# Report on the Explosion in the Gates Mine of the H. C. Frick Coke Company Gates, Fayette County, Pennsylvania July 25, 1924

by

J. W. Paul
Chief of Coal Mining
Investigations

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APPENDIX

Report on the Explosion in the
GATES MINE
Of the H. C. Frick Coke Company,
Gates, Fayette County, Pennsylvania,
July 25, 1924.

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General Statement:

An explosion occurred in the Nos. 6 and 7 West Butts section of the Gates Mine at 7:30 P.M., July 25, 1924, resulting in the death of 10 men in the region of the part of the mine to which the violence of the explosion was confined. The explosion originated by the ignition of gas by an electric arc or spark from the "nib" of a machine cable where it was attached to the feed wire. An extensive fall in the robbed out section forced a body of gas into the nearby live workings and the violent rush of air swayed the machine cable which resulted in the electric arc which ignited the gas.

Six of the men were killed by the violence and heat of the explosion, while four succumbed to the afterdamp after having traveled a short distance from the places where they were at work. The night crews in other sections of the mine were not affected and had no knowledge of the explosion until informed by persons who came in after the explosion. A complete watering system for allaying the dust, the wetting of the coal before loading and wetting the places before firing shots was in use and one sprinkler was killed by the explosion while playing the hose on the ribs of a room. Coal dust became involved and extended the scope or area of the gas explosion. No rock dust was in use. One hundred electric No. 6

detonators and 45 sticks of Monobel No. 1 explosive were involved in this explosion but their destruction resulted from the flame of the gas and were not the initiator of the explosion.

Location of the Mine:

This mine is located 25 miles south of Brownsville in Fayette County, Pa., on the east bank of the Monongahela river and was opened by shafts in 1900.

Ownership and Officials:

The mine is owned and operated by the H. C. Frick Coke Company with general offices in the Carnegie Building, Pittsburgh, Pa., while the operating headquarters are in Scottdale, Pa.

The officials are:

| | | |
|---|---|---|
| President, | W. H. Clingerman, | Pittsburgh, Pa. |
| General Superintendent, | Clay F. Lynch, | Scottdale, Pa. |
| Supt. of Gates Mine, | S. W. Brown, | Edenborn, Pa. |
| Mine Foreman, | Wentsing, | Adah, Pa. |

Coal bed:

The coal under development is known as the Pittsburgh and locally as the Connellsville coking and thick river bed, and is in the carboniferous age, Monongahela formation and has an average thickness of 7-1/2 feet having a shale parting of 1/2 to 1 inch 3-1/2 feet from the bottom.

The main roof is sandstone and shale while the immediate roof is a shale which is in the nature of a "drawslate" with varying thickness of 3 inches to 12 inches. In places the roof in this mine is exceptionally bad and requires close attention.

The floor is a hard fireclay which does not seem to heave along

the gob line where roof pressure is concentrated.

The coal is bituminous and well suited for coking, for which purpose the output of the mine is used exclusively.

A composite of the analyses of three face samples taken from different parts of the mine gave the following, as received:

| | | |
|---|---|---|
| Moisture | 1.9% | |
| Volatile matter | 33.5 | |
| Fixed carbon | 58.2 | $\frac{V}{V+C} = .36$ |
| Ash | 6.4 | |
| | 100.0 | |
| Sulphur | 0.9 | |
| B.T.U. | 13990 | |

Development:

The mine is reached by two shafts 250 feet deep, one of which is the hoisting shaft located on the bank of the Monongahela river on which all the output of the mine is transported in barges to the coking plant at Clairton, Pa. A third shaft at Edenborn serves as an outlet for part of the return air from this mine. Self-dumping cages are in use and the coal is loaded as run-of-mine. The hoisting shaft has an air compartment separated from the hoistway by a concrete wall.

Output and Employees:

The normal daily output is 2000 to 2500 tons, and on the day shift 300 and on the night shift 40 men are employed, the night shift consisting of coal cutters, timbermen, shot firers and water hose men.

Water and Moisture:

The mine is naturally dry with the exception of localized dips where some water is encountered, but one may travel throughout the mine without stepping into water. The ribs and floor in the live

workings and in the pillar work are dry and dusty except when treated with water by means of hose and nozzle.

The mine is completely laid with pipe for the distribution of water, and attachments for hose are provided along the entries and in the rooms.

Men are employed to apply water through hose and nozzle regularly on the night shift. The men so employed are classed as sprinklers. The sprinklers are required to apply water to the roof, ribs and floor and to wet the vicinity of all places just prior to blasting, also to wet down the coal before it is loaded into the mine car.

Gas:

This mine has been classed as gassy since it was first opened and fire bosses are regularly employed to test for the presence of gas in all parts of the mine. In the section of the mine where the explosion occurred, the records of the fire boss showed that explosive gas had not been reported since December 14, 1923. A workman present during the investigation stated to the writer that a week or ten days prior to the explosion gas had accumulated in this section to the extent that all men were kept out until it was cleared of the presence of gas.

Sixteen mine air samples were taken within the exploded area and each showed the presence of methane by chemical analysis, ranging from 0.08% to 1.73%, the latter in the roof cavity over a mining machine within a crosscut in a pillar, which place was driven 44 feet from room 21 and which had been sealed with a tight wooden stopping

for three days and during the last 10 hours the ventilating fan had been idle.

The other samples were taken at various places along the gob line, which was about 4000 feet long, after the fan had been idle for 10 hours, and the methane did not exceed 0.56%. The fan was purposely stopped running in order to make this test and the air was still, there being no natural ventilation. At two places near the gob line gas was detected by sound and in a safety lamp escaping from the floor.

Mining method:

The method of mining embraces multiple main entries and double panel entries with rooms and pillars. The plan of the mine workings resemble a checker board design, the coal being divided into blocks of approximately 100 feet square by rooms and cut throughs driven 12 feet wide. When the rooms have reached their limit within a panel, barrier pillars are left in which two or more entries are maintained for the return air from the area to be robbed. In that part of the mine in which the explosion occurred the process of removing room pillars had been in progress for several months and there existed a robbed area to the north about 200 feet wide by 1700 feet long and on the east a gob line of 1600 feet long extending east from 100 to 500 feet. An attempt is made to remove all the coal and it is claimed 95% is recovered. The work is concentrated along the gob line since the pillars may be attacked from three sides and in consequence a large tonnage may be obtained along a single break or gob line, the loaders handling as much as 20 tons per shift.

Mining and blasting:

The coal is undercut at the floor by shortwall electric mining machines making a 6-1/2 feet undercut. The coal is drilled in the center and near each rib by compressed air drills which receive the air from a portable air compressor driven by an electric motor. The holes are loaded and fired one at a time by a certified shot firer. The sprinkler wets the place with water from hose prior to the firing of the shot.

Monobel No. 1 L. F. is used for all blasting purposes and the explosive and electric detonators are handled only by the shot firer and his helper, and all shots are fired at night, the only other men in the mine at the time being the coal cutters, timbermen and sprinklers. The practice is to use 2-1/2 to 3 sticks of explosive in the center shot and 2 sticks in each rib shot. The timberman accompanies each machine and looks after the support of the roof where the machines do their cutting, and where the drillers work.

Electrical Equipment:

Electric power is received at the mine at 2300 A.C. volts and two converters are installed on the surface which deliver a current of 500 volts D.C. to the mine workings where it is used for haulage, coal cutting, pumping and air compressors. Sullivan C.F. 6 shortwall machines are used for cutting the coal. Trolley locomotives are used for hauling and are confined to intake air currents. Electric pumps are located in intake air currents. Portable air compressors having open circuit motors are taken to points within 75 feet of the places where compressed air drills are used and placed on the intake

air, but this intake air is liable to be rendered explosive by heavy falls in the robbed area, forcing gas out of the goaf into the workings.

None of the electrical equipment has the Bureau of Mines approval plate.

Firing:

Feed cables are conducted along intake air currents on entries. Supply wires extend a short distance up some of the rooms. The track is not bonded in the rooms, as machine cables extend back to the feed wires and are attached with hooks on the end of the cable, one wire of which has a fuse attached.

Lighting:

The mine is classed as gassy and no open flame lamps are permitted in the mine. The miners and day men use Edison permissible cap lamps and officials use permissible flame safety lamps and electric cap lamps. Fire bosses and shotfirers use permissible flame safety lamps and all machine men are provided with a flame safety lamp of permissible type. At the shaft bottom and at turnouts and side tracks on the intake current electric bulbs are used.

Haulage:

Horses are used for hauling cars in rooms and other places where trolley wires are not installed. Trolley locomotives are used for hauling cars from the assembly partings to the shaft, their use being confined to intake air which has not passed any working places.

The track gage is 44 inches; the mine cars are partly of wooden construction holding 60 bushels and partly all steel construction holding 75 bushels (3 tons). The cars are loaded slightly above the top and there is practically no spillage from the top along the roadways where horses are used for haulage, and along the main haulage there is no accumulation of loose coal, such as may fall from the cars is promptly cleaned up. The cars have lifting endgates to facilitate dumping in the self-dumping cages. The cars are fitted with roller bearings and lever brakes acting on all wheels.

Ventilation:

The ventilation is produced by two fans, one at the main hoisting shaft and one at the air shaft. The fans are multi-blade and have a capacity of 250,000 cu. ft. each. The air is forced into the air compartment of the shafts and is carried several hundred feet in the aircourses before it is switched into the haulage way and its parallel aircourses.. There are six separate splits of the air in the mine, one of which furnishes 51,000 cu. ft. per minute to the north section in which the explosion occurred. The return air along the north break line passes over the goaf and reaches two parallel return aircourses, and on the east the return air is along the break line and then passes to two return aircourses in the solid coal.

All the faces along the two break lines were visited and it was found that a current of air was going into the goaf. It has been determined in this and other mines of the same company that air will pass through the goaf for several hundred feet beyond the break line and the practice has the sanction of the state mine inspectors.

One predominating danger arises when a body of gas accumulates in some large cavity in the goaf which may be suddenly swept out into the live workings by a fall of the overlying material in the goaf. It was stated by workmen during the investigation that heavy falls in the goaf produced violent blasts of air and blinding clouds of dust in the active working places adjacent to the break line.

Fire Protection:

As previously stated, the mine is equipped throughout with water lines having valves and nipples for hose attachments at frequent intervals and a supply of hose at strategic points.

A smouldering fire was discovered in room 19 during the investigation. This consisted of a heated mass of fine coal dust surrounding the bottom of a prop and was emitting smoke but no active blaze was in evidence.

This company maintains a central rescue station equipped with 30 oxygen breathing apparatus and trained corps of men for action in case of fire or an explosion.

Recovery Operations:

With the replacement of 12 stoppings along the double intake air-courses of the No. 6 West Entry the exploded area was cleared of after-damp and all bodies were located and recovered within a few hours. With the exception of one, all bodies when found had an electric cap lamp burning. The exception was a body on which a small piece of rock had fallen and broken the lamp.

The Explosion:

The first indications of the explosion was the presence of smoke coming from the outlet of the adjoining Palmer mine and it was assumed that a fire or explosion had occurred in the Palmer mine, but upon

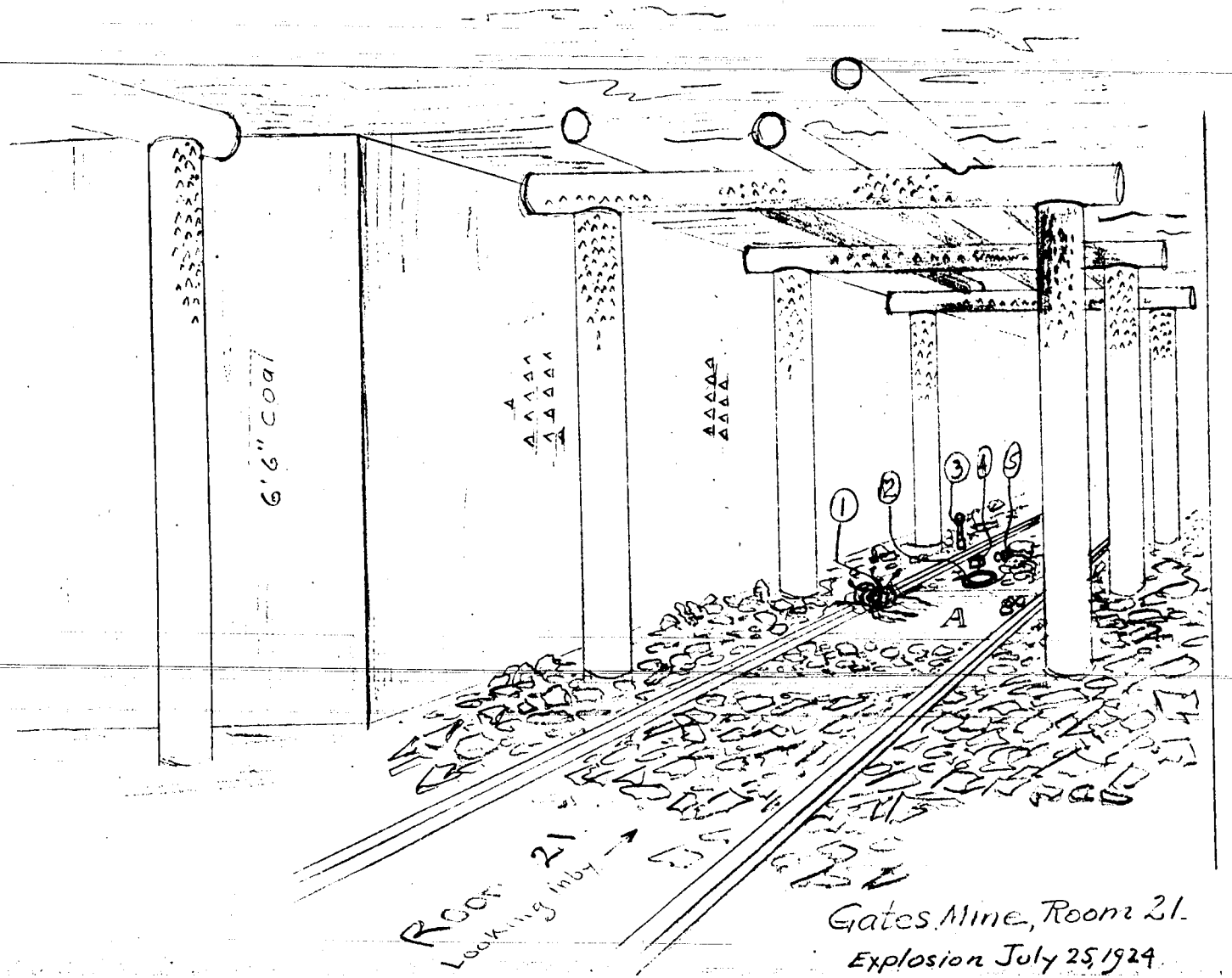
investigation it was found that the smoke was entering the return air current of the Palmer Mine from the Gates headings of the Gates mine. These headings had concrete and brick stoppings which had been blown out by the explosion and since the air pressure was less in the Palmer Mine the afterdamp moved in its direction.

The only men affected in the Gates Mine were the 10 men who were lost in the explosion. Men in other parts of the mine knew nothing of the explosion until notified by men who came from the outside.

The fans were running at normal speed and the night forces were in their respective sections. Twenty additional men were in other sections of the mine.

Explosives:

A burlap bag containing 220 sticks of Hemobel No. 1 had been carried into the mine and deposited at a point along the No. 6 Butt haulage and from this the shotfirer had taken a supply in a cotton or burlap bag for use in firing shots along the robbing line. The original bag when found contained 160 sticks and nearby were found scattered along the entry 15 sticks, making 175 sticks of the original 220. Since the shotfirer had sufficient places to blast during the shift to consume 45 sticks, it is assumed that he had taken this quantity with him. On the 8 Butt at room 8 was found a box half-full of explosive, 25 lbs. The shotfirer and his helper had gone to room 21 where there were 4 other men at work,- a sprinkler, a timberman and two machine men. The bag of explosive appeared to have been placed in the middle of the track under a part of the roof which was supported by crossbars and lagging. No. 6 electric detonators were carried in a




Gates Mine, Room 21.
Explosion July 25 1924.

J.W.P.
J.W.R.Jr.

10A

leather bag. A single shot DuPont machine was used for firing the explosive.

The mining machine was cutting a place in a pillar near the timbered place. The machine was sumping into the coal, and the starting lever was found in the on position. The twin cable extended out room 21 to the power wires at the No. 7 Butt and was hooked onto the power wires. One of the cable wires was provided with an electric fuse.

The following appears to have been the sequence of events: (See Sketch).

The bag of explosives had been placed on the floor near the middle of the track, and the detonators had been taken out of the leather bag preparatory to making primers for the shots. The sprinkler was playing the hose on the ribs of the coal at the entrance to a place which had been undercut in a nearby pillar. At this juncture a heavy fall occurred in the robbed-out section or goaf which forced a body of gas from the goaf into room 21 and created a rush of air that caused the machine cable to move where it was hanging on the power wires, resulting in an electric arc which ignited the gas, initiating an explosion which was intensified by coal dust.

The flame of the gas explosion and the inflamed coal dust set fire to the sack containing the explosive, presumably 45 sticks, and the explosive completely burned. The detonators were found in a tangled mass within 2 feet of the explosive. Approximately half of the 100 detonators had exploded while some were in normal

condition and many had been heated until the sulphur and tarry material had melted and had exuded from the shell. The timber above the explosive had been charred as much as 1/32 inch deep. Two safety lamps, belonging to the shotfirer and his helper, were found nearby. One was under a piece of slate which had fallen since the explosion and had a broken glass. The shotfirer's cable had not been unreeled. It was found 3 feet inby the point where the explosive burned.

Evidence of explosive:

The place had been visited by officials and workmen of the company and by the state mine inspectors prior to the arrival of the Bureau's investigator and when the site of the burned explosive was visited there remained only a few charred ends of wrappers from the explosive. It was reported that the loose slate had been thrown to one side in an effort to find unburned parts of the explosive. The dirt under the rail on the side to the right was similar in material and texture as in other panels of the track. On the left the dirt under the rail was of similar material and texture except for one foot where some person had scraped out the dirt. There was no evidence of any part of the explosive having exploded. The leather bag used for carrying the detonators was found about 100 feet beyond the seat of the fire near the gob and was in good condition.

Investigation:

The investigation was conducted for the Bureau by J. W. Paul assisted by F. E. Cash. J. E. Crawshaw, Explosives Engineer of the Bureau, was called to the mine and viewed the place at which the

explosive burned and his judgment was that there had been no explosion of the explosive.

Map showing extent:

The accompanying map was prepared by the engineer of the operating company and the details given conform with the data secured by the Bureau's investigators. The map shows the limits of the explosion, the location of the bodies of the men killed, the stoppings destroyed and the direction of the intake and return air currents, and the location of mine cars, cutting machines, drills and air compressor.

Extent of flame and heat:

Evidence of heat in the form of charred coal dust extends out to the 6 Butt in line with room 18 on the West side and out to room 6 and 7 Butt on the East side.

Within the area of a triangle of which 7 Butt entry is the base and the north and the east robbing lines form the other sides, there was much evidence of charred and coked coal dust on the coal, timber and mine cars.

Violence:

There being so many avenues for the release of pressure, the explosion did not assume any great violence in any part of theaffected area. A number of empty mine cars were blown from the track at places of intersection of entries and rooms and one car was blown 100 feet through a crosscut. All the men killed showed evidence of burns, those in room 21 being the most burned and the two machine men in room 13 having the least burns. These latter men had traveled 200 feet from their machine before they succumbed to the afterdamp.

A driller at the head of room 18 had traveled 75 feet and was found on top of a large slab of roof material in the gaaf.

The gaaf: The robbed area as viewed from the "break line" appeared to have been well occupied with fallen roof material. The fallen roof material was against all pillars and "stumps" of coal along the line of break and at the head of rooms and cross cuts the material stood at an angle of 30 to 40 degrees and 15 to 25 feet high. As previously stated, the return air was passing over the fallen material in the gaaf, except during the time the fans were idle and during this interval a small gas cap was detected in only two places well upon the fallen roof material.

Timbering:

The nature of the roof in this mine requires constant attention since the material over the drawslate frequently breaks and will fall if not supported by timber. At some points along the haulage roads the roof has cavities 15 to 25 feet above the coal. In many cases timber must be set close to the working face and it is the practice to set props near the face before men begin to load coal. Where these timbers interfere with the undercutting machines they are shifted and temporary props or cross bars are installed by special timbermen who accompany the coal cutters.

Coal dust:

This mine was considered as dry and dusty, and the use of water was intended to allay the dust and prevent it from being thrown into suspension by the concussion from blasting, and the movement of cars.

The analyses of ten road dust samples taken within the exploded area range in total incombustible from 21.2 to 33.6 per cent, the moisture

ranging from 6.5 to 13 per cent. The degree of fineness ranges from 7.7 to 35.2 per cent thru 100 mesh and from 2.2 to 20.6 per cent thru 200 mesh. The quantity of 20 mesh dust per foot of entry ranges from 9.7 to 45.8 ounces, or from 1/2 to 2-1/2 lbs. per foot of entry. If in suspension, the quantity per cu. ft. for a place having 84 square feet of cross section, the density of the dust will range from .12 to .54 oz., which is ample for the propagation of flame, since .08 oz. has given propagation in tests in the Bureau's experimental mine, using pure coal dust from the Pittsburgh coal bed. The taking of samples of dust in this mine for the determination of moisture was not the practice by the operating officials and the amount of moisture added was determined by visual inspection which is always unreliable.

Inert material required:

Where water is the agent for wetting coal dust to prevent it from propagating flame at least 25% by weight is required for Pittsburgh coal and with rock dust 65% is required in the absence of added water for dust 20% of which passes 200 mesh.

Previous explosion:

An explosion occurred in this mine on February 2, 1922, resulting in the death of 25 persons. The explosion originated at the head of one of the No. 2 Main face entries called the No. 4 flat and resulted from the ignition of gas, presumably from an induction spark from the shotfiring line of a single shot machine. A report on this explosion for the Bureau was prepared by J. W. Paul from data collected by him and W. J. Penc.

Following the explosion of February 2, 1922, the electric drills were replaced by compressed air drills.

Opinion of others on the July 25, 1924, explosion:

The first solution to this explosion was presented by the Chief Inspector of the operating company. He proposed that the bag of explosive had been accidentally ignited by a detonator being fired by a stray electric current; that the gases of combustion of the explosive were of an explosive nature when mixed with air and that these gases were ignited by the flame of the burning explosion and in turn ignited coal dust in the air and which was being conducted from the machine which was undercutting a place nearby. He later conducted some experiments to learn if burning explosive would ignite coal dust inan air current, with negative results. In these tests coal dust was set free in a moving current of air and allowed to pass over the burning explosive, the density of the dust being such that light and objects could be seen thru the dust.

Bureau's Test of the Explosive:

Samples of the explosive were secured from the bag which contained 160 sticks of Monobel No. 1 L. F. in the Gates Mine and subjected to tests to determine means of igniting the explosive, the nature and quantity of gases resulting from burning. The report of these tests is a part of the appendix of this report. The explosive was caused to burn,and the gases liberated when mixed with air were not explosive.

State Mine Inspectors:

A commission consisting of 5 state mine inspectors investigated and made a report on this explosion. The following is abstracted from

TABLE 1.

MINE AIR SAMPLES, GATES NO. 1 MINE
H. C. Frick Coke Company.

Taken on July 30, 31, and Aug. 3, 1924,
Following the explosion of July 25, 1924.

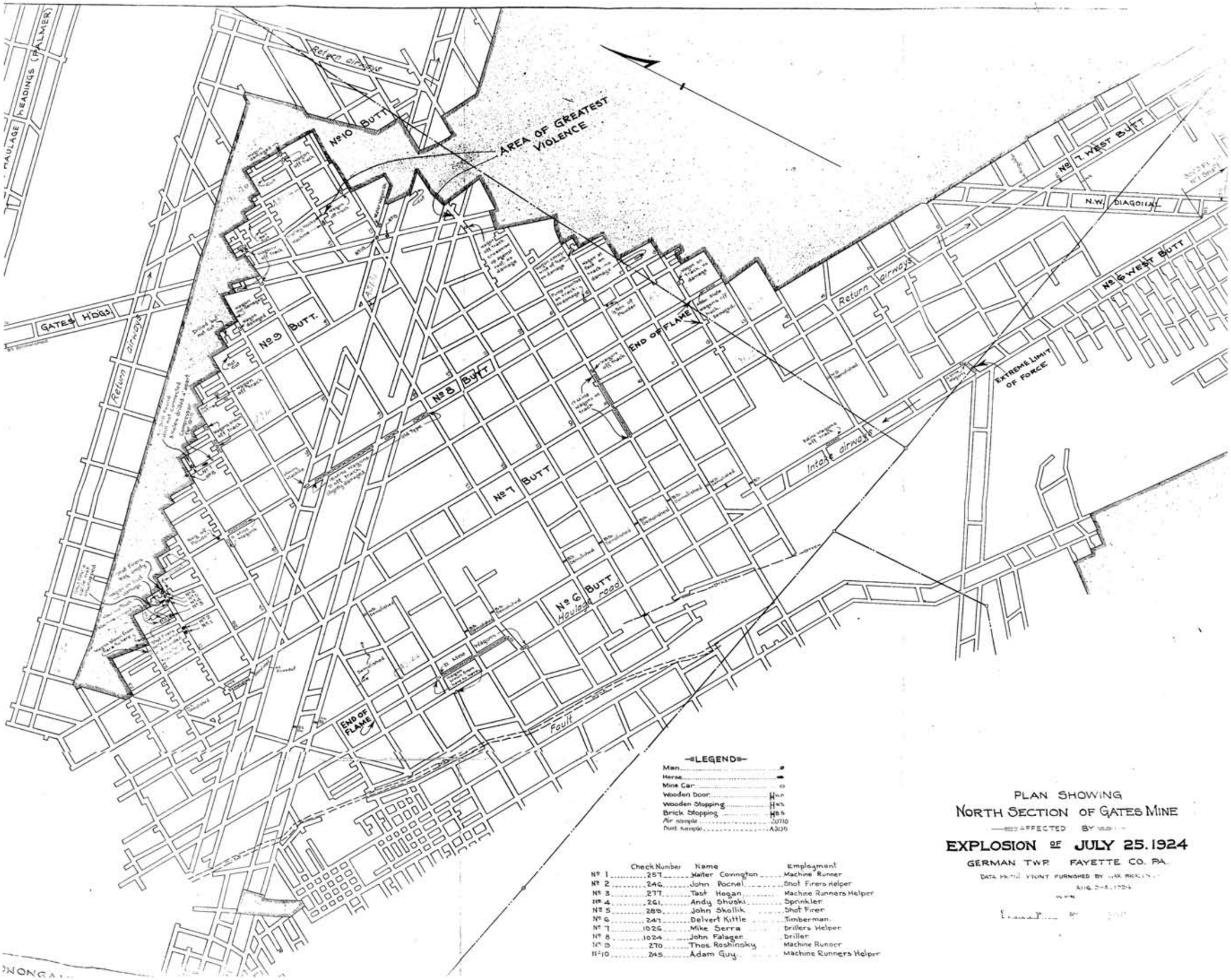
| Tube No. | Laboratory No. | Location of Sample. |
|---|---|---|
| 1 | 20704 | 21 room, in cut-thru where mining machine was cutting. |
| 2 | 20705 | do do do |
| 3 | 20706 | 16 room, 4th place outby gaaf on left facing gaaf |
| 4 | 20707 | do do do |
| 5 | 20708 | 21 room, 19 hrs. after mining machine place had been sealed, thru 2-inch pipe. |
| 7 | 20710 | 21 room, 19 hrs. after mining machine place had been sealed, behind seal, over machine. |
| 8 | 20711 | 21 room, 19 hrs. after mining machine place had been sealed, behind seal, over machine. |
| 9 | 20712 | 10 East overcast off north flats,-volume 25056 cu.ft. |
| 10 | 20713 | do do do |
| 11 | 20714 | Split off north flat return around pump,-vol.8862 cu.ft. |
| 869 | 20715 | 21 room, machine place, fan had been stopped 10 hrs. |
| 875 | 20716 | do do do |
| 872 | 20717 | 15 Entax room, Gates heading, in gaaf, fan stopped 10 hrs. |
| 881 | 20718 | do do do |
| 873 | 20719 | 13 room, second cut outby gaaf do |
| 882 | 20720 | do do do |

CHEMICAL ANALYSIS OF MINE AIR SAMPLES, GATES MINE, JULY, AUGUST, 1924.

| Tube No. | Lab. No. | $CO_2$ | $O_2$ | CO | $CH_4$ | $H_2$ | $N_2$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | 20704 | 0.19 | 20.68 | 00 | 0.08 | 00 | 79.05 | |
| 2 | 20705 | 0.25 | 20.63 | 00 | 0.08 | 00 | 79.06 | |
| 3 | 20706 | .16 | 20.85 | 00 | .18 | 00 | 79.11 | |
| 4 | 20707 | .14 | 20.64 | 00 | .18 | 00 | 79.04 | |
| 5 | 20708 | .08 | 20.57 | 00 | .08 | 00 | 79.27 | |
| 7 | 20710 | .19 | 20.36 | 00 | .38 | 00 | 79.07 | |
| 8 | 20711 | .20 | 20.36 | 00 | .36 | 00 | 79.08 | |
| 9 | 20712 | .21 | 20.47 | 00 | .20 | 00 | 79.12 | |
| 10 | 20713 | .24 | 20.58 | 00 | .22 | 00 | 78.96 | |
| 11 | 20714 | .15 | 20.64 | 00 | .18 | 00 | 79.03 | |
| 869 | 20715 | .47 | 19.09 | 00 | 1.73 | 00 | 78.71 | |
| 875 | 20716 | .49 | 19.06 | 00 | 1.70 | 00 | 78.75 | |
| 872 | 20717 | .26 | 20.32 | 00 | .52 | 00 | 78.90 | |
| 881 | 20718 | .31 | 20.28 | 00 | .56 | 00 | 78.85 | |
| 873 | 20719 | .21 | 20.32 | 00 | .39 | 00 | 79.08 | |
| 882 | 20720 | .23 | 20.41 | 00 | .37 | 00 | 78.99 | |

## CORONER'S VERDICT.

The explosion at the Gates mine of the H. C. Frick Coke Company, July 25, 1924, which caused the death of ten miners, was due to the accidental ignition of explosives used by the shotfirers in No. 21 mine, Seventh Butt, North Section; the flame ignited coal dust suspended in the air.




| | Check Number | Name | Employment |
|---|---|---|---|
| No 1 | 257 | Walter Covington | Machine Runner |
| No 2 | 246 | John Pocnel | Shot Firers Helper |
| No 3 | 277 | Tast Hogan | Machine Runners Helper |
| No 4 | 261 | Andy Shuski | Sprinkler |
| No 5 | 289 | John Skallik | Shot Firer |
| No 6 | 247 | Delvert Kittle | Timberman |
| No 7 | 1026 | Mike Serra | Drillers Helper |
| No 8 | 1024 | John Falagen | Driller |
| No 9 | 270 | Thos. Roshinsky | Machine Runner |
| No 10 | 245 | Adam Guy | Machine Runners Helper |

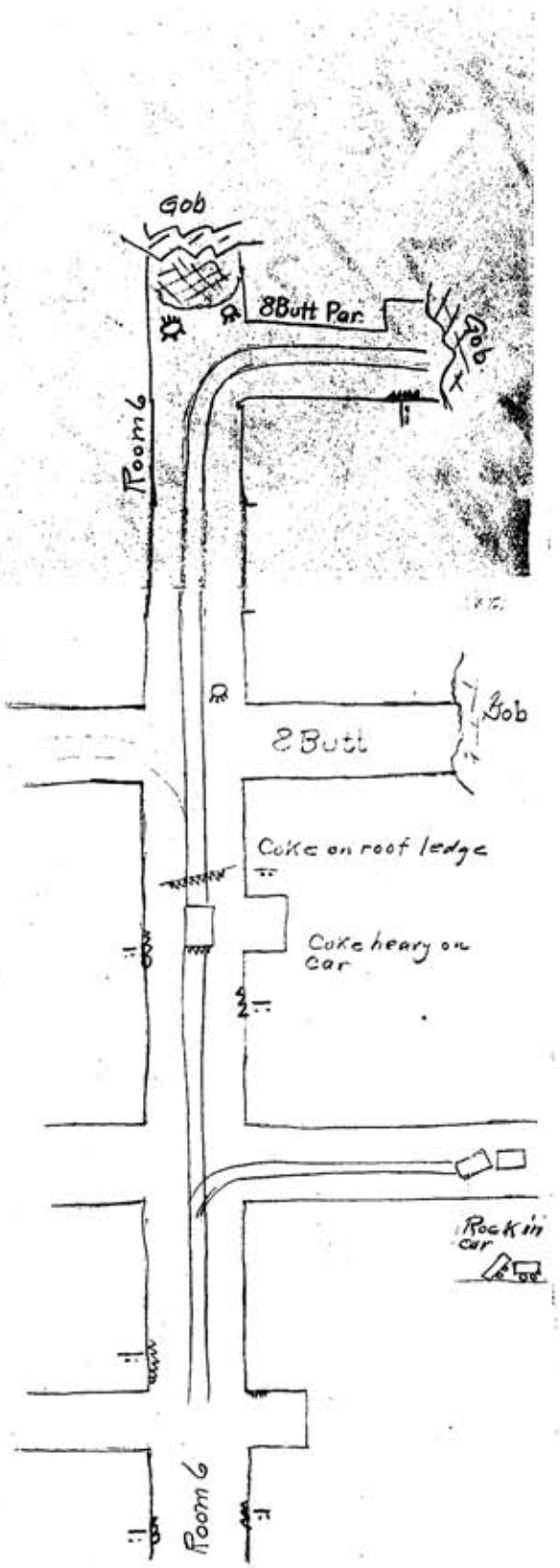
# PLAN SHOWING NORTH SECTION OF GATES MINE AFFECTED BY EXPLOSION OF JULY 25. 1924

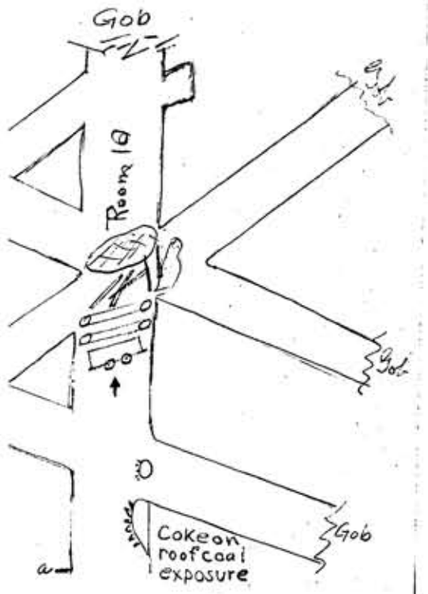
GERMAN TWP. FAYETTE CO. PA.

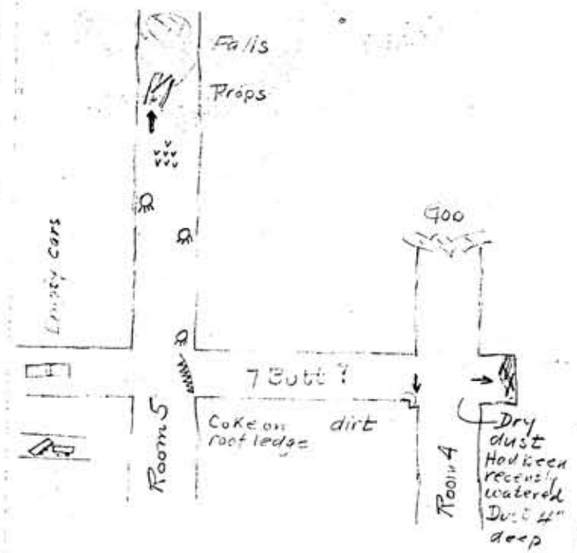
DATA FROM PRINT FURNISHED BY U.S. BUREAU OF MINES

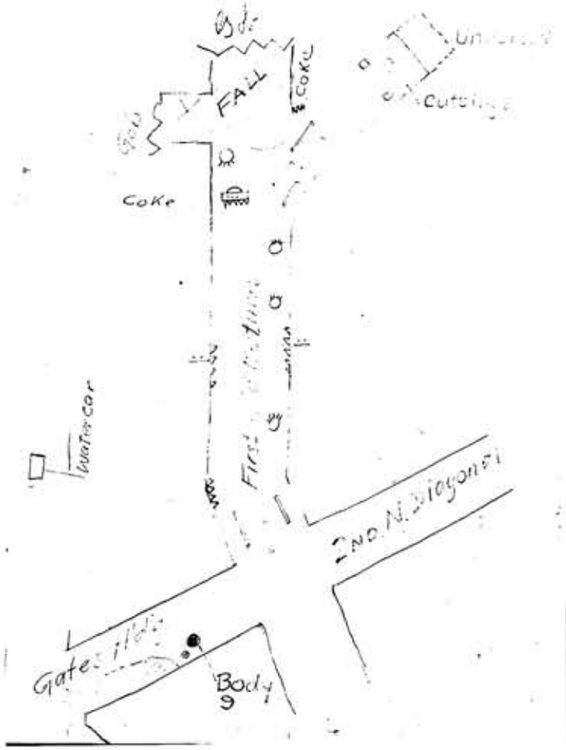
AUG. 26, 1924

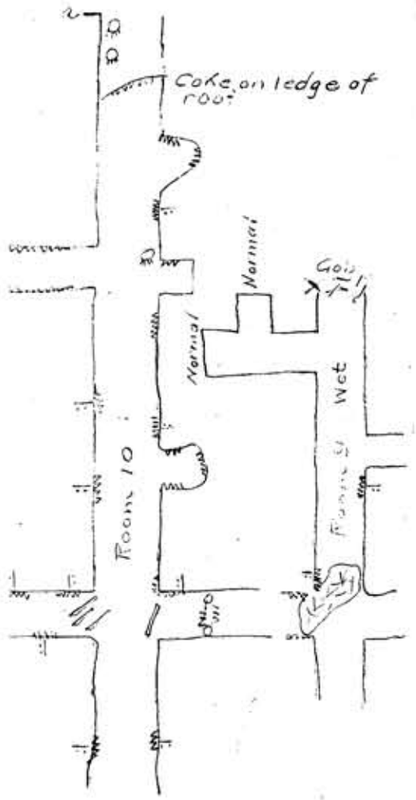
(29)

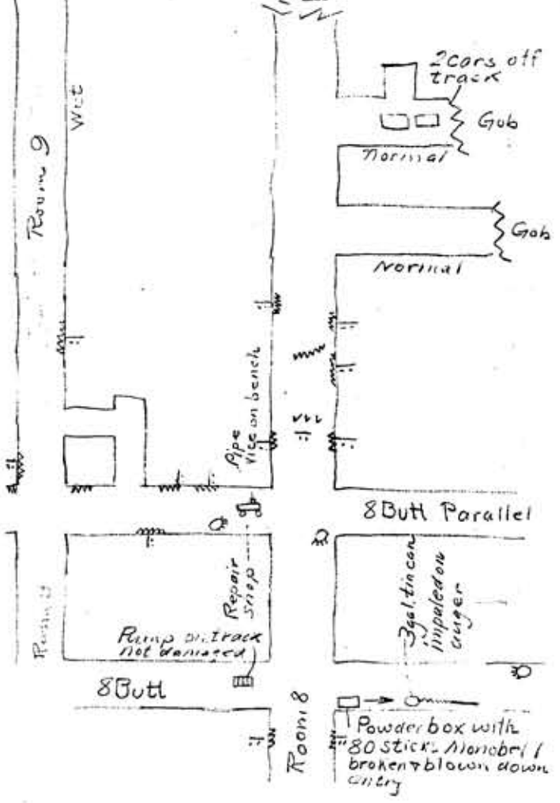

Gob
8Butt Par.
Gob
Room 6
8 Butt
Gob
Coke on roof ledge
Coke heavy on car
Rock in car
Room 6

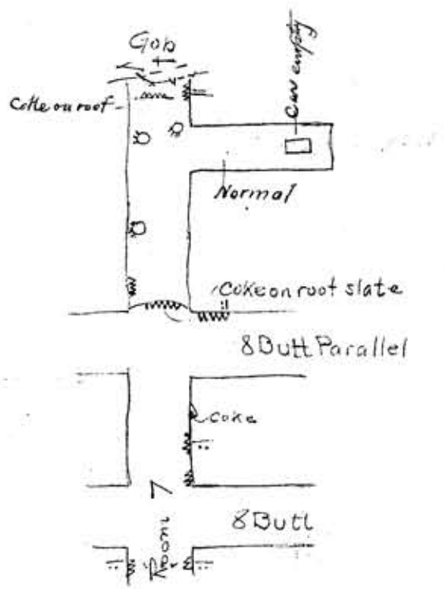

Gob
Room 10
Gob
Coke on roof coal exposure
Gob

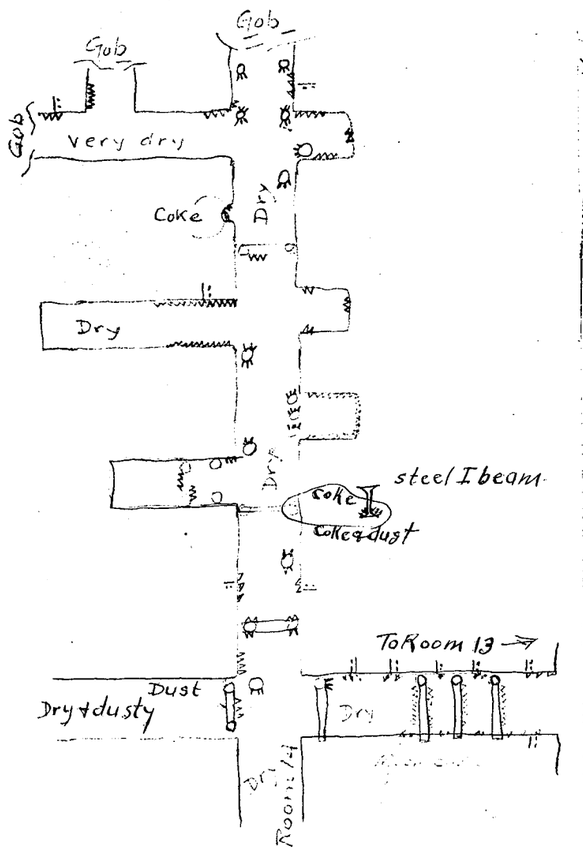

Falls
Props
Gob
Loaded cars
7 Butt ?
Coke on roof ledge
dirt
Room 5
Room 4
Dry dust Had been recently watered Dust 4" deep

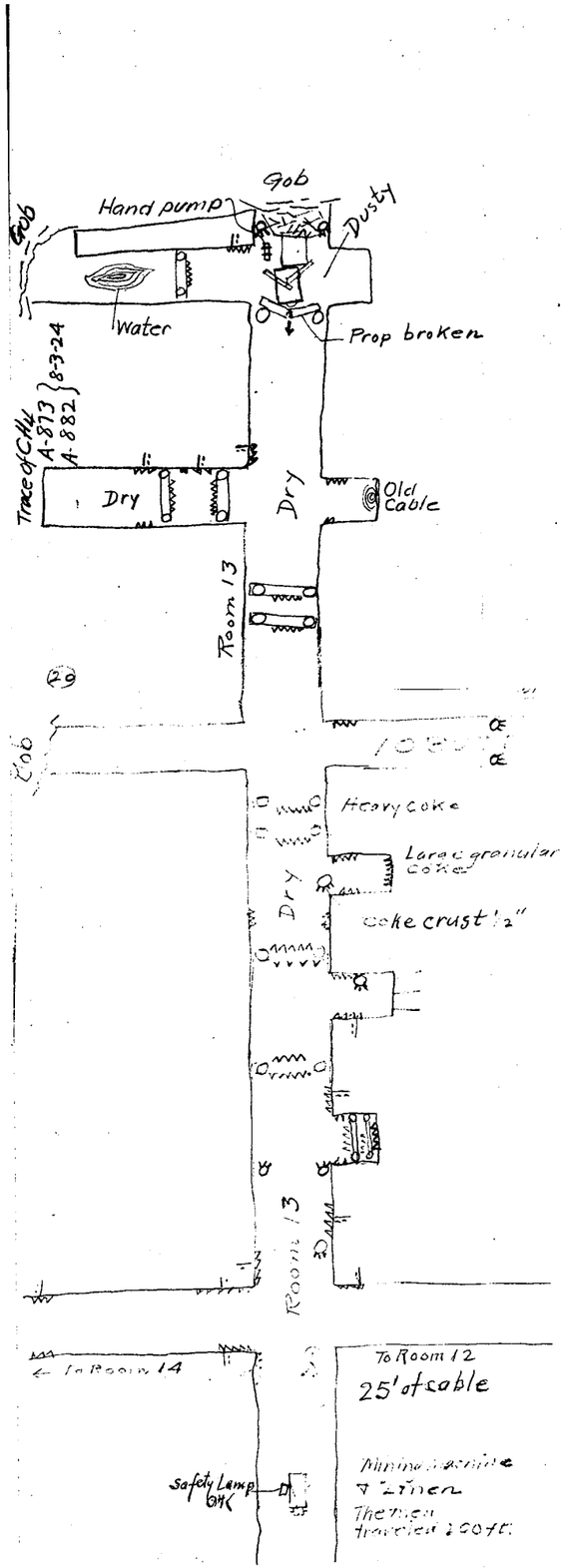

Gob
FALL
Coke
Coke
Water car
First
2ND N. Diagonal
Gate Hdg
Body


Coke on ledge of roof
Normal
Gob
Normal
Room 10
Room 11 Wet


Gob
2 cars off track
Gob
Normal
Gob
Normal
Room 9 Wet
Pipe rise on bench
8 Butt Parallel
Repair Shop
Room 12
Pump on track not damaged
8 Butt
3 gal tin can impaled on auger
Powder box with 80 sticks Nitroglycerine broken & blown down entry
Room 8


Gob
Coke on roof
Car empty
Normal
Coke on roof slate
8 Butt Parallel
Coke
7
8 Butt
Room


Gob
Gob
Gob
very dry
Coke
Dry
Dry
Dry
steel I beam
Coke
Coke + dust
To Room 13
Dust
Dry + dusty
Dry
Room 14


Gob
Hand pump
Gob
Dusty
Water
Prop broken
Trace of Chlz
A-873
A-882
8-3-24
Dry
Dry
Old Cable
Room 13
29
Gob
Heavy coke
Large granular coke
coke crust 1/2"
Dry
Room 13
← To Room 14
To Room 12
25' of cable
Safety Lamp
Gob
Heavy Coke
Under-cut
Undercut
Cuttings
Dust
Gob
← To Room 13
Room 12 1/2
Room 12 1/2
27
Fall
Gob
Gob
Face undercut by miners
Sliver of Bark in crack in roof coal
Old shot hole with wire
Piece of slate wire in prop
← To Room 13
Room 12
Dry dusty
Water car
Coke
Splinter of wood in roof
Regulator door 18" x 2"
Piece of door
17

DuPont battery for single shot

All overhead timber charred 1/1" thus: ⊙ having coke on the chair.

Prop charred for 18" from top

Dirt loose for 2' under rail

100 Detonators

#6 Lamp gave only trace of roof

Rail

4'8" 4'6" 4'8"

Battery

Coke on slate

Gob

(6) Timberman (machine)

Shot firer (5)

Coke from top to bottom of prop

Leather bag

Prop seared

Coke on break guard

Coke on L bar

Room 21

Water hose → To Room 20

Body of sprinkler No 4

Safety lamp slate

Logging charred

Chain near top of prop

Coke crusts

Coke crusts

Truck Reel Body of Scraper #3

Fall

Body of Machine #2 runner

Shot firer's helper #1

Machine cable extends to 7 Butt

Room 1

Notes on
NOTES No. 1 Mine
Explosion
July 25, 1924
by
J. W. Paul.

thus: ⊙ on prop

inby exposure

→ inby

out by exposure

← 11'6" →

Air samples 1 & 2

chain

Sullivan CE 7

Coal 6'6"

Truck Reel

Scraper's body #3

Temporary wooden tight stopping placed here 7-30-24 5 a.m.

Room 21

Cable

Gob

Direction of force as shown by Timber

Coke on roof

Gob

Room 20

Bad roof

Clean Surfaces

Direction force shown by Timbers

Heavy coke Floor swept clean

Sack with 160 sticks explosive 2 sticks out of sack 25 ft from 19

To Room 19 →

Room 20

More on outby

Coke full length

Room 20

3 holes drilled

Gob

Driller (8)

Drill

Air Compressor

Hose

To R. 18

Driller (7)

Horse, mane burned off

Coke crusts

Coke 2 in

Gob

Gob

Fall

GE 600 volt Motor on Compressor

Room 19

Coke

Coke grading on prop

Coal Slid down

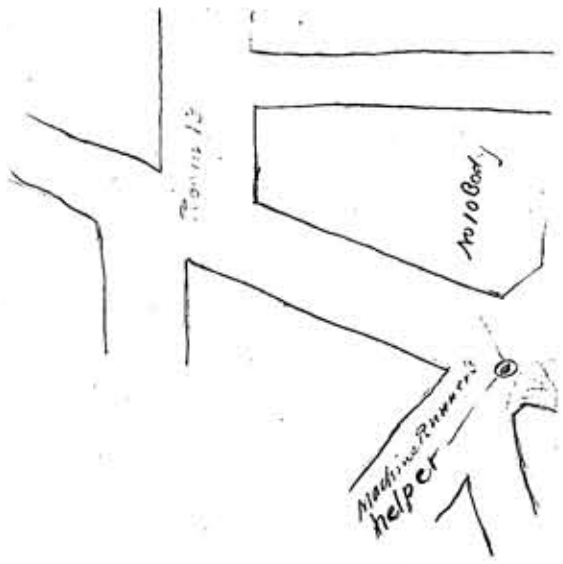
Sack of 150 sticks explosive

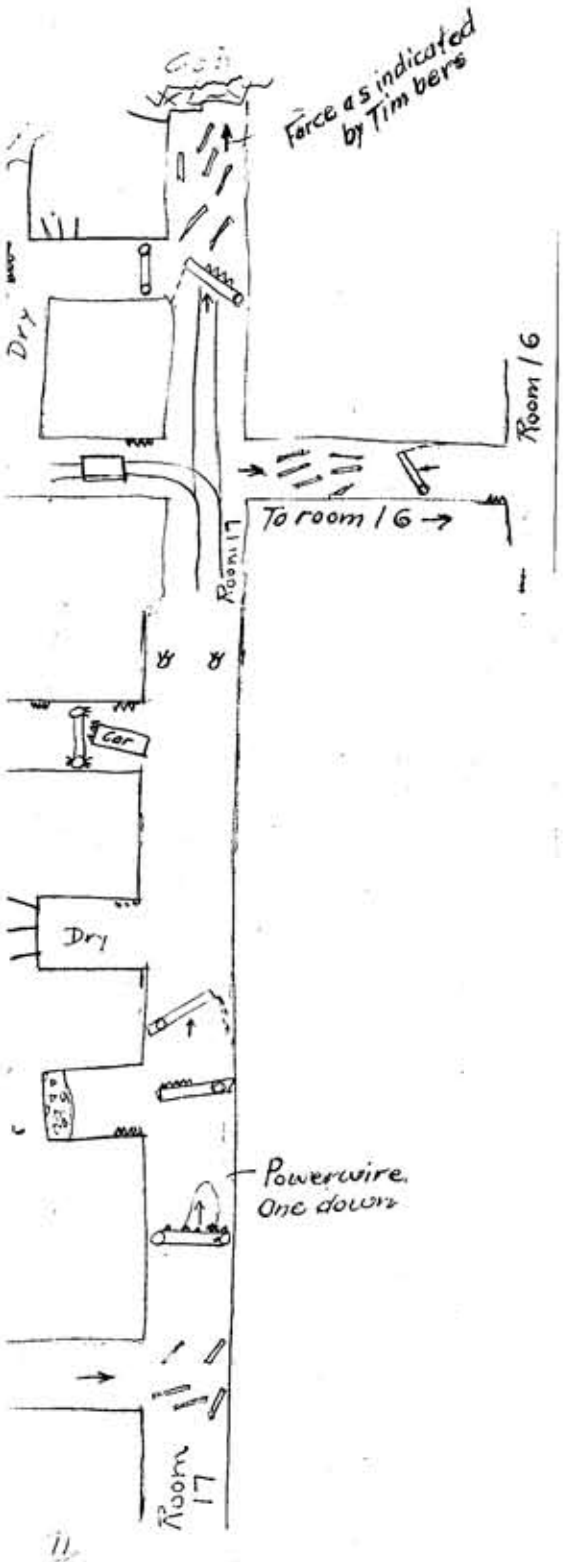
Face as indicated by Timbers

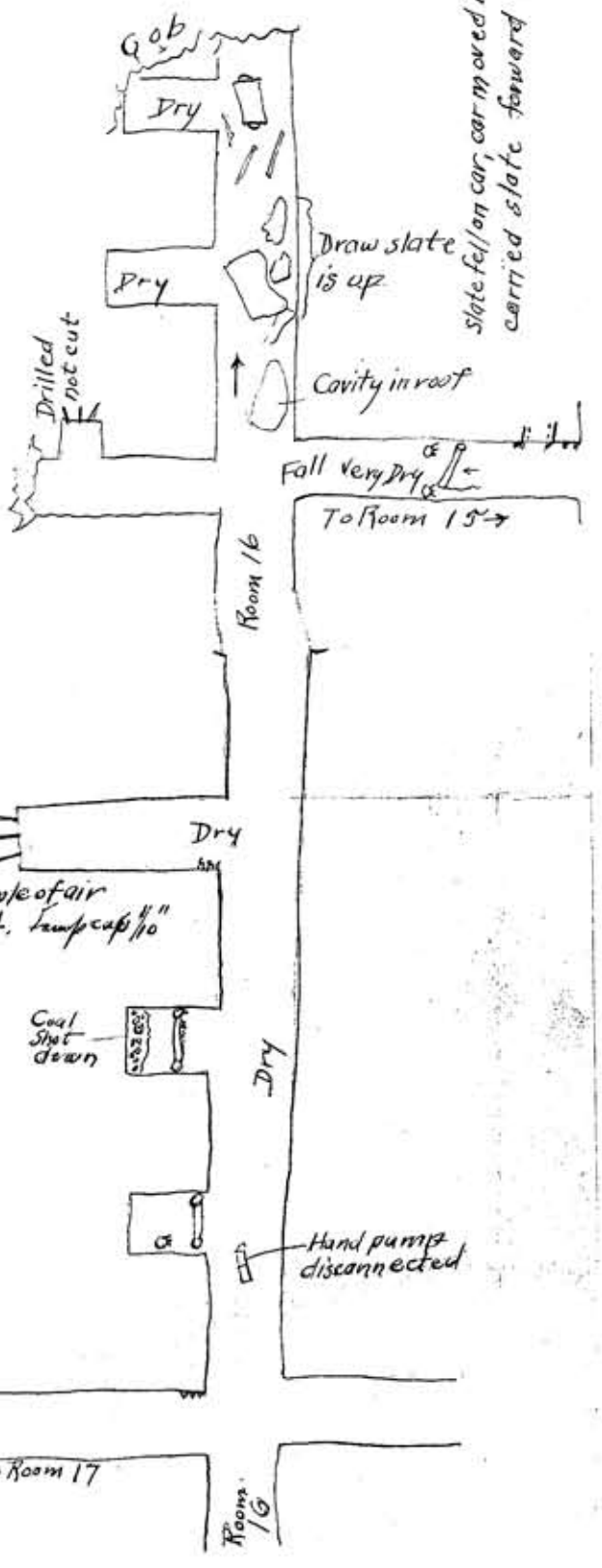
Room 19

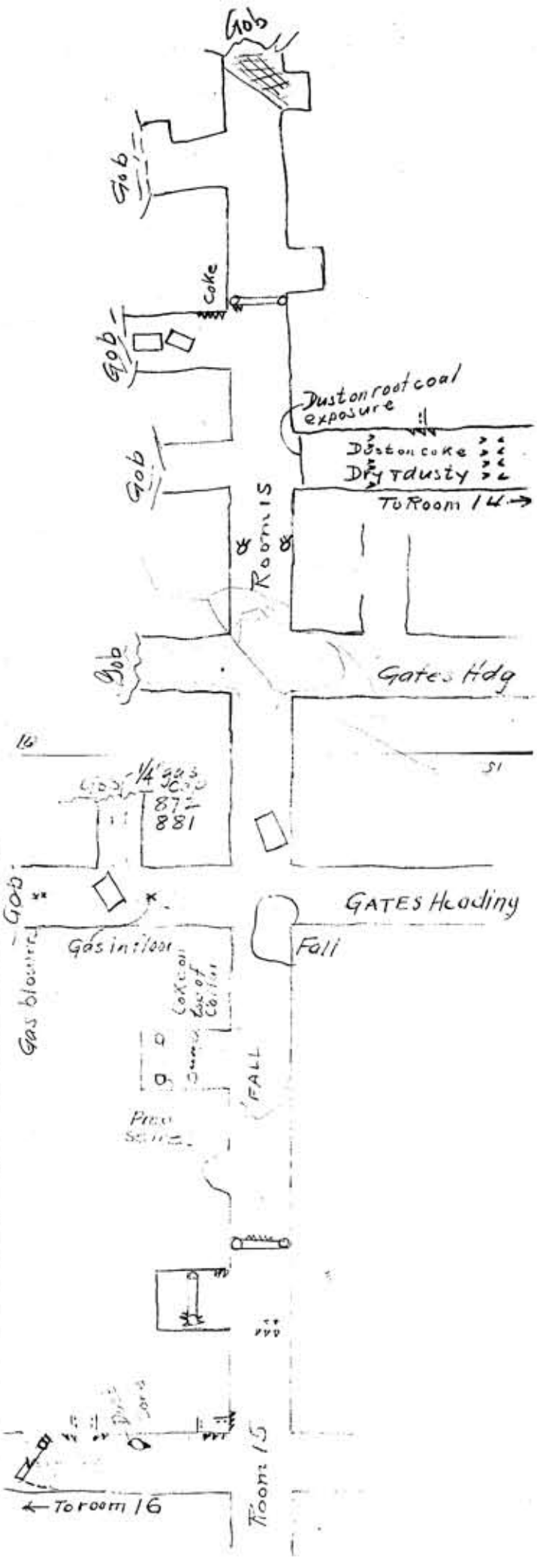
Cars

Car


Roof is
No 10 Coal
Meadow Rumps
helper


Force as indicated by Timbers
Dry
Room 16
To room 16 →
Room 17
Car
Dry
Powerwire
One down
Room 17


Gob
Dry
Dry
Draw slate is up
Slate fell on car, car moved in by carried slate forward
Drilled shot cut
Cavity in roof
Fall very Dry
To Room 15 →
Room 16
Dry
Sample of air 3:44. Lamp cap 1/10"
Coal Shot down
Dry
Hand pump disconnected
← To Room 17
Room 16


Gob
Gob
Coke
Gob
Gob
Dust on roof coal exposure
Dust on coke
Dry dusty
To Room 14 →
Gob
Room 15
Gates Hdg
Gob
14
51
87
881
Gob
GATES Heading
Gas in floor
Gas blowing
Fall
FALL
Room 15
← To room 16


Gob
Dry + dusty
Roof coal fallen
Roof coal fallen
Dry
Dry
Jack coal To Room 17
between roof & Collar
Collar
ressor
Room 18