Standard Pocahontas Mine Disaster Documents
Standard Pocahontas Mine
Standard Pocahontas Fuel
Welch, McDowell County, WV
Accident date: August 1, 1911
Number of items: 5 correspondence, 1 map, 4 photos, 1 news clipping, 1 report, 8 telegrams
Material types: correspondence, maps, photos, news clippings, reports, telegrams
Important persons mentioned: JT Ryan
Historical note: An explosion occurred while 9 men were in the mine. One was found dead from violence and burns, the others were brought out alive but seriously burned; 5 died later. The mine was being developed and no coal had been shipped. After shooting 3 holes in the face of 1 entry the foreman and another man reconnected the electric light wires used for illumination. One bulb did not light and when it was screwed in the glass broke causing an arc that ignited gas present from audible feeders. Ventilation was by temporary cloth brattices down the shaft and up the entry to the face; a steam jet at the shaft bottom induced circulation.
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Correspondence

Date	To/from	Subject	Size
8/4/1911	Chief clerk/engineer in charge	Suggestions on how to communicate with the chief clerk, and discussing plans	2 pages
7/13/1913	Chief mining engineer/Mr. Paul	Attached are duplicate copies of the BOM report by JT Ryan	1 page
8/7/1911	Mr. Paul/ JWP	Discusses received telegrams claiming no help was needed	1 page
8/2/1911	n/a/JWP	Report of accident and telegram updates	1 page
8/27/1913	Director/Jones	Letter accompanying copy of official	1 page

		report by JT Ryan	

Telegrams

Date	To/from	Subject	Size
8/2/1911	Bureau of Mines/JWP	Request for assistance	1 page (2 copies)
8/2/1911	JW Paul/Daily Telegraph	Three men killed 6 injured	1 page
8/3/1911	BOM/standard pacific fuel co	No assistance necessary	1 page
8/2/1911	Government rescue/Wilson	Telegraph undelivered	1 page
8/7/1911	Bureau of Mines/standard pocahontas fuel	Location of explosion	1 page
8/7/1911	Paul/Ryan	Mine location	1 page
8/2/1911	Wilson/Manning	Associated press reports explosion	1 page
8/2/1911	Engineer in charge/Manning	Enclosing copy of telegram	1 page

Other

Date	Type	From	Subject	Size
8/7/1911	Map	BOM	No 2 shaft Standard Pocahontas Mine	1 page
8/2/1911	Picture	n/a	People	1 page
8/2/1911	Picture	n/a	Ropes	1 page
8/2/1911	Picture	n/a	Mine	1 page
8/2/1911	Picture	n/a	People2	1 page
7/12/1913	Report	JT Ryan	Official report of accident investigation	28 pages
n/a	Newspaper clipping	n/a	4 miners killed; 9 hurt	1 page

COPY.

Western Union Telegraph Company

Van H. Manning Acting Director.

August 2, 1911.
(Phoned from Mr. Manning's residence at 2:45 a.m.)

Wilson, 630 Grove Street, Sewickley, Pa.

Associated Press reports explosion at Shannon, forty miles from Bluefield, West Virginia. Four killed, nine injured. Unable to learn if any miners are entombed. Reports meager.

Manning.

Western Union Telegraph

Bureau of Mines, Pittsburg, Pa.

Pittsburgh, Pa=, August 2, 1911.

Standard Pocahontas Fuel Co=, Columbuas Ohio.

Can the bureau of mines be assistance with rescue equipment.

Bureau of Mines.

J. W. P.
Jun C.S.

Confirmation 9:35 Am

Western Union Telgraph

Bureau of Mines. Pittsburg, Pa.

Pittsburg, Pa., August 2, 1911.

Standard Pocahontas Fuel Co., Shannon, W.Va.

Can the bureau of mines be assistance with rescue equipment.

Bureau of Mines.

J.W.P
per C.V.

Confirmation 9:35 am

REFER TO

DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

WASHINGTON

OFFICE OF THE DIRECTOR

August 2, 1911.

Mine Explosion at Shannon, Pa.

Engineer in Charge:

I enclose herewith copy of telegram sent you this morning at 2:45 o'clock. It was 'phoned at that time from my residence to the Western Union office here. Please advise me as to the time when it was received by you at Sewickley.

Very truly yours,

Acting Director.

4179

Form 165

THE WESTERN UNION TELEGRAPH COMPANY.

INCORPORATED

24,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD.

This Company **TRANSMITS** and **DELIVERS** messages only on conditions limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of **Unrepeated Messages**, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after the message is filed with the Company for transmission.

This is an **UNREPEATED MESSAGE**, and is delivered by request of the sender, under the conditions named above.

ROBERT C. CLOWRY, President and General Manager.

Aug 3 - 8 05

RECEIVED at 11

NOTICE

THIS TELEGRAM WAS TELEPHONED AT ..... M.

4 Welch Wva Aug 2-11

Bureau of Mines

Thanks for offer of assistance

It is unnecessary all moved

recovered

Standard Coal Fuel Co

THE WESTERN UNION TELEGRAPH COMPANY.

INCORPORATED

24,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD.

8 10

RECEIVED at '20 GR

2 Bluefield Wva Aug 7-11

Paul, Bureau mines

Mine located one mile west welch on Npw met nicolson address me welch.

Ryan.

8/8/11

25,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD

RECEIVED AT 23 Blue 8 15

AUG 7 1911

9 Welch Wva Aug 6-11

Bureau of Mines

Pgh Pa

Explosion occured in connecting

NOTICE
THIS TELEGRAM WAS TELEPHONED AT .... M

10

Form No. 101. 9 43/am

The Western Union Telegraph Company,

(INCORPORATED)

..................190

M Wilson J Sewickley
Chge Bureau of Mines

Your dispatch dated Aug 2

to Geovernment Rescue Car
Beaverdale Pa

is undelivered.

Reason: Car left beaverdale early this am & is attached to train no 3 West for Latrobe

Manager.

N E Church

Office.

N. B.—Changes in the address must be paid for at the usual rates.

MR. PAUL

J W Paul
c Mine Rescue Station
Three men killed and six injured
in standard Pocahontas explosion
no need of aid as all men were
gotten out within an hour after
explosion
Daily Telegraph Ptg Co

HMW/RC

August 4, 1911.

4177 SUBJECT: Mine Explosion, Shannon, Pa.

Chief Clerk:

Replying to yours of August 2nd, the watchman in the Bureau of Mines called me on phone at about 3:00 A. M. August 2nd. The telegram to which you refer as having been sent at 2:45 A.M., was phoned me at about 7:00 A.M., and delivered at 8:25. This is due to the fact that the Sewickley office is not open all night.

Heretofore, messages addressed to me from Washington to Sewickley at night have been received by the Pittsburg general office and phoned to me thence.

I would suggest that you hereafter invariably wire me, whether during or after office hours, at the Bureau of Mines, Pittsburg. There is a standing order with both telegraph companies when they receive messages after office hours to phone them to my Sewickley residence, and this has invariably been done.

Further in regard to this disaster, I immediately wired or phoned cars 6 and 7 to be prepared to proceed to Shannon if needed, and tried to get into communication with the officials of the Standard Pocahontas Fuel Company. By

about 5 A.M. I received word through Bluefields that the mine was only a development opening, from which it appeared to me unlikely that the bureau could be of any assistance.

Later in the day Mr. Paul got a telegram through to them, but not until the following morning did we receive acknowledgement to the effect that three men were killed and six injured and that everybody was out of the mine and we could be of no assistance, and thanking us for our offer.

Very truly yours,

Engineer in Charge.

M E M O R A N D U M .

Pittsburg, August 2, 1911.

Standard Pocohontas Coal Co., Shannon, Near Bluefield, W.Va.

Explosion on night of August 1, 1911.

Press reported four killed, nine hurt.

Long distance telephone message with the ass't editor of Bluefield Telegraph at Bluefield, W.Va., at 10;30 A.M.reported:

Shaft mine 300 ft. deep.

Mine in only 300 ft.

No coal shipped as yet.

Coal opened No.4. Merely developing.

4 killed and several injured.

Do not know cause of explosion.

Inspector Nicholson at the mine.

Telephone line to mine out of order.

General Manager lives in Welch, W.Va.,- has gone to mine.

Will make effort to learn if rescue car is needed and wire Pitt sburg. Think all have been recovered.from the mine. x x x x

Pittsburg telegraphed the Company at Welch, W.Va. (No office at Shannon), asking if assistance is needed.

At noon no later confirmation.

Cars 6 and 7 ready if advised by wire, to move.

J.W. P.

8m

DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

PITTSBURG, PA.

IN ANSWERING REFER TO
No.

August 7, 1911.

Memo for Mr. Paul.

The following telegram was received at three p.m. August 2, dated Bluefield, W. Va.:

"Three men killed and six injured in standard Pocahontas explosion. No need of aid as all men were gotten out within an hour after explosion.

(SIGNED) Daily Telegraph Ptg. Co."

Which confirms the statement given above by the editor of the Bluefield Telegraph.

August 3 the following telegram was received:

" Welch, W. Va.,
Bureau of Mines,
Thanks for offer of assistance it is unnecessary all moved recovered. (SIGNED) Standard Poc. Fuel Co."

Mr. J. T. Ryan has been detailed to visit mine at Shannon with a view ot making a complete report on same.

J.W.P.

Pittsburgh, Pa., July 23, 1913.

Chief Mining Engineer:

Find herewith duplicate copies of report by Mr. J. T. Ryan on the explosion at Standard Pocahontas Mine near Welch, West Virginia, on August 1, 1911.

Mr. Ryan is to be commended for the manner in which he has prepared this report.

J. W. Paul

LMJ-RJM

August 27, 1913.

Subject: Report on explosion at the Standard Pocahontas Mine.

Director:

Herewith, I am submitting copy of a report by J. T. Ryan on the explosion at the Standard Pocahontas Mine near Welch, W. Va., on August 1, 1911, also Mr. Paul's letter of submission to the chief mining engineer.

Mr. Rice has, as yet, had no opportunity of looking over this report so it is possible that his comments thereon will be submitted at a later date.

Very truly yours,

L M Jones

REPORT

ON

THE STANDARD POCAHONTAS MINE EXPLOSION.

--0--

On the night of August first, nineteen hundred eleven, at eleven nineteen an explosion occurred in the Standard Pocahontas Shaft mine. There were nine men in the mine at the time of the explosion. Of these nine men one was dead when found. Death was due to both violence and burns. The other eight were brought to the surface alive but all badly burned; five of whom died later. The three survivors badly burned were taken to the miners' hospital at Welch, where they were interviewed by the writer.

Location - The Standard Pocahontas mine is located two miles west of the town of Welch, in McDowell Co., W. Va. The nearest town and post office is Welch.

Ownership - The mine is owned and operated by the Standard Pocahontas Fuel Co., Main Offices at Columbus, Ohio, and local office

at Welch. The Mine Superintendent is J. W. Vest.

Geology - The coal bed mined is one of the lower beds in the Pottsville Series of the Carboniferous age and is known as the Pocahontas No. three bed. It is the lowest workable bed in this section and lies only two hundred ninety feet above the top of the Red Mauch Chunk Shales. The dip of the bed is N. 45° W. and averages about 1.5% and is fairly regular throughout this section. The Pocahontas No. three bed has an average thickness of about five feet in this section. It has a soft, columnar and typical coking structure and is the most important coal bed in the Pottsville Series. A section of the bed and analyses of it are appended to this report.

Roof - Directly overlying the coal is a soft slate about ten inches in thickness. Directly above this is found two inches of coal then the main roof, which is a sandy slate. A bore hole section taken near No. one shaft is attached to the report.

Moisture - The coal and roof as shown so far by the development are naturally moist and the working places and entries are moist.

Gas - Gas is given off mostly from the coal and audible feeders were detected in many places. See Appendix for report on gas samples.

Description of Mine and Method of Operation - The Standard Pocahontas Mine is in the early stages of development. Two shafts, known as the No. one or Main Shaft, three hundred fifty-three feet deep, and the No. two or air shaft, three hundred sixty-four feet deep, have been sunk to the coal. No coal had been shipped from the mine as the foundations were just being laid for the tipple which will be of steel construction. The powerhouse was about completed and the permanent hoisting equipment for the No. one shaft was installed except the cage; a temporary wooden cage being in use. The hoisting equipment for the No. two shaft was the same as was used in the sinking of the shaft and consisted of a steel bucket about three feet in depth and diameter, and operated by a small hoisting engine.

The two shafts are two hundred ten feet apart on a line N $41^{0}01$ W or the approximate dip of the measures.

From the bottom of each shaft an entry had been started N 48° 59' E. or at right angles to the line connecting the two shafts. These are to be the main entries for the development of the property. These are to be driven on approximately the line of strike and parallel to the property line. At a point on these main entries forty-two feet from the shaft bottoms, entries have been turned at about right angles and driven toward each other to connect the two openings. It was in this entry in the No. two shaft where the explosion originated and as the No. two shaft was the only one effected by the explosion it will be the only one referred to in this report from this on.

Mining - The coal in the No. two shaft was undercut by a Harris punching machine,was shot down and loaded at the face into the hoisting bucket which was moved to and from the shaft bottom on a truck.

Explosives - Permissible explosives Monabel and Colliers were used exclusively and were detonated by Victor double strength detonators. The maximum diameter of drill hole is one and one quarter

inches. The maximum charge of explosive used in each hole is two sticks. Clay and loam is used for stemming and a steel bar used for tamping. The explosives are carried into the mine by the men themselves.

Electric Equipment and Lighting - The electric equipment at the No. two shaft consisted ofan old generator rated as an eighty-light machine. Delivering forty amperes at a voltage of one hundred ten. The man in charge stated that it usually operated under a voltage of ninety. This can hardly be correct as the sixteen c.p. lamps that were being used would give a very dim light under a voltage of ninety.

The electric wires were carried down one compartment of the shaft to the bottom where , mounted on one of the shaft bottom timbers, was a single throw switch. Lighting wires were connected up to this switch and carried along the rib to the face of the entry. Three sixteen c. p. lights were strung at a distance of about thirty feet apart along the entry.

A photograph of the wires and bulbs showing their condition

after the explosion is attached to this report. Just before firing, the lighting wires were carried back to the switch at the shaft bottom and detached and the firing wires connected up in their place. A few locked Wolf safety lamps were used.

Ventitlation - No permanent ventilation system had been established in the No. two shaft. The shaft was divided into two compartments by brattice cloth and a line of brattice cloth was carried up both entries from the shaft bottom. Ventilation was secured by means of a steam jet at the bottom operating under a pressure of one hundred twenty-five pounds and was aided by the exhaust steam from the pumps at the bottom and other pumps at different levels in the shaft.

Humidity - The humidity of the mine was extremely high on account of the escape of the exhaust steam from the pumps and the use of a steam jet. This coupled with the high temperature made it extremely difficult for men to work in this shaft and for this reason there were nine men working at the face of the entry. They worked in shifts

of three and for fifteen minutes at a time.

The following humidity readings were obtained on the afternoon of August eight at the No. two shaft:

Time	Dry	Wet	Rel. Humidity	Where taken
1 P. M.	91½°	73½°	43%	Taken on surface
1.18 P.M.	93°	93°	100%	Main entry 25' away from shaft bottom.
1.45 P.M.	93°	92¼°	97%	Face of entry.
3.25 P.M.	89°	88°	96%	Near face of entry. 1 1/2 hrs. after steam jet and pumps had been stopped.

The following readings taken at No. one shaft on the afternoon of August nine.

Time	Wet Bulb	Dry Bulb	Rel. Humidity	Where taken
1.45 P.M.	72°	94°	34%	Top of No. 1 shaft
2.00 P.M.	75°	78°	87%	Near face of Main entry.
3.19 P.M.	74°	75°	96%	Main return near bottom of shaft.

Drainage - The shaft made a considerable quantity of water and waterrings were placed at fifty-five feet and one hundred twenty-five feet from the surface. At the top water ring there was installed air lift pump of six hundred gallons capacity and two Cameron steam

pumps of four hundred gallons and two hundred fifty gallons capacity. At No. two ring there was one steam pump of two hundred fifty gallons capacity. At the bottom of shaft there was one steam pump of one hundred gallons capacity.

Story of the Explosion - The day of the explosion was a clear warm day. The day shift had been working all through the day and no unfavorable conditions had been reported. The night shift of nine men had been at work for several hours. They were all working in the one entry that was being driven to connect the No. one shaft. The temperature was so high (93^0 wet bulb) at the face due to the steam jet and exhaust steam that the men could only work a short while and would then have to be relieved. This required a large number of men in the one entry to keep the work going continuously. The majority of the men employed on this shift had been employed by the Patterson Construction Co. of Pittsburgh in sinking the shaft and had been brought ~~then~~ there from Pennsylvania. The Patterson Co. had contracted to drive the entries until the two shafts were connected and the work was

in charge of Superintendent Upholster who had supervised the sinking of the shafts. John Smith was the foreman in charge of the night crew.

The face of the entry had been undercut to about a depth of five and a half feet and three holes had been drilled and charged with two sticks each of the permissible explosives and the shot firing wires connected at this end. The men then went back to the shaft bottom carrying the lighting wires and lights back with them and disconnecting these wires at the switch. The firing wires were then connected to the switch and the shots fired. Immediately after the shots were fired the compressed air was turned on the line leading to the face for the purpose of clearing out the smoke. This compressed air line operates the cutting machine.

A few minutes after this John Smith the foreman accompanied by Mr. Howard connected up the lighting wires and started for the face fastening the wires as he went. The last bulb was fastened to a cross timber about eight feet from the face. Smith then hallowed to Howard,

who had gone back a short distance on account of the smoke, to have the men at the switch throw in the switch. This was done and the bulb at the face lighted but the next one which was back about twenty-five feet did not light. Smith went back to this bulb and attempted to screw it in. Howard who was standing alongside of him had just turned his back to start out on account of the smoke and related to the writer that as he turned he heard glass break and the same instant he was enveloped in flame. He knew nothing more until he was brought to the surface.

Evidence of the Explosion on the Surface -

The explosion was plainly heard at the surface and the men there investigated and found smoke coming out of the shaft. The men working in the No. one shaft were then telephoned for and brought to the surface. Mr. Upholster who lives a couple hundred yards ffom the shaft heard the explosion and thinking something was wrong ran down to the mine. He took charge and lowered a safety lamp in the bucket and allowed it to remain in the bottom for a few minutes. When

raised it was still lighted. Ted Sweby, who had been called from the No. one shaft, asked for volunteers to go down with him. As no one volunteered he went down alone in the bucket. The cage landed on something soft and when Sweby stepped out he found that it was the body of Bannister. He loaded him in the bucket and brought him to the surface where he died about twenty minutes later. He then brought out Tucker, Fields, Howard, and Smith, having to carry the three latter some distance as shown by the map. Later with assistance the body of Hills and Arnold and Williams and Lilly were brought to the surface. Hills was the only one dead when found. He had a fracture of the right arm and left leg and was badly burned from the abdomen up. Arnold had a slight pulse when brought to the surface and died a few minutes later. Probable cause of death resulted from fracture on back of head. He had slight burn on the right side of face and neck. Bannister died about twenty minutes after he was brought to surface. Was badly burned about face and neck. Death caused by inhaling flame.

John Smith (Foreman) died in the hospital on August ten. Doctor reported that death was caused by inhaling flame as his throat was swollen shut. He was badly burned about the face and neck and his hair was all burned off.

Henry Lilly died August four. Was badly burned about face and neck. Right arm broken in two places.

Charles Fields died August eight. Casue of death--burns and exhaustion. Was badly burned about chest, face, arms, and hands. Right arm broken--both forearm and humurus.

The other three men were in the hospital at the time of this investigation and will recover. A photograph of these three was taken by the writer on the porch of the Miners' hospital at Welch on the afternoon of August 9.

obtained
Notes of evidence by Bureau of Mines Engineers.

On the morning of August two, Mr. Paul received a report from the Associated Press which stated that an explosion had occurred on the night of August one in a mine of the Standard Pocahontas Coal

Co. at Shannon near Bluefield, W. Va. in which four were killed and nine hurt. Being unable to locate Shannon Mr. Paul called the Bluefield Telegram on the telephone and received the following information:

"The mine is located near Welch and the General Manager lives at Welch. It is a shaft mine three hundred feet deep and mine only in three hundred feet. No coal had been shipped. Four were killed and several injured. Did not know the cause of the explosion. Inspector Nicholson at the mine but could not be communicated with as line was out of order. Will make effort to learn if rescue car is needed and wire Pittsburgh. Think all have been recovered from the mine."

Mr. Paul telegraphed the company at Welch, W. Va., asking if assistance was needed and also notified Cars six and seven to be in readiness to answer a call if wired to move.

At two P. M. of same day Mr. Paul received the following telegram from the Bluefield Telegraph Co.:

"Three men killed and six injured in Standard Pocahontas

explosion. No need of aid as all men were gotten out within an hour after explosion."

At eight five A. M. August three, the following telegram was received by Mr. Paul from The Standard Pocahontas Fuel Co. at Welch:

"Thanks for offer of assistance. It is unnecessary; all men recovered."

On August seven, 1913, the following telegram was received by Mr. Paul from the Standard Pocahontas Co. in answer to an inquiry of his asking for information regarding explosion and location of mine:

"Explosion occurred in connecting entry between two shafts. Will be working in same Monday night. Mine located two miles west of Welch, W. Va."

The writer was directed by Mr. Paul on August six to make an investigation of this explosion. He directed me to proceed to Bluefield and look up Inspector Nicholson and arrange with him to inspect the mine. The writer reached Bluefield on the evening of August seven,

having telegraphed Inspector Nicholson on the way and was met at the train by him. He arranged to accompany me to the mine on the following morning. On the morning of August eight the writer and Inspector Nicholson arrived at Welch and after much trouble secured a mule and buggy and drove to the mine where we were met by General Superintendent Vest and Assistant Superintendent Upholster. The rest of the day was spent in examining the No. one shaft, taking air measurements, gas samples, and coal samples. The descent was made in the bucket and at the time the pumps at the two water rings were not operating. Water was falling down the shaft from the rings in great volumes so that when we reached the bottom the bucket was filled with water above boot tops. The party consisted of Nicholson, Vest, Upholster, and the writer.

After about an hour and a half spent in the shaft all the members of the party had left on account of the high temperature except the writer, who remained down about three hours. Before I had completed taking the coal samples I entirely disrobed. It was a very good place for taking a Turkish bath.

The following day, August nine, was spent in making an examination of No. one shaft securing coal samples, air samples, and air measurements, taking photographs, interviewing the survivors and assisting the engineer in making a map for this report. Returned to Pittsburgh on the night of the ninth.

At the time of the investigation, which was seven days after the explosion, the damage to the mine had been repaired but the face of the entry had not been disturbed since the explosion. Mr. Cooper, a Mining Engineer, at Welch, made a survey with very complete notes on the day following the disaster. I obtained a copy of his map and this with the information I obtained is incorporated in a map attached to this report. From what evidence could be obtained it was learned that in the entry on the North side of the shaft all brattice cloth for conducting the air to the face was blown down. The brattice cloth dividing the shaft into two compartments was also blown out for a distance of twenty feet up the shaft. On the South side of the shaft no damage was done except that the line brattice was partly blown down.

The wires were up in this entry. No unusual conditions were found in this entry on the day following the explosion other than that gas was detected at the face.

At the face of the North entry it was found that the working face was sixteen feet wide. This was due to an apprehension that the entry being driven from No. one shaft was to their left. For this reason they widened out on the left and had undercut the left side for a width of about ten and a half feet and had fired three shots which did their work nicely as shown on the map by the pile of coal at the face. The explosion caused no damage at the face. A puncher board and four shovels were found just as they had been left by the workmen. The incandescent light suspended from the cross timber near the face and which was surrounded by a wire guard and was not damaged except that the tip of the bulb was broken off but the filament was not broken.

No. two bulb back a distance of about twenty-five feet from No. one and the onewhich probably caused the ignition was broken and

pieces of glass were still sticking in the socket. The bulb at the junction where this connecting entry turns off the main was not damaged at all. Some slightly charred dust was observed in the recesses of this junction and a sample of the dust taken, analysis of which is in the addenda. This was the only place in the mine where charred dust was observed. Inspector Nicholson maintained that previous to the explosion the line brattice had been carried so close to the rib on the return side that sufficient ventilation had not been maintained. Consequently after the explosion he had them change the line brattice to follow along the right rib so as to have the greater velocity on the intake air and also give a larger area. Mr. Vest, the Superintendent, claimed that there were places in the air way erected by Nicholson just as restricted as what were there prior to the explosion and if the explosion had resulted from this restricted air way then the same occurrence was liable to happen again even though the mine had been put in shape under the direction of Inspector Nicholson and pronounced safe.

To determine this point, measurements were made of the most

restricted area of the present air way and also of restricted sections of the old airway. These measurements are given on the map. The measurements given for the old brattice are by Cooper except at point marked "A" which appeared to be the most restricted point. The greatest area that was possible to have at this point was 8.5 sq. ft. That was only possible in case the prop to which the brattice was attached was set directly against the rail and also set in a vertical position. It not being possible to set the prop that close to the rail I should judge that the area here was not more than seven sq. ft. and was the most restricted point in the air way.

At point marked "B" which was the most restricted point in the intake of the present air way the measurements were as follows:

3 ft. wide by 4' 9" high, Area 14.25 sq. ft.

The velocity of the air at this point was taken when the steam jet was not operating but pumps running. These conditions were said to have prevalied at the time the explosion occurred. The velocity was found to be forty-five feet per minute, giving a total quantity of six hundred forty-one cu. ft. per minute. Velocity taken at the same

point when steam jet was in operation was one hundred eighty-two ft. per minute. Total quantity two thousand five hundred ninety-three cu. ft. per minute. On the return side of the temporary brattice erected by Nicholson a few feet away from shaft bottom measurements taken by Cooper and Vest and recorded in map give an area of only five feet six inches sq. ft. About twenty feet inside this point on the intake side the measurements taken by the writer were as follows:

Width six feet three inches; height six feet; velocity of air one hundred twenty-five ft. per minute. Total quantity of air four thousand six hundred eighty-seven cu. ft. per minute.

Conclusions and Lessons.

The explosion was caused by the ignition of gas by the breaking of an incandescent bulb. The gas probably was an accumulation of methane liberated by the three drill holes at the face and after the breaking down of the coal and also from the combustible gases liberated by the explosives. The amount of combustible gases from the latter would be small as both Monibel and Colliers give off little gas. The

ventilation at best was not very effective and the appliances for producing the ventilation may not have been in operation just prior to the explosion, though this could not be corroborated. Otherwise I don't see how an explosive mixture of gas could have accumulated twenty-five or thirty feet back from the face and on the intake where the ignition occurred unless this condition may have prevailed. On account of the large area of the intake air-way compared with the small area of the return in several places (one place the writer figured it could not have been more than seven sq. ft.) the velocity in the intake would be very low and when the compressed air was turned on the pressure on the return side due to the friction of the restricted air way might have been greater than the ventilating pressure on the intake side and consequently the gases and smoke forced out on the intake side by the compressed air.

This supposition is borne out by the statement of Howard who was with Smith and who had started out on account of the smoke being so thick just as the explosion occurred.

That it could have been an ignition of coal dust is, in the opinion of the writer, out of the question, on account of the wet condition and saturation of the dust as shown from the analysis of the dust collected at and near the point of ignition. A comparison of the volatile fixed carbon ratio from analysis of the face coal and dust is evidence of the dust having been little affected.

That these dangerous conditions existed was due partly to lack of experience on the part of the officials and miners. Due to their inexperience they did not comprehend the dangers incident to working a mine generating gas as freely as this one. Sufficient precautions were not taken in regard to the ventilation and the examination for gas especially before firing shots. The two Wolf lamps in the mine at the time of the explosion had both gone out some time before according to the evidence of the survivors so that no examination for gas could have been made before the shots were fired. The one lamp was suspended from a timber some distance back from the face so that it may have been extinguished by an explosive mixture prior to

the firing of the shots.

Another condition which existed prior to the explosion and which may have had some bearing on it is the fact that no provision was made at the mouth of the shaft for conducting away the return air and it could, therefore, mix with the intake air.

It must be admitted that conditions for working in the No. two shaft were extremely bad,in fact the worst that the writer has ever encountered and it was difficult to obtain or keep men of any type.

The bravery of Ted Sweby is worthy of mention. Going down the No. one shaft in the bucket under favorable conditions tries a man's nerve, yet he went down alone a few minutes after the explosion had occurred and without knowing what the conditions were like. Several of the survivors owe their lives to the quick action of Sweby.

Gas Samples.

Lab. No.	CO_2	O_2	CO	CH_4	N	Vel. of Air per min.	Quantity cu. ft.	Wet Bulb	Dry Bulb	Where Taken
1829	.05	20.42	0	.46	79.07	0*		92½	93	Taken at face of entry in No. 1 shaft where explosion occurred.
1830	.03	20.73	.00	.64	78.60			92½	93	Taken over pile of coal. Duplicate of 1829.
1831	.04	20.79	.00	.60	78.57	stationary	50	92½	93	Taken in same entry as above, back of cutter band.
1832	.41	20.71	.00	.20	78.68	Do	50	75	78	Face of entry in No. 1 shaft being driven to connect with entry in No. 2 shaft.
1833	.05	20.48	.00	.25	79.22	88'	7854	74	75	Main return at bottom of No. 1 shaft.
1834	.05	20.51	.00	.21	79.23	88'	7854	74	75	Duplicate of 1832.
1835	.06	20.31	.00	.90	78.73	stationary	--	75	78	Taken along rib 10' back of where sample No. 1843 was taken.

*This sample was taken about 12 feet beyond end of brattice around which 641 cu. ft. of air was passing per minute.

Notes regarding mine air samples.

That this coal bed gives off methane freely is shown by sample No. 1833. There being .25% methane in a volume of 7854 cu. ft. of return air in Shaft No. one. A map of this shaft was not obtained but the development is practically the same as in Shaft No. ~~one~~ two except that the main North entry is being developed along with the entry being driven to connect with No. one shaft. The writer was informed that when holes are drilled in the coal face that gas bleeds off with considerable force. Samples taken in No. two shaft show that with fair ventilation the methane is diluted below the point where it can be detected with a safety lamp.

Report of analyses of face coal samples and coal dust.

Lab. No.	Moisture	Vol. Matter	Fixed Carbon	Ash	Sulphur	Vol. Fixed Carbon Ratio	Fixed Carbon Vol. Ratio	Condition.
12512F	.70	15.81	76.01	7.48	.92	82.77	17.23	Air Dried
	3.68	15.34	73.72	7.26	.89	82.77	17.23	As received
		15.93	76.53	7.34	.92			Moisture free
12513F	.57	15.76	76.54	7.13	1.02	82.93	17.07	Air Dried
	2.36	15.48	75.16	7.00	1.00	82.93	17.07	As received
		15.85	76.98	7.17	1.02			Moisture free
12511F	.84	15.44	75.68	8.04	1.09	83.06	16.94	Air Dried
	13.43	13.48	66.07	7.02	.95	83.06	16.94	As received
		15.57	76.32	8.11	1.10	83.06	16.94	Moisture free

Sample No. 12512-F - Face coal sample cut from face of entry in No. two shaft being driven to connect with No. one shaft entry in which explosion occurred.

Sample No. 12513-F - Face coal sample cut from face of entry in No. one shaft being driven to connect with No. two shaft.

Sample No. 12511-F - Sample of dust collected from ribs and recesses along entry in No. two shaft in which explosion occurred. Mixed with this was some apparently charred dust.

These samples show the effect of complete saturation or humidifying of the air. The moisture content of the dust showing about ten parts more moisture than the face coal taken on the same entry.

The volatile fixed carbon ratio showed that the dust was but slightly affected. In fact the difference might not be greater than the allowable error in sampling and analysis.

Coal Sections.

A full section sample of the face coal was taken at the face of entry in No. two shaft being driven to connect with No. one shaft. The measurements were as follows:

Roof - Soft slate.

Coal laminated with Mother Coal	0' 6½"
Sulphur	0' ½"
Coal	0' 9½"
Bony	0' 4 "*
Coal	0' 3½"
Mother Coal	0' 1 "
Coal	2' 10"
Slate	0' ¼"
Coal	0' 1½"

*Note - Excluded from sample.

A full section sample of face coal was taken at the face of entry in No. one shaft being driven to connect with No. two shaft.

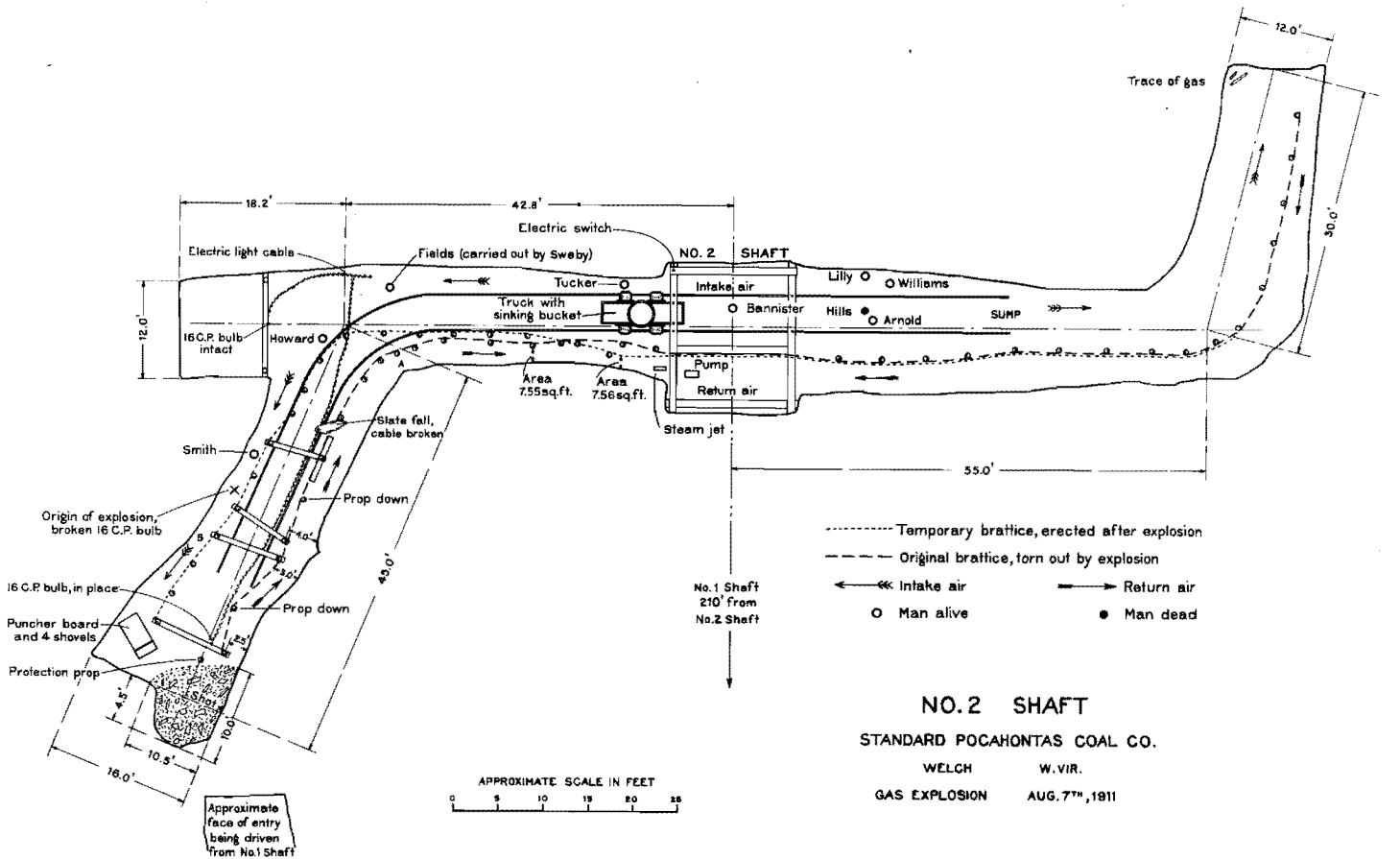
Roof - Soft slate.

Coal	0' 2"
Mother Coal	0' $\frac{1}{4}$"
Coal	0' $\frac{3}{4}$"
Mother Coal	0' $\frac{1}{4}$"
Coal	1'1$\frac{1}{4}$"
Bony	0'2$\frac{1}{2}$"
Coal	3' 4"

Total - - - - - - 4'11"

* Note - Excluded from sample.

Proximate analysis of foregoing sample, Laboratory No. 12513 F.

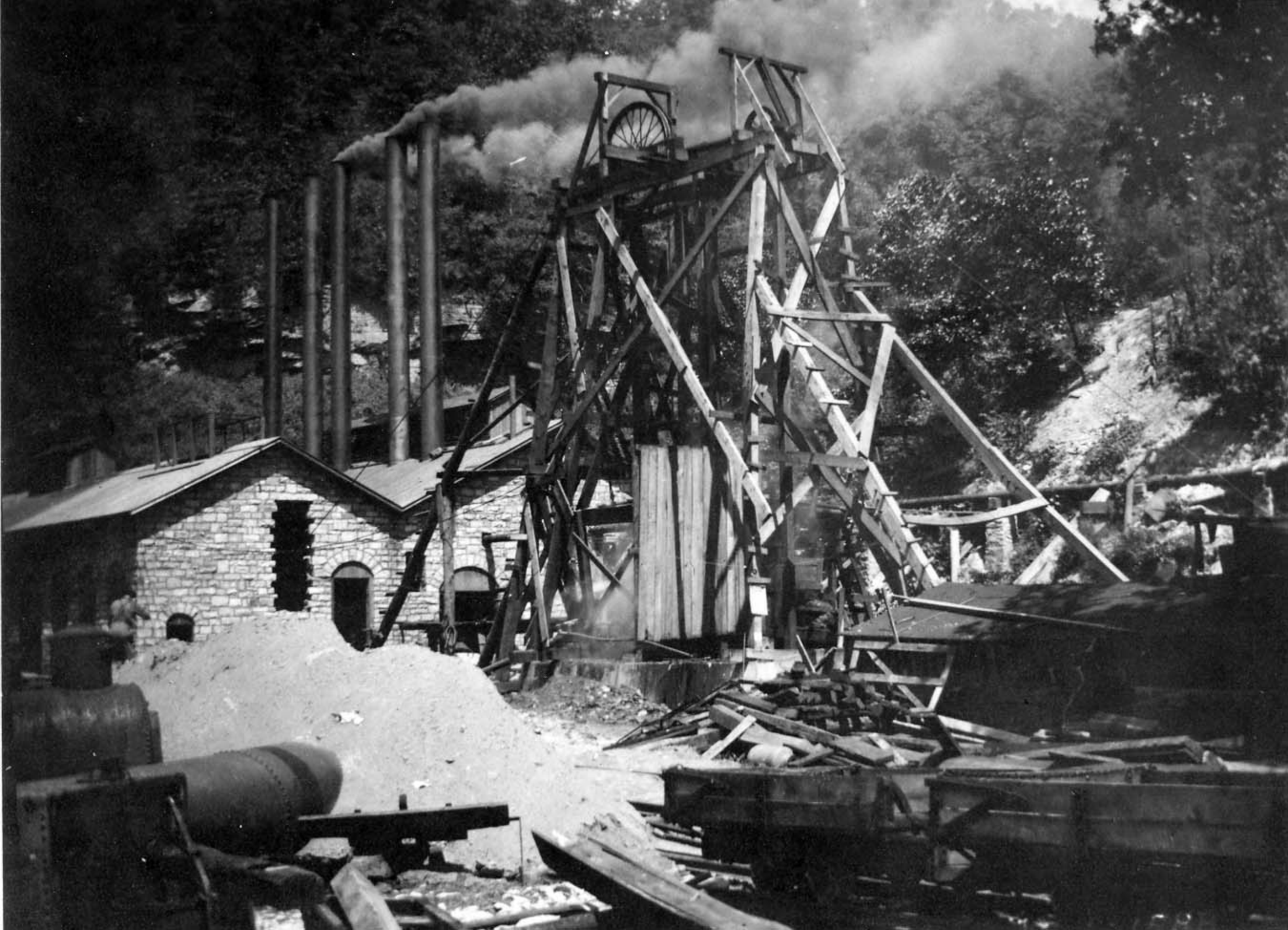


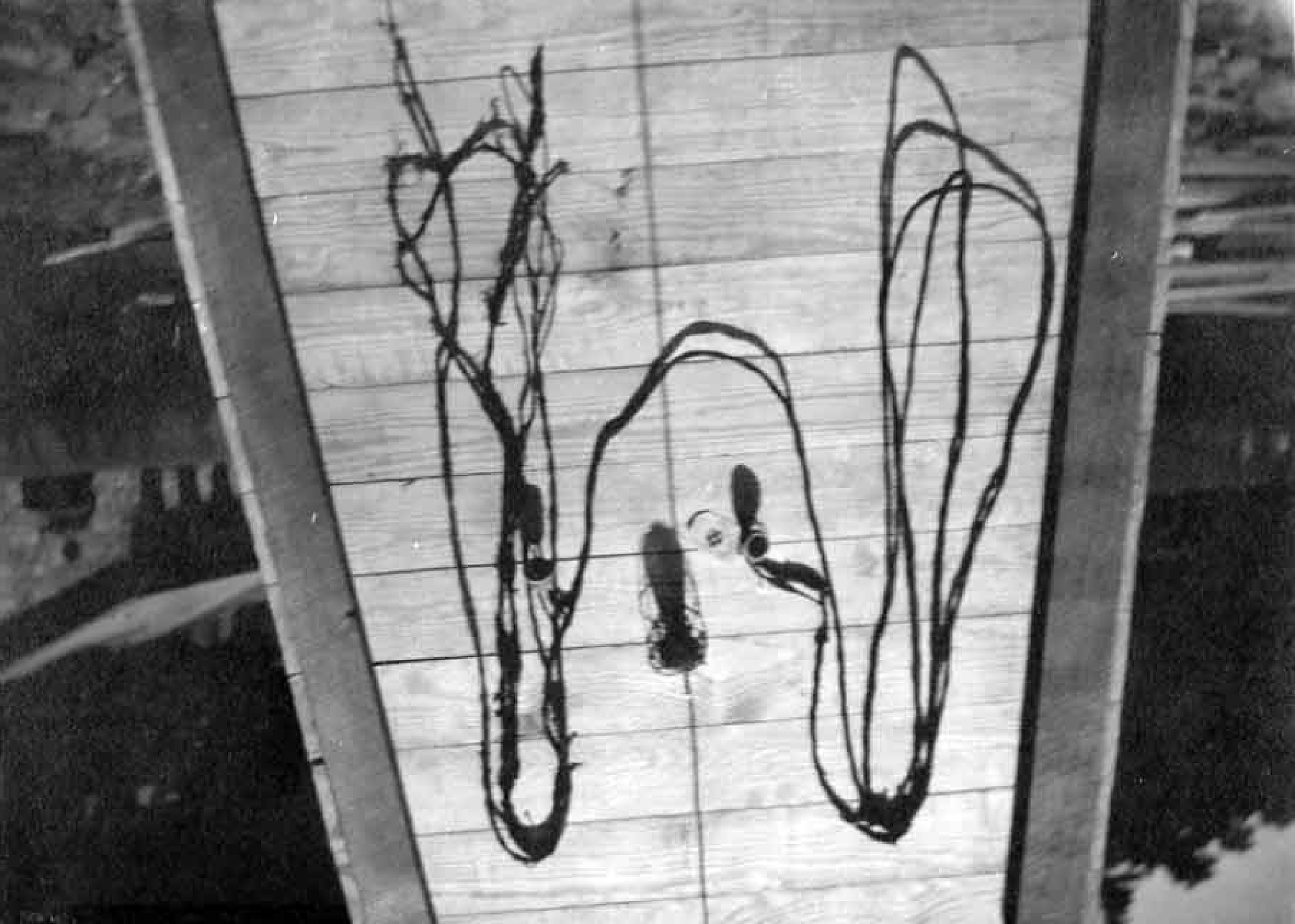
NO. 2 SHAFT

STANDARD POCAHONTAS COAL CO.

WELCH W.VIR.

GAS EXPLOSION AUG. 7TH, 1911





Foreigners Arrested.

warrants against the foreigners charging trespass. The entire 18 were arrested by Constables John Murray and J. E. Campbell and placed in the borough lockup. They will be given hearings today.

It is believed that some practical joker rented the house to the foreigners for a small consideration. The house is owned by Mrs. Anna E. Morris of Philadelphia, Pa.

4 MINERS KILLED; 9 HURT

Explosion in New Mine at Shannon, W. Va.

BLUEFIELD, W. VA., Aug. 2.—Four miners were killed and nine injured by an explosion a few minutes before midnight in the mine of the Standard Pocahontas Coal Company at Shannon. The names of those who lost their lives are not known here, nor is the cause of the explosion.

The mine recently began operations and had not yet begun shipments.