

J. W. Paul

REPORT
OF
MINE FIRE
AT
MINE NO. 1 (COALBURG SEAM)
OF THE
SYCAMORE COAL COMPANY
CINDERELLA, WEST VIRGINIA
(4 miles east of Williamson, W. Va.)

June 30, 1914.

by

J. W. Paul, Mining Engineer,

H. D. Mason, Jr., Asst. Mining Engineer, and

W. J. German, Foreman Miner.

Pittsburgh, Pa.,
July 14, 1914.

REPORT OF MINE FIRE

NO. 1 MINE, SYCAMORE COAL COMPANY,
CINDERELLA, W.VA., JUNE 30, 1914.

INTRODUCTION

A fire occurred Tuesday, June 30, 1914, about midnight, in the wooden fan house (on surface) at Mine No. 1 (Coalburg or upper seam) of the Sycamore Coal Co., at Cinderella, Mingo County, West Virginia. This fire was rapidly communicated to the wooden air chute, leading from the fan house to the pit mouth of the airway, thence to the timbers and coal in the mine. The gases resulting from this fire suffocated the 5 night men, who were the only persons in the mine at the time, and their bodies were not recovered until 14 hours later.

Location: Mine No. 1 is one of three mines at Cinderella, W. Va., operated by the Sycamore Coal Co. These mines are located near the summit of a mountain, (elevation 1360 feet), being reached by a steep incline ^{plane} 1000 feet in length, with a grade varying from 23 to 33 percent, while the power plant, tippie, washery, and town are located in the narrow gulch at the base of the mountain. (Elevation in valley 850 feet.) A spur track two and one-half miles in length extends from Cinderella Junction, on the main line of the Norfolk and Western Railway, to the tippie and loading plant at Cinderella. The daily output averages 600 tons, and 200 men are employed.

Ownership and operators: Mine No. 1 and the two adjacent operations were opened up in 1911 by the Sycamore Coal Co., postoffice address Cinderella, Mingo County, West Virginia; and have been working continuously since that time. The president of the Sycamore Coal Company is Samuel W. Patterson, who

is also an official of the Bottom Creek Coal & Coke Co., of Vivian, W. Va., where an explosion occurred November 18, 1911. No previous accidents have occurred at Mine No. 1.

Geology: The topography in this vicinity is extremely rugged and irregular. The small stream, Sycamore Creek, upon which Cinderella is located, flows southward through a narrow mountain gulch into the Tug Fork of the Big Sandy River two miles east of Williamson. Two coal seams, the Coalburg (upper), and the Winifred (lower), 58 feet apart, outcrop near the summit of the mountain.

Mine No. 1 is in the Coalburg, or upper seam, and the main entry is driven by a drift opening directly through the mountain, a distance of 600 feet, (see map).

The Winifred seam below is also operated by drift openings.

The West Virginia Geological Survey, 1914, reports upon these two seams as follows:

"The Coalburg Coal:- At 5 to 15 feet under the Coalburg massive, bluish gray sandstone, averaging 50 feet in thickness, there occurs a fairly persistent, multiple bedded coal that was long ago designated the Coalburg coal from the town (Kanawha County) where it was first exploited, 20 miles above Charleston. It was first mined on a commercial scale high up in the steep hills which overlook the town of Coalburg. The character of the coal in the Coalburg seam, as well as the structure of the bed itself, very much resembles that of the Winifred bed. Like the latter, it contains much splint coal, as well as alternating layers of softer or gas coal, and also one or more partings of shale, so that it is multiple bedded.

"It is a curious fact that although occupying different stratigraphic horizons, these two coal beds, the Coalburg and the Winifrede, seldom attain commercial value at the same locality, since it appears true, that where one of these beds is valuable, the other is either too thin for present mining operations, or is so impure as not to be marketable under present mining conditions, so that, sometimes the suspicion would arise that these two beds were after all one and the same. From 10 to 20 feet under the Coalburg coal and overlying the Winifrede coal, there occurs a massive

grayish brown, micaceous sandstone that is usually fine grained, and ranges from 20 to 100 feet in thickness.

"The Winifrede Coal:- At 0 to 5 feet under the Winifrede sandstone, there occurs a bed of coal that has been designated the Winifrede Coal from the town of that name on Fields Creek, 15 miles southeast of Charleston. The bed is a multiple one, and contains hard splint and block coal, making an excellent lump coal."

Both these coal beds are classed geologically in the Kanawha series.

Coal: At No. 1 mine the Coalburg seam averages 4 feet 6 inches in thickness, and is of a very "dirty" character, clay and slate bands constituting the impurities, which necessitates washing the coal to make it marketable. In the No. 2 mine below the Winifrede seam averages from 3 feet 6 inches to 5 feet 5 inches in height and is fairly "clean" throughout the mine.

The proximate analysis of the Coalburg coal from the Cabin Creek district is as follows:

Moisture - - - -	1.05
Volatile Matter-	33.65
Fixed Carbon - -	54.05
Ash - - - - - --	<u>11.25</u>
	100.00

No analysis of the Coalburg coal at No. 1 mine has been received.

Roof: The roof in No. 1 mine is 6 inches or less of hard gray shale overlaid by the characteristic bluish gray "Coalburg" sandstone. It was noted during our investigation of July 2nd that this sandstone roof was holding up solidly in spite of the hot fire and steam.

Floor: The pavement in No. 1 mine is a shale insofar as we could observe on July 2. Owing to the top falls incident to the fire, no exact observations could be made.

DEVELOPMENT AND SYSTEM OF WORKING

The development of No. 1 mine is small owing to the limited area of coal (see map). The system of working is the double entry, room and pillar method. Daily capacity about 150 tons.

The main haulage way and air course extend through the mountain for a distance of 600 feet with a 50 foot chain pillar. Two pairs of right butt entries are driven at about right angles off these main entries; also two pairs of left butt entries, which are driven in for a distance of 700 and 600 feet, respectively, off the main haulage way. The first left entries are driven within 20 feet of the outcrop, which circumstance was taken advantage of in recovering the bodies of the five victims of the fire (See map).

Mining: The coal is undercut throughout with Sullivan and Jeffrey electric chain machines.

Explosives: Black powder is used in shooting down the coal.

Electric equipment: One Westinghouse generator 300 K.W., 275 volts D.C., 1090 amperes, 150 R.p.m., and one General Electric generator, 275 volts, 800 amperes, 200 R.p.m., installed in the power plant in the valley below the mines furnish the power for motor haulage and cutting machines, as well as for two electric fans. Two Houston, Stanwood & Gamble boilers, 150 H.P. each, furnish the steam for a pair of Ball engines. The ~~tail rope~~ ^{*incline plane*} haulage system up the mountain side is driven by the electric power of these engines, also the endless belt conveyor, which brings the coal to the tipple plant, where it is picked and washed before being loaded for the market.

Haulage: Two General Electric motors, 8 tons, 115 amperes, 220 volts, and one Westinghouse, 12 tons, compose the haulage equipment at the mines.

Wooden cars are used, with a capacity of two tons. The track gauge is 48 inches.

Lighting: The miners use open lights exclusively, mainly carbide lamps. Electric lights are also installed along the haulage entries in the mines

Ventilation: A Robinson steel fan, 44 inches in diameter, was installed inside a frame building near the aircourse opening of the lower mine, with a frame air chute 6'x6'x115' long extending up the hillside to the aircourse opening of No. 1 mine, (see Sketch "A"), at a vertical distance of 58 feet above. This fan was being used as a blowing fan at the time of the fire, and was driven by an Allis-Chalmers electric motor, 30 H.P., 275 R.P.M., 250 volts, with a pulley of 10 inch diameter making the belt connection to the fan pulley of 24 inch diameter. The volume of air being forced into Mine No. 1 at the time of the fire was probably 15,000 cubic feet per minute. This fan was also used to ventilate the lower mine, where a sliding door regulated the amount of air as required. However, as no men were working in the lower mine at the time of the accident, and none had been working there for some months previous to the accident, Deputy Inspector Lambert stated that only a few thousand cubic feet of air was being furnished the lower mine, or simply enough to permit the pumpman to make his rounds each day.

Mine No. 1 was ventilated by a continuous air current, there being no splits. With the main aircourse as the intake, and the main haulage way as the return, wooden brattices in the crosscuts between the parallel entries, and wooden doors between the butt entries, served to direct the air current in its proper course, as plainly shown upon the mine map accompanying this report.

Drainage: Mine No. 1 by reason of its elevation is readily drained by ditching and no pumps are required. Mine No. 2, in the Winifrede seam, the work-

ings of which are directly underneath mine No. 1, is also easily drained with several hand pumps.

Fire protection: As the fan house and air chute, both wooden structures, were completely destroyed by the fire of June 30-July 1, we could not ascertain on our inspection of July 2nd whether or not fire extinguishers had been installed in or near these structures, but there was no evidence of fire protection to be seen at the other buildings adjacent to the mine openings, excepting water buckets at the blacksmith shop and motor repair shop. During our investigation of July 2nd, three fire extinguishers were noted in the motor shop, but these had evidently been brought up from the power plant in the valley below and used in fighting the fire. In their testimony at the Coroner's inquest, neither night boss James Clarke nor J. R. Hamilton, (the only two men who were present when the fire started), mentioned the use of water or fire extinguishers in attempting to subdue the fire; so that it would seem that neither protection was near at hand at that time.

Men employed: On the day shift there were usually 22 men employed in Mine No. 1; so it is fortunate that such a fire did not occur during the day.

STORY OF THE FIRE.

The fire started shortly after 11:30 P.M. Night Boss James Clarke and J. R. Hamilton, a demonstrator for the Sullivan Machinery Company, had come out of the mine at 11:30 P.M. to secure some oil and were sitting in the mine foreman's office, 300 feet distant from the fan house, eating lunch. The last places visited by Clarke and Hamilton before they came out of the mine were rooms 5 and 6 off the first left entry - where the 5 night men were working; the two Lyons brothers were running a machine in room 6 and Grover Seibolt,

James Collins, and Ben James (colored) were preparing shots and laying track in room 5. Neither Clarke nor Hamilton are certain as to the exact time they discovered the fire, but probably about 11:50 P.M. Clarke glanced out of the window of the mine foreman's office and saw flames issuing from the fan house.

Clarke and Hamilton immediately ran to the fan house and endeavored to enter and stop the fan, but the fire had already gained too much headway,- they could not enter the building. They then endeavored to break the connection of the wire (to the fan) at the point it joined the trolley wire, but they failed also in this. The fan continued to operate and the wooden air chute extending up to Mine No. 1 was already burning fiercely, the fan forcing all the smoke and heat directly into Mine No. 1; so that their next thought was for the safety of the five men inside the mine. They ran up to the pit-mouth of the haulage way of Mine No. 1, (return air), and found hot smoke and gases issuing in large quantities from this opening. Two times they endeavored to enter this haulage way and reach the mouth of the first left entries, (see map), 100 feet distant, but the smoke was so hot and noxious that they could not proceed into it more than 40 feet. They then ran down to the mine foreman's office and telephoned down to the town for assistance. Meanwhile the flames had enveloped almost the entire air-chute, 115 feet in length, and even after the fan stopped running the powerful up-draft from the flames continued to force the smoke and flame into the main air course of Mine No. 1.

Alleged causes: As heretofore stated, the fire originated in the fan house, but the cause has not been ascertained. At the Coroner's Inquest held July 2, at Williamson, W. Va., various theories were advanced. Mine

foreman Evan Thomas testified that there had been a wooden floor in the fan house, but he had never seen any accumulation of oil or grease there. His opinion was that the fire originated from an electric wire inside the fan house.

James Clarke, night boss, testified that he had charge of this electric fan at night, but never inspected it unless the power was cut off; also that it was the duty of the electrician to oil and repair the fan, which ran continuously day and night. His opinion was that a short circuit in the wiring or starting box might have caused the fire. Two holes for the wires were bored through the plank wall of the fan house, and the starting box was about one foot from the wall. No supplies were stored in the fan house excepting bolts and fittings for the Sullivan undercutting machines. Nobody to his knowledge had entered the fan house on the night of the fire.

J. R. Hamilton, demonstrator for the Sullivan Machinery Company, testified that he had been inside the mine with night boss James Clarke from 5:30 P.M. to 11:30 P.M. on the night of the fire. The air current seemed very good inside the mine, and when they came outside together at 11:30 P.M. they had noticed nothing wrong as they walked past the fan house. In his opinion a short circuit in the wiring might have caused the fire in the fan house.

E. C. Lambert, District State Mine Inspector, testified that upon his arrival at the mine, 2:50 A.M. July 1st, the fan house and air chute had burned completely to the ground; so that he was not certain as to the cause of the fire. In his opinion the fire might have started from a hot bearing, an arc from the starting box, or a "partial" circuit on the wiring, as the fan continued to run for a considerable period after the fire had started, which would not have been the case if there had been a short circuit in the wiring. In his opinion all fan houses and air chutes should be constructed of non-combustible material.

Work of recovery: Upon the arrival of District Mine Inspector E. C. Lambert from Williamson, W. Va., at 2:50 A.M. July 1st, (Three hours after the fire had started), he found that the fan house and air chute had burned completely to the ground, fires were burning fiercely in both air course and haulage way, and also in the air course of No. 2 mine underneath, and all attempts of rescue parties to enter Mine No. 1 had failed.

Meanwhile another electric fan had been hauled around the mountain side from Mine No. 4 opening, Winifrede seam, (see "E" on mine map), and Inspector Lambert had this fan set up at the mouth of the main haulage way (marked "C" on mine map) and run as an exhaust fan,, with the door open. This made the main haulage opening on the other side of the mountain the intake (marked "D" on mine map), the mouth of the main airway (marked "B" on map) having been bratticed up with sheet iron plates and earth. Inspector Lambert then led a rescue party into the mine through the main haulage opening at "D", thus going in with the intake air current, and they were able to proceed for 350 feet to point marked "F" on mine map. Further progress was impossible as there was a fierce fire burning 60 feet ahead at the mouths of the first left entries, (in which entries the five entombed men had last been seen). Inspector Lambert then returned with his party and re-closed the door at the north opening of the haulage way, "D".

It was then decided to drive a manway into the mountain side from the outcrop of the Coalburg seam into the face of the first left air course (marked "H" on mine map). Accordingly mining engineer Maurice extended a survey line around the thickly wooded mountain side (using carbide lamps), from pit mouth "C" to a point opposite the face of the first left air course, "H"; and the work of excavating this manway was commenced at 4 A.M. July 1st, and completed at

1:00 P.M., nine hours afterward. Many miners volunteered and the work was pushed as rapidly as possible in one hour shifts. The horizontal length of the manway, when completed, was 27 feet, width 4 feet, and height 5 feet, and many obstacles were encountered on account of the rough character of the ground.

Upon the completion of this opening, (see "H" on map), it became an intake, as the newly installed fan was exhausting at opening "C", and all other openings were closed. Inspector Lambert, after a preliminary examination with safety lamps, formed a rescue party to enter the first left entry through the newly made manway. Their first work was the erection of a tight canvas brattice across the first left air course at a point marked "K" on mine map. The purpose in this was to carry the intake air from the new opening through the last breakthrough and eastward along the first left entry, for it was surmised that the five entombed men would be found somewhere near rooms 5 and 6 off the first left entry, where they had last been seen by night boss James Clarke and J. R. Hamilton.

After waiting for 30 minutes to permit the fresh air current to force out the heavy smoke and gases from the first left entry, Inspector Lambert led a party of six men into the first left entry. It was still somewhat warm and smoky as they advanced for a distance of 300 feet to the mouth of room 6, (see mine map). A hasty advance was then made into the face of room 6, 100 feet, and the dead bodies of Harry Lyons and Marion Lyons were found beside the cutting machine. Harry Lyons was lying face upward with his head against the machine truck, and his brother Marion was lying face downward across Harry's body. Neither body was burned at all, and it appeared that both men had fallen in their working positions, having apparently made no attempt whatever to escape. The reverse lever on the Sullivan undercutting machine was found open,

the men had not even had time to throw this lever. The first volume of smoke which the air current carried in upon these men was certainly very noxious, to have overpowered them so suddenly. Inspector Lambert stated that on this first exploration the atmosphere in rooms 5 and 6 was very hot and thick, extinguishing several safety lamps, but with carbide lamps they proceeded to the face of the room.

Room 5 was next explored by going through the crosscut from room 6, (see mine map), and there were found the three bodies of Grover Seibolt, coal shooter, James Collins, coal shooter, and Ben James (colored), trackman, close together along the right rib 15 feet from the face of the room. The body of Seibolt was found face down, nearby the body of Collins face upward, while the body of James was found in a sitting posture against the rib. None of the bodies were burned at all, and from the positions in which they were found it would seem that none of the men had made any move to escape from the room, the gases having apparently suffocated them all at the places at which they were working.

Inspector Lambert and his party at once commenced carrying out the bodies to the surface through the newly made manway, and by 2:30 P.M. all five bodies had been recovered.

The mouth of the manway was again bratticed up and the fan at pit-mouth "C" (see map) reversed and run as a force fan. The work of fighting the fire was then commenced at "C" pit-mouth with the intake air. Meanwhile a large electric pump from Vivian, W. Va., from the Bottom Creek Coal & Coke Co. had arrived by railway and had been hauled up the mountain side and installed within and near the lower mine entrance. An accumulation of water in the No. 2 mine was made available for fire fighting. The fire in the lower mine had been

extinguished by the use of hand pumps and water buckets, and all attention was now given to fighting the fire in the upper, or No. 1 mine, which was a very hot and stubborn one, as noted by Messrs. J. W. Paul, H. D. Mason, Jr., and W. J. German, of the U. S. Bureau of Mines, upon their arrival at the mine at 7:00 A.M., July 2.

As per a letter received by J. W. Paul from President S. W. Patterson of the Sycamore Coal Co., this fire was finally extinguished on July 7, after six days' fighting.

Air samples: Air samples were collected by Messrs. Mason and German at pit-mouth "B", and 100 feet inside pit-mouth "C", at which point the smoke was very hot and thick.

Extent of fire: From all indications the fire extended into the main haulage way and main aircourse of Mine No. 1 for a distance of over 150 feet. The wooden door and brattice were destroyed in the first two crosscuts, also the two doors between the first left and first right entries, respectively. At the time of our inspection on the morning of July 2nd, the fire fighting crew had reached the first crosscut on the main haulage way and were directing the water from their hose line through this crosscut into the main airway. A canvas brattice had been erected across the main haulage way inby this first crosscut. The atmosphere inside this canvas brattice was very smoky and hot, apparently at least 130° F., indicating active fire inby on the haulage way.

Personnel: J. W. Paul, H. D. Mason, Jr., and W. J. German arrived at the mine at 7:00 A.M., viewed the bodies of the five men who had been killed, and investigated conditions inside and outside the mine until 11:30 A.M. The Coroner's inquest was then attended at Williamson, W. Va., from 1:30 to 3:30 P.M. In making this investigation valuable cooperation was given by S. W.

Patterson, G. S. Patterson, James Clarke, and Evan Thomas, of the Sycamore Coal Co., and by Chief Mine Inspector Earl A. Henry and his deputies, E. C. Lambert and Lawson Blankinsopp.

On the morning of July 1st at Pittsburgh, Pa., headquarters, a rescue crew of eight men,- H. D. Mason, Jr., H. I. Smith, A. J. Strane, H. D. Jones, W. A. Raudenbush, W. J. German, G. E. McElroy, and E. W. McCullough, was dispatched with ten sets of breathing apparatus via the B. & O. R. R. However, as word was received that all men were out of the mine, this party was recalled at Parkersburg, W. Va. J. W. Paul proceeded by a later train, taking a different route, and overtook Mason and German at Kenova, W. Va.

Brief resume of facts:

1. Fire originated about midnight of June 30th in a wooden fan house, enclosing an electrically driven force fan.
2. Fire was rapidly communicated to an ascending wooden air-chute 6' x 6' x 115'.
3. Both fan house and air-chute were practically destroyed in less than one hour's time.
4. Five men were working inside the mine.
5. Working place of these five men was 4500 feet distant from the fan, measured along the course the air traveled.
6. These men apparently received no warning, but were suffocated almost instantly.
7. All attempts by rescue parties to enter the mine proved futile.
8. Another fan was installed at the mouth of the main haulage way.
9. A manway was driven from the outcrop 27 feet to the face of the

first left entry and the five bodies recovered 14 hours later.

10. The fire was finally extinguished on July 7th after a seven days' fight.

Note:- The gases probably reached the men about 20 minutes after the fire started.

CONCLUSIONS

All fan houses and air chutes should be constructed of non-combustible material.

All mine fans should be examined by a competent man every one-half hour or oftener.

Efficient fire fighting appliances should be installed and be ready for immediate use where wooden structures are in service.

Oxygen breathing apparatus should be installed at all mines.

Stoppings and mine doors should be constructed of non-combustible material.

A telephone system should be installed in all mines or, where electric power is used, the shutting off of the power should be a signal for the men to come out of the mine.

Respectfully submitted. .

J. W. Paul

Mining Engineer.

H. D. Mason

Asst. Mining Engineer.

W. J. Lerman

Foreman Miner.

Pittsburgh, Pa.,
July 14, 1914.

Western Union Telegraph

H. M. Wilson

Engineer in Charge.

Pittsburgh, Pa., July 1,
Superintendent, Norfolk & Western Railroad, Kenova, West Va.

Party of six rescue men under Engineer Mason will
arrive Kenova eight forty tonight. Can you send them special
to Williamson account five men entombed at mine fire. Answer.

BUREAU MINES.

W

CONFIRMATION

Western Union Telegraph

H. M. Wilson

Engineer in Charge.

July 1, 1914.

H. D. Mason, Bureau Mines, Baltimore & Ohio train 719,
Parkersburg, W. Va.

Have wired Superintendent, Norfolk and Western
Kenova, directing to haul you special to Williamson. You
wire him or Huntington any further instructions. Paul will
join you via Columbus.

Wilson.

CONFIRMATION

Western Union Telegraph

H. M. Wilson

Engineer in Charge.

July 1, 1914.

Superintendent, Sycamore Mine, Williamson, West Virginia.

Engineers Paul and Mason with rescue crew of eight reach Kenova eight forty tonight, enroute Williamson. Have ordered special from Kenova. Ask Norfolk and Western to rush if necessary.

Wilson.

CONFIRMATION

H. M. Wilson

Postal Telegraph

H. M. Wilson

Engineer in Charge

July 1, 1914.

Bureau Mines, Washington, D. C.

Fire, Sycamore Mine, Williamson, West Virginia, reported by Associated Press four fortyfive a. m. Following rescue crew left via Baltimore and Ohio ten a. m. Will reach Kenova eight forty tonight, Williamson three thirty tomorrow morning. Mason, Smith, Huw Jones, Raudenbush, McElroy, Strane, McCullouch.

Associated press reported eleven a. m. five men still in. Have wired Norfolk and Western to send rescue crew special from Kenova on arrival.

Wilson.

cc Mr. Rice

cc Mr. Paul.

Pittsburgh, Pa., July 1, 1914.

Memorandum

Associated Press reports at noon (July 1) that they had telephone communication from Huntington that their representative had been in direct communication with Williamson, W. Va., and the information given was that there were 20 men in the mine yesterday when the fan house burned at the mouth of the drift, that 15 of the men escaped leaving 5 men still in the mine; that they had several lines of water hose installed and were fighting the fire from the front side and that men were engaged in the rear part of the property in an effort to get ^{through} the drift or shaft opening; that additional pumps were being rushed to the scene of the fire. A report received to-day at 10 o'clock at the Pittsburgh office from Williamson stated that the fire apparently was increasing in intensity, and that Inspector Lambert was on the ground.

Received at 4:30^{am} from associated Press fire
at Sagamore mine 4 men out
yesterday afternoon 30 more
entombed. Randerbush

Received at 5 a m July 1 -
from ass Press mine fire still
burning only 5 men inside
fighting fire short circuiting of wire
caught fire 5 men inside of it
working at fire associated Press say they
report from mine they may be
lost.

Randerbush

5:05 a m

Handwritten notes in the right margin, including the name "Randerbush" and some illegible scribbles.

June 30, 1914.—James Collins, 28, Shot Firer, American;
June 30, 1914.—Ben James, 29, Trackman, Negro;
June 30, 1914.—Henry Lyons, 22, Machine Runner, American;
June 30, 1914.—Marion Lyons, 19, Machine Helper, American;
June 30, 1914.—Grover C. Seabott, 23, Shot Firer, American; Cinderella Mine, Sycamore Coal Co. The fan house caught fire which, in turn, fired the timbers in drift mouth igniting the coal and the fumes and smoke were forced into the mine asphyxiating the above named persons.