

bottom of the shaft, and partings had been burnt out, causing large falls of shale and rock. The tower on the surface and all outbuildings were destroyed. A more modern tower and outbuildings have been erected, with suitable shaking screens for all grades of coal. The shaft bottom and partings have been retimbered in first-class manner and the mine is now one of the best fitted up plants in the district.

In October last, a serious fire also occurred at the Gillespie mine of the Consolidated Coal Co. No lives were lost but the property was greatly damaged and was only rescued from total loss by skillful treatment and a considerable expenditure of money. Mr. T. R. Stockett, Jr., chief engineer of the Consolidated Company, makes the following statement of the damages and difficulties of the situation at this mine and of the manner in which they were overcome:

GILLESPIE MINE FIRE.

Fire occurred October 16, 1896, about 7:30 p. m.

South side of mine resumed operations April 1, 1897.

North side of mine resumed operations July 1, 1897.

The fire, which broke out on the main north entry of the Gillespie mine October 16, 1896, at about 7:30 p. m. causing the total suspension of the production of coal from the mine for a period of five and a half months from the south side and eight and a half months from the north side, is supposed to have had its origin at the overcast, over the main entry at a point 460 feet north of the hoisting shaft and 280 feet north of the entrance to the air shaft. It may have been caused by a spark from the lamps of passing men; or by spontaneous combustion; or the breaking out of an old gob fire, due to the crushing or falling of the fire-walls walling off the west side old workings, which had been giving more or less trouble from fires for some years previous. This latter is now generally accepted as the originating cause of the fire.

The fan at the time of the fire was running as a "blower" and forcing into the mine about 44,000 cubic feet of air per minute, passing it down the air-shaft, through the overcast, up the air-course and back the main entry under the overcast to the hoisting shaft or upcast.

The overcast was constructed principally of lumber. That the fire was some time in destroying it was evidenced by the burned and charred timbers in the air-course for a considerable distance northward. The destruction or burning through of the overcast gave the air-current a quick return down the main entry, reversing the course of the fire and sweeping it along the main entry towards the hoisting shaft.

This shortening of the passageway for the air to travel increased the air produced by the fan to about 56,000 cubic feet per minute, and this was further largely augmented and its velocity accelerated by the furnace-like heat sweeping along the main entry and up the hoisting shaft, taking the fire but little time to traverse the 460 feet to the foot of the shaft. Luckily, however, the falling of the soapstone, which blocked the entry, and a small fall near the shaft, held it in check until the sealing up the shafts smothered it out, or prevented its spreading.

No one was in the mine after 5:30 p. m. the day of the fire, and the first indication of fire was the observance, by the night man at 7:30 p. m. of dense volumes of smoke ascending from the hoisting shaft. An alarm was sounded and the fan stopped. Two men who quickly entered the mine through the air-shaft succeeded in getting to the stable and liberated several of the mules, but were compelled to retreat owing to the smoke and heat. Upon their return to the surface, the tops of both the air-shaft and hoisting shafts were speedily closed and tightly sealed.

The following morning arrangements were made to ascertain the extent of the fire, if possible, by entering the mine through the airshaft, and a party of the company's officials began the descent on ladders, filling up the opening in the partition for an air-way as they descended and waiting for the fan above to move the smoke and gases ahead of them. Considerable time was then consumed, but the bottom was finally reached by three of the party, who saw not twenty feet ahead on the main entry, a solid wall of fire at white heat, the full height of the entry. The heat and gases forced a retreat and the top of the shaft was again sealed.

It was then concluded, in order to prevent the fire from creeping closer to the foot of the air-shaft, and to cut off the air from feeding the fire on the main entry, to seal up the air-shaft as hermetically as possible. This was accomplished by throwing clay down the shaft, a vertical distance of 355 feet, while a stream of water from a two-inch pipe was kept running into it at the same time, thus making a mixture of about the consistency of thick cream, or properly mixed cement, which permitted its spreading out into the air-courses and into all the crevices in the air-shaft. This filling in of clay mingled with water was kept up for several days. When it had blocked itself in the air-courses and reached a vertical height of 30 feet in the shaft, clay only was thrown in, and this packed and puddled itself. On top of this clay thereafter several feet of water was kept standing. A daily examination failing to detect any leakage. The wisdom and effectiveness of this plan was amply demonstrated later on.

In the meantime the temporary covering over the hoisting shaft had been removed and replaced by a more substantial one built in the hoistways and filled in with puddled clay, a pipe being placed in it to admit of observations being taken. After several days a self-registering thermometer was let down to the foot of the shaft, repeated readings of which failed to indicate a temperature much above the normal.

Preparations were then made for entering the mine through the hoisting shaft. A four-foot Murphy Champion Fan was set up at the head of the shaft and arranged to be run exhausting. The shaft was uncovered and a solid partition carried down on the buntons between the hoistways. Upon reaching the bottom considerable black damp was encountered. It was ascertained, however, that the bottom of the shaft was not damaged, and a fall could be seen about 25 feet up the north entry, the south side apparently being all right.

A temporary brattice was carried from the shaft to the fall and an opening made on either side of it. The black damp retarded the work considerably.

but by degrees an advance was made up the main north entry for about 100 feet, where the entry was found to be tightly closed by the fallen roof. The timbers along the entry from the shaft to this fall were charred and burned; evidence that the fire had been there and would soon have reached the foot of the shaft.

Arrangements were then made for the cleaning up of the entries and the restoration of the mine to its normal condition. The temporary brattice was removed and replaced by a permanent one, which was carried up the entry from the foot of the hoisting shaft, thus providing an intake and return of sufficient area to provide ample ventilation. This brattice was continued as the work progressed and used until the air shaft was reached, cleaned up and repaired, when the use of the fan temporarily set at the head of the hoisting shaft was discontinued for the larger fan at the head of the air shaft, and which latter was connected with the brattice on the entry and started up.

It was found that the soapstone over the coal, 17 feet in thickness, had all fallen, blocking the entry, 16 feet in width, tightly. Between the top of the loose fallen soapstone and the rock overlying was an open space, varying in width from 8 to 16 feet and in height from 2 to 4 feet. Soon after the work of cleaning up began the heat became stronger and the men were forced back by it, and the gases which came on them over the top of the fall, indicating that fire was still burning ahead and receiving air through the loose soapstone blocking the entry. To overcome this difficulty the following plan was used: A pipe from the surface reservoir was run down the shaft and up the entry to the face, and pushed ahead in the opening between the soapstone and rock. On the end of this pipe was fitted a "rose" and water was sprayed through it over the soapstone, the pipe being moved backward and forward at intervals. This was kept up until the heat diminished sufficiently for the workmen to carry a temporary brattice up the face of the fall and along the top of the soapstone in the opening under the rock some 50 or 60 feet, at which point a cross brattice was erected and tightly sealed. The temporary brattice was then removed and the work of cleaning up renewed; when the cross brattice was reached the same proceeding was repeated, the distance ahead gained for the new cross brattice varying with the conditions found, from 30 to 100 feet. Water was kept running on the top of the soapstone ahead of the cross brattice constantly, thus cooling the mass off for the next advance. At times the return water coming out on the entry would be quite hot and then would gradually cool to normal.

The above method of advancing was continued until the location of the overcast was reached. At several places along the entry fire was encountered, both in the coal and the soapstone. By far the biggest fire and the most difficult to handle was in the pillar between the entry and air course at the overcast; this pillar was found to be practically burned through and this delayed the work of advancing several weeks.

The main entry was cleaned up and retimbered for a distance of 900 feet north of the shaft, then a clear space of 230 feet was found, and then another fall of 50 feet in length, making a total distance of 1,180 feet from the shaft to the end of the falls occasioned by the fire. Considerable work was also

done in the air course and an approach to the location of the new overcast was made. This overcast was constructed entirely of brick and iron, and with its approaches was made as fire-proof as possible.

The fire walls, walling off the old gob fires, have been strengthened and extended and thermometers are kept on them and daily observations taken.

While the work of opening out was progressing considerable fire damp and black damp had accumulated in the extensive workings of the mine, and upon the completion of the overcast the air was turned into that part of the mine for the purpose of removing it. During the removal, which took several days, no one was allowed in the mine.

The twelve mules which were in the stable at the time of the fire, were suffocated. Their decomposed carcasses were reached and removed with the aid of crude carbolic acid and slack lime, on November 4, nineteen days after the fire.

The magnitude of the work, the difficulties encountered during its progress and to be overcome proved greater than anticipated. Workmen in shifts of eight hours each were kept almost uninterruptedly at work during the eight and one-half months the work was going on. That all of this work with its attendant dangers was carried to completion without any fatalities or casualties whatever is cause for congratulation and evidence of the careful management that directed it."

Fatal Accidents.—Morgan Jones, aged 35 years, occupation sinker, married, leaves a widow and three children, was killed July 4, 1896, at the mine of the Litchfield Mining and power Company, Litchfield, Montgomery county. The shaft had recently been sunk to a seam of coal 160 feet lower than the one that had formerly been worked. A reel about two feet in diameter was set in a frame on the platform of one of the cages; around the reel was a three-quarter-inch steel cable that was used as a hoisting rope from the cage to the bottom of the shaft as the sinking progressed; the material from the shaft was taken off at the seam that was formerly worked and stowed in the abandoned workings. The rope was uncoiled from the reel on the cage as the sinking advanced, it passed from the drum through a hole bored through the bottom of the cage at the center. The rope was fastened at the required length by two clamps, the lowest rested on two blocks of wood placed on the platform of the cage. When it was required to unwind some of the rope from the reel, the clamps were loosened and the required length of rope allowed to slide through them. The lowest clamp was wood, the other clamp placed immediately above it was iron. At the time of the accident four men were engaged putting in slides; it being about the middle of the shift they had come to the upper seam and before lunch had concluded to place four slides on the platform that they were working on. The platform was hoisted to about nine feet from the landing at the upper seam when two of the men got off and put the guides on the platform. Morgan Jones and Charles Veit remained on the platform. A signal was given to the engineer to hoist the platform to the level of the landing at the upper seam. Just as the engine began to hoist the platform began to descend. The rope slipped through the clamps, uncoiling