

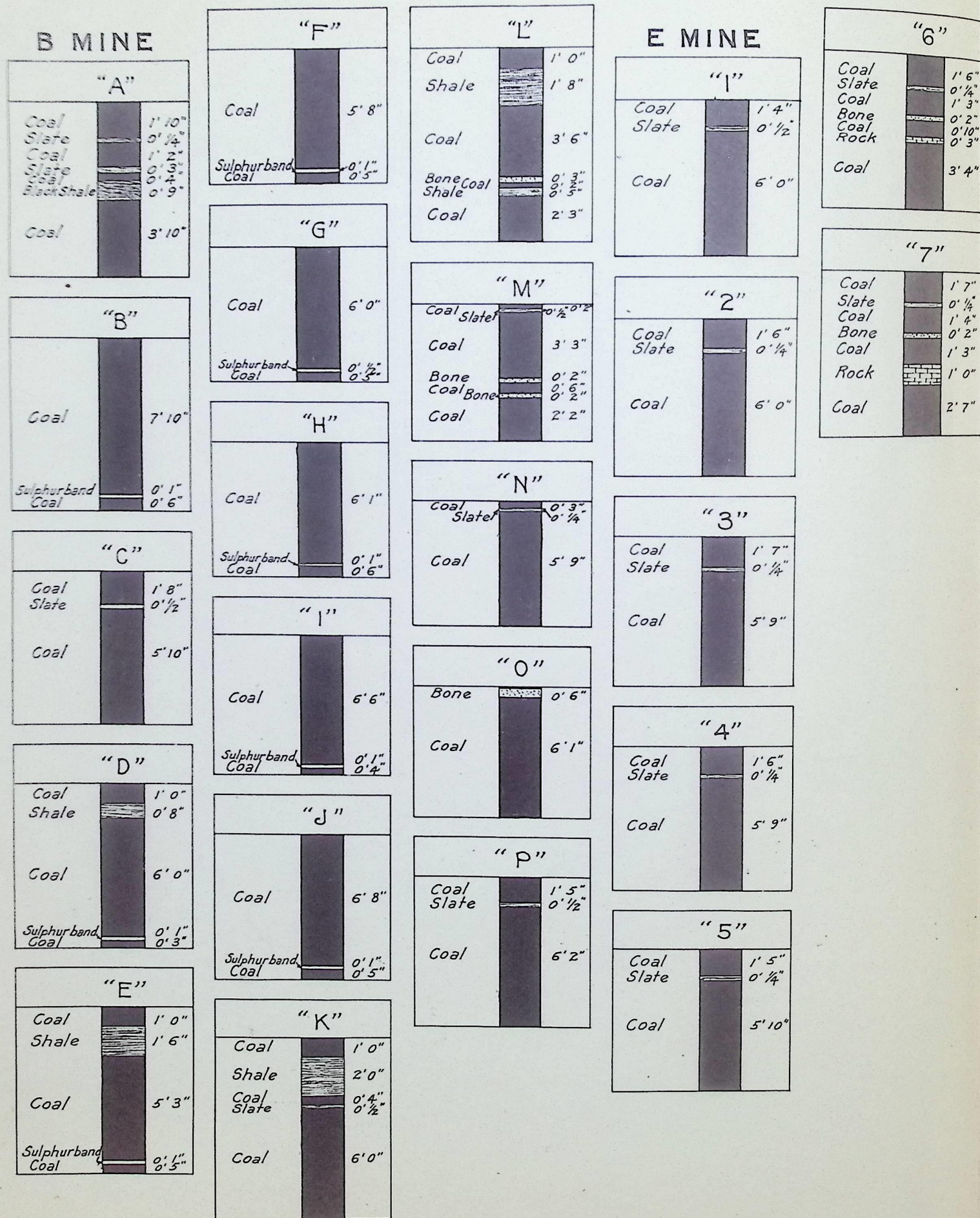
Superior Coal Company.

SHEET OF DIAGRAMS

SHOWING

SECTIONS OF COAL SEAMS IN B & E MINES

SUPERIOR WYOMING



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MINE 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 GENERAL WORKING CONDITIONS

And

SAFETY OF EMPLOYEES

In

"B" AND "E" MINES,

Of

THE SUPERIOR COAL COMPANY,

At

S U P E R I O R, W Y O M I N G.

By

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

To: D. O. CLARK, ESQ.,
Vice-President & General Manager,
Superior 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 "B" and "E" Mines of the Superior Coal Co., and herewith present to you, my report on the same.

The Location Of The Superior Mines, is at Superior, Sweet Water County, Wyoming, situated at the terminus of a branch railway about nine miles (north) from Thayer Junction on the main line of the Union Pac. R. R. and about 18 miles in a north-easterly direction from the coal mining district of Rock Springs.

The Geological Characteristics, of the coal field are identical with Rock Springs, both forming a part of Wyoming's most important and prolific coal area. The lithological character of the rocks remain very much the same as at Rock Springs, consisting of successive beds of sandstone, massive and laminated, of the Laramie Cretaceous period.

The coal bearing area, is doubtless quite extensive, and indications point, that collieries at Superior will furnish large outputs of coal for many decades to come.

The Quality Of The Coal, is about the same as that at Rock Springs; gives good results as a steam fuel and is received favorably for domestic use.

The percentage of moisture in the coal, from what is known as "Number 1 Seam" (being the horizon of the coal bed worked so extensively by Number 1 Mine at Rock Springs), is higher at Superior.

Analyses:

	<u>"A" Mine, #1 Seam</u>	<u>"B" Mine, #7 Seam</u>	<u>"C" Mine, #1 Seam</u>	<u>"C" Mine, #7 Seam</u>
Moisture,-----	11.04%	7.81%	10.57%	9.92%
Volatile Matter,----	37.02	37.07	36.95	34.99
Fixed Carbon,-----	47.14	50.20	45.23	47.26
Ash,-----	<u>4.80</u>	<u>4.92</u>	<u>7.25</u>	<u>7.83</u>
	100.00%	100.00%	100.00%	100.00%

In The Following Brief History Of The Mines, we will state, that four years ago, they were in the initiative stage of opening.

So marked has been their rapid construction and development, that upwards of one thousand workmen are now employed in and about the mines, and during the past year, about 1,000,000 tons of coal have been produced.

We think this industrial showing carries with it a degree of superior merit.

I shall not attempt to describe, in detail, the character of equipment, the modern improvements and installation of electric power in the conduct of this up-to-date colliery, as any semblance to such an undertaking would require much more time and space than would be prudent for me to indulge in, at this time. Suffice is to say, however, that I saw a most admirably fitted up colliery in manner of design and equip-

ment, to successfully mine and handle large quantities of coal, up to 5,000 or 6,000 tons per day, whenever necessity shall press for it.

The Power Plant, is indeed a model of its kind, and it is seldom that such massive construction of buildings, or installation of such units of electric power are seen at coal mines.

The Power House, consists of a solid re-inforced concrete building of a very pleasing design, 30 ft. by 80 ft., in which are installed four alternating and two direct current General Electric generators, each unit having a capacity of three hundred kilowatt. All rest on massive foundations, exhibiting a fixed stableness and uniformity of operation agreeable to the eye.

The Boiler House, is also a solid re-inforced concrete building of 68 ft. by 80 ft. with off-set sustaining columns in the walls at intervals. The smoke stack is also a monolith concrete structure, which lends to the symmetry of the buildings as a whole.

There are in operation, four 300 H. P. and four 250 H. P. internally fired boilers, all admirably equipped with underfed stokers. The coal is automatically fed from over-head bins, and the ashes are removed through an under-ground passage to the ash-pile.

The Company's Mercantile Store, is a concrete structure of spacious dimensions, with a substantial basement throughout, in which a refrigerating, cold storage and ice manufacturing plant is a unique feature.

The building, as a whole, is of good proportions, nicely arranged. Its imposing appearance confers upon the town of Superior, an air of corporate dignity.

The Company's Office Building, a one and one-half story structure of stone, of pleasing design and proportions, with commodious rooms for the Superintendent, his clerical force and engineering department.

The Dwellings Of The Workmen, have a cosy and pleasant appearance, are of varied design, neatly painted, well arranged and situated on high sloping ground.

An Abundant Water Supply, for the works and the town, is furnished by a system of well borings (nine in number), eight of which are situated in proximity to the power plant and one at the "D" Mine.

For location, depth and size of wells, casing, pumps, capacity and analyses of water, etc., see "Record of Wells" at end of this report.

It will be observed that there are three beds of water sand.

The water on being pumped from the well, has a decidedly dark color, but settles and clears up after standing.

An Electric Lighting Plant, furnishes light for the mines, store, office and town.

The Coal Seam In "B" and "E" Mines, is undermined and no shot hole is permitted to be drilled beyond the back of the mining. Thus, no tight shooting can be experienced, which is a great redeeming feature of safety in a coal mine.

Powder Used To Coal Mined, is as follows:

"B" Mine: Pick mining, 88 tons per keg of F black powder.

" " Machine mining, 9.6 tons per pound of permissible powder, Trojan and Monobel.

"E" Mine: Machine mining, 2.25 tons per pound of permissible powder--all narrow work in developing entries and air-courses.

Remarks: You will notice that the permissible powders show an excellent record with machine mining, 240 tons of coal per 25 lbs. of powder used, while but 88 tons were mined by miners, per keg (25 lbs.) of single F. black powder.

I do not know what the difference in the percentage of slack is, but looking at the paramount feature of safety, it points favorably to the use of permissible powders.

You will also note that in "E" Mine, with narrow work entirely (mined by machines), 56 tons of coal were mined per 25 lbs. of permissible powder used.

The Dip Of These Mines, trend in a north-easterly direction with an inclination from the horizontal of about 4 degrees.

For Haulage, A 75 H. P. Electric Hoist, is placed above the 6th North Entry, which delivers the coal to the main drift, at the foot of the plane.

A Three-Ton Electric Locomotive, hauls the coal on the 3rd North Entry to the plane.

A Three-Ton Electric Locomotive, hauls from the 3rd South Entry to the plane.

A Ten-Ton Electric Locomotive, hauls from the main drift (from the bottom of the plane) and from the dip to the tippie. But few horses are used.

The Stabling Of Horses And Mules, is entirely on the surface; no stables are in the mines.

Spontaneous Combustion, has never occurred at Superior Mines. Like Rock Springs, the physical character of the roof and floor of the coal seams are not susceptible to "heating" when crushed by a "creep" or squeeze.

Marsh Gas (C. H.⁴), has never been detected in these mines, and from experience in the operation of the same meas-

ures at Rock Springs, it would seem that this gas is non-existent throughout the field.

Precautions Taken Against Fire, both throughout the underground workings of the mines and about the buildings on the surface, were in fairly good evidence.

The Ventilation Of The Mines ("B" and "E"), is produced by a fan (electrically driven, 60 H. P.), placed at the air shaft of "E" dip, having a capacity of 60,000 cu. feet of air per minute.

Volume of air in cubic feet per minute at "B" inlet, 49,000.

Volume of air passing from the mine at outlet, 54,000 cu. ft. per minute.

Cu. ft. of air per minute at face of Main Entry,-----	21,000
" " " " " " Main In-take, E Mine,---	22,750
" " " " " " face of No. 1 No. Entry,	7,130
" " " " " " " " " 2 No. Entry,	6,900
" " " " " " " " " Slope,-----	7,500
" " " " " " " " " No. 2 So. Entry,	4,620
" " " " " " " " " 1 So. Entry,	10,660
" " " " " " " " " Main Return,-----	26,400

Both mines are well ventilated.

"B" Mine, is a "drift" opening or tunnel driven through faulted or barren ground for about 2,000 feet before reaching the coal seam in place and in workable form.

Note: If the reader will please unfold the map showing the underground workings of "B" Mine, at end of this report (it is the first of a series of maps there attached), and keep the same before him for reference during the perusal of this report, a better understanding of what I shall advance will be obtained.

It will be observed that the entrance of the "drift" (or tunnel) is in proximity to the line of the coal outcrop of "No. 7 Seam".

Upon workable coal being reached (2,000 ft. from the portal), the main drift was continued on its course, on the coal seam (see map) to the section line of Government land and foot of the plane.

The plane is driven directly to the raise, and from it are turned, at regular intervals, the 2nd, 3rd, 4th and 5th South Entries, also the 2nd, 3rd, 4th, 5th and 6th North Entries.

The Face Of The Second South Entry, has reached the faulted area of ground passed through in the main drift, and there is 2' 6" of slate in the center of the coal seam, which has been abandoned. Some pillars here are left in, as they are under a portion of the town.

For Section Of Coal Seam At Face Of 3rd So. Entry,
see Diagram "A" on Sheet of Diagrams showing the character
of the coal seam of "B" and "E" Mines at the front of this
report.

For section of the seam, back on 3rd South Entry at a
point where No. 37 room from the 2nd South comes through, see
Diagram "B".

At face of Room 20 (3rd South Entry), see section of
seam in Diagram "C".

For Section Of Coal Seam At Face Of 4th So. Entry,
see Diagram "D".

For section of coal seam at entrance of No. 11 room, see
Diagram "E".

In No. 13 room (4th South) the "intervening stratum" of
shale is timbered up. It appears to get thicker and stronger
and the shot-firers see that sufficient and proper timbering
is done.

For Section Of Coal Seam At Face Of 5th So. Entry,
see Diagram "F". The slate over the coal where it is broken
down back in the entry, shows it to be 9" in thickness. One
foot of coal lies above this.

For Section Of Seam At Face Of Plane, see Diagram
"G".

At a point from the air-course, opposite the "hoist", on Main Plane, a sump is being made to hold water, at this high elevation, to which a pipe line will be connected for the successful watering of the workings under it.

Pipe Lines For Sprinkling, purposes, to dampen the coal dust on roadways, were in evidence throughout the mine.

There Is An Air Shaft, a little above the 6th North Entry, which adds much to the ventilation.

Face Of 6th North Entry, see section of coal seam in Diagram "H". The shale over the coal seam here is 1' 9" in thickness. Above the shale, there is 1 ft. of coal.

Face Of 5th North Entry, for section of coal seam; see Diagram "I". The shale over the coal is timbered up, but it is fragile and breaks around the timbers and looks as if it should be taken down. Think it may be difficult to timber this slate up in rooms.

Room No. 11, in 4th North Entry, see section of coal seam in Diagram "J".

Face Of 4th North Entry, see section of coal seam in Diagram "K".

Face Of 3rd North Entry, see section of seam shown by Diagram "L".

In Room 16, note section of seam shown in Diagram "M". At this point (see map), note that the entry has reached "forbidden ground" (Government). Here, the intervening stratum of shale is timbered up with apparent success.

In face of No. 8 room, 2nd North Entry: for section of seam, see Diagram "N". The "intervening" shale is but 3" in thickness here.

Face Of 2nd North Entry, for section of coal seam, see Diagram "O". This entry is also up to the section line of Government land.

Face Of Dip Entry, for section of coal seam, see Diagram "P".

The physical conditions here are very good, but the face of the entry is approaching Government land.

The Hydraulic Mining Cartridge, a substitute for powder in breaking down coal, I saw tested in Room 24, "B" Mine. The width of the room was 30 feet and was mined (by a machine) 6 feet deep. The coal seam was 7 feet in thickness.

Two men were with the machine; they drilled two holes, one on each side of the room, about 6 feet from the rib, two

cartridges were put in place and the thrust made in 30 minutes. The coal thrust to the floor was about thirty tons, being 26 feet front face by 16 feet at the back.

The coal was large and "lumpy", with very little slack.

It seems that the pressure from the cartridge "shears" back over the "rib" into the solid pillar and seldom cuts off on the rib-side, but often shatters the coal there to such a degree that difficulty is experienced in shooting the "rib corners" down, as the force of the powder charge seeks lines of least resistance through the shattered cracks in the coal.

I understand that Mr. Brennan (Supt.), will make exhaustive tests, which I trust will meet with a fair measure of success.

Note:--In large coal seams like Hanna and Pleasant Valley, the Hydraulic Cartridge will be very successful in pulling down top coal in rooms when "retreating" back with pillars. In both mines, 10 feet of top coal should be left up in "advancing" the workings.

The continuation of the underground workings from "D" Mine, north of the dip entry (see map) enter into territory that is known as "E" Mine.

"E" Mine, consists of a shaft opening, sunk to a depth of 110 feet, with double hoisting compartments.

Only development work is now being followed, and the coal therefrom is hauled through "B" Mine and dumped over its tipple, and may so continue for sometime to come, probably until sufficient development will warrant a production which will be more economically handled by the modern equipment now installed and in readiness at the pit top of "E" Mine, which bids fair to be one of the up-to-date coal pits in the West.

The Hoisting Derrick, Tipple and Shaking Screen erections are constructed entirely of steel, set upon concrete foundations.

A 200 H. P. Electric Engine, is set in place upon the top of the derrick head frame, thus admitting the cables to run from the winding drums of the engine perpendicularly to and from the hoisting compartments of the shaft.

The Hoisting Cages Are Self-Dumping, i. e. the coal is dumped from the pit car without the car itself leaving the cage.

The Box-Car Loader, is of the most improved type. The R. R. car is tipped lengthwise at such an angle that the

coal from the loading chute of the mine tibble, runs by gravity to the end of the box-car. When one end is loaded, the great cradle like crane of the "loader" is again put in motion and tilts the empty end down so the coal will run into it (the weight of the coal on the inclined loaded end of the car holds itself in place). When loaded, the car is brought to a horizontal position (with the rails) and is run off, when the loader is in position to take on another empty car.

A Storage And Rescreening Bin, with belt conveyors, has been erected to screen out the by-product of fine slack and convey it to the bins in the boiler house of the power plant, as an economic fuel.

At Face Of 1st North Entry, "E" Mine, (from the slope), see section of coal seam in Diagram "No. 1".

The physical conditions of the roof and the coal seam are good. It will be observed, however, that the face of the entry is approaching in close proximity to the line of Government land.

At Face Of 2nd North Entry, direct from the bottom of the shaft, see section of coal seam shown by Diagram "No. 2". This entry will also soon reach the line of Government land.

For Section Of Coal Seam At Face Of Slope, see Diagram "No. 3".

As I understand it, your company owns Section 21, and indications point that the slope may enter into a good body of coal in that direction.

For Section Of Coal Seam At Face Of 3rd So. Entry, see Diagram "No. 4."

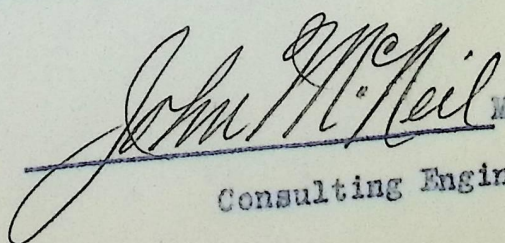
At Face Of No. 3 North Entry, see section of seam in Diagram "No. 5".

At Face Of No. 2 South Entry, note section of seam in Diagram "No. 6".

At Face Of No. 1 South Entry, see section of coal seam in Diagram "No. 7".

At The Bottom Of "E" Shaft, steel and concrete are used instead of timber, and the lower 25 feet of the shaft (above the coal seam) is concreted, as a precaution against fire.

Respectfully submitted,

 M. E.
Consulting Engineer.