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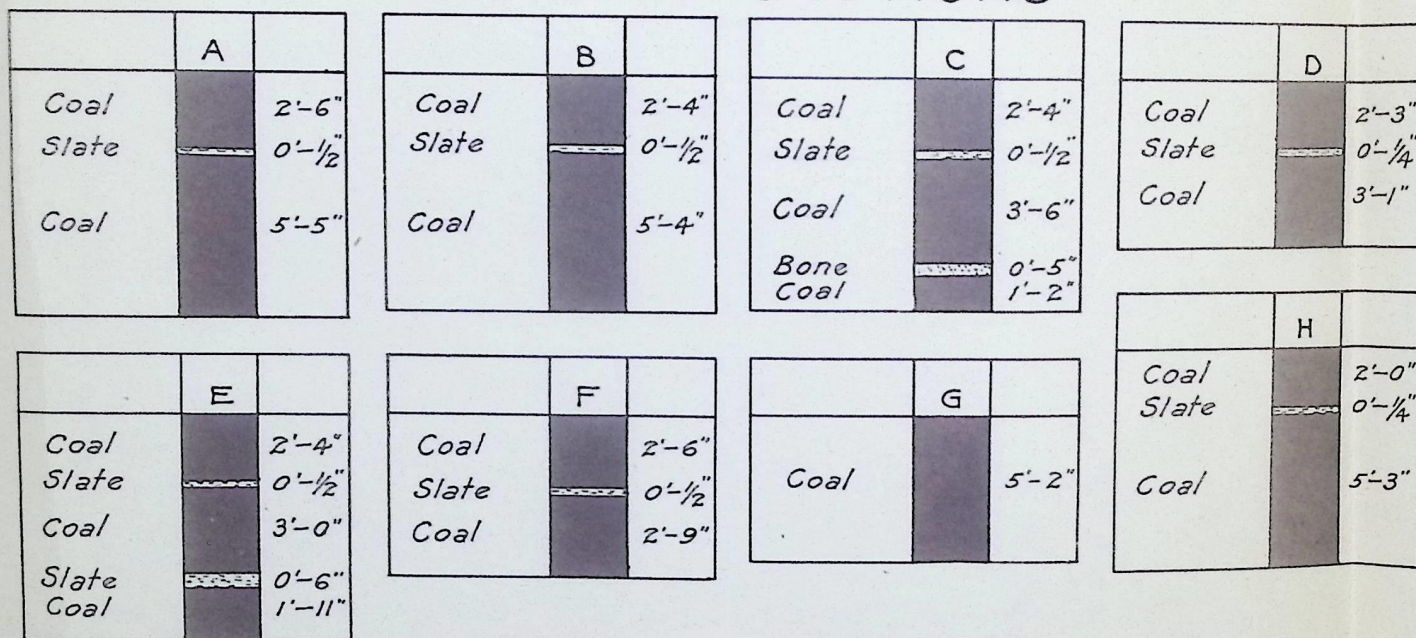
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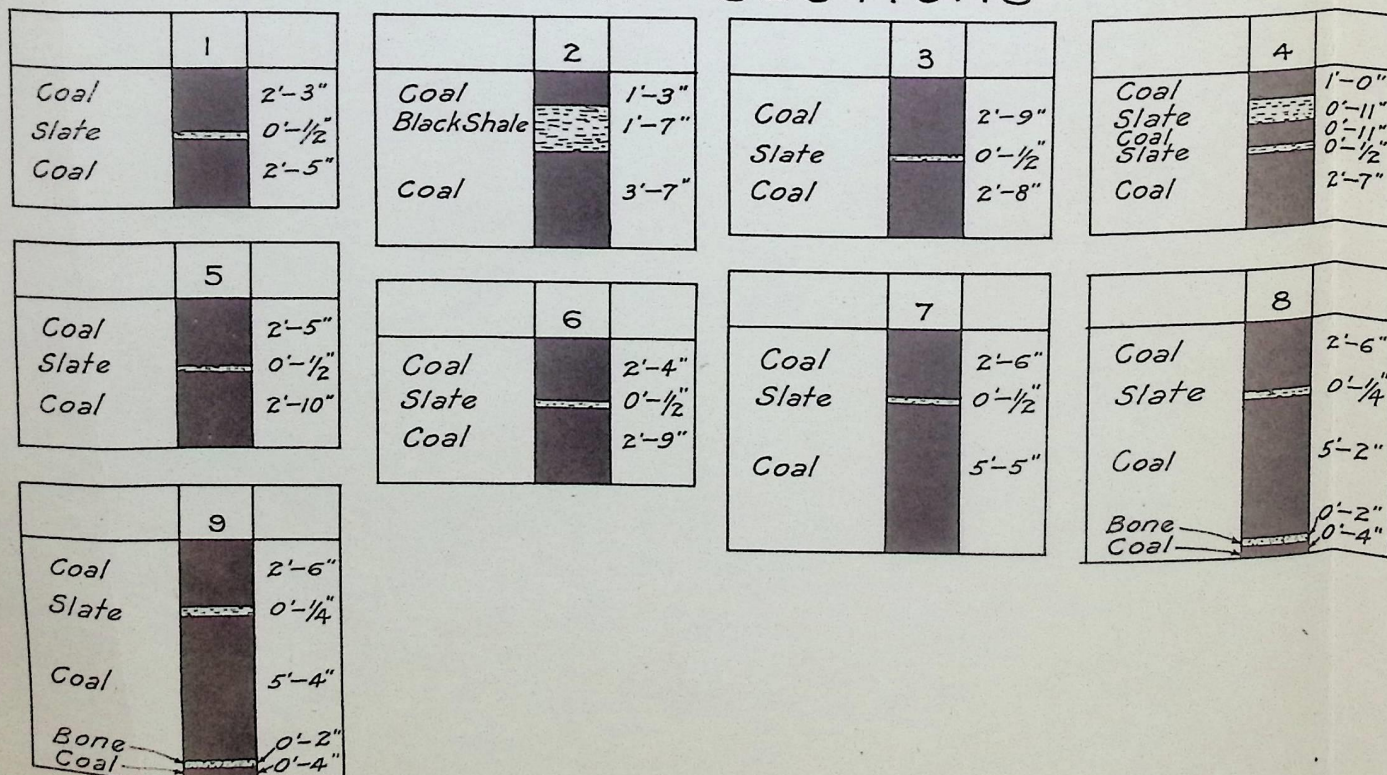


# DIAGRAMS OF SECTIONS OF THE COAL SEAMS Nos 7 & 9 MINES ROCK SPRINGS WYOMING

## No 7 MINE SECTIONS



## No 9 MINE SECTIONS





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John McNeil, M. E.  
Consulting Engineer  
EQUITABLE BUILDING.  
DENVER, COLO.

CONSTRUCTION WORK, EXAMINING AND REPORTING ON  
COAL PROPERTIES A SPECIALTY.

TWENTY-FIVE YEARS EXPERIENCE IN COLORADO.  
TEN YEARS AS STATE INSPECTOR OF COAL MINES.  
CLASS 1884.

R E P O R T

On

THE WORKING CONDITIONS,

And

SAFETY OF EMPLOYEES,

In

N O S. 7 A N D 9 M I N E S

Of

THE UNION PACIFIC COAL COMPANY,

At

ROCK SPRINGS, WYOMING.

By

JOHN MCNEIL, M. E.,  
Consulting Engineer,  
Equitable Building,  
Denver, Colorado.  
MARCH, 1911.

To: D. O. CLARK, ESQ.,  
Vice-President & General Manager,  
Union Pacific Coal Company,  
Omaha, Nebraska.

Dear Sir:

I n t r o d u c t o r y:

In compliance with your wishes, I made an examination of Nos. 7 and 9 Mines, at Rock Springs, Wyo., and herewith have the pleasure to submit, this, my report on the same.



No. 7 Mine, consists of a drift opening, and is operated on the same coal seam as Nos. 8, 9 and 10 Mines at a horizon, geologically, of about 260 feet under No. 1 seam.

Note: (No. 1 coal seam was successfully operated in No. 1 Mine upwards of 40 years. It consisted of a slope opening and was probably the largest and most steady producer in the state. The coal was of a superior quality for domestic and general use, and was ever a favorite fuel on the market. But, on account of expensive mining, caused by an increased cost of pumping and haulage from great depths and distances, operations were abandoned during the past year for the reason that coal for present use, and some decades to come, could be mined at a lower cost from the coal field by new openings in other localities.

No. 1 coal seam, however, in itself, never looked better in thickness and freer from "bone" and slate impurities than at the face of its abandoned workings. So, no doubt, at some distant future period, when necessity shall press for fuel, and deeper mining is followed, No. 1 Mine may again become one of the leading coal producers of the state.

With this said, no further mention, at this time, will be made of No. 1 Mine.)



The Ventilation of No. 7 Mine, is produced by the mechanical means of a 6-ft. face by 20 ft. in diameter Guibal exhaust fan, operated by steam, and runs about 90 revolutions per minute.

The volume of air entering the inlet to the mine is about 44,000 cu. ft. per minute, and the volume passing through the outlet from the mine is about 51,000 cu. ft. per minute. The increase at the outlet is not due entirely to expansion, there is doubtless a small leakage from the air current of the adjoining mine.

Air Measurements:

No. 2 Dip,-----	11,275	cubic feet	per minute,	
No. 1 " -----	7,200	"	"	"
"A" Entry,-----	8,400	"	"	"
"B" " -----	3,240	"	"	"
"C" " -----	4,800	"	"	"
"3" " -----	2,205	"	"	"
"C" Plane,-----	6,880	"	"	"
Total number of men employed,-----	262,			
Number of mules and horses,-----	25,			

While the above volume of air, after making an allowance of 6,000 cubic feet per minute for mules, meets (just about) the requirements of the state law, I would advise an increase in the total volume, on account of the air being depleted to



a more-or-less degree, i. e. robbed of its due proportion of oxygen by the extremely long distance the air current has to travel in its circuitous route from the inlet to the outlet of the mine, powder fumes and noxious gases met with.

A 7 ft. Stine "booster" fan, electrically driven, is situated in the return air-way at a point about two miles from the steam fan at the outlet, which does fairly good service.

I will recommend that a large ventilating fan be placed at the spacious air shaft on "E" Plane, No. 7 Mine, to increase the ventilating currents generally, throughout Nos. 7, 8 and 9 Mines, as there is no doubt in my mind but that during summer months, miners at the working faces will suffer and labor under considerable difficulty, owing to a scarcity of good air.

The installation of a fan at the shaft mentioned, could be done at a minimum cost, in-as-much as electric power, to run it, could be obtained from the wires which will conduct the current to the hoist to be placed on "E" Plane.

The air current at the face of No. 3 Entry travels 16,000 feet on entries alone, besides through rooms and cross-cuts, and has yet to return to the outlet.

The air at the face of entries and in many of the rooms, was rather poor and impure at the time of my visit. I am aware that the operations of these mines may be discontinued



in the comparatively near future, but the ventilation absolutely needs improvement now.

The Air-Current Carries Moisture, to a fair degree of saturation in this mine, and but very little sprinkling of water is required. Fine coal dust on the roadways show a decided dampness and "brattice screens" become more-or-less damp and in cases are literally wet.

This admirable condition not only keeps the coal dust damp, but also renders a beneficial effect of a comparatively low temperature in the mine.

This saturation, or natural moisture in the air, however, gives trouble, in places, not a little, in depositing moisture upon the roof of the entries, and in the absence of top coal, disintegrates and breaks down the shale roof by its moist atmospheric influences which have caused a perceptible increase in the cost of timber and care of roadways, as compared with conditions where the workings were in closer proximity to the outcrop and consequently drier. Natural moisture was almost entirely absent in the workings nearer the outcrop.

The Thickness of the Coal Seam, and its condition, was measured and noted by me in numerous places throughout the mine, and its thickness ranges from about 4' 9" to 8 feet.

Note: Please unfold sheet of diagrams and note sections taken of the seam; also unfold map of the workings at end of this report and note references made thereto.



For	Sec.	of	coal	seam	at	face,	No. 1	Entry,	-----	See	dia.	"A"
"	"	"	"	"	"	"	"	2	"	-----	"	"B"
"	"	"	"	"	"	"	R 48,	A	Entry,	-----	"	"C"
"	"	"	"	"	"	"	B	Entry,	D	Plane,	--	"D"
"	"	"	"	"	"	"	Room 31,	B	Entry,	--	"	"E"
"	"	"	"	"	"	"	3	Entry,	D	Plane,	--	"F"
"	"	"	"	"	"	"	C	"	"	"	--	"G"
"	"	"	"	"	"	in	pillars	A	Entry,	C	Plane,	"H"

Remarks:

"E" Plane will soon be started as a producer.

Face of No. 2 Entry is being driven out rapidly, planes on the panel system will be opened from it every 600 feet, and rooms from same will be turned and run on the "strike" or level of the coal seam. Electric hoists of 20 H. P. will be set to operate these planes, one of which is now in successful operation.

At face of "C" Entry on "D" Plane, the coal seam appears a little disturbed and looks "curly", and the dip there has changed from normal (5 to 7 degrees) to 17 to 22 degrees. This condition, however, may be local.

"A", "C" Plane, pillars are being drawn.

"B" and "C" on "C" Plane, entry "stumps" are being drawn. About 20 miners are so employed and may take a year to mine out these pillars.



I was pleased to note the large percentage of coal being recovered from pillar work generally, probably over 90% of the coal is being taken out in pillar drawing. This is, indeed, a very good showing, and, on the whole, there are few coal mines in which a higher percentage of coal is extracted from the seam.

The Quality Of The Coal, may be classed in the category of sub-bituminous. It is free burning, without tendencies to coke, is a fairly good steam fuel, and is received with favor for domestic use.

The following analyses were made by the late Morgan Griffiths, at Rock Springs, Wyoming:

Analyses:

	No. 7 Mine.	No. 9 Mine.
Moisture,-----	10.91%	12.04%
Volatile Matter,---	37.90	35.30
Fixed Carbon,-----	48.19	47.86
Ash,-----	<u>3.00</u>	<u>4.80</u>
	100.00%	100.00%
Specific Gravity,--	1.298	1.288

The Coal Is Extracted By Machine And Hand Mining, and shooting from the solid is strictly prohibited, hence,



the danger that lurks in the gloom of that unnatural and uncalled for system of mining coal, is never in evidence there, for which, all concerned should feel truly thankful.

The System of Mining, is by the mode of Room and Pillar on the double entry system, from which planes are driven to the raise at intervals of about 5,000 feet apart. See map.

The Haulage Of The Coal, in these mines, is becoming a seriously expensive factor, and it is essential that only the most modern systems be followed, to render it a fair degree of commercial success. By referring to the map, it will be seen that the coal is being hauled from four to four and one-half miles. Such distances of underground haulage are abnormal.

Electric Locomotives are used on the main haulage-way to the tipple, running at a speed of about 8 miles per hour with trains of 50 to 70 pit cars.

Engines Electrically Driven, are stationed at the head of each inclined plane, and with cables, hoist and lower trains of empty and loaded cars to and from the various entries to the electric locomotive stations on the main haulage entry.

Electric Light And Bell Signals are used, and are admirably arranged for convenience and safety. The permanency of trackage and traveling speed of trains over this haulage



system, is veritably railroading underground. Unlike railroading on the surface, however, there is not only the cost of properly ballasting and keeping the track in repair, but there are many other additional items of expense which drain upon resources, such as cleaning tracks, sprinkling with water the coal dust thereon, taking down "bad" rocks from the roof, or timbering them up, as the case may be, and keeping in repair hundreds of stoppings, and numerous over-cast air-bridges to prevent leakage of the air currents, so as to conduct and maintain an adequate supply of air for the workmen at the interior of the workings and throughout the entire ramifications of the mine.

The cost of these, in the aggregate, is becoming excessive, so much so, that it will soon be a question, whether a much further extension of these workings would be a reasonable expenditure of money, and if the sinking of deep shafts ahead of the present interior might not be a profitable and warranted investment of capital to obtain a lower working cost per ton of coal.

The Capacity Of The Mine is about 1,000 tons per day.

There is no Pumping Of Water required in this mine, as little, if any, is met with, and that which may appear,



drains to the dip to No. 10 Mine, where the pumping of water is done for Nos. 7, 8 and 9 Mines, as well as the growth from its own workings.

The Tons Of Coal Mined Per Keg Of Powder Used, for the year ending December 31st, 1910, were 108.5 tons of 2,000 lbs.

For the thickness of the coal seam, namely about an average (being mined) of 5 ft. 9 in., the above, compared with coal mines generally, is a fairly good showing. I sincerely trust, however, that even this quantity of powder may be, in the near future, materially reduced by a measure of success with the "Hydraulic Cartridge", which I saw under test at your Superior Mines with a fair degree of success.

The Underground Stables, as a protection from fire, have partitions and props covered with sheet iron. They are lighted with electricity and no naked lamps are permitted inside the stables. Good sanitary conditions, for the general comfort of horses and mules, were in evidence.

Spontaneous Combustion In Gobs, has never been known to have occurred in these mines at Rock Springs.

The floor of the coal seams consists chiefly of sandy or arenaceous shale, which is hard and compact, does not "heave" and withstands the compressive force of a "creep" or squeeze



of the strata and the coal does not sink into the floor. "Creeps" of the strata seldom occur there, unless when "drawing" pillars, and as a rule, the overlying strata breaks off and caves in readily and the workings have a low temperature, compared with most mines, all of which conditions are favorable for the prevention of spontaneous combustion.

Fire Proof Rock Stoppings, were in evidence throughout the mine, and were well built generally, also carefully plastered with sandy loam, which is well adapted for such use. In fact, it is only the substantial nature and solidity of stoppings that make it possible to extend the workings to their present abnormal distance from the surface with such a small volume of air entering the inlet.

In such an extensive mine, it is a mistake to have less than 70,000 cubic feet of air entering the intake; and I sincerely hope that the installation of a fan at the shaft on "E" Plane will meet with your approval.

Air-bridges and Trap Doors, were also built with a fair degree of observance as to precautions against fire.

The Following Recommendations are presented for the further prevention of mine fires by accidental origin from the probable ignition of wooden tool chests and board seats. The



abandonment of these, cannot fail to lessen the risk of fire.

I noticed, during my tour of inspection, a number of wooden boxes, the dimensions of one, in which were kept the tools of day men, oil cans, etc., and made of 2" plank, was about 7 ft. long, 4 ft. 6 in. wide and 4 ft. high; and in close proximity, was a wooden seat between props, a place where the under-foreman receives and gives orders to shot-firers, machine men, etc.

An order from you, prohibiting wooden boxes and seats (unless covered with sheet iron) throughout the mines, would be a step in the right direction.

No. 9 Mine: The entrance of No. 9 Mine is by a self-acting incline plane, known as No. 1 or "A" (opened in proximity to No. 7 Mine, see map) on a raise of 5 to 6 degrees for a distance of about 1,000 feet over which the haulage is operated by gravity (by a drum and cable) from the head of the incline to tipple on the surface.

The Main Haulage-Way, from the head of the plane to the interior of the workings, is a level, known as No. 3 Entry, about four and one-half miles in length, which intersects four engine planes that lower the coal to the main haulage-way and



is hauled from there to Plane No. 1, by electric locomotives in trains of 60 to 72 pit cars.

The Output of The Mine, is about 1,100 tons per day.

The Ventilation Is Produced by "double Murphy" exhausting fans 10 feet in diameter, electrically driven at about 80 revolutions per minute.

There are four airway intakes to this mine, furnishing an aggregate volume of 58,000 cubic feet of air per minute, and the total return air-current at the outlet is 60,500 cubic feet per minute.

The following are the measurements of air circulating in the various entries:

Air Measurements:

No. 4	Entry face,	-----	6,600	cu. ft. per minute,
No. 5	"	"	-----	6,000 " " " "
No. 8	South Entry face,	-----	7,680	" " " "
No. 8	North	"	-----	7,200 " " " "
No. 9	"	"	-----	5,500 " " " "
No. 10	"	"	-----	4,750 " " " "
No. 9	"	"	3 Plane Face	6,050 " " " "
No. 11	"	"	"	10,500 " " " "
No. 3	Plane face,	-----	6,500	" " " "



The number of men employed, 254,

Number of horses and mules, 26.

The Thickness Of The Coal Seam, and its conditions,  
will be seen on sheet of diagrams in front of this report.

For sec. at face of-----	#10 No. Entry, D Pl. see Dia. #1,
" " " " "-----	9 " " " " " 2,
" " " " "-----	8 " " " " " 3,
" " 125' from face of---	8 " " " " " 4,
" " at face of,-----	5 " " " " " 5,
" " " " "-----	4 Entry on 4th " " " 6,
" " " " "-----	14 " " 3rd " " " 7,
" " " " "-----	13 " " 3rd " " " 8,
" " " " "-----	12 " " 3rd " " " 9,

Remarks:

The coal seam in No. 10 North Entry is stained with a white discoloration, as if affected by proximity to the atmospheric influences near the outcrop, but has a fairly good degree of hardness, and may be marketable fuel for some distance yet.

The stratum of slate in the coal at the face of No. 9 Entry is absent on the surface outcrop, thus, it may be local.

Note normal section of seam at face of No. 8 Entry, while 125 feet back from the face there is a stratum of slate 11 inches in thickness, see Dia. No. 4.



Nos. 6 and 7 Entries are worked up to the boundary line of Section 8, owned by the Gunn-Thompson Coal Company.

Throughout these exterior workings (in nearer proximity to the outcrop) it is naturally dusty, and in places, "bone dry". Without a copious supply of water, it is a difficult matter to satisfactorily wet coal dust.

Water is hauled from No. 1 plane in specially constructed steel tanks, each holding about 375 gallons, and from nine to twelve tanks of water are sprinkled on some portions of the roadways (within the dusty zone) daily.

Water sprayed from a tank (without pressure) cannot sufficiently wet coal dust, and the dryness of the air circulating in these outer workings (especially in cold weather) frees the dust from moisture rapidly by absorption, and carries it in saturation towards the interior workings.

No. 9 Mine presents the driest underground conditions at Rock Springs. In this connection, however, we are glad to state that the coal seam is undermined and that there is absolutely no shooting off the solid, hence the dry and dusty conditions are very much less dangerous on account of this redeeming feature.

Note:--Mr. George Pryde, Supt., and Mr. Medill, Foreman, informed me that they experienced trouble sometime ago with men from Hanna and other "solid shooting" districts, in getting them to undermine the coal.



In one case, a miner fired a "tight" shot on the solid, resulting in blowing powder and dust flames down on the entry and causing such severe concussion that a man engaged in building a stop-ping in the entry cross-cut, received a considerable shock, and thinking something seriously had occurred, he ran for Foreman Medill, who, it is needless to say, discharged the miner.

I mention this instance here, designedly to show: What might have been.

I never hear a "windy shot" in a dusty coal mine without being thankful for a safe deliverance.

Wherever a coal seam is under-mined, it insures a maximum of safety from "windy" shots.

The face of No. 5 Entry has now reached the unusual distance of four and one-half miles from the entrance of the mine. The coal seam here is about normal. See Diagram No. 5. A copious amount of natural moisture is present, which keeps the coal dust and workings in an admirable state of saturation. But, the good feature which produces this moist condition (saturated air-current), has a bad effect in disintegrating the roof, which for 20 inches immediately over the coal, consisting of thin laminated layers of arenaceous shale, "cuts" and falls down readily. Above this roof, the rocks contain more sand and become stronger to withstand the disintegrating influence of the saturated air current.

In such entries, I would advise leaving up top coal for the roof and taking up a portion of the floor to make the



necessary height where the coal seam is low, as a matter of economy in the saving of moving debris and timber.

The face of No. 4 Entry shows the coal also a little thin but normal as to impurities. See Diagram 6.

For section of coal at face of No. 14 Entry, 3 Plane, see diagram No. 7. A portion of the top coal is left up for a roof to save timbering. See section of coal seam, Dia. 8, taken at face of No. 13 Entry off of 3 Plane.

At face of 12th Entry, 3 Plane, we have about the same conditions as in Entry 13. See Dia. 9.

In No. 11 North Entry, off 3 Plane, the pillars are being drawn out successfully, obtaining a maximum percentage of the coal. The thickness of the seam there is about 7' 6".

In No. 8 So. Entry, the pillars are also being taken out with success.

In No. 8 No. Entry, 3 Plane, a number of Jap miners are engaged in taking out pillars, recovering most of the coal.

The Underground Stables, consisting of 26 stalls (in which were stabled 22 head of mules and horses) are well lined with sheet iron, lighted entirely by electricity--open lamps are strictly prohibited. Water under pressure is constantly at hand, and other evidences were present of precautions being taken to reduce to a minimum the possibility of fire origin.



The stables are well ventilated, and the air passing through same is conducted to the return air-course, away from the workmen.

Heating In The "Gobs" By Spontaneous Combustion, has never been detected, and for the prevention of progress from fires by accidental ignition, barrels of water are kept in readiness on double switches with powder kegs to form a bucket line in case of an emergency.

Stoppings And Air Bridges, are constructed from stone, and otherwise made as near fire proof as possible.

To Revivify Persons From Electric Shock, printed instructions are framed in glass and posted at prominent places in the mine, and "day" employees are required to acquaint themselves with the same, so as to resuscitate anyone who might be overcome by an electric shock.

An Underground Telephone System, is kept in working order throughout the workings of the mines for general conveniences, but is especially invaluable in case of an accident to employees when the doctor, nurse and ambulance may be called for from the interior of the underground workings to receive an injured person or persons upon reaching the surface.



Electric Signal Bells On Engine Planes, are admirably arranged, for safety as well as for hoisting instructions generally.

"Escape Man Holes" In The Sides Of All Haulage-Ways, in the mines, whether on engine planes, or electric locomotive ways, are admirably provided, for persons to enter while trains of pit cars are passing; and further "man-way" traveling passages are provided, parallel with all hoisting slopes or planes, wherever too dangerous for travel.

"Man trip trains", with safety appliances, are used to take the workmen to and from the interior workings, as to travel to and from their working places in such extensive mines would be an altogether too strenuous undertaking.

Explosive Gas "Fire damp" (C. H<sup>4</sup>.) has never been detected in the Rock Springs Mines.

This most valued feature, together with the fact that the coal seam is absolutely undermined before blasting, also the presence of natural moisture, in places, and the partly sprinkling of dusty zones, with other safeguards enumerated, explain, we think, the large tonnage of coal produced per life lost within these mines, as compared with gaseous collieries, or in mines where the odious system of blasting coal from the solid, is permitted.



The Tons Of Coal Mined Per Keg Of Powder Used, for the year ending December 31st, 1910, were 72 and  $\frac{2}{3}$  tons of 2,000 lbs.

The average thickness of the coal seam over the mine is about 5' 3". Considering the thickness of the coal seam, the showing is fair, but we shall hope that by the use of the hydraulic cartridge, the above quantity of powder may, in the near future, be materially reduced.

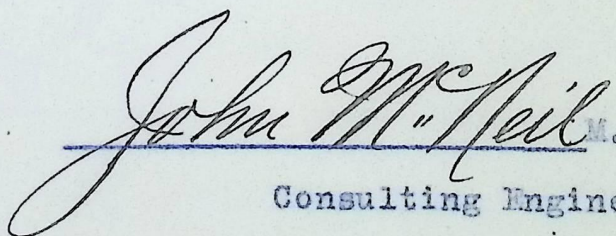
The systems of mining and haulage are about the same as in No. 7 Mine.

There is no pumping required in this mine.

Trusting these reports shall meet with your approval,

I am,

Very Respectfully yours,

 M. E.  
Consulting Engineer.



A P P E N D I X.

-----0-----

Remarks: It is said, the inevitable risks in American coal mines exact in their toll of accidents, 34%, and 66% due to the negligence of employees and employer.

In 1908, 2,450 fatal and 6,772 non-fatal accidents occurred in the mines of the United States. It seems that many deaths occurred from risks taken to save labor, being in too much of a hurry, and ignorance or non-observance of company's special rules.

I would advise that general instructions be frequently given to employees regarding the proper and safe conduct of their work by those in charge at the mines. See to it that all employees understand the company's rules, and demand an uncompromising obedience to the same.

Protect workmen and property against the dangers arising from spontaneous combustion of the "gobs" and ordinary fires in and about the mines with every known precaution.

Have adequate ventilation for the comfort and health of the men at the face of the work.

Prohibit "shooting from the solid"; no shot hole to extend beyond the mining.



Do not allow two or more shots to be fired in one place at the same time, let a sufficient interval elapse between blasts.

Do not permit wooden or other inflammable tool houses, boxes, seats, etc. in the mines; have same constructed with non-combustible materials, as far as practicable.

Remove all coal dust and other debris from haulage roads from time to time, keeping tracks as clean as possible, to prevent such debris from being ground up and carried off in suspension with the air-currents.

Demand an uncompromising obedience to your order, in having inspections made of every working place before the regular workmen enter, to see whether or not gas is generated; and have fire-bosses and mine foremen see that miners who are ignorant or indifferent to their own safety, are compelled to properly timber their working places.

The Organization Of A Class For American Red Cross First Aid Instruction, at each of your collieries, could not fail in its humane object of rendering, at times, incalculable good in the skillful handling and ministering timely aid to injured workmen, in the absence of a doctor.

Such a class might well include the superintendent, pit-boss and clerks at the mine, adding a few conscientious workmen of temperate habits and humane feelings who would find



their reward for services in alleviating the sufferings of their injured fellows. The class could be instructed, from time to time, by your regularly appointed physician.

There would, of course, be a necessary expenditure of money connected with the class, the maintenance of supplies, medicine, stretchers and other paraphernalia, but there might also be created, ways and means by which the general public would gladly contribute to the aid of such a humane cause, and should a tax to your companies reach a mill per ton, it would be a legitimate, as well as a humanitarian charge to the cost of coal.

The opportunity and pleasure was mine to meet 1st Lt. M. J. Shields, Medical Reserve Corps, U. S. Army, but now among coal miners in the interest of the American Red Cross as Medical Director to members of coal mine rescue cars and life saving stations.

In my talk with Doctor Shields, I was deeply impressed with the humane nobleness and vital importance of coal mining rescue work. This generously good and able gentleman kindly presented me with a copy of The American "Red Cross Abridged Text Book on First Aid", of which he is author, jointly with Major Charles Lynch, Medical Corps, United States Army.

Faithful to the request of Dr. Shields, I have carefully read his manual of instruction, with the result that I herewith enthusiastically recommend to your personal and mature



consideration, the adoption of "First Aid" work at the mines of your several coal companies.

Dr. Shields related to me, in part, the life saving value which these classes and organizations of "First Aid" have already proved in the coal mining districts of Pennsylvania.

Allow me, for your information, to herein copy the following brief remarks from the pages of the manual of First Aid:

"To gain the first-aid certificate of the Red Cross, it is, of course, necessary for students in associations to pass the same examination required from those in classes.

"The following course of instruction is recommended:

1. Structure and mechanism of the body.
2. First-aid materials.
3. General directions for rendering first aid. Shock.
4. Injuries without the skin being pierced or broken.
5. Injuries in which the skin is pierced or broken.
6. Local injuries from heat, cold and electricity.
7. Unconsciousness and poisoning.
8. Handling and carrying of the injured.
9. Special injuries of mine or railroad, etc.
10. Lecture by an expert on means for preventing accidents.
11. General review.
12. Sanitary matters, prevention of contagious diseases, such as tuberculosis, typhoid, scarlet fever, etc.



"The lectures should be shorn of all technical terms and half an hour is quite enough for them. Then the medical director or teacher should ask questions and superintend practical work by the class for half an hour. Practical work should be increased as much as possible just as soon as the men can do anything in this direction. After this, if possible have the men discuss the subject among themselves, telling about recent injuries they have seen, how they have dressed them, etc.

"All the men should, if practical, have date cards for the year with numbers on the margin which are to be punched out at each meeting.....

"Contests in different classes or associations and between such organizations have been found to be one of the best ways to stimulate study of first aid as well as to arouse public interest in this important subject.

"The events in such contests should naturally be those having to do with first aid problems of special interest to the particular organizations concerned. As a sample of such contests, the following is taken from a program of an actual contest in the Pennsylvania mines.

Event No. 1.--Man insensible from gas, totally helpless. Oneman to pick him up, carry him fifty feet to good air, lay him down and perform artificial respiration for one minute.



Event No. 2.--Man injured in lower part of body.  
Two men to form four-handed seat and carry him fifty feet.

Event No. 3.--Man injured; leg broken. Three men  
to splint his leg with a mine sprag and some straw or hay;  
make temporary stretcher out of two mine drills and two coats,  
and carry fifty feet.

Event No. 4.--Man injured; wound right side of  
temple; one man to open packet and dress wound.

Event No. 5.--General contest of eight teams. Man  
unconscious; wounds, simple fracture of right arm between  
elbow and shoulder; crushed foot with severe hemorrhage;  
apply tourniquet for bleeding, splints for fracture, perform  
artificial respiration for one minute, place on stretcher,  
carry fifty feet over car loaded with coal, pile of mine rock,  
then over fence and place in ambulance.

"An officer in charge, judges, a time-keeper and a  
starter will be required for such contests.

"The First Aid Department of the Red Cross will arrange  
such contests when desired and will award medals to successful  
contestants.

#### Red Cross Examination and Certificate.

"The Red Cross stands ready to arrange an examination  
for its certificate for any class of twenty persons on the  
conclusion of a course of instruction in first aid."



In Conclusion, it must not be construed that my enthusiasm for "First Aid" inspires me to the extent that such a class at a coal mine should necessarily have to deal with the prevention of contagious diseases or become students in anatomy, but I do think that such a class should be taught to handle and care for, in a practical manner, injured workmen in and around coal mines.

I have personally known of cases where men, becoming insensible from "after damp" gas, die for lack of medical aid, when, if the principles of "First Aid" had only been known to their fellow workmen, their lives might have been saved.

Again, I have witnessed injured men suffering much unnecessary pain, which could have been alleviated by more skillful handling.

It remains for well-regulated coal companies, such as yours, to be leaders in this humane and most worthy cause.

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