THE HILL-FARM-PARRISH MINE-FIRE.

BY FRANK A. HILL, DUNBAR, PA.

(Schuylkill Valley Meeting, Reading, October, 1892.)

AFTER a long struggle with an underground mine-fire and its accompanying evils, having experienced the discouragement of many retreats, the uncertain hope of varying advances, and the gratification of final success, I am tempted to give the members of the Institute some of the details of the fight. I do not write with the thought of treating a novel subject, but with the hope that some one as unfortunate as ourselves may be led by our experience to avoid our mistakes and to profit by our successes.

The fire occurred on June 16, 1890. It was a calamity awful in its results, ringing the death-knell of thirty-one stalwart miners, bringing sorrow and desolation to many homes, and destroying in a few hours the work of years. While there have been a number of disasters in the history of American mining in which there was a greater loss of life and property, I know of none in which so simple a cause led to results so serious.

A description of the mine, with the details of the accident, is necessary for a full understanding of the conditions existing at the time.

The Hill-Farm-Parrish mine is in Dunbar township, Fayette county, Pa., about one mile from Dunbar station, on the Pennsylvania and Baltimore & Ohio railroads, about four miles south of Connellsville, nine miles northeast of Uniontown, and in the heart of what is celebrated as the Connellsville coke region. The mine is owned and operated by the Dunbar Furnace Company; and all the coal produced is made into coke and used in the company's furnaces, one mile to the east. The mine is opened by two slopes, the Hill-Farm and Parrish, the latter known also as the Ferguson. The Hill-Farm slope is 2600 feet northeast of the Parrish. There are 150 ovens at the former and 70 at the latter slope. The Hill-Farm slope is 4100 feet in length, and the length of the Parrish at the time of the accident was 3700 feet. The average dip of the coal is about 8 degrees S. of W. The workings of the two slopes are con-

nected in a number of places. The flat headings or gangways and the rooms intersect in one general system. The accompanying map (Fig. 1) shows the character and extent of the workings. Fig. 2 is a plan and profile of the Hill-Farm slope. Fig. 3 is a section of the Connellsville seam, as shown at the foot of bore-hole No. 1.

The most available connection between the slopes at the time of the accident was what is known as the Ferguson heading, the others being obstructed by falls and brattices. The pumps at Hill-Farm were about 3500 feet from the slope-mouth. The water was lifted about 500 feet, through a vertical 8-inch hole, to the surface. At Parrish the water is pumped up the slope.

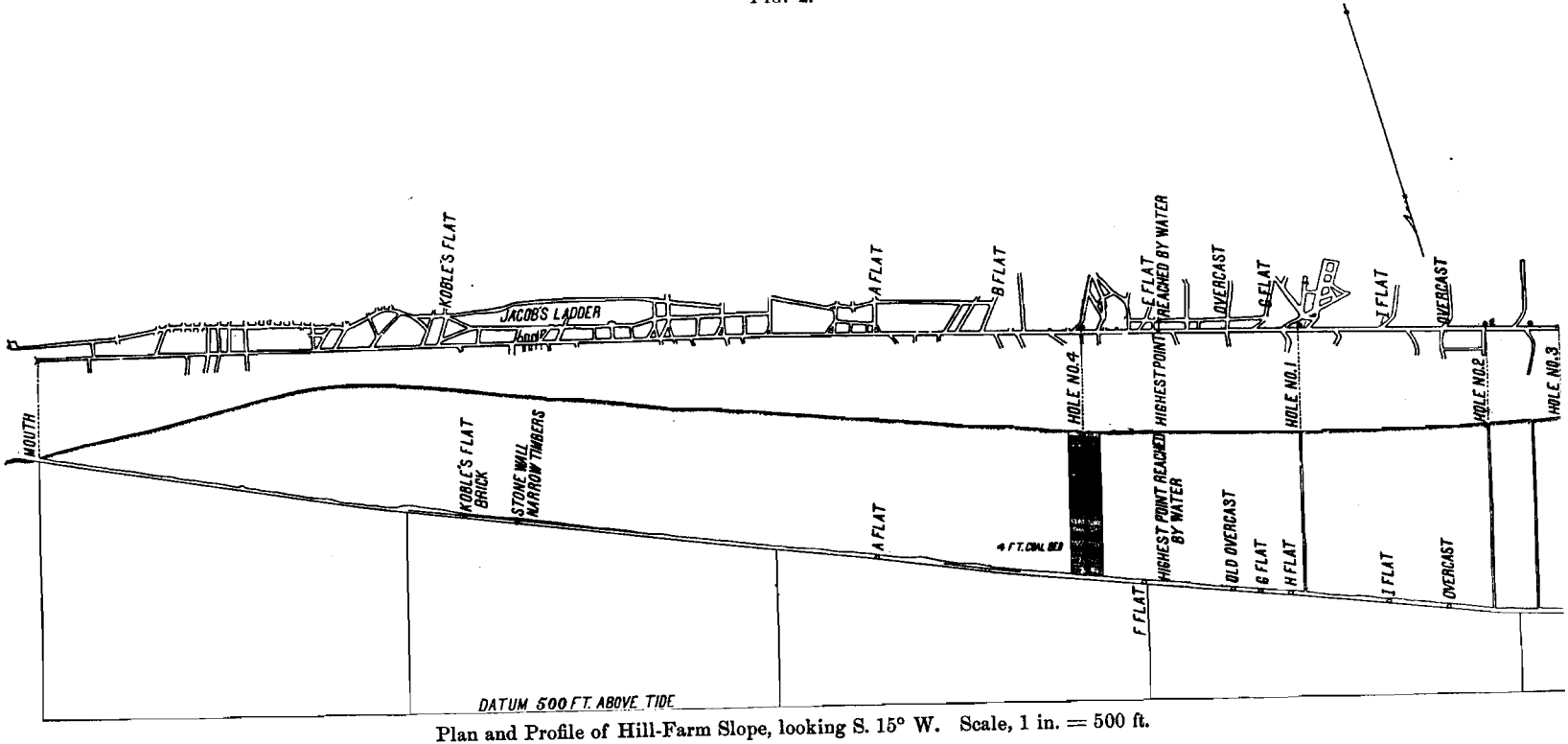
The steam was carried down the slope in pipes from boilers at the respective slope-mouths. This system, however, had many disadvantages. A large proportion of the steam was lost in transmittal; the extreme heat of the slope prevented men from making repairs satisfactorily; and the ventilation, while equal, if not superior, to that of adjoining collieries, and fully within the requirements of the law, was not as good as could have been produced by a better system. In addition, there was great danger from fire, due to the steam-dried dust and timber on the slope.

A plan to correct these troubles was being rapidly put into execution when the accident occurred (this plan has since been carried out). Two additional bore-holes were sunk from the surface to the foot of the Hill-Farm slope, one for sending down steam and a second for pumping water. Boilers were to be erected at the top of the steam-hole, and from them steam was to be carried to the Hill-Farm pumps. The Parrish pump was to be moved to the bottom of the second bore-hole at the Hill-Farm; and the steam-pipe from the new boilers was also to be connected with it. All the drainage from both pits can be readily handled in this way. This scheme gives dry steam direct to the three pumps, removes the steam-line from the slope, and makes a very simple and economical pumping-system.

A 14-foot fan at the Hill-Farm and a 12-foot fan at Parrish were to supply ventilation for both pits. Both of these fans are now in use.

In carrying out this plan, the steam-hole where the accident occurred was the first one drilled. It was completed in five weeks, and during that time, though frequent tests were made, no indications of gas were seen. The hole is 505 feet deep and 8 inches in diameter. It contained at the time of the accident a depth of about 475 feet of water.

FIG. 2.



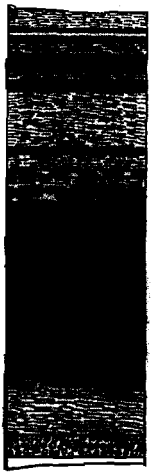
Plan and Profile of Hill-Farm Slope, looking S. 15° W. Scale, 1 in. = 500 ft.

This hole was finished on Saturday, June 14th, the drill coming down in solid coal, about 6 feet from the rib of the slope.

On Monday, June 16th, John Kerwin, a miner, was ordered to cut into the bore-hole from the face of a small opening, about 4 feet from the rib of the slope. By 11 A.M., Kerwin had taken out two wagon loads of coal and had cut a third when the face of the coal began to "work." Kerwin and Edward Condren (the latter was visiting Kerwin "to see him get a ducking") were in the rib-hole, and immediately hurried out to the slope. The water at once came out with a rush and made considerable noise. Both men ran up the slope about 100 feet. At the same time the trip of wagons came down with Frank Maloy, rope-rider, on the front wagon. At this time there were within sight of the bore-hole, Kerwin, Condren, Maloy, William Landy, and William Hayes. All were frightened by the noise of the water. William Hayes, either with the object of turning the switch for the wagons to go into the lower flat heading, or possibly unnecessarily alarmed about the water injuring the men below, ran down the slope with his naked light. As he passed opposite the bore-hole he ignited a feeder of gas. The best testimony seems to show that this feeder blew out about 6 feet and went back again, but was quickly followed by another, the gas burning as from the end of a pipe. In an instant a muslin brattice opposite the hole was in a blaze. The men were frightened, and ran for a place of safety. In a few moments the slope was on fire. No attempt was made to tear down the brattice, the trip was not moved, and the fire extended from one wooden object to another until the slope was ablaze. An alarm was immediately sounded, and all the men on the left and one man on the right side of the slope escaped up the Hill-Farm manway. Thomas and Daniel Shearin, fire-bosses, and David Hayes, pump-man, consulted hurriedly as to what to do. It was decided that Thomas Shearin go to the surface and have the bore-hole closed, in order to cut off any current of air there might be down the hole. He left his brother Daniel and Hayes at the junction of the Ferguson heading and Hill-Farm manway, 3300 feet from the surface. He told them he thought it was impossible to render any help to the men on the right, 29 in number, and warned them in case they were compelled to retreat, "for God's sake to go by the way of Ferguson." The mine-boss and his assistant were at the slope-mouth eating dinner when the accident occurred. They attempted to get down the manway, but were driven back by the smoke. They then, with others,

went down the Parrish slope, crossed to the Hill-Farm manway, and on down to within 100 feet of the wooden overcast which carried the air to the workings on the right hand of the slope. Every approach to the slope, as well as the slope itself, was filled with smoke. All the rooms on the left side (I flat) were visited and found empty, the men having escaped by the manway. After several in-

FIG. 3.



Section of the Connellsville Seam at Bottom of Bore-Hole No. 1 (Figs. 1 and 2).

Details of section, from the top downward:

	In.		Ft.	In.
Coal,	4	Slate,		3
Slate,	1	Black slate,	2	6
Coal,	5	Coal, good,		4
Slate, with streaks of coal,	6	Slate, bone and coal,		11
Coal,	6	Coal, bony,		4
Slate,	1	Slate,		10
Coal,	2	Coal, bony,		6
Slate,	1	COAL,	9	4
Coal,	2	Black slate,	3	0
Black slate,	4	Iron-ore,	1	2
Coal, hard,	9		—	–
Total height,			22	7

effectual attempts to cross the slope, all of which were prevented by the smoke, efforts in that direction were for the time abandoned. It being thought probable that the men from the right had gotten across the slope and were overcome by smoke in the manway, the party retreated by way of the Ferguson heading and the Parrish slope,

and, on returning to the Hill-Farm, succeeded in getting down the full length of the manway, which in the meanwhile had become partially clear of smoke. About midway the dead bodies of Daniel Shearin and David Hayes were found, but no trace of the others was seen. Continuous and desperate efforts to cross the slope to the men on the right were made until 10 o'clock in the evening, but without success.

It was then decided to erect the two fans at once, one at the Parrish slope and the other at the Mahoning slope (the Mahoning slope adjoins the Hill-Farm on the north, and is operated by the Cambria Iron Company, of Johnstown). These two fans were kindly furnished by Superintendent Lynch, of the H. C. Frick Coke Company, by the efficient work of whose employees one of them, with its engine, was ready for work in 17 hours from its arrival on the ground.

It was evident that the quickest way of getting at the fire and saving the company's property was from the Parrish slope. It was thought by some, however, that the men on the right might still be living, and that the fan at Parrish, if set in motion, might blow the flame and smoke on the men. This opinion was incorrect; but so long as there was a doubt in the mind of any one, it was considered the more humane plan to drive through the dividing pillar, between the Hill-Farm and Mahoning mines. The Mahoning slope is 1800 feet north of the Hill-Farm. A hole was started from the Mahoning manway, 2600 feet from the surface, and driven through the gob of the old workings, in the direction of the Hill-Farm. This hole, which was about 4 feet high by 6 feet wide, met with unexpected obstructions, the gob being packed solidly in every direction. The hole was driven some 400 feet through this material, and about 150 feet through the solid coal. After a few days it was seen that the efforts to rescue the men alive could not possibly meet with success; but it was hoped that their bodies, at least, might be recovered. After two weeks of unremitting labor, the Hill-Farm workings were reached and partially explored, but no trace of the men, excepting two dinner-buckets and two blouses, were found. The search was then abandoned, and a 3-foot brick wall was erected in the pillar between the two mines.

During the two weeks that the attempt from the Mahoning mine was being made, the flames were sweeping with increasing power up the Hill-Farm slope to its mouth. For several days previous to the abandoning of the attempted rescue, the flames were pouring out of

the slope-mouth. As soon as the effort from the Mahoning side was given up, we at once built wooden brattices on the Hill-Farm side of the Parrish slope, in order to protect the latter slope from the gases resulting from the fire. We also wished to cut off any supply of air the fire might receive from the ventilating-current of the Parrish workings, which we intended to work if possible, and which we did operate without any trouble. The mouths of the Hill-Farm slope and manway were sealed with brick and clay brattices, and all crop-falls and openings were closed as far as possible. In two days the odor of the leakage of black-damp (carbonic acid gas, CO_2) in the crop-falls was plainly noticeable, and its deadly effect was emphasized by the presence of the dead bodies of dozens of birds, field-mice, and rabbits which had been overcome in passing the holes. The rapid accumulation of black-damp encouraged us, as we knew no fire could burn in such an atmosphere, and that under such circumstances we need fear no accumulation of fire-damp (carburetted hydrogen, CH_4).

The Hill-Farm slope is one of the oldest in the Connellsville region. Its upper levels were worked with methods most crude and imperfect. In several places rooms were turned directly in the rib of the slope, and no natural pillars remained between the slope and manway. Artificial pillars, made of a cribbing of old timber, slate, and dirt, were substituted. At the "Narrow Timbers" the workings from the Mahoning mine crossed the boundary, and the Hill-Farm slope was driven through them. The Mahoning pillars in this vicinity had been robbed, and this, together with close working on the Hill-Farm side, had caused a squeeze. The sides and top of the slope and manway at this point were supported by cribbing, old, oil-soaked, and dust-covered. At the pumps at the foot of bore-hole No. 1, heavy timbers were set for protection. At other scattered points along the slope there was timber, but as in most of the coke-region slopes, there was little, other than at the points named. The dust and timber in the slope were dried by the radiation from the pipes, the average temperature being about 130° F. There had been no gas in the mine for two years previous to the accident, and none in quantity for eight years. The lower levels of the mine were in good condition.

We were now confronted with the question, how to recover the mine. Three plans suggested themselves: 1. Open a new slope to the south of the Hill-Farm slope. 2. Abandon the Hill-Farm openings and hoist all the coal from the Parrish slope and carry it

overland to the Hill-Farm ovens; or, 3. Fight our way down through the fire and falls, and re-establish the old slope.

The first plan was set aside, as it would necessitate sinking the new slope through unknown and abandoned workings for over 3000 feet, with little prospect of excluding from it the fire or its resultant gases.

The second plan was tempting as being easiest and safest, though not most promising in its final results. The fire would remain an unknown quantity, and the plan would necessitate the transportation of coal over a high-grade road, making a double haul inside and out. The results would be uncertain and the fire-conditions unchanged.

The boldest plan was finally decided upon, viz., to clean up the Hill-Farm slope. This was undertaken with some misgivings, not lightened by the kindly-expressed but emphatic assurance of experienced men that it could not be done. The conditions against us were the unknown quantity and character of the fire, the condition of the cribbed and weakened portion of the mine, and the irregular and unmapped workings. The only thing in our favor was the known presence of great quantities of black-damp, and the probable absence of fire-damp.

On September 1st the mine was opened, after having been closed for 58 days, during which time the black-damp had been doing its work. Our first thought was to recover the manway entire, and then attack the slope. The manway was our downcast and the slope our upcast. We reached Koble's Flat without meeting any serious obstruction. Here we found the manway fallen. In trying to force our way through, we found the slope getting hotter and hotter, until it was again ablaze, and the fire was encroaching on the workings to the south of the manway. We still fought on until the cribbing above us, between the slope and manway, caught fire, and we were compelled to retreat and again seal up the mine. Satisfied that we had made a mistake, we decided to cut the slope and manway into small sections and clean up everything as we moved down. This general plan was carried to a successful issue.

Our first brattice (A) was erected on the manway, and the air-current, instead of continuing down the manway, took the shorter way through the "cut-through," into the slope. Brattice B was then put upon the slope. These brattices were made of wood, with the joints clayed, and were banked at the bottom with burned ore-dust. The course of the air was then down the manway, through

the "cut-through," and up the slope. These brattices gave us clean ventilation where we wanted it, reduced very materially the supply of air to the fire below, and permitted the black-damp from the old workings and the results of combustion from the smouldering fire below to collect and hold the fire in check. It was always a struggle to put up the slope-brattices. The leakage from the manway and other points, and the natural expansion of the heated air from below, brought up volumes of hot air, gas, and very fine hot dust that were hard for the men to endure. By using shields of brattice-cloth and nailing them to the coal on the top and sides, we succeeded, by their temporary protection, in erecting the wooden brattices.

A line of water-pipe, 2½ inches diameter, was laid along the manway, and from it side-lines of pipe and hose were laid onto and up the slope. The slope was filled with falls and accumulated coke and ashes. Most of this would blaze up as the fire reached it. When the fire was watered out sufficiently to permit the fallen material to be loaded into wagons, it was hoisted to the waste-bank on the surface. As each section was cleaned and made safe, the slope-brattice was first removed and then the manway brattice; the manway brattice (C) for the next section was then put up, followed by the slope-brattice D, and the ventilation thus advanced. This scheme of bratticing was continued until the water which had accumulated at the bottom of the slope was reached.

It is impossible, in a paper of this character, to give the details of the work. We were confronted daily by unexpected obstructions, and could only meet them as they arose. Our success was, therefore, not due to any well-conceived plan of action, but to persistent sticking to the work until we had accomplished it.

Several points especially hard to overcome are worthy of notice. On reopening the mine after our failure to get down the full length of the manway, we found a new fall of slate on the manway just below "Bevil's Flat." It was decided best not to move this fall, but to cut through the pillar and around it. In doing this some of the loose coal was thrown on the fall. Several weeks later, while working below this point, smoke and gas burst through the brattices and we were again compelled to retreat. This time we cleared the fall, having found it a mass of fire. I believe this to have been a case of spontaneous combustion.

Our greatest difficulty was at the "Narrow Timbers." It is evident that the timbers here were burned in the early stages of the

fire, and the weight of slate, sandstone and coal falling blocked the slope and spread the flame to the right and left. We made two attempts to pass this point without success. We first tried to force our way down the old manway. After running great risk from falls, gas, and heat, we reached Jacob's Ladder, to find everything burning. We again retreated, and decided to cut down through the rooms to the left of the manway, thinking we could get to the left of the fire and fight it towards the slope. After struggling through the abandoned rooms and pillars for 300 feet we found the fire had reached out to our point of intersection with the Jacob's Ladder level. Thoroughly disheartened, we again closed the mine for several weeks.

When we again reopened, we drove a new manway in the pillar between the slope and the old manway, and by cutting the "Narrow Timbers" section into very small portions, succeeded in getting through them. The fall here is about 40 feet high, and for the protection of the men from falls, we were compelled to build cribbings and cross-timber as rapidly as the *débris* was removed. These cribbings frequently caught fire, and gave us endless trouble, and required constant watchfulness. We finally cleared up and rebuilt the "Narrow Timbers," after being held at them for three months without advancing a foot. At the "A" and "B" flats we had great trouble with fire in the interleaved seams of slate and coal which overlie the main bench of coal. We here verified the experience of other mine-fires. Here, as at other points, there was no serious fire in the main coal; but in the slate, in its heat-broken and cracked condition, the fire extended several feet into the rib and top. We had great trouble from this cause. We could not reach the fire with water. We could deaden it for several inches from the rib, but on leaving it and advancing, it would burst out afresh and bring us back. It was suggested that we blast the fire out of the top and sides. This we did. A hole was drilled, the hose pipe inserted, and the water allowed to play into it. When sufficiently cooled, dynamite was hurriedly inserted and fired, bringing down the burning slate and coal. It was quickly extinguished with the hose, and the work pushed on to the lower levels.

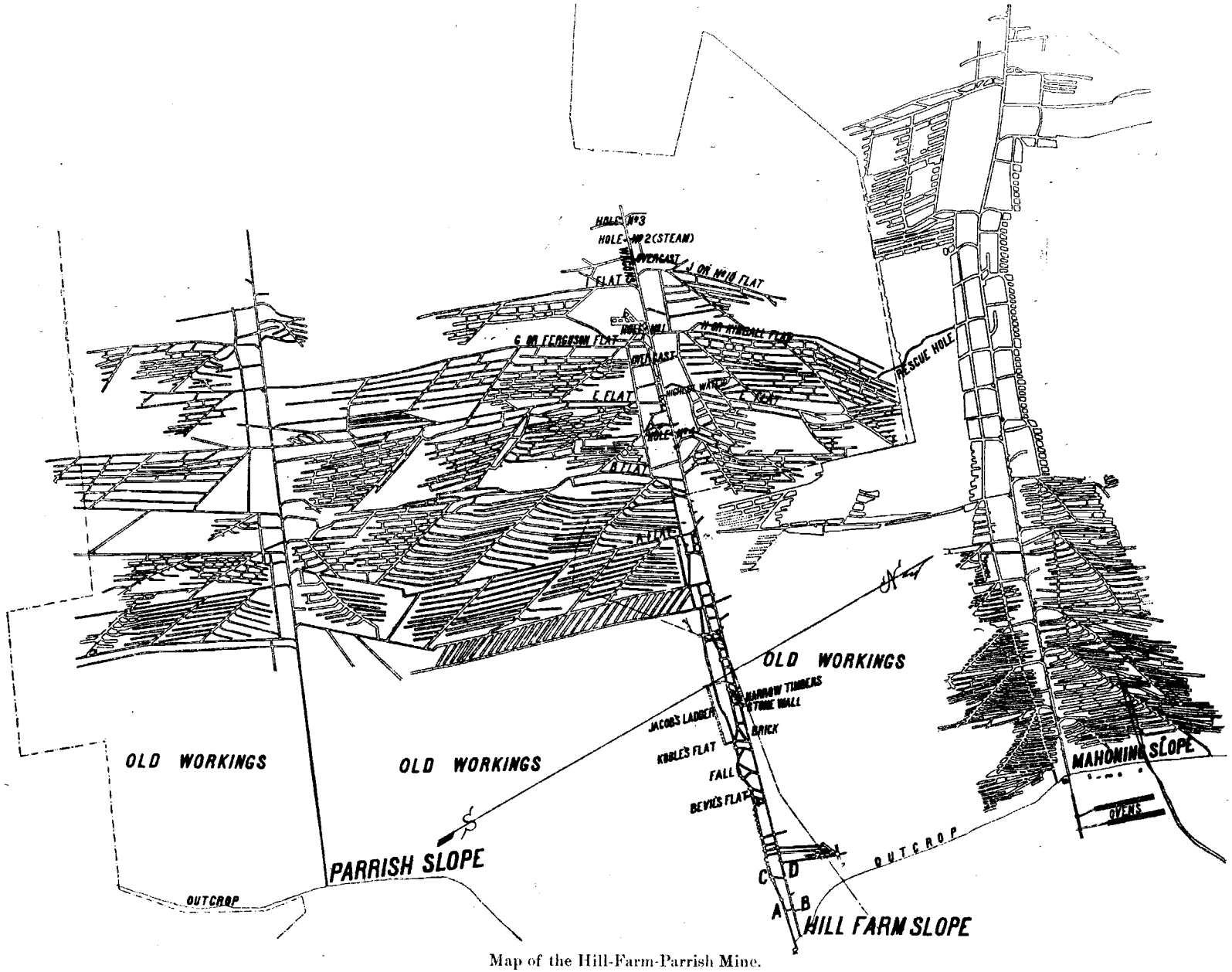
After numerous difficulties we reached, October 1, 1891, the water which had accumulated in the mine. Our anxiety in regard to the fire was over, and pumping at once began. On March 25th, the water was lowered so that "J," or No. 10 flat was entered, and the bodies of 23 of the men were recovered; on April 12th the mine

was dry and the remaining 6 bodies were taken out. It was a matter of much satisfaction that we were able to identify each of the men and give them to their friends for burial among their own. The bodies were generally recognized by their clothing, checks, watches, or some physical distinction. The faces of two were still recognizable. The general action of the water on the flesh seemed rather to "mummify" than to destroy. One face was petrified. The clothing was generally perfect, except that where there was iron, as in belt-buckles or buttons, these were gone. There was no sign of suffering on any of the men, and, with one or two exceptions, no sign of resistance to their fate. All had apparently quietly slept away, overcome by the wood smoke in a few minutes from the starting of the fire.

The immediate cause of the accident was the ignition of gas from the bore-hole, which fired a muslin brattice used to divide the air in the lower slope. This fire extended to the trip of wagons, from the wagons to the wooden overcast, from the overcast to the timbers at the pumps, and from them up the slope. There was no explosion. Doors, brattices, and stoppings were untouched. Light objects within 10 feet of the bore-hole were unmoved. There was no after-damp. Wood smoke filled the mine and killed the men. There was a peculiar though simple combination of circumstances that fatal morning. Had William Hayes delayed his trip down the slope a few seconds longer the gas would have been diffused and been non-explosive. Had the trip of wagons not come down when it did, the fire would have burned itself out at the brattice. The presence of the gas was entirely unforeseen and unexpected. Where it came from I do not know. Mr. William Duncan, State Mine Inspector of the Fifth Bituminous District, than whom there is no higher authority, contends that in this case the gas came from the 5-foot coal-bed about 75 feet above the Connellsville bed. Mr. Duncan considers the 5-foot bed the great gas-reservoir of the district. This is the opinion generally held throughout the region. The main coal with us discharges no gas.

During the progress of the work we had black-damp and white-damp (carbonic oxide, CO) to contend with. The white-damp was the most insidious danger, as the men failed to recognize its presence until too late to escape its effect. The black-damp was annoying, and caused the men much discomfort, but only by its use in forcing it back on the fire were we successful in accomplishing our work. I believe there was no fire-damp in the mine at any time during the

FIG. 1.



Map of the Hill-Farm-Parrish Mine.

Showing portions of slope and manway destroyed by the fire of June 16, 1890, and through which the mine has been recovered. Scale, 1 in. = 800 ft.

work. Frequently, in watering the fire, we would have slight explosions of a gas which burned with a blue flame.

Our experience showed us that there is little coal destroyed by fire in a bed like the Connellsville seam. The face of the coal is coked, and prevents further combustion by cutting off the air. If the fresh air, coming in contact with the burning coal, is reduced to a minimum, the fire can be held in check; but an extremely small amount will support combustion in burning wood. Our most stubborn fires were sustained by old timber. We learned that the bituminous slate of the Connellsville bed sustains fire better than the coal; and also, that the conditions for the extinguishing of fire have to be such as to insure the practical exclusion of air and the placing of water directly on the burning material. Last, but not least, our experience taught us that we could not work on any preconceived idea, but were obliged to modify our plans daily, and that from the start to the finish, our final success was very uncertain. The mine to-day is in first-class shape, our only inconvenience resulting from the fire being in the frequent falls of the shattered roof of the slope.

Our experience has shown that there should be stone, brick, or other non-combustible brattices between all main haulage-ways and air-ways. All overcasts and air-crossings should be made of stone, brick, or iron. No steam-lines should be permitted on main haulage-ways, travelling-ways, or air-ways. Bore-holes through the overlying measures should be opened at times when no men are in the mine other than those necessary to perform the immediate work. Men of known skill and courage should alone be trusted to do the work. The mine-boss should be on the spot when the work is done. Our experience again emphasizes the uncertainty of mining and the necessity for "eternal vigilance."

The credit for the success of this work is largely due to Robert Lang, our mine-superintendent. His undaunted courage, persistent energy, and constant watchfulness carried us through the work without the loss of a man or the serious injury of any one. He was ably assisted by Hugh Doran, William Beane, William Holsing, John Stevenson, Michael Callahan, shiftmen, and John and Charles McBride and our employees generally did faithful work. Without their fearless, honest effort, this paper could not have been written.

The mine is open to the individual inspection of any one, and can "speak for itself."

Correspondence

Dated

07/1911 - 12/1933

Hill Farm Mine

DUNBAR FURNACE COMPANY

MANUFACTURERS OF

High Grade Pig Iron, Connellsville Coke and Silica Sand

IN YOUR REPLY PLEASE REFER TO FILE NO.——

SHIPPERS OF BITUMINOUS COAL

DUNBAR, FAYETTE CO., PA., 7/17/11

interesting and instructive work: and You can kindly forward this letter to Dr. Holmes with our Compliments, and whenever he cares to come with you all to inspect this famous mine We shall consider it an honor & pleasure to allow You all that opportunity. Our mine Supt John W. Greaves will be very glad to conduct Dr. Holmes & You all through the mine as it now is. We took along with us on our inspection trip yesterday some White mice which were not at all affected. You probably remember that the Hill Farm Fire started June 16-1890. Our mine Supt will be glad to assist You in exploration & can explain to You when here how We think the fire was smothered out finally by the black damp. It is a very interesting and instructive ending to what was a most famous & pathetic mine fire. We now expect to mine considerable Coal from Hill Farm and the Company will later on get ready most likely to do so. Hill Farm mine was closed up in May 1897; and the mine has not been opened since. Should Dr Holmes decide to come here & have a look at the mine, or any of you all, let us know so We will be on hand with kind Regards

Very truly Yours Stuart B Marshall
Genl. Supt & Asst. Gen. Mgr.

DUNBAR FURNACE COMPANY

MANUFACTURERS OF

High Grade Pig Iron, Connellsville Coke and Silica Sand

IN YOUR REPLY PLEASE
REFER TO FILE NO.——

SHIPPERS OF BITUMINOUS COAL

DUNBAR, FAYETTE CO., PA., 7/12/11

442

BUREAU OF MINES
PITTSBURG PA.
RECEIVED
JUL 13 1911

Mr. A. M. Wilson, Eng. in C.
dept of the Int.
Bureau of Mines,
Pgh. Pa.

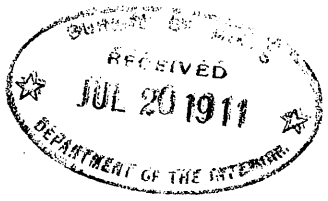
My dear Mr. Wilson:-

It may interest Dr. Holmes, the Head of Your dept., and You all, to know that We believe our famous mine fire at our Hill Farm Mine is now No more; and that We can again start mining out that well known old Basin Connellsville Seam of Coal. Such is the opinion of our mine Supt. John Freare & our engineer S.W. Arnshaw & it has been corroborated & confirmed by Mr. Fred C. Keighley Supt of Oliver & Snyder Co., who examined Hill Farm with us yesterday. We are all of that opinion as it is nice and cool inside No test shows for White Damp or Fire Damp & only Black Damp where natural Ventillation ceases. We thought this would interest You all; Mr Paul Mr. Burnell & others Associated in Your

HMW WJS C

HHH

July 18, 1911.



Mr. Stuart B. Marshall,
Genl.Supt & Asst.Genl.Mgr.,
Dunbar Furnace Co., Dunbar,Pa.

Dear Sir:

I was delighted, as are Messrs. Paul, Rutledge and Burrell, to whom I showed your letter of July 12, with the very gratifying news of the final extinction of the fire in Hill Farm Mine and the fact that same is about to be opened up and operated again after its long suspension from work. I am especially grateful to you for your thoughtfulness in advising us of this event and will forward your letter to Director Holmes for his attention. Unfortunately, he is now in the far West en route to Alaska, and will probably not be East again in six months; at that time he will, I am asure, rejoice with you.

I hope that some of us may, at some time in the near future, be able to accept your kind invitation to visit your Hill Farm Mine. We will be glad to do anything we can in the way of coöperation with you, in the way of making an investigation of its present condition as a matter of scientific and future record; also, if you care to do so, when the time arises, we will be glad to have a rescue car visit the mine with a view to giving instructions to the employes in rescue and first aid work. With best regards,

Very truly yours, HMW

GSR:AHE

February 10, 1913.

Mr. Fred C. Keighley, Genl. Supt.,
Oliver & Snyder Steel Company,
Oliver, Penna.

My dear Mr. Keighley,

I was informed by Mr. R. J. Young, state mine inspector, that you were conversant with the circumstances connected with the Dunbar mine explosion in about 1885. He says that you were state inspector at that time. He and Mr. Taylor stated that a leak from a gas well brokeninto the mine and was ignited, which set fire to the coal in an overcast, which prevented the escape of some 39 (?) men.

I would be very much pleased if you will let me know some details of this, and whether or not there was any published report of the disaster. This matter was brought out in a discussion with gas and oil well operators, who thought that the accidents that occur from gas wells were so insignificant that gas wells should not be considered a serious menace to mines.

Yours sincerely,

Geo. S. Rice

Chief Mining Engineer.

Oliver & Snyder Steel Company,
MINING SUPERINTENDENT'S OFFICE.
OLIVER, FAYETTE CO., PA.

FRED. C. KEIGHLEY,
GEN'L SUPT.

PITTSBURGH OFFICE
So. 10TH AND MURIEL STS.

mine in order to form a discharge outlet for the mine water. This bore hole was over 500 feet deep and said to be nearly full of water when it reached the coal. I was told that it reached the coal on Saturday night, and if the Management had had a speck of gumption about them they would have opened that bore hole on Sunday when there were no men in the mine; however, for some reason unknown to me the work of opening the bore hole was not started until the Monday morning following, and the miners were all at work. It seems that John Kerwin was engaged in cutting over from the slope to the bore hole when his pick suddenly broke into the hole; the result was that a torrent of water poured out therefrom and the pressure must have been terrific with a head of over 500 feet, as you will understand. The sudden releasing of this water at the bottom of the hole caused a vacuum to be formed in the bore hole itself which was immediately filled with gas from the strata traversed by the bore hole. A trapper boy heard the rushing of the water and at once concluded that water had burst into the mine; he knew that five or six men were working in the dip and would be drowned if there was any great volume of water. He wished to warn them of their danger and in doing this he passed the place where the bore hole had been punctured and the naked light on his cap ignited the gas that was issuing from the bore hole. This developed into a long tongue of flame that reached across the slope and set the brattice cloth on fire; the brattice cloth soon reached some greasy timber, and, it is said, a barrel of pit car oil, and this took fire and set a trip of cars on fire that was standing directly on the slope. Of course the men below these burning cars could not get out as the slope from that point down was single and ventilated by brattice cloth instead of being paralleled as was the intention later on.

I should hardly class that accident as an explosion, it was really a very large mine fire, but it did have its origin in the gas that issued from the bore hole. The

Oliver & Snyder Steel Company,
MINING SUPERINTENDENT'S OFFICE,
OLIVER, FAYETTE CO., PA.

FRED. C. KEIGHLEY,
GEN'L SUPT.

PITTSBURGH OFFICE
SO. 10TH AND MURIEL STS.

Oliver, Pa., February 12, 1913.

Mr. George S. Rice,

Chief Mining Engineer, Bureau of Mines,

Pittsburgh, Pa.

ANSWERED
FEB 24 1913

My dear Mr. Rice:

Replying to your letter of February 10th in which you take up the matter of accident at the Hill Farm Mines, Dunbar, in the year 1889. Mr. Young is right when he states that I was State Mine Inspector at that time and had charge of the work immediately after the accident. There were 31 men lost in this accident and not 39 as you have been informed. Two of the bodies were taken out during the afternoon of the first day, the other 29 bodies were not recovered for something like two years afterwards.

As to the cause of the accident and what immediately followed, would say that although it is more than twenty years since the accident occurred I think I can give you a pretty good idea of it: On the morning of the accident I had arranged to go to Somerset County,Pa. to inspect some mines located there that were in the Fifth Bituminous District at that time, and expected to be away about a week. Just as I was getting on the train to go to Somerset County an acquaintance of mine said there had been an accident at the Hill Farm Mine and asked me if I had heard of it. I had not heard anything of it but told him that instead of going to Somerset I would get off the train at Ferguson Station, which I did. When I reached the Hill Farm Mine I found that it was on fire and large volumes of smoke were being given off. Of course in the line of my duty as Mine Inspector I inquired into the cause of the accident; what I was told is substantially as follows:

A drill hole had been put down from the surface into the dip section of the

Oliver & Snyder Steel Company,
MINING SUPERINTENDENT'S OFFICE,
OLIVER, FAYETTE CO., PA.

FRED. C. KEIGHLEY,
GEN'L SUPT.

PITTSBURGH OFFICE
SO. 10TH AND MURIEL STS.

G.S.R. #3.

chances are that if the boy had run down five minutes sooner, or five minutes later there would have been no fire; as itwas he happened to pass the point with his naked light at the very instant the gas was issuing from the hole. I have always understood that there was no large amount of gas in the bore hole, and if a person would stop to think there could not have been a very large amount for the reason that the hole had been in the process of drilling for some time, two or three months perhaps, and the gas naturally would escape up the hole. The sudden liberation of the water would explain why the gas rushed down the bore hole, the vacuum produced would be enough to draw out any gas that was in that immediate vicinity.

This accident was the cause of that particular provision now appearing in the mining law which states that no bore hole shall be tapped during working hours, or while men are engaged at work,-- I do not remember the exact words but this is the substance of it. The real cause of the disaster seems to have been lack of good judgment; there was no reason in the world why the hole could not have been opened up on Saturday night or some time during Sunday.

I think several reports were printed relative to this accident and possibly I may have one at home; if I can find it will mail it to you.

Very truly yours,

Fred C. Keighley

GSR:AHB

8-627

February 21, 1913.

Mr. Fred C. Keighley, Supt.,
Oliver & Snyder Steel Company,
Oliver, Penna.

Dear sir:-

I received your letter of February 12, relative to the Dunbar disaster of 1899. I thank you very much for your very complete explanation of the accident.

Yours sincerely,

Chief Mining Engineer.

December 29, 1933 ERM:LJ

Mr. W. W. Adams
U. S. Bureau of Mines
Washington, D. C.

(Through Mr. Forbes)

Dear Mr. Adams:

In going over your Bulletin 355, "Coal Mine Accidents in the United States, 1930", I found on page 95 what I believe to be an error; the Hill Farm mine at Dunbar, Pa., in which a mine fire occurred on June 16, 1890, causing the death of 31 men, is marked as an anthracite mine. I believe this is a bituminous mine. This mine is located at Dunbar, Pa., between Connellsville and Uniontown, Pa.

I have attempted to find records of the Pennsylvania Department of Mines reports of this occurrence, but this office has no published reports of fatalities for 1890. I conferred with two men, one who was superintendent of this mine shortly after this disaster, who recalls very vividly the work of removing the bodies six months after the fire had been sealed; the other man has also a clear recollection of the incident.

I would like to see this corrected as I believe this is one of the most disastrous fires that has ever occurred in the bituminous region of Pennsylvania. If you have any authentic records of accidents for the year 1890, I certainly would appreciate having the correct information.

Very truly yours,

ERM

E. R. MAIZE,
Junior Mining Engineer.

cc File
D. Harrington