pounds per square foot; 30,358 cubic feet of air was passing in the mine.

In the second shaft, 655 feet deep, the barometer indicated 30.6, and temperature at down cast 58°, and the temperature at up cast 117°; this would give a pressure in the down cast of 51.379 pounds per square foot, and for the up cast 46.116 pounds, equal to a pressure of 5.26 pounds for ventilation; 48,290 cubic feet of air was passing.

The first furnace consumed 6,850 pounds of coal in twenty-four hours, and the second furnace consumed 6,720 pounds in twenty-four hours. The two furnaces circulated 78,588 cubic feet of air per minute.

A Guibal fan was afterwards installed to take the place of the two furnaces, the ordinary speed being 60 revolutions per minute. The average quantity of air circulated was 106,680 cubic feet per minute. The water gauge indicating 2.8 inches, or 14.56 pounds, for ventilation.

Tabulated results of the above calculations show the economy of fan over the two furnaces.

The wages and price of coal are those regulated by the English market, at the time of writing, reduced to United States money.

PRINCIPLES OF VENTILATION.

	Quantity by furnaces.	Quantity by the fan.	DUE TO FAN.	
			Increase.	Decrease.
Cubic feet per minute.....	78,588	106,680	28,092	.....
Pressure in pounds per square foot.....	5.304	14.50	9.25	.....
Cost of fuel, wages, etc., for 24 hours.....	\$ 10.44	\$ 5.33		\$ 5.11
Cost per hour on the air, for 24 hours.....	.82	.12		.70
Pounds of coal consumed per hour on the air per hour.....	49	10		39
Amount saved in one year by the fan.....				\$2,120.65

Considering the two furnaces cited, had the depth of the shafts been one 25 and the other 100 feet, the pressure would have been 0.5168 and 0.6299, instead of 5.37 and 5.26 lbs. This clearly shows the impotency of furnace ventilation with shallow shafts.

The efficiency of the fan in a great measure depends, first on the construction, second, capacity, third, periphery velocity. C. M. Percy in his works on mechanical ventilation says, "That we find even the same fan working at the same mine varying in the quantity of air, although the speed and water gauge are constant," but don't state that the density of the air is constant. The same author gives the result of nineteen fans of different type, the average of which are water gauge 1.77 inches, periphery velocity 5,068 feet per minute, and 149,000 cubic feet of air per minute circulating.

The first cost of a furnace may not be so great as the first cost of the fan, but it has been shown in the case cited, that 80 per

cent more coal was consumed by the furnaces than that of the fan, with 26 $\frac{2}{3}$ per cent more air in favor of the fan.

From the above it appears that four times the pressure can be easily procured by a fan at a less cost than by a furnace in our average Iowa mines; this means double the quantity of air obtained, with all the advantages of changing the air current at pleasure, where, by a furnace this cannot be done, and all the summer long some mines are tormented with foul air for the lack of sufficient pressure which a furnace cannot give.

FORCING AND EXHAUSTING METHODS.

When exhausting a partial vacuum is created within the mine workings, and the pressure is lessened; hence there will be more leakage of gas from the strata, and foul air from old workings, and badly constructed, leaky stoppings inward, emitting and diffusing the pure intake air current with a poisonous mixture.

When forcing all spaces are filled with air with an extra pressure outward, thus preventing the escape of gas. But should the pressure be suddenly relieved, a greater amount of gas would be evolved.

In the following pages it will be shown that the pressure is not the main factor in procuring ample ventilation. No matter what amount of pressure be applied, if the area of the air courses be not sufficiently large to contain the air at a reasonable velocity, because the limit is soon attained when we know that the power required increases as the cube of the velocity.

The sanitary condition of all mines greatly depends on the actions of each and every man employed therein, and all miners, as well as pit bosses, should bear this in mind. Seventy-five miners are often working in one current of air, one hundred and seventy-five pounds of powder will, on an average, be exploded by them at noon, and seventy-five lamps are burning constant, and if the filthy practice of depositing excrement in the air courses, combined with the combustion of seventy-five torches burning low grade, cheap mineral oils be allowed, then we have the horrible condition of affairs, far more pestilential and disgusting than the black damp.

However, I am free to say that but few of our mines have ever been found in such a condition; but some have been found so.

Every break through in rooms and every cross-cut in entries, should be of no less area than entries, or other air spaces, except when necessary to regulate the current of air. And the refuse in the rooms should be placed in such a manner so as to act as a conductor for the air to pass from face to face through the holings with the least possible obstruction or resistance; but it is in such

places where mostly props, tools, boxes and slate are often found, and the air spaces reduced to a few square feet; and here the air current is strangled.

The water gauge has been used at four of the mines in order to ascertain the amount of pressure exerted, necessary to propel the air through each respective mine.

The tabulated results will show where deficient or contracted air course are; because a low water gauge with a good volume of air passing will show that the passages are clear. And a high water gauge with a small volume of air passing will show that the passages are obstructed, or that they are small; as per columns 7 and 16, on horizontal line 4. Here the pressure or water gauge reads 1.2 inches, and the quantity 15,000 cubic feet. While on the same column, and on horizontal line 5, water gauge reads 1.4 inches and 85,000 cubic feet.

Other explanations are given over.

TABLE No. 1.

NAME OF MINE.	Diameter of fan in feet.		Area of surface of fan blade in feet.		Number of revolutions per minute.		Steam pressure at boiler, in pounds.		Piston speed per minute.		Water gauge in inches.		H = theoretical WG = 2g - in inches.		Pressure due to friction, in pounds.		W G x 5.2 = pressure in pounds per square foot.		Size of fan engine.		Horse power exerted by engine.		Horse power exerted on the air.		*Velocity of air in air shaft.		Percentage of good effect.		Cubic feet per minute.		Number of men employed or equivalent.		Cost per man per day per ventilation.		CONNECTION OF FAN TO ENGINE—FORCING OR EXHAUSTING.			
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Carbonado No. 4	10 7 1/2	10 7 1/2	98	50	196	0.7	0.019	3.54	3.64	7 x 12	11 1/4	4.72	0.68	42.4	42,800	375	6.0212	By belt forcing.																				
Knoxville Junction	10 5 1/4	114	40	266	0.4	0.014	2.00	2.08	10 x 14	35 3/4	2.36	471	9.35	33,900	214	0.0650	Direct exhausting.																					
Consolidation No. 6	12 9	107	90	210	0.58	0.059	2.55	3.01	8 x 12	28.75	4.87	1,027	17.00	53,500	400	0.0217	By wire rope forcing.																					
Seymour	10 7 1/4	120	85	200	1.20	0.043	5.00	6.24	6 x 10	14.60	2.89	833	20.00	15,000	50	0.0400	By belt exhausting.																					
Consolidation No. 6	12 9	170	70	180	1.40	0.109	9.40	7.28	8 x 18	38.38	18.75	1,545	48.85	85,000	400	0.0217	By belt forcing.																					

* See Table No. 2. The velocity of air current is taken in the shaft, instead of the peripheral velocity of the fan. Average cost per day per man employed at the above mines, 0.0228 cents. Total approximate value of ventilating motors at the above mines, \$4,000.

TABLE No. 2.

	Peripheral velocity, in feet, per second.	Height of air column due to $\frac{v^2}{2g}$	Weight of air volume in pounds; temper- ature 75°, and bar- ometer 29 inches.	Theoretical water gauge in inches.	Indicated water gauge in inches.		
1.....	50.26	39.23	2.833	0.5447	0.700	0.1553	.....
2.....	59.69	55.30	3.979	0.7000	0.400	.....	0.300
3.....	67.21	70.00	5.000	0.9688	0.580	.....	0.388
4.....	62.82	61.00	4.390	0.8440	1.200	0.3560	.....
5.....	105.80	177.00	12.730	2.4500	1.400	.....	1.050

Capacity of, or volume, not being considered.

On the first horizontal line on column 7 the water gauge reading is 0.7 of an inch, and if we multiply 0.7 by 5.2 we have 3.64 pounds as pressure per square foot of area exerted on the air shaft, in order to propel 42,800 cubic feet of air down the shaft and through all the workings in the mine, 5.2 pounds being the weight of one square foot, one inch deep (of water).

Column 8 shows the theoretical head of air column reduced to water gauge in inches, necessary to produce the velocity in column 14 independent of the mine resistance. Column 9 shows the pressure necessary to overcome friction. Column 10 shows that 3.64 pounds per square foot of area is exerted on the air shaft as stated above. The air shaft, having 64 feet of area, and the velocity in column 14 being 668 feet; $668 \times 64 = 42,752$ or 42 cubic feet short of the quantity. Some discrepancies may be found in the calculations of the table, but it must be remembered that all the figures were taken practically at the mines, and are given in the table precisely as taken. Column 15 shows 42.4 per cent of useful work obtained. On horizontal line (2) column 7, 12 and 15, will show that the air courses are good, 0.4 of an inch water gauge producing 33,900 cubic feet of air; but 12 and 15 shows the fan to be worthless, as it really is, only giving comparatively 9.35 per cent of useful effect. Column 5 gives the steam pressure at boiler without any deductions for loss. Column 12 no deductions are taken for friction. On the third and fifth horizontal lines are the results of the same fan at the same mine given, but working under different conditions. The table will show the different results.

Before the change transpired in this case the fan was run by an 8' x 12' engine, transmitting power by wire rope about 400 feet to the fan. A double horizontal engine cylinders 8' x 18' was set well up to the fan and fan driven by a belt. The gain of useful effect was comparatively 31.85 per cent. The speed at each observation was 107 and 170 revolutions, with water gauge reading 0.58 and 1.4 respectively.

On the fourth horizontal line at column seven, the water gauge indicates 1.2 inches, equal to a pressure of 6.24 lbs. per square foot of area, and column 14 gives 833 feet velocity, and in column 16 gives 15,000 cubic feet of air passing. $18 \times 18 = 324$ —18 feet of area in the air shaft.

In this case 1.2' depression gives 15,000 cubic feet of air, and on line 5, 1.4' depression gives 85,000 cubic feet of air, the areas being 18 and 55 feet respectively. Had the depression been the same for both areas the larger air passage would pass an equal quantity of air 16 times the distance as that of the smaller.

Summary: If we take the average quantity of air produced in English mines, as quoted from C. M. Percy, to be correct, that is 149,000 cubic feet, with 1.77 inches water gauge; then we have still ample room for improvement.

As the average quantity in the table is 46,040 cubic feet produced by an average water gauge of 0.856 inches.

Taken the fans given in the table, the percentage compared with the former would be as follows:

- (1) $\sqrt{0.7} : \sqrt{1.77} :: 42,800 : 680,34$, or 45 per cent of 149,000.
- (2) $\sqrt{0.4} : \sqrt{1.77} :: 33,900 : 64,400$, or 43 per cent of 149,000.
- (3) $\sqrt{0.58} : \sqrt{1.77} :: 53,500 : 93,427$, or 62 per cent of 149,000.
- (4) $\sqrt{1.2} : \sqrt{1.77} :: 15,000 : 18,219$, or 10 per cent of 149,000.
- (5) $\sqrt{1.4} : \sqrt{1.77} :: 85,000 : 95,546$, or 64 per cent of 149,000.

Remark: As some economists have suggested, that ventilating fans be driven by horse power machines, it is expected that the above results as shown, may be of some advantage to assist them in the matter. "We want a fan that will sweep out the smoke and let the men start work again; nothing else will pay here; we can slow down the speed when the smoke is all out."

(Managers of Consolidation Coal Co.)

Air in passing through an opening in a thin plate meets with resistance, and M. Murgue has pointed out the convenience of assimilating the works of a mine to such an opening in calculations for

ventilating purposes. This opening he has named the equivalent orifice. See A. L. Steavenson's translation of M. Murgue's works on the fan. A fan one foot in diameter may give a depression equal to a fan twenty feet in diameter, but it is clearly evident that a small fan can not handle but a small volume of air. The proportions of fan are given as $\frac{1}{3}$ diameter for inlet of air, and $\frac{1}{3}$ diameter for width of fan blades. Experience proves that when the fan blades are nearly $\frac{1}{2}$ the diameter much better results are obtained.

The fans at English mines vary from 10 to 50 feet in diameter, and from 3 to 15 feet in width, and pass from 60,000 to 300,000 cubic feet per minute with water gauge from 1.5 to 2.7 inches.

In the last case 127 lbs. would be expended on the air, and if the fan gave 50 per cent useful effort the engine required to drive the fan would be not less than 254 horse power.

Finally, the greatest obstacle the mine inspector has to contend with in order to have the mines properly ventilated so as to fulfill the requirements of the law, is through the inability of the men in charge, many of which have no knowledge of what their duties are, while some others who may have sufficient ability have to be governed by those who have never acquired any mining experience, practical or theoretical.

These are stubborn facts, which ought not to be tolerated, if we are not liable to be blown to pieces by an explosion of fire damp, we have other gases to expel from the mines which are by far more poisonous than fire damp and which require a much more vigorous current of air to expel from the mine on account of its greater density, not including the immense volumes of powder smoke.

In view of these facts we would earnestly call the attention of our law-makers to formulate and pass a law requiring all mine managers to pass an examination before a board of examiners to be appointed for that purpose, so that every pit boss may qualify before he may be placed in the position of a colliery manager.

We believe a good law enacted for this purpose would be of incalculable value to mining interests.

BIENNIAL REPORT
OF THE
THIRD DISTRICT,

EMBRACING

BOONE, DALLAS, GREENE, GUTHRIE, MARION, POLK, AND
WEBSTER COUNTIES.

MORGAN G. THOMAS, INSPECTOR,

REPORT.

To the Hon. HORACE BOIES, Governor of Iowa:

SIR—In accordance with the law, I have the honor to present herewith the biennial report of the Third District on Mines and Mining.

I assumed the official duties as Mine Inspector of this district the first day of December, 1889, as successor to James E. Stout.

During my term of office up to June 30, 1891, I have made two hundred and thirty inspections, in regard to safety, sanitary and ventilation, etc.

The mines were generally found in good working condition. When deficient in any of the requirements of law were found, I have had no trouble of any consequence in enforcing compliance.

There is now several new shafts being sunk in the district, with good prospects of successfully opening up new coal fields.

Taking in consideration the energy with which these new works are being pushed forward to completion, and the many improvements being made to the old mines, with prospects of a good demand for coal, I think the future outlook of the mining industry for this district is very encouraging.

The report contains numerous statistical tables showing the annual output of coal, the amount of money received for the total product at the mines, the number of miners and employes in and about the mines, the total amount of money paid to them annually, the location of mines and by whom operated, the number of improvements, etc., also a list of fatal and non-fatal accidents, and some of their causes, with suggestions that I believe, if adhered to, would prevent many of such accidents.

With other recommendations that I think will be of interest to the operators, miners and State generally.

Respectfully submitted,

MORGAN G. THOMAS,
Mine Inspector, Third District.

The third district comprises the following counties: Boone, Dallas, Greene, Guthrie, Marion, Polk and Webster.

There are about one hundred and seven mines in the district, sixty-eight are shipping mines, and thirty-nine are operated for local trade; some of the local mines are not reported as they change hands often, and work only a few months in winter time.

There are in the district forty-eight mines using steam power for hoisting purposes, and fifty-nine using horse power for the same.

Thirty-five of the mines are ventilated by fan, and seventy-two use the furnace method of ventilation.

Fifty-three of the mines are worked on the room and pillar system of mining, and fifty-four are worked on the long wall plan.

The following are the numbers of new mines opened, and old mines abandoned during the last two years.

COUNTY.	New mines opened.		Old mines abandoned.	
	1887.	1888.	1887.	1888.
Boone.....	1	1	1	1
Greene.....	3	1	1	1
Marion.....	5	1	1	1
Polk.....	6	3	3	3
Total.....	16	6	6	6

The above has reference only to the shipping mines of the district. There are about three hundred and forty-six horses and mules employed in hauling coal in the mines of the district, including those that are used for hoisting coal from the mines to the surface. The average number of miners employed in the district is two thousand one hundred and fifteen (2,115). The average number of laborers employed in and around the mines is five hundred and seventy-six (576). Total number of men employed in and around the mines in district two thousand six hundred and ninety-one.

COAL OUTPUT OF THE COUNTIES COMPRISING DISTRICT No. 3, FOR THE PAST FIVE YEARS.

COUNTY.	1887.	1888.	1889.	1890.	1891.
Boone.....	167,068	157,650	124,615	132,584	180,577
Dallas.....	40,220	54,580	69,430	42,008	43,324
Greene.....	105,894	131,714	94,415	74,135	74,544
Guthrie.....	18,305	18,680	13,412	8,630	11,963
Hamilton..	6,609	6,480	2,500		
Polk.....	305,064	386,321	356,039	508,149	397,833
Webster.....	146,221	174,293	145,653	130,000	124,963
Marion.....	212,695	230,652	143,504	170,183	210,061
Total.....	1,101,966	1,160,380	930,658	1,066,787	1,051,295

The net increase of the output of coal in the third district over the former biennial period is 18,044 tons, this increase is very perceptible in the counties of Boone, Marion and Polk, as the mines in these counties are principally shipping mines. While Dallas, Greene, Guthrie and Webster shows a decrease. The reason of this is the majority of the mines in these counties depends largely upon the local trade, or home consumption for the sale of their coal. Consequently the very mild winters for the past two years have had a great effect on the demand and output, as the demand was not sufficient to keep the output up to the standard of previous cold winters.

NAMES OF MINES AND LOCATION.
BOONE COUNTY.

NAME OF COMPANY, FIRM OR OPERATOR.	Number of mine.	Kind of mine.	Depth of shaft.	Thickness of vein.	How ventilated.	Kind of power used.	Shipping or local.	P. O. ADDRESS.
W. D. Johnson Coal and Mining Company	No. 1	Shaft	240 feet	3 to 3 1/2 feet	Fan	Steam	Shipping	Boonsboro.
Milford Mine	No. 1	Shaft	100 feet	4 feet	Fan	Steam	Shipping	Boonsboro.
Rogers & Crow	No. 1	Shaft	205 feet	4 feet	Fan	Steam	Shipping	Boonsboro.
Clyde Coal and Mining Company	No. 1	Shaft	60 feet	3 1/2 feet	Fan	Steam	Shipping	Boonsboro.
John Marshall & Son	No. 1	Shaft	45 feet	3 1/2 feet	Furnace	Steam	Shipping	Boonsboro.
Angus Coal and Mining Company	No. 1	Shaft	85 feet	3 to 4 feet	Fan	Steam	Shipping	Angus.
Dalby Bros.	No. 1	Shaft	112 feet	4 to 5 feet	Fan	Steam	Local	Angus.
James Wilson	No. 1	Shaft	50 feet	3 1/2 feet	Furnace	Horse	Local	Pilot Mound.
Zankle Mine	No. 1	Shaft	80 feet	3 1/2 feet	Furnace	Horse	Local	Pilot Mound.
Hutchinson Bros. & Son	No. 1	Shaft	125 feet	4 feet	Furnace	Horse	Local	Zenorsville.
Joseph York Mine	No. 1	Shaft	85 feet	4 feet	Furnace	Steam	Shipping	Boonsboro.
Samuel McBirnie	No. 1	Shaft	150 feet	3 feet	Furnace	Horse	Shipping	Boonsboro.
McBirnie & Nelson	No. 1	Shaft	40 feet	3 feet	Furnace	Horse	Shipping	Boonsboro.
Clark & Flockard	No. 1	Shaft	80 feet	3 feet	Furnace	Horse	Shipping	Boonsboro.
Riverside Coal Company	No. 1	Shaft	35 feet	3 feet	Furnace	Horse	Shipping	Boonsboro.
Highland Chief	No. 1	Shaft	60 feet	3 feet	Furnace	Horse	Local	Boonsboro.
H. E. Hall	No. 1	Slope	3 feet	3 feet	Furnace	Horse	Shipping	Boonsboro.
Garden Hill	No. 1	Shaft	208 feet	2 1/2 feet	Furnace	Steam	Local	Madrid.
Knox Bros.	No. 1	Drift	3 feet	3 feet	Furnace	Horse	Local	Madrid.

DALLAS COUNTY.

Dawson Coal Company	No. 1	Shaft	165 feet	3 1/2 feet	Fan	Steam	Shipping	Dawson.
Van Meter Coal Company	No. 1	Shaft	265 feet	3 feet	Fan	Steam	Shipping	Van Meter.
J. R. Strange & Son	No. 1	Shaft	35 feet	3 feet	Furnace	Horse	Local	Chestnut Ford.
Redfield & Hutchins	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Horse	Local	Linden.
O. P. Cane	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Redfield.
Canfield & Botts	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Redfield.

GREENE COUNTY.

Keystone Coal and Mining Company	No. 1	Shaft	75 feet	4 1/2 feet	Fan	Steam	Shipping	Angus.
Craig Coal and Mining Company	No. 1	Shaft	85 feet	4 feet	Fan	Steam	Shipping	Angus.
Rippey Coal Company	No. 1	Shaft	120 feet	4 1/2 feet	Fan	Steam	Shipping	Rippey.
Dale & Goodwin	No. 1	Shaft	150 feet	3 feet	Fan	Steam	Shipping	Grand Junction.

GUTHRIE COUNTY.

Clipper Mine	No. 1	Shaft	126 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
Panora Coal Mine	No. 1	Shaft	84 feet	2 1/2 feet	Furnace	Horse	Local	Panora.
Greenbrier Mine	No. 1	Shaft	60 feet	2 1/2 feet	Furnace	Horse	Local	Jamacla.
Black Diamond	No. 1	Shaft	65 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
Marshall Mine	No. 1	Shaft	55 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
S. S. Briggs	No. 1	Shaft	40 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
P. Renslow	No. 1	Shaft	48 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
G. W. Butler	No. 1	Shaft	70 feet	2 1/2 feet	Furnace	Horse	Local	Fansler.
H. Hutchen	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Bayard.
Chas. Miller	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Bayard.
W. P. Williams	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Bayard.
Isaac Clark	No. 1	Drift	2 1/2 feet	2 1/2 feet	Furnace	Man	Local	Bayard.
Higgins, Hoops & Morris	No. 1	Shaft	85 feet	2 1/2 feet	Furnace	Horse	Local	Panora.

MARION COUNTY.

Whitebreast Fuel Company No. 11	No. 1	Slope	4 to 7 feet	4 to 7 feet	Furnace	Steam	Shipping	Flagler.
Black Diamond Coal Company	No. 1	Slope	4 to 6 feet	4 to 6 feet	Fan	Steam	Shipping	Dunreath.
Midland Coal Company	No. 1	Shaft	35 feet	3 1/2 to 4 feet	Fan	Steam	Shipping	Morgan Valley.
Otley Coal Company	No. 1	Shaft	85 feet	4 feet	Fan	Steam	Shipping	Otley.
Midland Coal Company	No. 2	Slope	3 1/2 to 4 feet	3 1/2 to 4 feet	Fan	Steam	Shipping	Morgan Valley.
Wm. Lewis	No. 1	Shaft	50 feet	4 feet	Furnace	Steam	Local	Knoxville.
Boerdinal, J. A.	No. 1	Slope	40 feet	5 feet	Furnace	Steam	Shipping	Hamilton.
Atlas Coal Company	No. 1	Shaft	40 feet	5 feet	Furnace	Horse	Shipping	Hamilton.
Geo. C. Davis	No. 1	Shaft	50 feet	5 feet	Furnace	Horse	Shipping	Hamilton.
Oak Hill Mine	No. 1	Slope	5 to 7 feet	5 to 7 feet	Furnace	Horse	Shipping	Flagler.
Bussy Mine	No. 1	Slope	4 feet	4 feet	Furnace	Horse	Shipping	Bussy.
Swan Mine	No. 1	Shaft	80 feet	4 feet	Furnace	Horse	Shipping	Swan.
S. M. Ruetman	No. 1	Slope	4 feet	4 feet	Furnace	Horse	Local	Knoxville.
Wm. Gamble	No. 1	Shaft	54 feet	4 feet	Furnace	Horse	Local	Knoxville.
Collins & Co.	No. 1	Slope	4 feet	4 feet	Furnace	Horse	Local	Knoxville.
John Yonser	No. 1	Slope	4 feet	4 feet	Furnace	Horse	Local	Marysville.
David Fry	No. 1	Slope	4 to 7 feet	4 to 7 feet	Furnace	Horse	Local	Marysville.
Geo. Marshall	No. 1	Slope	4 to 6 feet	4 to 6 feet	Furnace	Steam	Local	Otley.
Patrick Carey	No. 1	Slope	3 1/2 feet	3 1/2 feet	Furnace	Horse	Local	Pella.
Lewis Woodyard	No. 1	Slope	4 feet	4 feet	Furnace	Horse	Local	Pella.

REPORT OF STATE MINE INSPECTORS.

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REPORT OF STATE MINE INSPECTORS.

MARION COUNTY—CONTINUED.

NAME OF COMPANY, FIRM, OR OPERATOR.	No. of mines.	Kind of mine.	Depth of shaft.	Thickness of coal.	How vent- lated.	Kind of power used.	Shipping or local.	P. O. ADDRESS.
Wm. Franklin	No. 1	Slope	.....	3 feet	Furnace	Horse	Local	Pella.
J. M. Markham	No. 1	Shaft	60 feet	4 feet	Furnace	Horse	Local	Pella.
Samuel States	No. 1	Drift	.....	3 feet	Furnace	Horse	Local	Attica.
Lewis Whitlatch	No. 1	Drift	.....	3 feet	.....	Horse	Local	Attica.
Samuel Whitlatch	No. 1	Drift	.....	3 feet	.....	Horse	Local	Attica.
Hugh McNish	No. 1	Drift	.....	3 feet	Furnace	Horse	Local	Monroe.
W. O. Robertson	No. 1	Drift	.....	4 feet	Furnace	Horse	Local	Knoxville.

POLK COUNTY.

Bloomfield Coal and Mining Company	No. 1	Shaft	191 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Coon Valley Coal and Mining Company	No. 1	Shaft	118 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Coon Valley Coal and Mining Company	No. 2	Shaft	35 feet	3 to 4 feet	Fan	Steam	Shipping	Des Moines.
J. M. Christy Coal and Mining Company	No. 2	Shaft	115 feet	3½ to 4 feet	Fan	Steam	Shipping	Des Moines.
Samuel Dale	No. 1	Shaft	100 feet	3 feet	Furnace	Horse	Local	Commerce.
Des Moines Coal and Mining Company	No. 1	Shaft	103 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Eureka Coal and Mining Company	No. 1	Shaft	150 feet	4 to 6 feet	Fan	Steam	Shipping	Des Moines.
Polk County Coal and Mining Company	No. 1	Shaft	120 feet	4½ feet	Fan	Steam	Shipping	Des Moines.
Garver Coal and Mining Company	No. 1	Shaft	118 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Maple Grove Coal and Mining Company	No. 1	Shaft	100 feet	3½ to 4 feet	Fan	Steam	Shipping	Des Moines.
Proctor Coal and Mining Company	No. 1	Shaft	204 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Union Coal and Mining Company	No. 1	Shaft	150 feet	4 to 5 feet	Fan	Steam	Shipping	Des Moines.
Rose Hill Coal and Mining Company	No. 1	Shaft	85 feet	3 to 4 feet	Fan	Steam	Shipping	Des Moines.
Van Ginkle Coal and Mining Company	No. 1	Shaft	75 feet	3 to 5 feet	Fan	Steam	Shipping	Des Moines.
Midland Coal and Mining Company	No. 1	Shaft	50 feet	3½ feet	Fan	Steam	Shipping	Runnells.
Polk City Coal and Mining Company	No. 1	Slope	228 feet	3½ to 4 feet	Fan	Steam	Shipping	Polk City.
Logan Mine	No. 1	Slope	.....	3½ feet	Furnace	Horse	Local	Runnells.
Runnells' Slope	No. 1	Slope	.....	3½ feet	Furnace	Horse	Shipping	Runnells.

WEBSTER COUNTY.

Crooked Creek Coal Company	No. 1	Slope	.....	3 to 3½ feet	Furnace	Steam	Shipping	Lehigh.
Crook Creek Coal Company	No. 2	Slope	.....	3 to 3½ feet	Furnace	Steam	Shipping	Lehigh.
Crooked Creek Coal Company	No. 3	Slope	68 feet	3 to 3½ feet	Furnace	Steam	Shipping	Lehigh.
Craig Coal Company	No. 5	Slope	.....	3 feet	Furnace	Horse	Shipping	Kalo.
Craig Coal Company	No. 6	Shaft	.....	3 feet	Furnace	Horse	Shipping	Kalo.
Craig Coal Company	No. 7	Slope	65 feet	4 feet	Fan	Horse	Shipping	Kalo.

WEBSTER COUNTY—CONTINUED.

Carey Coal Company	No. 1	Slope	.....	3½ feet	Furnace	Steam	Shipping	Lehigh.
Black Diamond Coal Company	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
G. W. Carey	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
S. W. Corey	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
H. A. Corey	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
A. Smith & Son	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
Carlson & Co.	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Lehigh.
E. Johnson	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Kalo.
Mills & Emerads	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Kalo.
Porter & Howells	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Kalo.
Collins & Bros.	No. 1	Slope	.....	3 feet	Furnace	Horse	Shipping	Kalo.
James Martin	No. 1	Slope	.....	4 to 6 feet	Furnace	Steam	Shipping	Coalville.
Isaac Rhodes	No. 1	Drift	.....	3 feet	Natural	Man	Local	Coalville.
A. Stine	No. 1	Drift	.....	3 feet	Natural	Man	Local	Coalville.

TABLE No. I.

Showing number of mines, annual output, number of miners and other employes, value of product, etc., in District No. 3, for the year ending June 30, 1890.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mines.
Boone	19	132,584	343	72	.98	132,604.00	59,006.00	1.70	236,884.25
Dallas	4	42,698	98	23	1.00	42,774.00	26,003.00	1.80	76,692.05
Greene	6	74,135	208	40	.92	68,997.00	14,746.00	1.58	117,041.00
Guthrie	12	8,939	104	20	1.50	13,900.00	1,106.00	2.50	22,247.00
Marion	27	170,183	317	81	.75	127,637.00	43,793.00	1.23	208,686.41
Polk	15	508,149	625	185	.90	469,612.00	212,176.00	1.51	769,550.28
Webster	20	130,999	428	72	.94	121,675.00	40,370.00	1.61	209,562.00
Totals	103	1,066,787	2,123	495	.92	976,569.00	397,800.00	1.53	1,640,662.99

TABLE No. II.

Showing number of mines, annual output, number of miners and other employes, value of product, etc., in District No. 3, for the year ending June 30, 1891.

NAME OF COUNTY.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mines.
Boone	19	189,577	480	128	.94	177,003.75	69,364.41	1.86	351,825.31
Dallas	6	43,324	106	34	.93	40,278.08	14,450.00	1.78	75,983.40
Guthrie	16	11,993	87	15	1.48	17,770.00	2,260.00	2.50	29,982.50
Greene	4	74,544	158	32	.85	63,962.79	14,558.00	1.59	118,173.29
Marion	27	216,061	347	132	.75	158,679.32	43,341.19	1.30	275,300.31
Polk	18	397,853	652	217	.88	321,048.73	97,544.26	1.53	604,921.25
Webster	20	124,963	273	96	.84	104,360.00	44,628.17	1.61	200,325.50
Totals	110	1,052,295	2,103	654	.84	882,732.76	277,146.06	1.57	1,637,465.56

TABLE No. III.

Showing average number of mines in operation, output of coal, average number of miners and other employes, compensation of employes, value of product, etc., in District No. 3, for the biennial period ending June 30, 1891.

NAME OF COUNTY.	Average number of mines in operation.	Number of tons of coal produced.	Average No. of miners employed.	Average number of all other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mines.
Boone	19	322,161	412	100	.96	309,607.75	119,370.41	1.83	588,710.56
Dallas	5	86,022	102	30	.97	83,032.08	41,663.00	1.79	153,625.45
Guthrie	14	20,332	96	18	1.49	31,370.00	3,366.00	2.50	52,229.50
Greene	5	148,679	183	36	.90	132,250.70	29,304.63	1.59	235,214.29
Marion	27	380,244	332	107	.75	286,316.32	87,134.19	1.27	483,986.72
Polk	17	906,982	639	201	.88	790,660.73	309,720.26	1.52	1,374,471.53
Webster	20	255,062	351	84	.88	226,035.00	84,098.17	1.61	409,890.50
Grand total	107	2,119,082	2,115	576	.88	1,859,301.70	674,946.06	1.55	3,298,128.55

NAME AND DESCRIPTION OF MINES IN DISTRICT NO. 3.

BOONE COUNTY.

W. D. JOHNSON MINE.

Located at Boonsboro, on the C. & N. W. R'y. Owned and operated by the W. D. Johnson Coal and Mining Co. Is a shaft, 240 feet; worked part long wall and part room and pillar. Steam power; ventilated by fan. Employs one hundred and twenty men. Coal shipped to markets north and west.

T. N. CANFIELD,
Manager.

WILLIAM BLYTHE,
Superintendent.

MILFORD MINE.

Owned and operated by Birmingham & Keating; located near Boonsboro. Is a shaft. Steam power; fan ventilation. Employs about sixty men. Product shipped on the C. & N. W. R'y to markets north and west.

JOHN KEATING,
Superintendent.

ROGERS & CROW MINE

Is a shaft 206; located near Boonsboro; steam power; ventilated by fan. Owned and operated by Rogers & Crow. Employ forty-eight men. Coal shipped on C. & N. W. R'y to markets north and west.

WM. CROW,
Superintendent.

CLYDE MINE.

Located near Boonsboro on the C. & N. W. R'y. Is a shaft eighty feet; operated by the Clyde Coal & Mining Co. Steam power; ventilated by fan. Employ about fifty men. Product shipped to markets west and north.

O. M. CARPENTER,
Superintendent.

JOHN MARSHALL & SON.

Mine located near Boonsboro. Is a shaft forty feet; steam power; ventilated by furnace. Employ forty men. Coal shipped on C. & N. W. R'y to markets north and west.

JOHN MARSHALL,
Superintendent.

ANGUS COAL COMPANY.

Located at Angus. Operated by the Angus Coal & Mining Co. Is a shaft eighty-five feet. Steam power, fan ventilation. Employ fifty men. Product shipped west and north on C., R. I. & P. R'y.

JOSEPH RAMSEY,
Superintendent.

DALBY BROS. MINE.

Operated by Dalby Bros. Located at Angus. Is a shaft one hundred and twelve feet. Steam power, ventilated by fan. Coal sold to local trade. Employ ten men.

JAMES DALBY,
Superintendent.

JAMES WILSON MINE.

Located about three miles from Pilot Mound. Is a shaft; fifty feet. Horse power; furnace ventilation. Coal sold to local trade. Employs about fifteen men in winter. Owned and operated by Mr. Wilson.

JAMES WILSON,
Superintendent.

ZANKLE MINE.

Owned and operated by Zankle Bros. Located three miles east of Pilot Mound. Is a shaft; eighty feet. Horse power; natural ventilation. Employs eighty men in winter. Product sold to local trade.

ZANKLE BROS.,
Superintendent.

HUTCHINSON BROS. & SON.

Located at Zenarsville. Owned and operated by Hutchinson Bros. & Son. Is a shaft; one hundred and twenty-five feet. Horse power; ventilated by furnace. Coal sold to local trade. Employs about twenty men.

JOHN HUTCHINSON,
Superintendent.

JOSEPH YORK MINE.

Owned and operated by Joseph York. Located at Zenarsville. Steam power; ventilated by furnace. Product sold to local trade. Employ twenty-eight miners in winter. Is a shaft eighty-six feet.

HUGH GIVEN,
Superintendent.

SAMUEL McBRINIE MINE.

Located near Boonsboro. Owned and operated by Samuel McBrinie, is a shaft one hundred and fifty feet. Coal hauled by wagons and shipped on the C. & N. W. Ry. Employ seventeen men. Steam power, furnace ventilation.

SAMUEL McBRINIE,
Superintendent.

MCBRINIE & NELSON MINE.

Owned and operated by McBrinie & Nelson. Located near Boonsboro. Is a shaft forty feet, ventilated by furnace. Horse power. Product hauled by wagons and shipped on the C. & N. W. Ry. Employ twenty-eight men.

ROBERT NELSON,
Superintendent.

CLARK & FLOCKARD MINE.

Located near Boonsboro, owned and operated by Clark & Flockard, is a shaft eighty feet; horse power; ventilated by furnace; coal hauled by wagons and shipped on the C. & N. W. R'y. Employ twenty-seven men in winter.

ROBERT CLARK,
Superintendent.

RIVERSIDE COAL COMPANY'S MINE

Is a shaft thirty-five feet; owned and operated by the Riverside Coal Company; located near Boonsboro, ventilated by furnace; product shipped on the C. & N. W. R'y. Employ twelve men.

JAMES WIEB,
Superintendent.

HIGHLAND CHIEF MINE.

Owned and operated by John Peacock; located at Moingona; horse power; ventilated by furnace; coal sold to local trade; employ ten men.

JOHN PEACOCK,
Superintendent.

H. E. HALL MINE.

Owned and operated by H. E. Hall; located two and half miles west of Boonsboro; coal hauled in wagons to the C. & N. W. R'y; employ fifteen men in winter; is a slope, natural ventilation.

GARDEN HILL MINE

Owned and operated by the Heaps Bros.; located near Boonsboro; is a shaft two hundred and eight feet; horse power; ventilated by furnace; product shipped on the C. & N. W. R'y; employ fifteen men.

HEAPS BROS.,
Superintendent.

Knox Bros. and Robert Porter operates small mines near Madrid; the coal is sold to local trade; employ about six men.

James Bukley & Son operates a small mine near Centerville; coal sold to local trade; employ about four men.

DALLAS COUNTY.

DAWSON COAL CO.

Located at Dawson, on the C., M. & St. P. R'y. Operated by the Dawson Coal Co. Is a shaft; one hundred and sixty feet. Steam power; ventilated by fan. Employs forty-five men. Product shipped to western markets.

JOSEPH RAMSEY,
Superintendent.

VAN METER MINE.

Owned and operated by the Van Meter Coal and Mining Co. Steam power; fan ventilation. Is a shaft; two hundred and seventy-five feet; worked long wall. Employ fifty-six men. Coal shipped to western markets on the C., R. I. & P. R'y.

JOHN BUSHNELL,
Superintendent.

J. R. STRANGE & SON.

Located on the Des Moines river, near Chestnut Ford. Is a shaft; forty-five feet; worked on the long wall plan. Horse power. Coal sold to local trade. Employ about fifteen men in winter.

J. R. STRANGE,
Superintendent.

Joseph Staples, located near Linden, operates a small mine for local trade. Three men employed.

There are several other small mines in the vicinity of Redfield, operated during the winter months. Coal all sold locally.

GREENE COUNTY.

KEYSTONE COAL CO.

Located at Angus. Operated by the Keystone Coal and Mining Co. Steam power; ventilated by fan. Is a shaft; one hundred feet; worked on the room and pillar system. Employ about sixty men. Product shipped on the C., R. I. & P. R'y to markets north and west.

JOHN MCKAY,
Superintendent.

CRAIG COAL CO.

Owned and operated by the Craig Coal and Mining Co., successors to the Bell Coal and Mining Co. Is a shaft; eighty-five feet; worked on the room and pillar plan. Steam power; ventilated by fan. Employs about sixty men. Product shipped on the C., R. I. & P. R'y to markets north and west.

JEREMIAH DAWSON,
Superintendent.

DALE & GOODWIN.

Located at Grand Junction, on the C. & N. W. R'y and C., R. I. & P. R'y. Is a shaft; one hundred and fifty feet. Steam power; ventilated by fan; worked on the long wall plan. Employ fifteen men. There was 3,285 tons of fire clay mined out of this mine and manufactured into tile and brick.

ROBERT GOODWIN,
Superintendent.

RIPPEY COAL CO.

Is a shaft; one hundred and fifty feet. Steam power; ventilated by fan; worked room and pillar system. Employ about seven men. Located on the C., R. I. & P. R'y.

ISAAC SIMPSON,
Superintendent.

GUTHRIE COUNTY.

CLIPPER MINE.

Located at Fansler; owned and operated by A. Marchant; is a shaft hundred and twenty-six feet; employ about twelve men in winter; coal sold to local trade.

A. MARCHANT,
Superintendent.

PANORA COAL MINE.

Located at Panora; owned and operated by D. D. Rees; is a shaft eighty-four feet; horse power; ventilated by furnace; employ nine men in winter; coal sold to local trade.

D. D. REES,
Superintendent.

GREENBRIER MINE.

Owned and operated by W. D. Simon; located near Jamaica; is a shaft sixty feet; horse power; ventilated by furnace; worked on room and pillar plan; employ eight men; coal sold to local trade.

W. D. SIMON,
Superintendent.

MARSHMAN MINE.

Located near Fansler; operated by John Marshman; coal sold to local trade; employ four men.

S. S. Griggs operates a small mine near Fansler; coal sold to local trade; employs four men in winter.

Isaac Clark owns and operates a mine near Bayard; is a drift; employs about eight men; coal sold to local trade.

BLACK DIAMOND.

Owned and operated by James Thomas; located three miles west of Fansler; is a shaft ventilated by furnace; product sold to local trade; employ about ten men in winter.

Huggins, Hoops & Marris operates a mine three miles south of Panora; employ ten men in winter; coal sold to local trade.

P. Renslow operates a mine near Fansler. Employ five men. Coal sold to the local trade.

G. W. Butler operates a shaft mine near Fansler. Coal sold to the local trade. Employs six men in winter season.

Isaac Clark, W. P. Williams, Chas. Miller and H. Hutchen, operates small mines each, in the vicinity of Bayard, during the winter months for local trade.

There are other small mines in operation in this county. They change hands so often, and only operating a few months during winter, that it is hard to keep a record of them.

MARION COUNTY.

WHITEBREAST FUEL COMPANY No. 11

Is a slope mine located near Flagler. Worked on the room and pillar plan with steam hoisting power; ventilated by fan. Employ about one hundred and thirty men. Product shipped on C., B. & Q. R'y to western markets.

S. A. FLAGLER,
Manager.
HARRY BOOTH,
Superintendent.

BLACK DIAMOND MINE.

Owned and operated by the Black Diamond Coal and Mining Company, located at Dunreath, is a slope mine, worked on the room and pillar system;

fan ventilation; steam power. Employ eighty-four men. Coal shipped on the Wabash railroad to Des Moines and western markets.

WM. ROBINSON,
Superintendent.

MORGAN VALLEY MINE

Owned and operated by the Midland Coal & Mining Company. Located at Morgan valley on Wabash R'y. Room and pillar work; steam power; ventilated by fan. Employ twenty-eight men. Coal shipped to western markets.

WILLIAM D. MORGAN,
Superintendent.

OTLEY MINE

Located near Otley is a shaft eighty-five feet deep, owned and operated by the Marion County Coal & Mining Company. Worked on room and pillar plan; steam power; ventilated by fan. Coal shipped on the C., R. I. & P. R'y to markets west. Employ about thirty-five men.

RICHARD FRASIER,
Superintendent.

LEWIS MINE

Situated at Knoxville on the C. B. & Q. Railroad, is a shaft fifty feet deep. Horse power; ventilated by furnace; mine worked on room and pillar plan. Employ about twenty-five men. Product sold locally and shipped to western markets.

WILLIAM LEWIS,
Superintendent.

BOUDINOT MINE

Located at Hamilton, is a slope worked on room and pillar plan. Employ about eighteen men. Coal sold locally and shipped to western markets on C., B. & Q. R'y.

J. A. BOUDINOT,
Superintendent.

ATLAS COAL MINE.

Owned and operated by the Atlas Coal and Mining Company, near Hamilton, is a shaft thirty feet deep; horse power; room and pillar work; ventilated by furnace. Employ fifteen men. Product sold locally and shipped on C., B. & Q. R'y.

C. E. MALLORY,
Superintendent.

DAVIS MINE,

Located near Hamilton, is a shaft sixty-five feet deep; room and pillar work; horse power; furnace ventilation. Employ about eighteen men. Coal sold locally and shipped on the C., B. & Q. R'y.

GEO. C. DAVIS,
Superintendent.

OAK HILL MINE

Is a drift, located at Flagler; room and pillar work; horse power; ventilated by furnace. Employ twenty-eight men. Coal shipped on C., B. & Q. R'y.

SAMUEL ROLLINS, *Superintendent.*

BUSSEY MINE,

Owned and operated by Powers & Marsh, located at Bussey, is a slope worked room and pillar. Horse power; ventilated by furnace. Employ twelve men. Local sales and ship on C., B. & Q. R'y.

J. A. J. POWERS,
Superintendent.

SWAN MINE,

Owned and operated by Thomas & Norman, is a shaft eighty feet deep; room and pillar work; horse power; furnace ventilation. Employ twelve men. Coal sold locally and shipped on C., B. & Q. R'y.

JOHN THOMAS,
Superintendent.

At or near Knoxville there are several small mines, operated for local trade, by S. M. Ructman, Wm. Gamble, Jacob Bingham, John Martin, Collins & Co. and W. O. Robinson. They employ about forty men altogether.

John Youser and David Fry are operating small mines at Marysville, for local trade. They employ about ten men.

Geo. Marshall is operating a small local mine at Otley. Employs about twelve men.

There is five small mines being operated near Pella, for local trade, by Patrick Corey, Wm. Franklin, Lewis Woodyard, J. M. Markham and others. Employ about twenty-five men.

Samuel States, Lewis Whitlatch and Samuel Whitlatch operate small mines, for local trade, near Attica. Employ about twelve men.

LIBERTY CORNER MINE.

Located near Monroe. Is a drift; room and pillar work. Horse power; ventilated by furnace. Operated for local trade. Employs about six men.

HUGH MCNEISH.

POLK COUNTY MINES.

BLOOMFIELD MINE.

Is a shaft; one hundred and ninety-one feet deep. Owned and operated by the Bloomfield Coal & Mining Co. Employ about ninety men. Worked on the room and pillar plan. Steam power, fan ventilation. Located near Des Moines. Coal sold at local sales in the city and shipped on the C. B. I. & P. Ry. to markets north and west.

CHAS. WORTH,
Superintendent.

COON VALLEY MINE No. 1.

Located near Des Moines is a shaft, one hundred and eighteen feet deep. Owned and operated by the Coon Valley Coal and Mining Co. Steam power,

fan ventilation. Room and pillar work. Employ forty men. Coal sold to the city trade and shipped to the north and western markets on the C. R. I. & P. Ry.

THOS. BECK,
Superintendent.

COON VALLEY MINE No. 2.

Owned and operated by the Coon Valley Coal and Mining Co. Near Manbeck. Worked on the room and pillar plan. Steam power, fan ventilation. Employ twenty-eight men. Shaft forty-five feet deep. Coal shipped on the C. R. I. & P. Ry. to western markets.

THOS. BECK,
Superintendent.

CHRISTY MINE No. 2.

Is a shaft, one hundred and fifteen feet deep. Located four miles east of Des Moines on the C. R. I. & P. Ry. Owned and operated by the Christy Coal and Mining Co. Room and pillar work. Steam power, fan ventilation. Employ seventy men. Coal shipped to western markets.

JAS. E. STOUT.

DALE MINE.

Is a shaft, operated by Samuel Dale, near Commerce. Employs six men. Ventilated by furnace. Horse power used for hoisting. Sell all of their coal to local trade.

SAMUEL DALE,
Superintendent.

DES MOINES MINE.

Owned and operated by the Des Moines Coal and Mining Co., near Des Moines. Is a shaft, one hundred and five feet deep; room and pillar work. Steam power; fan ventilation. Employing fifty-three men. Coal shipped to markets north and west on C. R. I. & P. Ry., and sold locally in the city.

ED. TURBY,
Superintendent.

EUREKA MINE.

Located in South Des Moines. Is a shaft; one hundred and fifty feet deep. Owned and operated by the Eureka Coal and Mining Co. Worked on the room and pillar plan. Steam power; ventilated by fan. They employ about fifty-seven men. Coal sold in Des Moines and shipped to western markets on C. R. I. & P. Ry.

CHARLES CARLSON,
Superintendent.

GIBSON MINE.

Is a shaft one hundred and five feet deep near Des Moines, owned and operated by the J. B. Gibson Coal & Mining Company. Room and pillar work; ventilated by fan; steam power. Employ twenty-seven men. Coal shipped on the C. R. I. & P. Ry. to the city and western markets.

JOHN B. GIBSON,
Superintendent.

GARVER MINE

Located in East Des Moines on the N. W. Ry.; is a shaft one hundred and twenty feet deep. Room and pillar work; ventilated by fan; steam power. Owned and operated by the Garver Coal & Mining Co. Employ about thirty men. Their coal is sold to the city and northwestern markets.

MICHAEL QUINN,
Superintendent.

LOGAN MINE.

Located near Runnells on the Wabash Ry. is a small slope mine, worked on the room and pillar plan; ventilated by furnace. Employ seven men.

STAHLBRENN,
Superintendent.

MAPLE GROVE MINE.

Owned and operated by the Maple Grove Coal & Mining Co., is a shaft one hundred and five feet deep. Room and pillar work; steam power; fan ventilation. Employ fifty-eight men. Coal shipped on the C. St. P. & K. C. Ry.

ANDREW CARLSON,
Superintendent.

POLK CITY MINE.

Located at Polk City, on N. W. Ry., owned and operated by the Polk City Coal and Mining Co., is a shaft 225 feet deep, worked on the long wall system. Ventilated by fan; steam power. They employ from ten to twenty men and sell their coal principally to local trade.

T. P. WIENHART,
Superintendent.

PROCTOR MINE

Is a shaft 200 feet deep, located in South Des Moines, owned and operated by the Proctor Coal & Mining Company. Employ forty-eight men. Room and pillar work. Ventilated by fan; steam power. Coal shipped to western markets and local trade in Des Moines.

WM. EDGE,
Superintendent.

BUNNELLS' SLOPE

Is a small mine located near Runnells, on the Wabash railway. Room and pillar work. Ventilated by furnace. Employ six men.

JAMES KYLE,
Superintendent.

BUNNELLS' MINE.

Owned and operated by the Midland Coal and Mining Company, is a shaft forty-five feet deep, located near Runnells; worked on the room and pillar; steam power; ventilated by fan. Employ about thirty-five men. Coal shipped on Wabash railway to western markets.

J. N. PATTON,
Superintendent.

UNION MINE.

A shaft one hundred and fifty feet deep, located in South Des Moines, owned and operated by the Union Coal and Mining Company. Employ thirty-four men. Room and pillar work; ventilated by fan; steam power. Product shipped to western markets and sold to city trade.

EVAN DAVIS,
Superintendent.

ROSE HILL MINE.

Owned and operated by the Rose Hill Coal and Mining Co. Is a shaft; ninety feet deep; located near Des Moines; worked on the room and pillar plan. Steam power; ventilated by fan. Employ about sixty-five men. Ship their coal on C., St. P. & K. C. R'y.

VAN GINKEL MINE.

Located a short distance from Des Moines. Is a shaft; seventy-five feet deep; owned and operated by the Van Ginkel Coal and Mining Co.; room and pillar work. Steam power; fan ventilation. Employ about seventy men. Coal shipped to markets north and west and sold to city trade.

PETER HEENLEY,
Superintendent.

WEBSTER COUNTY.

CROOKED CREEK MINE No. 1.

Located at Lehigh. Owned and operated by the Crooked Creek Coal Co. Drift mine; ventilated by furnace. Employ twelve men. Coal shipped on the Crooked Creek & Webster City R'y.

JOHN HAMILTON,
Superintendent.

CROOKED CREEK MINE No. 2.

Operated by the Crooked Creek Coal and Mining Co. Slope. Steam power; ventilated by furnace; worked on the long wall system. Employ about seventy men.

JOHN HAMILTON,
Superintendent.

CROOKED CREEK SHAFT.

Steam power; furnace ventilation. Owned and operated by the Crooked Creek Coal and Mining Co. Employ about fourteen men.

JOHN HAMILTON,
Superintendent.

CRAIG MINE No. 5.

Located at Kalo, owned and operated by the Craig Coal and Mining Company. Drift, worked on the long-wall system; ventilated by furnace. Employ sixteen men. Product shipped on the Minneapolis & St. Louis railway.

JERRY DAWSON,
Superintendent.

CRAIG MINE No. 6.

Drift mine, ventilated by furnace, owned and operated by the Craig Company. Employ forty-five men.

JERRY DAWSON,
Superintendent.

CRAIG SHAFT.

Shaft, sixty-five feet deep, located at Kalo; owned and operated by the Craig Coal Company; horse power; ventilated by fan. Employ forty men.

JERRY DAWSON,
Superintendent.

COREY COAL COMPANY.

located at Lehigh, operated by the Corey Coal Company. Slope; steam power; ventilated by furnace; worked on the long-wall plan. Employ sixty men. Product shipped on the Mason City & Fort Dodge railway.

REES STEPHENS,
Superintendent.

BLACK DIAMOND.

operated and owned by Samuel McClure, located near Lehigh. Horse power; furnace ventilation; worked on the long-wall system. Employ thirty-five men. Coal is shipped on the Crooked Creek & Webster City and the Mason City & Fort Dodge railways.

D. W. TOWMLEY,
Superintendent.

George W. Corey, owns and operates a drift mine near Lehigh, on the long-wall system. Horse power; furnace ventilation. Employs twenty-three men. Coal shipped on the Crooked Creek & Webster City railway.

S. W. Corey is operating a drift mine near Lehigh. Coal shipped on the Mason City & Fort Dodge Ry. Horse power; ventilated by furnace. Employ twenty-four men.

C. S. Corey is operating a small mine near Lehigh. Drift mine. Horse power; furnace ventilation. Sixteen men employed.

A. Smith & Son are operating a drift mine at Lehigh. Coal sold to local trade. Employs five men.

Porter & Howells are operating a small mine at Kalo during the winter months. Coal sold to the local trade.

CARLSON COAL COMPANY.

Operates a drift mine at Kalo. Horse power; furnace ventilation. Worked on longwall. Employ about eighteen men in winter. Product shipped on Minneapolis & St. Louis Ry.

COLLINS BROS. MINE.

Located at Coalville. Owned and operated by the Collins Bros. Steam power; ventilated by furnace. Employ forty men. Slope mine. Product shipped on the Mason City & Fort Dodge Ry.

There are several small mines in the vicinity of Coalville, operated during the winter months by different parties. Coal sold to local trade.

IMPROVEMENTS MADE IN MINES DURING PAST TWO YEARS.

BOONE COUNTY.

NAME.										
	Air shafts.	Second opening.	Stairways.	Safety gates.	Safety catches.	Brakes on drums.	Fans.	Furnace.		
Rogers & Crow	1	1	1	1	1	1	1	1	1	1
Hiland Chief	1	1	1	1	1	1	1	1	1	1
Garden Hill	1	1	1	1	1	1	1	1	1	1
Angus Coal Company	1	1	1	1	1	1	1	1	1	1
Total	4	4	4	4	4	4	4	4	4	4

GREENE COUNTY.

Keystone Coal and Mining Company	1	1	1	1	1	1	1	1	1	1
Craig Coal and Mining Company	1	1	1	1	1	1	1	1	1	1
Total	2	2	2	2	2	2	2	2	2	2

GUTHRIE COUNTY.

John Thomas Mine	1	1	1	1	1	1	1	1	1	1
Greenbrier Mine	1	1	1	1	1	1	1	1	1	1
Total	2	2	2	2	2	2	2	2	2	2

MARION COUNTY.

Black Diamond Coal Company	1	1	1	1	1	1	1	1	1	1
Davis Mine	1	1	1	1	1	1	1	1	1	1
Bonded Mine	1	1	1	1	1	1	1	1	1	1
Star Mining Company	1	1	1	1	1	1	1	1	1	1
Lewis Mine	1	1	1	1	1	1	1	1	1	1
Robertson Mine	1	1	1	1	1	1	1	1	1	1
Powers & March Mine	1	1	1	1	1	1	1	1	1	1
Midland Coal Company	1	1	1	1	1	1	1	1	1	1
Hill Coal Company	1	1	1	1	1	1	1	1	1	1
Total	10	10	10	10	10	10	10	10	10	10

POLK COUNTY.

J. M. Christy's Mine	1	1	1	1	1	1	1	1	1	1
Eureka Coal and Mining Company	1	1	1	1	1	1	1	1	1	1
Maple Grove Coal Company	1	1	1	1	1	1	1	1	1	1
Garvey Coal and Mining Company	1	1	1	1	1	1	1	1	1	1
Lockwood Coal Company	1	1	1	1	1	1	1	1	1	1
Proctor Coal and Mining Company	1	1	1	1	1	1	1	1	1	1
Total	6	6	6	6	6	6	6	6	6	6

WEBSTER COUNTY.

Carry Coal Company	1	1	1	1	1	1	1	1	1	1
Craig Coal Company	1	1	1	1	1	1	1	1	1	1
Total	2	2	2	2	2	2	2	2	2	2

SCALE TESTING.

Chapter 54, Laws of 1888, makes it obligatory on the Mine Inspector, of each Mining District, to keep in their office a full set of standard balances and test weights, for the purpose of testing and adjusting all scales, beam, and other apparatus used in weighing coal as often as occasion demands.

I have been requested at different times during my term of office to test the scales in this district; these requests come from miners that are interested. I have made a special effort to comply with these requests, when sent to this office in writing, or told me verbally. As it would not be advisable for the Inspectors to carry the test weights with them at all times when out on duty, as fifty-two pounds weights would be very inconvenient as well as expensive in transporting them to and from all mines that we necessarily have to visit for the purpose of inspection.

I have adjusted and approved the scales of nine different mines since December 1st, 1889, the date of my appointment, five of which I found to be correct without making any changes; the other four were incorrect, but when I notified the Operator or the Superintendent of the defect they were ready and willing to have

them properly adjusted as soon as it could possibly be done. In some instances removing their old scales and replacing them with new ones, I feel sure that it was no intention of the Operator or Superintendent to have their scales anything but correct.

Prior to the above dates, my predecessor, James E. Stout had occasion to test the scales of the Eureka Coal Co., July 5th, 1889, and found them incorrect. He requested the Superintendent to have them properly adjusted, and on the 15th of the same month he returned and found them all right and approved them.

He was also called July 29th, 1889, to test the scales of the Coon Valley Coal Company, but found them correct and approved them.

I tested the scales at the Des Moines Coal Co.'s mine, December 3d, 1889, and found them incorrect. I ordered them adjusted properly; December 7th I found them correct.

At the Polk County Coal Co.'s mine, June 12th, 1890, I tested three sets of scales; two of them were correct. The other one (the railroad scale) was out of order. I notified the Superintendent; when I called to 19th, I approved them as they were correct.

July 21st, 1890, I tested the scales at the Marion County Mine and found them correct.

The scales at the Rose Hill Coal Co. were tested August 4th, 1890, by cleaning up the platform and removing some dirt that had gone down to the scales bed; they were exactly correct, and I approved them.

The scales at the Angus Coal Co. were tested August 28th, 1890, and were in good order.

September 11th, 1890, the scales at the Whitebreast Fuel Co.'s mine were tested, and found to be all right.

At the Rose Hill Coal Co. the miners requested me to come and test their R. R. scales October 11th, 1890. I found them correct, and they were approved.

The R. R. scales at the Des Moines Coal Co.'s mine were tested October 13th, 1890, at the request of the miners; they were out of order. I notified the Operator to have them repaired. They purchased a new scale and put them in place of the old ones, which proved to be correct.

The scales at the Maple Grove Mine were tested January 20th, 1891, and found to be in good order.

The scales at the Garner Coal Co.'s mine was tested March 10th, 1891. They were incorrect. The Superintendent was notified of their condition. On the 11th inst. I tested them again, and I approved them.

FATAL ACCIDENTS.

STATE OF IOWA } ss.
Polk County }

An inquisition holden by me at Shank Bro's. undertaking office situated at Sixth and Mulberry Sts., in the city of Des Moines, Polk county, Iowa, on the 19th and 20th days of December, 1889, before I. W. Griffith, coronor of said county, upon the body of C. V. Lewis, there lying dead, by the jurors upon their oaths do say that the said C. V. Lewis came to his death about the hour of 5 o'clock P. M., on the 19th day of December, 1889, at Cottage Hospital, situated at Des Moines, Polk county, Iowa, by means of injuries received at the Rose Hill coal mine, on the 19th of December, 1889, caused by being too close to a shot which he fired in a room in which he was working in said Rose Hill coal mine, situated in Bloomfield township, Polk county, Iowa, and we further find, from a careful examination of the evidence before us that said injuries were caused by his own negligence and inexperience, and not otherwise, in testimony whereof we have hereunto set our hands this 20th day of December, 1889.

A. L. McCANN,
WM. HALLETT,
W. A. BIRNEY,

Jurors.

Attest.

I. W. GRIFFITH, *Coroner of Polk County, Iowa.*

STATE OF IOWA } ss.
Polk County }

An inquisition holden at the residence of John Kirk, situated in Grant township, Polk county, on the 14th day of January 1890, before I. W. Griffith, coroner of said county, upon the body of Walter S. Butler, there lying dead, by the said jurors, upon their oaths do say, that the said Walter S. Butler came to his death about seven thirty o'clock, on January 14, 1890, at the Christy coal mine, situated in Grant township, Polk county, Iowa, by means of being crushed about the head in such a manner as to cause his death, and we find from a careful examination of the evidence and the body, there being no other marks of violence than the wounds in the head that he came to his death by being crushed between the timbers of the main landing and the cage in the coal shaft of the Christy & Co's. coal mine in said county, and the jury further find that there was no negligence upon the part of said company or its employes, and that said casualty and death was purely accidental and not otherwise.

In testimony whereof we have hereunto set our hand the day and year above written.

his
ISAAC X DEFORD,
mark

JOHN KIRK,
W. J. FISHER,

Jurors.

Attest:

ISAAC W. GRIFFITH, *Coroner of Polk County.*

STATE OF IOWA, } ss.
Polk County, }

An inquisition, holden at the residence of Patrick O'Hara, situated on Jefferson street, in South Des Moines, Iowa, the 29th and 30th days of January, 1890, before I. W. Griffith, coroner of said county, on the body of Patrick O'Hara, there lying dead, by the jurors whose names are hereto subscribed, the said jurors upon their oaths do say that the said Patrick O'Hara came to his death about the hour of four o'clock P. M., on the 29th day of January, 1890 by means of being crushed by slate, which fell from the roof of his room in which he was working, in the Des Moines Coal and Mining Company's mine, situated in Bloomfield township, Polk county, Iowa; and we further find, from a careful examination of the evidence before us, that the said Patrick O'Hara came to his death by his own negligence, by not using sufficient props in his room in said coal mine.

In testimony whereof we have hereunto set our hands this the 30th day of January, 1890.

JOSEPH DIPPERT,
R. KESSNER,
F. L. TODD,
Jurors.

Attest:

I. W. GRIFFITH,
Coroner Polk County.

STATE OF IOWA, } ss.
Polk County, }

An inquisition holden at the residence of Mathew Adey, in South Des Moines, being in the Fourth ward of said city, in said county, on the 10th, 12th and 13th days of May, 1890, before I. W. Griffith, coroner of Polk county, upon the body of George Adey, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths do say that the said George Adey came to his death on or about 4 o'clock P. M., on Saturday, the 10th day of May, 1890, from injuries received by means of falling slate in the Rose Hill coal mine, in said city of Des Moines, at or about 11:45 o'clock A. M. of said day. And the jurors further find, after a thorough and careful investigation of the facts of the case, and by evidence that at the time of the accident which resulted in the death of George Adey he was engaged in the performance of his duty, in sawing timber under the direction of the pit boss or timber man, Lewis Rees. That both the deceased and the pit boss supposed, and so expressed themselves, that there was no danger of the roof falling at that time. In this supposition both erred, and this error of judgment led to the exposure which resulted in the death of the deceased.

In testimony whereof the jurors have hereunto set their hands this 13th day of May, A. D. 1890.

A. J. LOUGHRAN,
JOHN B. HATCH,
W. H. CRYDLER,
Jurors.

Attest:

I. W. GRIFFITH, *Coroner Polk County.*

STATE OF IOWA, } ss.
Polk County, }

An inquisition, holden at Shank Bros.' undertaking rooms, Sixth and Mulberry streets, Polk County, Iowa, on the 27th and 28th days of December, 1890, before I. W. Griffith, Coroner of said county, upon the body of Wm. Kohlpoth, there lying dead, by the jurors whose names are hereunto subscribed, the said jurors, upon their oaths, do say that the said Wm. Kohlpoth came to his death about the hour of 12:15 o'clock P. M., December 27th, 1890, in the Rose Hill Coal Mine, situated in Bloomfield township, Polk county, Iowa, at the time and place above written, by means of an accidental shot fired in said Rose Hill Coal Mine, in which deceased was working, and we further find from a careful examination of the evidence before us that said death was caused by lack of precaution of deceased in going to the room too soon after lighting, and the shot failed to go off, and not otherwise.

In testimony whereof we have hereunto set our hands this 28th day of December, 1890.

T. B. ROBINSON,
J. H. STAFFORD,
WILLIAM DOUGLASS,
Jurors.

Attest:

I. W. GRIFFITH, *Coroner Polk County, Iowa.*

STATE OF IOWA, } ss.
Polk County, }

An inquisition holden at 465 East Second street, in Des Moines, Polk county, Iowa, on the 4th and 5th days of February, 1891, before I. W. Griffith, coroner of said county, upon the body of C. W. Anderson, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors upon their oaths do say that the said C. W. Anderson came to his death about the hour of 7:30 o'clock, P. M., February 4th, 1891, at No. 465, East Second street, Des Moines, Iowa, by means of being crushed by a piece of slate which fell on him from the roof of the Eureka Coal Mine on the 2d day of February, 1891, about the hour of 10 o'clock A. M., and we further find from a careful examination of the evidence before us that said accident, casualty and death was purely accidental and not otherwise.

In testimony whereof we have hereunto set our hands this the 5th day of February, 1891.

H. B. KETTLEMAN,
A. F. WHITTHALL,
JAMES PARKER,
Jurors.

Attest:

I. W. GRIFFITH, *Coroner Polk County, Iowa.*

STATE OF IOWA, } ss.
Marion County, }

An inquisition holden at Hamilton, in Marion county, on the 12th day of February, 1891, before T. J. Stillwell, a Justice of the Peace, in and for

said county, upon the body of Fredric Butcher there lying dead by the jurors whose names are hereunto subscribed. The said jurors upon their oaths do say that the said Fredric Butcher came to his death between the hours of one and three o'clock P. M., February 12, 1891, by a fall of slate while working in the capacity of miner in the mines of one Geo. C. Davis, near Hamilton, county and State aforesaid. And we find the same to be purely accidental and unforeseen and happened in the room in which he had been working. Further, that we, the jurors, exonerate Geo. C. Davis from all liability in connection with the accident.

In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

A. L. MORRELL,
I. F. GREGG,
O. T. FRANCES,
Jurors.

Attest:

J. G. STILLWELL, *Justice of the Peace.*

STATE OF IOWA }
Webster County } ss.

An inquisition holden at Lehigh, in Webster county, Iowa, on the 11th day of March, 1891, before C. H. Churchill, Coroner of said county, upon the body of John Peterson, there lying dead by the jurors, whose names are hereunto subscribed. The said jurors upon their oaths do say that the said John Peterson came to his death by a bucket accidentally falling upon his head, through the use of an unsafe hook, while working in shaft No. 2, of the Crooked Creek Coal Co., situated at Lehigh, Webster county, Iowa. In testimony whereof the said jurors have hereunto set their hands the day and year aforesaid.

J. D. ECHELBERGER,
S. D. COULEE,
W. A. CARRY,
Jurors.

Attest:

C. H. CHURCHILL, *Coroner.*

J. F. McNalton was killed by a fall of slate in the Black Diamond Coal and Mining Co.'s mine at Dunreath, Marion county, Iowa, June 22d, 1891. There was no Coroner's inquest held on the body, consequently we have no report, except a report from William Robinson, Mine Superintendent, stating that the cause of the accident was in not keeping the roof safely propped. No blame attached to anyone.

WM. ROBINSON,
Superintendent.

STATE OF IOWA }
Polk County } ss.

An inquisition, holden at the residence of Joseph Waskey, situated in Four Mile township, Polk county, Iowa, on the 18th day of June, 1891, before I. W. Griffith, Coroner of said county, upon the bodies of Joseph and William Waskey, there lying dead, by the jurors whose names are hereunto subscribed. The said jurors, upon their oaths, do say that the

said Joseph and William Waskey came to their deaths about the hour of 11 o'clock A. M., June 18th, 1891, in a room in which they were working in Christy Coal Mine, situated in Four Mile township, Polk county, Iowa, by means of being crushed by a fall of slate, which fell on them from the roof of the room in which they were working, in the said Christy Coal Mine. And we further say and find from a careful examination of the evidence before us that said accident, casualty and deaths were purely accidental, and not otherwise.

In testimony whereof we have hereunto set our hands this 18th day of June, 1891.

JAMES H. DEAN,
E. T. FISHER,
T. H. FINCH,
Jurors.

Attest:

I. W. GRIFFITH, *Coroner.*

TABLE

Showing the number and cause of all fatal casualties reported in District No. 3 for the biennial period ending June 30, 1891:

DATE.	NAME OF DECEASED.	CAUSE OF CASUALTY.	NAME OF COMPANY OR MINE.	WHERE LOCATED.
December 19, 1889	C. V. Lewis	Caught by a blast	Rose Hill	Des Moines.
January 14, 1890	Walter S. Butler	Crushed by cage	Christy mine	Des Moines.
January 20, 1890	Patrick O'Hara	Falling slate	Des Moines Company	Des Moines.
May 10, 1890	George Adey	Falling slate	Rose Hill	Des Moines.
December 27, 1890	William Cohipath	Caught by a blast	Rose Hill	Des Moines.
February 4, 1891	C. W. Anderson	Falling slate	Eureka mine	Des Moines.
February 12, 1891	Fredric Butcher	Falling slate	George C. Davis mine	Hamilton.
March 17, 1891	John Peterson	Bucket falling on him	Crooked Creek, Shaft No. 2	Lehigh.
June 22, 1891	J. F. McNalton	Falling slate	Black Diamond	Dunreath.
June 18, 1891	Joseph Woskey	Falling slate	Christy mine	Des Moines.
June 18, 1891	William Woskey	Falling slate	Christy mine	Des Moines.

NON-FATAL CASUALTIES OF THIRD MINING DISTRICT.

DATE.	NAME.	OCCUPATION.	CHARACTER OF INJURY.	CAUSE OF ACCIDENT.	RESIDENCE.
July 27, 1889	Peter Nelson	Miner	Foot crushed	Fall of slate	Des Moines.
July 28, 1889	L. Erickson	Miner	Leg broken	Falling coal	Boonesboro.
November 5, 1889	P. Cushman	Mule driver	Slightly injured	By coal car	Des Moines.
November 25, 1889	Charles Swanson	Miner	Leg broken	Fall of slate	Des Moines.
December 5, 1889	V. Carlson	Miner	Face and arms burned	Explosion of keg of powder	Boonesboro.
December 5, 1889	A. Anderson	Miner	Face and arms burned	Explosion of keg of powder	Boonesboro.
December 9, 1889	D. Fillman	Miner	Slightly injured	Fall of rock	Des Moines.
January 2, 1890	A. Hesselstrom	Miner	Slightly bruised	Fall of slate	Des Moines.
January 7, 1890	Ed. Kirk	Employe	Seriously hurt	Falling from elevator door	Des Moines.
January 17, 1890	M. Harrison	Miner	Hips and back bruised	Fall of coal	Flagler.
January 18, 1890	A. Hancock	Miner	Leg fractured	Fall of slate	Flagler.
January 23, 1890	E. Sanderson	Cager	Foot bruised	Caught by cage	Des Moines.
January 25, 1890	Gust. Brandt	Mule driver	Head and body bruised	By car of coal	Des Moines.
March 5, 1890	J. Palmer	Miner	Slightly hurt	Falling against pit car	Flagler.
March 21, 1890	I. Hall	Miner	Hip bruised	Fall of slate	Des Moines.
March 27, 1890	W. Kirkham	Miner	Hand crushed	Falling rock	Flagler.
April 2, 1890	T. Shepherd	Miner	Knee and ankle hurt	Fall of roof	Flagler.
April 25, 1890	A. Jones	Miner	Foot bruised	Falling coal	Flagler.
April 25, 1890	Wm. Davis	Mule driver	Leg bruised	Car jumping the track	Flagler.
May 9, 1890	M. Wagoner	Miner	Two toes broken	Falling roof	Flagler.
June 9, 1890	H. Murry	Miner	Fingers mashed	Between pit cars	Des Moines.
September 26, 1890	John Brown	Miner	Finger mashed off	Falling coal	Flagler.
September 29, 1890	P. Anderson	Miner	Leg and hand bruised	Fall of slate	Des Moines.
October 2, 1890	Wm. Crook	Miner	Badly burned	Explosion of can of powder	Dunreath.
October 12, 1890	J. Jeffries	Miner	Back injured	Fall of slate	Des Moines.
October 13, 1890	John Pierson	Miner	Leg fractured	Fall of coal	Boonesboro.
October 20, 1890	Neis Olsen	Miner	Back broken	Fall of slate	Des Moines.
November 26, 1890	Thomas Davis	Miner	Thumb mashed	Fall of coal	Flagler.
December 27, 1890	J. Jeffries	Miner	Arm broken	Fall of slate	Polk City.
December 27, 1890	J. Olsen	Miner	Leg bruised	Fall of coal	Polk City.
January 1, 1891	J. Brumberg	Miner	Slightly injured	Fall of slate	Des Moines.
January 29, 1891	R. Sweeney	Mule driver	Breast crushed	Between car and prop.	Flagler.
February 16, 1891	R. O'Hughes	Miner	Bruised and eye dislocated	Shot from powder	Des Moines.
March 6, 1891	J. Monahan	Mule driver	Foot crushed	By coal car	Des Moines.
March 11, 1891	W. S. Miller	Miner	Cut on head	Fall of slate	Dunreath.
April 7, 1891	C. Horton	Miner	Seriously hurt	Fall of soap-stone roof	Flagler.
June 23, 1891	F. Furgison	Miner	Head and back hurt	Fall of slate	Dunreath.
June 23, 1891	A. Leighe	Miner	Head and back hurt	Fall of slate	Dunreath.
	Total	38			

RECAPITULATION.

RESIDENCE.	Number.	CASUALTIES.	Number.	PER CENT.
Des Moines	16	Falling slate or roof.....	18	47.37
Flagler	12	Falling coal	8	21.05
Boonesboro	4	Pit cars	7	18.42
Dunreath	4	Powder explosion.....	4	10.52
Polk City	2	Falling from elevator.....	2	5.26
Totals.....	38	Totals.....	38	100.00

STRIKES.

I have the unpleasant duty of reporting to your Excellency a few strikes that took place in this district during the last two years, the most important one occurred May 1, 1891.

This strike was general in Polk and Marion counties, with the exception of a few mines, while Boone, Dallas, Guthrie and Webster counties did not participate in, but worked on the same basis as they did the year before.

The miners of Angus made a demand to the operators by asking that eight hours be constituted a day's labor in the mines. Their demand was conceded to by the operators, and they resumed work at once. Also the miners of Dunreath, Marion county, made a similar demand which was granted, and they returned to work without the loss of any time. Had the miners of Polk and Marion counties imitated the miners of Angus and Dunreath by making a demand to the operators before they abandoned their work, I believe the result would have been different to what it was.

There was a misconception among the miners of Polk and Marion counties as to the magnitude of the strike, and the means by which it was to be conducted and upheld; had they known the true condition of affairs, and were the facts presented to them properly as circumstances stood on the first day of May, I am doubtful whether the miners of the above counties would have assumed the attitude they did in regard to it.

I do not wish to make any criticism on the above strike, but state facts as they presented themselves to me, but can assure the miners of Iowa that thrift, integrity, sobriety and self-reliance are the

best friends to rely upon if we intend to make life successful. Develop and improve our mental faculties, as well as our physical strength, and exercise our judgment in matters pertaining to our own welfare and comfort.

Strikes should be the last resort applied to as a remedy toward adjusting grievances; before adopting such a course take council with some of your most conservative men in regard to the matter, rather than be led by the most radical among you, who may have nothing at stake except the advancement of some private hobby of their own, and who care but little of the unpleasant position many a family is placed in by the advice of such unscrupulous leaders.

The worst enemy the laboring class of this country have to contend with, is the great overflow of cheap and unskilled labor that is permitted to come here from foreign countries, and compete with American labor at a very low price, or any price they can get, and care but little about the improvement of labor or good citizenship, this undoubtedly has a very demoralizing effect. It seems to me that it would be more beneficial to the miners and laborers of this country if they would devote their energies and abilities in a proper and reasonable manner towards stopping or at least limiting this class of immigration.

The miners of Polk and Marion counties lost in wages during the above strike about eighty thousand dollars, besides what was lost by those engaged in Polk county hauling coal from the different mines to supply the city trade.

The operators of the above counties lost, owing to the strike, about thirty thousand dollars. Thus the strike was a great detriment to all connected with the coal business, and also many that were not directly connected with the business lost money owing to the unfortunate affair.

April 1st, 1891, a local strike took place at Corey Coal Co.'s mine at Lehigh, Webster county. The cause being a disagreement between the miners and the company in adjusting the summer price for mining. There has been no settlement made at this writing, August 14th, therefore the result of the strike is not known.

SUGGESTIONS TO MINERS.

The coal in this State is mined either by room and pillar, or long wall system of mining; and by looking over the list of accidents that happened in this District within the two last years it is observed at once that all the fatal accidents take place in the mines that are worked by the room and pillar system of mining coal.

Therefore it is evident that the room and pillar system of mining is more dangerous than the long wall mode of mining coal.

When we investigate the cause of the accidents we find that nearly all of them can be traced to some neglect or carelessness on the part of the miner himself.

Because, once the miner opens his room off the entry he is responsible for his own safety; provided, the Operator furnish him with sufficient timber to secure his place of working.

A number of accidents are caused by the neglect of the miners in not putting up sufficient props to secure the roof of his room, after the coal is extracted by powder, and in not putting them up at the proper time, while oftentimes knowing the unsafe condition of the roof under which he works; but being too anxious to load out the coal, and accomplish a good day, he works at the risk of receiving a serious accident or, indeed, losing his life.

The roof should be examined carefully after the blasting is done and before work is resumed. The first thing done in entering the room in the morning should be a thorough examination of the roof, and if timber is needed to secure the roof, put them in at once. More especially so on Monday mornings, because you have been absent from your work from Saturday evening until Monday morning, during which time the air has had more time to penetrate the roof and loosen it at the face of your working place.

But how often do miners in the morning hurry into their place of working and fill a car of coal before giving any attention to the safety of the roof under which they work.

We believe many accidents would be avoided if, in addition to the tapping test of the roof, were the roof carefully inspected by the mine foreman each day for the purpose of detecting natural

dislocations, such as faults, slips, or other defects that may be developed in working out the coal. And if the bearing, the inclination and the frequency of occurrence of the slips were studied by such official and the timbering ordered to be regulated accordingly.

Again, many of the accidents happen because of the carelessness by which powder is handled. Miners do their work in too much of a hurry, without considering the danger to which they expose themselves by performing certain work.

For instance, some miners will take a pick to make a hole in a keg of powder rather than take time to unloosen the stopper. Such act is very dangerous, because the least friction of iron with powder will explode it, and the explosion would cause serious results.

Another habit that is very dangerous, and should be prohibited, is the packing of powder down stairs on ladders into the mines, because the keg of powder is liable to slip out of a person's grasp, and by the concussion of the fall, explode and be the cause of numerous accidents, and also of setting the shaft and mine on fire.

Powder should be sent down to the mine on the cage at a certain hour each day and the utmost care should be taken in handling it.

In the most of mines there is no system adopted for the firing of blasts; whoever gets ready first, when the time comes put off his blast, no matter whether he is on the first, or last on the return air; for the lack of some rule for the firing of blasts many an accident happens that otherwise could be avoided.

In each entry the first blast should be fired by the last man on the return air, then fire in rotation so that the last man to fire would be the first on the intake air. By adopting such a rule a miner would only have to contend with the powder-smoke that his own blast would make and would not be as liable to accidents by blasting.

In each mine where powder is used, certain rules should be adopted for firing of blasts, and the Superintendent should assist in having them strictly enforced.

While improvements in the nature of material and appliances for the support of the roof and sides in road-ways, and the method of using them must tend to the diminution of accidents from falls of coal and roof. There is no question that unremitting, careful and intelligent inspection by mine foremen, and the continual devotion of skilled labor in placing and securing reliable supports, even

when their necessity may seem open to question, constitute the best safeguard against accidents.

We may pass insurmountable acts for the protection of miners but we shall have to teach him how to take care of himself before accidents in mines will materially decrease, especially those arising from falls of coal and roof at the face of the workings.

We enumerate the above to call the attention of miners to why accidents do happen and the cause of the majority of them; should a little more discretion, thought and care, be exercised on the part of the miner, we are confident that the accidents would not be as numerous as they are.

Another custom that should be abandoned is the habit of tamping blasts with fine coal; because the fine coal is so much more liable to take fire when the blast is fired than if the tamping was clay, or some other material; especially so if the mine is dry and dusty, and the blast should blow out the powder without extracting the coal.

How often have we noticed when the powder is blown out without extracting the coal, the room or entry where the explosion takes place is filled with small sparks of fire which is caused by the fine coal that was used in tamping the hole, and those sparks of fire are liable of causing an explosion by setting the dust, without the aid of fire damp on fire.

I insert below the opinion and experience of some of our best authorities on the subject for such as may not have the opportunity to consult them.

The Prussian Fire Damp Commission after a series of experiments gives the following as their conclusion on the subject.

1. The sensitiveness of dusts to explosions depend not only upon their inflammability or the proportion of combustible matter they contain, but also upon their fineness and certain other mechanical and physical peculiarities.

2. The presence of fine coal dust in the immediate vicinity of the working places gives raise to more or less considerable elongation of the flame from the blown out shot, whether small quantities of fire-damp be present in the air or not. Thus, elongation or proportion of flame by dust is generally or to a limited extent in the complete absence of fire-damp even if deposits of dust extend to considerable distance beyond the seat of the shot. The use of coal dust tamping has the effect of decidedly, though not very greatly favoring the limited propagation of flame by dust.

3. There are, however, some descriptions of very inflammable dust, which when raised in dense clouds by the action of a blown out shot and fire by it, will not only continue to carry the flame on even to distances beyond the confines of the dust deposits, but will also produce explosive effects in the complete absence of fire-damp which resembles those furnished by some other dust, only when there is a large admixture of fire-damp in the air.

4. All the phenomena produced by the burning and propagation of flame by coal dust are intensified by the pressure in the air of only small proportions of fire-damp, the required quantity varying with the sensitiveness or ready inflammability of the dust.

GEOLOGICAL SURVEY.

I would recommend to your excellency that an economic geological survey of the State be made. The geological survey that has been made is incomplete, and without a further survey the money expended and work done by Prof. White are useless, as no important results were achieved. The people are entitled to know what nature has laid down here for them.

Prof. Charles A. White, who made a geographical survey of the State in 1868 and 1869 acknowledges in his report thus:

The survey and its different members are in possession of much other valuable matter, the results of incomplete observations that is yet too imperfect for publication. This will necessarily be entirely lost unless the observations are completed; again, a heavy important work is now arrested in the very midst of its usefulness. This is the detailed examination of the Lower Coal Measures formation, which is known to contain far the most important part of the coal of the State. * * * There is probably nothing an author regrets more than to be obliged to publish the result of his labors in an incomplete form.

While Prof. White's survey has been of great benefit towards developing the mineral resources of the State, a more definite economic geological survey would be of untold benefit to the people of the State, especially the farmers, as their land may contain minerals, such as *coal, iron ore, lead, building stone, fire clays, glass sands, knolin gas*. Such resources should be known to our people, thus adding to their wealth, and also contributing largely towards the wealth of the State.

Also a thorough economic geological survey would be of great aid to the prospector and miner in locating localities where coal and other minerals may be found, since beds of shale or other mineral, of known distance from a coal seam are often exposed, when the coal itself is not and so indicate where it may be found.

The great progress made of late years in the science of geology has made geologists so minutely acquainted with all the rock formations above and below the coal measures that is now a comparative easy matter to determine whether in any given spot coal may or may not be found.

Some reasons why we urge an economic geological survey to be made of the State:

1. Moneyed wealth which lies in mineral resources, such resources should be known to our people.
2. The great financial gain from a few discoveries, as compared with cost of making them. The great gain to Pennsylvania and Ohio in their oil and gas fields, from geological survey. The great discoveries made in Michigan of copper and iron ore deposits by geological surveys, etc.
3. The advantage the miner and prospector of the State would gain from such a survey. It is proven by previous surveys that the St. Louis limestone, which is the base of the lower coal measures, dips towards the southwestern part of the State. The said limestone Strata appears on the surface in Keokuk, Marshall, Hamilton and Webster counties and dips gradually towards the southwest, and is found again on the surface down in the State of Missouri. Therefore, the probability is that the southwestern part of the State is all underlain with a large basin of coal.
4. The advantage of such a survey to the farmers of the State would be, where some of the above mineral would be found, an advance in the price of their land, new industries would open out, an increase in population and a ready market at home for all their produce, etc.
5. The advantages that science would gain from such a survey.
6. The backwardness of Iowa, in her geological work, as compared with her sister States. The State of Missouri has a geological survey in progress at present and the result is very flattering for the future prosperity of the State. The mineral resources of Iowa are unquestionably great. The expense to accomplish such a survey would be small; the State is out of debt.

There are very frequently inquiries coming to this office from parties outside the State for lands containing some of the above re-

sources, yet our means of giving any definite information, as to the mineral resources of the State are limited. We believe if a thorough economic geological survey of the State would be made, that it would be a benefit to all the people that live within her boundaries.

SCHOOL OF MINES.

I would also respectfully recommend to your Excellency that steps be taken for the establishment of a School of Mines in the State of Iowa; where the children of our miners and mechanics could be taught in the theories of those branches of industries that they follow.

The importance of this step is being impressed upon us more fully each day as we come in contact with examples of ignorance and incompetency on the part of mine superintending, and bossing, and otherwise in control of our mines, factories and shops.

Not only is this fact observant in the mining industries of Iowa, but as well, and to the same extent in the manufacturing industries, and in construction, and building, as pertaining to highway bridges, and in all work where engineering knowledge and skill is required.

We would respectfully draw attention to the growing need of this knowledge by mechanics and economics, with the rapid growth of our State.

Every year calls for more definite knowledge; more scientific and accurate methods; more complicated machinery, and greater intelligence on the part of the men. If this intelligence is not possessed by the miners, mechanics and artisans of our own State, they must give place to men from other parts, and men of our own soil must earn their living by doing work of lower grade, while their places in the mines, and in the shops are filled with men from other states; as, for example, the introduction of the "Stanley Header," for entry driving in the mines near Centerville; the introduction of electric plants for lighting, and for motive purposes at many of our mines; the introduction of electric street cars, in many of our cities; these and numerous other improved appliances introduced are calling for men of technical knowledge and skill.

Other States furnish within their own borders the means and opportunities for the acquirement of such knowledge; why not the State of Iowa?

It is the privilege and duty of the State to place within the reach of its citizens the means of acquiring knowledge in all branches that will fit them for usefulness, and more especially does this affect the material interests of the State, where such knowledge pertains to the development of her material resources and wealth.

Can the State of Iowa afford, standing as she does in the fore most ranks of the agricultural world, and having unknown and undeveloped mineral wealth in and beneath her soil; can Iowa afford to extend anything else than a liberal hand to assist her sons of toil longing for a higher knowledge than obtainable in the high schools as pertaining to mines, mechanics and economies. Let Iowa give them every encouragement and they will stand as co-equals with their brothers in other states:

There are many among the foremen and working men in our mines and in our shops to-day, who feel with regret their incapacity to properly do work that presents itself, and who have a laudable ambition to see their sons better educated. It is common to see these men in possession of instruments they do not comprehend, and it is painful to see bungling and failure where accuracy and success should be.

It is a fact these men know where they fail, but are helpless to do better from the limit of their knowledge.

Many of these miners, mechanics and artisans are studying after hours from their own collected libraries of text-books, unguided and unaided. Often the books used are poor authority.

We have endeavored thus far to show

First—The importance of the establishment of a state school of miners.

Second—The need of such an institution of knowledge.

Third—The duty of the State to provide the means.

Fourth—The appreciation of such privilege by those to be benefited.

And now what would be the legitimate result or outgrowth of such as affecting the citizens.

It is not claimed in this recommendation that all of those most in need and appreciating the value of such knowledge, would avail themselves of the privilege extended them, or that any proportion of our miners, mechanics and artisans would leave their mines,

shops and benches to attend a school however beneficial. Too many of them have families to support and could not give their time to a systematic course of study.

But while the main support of the school would be derived from young men who have finished their course in the high school and from others who come from the mines and shops and by passing an entrance examination show themselves fitted to take up the prospected course; yet, beyond this, it is claimed the school would in a most direct way influence those unable to attend through their association and contact with men coming therefrom.

Such men would have and carry with them ideas endorsed by the school. They would recommend text-books and lines of study endorsed by the school and in an untold number of ways educate and uplift their fellows in work.

Second—As affecting the State, a more successful location and extraction of the mineral wealth be assured, by the diffusion of such knowledge; also the more general adoption, and application of principles and methods to which many of our shops are strangers to-day; and by such means manufactories within our own State would be carried on at a saving of expense and rendered thereby more valuable.

In short, the whole industrial interest of the State would be benefited, and we ourselves be made richer and happier in the possession of more accurate knowledge by our practical, hard working men.

Let the methods of the school be practical, as they are scientific. Let the students be taken into our mines, and into our shops for the practical illustration of theory and formula.

In closing, we would say there is, in our judgment, more of a hopeful prospect of substantial benefit accruing to the State from the industrial education of her own citizens than from any other source.

We have more faith in the training of our practical western men, educated to their needs, than in the employment of men from eastern schools.

They are, no doubt, educated to a higher standard, but fail, not infrequently, from their want of familiarity with western ways and means.

RECOMMENDATION.

I further recommend to your Excellency the repeal of a part of the Mining Laws. Namely: Chapter 46, Laws of 1890.

The above chapter conflicts with Chapter 21, Laws of 1884, Sections 8 and 9. The laws of 1890 allow Operators three years time to make a second opening to all mines that are over two hundred feet deep, while the laws of 1884 allow only two years time, which is ample time to make all necessary improvements in connection with a mine.

Three years is too long a time for miners to work at a depth of over two hundred feet without a second opening. The shaft is liable to take fire and burn down, or it may cave in; should either happen the men that would be in the mine at the time could not possibly escape. Therefore we urge the entire repeal of Chapter 46, Law of 1890.

CONCLUSIONS.

I have endeavored to incorporate in this report all statistics, recommendations, suggestions and matter relative to the mines and mining interest of the Third district, as I believe would be of interest not only to the miner and operator, but to the public in general.

There is a large amount of work done by the Inspector, that is not included in this report, as I did not deem it advisable as it would make the report too voluminous, and we think it unnecessary to make a detailed report of each visit or inspection made to the different mines, as we keep a record in the office of every mine inspected, also send copy of the record of inspection at the end of each month to the Governor to be filed in that office, consequently do not give that part of the work only as a whole.

Since my term of office commencing December 1st, 1889, I have made 230 inspections, and visits of the different mines in this district.

It has been necessary to visit some of the mines oftener than others. This was owing to the condition of the mine at my first visit. If found lacking in any of the requirements of the mining law, I invariably notified the Operator or Superintendent of the deficiency with orders to make the necessary repairs as soon as possible; I would then revisit the mine in a short time to see that my orders were carried out in compliance with the law.

I have been lenient in these matters as it was possible to be, aiming to do justice by all without injuring any one, or neglecting my duty as an official.

I have had but very little trouble or opposition in my duties as Inspector, but on the contrary have generally found all concerned ready and willing to co-operate with, and assist me in having the laws complied with.

There has been eleven fatal and thirty-eight non-fatal accidents reported to this office in this district for the two years ending June 30th, 1891, all of which has been properly recorded and reports filed.

I have given a detailed account of the accidents in tables tabulated so as to show the time of accident, the name of the person killed or injured, the cause, etc., also the verdict of the coroner's jury is given in full in each fatal accident.

I have had frequent calls to test and adjust the scales at different mines in the district. I have responded as promptly as possible in all cases and have found but few scales out of order, those I adjusted properly to the satisfaction of all concerned.

We have endeavored to give as near a correct statement as possible of the number of mines, the total out-put of coal, the number of miners and all other employes, the amount of money paid them for their labor, the average price per ton paid for mining, also the total amount of money received for the product, the average selling price at the mine, etc.

This shows one hundred and seven (107) mines in the Third District in good working order, producing annually one million, fifty-nine thousand, five hundred and forty-one (1,059,541) tons, or two million, one hundred and nineteen thousand, and eighty-two (2,119,082) tons for the biennial period ending June 30th, 1891. The average selling price of coal at the mines is one dollar and fifty-five cents (\$1.55) per ton; making the total receipts for the product for the two years three millions, two hundred and ninety-eight thousand, one hundred and twenty-eight dollars and fifty-five cents (3,298,128.55).

The producing of this coal gives employment to two thousand, one hundred and fifteen (2,115) miners, and five hundred and seventy-six (576) other employes in and around the mines. The miner receives an average of eighty-eight (88) cents per ton for mining, or a total of one million, eight hundred and fifty-nine thousand, three hundred and one dollars and seventy-six cents (\$1,859,301.76) for the two years. Add to this six hundred and seventy-four thousand, nine hundred and forty-six dollars and six cents (\$674,946.06) the amount paid other employes, and it gives a grand total of two millions, five hundred and thirty-four thousand, two hundred and forty-seven dollars and eighty-two cents (\$2,534,247.82) paid out to the miners and employes in and around the mines of the Third Mining District.

The above does not include the incidental expense of working the mines, such as timber, machinery, entry work, turning of rooms, sinking of shafts, tracking, mine cars, mules, royalty on coal, interest on money invested and hauling of coal to railroad track, as many of our mines are some distance away from railroads.

I am glad to note the interest manifested throughout the mining district by the miners in school matters. Years ago the majority of them imagined that schools were something they had no jurisdiction over, consequently they were disinterested. Now we find in nearly every mining locality miners as school directors and taking as much interest in the education of their children, and other things pertaining to school matters, as anyone in the vicinity.

This is commendable on the part of the miner and means that the future miner, whether he be an operator or laborer, will be educated, intelligent and industrious, and I believe that this will have a great tendency toward harmonizing the two factions (the miner and operator), relative to strikes and other disagreements, than any one thing.

It would be a good move and in the right direction if the miners in the different localities would establish a reading room, or a place that would entertain the minds of those that could spare a few hours each week in reading. Such a place, especially in the larger camps, could be kept to a high standard, and there would be no question as to the good results it would have both present and future.

It would require no great effort on the part of the miner, or any one interested, to start an institution of that kind. The cost would be nominal. We believe that many of our newspaper men

would kindly send copies of their papers free to such an institution. Add to this a few of our monthly periodicals with a very light donation from each one interested, and you will have established an institution that would be a monument of honor to any society.

SUMMARY.

In order that a complete review of the mining industry may be had, we have summarized the following detailed districts tabulations in three tables:

TABLE No. I.

Showing number of mines, number of tons of coal produced, number of miners and other employes, total amount of money paid miners and all other employes, value of product at mines, etc., for the year ending June 30, 1890.

NUMBER OF DISTRICT.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mine.
District No. 1...	153	1,314,765	3,313	548	.79	\$ 1,038,065.00	\$ 296,897.00	1.34	\$ 1,740,667.11
District No. 2...	88	1,598,060	2,817	602	.78	1,249,436.00	429,856.00	1.41	2,253,299.27
District No. 3...	103	1,090,787	2,123	490	.95	976,569.00	397,800.00	1.54	1,640,662.99
Total	344	3,980,592	8,253	1,640	.82	3,264,065.00	1,124,553.00	1.42	5,634,629.37

TABLE No. 2.

Showing the number of mines, output of coal, number of miners and employes, amount paid miners and employes, value of output at the mines, etc., for the year ending June 30, 1891.

NUMBER OF DISTRICT.	Number of mines.	Number of tons of coal produced.	Number of miners employed.	All other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mine.
District No. 1...	170	1,136,190	2,721	687	.83	\$ 938,838.75	\$ 227,430.37	1.32	\$ 1,567,012.06
District No. 2...	97	1,533,496	2,311	754	.76	1,165,718.24	290,715.04	1.32	2,009,916.77
District No. 3...	110	1,952,295	2,103	634	.84	882,723.76	277,146.06	1.57	1,657,465.56
Total.....	377	3,721,981	7,035	2,005	.81	2,988,280.55	795,291.47	1.39	4,574,304.39

TABLE No. 3.

Showing the grand total for the State for the biennial period ending June 30, 1891.

DISTRICTS.	Average number of mines in operation.	Number of tons of coal produced.	Average number of miners employed.	Average number of all other employes.	Average price per ton paid for mining.	Total amount paid miners.	Total amount paid all other employes.	Average selling price per ton at mine.	Total value of product at mine.
District No. 1.....	162	2,450,955	3,017	618	.82	\$1,996,933.75	\$ 524,227.37	\$1.33	\$ 3,247,680.17
District No. 2.....	93	3,132,446	2,515	684	.78	2,416,154.34	720,571.04	1.36	4,263,198.04
District No. 3.....	107	2,119,082	2,113	575	.88	1,859,301.76	674,946.06	1.55	3,298,128.53
Grand total.....	362	7,702,483	7,645	1,877	.82	\$6,272,389.75	\$1,919,844.47	\$1.40	\$ 10,809,606.76

J. H. Cox, Secretary.

IOWA
MINING LAWS,

PASSED BY THE

TWENTIETH, TWENTY-FIRST, TWENTY-SECOND AND
TWENTY-THIRD GENERAL ASSEMBLIES.

IOWA MINING LAWS.

CHAPTER 140, LAWS 1886.

PROVIDING FOR MINE INSPECTORS, THEIR APPOINTMENT, DUTIES AND COMPENSATION.

AN ACT to Repeal Sections 1, 2, 3, 4, 5 and 6, of Chapter 21, Acts of the Twentieth General Assembly, and enact substitutes therefor providing for Mine Inspectors, their manner of appointment, compensation and defining their duties and terms of office.

Be it enacted by the General Assembly of the State of Iowa.

SECTION 1. That there shall be appointed by the Governor with the advice and consent of the Senate three Inspectors of Mines, who shall hold their offices for two years, the said Inspectors subject however to be removed by the Governor for neglect of duty or malfeasance in office. Said term of office shall commence on the first day of April of each even numbered year. Said Inspectors shall have a theoretical and practical knowledge of the different systems of working and ventilating coal mines and of the nature and properties of the noxious and poisonous gases of mines and of mining engineering, and said Inspectors before entering upon the discharge of their duties shall take an oath or affirmation to discharge the same faithfully and impartially, which oaths or affirmations shall be endorsed upon their commissions, and their commissions so endorsed shall be forthwith recorded in the office of the Secretary of State, and such Inspectors shall each give bonds in the sum of two thousand (2,000) dollars, with sureties, to the approval of the Governor, conditioned for the faithful discharge of their duties.

The State shall be divided into districts.

The Governor shall divide the State into inspection districts and shall assign the Inspectors to duty in such place or district as he shall deem proper.

SEC. 2. Said Inspectors shall give their whole time and attention to the duties of their offices respectively, and shall examine all the mines in this State as often as their duties will permit, to see that the provisions of this act are obeyed, and it shall be lawful for such Inspectors to enter, inspect and examine any mine in this State and the works and machinery belonging thereto, at all reasonable times by night or day, but so as not to unnecessarily obstruct or impede the working of the mines, and to make inquiry and examination into the state and condition of the mine as to ventilation and general security as required by the provisions of this act. The Inspectors shall make a record of all examinations of mines inspected by them showing the date when made, the condition in which the mines are found, the extent to which the laws relating to

Inspectors shall make a record of all examinations.

mines and mining are observed or violated, the progress made in improvement and secured by the provisions of this chapter, number of accidents, injuries or deaths in or about the mines, the number of mines visited, the number of persons employed in or about the mines, together with all such facts and information of public interest concerning the condition of mines as they may think useful and proper, or so much thereof as may be of public interest to be included in their biennial report. The owner and agents of all coal mines are hereby required to furnish the means necessary for such inspection, and it shall be the duty of the

In case of accident to give notice to inspector and to coronor of county.

persons having charge of mines whenever any loss of life shall occur by accident connected with the workings of such mine to give notice forthwith by mail or otherwise to the Inspector of mines of his district and to coronor of the county in which such mine is situated, and the coronor shall hold an inquest on the body of the person or persons whose death has been caused, and inquire carefully into the cause thereof, and shall return a copy of the verdict and all testimony to the said Inspector. No person having a personal interest in or employed in the mine where a fatal accident occurs shall be qualified to serve on the jury empaneled on the inquest, and the owner or agent of all coal mines shall report to the Inspector all accidents to miners in and around the mines, giving cause of same, such report to be made in writing and within ten days from the time any accident occurs.

SEC. 3. Said Inspectors while in office shall not act as agents or managers or mining engineers or be interested in operating any mine, and the Inspector shall biennially on or before the 15th day of August preceding the regular session of the General Assembly make a report to the Governor of their proceedings and the condition and operation of the mines in this State, enumerating all accidents in or about the same, and giving all such information as they may think useful and proper, and making such suggestions as they may deem important as to future legislation on the subject of mining.

Inspector to make report to Governor.

SEC. 4. The inspectors provided for in this act shall each receive a salary of twelve hundred dollars (\$1,200) per annum, payable monthly, and shall be furnished with necessary stationery and actual traveling expenses, not to exceed five hundred dollars (\$500) per annum, provided that each Inspector shall file at the end of each quarter of his official year with the Auditor of State a sworn statement of his actual traveling expenses incurred in the performance of his official duty for such quarter, the said salary and expenses to be paid by the State as the salaries and expenses of other State officers are provided for. They shall have and keep an office in the Capitol at Des Moines, in which shall be kept all records, correspondence, papers, apparatus and property pertaining to their duties belonging to the State, and which shall be handed over to their successors in office. And each Inspector shall, during his term of office have and keep a residence in the district to which he is assigned without expense to the State, also have and keep an office at a place designated by the Governor, accessible to railroad and telegraph in their respective districts where at reasonable times and when not actually engaged elsewhere such Inspectors shall be found.

Each Inspector to have a residence and office in his district.

SEC. 5. Any vacancy occurring in the office of Inspector when the Senate is not in session, either by death or resignation, removal by the Governor or otherwise, shall be filled by appointment by the Governor, which appointment shall hold good until his successor is appointed and qualified.

SEC. 6. There shall be provided for such Inspectors all instruments necessary for the discharge of their duties under this act, which shall be paid for by the State on the certificate of the Inspectors and shall be the property of the State.

CHAPTER 21, LAWS 1884.

MINES AND MINING.

AN ACT to regulate mines and mining, and to repeal Chapter 202 of the Acts of the Eighteenth General Assembly.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 7. The agent or owner of every coal mine shall make or cause to be made an accurate map or plan of the working of such mine on a scale of not less than one hundred feet to the inch, showing the area mined or excavated. Said map or plan shall be kept at the office of such mine. The agent or owner shall, on or before the first day of September of each year, cause to be made a statement and plan of the progress of the workings of such mine up to said date, which statement and plan shall be marked on the map or plan herein required to be made, in case of refusal on the part of said owner or agent for two months after the time designated to make the map or plan, or addition thereto, the Inspector is authorized to cause an accurate map or plan of the whole said mine to be made at the expense of the owner thereof, the cost of which shall be recoverable against the owner in the name of the person or persons making said map or plan, and the owner or agent of all coal mines hereafter wrought out and abandoned, shall deliver a correct map of said mine to the Inspector to be filed in his office.

Owner or agent of mines shall make a map or plan of same.

SEC. 8. It shall be unlawful for the owner or agent of any coal mine worked by a shaft to employ or permit any person to work therein unless there are to every seam of coal worked in such mine, at least two separate outlets; separated by natural strata of not less than one hundred feet in breadth, by which shafts or outlets distinct means of ingress and egress are always available to the persons employed in the mine, but in no case shall a furnace shaft be used as an escape shaft; and if the mine is a slope or drift opening, the escape shall be separated from the other openings by not less than fifty feet of natural strata, and shall be provided with safe and available traveling ways, and the traveling ways to the escapes in all coal mines shall be kept free from water, and falls of roof, and all escape shafts shall be fitted with safe and convenient stairs at an angle of not more than sixty degrees descent, and with landings at easy and convenient distances, so as to furnish easy escape from such mine; and all air shafts used as escapes where fans are employed for ventilation shall be provided with suitable appliances for hoisting the underground workmen, said appliances to be always kept at the mine ready for immediate use, and in no case shall any combustible material be allowed between any escape shaft and hoisting shaft, except such as is absolutely necessary for the operation of the mine, provided that where a furnace shaft is large enough to admit of being divided into an escape shaft and a furnace shaft. There may be a partition placed in said shaft properly constructed so as to exclude the heated air and smoke from

There shall be two separate outlets to every seam of coal worked.

the side of the shaft used as an escape shaft, such partition to be built of incombustible material for a distance of not less than fifteen feet up from the bottom thereof, and provided that where two or more mines are connected underground. Each owner may make joint provisions with the other for the use of the other's hoisting shaft or slope as an escape, and in that event the owners thereof shall be deemed to have complied with the requirements of this section, and, provided further, that in any case where the escape shaft is now situated less than one hundred feet from the hoisting shaft there may be provided a properly constructed underground traveling way from the top of the escape shaft, so as to furnish the proper protection from fire for a distance of one hundred feet from the hoisting shaft, and in that event the owner or agent of any such mine shall be deemed to have complied with the requirements of this section; and, provided further, that this act shall not apply to mines operated by slopes or drifts, openings where not more than five persons are employed therein [and provided further, that any escapement shaft that is hereafter sunk and equipped before said escapement shaft shall be located or the excavation of for it begun, the District Inspector of mines shall be duly notified to appear and determine what shall be a suitable distance for the same. The distance from main shaft shall not be less than three hundred feet without the consent of the Inspector, and no building shall be put nearer the escape shaft than one hundred feet, except the house necessary to cover the fan.]—Chapter 56. Laws of 1888, Section 1.

SEC. 9. In all mines there shall be allowed one year to make outlets as provided in section eight, when such mine is under two hundred feet in depth, and two years when such mine is over two hundred feet in depth, but not more than twenty men shall be employed in such mine at any one time, until the provisions of section eight are complied with, and after the expiration of the period above mentioned. Should said mines not have outlets aforesaid, they shall not be operated until made to conform to the provisions of section eight [and, provided further, that this act shall not apply to mines where the escape way is lost or destroyed by reason of the drawing of pillars preparatory to the abandonment of the mine, provided that not more than twenty persons shall be employed in said mine at any one time.]

SEC. 10. The owner or agent of any coal mine, whether it be operated by shaft, slope or drift, shall provide and maintain for every such mine an amount of ventilation of not less than one hundred cubic feet of air per minute for each person employed in such mine, and not less than five hundred cubic feet of air per minute for each mule or horse employed in the same, which shall be distributed and circulated throughout the mine in such manner as to dilute, render harmless and expel the poisonous and noxious gases from each and every working place in the mine, and whenever the Inspector shall find men working without sufficient air or under any unsafe conditions he shall first give the operator or his agent a reasonable notice to rectify the same and upon a refusal or neglect so to do the Inspector may himself order them out until said portion of said mine shall be put in proper condition, and all mines governed by the provisions of this act shall be provided with artificial means for producing ventilation such as exhaust or forcing fans, furnaces or exhaust steam or other contrivances of such capacity and power as to produce and maintain an abundant supply of air for all the requirements of the persons employed in the mine; but in case a furnace is used for ventilating purposes it shall be built in such manner as to prevent the communication of fire to any part of the works by lining the upcast with incombustible material for a sufficient distance up from said furnace to insure safety.

SEC. 11. The owner or agent of every coal mine operated by a shaft or slope in all cases where the human voice cannot be distinctly heard shall forthwith provide a metal tube and maintain a metal tube or other suitable means for communication from the top to the bottom of said shaft or slope, suitably calculated for the free passage of sound therein, so that communication can be held between persons at the bottom and top of the shaft or slope, and there shall be provided a safety catch of approved pattern and a sufficient cover overhead on all carriages used for lowering and hoisting persons, and on top of every shaft an approved safety gate and also an approved safety spring on top of every slope, and an adequate brake shall be attached to every drum or machine used for raising or lowering persons in all shafts or slopes, and a trial shall be attached to every train used on a slope, all of said appliances to be subject to the approval of the inspector.

SEC. 12. No owner or agent of any coal mine operated by shaft or slope shall knowingly place in charge of any engine used for lowering into or hoisting out of such mine persons employed therein, any but experienced, competent and sober engineers, and no engineer in charge of such engine shall allow any person except such as may be deputed for that purpose by the owner or agent, to interfere with it or any part of the machinery, and no person shall interfere or in any way intimidate the engineer in the discharge of his duties, and the maximum number of persons to ascend out of or descend into any coal mine on one cage, shall be determined by the Inspector, but in no case shall such number exceed ten, and no person shall ride upon or against any loaded cage or car in any shaft or slope except the conductor in charge of the train.

SEC. 13. No boy under twelve years of age shall be permitted to work in any mine, and parents or guardians of boys shall be required to furnish an affidavit as to the ages of their boys when there is any doubt in regard to their age, and in all cases of miners applying for work the agent or owner of the mines shall see that the provisions of this section are not violated.

SEC. 14. In case any coal mine does not in its appliances for the safety of the persons working therein conform to the provisions of this act, or the owner or agent disregards the requirements of this act for twenty days after being notified by the Inspector, any court of competent jurisdiction, while in session, or the judges in vacation, may, on application of the Inspector, by civil action in the name of the State, enjoin or restrain by writ of injunction the said agent or owner from working or operating such mines with more persons at once than are necessary to make the improvements needed, except as provided in section eight and nine, until it is made to conform with the provisions of this act, and such remedies shall be cumulative, and shall not take the place of or effect any other proceedings against such owner or agent authorized by law, for the matter complained of in such action, and for any willful failure or neglect to comply with the provisions of this law by any owner, lessee or operator of any coal mine or opening whereby any one is injured, a right of action shall accrue to the party so injured for any damage he may have sustained thereby, and in case of loss of life by reason of such willful neglect or failure aforesaid, a right of action shall accrue to the widow, if living, and if not living, to the children of the person whose life shall be lost, for like recovery of damages for the injury they shall have sustained.

SEC. 15. Any miner workman or other person who shall knowingly injure or interfere with any air-course or brattice, or obstruct or throw open doors or disturb any part of the machinery, or disobey any order given in carrying out the provisions of this act, or ride upon a loaded car or wagon in a shaft or slope, except as provided in section twelve, or do any act whereby the lives and health of the persons or the security of the mines and machinery is endangered, or if any miner or person employed in any mine governed by the provisions of this act shall neglect or refuse to securely prop or support the roof and entries under his control, or neglect or refuse to obey any order given by the superintendent in relation to the security of the mine, in the part of the mine under his charge or control, every such person shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding one hundred dollars or imprisonment in the county jail not exceeding thirty days.

SEC. 16. Whenever written charges of gross neglect of duty or malfeasance in office against any Inspector shall be made and filed with the Governor, signed by not less than fifteen miners or one or more operators of mines, together with a bond in the sum of five hundred dollars payable to the State and signed by two or more responsible freeholders and conditioned for the payment of all cost and expenses arising from the investigation of such charges, it shall be the duty of the Governor to convene a board of examiners to consist of two practical miners, one mining engineer and two operators, at such time and place as he may deem best, giving ten days' notice to the Inspector against whom charges may be made, and also the person whose name appears first in the charges, and said board when so convened and having first been duly sworn or affirmed truly to try and decide the charges made, shall summon any witness desired by either party and examine them on oath or affirmation which may be administered by any member of the board and depositions may be read on such examination, as in other cases, and report the result of their investigations to the Governor; and if their report shows that said Inspector has grossly neglected his duties or is incompetent or has been guilty of malfeasance in office, it shall be the duty of the Governor forthwith to remove said Inspector and appoint a successor; and said board shall award the cost and expenses of such investigation against the Inspector or person signing said bond.

SEC. 18. The owner, agent or operator of any coal mine shall keep a sufficient supply of timber, to be used as props, so that the workman may at all times be able to secure the workings from caving in, and it shall be the duty of the owner, agent or operator to send down all such props when so required.

SEC. 19. Any person willfully neglecting or refusing to comply with the provisions of this act when notified by the Mine Inspector to comply with such provisions, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding five hundred dollars or imprisonment in the county jail not exceeding six months, except when different penalties are herein provided.

SEC. 20. Chapter 202 of the acts of the Eighteenth General Assembly is hereby repealed.

SEC. 2. That chapter 21, laws of the Twentieth General Assembly be and the same is hereby amended by enacting the following supplementary section:

Misdemeanor for miners to neglect to prop the roof of rooms in their charge.

Inspector may be removed for malfeasance in office or incompetency.

Owners or agents shall furnish timber for props whenever required.

Failure to comply with this section a misdemeanor.

Section 22. The Executive Council shall appoint a board of examiners, composed of two practical miners, two mine operators and one mining engineer who shall have at least five years' experience in his profession. The members of said board shall be of good moral character, and citizens of the United States and State of Iowa, and they shall before entering upon their duties take the following oath (or affirmation): I ———, do solemnly swear (or affirm) that "I will perform the duties of examiner of candidates for the office of Mine Inspector to the best of my ability, and that in recommending any candidate I will be governed by the evidence of qualification to fill the position under the law creating the same, and not by any consideration of political or personal favors; that I will grant certificates to candidates according to their qualifications and the requirements of the law." They shall hold their office for two years.

Section 23. Said board shall meet biennially on the first Monday in April of each even-numbered year, except that for the year 1888, said board shall meet on the second Monday, in the office of State Mine Inspector, in the Capitol, and they shall publish in at least one newspaper published in each mining district of the State the date fixed by them for the examination of candidates. They shall be furnished with the necessary stationery and other necessary material for said examination in the same manner as other State officers are now provided. They shall receive as compensation the sum of \$5.00 per day for time actually employed in the duties of their office and actual traveling expenses. The said compensation and expenses shall be paid in the same manner as the salaries and expenses of other State officers are now paid; provided, that in no case shall the per diem received by any member exceed \$50.00 for each biennial session.

Section 24. Certificates of competency shall be granted only to citizens of the United States and State of Iowa, of good moral character, not less than twenty-five years of age, who shall have at least five years' experience in the mines, and who shall not have been acting as agent or superintendent of any mine for at least six months prior to their appearance for examination.

Section 25. The examination of candidates for the office of Mine Inspector shall consist of oral and written questions in theoretical and practical mining and mine engineering, on the nature and properties of noxious and poisonous gases found in mines, and on the different systems of working and ventilating of coal mines. The candidates shall not be allowed to have in their possession at the time of their examination, any books, memoranda or notes to be used as aids in said examination. The board of examiners shall give to all persons examined who in their judgment possess the requisite qualifications, certificates of such qualification, and from the persons holding such certificates the Governor shall appoint the State Mine Inspector.

Section 26. This act being deemed of immediate importance shall take effect on and after its publication in the Iowa State Register and Des Moines Leader, newspapers published in Des Moines, Iowa.

Approved April 12, 1888.

The Executive Council shall appoint a board of examiners.

CHAPTER 53, LAWS OF 1888.

PROVIDING FOR THE WEIGHING OF COAL AT MINES.

AN ACT to Amend Chapter 21 of the Acts of the 20th General Assembly, Providing for the weighing of Coal at Mines.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. That the owner or agent of each coal mine within this State, at which the miners are paid by weight, shall provide at such mines suitable scales of standard make for the weighing of all coal mined.

SEC. 2. The owner or agent of such mine shall require the person authorized to weigh the coal delivered from said mine to be sworn before some person having authority to administer an oath, to keep the scales correctly balanced, to accurately weigh, and to record a correct account of the amount weighed of each miner's car of coal delivered from such mine, and such oath shall be kept conspicuously posted at the place of weighing. The record of the coal mined by each miner shall be kept separate and shall be open to his inspection at all reasonable hours, and also for the inspection of all other persons peculiarly interested in such mine.

SEC. 3. In all coal mines in this State the miners employed and working therein may furnish a competent check-weighman, who shall at all proper times have full right of access and examination of such scales, machinery or apparatus, and seeing all measures and weights of coal mined and accounts kept of the same, provided that not more than one person on behalf of the miners collectively shall have such right of access, examination and inspection of scales, measures and accounts at the same time, and that such person shall make no unnecessary interference with the use of such scales, machinery or apparatus. The agent of the miners, as aforesaid, shall before entering on his duties, make and subscribe to an oath before some officer duly authorized to administer oaths, that he is duly qualified and will faithfully discharge the duties of check-weighman. Such oath shall be kept conspicuously posted at the place of weighing.

SEC. 4. Any person, company or firm having or using any scale or scales for the purpose of weighing the output of coal at mines so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever by reason of which such coal is not correctly weighed, or reported in accordance with the provisions of this act; or any weighman or check-weighman who shall fraudulently weigh or record the weights of such coal, or connive at or consent to such fraudulent weighing, shall be deemed guilty of a misdemeanor, and shall, upon conviction for each such offense be punished by a fine of not less than two hundred dollars (\$200) or more than five hundred dollars (\$500), or by imprisonment in the county jail for a period not to exceed sixty days or by both such fine and imprisonment; proceedings to be instituted in any court of competent jurisdiction.

SEC. 5. Any person, owner or agent, operating a coal mine in this State who shall fail to comply with the provisions of this act, or who shall obstruct or hinder the carrying out of its requirements, shall be fined for the first offense not less than fifty dollars (\$50) nor more than two hundred dollars (\$200); for the second offense

not less than two hundred dollars (\$200) nor more than five hundred dollars (\$500); and for a third offense not less than five hundred dollars (\$500); provided that the provisions of this act shall apply only to coal mines whose products are shipped by rail or water.

SEC. 6. That section 17 of chapter 21 of the laws of 1884 is hereby repealed.
Approved April 6, 1888.

CHAPTER 54, LAWS OF 1888,

WEIGHING COAL AT MINES.

AN ACT to Establish a Uniform System of Weighing Coal at the Mines of this State, and to Punish certain Irregularities connected therewith.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. That all coal mined in this State under contract for payment by the ton or other quantity shall be weighed before being screened unless otherwise agreed upon in writing, and the full weight thereof shall be credited to the miner of such coal; and eighty pounds of coal as mined shall constitute a bushel, and two thousands pounds of coal as mined shall constitute a ton. Provided that nothing in this act shall be so construed as to compel payment for sulphur, rock, slate, black jack or other impurities including slack and dirt which may be loaded with or amongst such coal.

SEC. 2. Each State Mine Inspector shall procure from the State Superintendent of Weights and Measures at the expense of the State a full and complete set of standards, balances and other means of adjustment such as are necessary in the comparison and adjustment of the scales, beams and other apparatus used in weighing coal at the mines to the State standards of weight; and it shall be the duty of said Inspectors to examine, test and adjust as often as occasion demands all scales, beams, and other apparatus used in weighing coal at the mines.

SEC. 3. Any person damaged by reason of coal mined not having been weighed and credited to him in accordance with the provisions of this act may recover his damage in a civil action against the employer, but such action must be begun within two years after the right thereto accrued; but his right to recover in such action shall not be barred by reason of his having knowledge of the violation of this act at the time.

Approved April 12, 1888.

CHAPTER 55, LAWS OF 1888.

PROTECT WORKMEN IN MANAGEMENT AND CONTROL OF WAGES.

AN ACT to Provide for the Payment of Wages of Workmen Employed in Mines, in the State of Iowa, in Lawful Money of the United States, and to Protect said Workmen in the Management and Control of their own Earnings.

Be it Enacted by the General Assembly of the State of Iowa:

SECTION 1. It shall be unlawful for any person, firm, company or corporation, owning or operating coal mines in the State of Iowa, to sell, give, deliver or in any manner issue, directly or indirectly, to any person employed by him or it, in payment for wages due for labor, or as advances on wages of labor not due, any script, check, draft, order or evidence of indebtedness, payable or redeemable otherwise than in their face value in money; and such person, firm, company or corporation who shall violate any of the provisions of this section, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not exceeding three hundred dollars (\$300) nor less than twenty-five dollars, and the amount of any script, token, check, draft, order or other evidence of indebtedness sold, given, delivered or in any manner issued in violation of the provisions of this act, shall recover in money at the suit of any holder thereof, against the person, firm, company or corporation, selling, giving, delivering, or in any manner issuing the same; provided that this act shall not apply to any person, firm, company or corporation employing less than ten (10) persons.

SEC. 2. Whoever compels, or in any manner seeks to compel or coerce an employe of any person, firm, company or corporation, to purchase goods or supplies from any particular person, firm, company or corporation, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine not exceeding five hundred (500) dollars or imprisoned in the county jail, not exceeding sixty days, or both at the discretion of the court.

SEC. 3. The county attorney of any organized county, upon complaint being made to him of the violation of any of the provisions of this act within this county, shall cause such complaint to be investigated before the grand jury of the county where such wrong has been complained of, at its next session following the time such complaint is made.

Approved April 6, 1888.

CHAPTER 57, LAWS OF 1888.

TO PREVENT BLACK LISTING.

AN ACT for the Protection of Discharged Employes and to Prevent Black Listing.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. That if any person, agent, company or corporation, after having discharged any employe from his or its service shall prevent or attempt to prevent by word or writing of any kind such discharged employe from obtaining employment with any other person, company or corporation, except by furnishing in writing on request a truthful statement as to the cause of his discharge, such person, agent or corporation, shall be guilty of a misdemeanor and shall be punished by a fine not exceeding five hundred dollars nor less than one hundred dollars, and such person, agent, company or corporation shall be liable in penal damages to such discharged person to be recovered by civil action; but this action shall not be construed as prohibiting any person or agent of any company or corporation setting forth a truthful statement of the reasons for such discharge.

SEC. 2. If any railway company, any other company or partnership or corporation in this State shall authorize or allow any of its or their agents to black list any discharged employe or attempt by word or writing or any other means whatever to prevent such discharged employe or any employe who may have voluntarily left said company's service from obtaining employment with any other person or company except as provided for in section 1 hereof, such company or co-partnership shall be liable in treble damages to such employe so prevented from obtaining employment, to be recovered by him by civil action.

SEC. 3. This act being deemed of immediate importance shall be in force and take effect from and after its publication in the Iowa State Register and the Des Moines Leader, newspapers published in the city of Des Moines and the State of Iowa.

Approved April 16, 1888.

CHAPTER 46, LAWS OF 1890.

ESCAPE SHAFTS IN COAL MINES.

AN ACT to amend section 9, Chapter 21, Acts of the 20th General Assembly, as amended by Section 2, Chapter 56, Acts of the Twenty-second General Assembly, relative to escape shafts in coal mines.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. That Section 9, Chapter 21, of the Acts of the Twentieth General Chap. 21, acts Assembly, as amended by Section 2, Chapter 56, Acts of the Twenty-20 G. A., Chap. 56, acts 22 G. second General Assembly, be so amended as to read as follows: A. amended.

Section 9. In all mines there shall be allowed one year to make out-lets as provided in Section 8, when such mine is over two hundred feet in depth; and two years when such mine is over two hundred feet in depth; but not more than twenty men shall be employed in such mine at any one time until the provisions of section eight are complied with; [provided that in the case of mines over two hundred feet in depth, there shall be allowed three years on the condition that during the third year not more than ten men shall be employed in such mine at any one time and provided further, that in cases where the two years shall already have expired, a third year shall be allowed after the taking effect of this Act;] and after the expiration of the period above mentioned should said mines not have the outlets aforesaid, they shall not be operated until made to conform to the provisions of section eight. And provided further, that this act shall not apply to mines where the escape way is lost or destroyed by reason of the drawing of pillars preparatory to the abandonment of the mine; provided that not more than twenty persons shall be employed in said mine at any one time.

Sec. 2. And provided further, that ten men or less may be lawfully employed in any coal mine without reference to the provisions of this or any other act.

Approved April 17, 1890.

CHAPTER 47, LAWS OF 1890.

PROTECTION OF LABORERS.

AN ACT to protect laborers and miners for labor performed in developing and working in Coal mines, additional to Chapter 100 Acts of the 16th General Assembly and Chapter 179, Acts of the 20th General Assembly.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. Every laborer or miner who shall perform labor in opening and developing any coal mine, including sinking shafts, constructing slopes, or drifts, mining coal and the like, shall have a lien upon all the property of the person, firm or corporation, owning, constructing or operating such mine, used in the construction or operation thereof, including real estate, buildings, engines, cars, mules, scales and all other personal property, for the value of such labor for the full amount thereof, upon the same terms with the same rights and to be secured and enforced as mechanics' liens are secured and enforced.

SEC. 2. This act being deemed of immediate importance shall take effect and Publication. be in force from and after its publication in the Iowa State Register and Des Moines Leader newspapers published in Des Moines, Iowa.

Approved April 30, 1890.