

## THE MAITLAND EXPLOSION.

A gas explosion occurred in the fourth west workings of the Sunshine district of the Maitland mine, about 9 o'clock a. m., February 19, 1906, the same resulting in the death of fourteen men, whose names, occupations, etc., are given in the list below:

Name of Person	Nationality	Occupation	Age	Married or single
John Titters.....	American	Miner	26	Single
F. Beam .....	American	Miner	28	Single
Wm. Moran .....	American	Miner	22	Single
B. Lovera .....	Italian	Miner	37	Single
A. Zanatti .....	Italian	Miner	43	Single
K. Koster .....	Italian	Miner	28	Married
Jno. Koster .....	Italian	Miner	33	Single
F. Nizzi Brothers.....	Italian	Miner	35	Single
J. Nizzi		Miner	28	Single
Tony Ari .....	Italian	Miner	29	Single
P. Divizio .....	Italian	Driver	19	Single
Fred Zenna .....	German	Miner	31	Married
Archie Miller .....	Scotch	Fire-boss	33	Married
N. Jacávak .....	Slav	Miner	45	Single

Ten of the victims died from suffocation, due to "after damp," and the other four from the combined effects of after damp and burns inflicted upon their faces and hands by the heat generated by the explosion of the fire damp.

The mine is located about four miles northwest of Walsenburg, the county seat of Huerfano county, and on a branch line of the Denver & Rio Grande Railroad. It is operated by the Victor Fuel Company. W. J. Murray, general superintendent; Harry Elliott, local superintendent, and Thomas Ash, mine foreman, are the managing officials of the mine.

The Maitland and Sunshine slopes are situated about a half mile apart, and were originally opened and operated by two independent parties. Although developing the same veins, their respective workings were isolated from each other by a sixty-foot dyke of eruptive material. Soon after the Victor Fuel Company became possessor of the Sunshine property, a tunnel was driven through the "dyke" from the terminus of the Maitland third east entry; thus the two mines were connected, and since then the entire product of the Sunshine has been hauled out through the Maitland slope. There are two veins of coal being developed, geologically separated by fourteen feet of arenaceous shale, the lower vein having a thickness varying from five to five and a half feet; the other, not quite as uniform in thickness, and worked as an auxiliary to the former, varies from two and a half to three and

a half feet, overlaid by an immense stratum of hard, resistive sand rock. The slopes are driven in the bottom seam in a southwesterly course, and nearly in line with the dip of the measures, which approximate five degrees, and have reached a distance of 3,000 feet from the entrance, which is the outcrop of the coal. The lower seam, which is first mined of the two, is worked systematically on the double entry room and pillar method. Here a series of rooms are driven to their destination and the pillars extracted; then the roof falls, usually to the sand rock immediately overlying the upper seam, leaving its bed of coal lying practically loose upon the surface of the fallen shale. If the superincumbent sand rock remains intact, a slant (incline) roadway is then constructed through the brow of the fallen debris, and the coal of the top vein is thus won.

Ventilation of both districts is effected by a twenty-foot force fan, located at the mouth of the main air course to Maitland. At a normal speed of eighty revolutions, the fan produces a total quantity of 40,000 cubic feet per minute. This main air course is driven in the upper seam for a distance of about one-third of a mile, at which point the principal air volume is divided in two—one division of the current (19,500 cubic feet per minute), being conducted through the said third east entry, now used only as electric haulage way and air course into the Sunshine workings, whence, after completing its circuit, it escapes in a diverging manner through the worked out parts of the Sunshine and the workings of the Pictou mine, a property adjoining. The other portion of the main current traverses the Maitland, returning up the latter's slope. All the present workings of the Sunshine are embraced within the section of the slope lying to the dip of the said connecting tunnel, and are confined to the third and fourth west fifth and sixth east entries, and the total number of men employed was 45. Dividing the 19,500 cubic feet of air by this number, we find that the quantity entering exceeded 400 cubic feet per man per minute.

It happened that on the day the accident occurred I was making a general inspection of the Baum-Saunders mine, seven miles out from Fort Lupton. The camp being new, communication with other points by wire or telephone had not yet been established; therefore, I could not be notified of the occurrence until I arrived at home at 6:30 p. m., although the office was informed of the fact early in the day by the Victor Fuel Company. I took the night train for Pueblo, so as to be in readiness for the first morning train to Maitland, arriving there about 11 a. m., and was at once informed that all the bodies had been recovered, the last one at 11:45 p. m. the same day of the accident.

The fourth west entry and its eleven tributary rooms, the seat of the catastrophe, were all retreating with the stumps and pillars. The total length of the entry, whose destination was determined by its contact with coked coal adjacent to the dyke.

was 400 feet, and the room lengths varied from 50 to 220 feet, conforming to the irregularity due to the metamorphosed condition caused by the dyke. Extraction of the pillars of the two inner rooms and the entry stumps to No. 9 had already been completed, and the pillars of the outer rooms were back from forty to fifty feet from their terminating line, which was the chain pillar of the third west air course.

In this excavated area, at the head of rooms Nos. 3, 4 and 5, the roof had fallen in irregularly across the faces, and longitudinally with the roadways for a distance of 20 to 30 feet, but leaving an open space of 20 feet or more between the outer edge of the falls and the working faces of the pillars. These caves were of varying heights, from a few feet to probably the whole thickness (14 feet) of the intervening shale between the two seams, but the exact height to which the heavier part of the falls reached could not be accurately determined, because at every accessible point where an examination could be made I found that at a height of 10 to 12 feet the fallen ground formed a close contact with the solid sides, and practically filling the cavity and making an investigation higher up impossible.

I entered the mine soon after my arrival, accompanied by Supt. Elliott and other employes. At this time the stoppings that were blown out and the damaged door at the mouth of the entry had not yet been replaced, excepting by crude devices, set up temporarily, and consequently the ventilation was impaired and seriously disarranged, the current short-circuiting before reaching the fourth west workings. Yet the workings were perfectly clear of all after damp, and I was able to pass with safety lamps along all the pillars' faces. I found explosive gas (fire damp) at the heads of rooms 3, 4 and 5. In the former two the gas only extended a short distance back from the falls, but in No. 5 it was found close to the pillar in a cavity in the roof.

I inspected the mine again on March 1, and, although the work of rebuilding stoppings, etc., was not yet completed, the gas had at this time receded considerably and could be found only along the edge of the falls. On the 8th of March I was notified by Supt. Elliott that the ventilation had been restored to its normal condition in the affected district, and I again visited the scene and found that the gas had disappeared from all the places excepting at the top of the fall at the head of room No. 5. Here a small accumulation still existed at a point where the air current could not reach effectively, but since then a cross cut has been driven through the chain pillar at the head of the room by the use of which the current has been brought to play directly upon the gas until the last vestige disappeared.

There were two fire bosses employed at the mine, each examining his own district every morning before the other employes would enter. Andy Miller, fire-boss, Maitland district, a brother of the deceased fire-boss of the Sunshine, upon being questioned as to his knowledge of the conditions in the Sunshine

previous to the explosion, stated that at 6 a. m. the day of the disaster he and Archie met as usual, after making their rounds, at the third east double parting, Maitland, and in talking of the condition of their respective districts Archie said his "route was all clear excepting a little gas at the top of a cave in the fourth west." This testimony was verified by the deceased's report in the daily report book, in which he had recorded, "Some gas in No. 5, 4, W. SS."

From the small amount of damage done to the mine, it is evident that the explosion was of a very mild nature. Its effects, to any appreciable degree, did not extend up the slope and parallel air-course beyond the mouth of the fifth west entry, a distance of about 600 feet from the initial point. Within this distance nearly all the cross-cut stoppings were blown out, one over-cast torn down, and in all there were three falls of roof where timber had been blown out, aggregating twenty pit-cars of rock. The other entries not the least disturbed.

Of the fourteen killed only four were burned, viz.: Miller, fire-boss; Divizio, driver; Titters and Moran, miners, whose bodies were found in room 4, which was occupied by the latter two. According to Dr. McGuire's testimony, even their burns would not have proven fatal without the aid of the after damp. The other nine men who worked in the pillars on both sides of room No. 4 were found on the double parting at the mouth of the west fourth entry, all of whom died from suffocation only.

B. Lovera was working in the second room of the sixth east entry, and while trying to make his escape up the slope immediately after the explosion, he fell at said wrecked over-cast, and although soon rescued, he died in two hours after reaching the surface from the effects of inhalation of after damp.

Archie Miller served seven months as fire-boss at this mine, and had held a similar position for five years at another mine previous to beginning here. He held second and first class certificates, awarded him after standing rigid examinations, proving his ability to act in such capacity; therefore the man's competency to fill this position can not be questioned.

In spite of the weakness of the force of the explosion and the limited area covered by the flame, as is evidenced from the fact that those in the adjoining pillars, although working so close to each other in the same open space, were not burned. Yet it can be clearly seen that it was of sufficient magnitude to prove beyond a doubt that the accumulation of gas at the time it exploded exceeded the volume found by the fire-boss when making his morning examination. The amount of gas found by him being small and situated at the top of the cave, a rather remote point from the nearest working face, he undoubtedly believed that it was perfectly safe for the men to work and that no unexpected danger would develop. The men had worked two hours before it occurred, which shows that the faces were

clear when the shift started, hence the direct cause of how the increased accumulation came about can only be conjectured. If the air current had been cut off, or even reduced, we would naturally attribute it to such, but facts, as brought out by the evidence obtained through different sources, proved that the ventilation was at normality. There was no powder used in that particular section, and I did not discover the remotest evidence to indicate that dust took any active part in the explosion. Therefore, it can only be attributed to a sudden inflow of gas brought about by the squeeze of the superincumbent strata opening up fresh pores and thus exposing new feeders, and it is possible that the rapidity of transpiration of the gas was also augmented by a simultaneous fall of barometrical pressure.

While the cause of the explosion can not be charged to any negligence on the part of the officials, yet the occurrence teaches us that when pillars are being drawn under conditions so susceptible to a sudden inflow of gas from roof caves, and this occurring only locally and no danger for the same to reach any other part of the workings, safety lamps should be used exclusively in such particular districts.

JOHN D. JONES.

VERDICT OF JURY.

"That the above named men came to their death at Maitland mine at about 9 a. m., February 19, 1906. We furthermore find that the above named men came to their death by the suffocation caused by an explosion of gas in the fourth west Sunshine entry in No. 4 or 5 room of the Maitland mine. We, the jury, find, according to the evidence produced before us, that the death of the above named men was an unavoidable accident, and every known precaution which miners could take was taken to avoid the same.

"(Signed)

"E. L. TROUNSTINE,

Foreman.

"A. B. ONEIL,

"ROBERT YOUNG,

"RICHARD WEIN,

"VICTOR SANDOVAL,

"CARPIO ARCHULETO.

"S. JULIAN LAMME,

"Coroner of Huerfano County."

THE CUATRO EXPLOSION.

An explosion of "fire damp" occurred in the second north opening of the Cuatro mine at 10:25 a. m. (Sunday), April 22, 1906, and caused the deaths of nineteen persons.