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BITUMINOUS COAL MINING IN NORTHERN MISSOURI.

BY

TRUE WALTER BLAKE.

—  
A  
THESIS

submitted to the faculty of the  
SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI  
in partial fulfillment of the work required for the  
Degree of  
ENGINEER OF MINES

Rolla, Mo.

1914.

Approved by

C. R. Forbes

Professor of Mining.

17336

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## BITUMINOUS COAL MINING IN NORTHERN MISSOURI.

### INTRODUCTION.

Missouri was the first state west of the Mississippi to produce a commercial output of coal and, although in later years some of the western states have produced a larger yield, still the Missouri mines bid fair to hold their present standing as there are hundreds of acres of virgin coal land in this state that will be able to be worked profitably after the eastern coal operators have worked out their thicker veins of coal.

The coal is won from the grasp of Mother Earth by either room-and-pillar or longwall systems in the larger mines, each method being employed to advantage in some fields while both are employed in others.

The three mining methods as used in mining coal in Northern Missouri are:

(1) Room-and-pillar --- in which rooms or stalls are driven off the entries with pillars of coal left between. The coal in this type of mine was originally shot off the solid by using large quantities of black powder but now, in many mines, it is undercut by chain machines or mined with the aid of coal punchers.

(2) Longwall --- in which the coal presents a continuous advancing or retreating face. Longwall advancing

is the longwall universally employed in Missouri on account of the smaller outlay of initial capital.

The crude work of undercutting the coal by means of a miner's pick is being mechanically done in many localities by means of longwall chain-type machines.

(3) Open-pit --- in which the coal outcrops with a thin overburden of soil that can be stripped before the coal is mined. This practice is not used much in the Missouri coal fields.

The coal mined in Missouri is of a bituminous nature and generally speaking a hard bituminous coal.

The commercial coal beds vary from 17 inches to 58 inches in thickness and lie nearly horizontal at a varying depth below the surface.

Because of the horizontal position of the beds a shaft (vertical shaft) is generally sunk upon the coal land, although slopes, drifts, and open-pits are sometimes used.

The coal beds are the (1) Mulberry (2) Lexington (3) Maly (4) Bevier (5) Tebo (6) Lower Beds.

The Bevier bed is the most important as fifty-six percent of the state's total output is mined from it. This bed is mined in Macon, Adair, Randolph, N.E. Howard, Boone and Calloway Counties, at Milan in Sullivan County and in the deep shafts at Leavenworth, Kansas.

THE MISSOURI COAL FIELDS AS THEY RANKED IN 1910.

- (1) Bevier Field (mines 27% of the state's output)  
comprising the Bevier, Huntsville, Higbee, Columbia, Fulton and Macon districts.
- (2) Lexington Field (mines 27% of the state's output)  
Coal bed only 20 inches thick. This field comprises part of the Richmond district and the Higginville and other districts.
- (3) Novinger Field (mines 15% of the state's output)  
Most of the larger mines are situated near the city of Novinger.
- (4) Mendota Field (mines 2% of the state's output)  
comprising part of Putman, Schuyler and Adair counties.
- (5) Leavenworth Field. The coal lying in Missouri is mined from the deep shafts at Leavenworth, Kansas.
- (6) Rich Hill and Minden Fields.
- (7) Marceline.
- (8) Vandalia.
- (9) Jordon.
- (10) Lewis and others.

THE NOVINGER FIELD.

The Novinger Field lies in the N.W. part of Adair County. The present active mines in this district are Rombauer Mines #3 and #4 (longwall), Kansas City Midland Mine #3 (room-and-pillar), Nineveh Mine #1 (slope)(room-and-pillar), Star Mine at Kirksville (longwall), Arctic Mine #1 (room-and-pillar) and Great Northern Mine #21 (room-and-pillar). Some mines have been worked out during the past year but new shafts are being commenced to take the places of the worked-out ones.

The Bevier coal bed, as mined in the Novinger Field, averages 42 inches in thickness with a 1-inch band of clay and a  $\frac{1}{4}$ -inch band lying about 4 inches apart in the lower half of the coal seam. The coal is overlaid with a shale bed of varying thickness and underlaid with about 36 inches of clay.

To the northwest of the city of Novinger a bench rock (a clay-like shale) up to 15 inches thick works into the coal bed between the upper 30 inches and the lower 12 inches of coal, which is greatly detrimental to the mining.

At Stahl, further to the northwest of Novinger, this bench rock acquires a thickness of 9 feet.

THE ROMBAUER COAL COMPANY.

The Rombauer Coal Company commenced operations near the city of Novinger in June, 1897 by opening Mine # 1, a solid shooting room-and-pillar mine, west of the city.

Mine #2 also employed the room-and-pillar system and this mine has worked out the coal under the greater part of the city of Novinger. Mine #1 was abandoned in 1908 and Mine 2 was abandoned in March, 1913.

Mine #3 and Mine #4 are three and two miles north and northwest respectively of the city. Both these mines were originally operated on the room-and-pillar (solid shooting) plan but in the fall of 1910 Goodman longwall electric machines, manufactured by the Goodman Manufacturing Company of Chicago, were introduced and this is the present mode of operation.

In November, 1913 the west side of Mine #3 (which side contained the bench rock) was cut off on account of excessive cost of production.



The mines are equipped as follows:

Mine # 3.

Mine equipment.

- 1 3-ton Goodman electric locomotive.
- 4 Goodman longwall coal-cutting machines.
- 4 500 ft. mining-machine cables.
- 308 pit cars capable of holding one ton of coal.
- 2 steel trucks for moving coal-cutting machines.
- 7 mules.
- 2 ponies.

Top equipment.

- 1 frame tippie 26 X 75 ft. containing steel chutes, steel rotary screen, gravity screens, 2 sheave wheels, 1 pair scales, one 1-ton crab, and all other necessary equipment for loading coal.
- 2 boilers - 100 H.P. each, with injector, steam gauge, safety valve, and all steam fittings.
- 1 boiler - 150 H.P., with all fittings.
- 1 boiler feed pump 6X4X6.
- 1 boiler feed pump  $4\frac{1}{2}$ X3X4.

These boilers furnish steam for the power house, hoisting engine, fan engine, etc.

- 1 82 ft. 2-compartment shaft (7' X 12'9" inside)
- 2 self dumping cages, single deck (4'10" X 6'5")

## Top equipment (continued)

- 1 power plant containing
    - 1 263 H.P. high speed Mc Euen engine
    - 1 175 K.W. Goodman Mfg. Co. generator
    - 1 2 ply leather belt
    - 1 switch board with switches, circuit breaker, voltmeter, ammeter and all fixtures.
    - 2 lightning arrestors.

This power plant also furnishes power for Mine #4.
  - 1 10 X 12 Geared Hoisting Engine (Eagle Iron Works) with 2 7/8 inch steel cables.
  - 1 7 X 8 Single Engine to run rotary.
  - 1 Christy Box car Loader
  - 1 Fan Engine 7 X 10.
  - 1 12 ft. steel ventilating fan.
  - 1 4½ X 3 X 4 steam duplex mine pump (Gardner)
  - 1 4 X 6 single pump for mine, belt drive (Deming)
  - 2 Howell mining drills.
  - 1 blacksmith shop and machine shop
- Mine timber, props, cap pieces, etc.

Mine # 4.

## Mine equipment.

- 5 Goodman longwall electric machines.
- 5 mining machine cables.
- 195 pit cars capable of holding one ton of coal.
- 10 mules.
- 1 pony.

## Top equipment.

- 1 frame tippie in hoisting order with hopper set on 5-ton Fairbank scales and with gravity and rotary screens for screening coal, 2 sheave wheels and one 1-ton crab.
  - 1 2-compartment shaft 92 ft. deep, 7 ft. by 12 ft. 9 in. inside dimensions.
  - 2 self dumping cages 4 ft. 10 in. by 6 ft. 5 in.
  - 2 flue boilers 4 X 20 ft. with fittings.
  - 1 hoisting engine 9 X 14 in. (Aulman) with 2 7/8 in. steel cables.
  - 1 Samson rotary engine 6 X 7 in. with 65 ft. of line shaft connecting to rotary screen.
  - 2 A. E. Gardner pumps 4½ X 3 X 4.
  - 1 Ottumwa box car loader.
  - 1 fan engine 6 X 12.
  - 1 fan 3 X 10 feet.
- Mine buildings, mine timber, etc.

Wage scale

The loaders receive 73 cents a short ton for loading the coal (39 in. to 42 in. thick). This also includes the setting of straps to help secure the working place and the delivery of the car of coal at the skip entry switch. The loaders also receive 89 cents a lineal yard for taking down the brushing rock in the rooms and entries to a height of 2 feet above the top of the coal and 5 feet wide at the top. This brushing-rock has to be built into the road-walls (5 feet wide) by the loaders. They also receive \$5.32 for a room turning and 68 cents for each crib and are paid extra for clay and rock occurring in their coal and for other deficient work, at a price agreed upon with the mine foreman.

The bottom day-men receive as an 8-hour daily wage as follows: (1) machine runners - - -\$3.06 (2) machine helpers - - -\$3.05 (3) timbermen, tracklayers, cagers, pluggers, drivers, roadmen, etc. - - -\$2.84 (4) spraggers - - -\$1.95 (5) trappers - - -\$1.25.

The top-men receive as follows: (1) hoisting engineer (first class) - - -\$3.38 (2) 1st blacksmith - \$3.34 (3) 2nd blacksmith - - -\$3.05 (4) dynamo tender - - \$3.34 (5) car handlers and other ordinary top labor - - -\$2.25.

Method of superintendence.

Each mine has a mine superintendent and two assistant foremen. The working face of the mine is divided about equally between the two assistant foremen (face foremen) and they see that the coal is properly mined and other work done in a workman-like manner on their half of the face; they take up and agree upon payment for extra work required to be done by the loaders; measure brushing and take up other deadwork semimonthly; and help direct the work of the daymen.

The superintendent (or pit boss) has supervision over all the work at the mine.

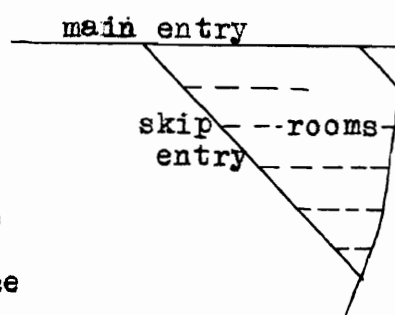
Method of keeping up surveys, sights, etc.

In the placing of the underground workings of the two longwall mines (# 3 and # 4) upon a scientific basis; first a complete underground transit survey was made and it connected with all surface lines. Then the survey was plotted and the proposed working plan was extended on the mine map.

As the roof is not strong enough to permit the use of the face track system of longwall mining, the Scotch system is used with rooms turned off the skip entries

at 45 degrees, allowing about 35 feet of face between each room.. The system as used is also a modification of the diamond-panel plan of central Illinois, the rooms being cut off at 150 feet and the skips at 600 feet, thereby concentrating and shortening the haulage.

The main entry, skip entry, and room courses are kept on the cardinal points of the compass or their bisectors, altho sometimes this rule has to be deviated from to meet some local condition of the face



or top. The working places are numbered consecutively around the face, the numbers being painted on the crib at the mouth of the place.

Sights are set with a compass and in all the entries two holes 6 inches deep and 1 inch in diameter are drilled in the roof about 30 inches apart showing the true course of the skip. Then wooden plugs are driven into these holes and iron spads driven into the plugs showing the exact alignment of the entry and then strings are tied in the holes in the spads to facilitate the future "lining in" of the place.

Two holes, about one inch deep, drilled in alignment in the roof with chalk designators suffice to keep rooms (which only have to be driven 150 feet) on their true course.

Falls of rock frequently carry the sights with them and they have to be replaced. After a day of replacing lost sights and "lining in" the loaders, the engineer gives the foreman a list containing the numbers of the entries, skips, and rooms that require alteration of their course in order that the foreman will be certain to see that the loaders in these places turn their next walls and the tracklayers lay the next pair of rails according to the sights.

Longwall machine operation.

The Goodman electric longwall machines, using a 40 inch cutter arm, have been operated at the Rombauer Mines #3 and #4 since the fall of 1910.

The chief differences between longwall machine-mined coal and room-and-pillar coal shot off the solid are:

(1) The machine-mined coal breaks down in large pieces whereas the other is shot into smaller pieces.

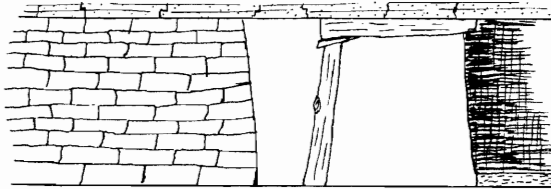
(2) The percentage of slack is much smaller in machine mined coal than in coal mined off the solid.

(3) The act of discharging large quantities of black powder in the coal, seems to lower the coal's calorific power. This difficulty is not met with if the coal is undercut by machines because then if the

weight of the roof does not break the coal down, only small plug shots are required. (The hydraulic mining cartridge was tried unsuccessfully at Rombauer Mine #3 as a means of breaking down the coal.)

(4) The loaders are always working in a fresh current of air in the longwall system which is an advantage over the room-and-pillar.

Preparatory for the machine cutting the loaders, after removing the coal, mine a hole 3 inches deep (called a hitching) in the very top of the coal seam and set a strap in this hitching supported at the other end as per sketch.



As the machines undercut the coal they are dragged along the face by means of a double  $\frac{1}{2}$  inch steel cable pulling from the machine to a pulley set firmly in place about 50 feet ahead of the machine.

These machines cut from 300 to 500 feet in a day of eight hours although similar machines cutting in a softer clay can cut 1000 feet per eight hour shift.

The machine crew consists of four men (1) machine runner (2) 1st shoveler (3) 2nd shoveler (4) timberman.



The runner has charge of the operation of the machine and the machine crew. The first shoveller shovels the dirt away from under the sprocket wheel of the machine as it mines it out from under the coal. The second shoveller shovels the dirt out that is left under the coal and removes the clod. The timberman sets an extra prop under each strap about 3 inches from the coal, in order that they may hold the roof rock when the coal support is mined away. The timberman also sprags the coal so that the bottom-coal will drop away from the top-coal, thereby facilitating the mining.

One of the primary factors in the successful operation of a longwall machine mine is to keep the machines moving and to do this the foreman has to always be figuring two or three days ahead in having the loaders placed so that they can clean up their places before the machine gets to them.

Difficulties are met with in the machine operation by cutting into sulphurs (masses of iron pyrites) imbedded in the clay and thereby "hanging the machine up" until the sulphur is shot or mined out. The machines have to be stopped when they run up against some unmined coal and sometimes parts of the machines wear out or break.

Whenever a machine is forced to stop running, for any cause, it is not doing its part toward the mine output, which means a lower tonnage and therefore a higher mine cost per ton.

Mine operation costs.

Comparative cost statements are kept for each month separately showing the cost and cost per ton for the different items that make up the miners' semi-monthly payroll. To get the total cost per ton the royalty (four cents a ton), office payroll, timber, and other overhead expenses have to be added to the mine operation costs.

These include only labor at or about the mines. The entry cost only enters as an item on the cost records when a tight end (where the cutting machines have to be sumped in or pulled out) is driven ahead the same as an entry is driven in a room-and-pillar mine.

All other items are self-explanatory and they are shown for a period extending from October, 1912 to April, 1914 inclusive.

MINE OPERATIONS FOR OCTOBER, 1912.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	5260.33	.6817	5607.26	.7223
Cutting	1352.15	.1752	1028.97	.1325
Brushing	470.04	.0609	619.39	.0798
Plugging & Shoot- ing -	528.24	.0684	396.18	.0514
Misc. Face Labor	1031.84	.1337	1188.53	.1531
Bench Rock	329.70	.0427	- - -	- - -
Room Turning	15.96	.0021	60.17	.0077
Cribs	.68	.0001	4.08	.0005
Entry	246.03	.0319	- - -	- - -
Clay & Rock	2.00	.0003	232.90	.0300
Foremen	414.37	.0537	385.71	.0497
Haulage	950.98	.1232	445.48	.0574
Cagers, T.L.Tim- bermen Etc.,	1439.28	.1865	660.64	.0851
Top Labor	1086.40	.1408	790.61	.1018
Electrical	74.70	.0096	78.84	.0101
Power House	104.93	.0136	- - -	- - -
Development	603.19	.0782	40.47	.0052
Miscellaneous	1006.88	.1305	248.37	.0319
<b>Total</b>	14917.70	1.9331	11787.60	1.5185
Tons mined	7716.8		7762.7	
Days worked	19		19	

MINE OPERATIONS FOR NOVEMBER, 1912.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	5298.88	.6778	5651.04	.7228
Cutting	1035.95	.1325	891.15	.1140
Brushing	470.74	.0602	566.27	.0724
Plugging & Shoot- ing,	418.19	.0534	315.60	.0404
Misc. Face Labor	787.03	.1007	931.87	.1192
Bench Rock	219.72	.0281	- - -	- - -
Room Turning	37.24	.0047	63.84	.0082
Cribs	4.08	.0005	2.72	.0003
Entry	18.04	.0023	- - -	- - -
Clay & Rock	- - -	- - -	196.70	.0252
Foremen	387.31	.0495	333.13	.0426
Haulage	1000.81	.1282	501.68	.0642
Cagers, T.L. Tim- bermen Etc.,	696.88	.0891	553.80	.0708
Top Labor	1006.47	.1288	764.16	.0977
Electrical	156.77	.0201	143.89	.0184
Power House	93.51	.0120	- - -	- - -
Development	258.04	.0330	33.72	.0043
Miscellaneous	<u>1211.27</u>	<u>.1549</u>	<u>157.99</u>	<u>.0202</u>
Total	\$13100.93	1.6758	\$11107.56	1.4207
Tons mined	7817.6		7818.5	
Days worked	20		19	

MINE OPERATIONS FOR DECEMBER, 1912.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	6444.14	.7472	6178.93	.7276
Cutting	1373.75	.1593	1002.00	.1180
Brushing	624.90	.0725	580.87	.0684
Plugging & Shoot- ing	481.37	.0558	302.46	.0356
Misc. Face Labor	1082.04	.1255	960.57	.1131
Bench Rock	76.82	.0089	- - -	- - -
Room Turring	42.56	.0049	58.52	.0069
Cribs	13.60	.0016	6.80	.0008
Entry	- - -	- - -	- - -	- - -
Clay & Rock	- - -	- - -	239.05	.0281
Foremen	464.05	.0538	325.00	.0383
Haulage	1088.95	.1263	562.77	.0663
Cagers T.L. Tim- bermen Etc	680.57	.0789	577.59	.0680
Top Labor	1104.61	.1281	786.15	.0926
Electrical	145.61	.0169	136.86	.0161
Power House	101.31	.0117	- - -	- - -
Development	322.72	.0374	96.96	.0114
Miscellaneous	<u>331.56</u>	<u>.0384</u>	<u>166.89</u>	<u>.0196</u>
Total	14378.56	1.6674	11981.42	1.4108
Tons mined	8623.56		8492.61	
Days worked	22		23	

MINE OPERATIONS FOR JANUARY, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	5999.85	.7515	4388.26	.7226
Cutting	1227.60	.1537	865.55	.1425
Brushing	613.51	.0768	426.39	.0702
Plugging & shoot- ing, -	494.16	.0619	250.64	.0413
Misc. Face Labor	582.90	.0732	812.95	.1339
Bench Rock	62.50	.0078	- - -	- - -
Room Turning	63.84	.0080	45.56	.0075
Cribs	9.52	.0012	6.80	.0011
Entry	- - -	- - -	- - -	- - -
Clay & Rock	- - -	- - -	170.10	.0280
Foremen	366.00	.0458	331.37	.0546
Haulage	961.96	.1205	375.75	.0619
Cagers, T. L. Tim- bermen Etc.,	775.67	.0972	568.35	.0936
Top Labor	993.69	.1245	760.96	.1253
Electrical	147.54	.0185	116.32	.0192
Power House	97.23	.0122	- - -	- - -
Development	39.05	.0049	23.26	.0038
Miscellaneous	<u>353.89</u>	<u>.0443</u>	<u>235.63</u>	<u>.0388</u>
total	\$12788.91	1.6020	9377.89	1.5443
Tons mined	7983.12		6072.58	
Days worked	18		14	

MINE OPERATIONS FOR FEBRUARY, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4231.45	.7446	\$3827.15	.7119
Cutting	707.30	.1244	642.03	.1194
Brushing	426.64	.0751	374.48	.0697
Plugging & Shoot- ing,	271.00	.0477	217.97	.0405
Misc. Face Labor	470.42	.0828	670.24	.1247
Bench Rock	37.18	.0066	- - -	- - -
Room Turning	31.92	.0056	62.84	.0117
Cribs	2.72	.0005	1.36	.0003
Entry	- - -	- - -	- - -	- - -
Clay & Rock	- - -	- - -	142.35	.0265
Foremen	290.01	.0512	223.50	.0416
Haulage	683.78	.1203	348.81	.0649
Cagers T. L. Tim- bermen Etc.,	558.06	.0982	361.74	.0673
Top Labor	619.57	.1090	487.09	.0906
Electrical	123.58	.0217	60.84	.0113
Power House	86.47	.0152	- - -	- - -
Development	14.20	.0025	- - -	- - -
Miscellaneous	<u>188.11</u>	<u>.0331</u>	<u>86.61</u>	<u>.0161</u>
Total	\$8743.31	1.5385	\$7507.03	1.3965
Tons mined	5683.03		5375.65	
Days worked	13		12	

MINE OPERATIONS FOR MARCH, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$5478.55	.7438	\$3288.31	.7088
Cutting	1041.20	.1414	590.62	.1273
Brushing	599.09	.0813	356.55	.0769
Plugging & Shooting,	370.27	.0503	227.90	.0491
Misc. Face Labor	671.70	.0912	788.80	.1700
Bench Rock	51.46	.0070	- - -	- - -
Room Turning	69.16	.0094	26.60	.0058
Cribs	2.04	.0003	- - -	- - -
Entry	15.52	.0021	0 - -	- - -
Clay & Rock	- - -	- - -	120.75	.0260
Foremen	345.00	.0468	252.75	.0545
Haulage	916.42	.1244	303.21	.0654
Cagers, T. L. Tim- bermen Etc.,	780.29	.1059	344.34	.0742
Top Labor	733.18	.0995	489.31	.1055
Electrical	85.40	.0116	74.36	.0160
Power House	101.68	.0138	- - -	- - -
Development	- - -	- - -	- - -	- - -
Miscellaneous	<u>309.23</u>	<u>.0420</u>	<u>103.05</u>	<u>.0222</u>
total	11570.19	1.5708	6966.55	1.5017
Tons mined	7365.88		4639.27	
Days worked	15		10	



MINE OPERATIONS FOR APRIL, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$2795.44	.7360	\$3533.92	.7154
Cutting	505.37	.1331	593.10	.1201
Brushing	361.01	.0955	386.01	.0781
Plugging & Shooting	238.91	.0629	232.17	.0470
Misc. Face Labor	631.19	.1661	783.13	.1585
Bench Rock	30.62	.0080	- - -	- - -
Room Turning	18.62	.0049	42.56	.0086
Cribs	2.04	.0005	1.36	.0003
Entry	18.17	.0048	- - -	- - -
Clay & Rock	- - -	- - -	139.95	.0283
Foremen	343.75	.0905	265.75	.0538
Haulage	532.55	.1402	337.42	.0683
Cagers, T. L. Timbermen Etc.,	553.45	.1457	282.22	.0571
Top Labor	585.95	.1543	508.76	.1030
Electrical	72.66	.0191	88.08	.0178
Power House	97.60	.0256	- - -	- - -
Development	20.59	.0054	- - -	- - -
Miscellaneous	<u>265.05</u>	<u>.0697</u>	<u>35.59</u>	<u>.0072</u>
Total	\$7072.97	1.8623	7230.02	1.4635
Tons mined	3798.09		4940.23	
Days worked	7		11	

MINE OPERATIONS FOR MAY, 1913.

	<u>M I N E #3</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4756.83	.7474
Cutting	922.50	.1450
Brushing	510.46	.0802
Plugging & shooting	346.14	.0544
Misc. Face Labor	960.99	.1510
Bench Rock	39.77	.0062
Room Turning	15.96	.0025
Cribs	- - -	- - -
Entry	46.21	.0073
Clay & Rock	- - -	- - -
Foremen	416.25	.0654
Haulage	822.41	.1292
Cagers, T.L. Timbermen Etc.,	663.84	.1043
Top Labor	742.64	.1167
Electrical	167.18	.0263
Power House	86.84	.0136
Development	31.24	.0049
Mine #4	739.75	.1162
Miscellaneous	<u>413.96</u>	<u>.0650</u>
Total	\$11682.97	1.8356
Tons mined	6364.71	
Days worked	12	

MINE OPERATIONS FOR JUNE, 1913.

	<u>M I N E #3</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4332.20	.7681
Cutting	871.15	.1545
Brushing	490.68	.0870
Plugging & shooting	290.39	.0515
Misc. Face Labor	710.00	.1259
Bench Rock	20.32	.0036
Room Turning	47.88	.0085
Cribs	2.04	.0004
Entry	39.47	.0070
Clay & Rock	- - -	- - -
Foremen	403.00	.0714
Haulage	771.20	.1367
Cagers, T.L. Timbermen Etc.,	610.59	.1083
Top Labor	668.92	.1186
Electrical	115.01	.0204
Power House	80.16	.0142
Development	- - -	- - -
Mine #4	407.94	.0723
Miscellaneous	<u>307.78</u>	<u>.0546</u>
Total	\$10168.73	1.8030
Tons mined	5639.80	
Days worked	12	

MINE OPERATIONS FOR JULY, 1913.

	<u>M I N E #3</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4479.30	.770
Cutting	1001.14	.172
Brushing	480.14	.082
Plugging & Shooting	271.92	.046
Misc. Face Labor	746.42	.128
Bench Rock	16.52	.0028
Sulphur	- - -	- - -
Room Turning	37.24	.0064
Cribs	2.04	.0003
Entry	25.11	.0043
Foremen	387.65	.066
Haulage	747.56	.128
Cagers, T. L. Timbermen Etc.,	542.27	.093
Top Labor	684.71	.117
Electrical Labor	138.58	.023
Development	- - -	- - -
Power House Labor	<u>70.14</u>	<u>.012</u>
Total	\$9630.74	1.657
Miscel. Labor Mine #4	<u>444.19</u>	<u>.076</u>
	\$10074.93	1.733
Tons mined	5799.08	
Days worked	14	

MINE OPERATIONS FOR AUGUST, 1913.

	<u>M I N E #3</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$7881.49	.778
Cutting	1281.67	.126
Brushing	923.99	.091
Plugging & Shooting	469.66	.046
Face Labor	1146.92	.113
Bench Rock	28.60	.003
Sulphur	6.75	.0006
Room Turning	79.80	.008
Cribs	11.56	.001
Entry	34.63	.003
Foremen	412.90	.04
Haulage	1244.06	.122
Cagers, T.L. Timbemen Etc.,	988.48	.097
Top Labor	952.17	.093
Electrical Labor	111.52	.011
Development	88.38	.008
Power House Labor	<u>101.96</u>	<u>.01</u>
Total	\$15766.54	1.5554
Misc. Labor Mine #4	<u>765.29</u>	<u>.075</u>
	\$16531.83	1.6304
Tons mined	10160.58	
Days worked	21	

MINE OPERATIONS FOR SEPTEMBER, 1913.

M I N E #3  
(Mine #4 working 2nd half of month)

	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$11265.66	.7575
Cutting	1864.12	.1253
Brushing	1256.81	.0845
Plugging & Shooting	699.35	.0470
Misc. Face Labor	1372.00	.0922
Bench Rock	37.47	.0025
Room Turning	90.44	.0061
Cribs	9.52	.0006
Entry	127.54	.0085
Clay & Rock	83.95	.0056
Foremen	615.86	.0414
Haulage	1655.97	.1113
Cagers, T.L. Timbermen Etc.,	2017.31	.1356
Top Labor	1403.04	.0943
Electrical	155.05	.0104
Power House	105.75	.0071
Development	70.28	.0047
Misc. (Including) (Mine #4 )	<u>1015.17</u>	<u>.0682</u>
Total	\$23845.29	1.6034
Tons mined	14871.6	
Days worked at #3	24	
"      "      " #4	11	
	<u>35</u>	

MINE OPERATIONS FOR OCTOBER, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$9323.93	.7759	\$8276.04	.7246
cutting	1546.83	.1287	1323.23	.1160
Brushing	916.85	.0763	804.42	.0702
Plugging & Shoot- ing, 621.07	621.07	.0517	438.95	.0383
Misc. Face Labor	1084.06	.0902	1177.95	.1031
Bench Rock	43.73	.0036	- - -	- - -
Room Turning	63.84	.0053	85.12	.0074
Cribs	17.77	.0015	7.48	.0007
Entry	398.21	.0331	- - -	- - -
Clay & Rock	13.75	.0011	307.98	.0267
Foremen	464.48	.0387	298.23	.0261
Haulage	1476.29	.1229	838.55	.0735
Cagers, T.L. Tim- bermen Etc.,	1851.13	.1540	804.95	.0705
Top Labor	1150.44	.0957	979.32	.0856
Electrical	91.26	.0076	108.15	.0094
Power House	111.96	.0093	- - -	- - -
Development	129.75	.0108	65.28	.0105
Miscellaneous	<u>366.69</u>	<u>.0305</u>	<u>143.42</u>	<u>.0130</u>
Total	19672.04	1.6369	15659.07	1.3716
Tons mined	12107.86		11416.65	
Days worked	24		26	

MINE OPERATIONS FOR NOVEMBER, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$6142.86	.7556	\$6868.99	.7329
Cutting	1060.49	.1403	1143.53	.1261
Brushing	664.00	.0850	650.65	.0712
Plugging & Shoot- ing	375.77	.0545	359.96	.0393
Misc. Face Labor	617.79	.0748	747.89	.0855
Bench Rock	46.56	.0052	- - -	- - -
Room Turning	58.96	.0086	42.56	.0042
Cribs	6.80	.0011	3.40	.0009
Entry	300.36	.0393	- - -	- - -
Sulphur	8.20	.0010	- - -	- - -
Clay & Rock	- - -	- - -	246.85	.0268
Foremen	389.15	.0589	262.40	.0299
Haulage	966.11	.1187	642.08	.0705
Cagers, T. L. Tim- bermen Etc.,	1188.54	.1570	691.07	.0778
Top Labor	810.86	.1155	798.74	.0896
Electrical	76.03	.0118	84.49	.0093
Power House	100.94	.0167	- - -	- - -
Development	205.10	.0266	- - -	- - -
Miscellaneous	<u>471.73</u>	<u>.0777</u>	<u>67.37</u>	<u>.0117</u>
Total	13490.25	1.6673	12509.98	1.3547
Tons mined	8032.21		9234.05	
Days worked	17		20	



MINE OPERATIONS FOR DECEMBER, 1913.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$3920.03	.7268	4712.32	.7245
cutting	642.16	.1192	783.72	.1205
Brushing	311.19	.0577	462.81	.0711
Plugging & shoot- ing	227.13	.0420	278.67	.0428
Misc. Face Labor	476.85	.0884	704.22	.1083
Room Turning	26.60	.0047	74.48	.0115
Cribs	6.80	.0012	6.12	.0009
Entry	267.56	.0496	- - -	- - -
Clay & Rock	7.00	.0010	153.60	.0236
Foremen	288.52	.0534	278.95	.0429
Haulage	563.65	.1045	480.45	.0739
Cagers, T. L. Tim- bermen Etc	811.41	.1504	397.13	.0610
Top Labor	638.52	.1183	714.84	.1099
Electrical	71.83	.0133	77.74	.0119
Power House	100.57	.0186	- - -	- - -
Development	- - -	- - -	29.43	.0045
Miscellaneous	<u>243.09</u>	<u>.0450</u>	<u>69.95</u>	<u>.0.08</u>
total	\$8602.91	1.5941	\$9224.43	1.4166
Tons mined	5393.29		6504.59	
Days worked	17		15	

MINE OPERATIONS FOR JANUARY, 1914.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4545.45	.7260	\$4450.55	.7267
Cutting	752.40	.1213	792.73	.1294
Brushing	376.73	.0604	496.14	.0810
Plugging & Shoot- ing,	299.40	.0476	254.70	.0416
Misc. Face Labor	571.51	.0908	566.00	.0924
Room Turning	21.28	.0035	37.24	.0061
Cribs	12.92	.0023	7.48	.0012
Clay & Rock	1.00	.0001	162.80	.0266
Foremen	266.62	.0420	262.45	.0428
Haulage	567.87	.0906	462.99	.0756
Cagers, T. L. Tim- bermen Etc.,	834.76	.1351	407.11	.0665
Top Labor	720.45	.1160	596.01	.0973
Electrical	76.05	.0122	50.70	.0083
Power House	52.14	.0085	52.14	.0085
Development	26.46	.0044	276.16	.0451
Miscellaneous	<u>154.77</u>	<u>.0252</u>	<u>132.65</u>	<u>.0205</u>
Total	9279.81	1.4860	9007.85	1.4696
Tons mined	6245.16		6124.59	
Days worked	21		14½	

MINE OPERATIONS FOR FEBRUARY, 1914.

	<u>M I N E #3</u>		<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$2374.04	.7193	\$5361.56	.7266
Cutting	496.37	.1504	924.85	.1260
Brushing	208.99	.0633	546.49	.0730
Plugging & Shooting	125.82	.0381	316.82	.0428
Misc. Face Labor	283.51	.0859	621.84	.0840
Room Turning	45.22	.0137	53.20	.0075
Cribs	6.12	.0019	7.48	.0011
Clay & Rock	- - -	- - -	150.55	.0202
Foremen	220.25	.0667	269.00	.0370
Haulage	326.31	.0988	548.98	.0744
Cagers, T.L. Timbermen Etc.,	587.27	.1780	484.84	.0650
Top Labor	553.07	.1676	666.37	.0907
Electrical	68.86	.0209	77.74	.0105
Power House	46.70	.0142	46.70	.0063
Development	- - -	- - -	- - -	- - -
Miscellaneous	<u>81.02</u>	<u>.0245</u>	<u>32.53</u>	<u>.0114</u>
Total	\$5423.55	1.6433	\$10158.95	1.3765
Tons mined	3300.42		7379.98	
Days worked	12		16	

MINE OPERATIONS FOR MARCH, 1914.

	<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$5495.83	.7228
Cutting	819.39	.1063
Brushing	633.52	.0815
Plugging & shooting	278.45	.0356
Misc. Face Labor	619.90	.0797
Room Turning	73.48	.0107
Cribs	6.80	.0010
Clay & Rock	178.14	.0235
Foremen	275.50	.0378
Haulage	504.19	.0669
Cagers, T.L. Timbemen Etc,	551.81	.0727
Top Labor	704.68	.0963
Electrical	70.98	.0094
Power House	105.90	.0147
Development	4.62	.0006
Miscellaneous	<u>157.00</u>	<u>.0219</u>
Total	\$10480.19	1.3814
Mine #3	<u>266.85</u>	<u>.0350</u>
Total	\$10747.04	1.4164
Tons mined	7587.76	
Days worked	15	

MINE OPERATIONS FOR APRIL, 1914.

	<u>M I N E #4</u>	
	<u>Cost</u>	<u>Cost per ton</u>
Loading	\$4009.38	.7220
Cutting	714.55	.1288
Brushing	402.91	.0725
Plugging & Shooting	210.84	.0380
Misc. Face Labor	512.53	.0924
Room Turning	37.24	.0067
Cribs	6.12	.0011
Clay & Rock	95.75	.0172
Foremen	265.75	.0478
Haulage	433.69	.0780
Cagers, T.L. Timbermen Etc.	552.76	.0995
Top Labor	623.01	.1122
Electrical	76.88	.0138
Power House	101.40	.0183
Development	- - -	- - -
Miscellaneous	<u>155.00</u>	<u>.0279</u>
Total	\$8197.81	1.4762
Mine #3	<u>271.45</u>	<u>.0488</u>
Total	8469.26	1.5250
Tons mined	5553.56	
Days worked	12	

OVERHEAD EXPENSES FROM OCTOBER, 1912 TO  
JANUARY, 1914 INCLUSIVE.

	<u>Amount</u>	<u>Per ton</u>
October, 1912	\$5724.89	.257
November, "	5589.96	.266
December, "	5884.18	.244
January, 1913	6109.32	.305
February, "	6256.81	.412
March, "	4287.95	.3206
April, "	4421.82	.4895
May, "	3683.30	.5796
June, "	3131.64	.5450
July, "	3156.91	.543
August, "	4193.78	.4135
September, "	6513.04	.4410
October, "	7724.06	.3300
November, "	6747.39	.4023
December, "	4717.06	.3964
January, 1914	3413.06	.2759
Average per ton per month,		.3888

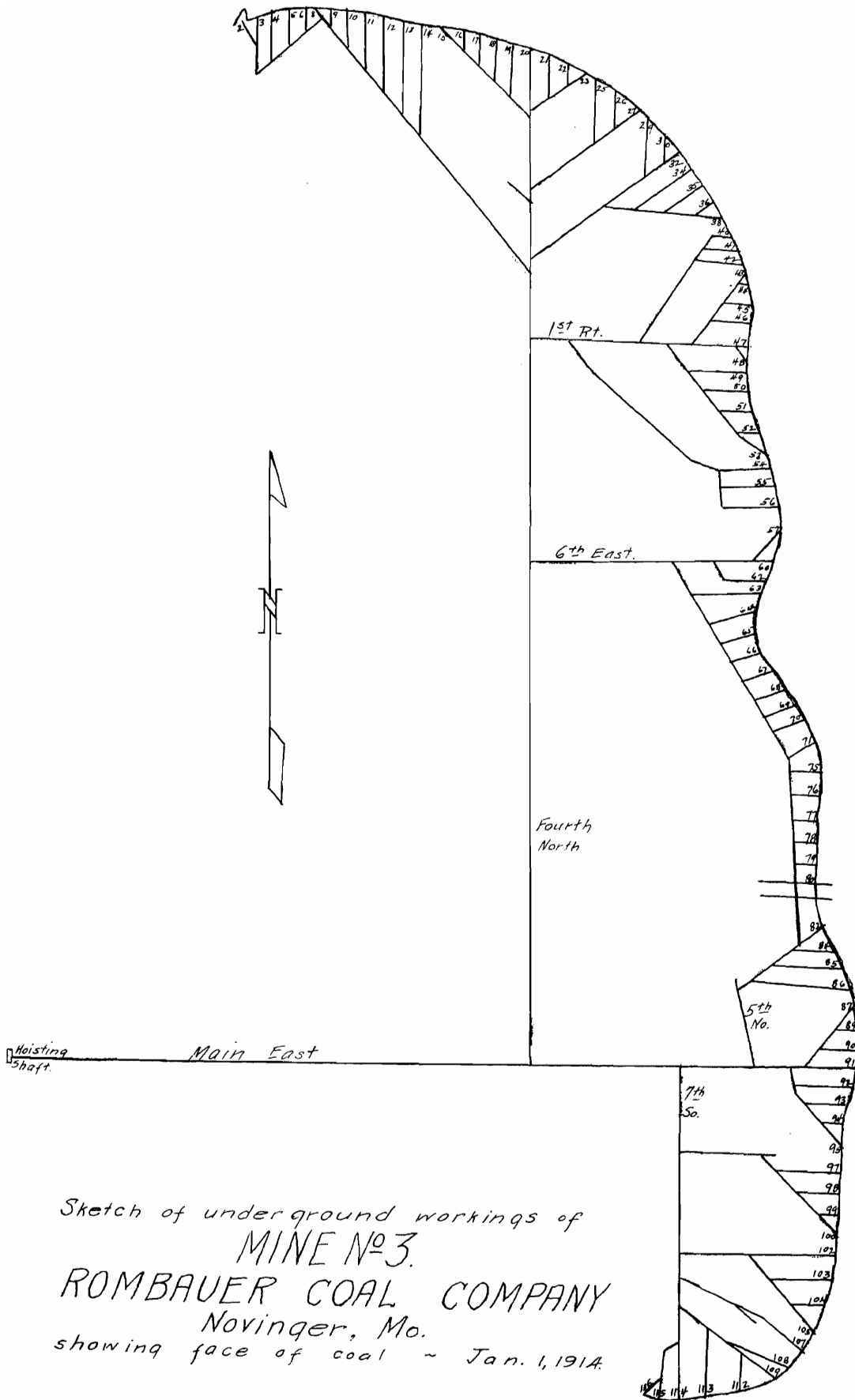
This includes royalty, office expense, timber, boiler coal used at mines, etc.

The data shown in these mine operating statements show the actual mine costs as shown by the mine payroll books for the different items. The data is shown as data for these two mines with a rather poor top or roof condition (worse at Mine # 3 than at Mine # 4); that are liable to large falls of rock on the roadways and face; that have to have the main entries well timbered; that have a fairly difficult coal to break down into sizes capable of being handled; that pay 73 cents a ton for loading 40 inch coal, after it has been undercut by machines; that combined do not mine over 1000 tons daily; but that are free from gas and difficult drainage problems, thereby eliminating two of the huge items with which coal mining engineers have to contend.

Mine #3 has a working face of 3100 feet and Mine #4 has a face of 4500 feet as shown in the accompanying sketches of the mines.

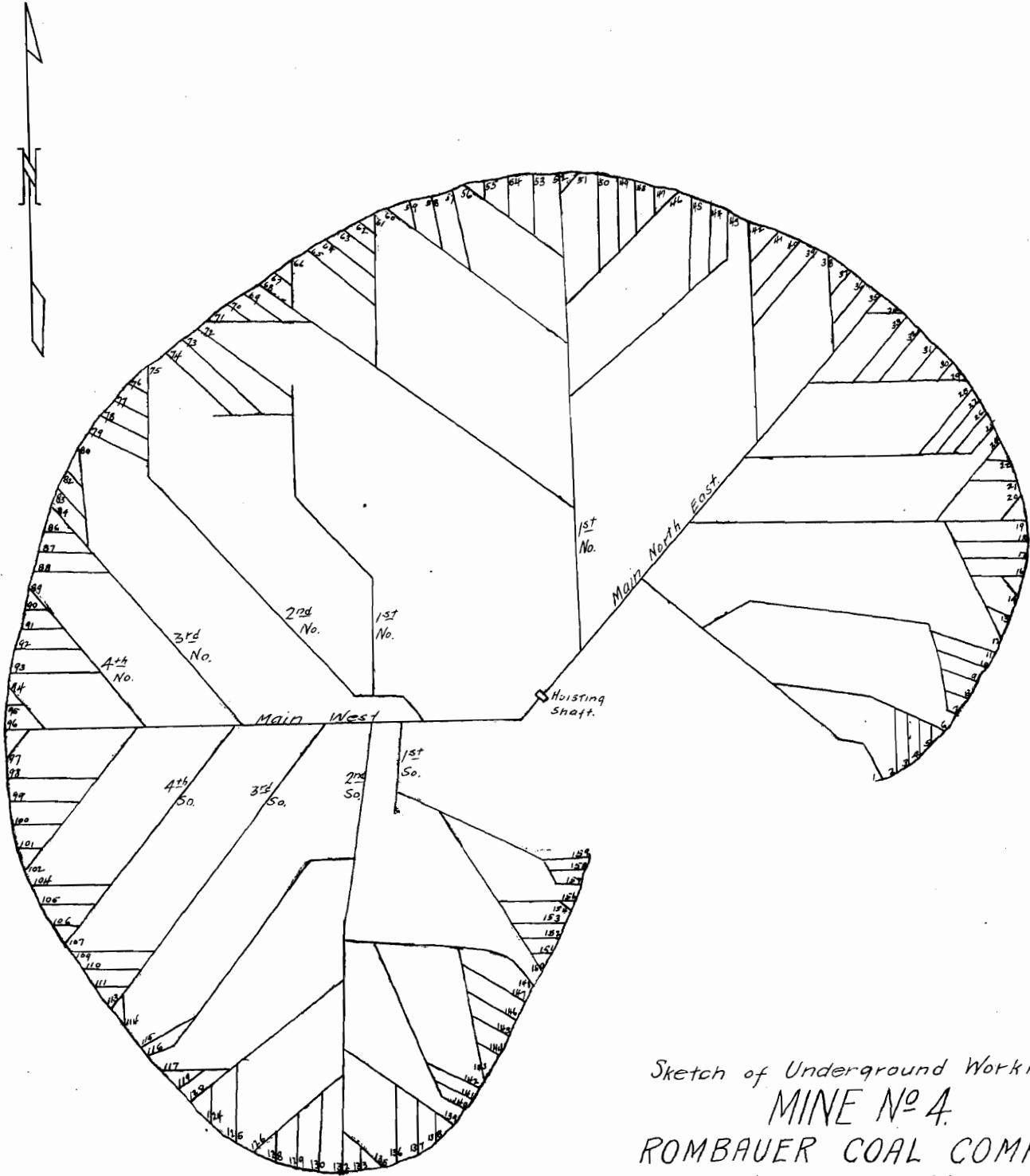
Mine #3 employes 95 loaders, 46 daymen and 11 topmen. Mine #4 employes 137 loaders, 67 daymen and 12 topmen.

The average daily wage for loaders from October, 1912 to April, 1914 inclusive was \$3.00 at Mine #3 and \$3.47 at Mine #4.



Sketch of underground workings of  
 MINE No. 3.  
 ROMBAUER COAL COMPANY  
 Novinger, Mo.  
 showing face of coal ~ Jan. 1, 1914.





Sketch of Underground Workings of  
 MINE No. 4.  
 ROMBAUER COAL COMPANY  
 Noringer, Mo.  
 showing face of coal - Jan. 1, 1914.

The daily cost report.

The daily cost report is only an accurate estimate due to the fact that the amount of mine deadwork (brushing, clay & rock, etc.) is only taken up out at the mines and turned into the office by the mine foremen semimonthly i.e., at the end of each half month.

The accompanying is a good, simple and readily understood daily cost report that is used by the Rombauer Coal Company with figures as shown for the first half of October, 1913.

These data are taken from the foremen's daily time reports and the coal bulletins.

DATE	COAL MINED	TRACKLAKERS		HAULAGE	FOREMEN		CUTTING		FACE LABOR		DEVELOPMENT		TOP		ESTIMATED DEADWORK COST		TOTAL TONS	AVERAGE TONMILE	TOTAL COST	MINERAL COST per ton	LOST per ton working days to date	LOST per ton idle days to date	TOTAL COST per ton				
		CAGERS	TIMBERMEN		Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton	Per ton			
MINE #3																											
1	4-11-20	3400	320	76.57	17.07	51.24	13.10	17.25	4.92	6.17	15.71	60.99	14.84	6.68	1.35	54.17	4.23	50.00	12.16	11.11	11.11	678.77	166.14	165	165		
2	4-12-20	3400	320	77.07	17.07	51.24	13.10	17.25	3.90	6.40	14.00	63.70	14.47	11.67	1.08	41.77	4.31	50.00	11.31	8.53	11.26	762.05	157.03	162	162		
3				77.17				17.25		6.50		14.17				36.70								162	15	180	
4	4-10-22	3300	360	77.07	16.00	13.63	60.33	13.71	3.92	5.87	13.51	55.62	12.64	2.84	60	41.23	4.27	50.00	11.36	12.35	4.31	676.74	106.07	160	11	171	
5																25.83								160	13	175	
6	5-08-23	3400	340	77.02	19.00	13.66	55.66	10.96	24.75	4.37	6.40	12.05	49.62	9.76	11.36	2.25	42.73	5.59	50.00	9.24	18.01	4.20	25.34	141.44	156	10	166
7	5-07-23	3400	340	76.90	17.73	12.19	59.42	9.27	17.25	2.33	6.40	10.96	56.70	9.36	11.36	1.87	43.14	7.20	50.00	3.23	24.03	4.31	152.19	110.38	153	7	160
8	5-09-23	3400	340	77.22	17.15	17.12	59.57	17.53	17.25	3.34	6.10	11.48	52.66	12.31	5.67	1.17	42.12	5.27	50.00	4.82	20.17	4.16	173.34	150.97	153	6	159
9																56.00								153	14	167	
10	5-04-23	3400	340	77.65	10.49	62.91	11.46	17.25	3.14	4.50	8.35	15.00	15.49			44.07	5.03	50.00	4.10	31.66	4.40	74.15	145.00	152	12	164	
11	5-05-23	3400	340	77.23	10.50	59.92	11.14	17.25	3.21	4.60	8.75	15.16	10.18	2.84	53	41.93	7.70	50.00	4.29	40.00	5.00	76.09	112.90	150	11	161	
12																35.32								150	12	162	
13	5-22-24	3400	340	77.10	7.60	13.41	61.54	12.37	24.75	4.44	6.01	8.83	35.30	16.34	5.52	34.43	1.66	50.00	4.57	45.26	5.03	74.54	152.47	151	10	161	
14	5-20-24	3400	340	77.42	5.10	10.17	63.11	12.13	17.25	3.31	4.60	10.42	35.10	16.36	10.30	1.95	42.61	3.77	50.00	4.67	50.46	5.04	159.21	151.44	151	9	160
15	4-12-22	3200	360	77.80	13.07	12.37	58.50	12.94	20.50	4.53	2.25	11.00	110.25	21.52	8.52	44.35	4.82	50.00	11.06	54.45	5.00	71.33	172.35	152	9	161	
Total				182.76		660.11		242.50		74.19		132.09		74.50		499.42		550.00				3161.19					

MINE #4																										
1	4-16-20	3300	380	72.84	31.43	6.70	31.90	6.84	9.83	2.11	4.35	4.73	16.10	9.94		31.70	7.80	41.00	8.80	47.66	11.66	574.17	124.23	124		124
2	3-12-21	3400	370	73.00	17.33	4.27	31.70	1.67	9.75	2.64	16.70	12.6	44.90	13.47		31.85	8.06	35.00	4.44	8.53	11.19	445.75	125.52	124		124
3																24.09								124	10	134
4	3-04-21	2600	72	73.00	30.15	9.82	24.06	7.81	7.83	2.70	43.10	13.21	37.70	10.92		30.88	1.43	30.00	4.65	12.02	11.01	476.04	136.23	130	8	138
5																10.70								130	12	142
6	3-04-21	2400	35	72.00	29.42	7.34	31.90	8.01	13.16	3.33	49.10	12.43	60.70	15.36		31.49	3.71	35.00	8.86	15.97	3.44	443.62	137.60	132	9	141
7	4-15-20	3300	370	72.64	21.42	6.83	30.00	6.65	9.83	2.12	67.30	13.20	54.23	12.77		31.83	6.16	35.00	1.50	20.61	4.12	430.32	124.44	131	7	137
8	4-15-20	3400	340	73.00	25.41	3.25	31.90	6.71	9.83	2.07	44.20	10.30	67.20	12.40		31.60	6.63	35.00	1.37	25.46	4.22	432.40	124.76	130	6	136
9	4-23-21	3000	300	73.00	27.43	6.80	31.90	7.54	9.83	2.32	41.10	14.51	76.20	13.01		31.24	7.29	35.00	1.25	29.87	4.72	433.97	131.02	131	5	136
10	4-16-21	3200	340	73.00	13.07	2.48	39.16	7.18	9.83	2.02	41.00	9.91	53.96	11.10		32.61	6.72	35.00	1.24	30.43	4.31	411.24	121.05	130	4	136
11	4-24-21	3400	300	72.48	32.90	7.70	31.90	7.52	9.83	2.32	31.70	7.41	70.60	16.65		31.26	7.37	35.00	1.25	38.69	4.30	502.20	130.23	130	4	134
12																25.14								130	4	136
13	4-06-20	2800	370	71.74	34.38	6.00	31.90	7.85	13.16	3.24	49.15	12.10	59.25	14.10		31.24	7.64	35.00	1.86	42.75	11.27	535.01	131.70	130	6	136
14	4-21-21	3100	370	72.54	30.71	7.17	31.90	7.43	9.83	2.30	73.44	17.13	41.61	11.33		31.83	7.42	35.00	1.16	47.04	4.24	574.77	133.43	131	5	136
15	4-12-21	3100	340	73.00	32.80	2.45	31.90	6.70	9.83	2.07	44.20	9.21	53.25	11.34		30.97	6.50	35.00	1.42	51.70	4.31	530.70	123.11	129	5	134
Total				373.45		341.60		144.20		66.11		730.83		441.77		476.00						3466.50				

The monthly operating statement.

A self-explanatory operating statement, showing profit and loss, is made out every month as per following specimen:

STATEMENT OF OPERATIONS FOR OCTOBER, 1913.MINE # 3.

	<u>Amount</u>	<u>Per Ton</u>	
Top Labor	\$1262.40	.103	
Bottom Labor	2852.91	.233	
Haulage	1476.29	.120	
Electrical Labor	91.26	.007	
Miscel. Labor	366.69	.030	
Total	6049.55	.493	
Loading	9323.93	.760	
Cutting	1546.83	.126	
Face Labor	1705.13	.139	
Brushing	916.85	.075	
Development	129.75	.010	
Total	13622.49	1.110	
Total Payroll (Mine #3)	19672.04	1.603	

MINE # 4.

Top Labor	979.32	.088	
Bottom Labor	1195.78	.108	
Haulage	838.55	.075	
Electrical Labor	108.15	.010	
Miscel. Labor	143.42	.013	
Total	3265.22	.294	
Loading	8276.04	.747	
Cutting	1323.23	.119	
Face Labor	1616.90	.146	
Brushing	804.42	.072	
Faults	307.98	.028	
Development	65.28	.006	
Total	12393.85	1.118	
Total Payroll (Mine #4)	15659.07	1.412	
Grand Total Payroll	35331.11	1.513	

(continued on next page)

	<u>Amount</u>	<u>Per Ton.</u>	
Admstr. & Accounting	\$410.00	.0176	
Timber	1380.06	.059	
Supplies	332.79	.014	
Feed	189.00	.008	
Boiler Coal	581.40	.025	
Machine Supplies	313.88	.0135	
Insurance, Liab. & Fire	404.62	.0173	
General Expense	287.00	.012	
Office Rent, Supplies Etc	84.86	.0036	
Total	3983.61	.170	.170
Royalty	1234.48	.053	
Legal Expense	8.33	.0003	
Taxes	35.00	.0015	
Commission Account	1836.29	.079	
Company Powder	136.85	.006	
Interest Account	375.00	.016	
Total	3625.95	.155	.155
Farm Labor	114.50	.005	.005
Grand Total Expense	43055.17	.005	.005

1.843

C R E D I T S

Car Load Sales	44015.98	1.8851	
Retail Coal	20.16	.0009	
Smith Shops	84.48	.0036	
Discount	98.64	.0042	
Rent	123.00	.0053	
Profit on Powder	34.85	.0015	
Profit on Supplies	60.96	.0026	
Misc. Loss & Gain	119.53	.0051	
Total Credits	44557.60	1.9063	
Net Gain	\$1502.43		
Net Gain per ton		.0653	

Tons Mined #3	12268.375
Tons Mined #4	11080.425
Total	23348.800

Days worked #3	24
Days worked #4	26
Total	50

Average Daily Tonnage - 934.

This statement and the bank account show the company's success from a financial standpoint.

# ROMBAUER COAL COMPANY

In Account with

Name..... Check No.....

For the 2nd Half of..... 191..... Mine No.....

Date	Weight of Coal	Hours	SUPPLIES	Amount	Debits	Amount	Credits	Amount
16					Orders		lbs. Coal	
17					Rent		Days	
18					Doctor		Entry	
19					Coal		X-Cut	
20					Powder		Brushing	
21					Supplies		Brushing	
22					Smithing		C. & R.	
23					Dues		Rooms	
24					Fines Coll.		Chks. Ret.	
25					Check Weighman		Cribs	
26					U.M.W. of A.1%			
27							Total	
28					Total			
29							Balance Due	
30					<i>Received Payment in Full.</i>			
31								

Office Methods.

A loose leaf time ledger is used in which to keep record of the amount of coal loaded by each man or the amount of day work done (see sample). These amounts are posted from the coal bulletins and foreman's time reports daily, as well as are the debits such as supplies, advanced time orders, etc.

Semimonthly these amounts are segregated, the amounts from the foreman's deadwork reports added, and statements written with indelible pencil on that part of the loose leaf reserved for that purpose. These loose leaves are then taken out of the ledger binder and folded with the statement part out, so that they may be run through a copying machine making duplicate copies that are given to the miners at least two days before pay day, - which fall on the 10th and 25th of each month.

The payroll is written off directly from these statements and then balanced. The name of each employee and the amount due is written on separate pay envelopes also from these statements.

After pay day the amount of each royalty voucher and insurance voucher is figured and also a voucher is made showing how the payroll figures were derived.

Business side of coal mining.

The items that the business manager of a mine has to consider are (1) to produce a good clean commercial coal at a fair profit (2) to keep the interests of the workmen in harmony with the interests of the company (3) to sell the coal - either by contract or in the open market.

Whether or not the mine will be able to produce coal at a profit has to be taken into consideration at the time of the making of the biennial contract with the miners (members of the United Mine Workers of America) and then the great burden of producing coal at a profit falls principally on the shoulders of the Mine Superintendent and Foremen.

It is a difficult problem to preserve perfect harmony between the operator and the miner if one or the other wants to receive all of the profits derived from the production and selling of the coal, but if the operator will let the miner earn a fair wage for his work and the miner permit the operator to make a fair profit on his investment, then there are forces in motion that tend to produce harmony. This matter should be considered at the making of the biennial contract and agreement between the operators and the miners.



The coal has to be sold and, as the freight rates to eastern markets are prohibitive except in extreme instances, the coal from the bituminous mines of Northern Missouri has to be shipped to points west such as Kansas City, Omaha, etc. The local railroads generally contract for a share of the mines' output, but it is to the commercial business in the fall and winter months that the coal operator has to look for his greatest profits.

#### Conclusions.

The Rombauer Coal Company is capitalized at \$150,000 although at present it is operating in the hands of a Receiver. This condition was brought about principally by the prohibitive wage scale, out of proportion with the other longwall mines of the state, that has been forced upon the company since the installation of the longwall machines. The Rombauer scale as compared with the other longwall scales in Missouri show a differential of from 18 to 52 cents per ton in favor of the other mines.

If the Rombauer Coal Company is able to make the next biennial contract with the miners (it will go into effect Aug. 1, 1914) a contract that contains a scale

in fitting with the scales of other Missouri longwall mines it will mean success for the longwall machines in this field, success for the Rombauer Coal Company and a boost for the city of Novinger.

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