



Reports

Dated

01/23/1907 - 03/12/1907

Primero Mine

VERDICT OF JURY.

We, the undersigned Coroner's Jury, duly impaneled and sworn to try the issue of the cause of the deaths of Angelo Della-Maddalena, Encio Stiffi, C. Casagrande, Robt. Fatur, John Fatur, Genlicio Rudolph, John Tokar, John Bozo, John Toth, Omobono Stuffatti, Modesta Formilli, Fortunato Giacomozi, Angelo Pesetta, Luis Sipos, Jos. Sipos, Frank Hobart, Dominic Pesetta, John Hamecke, John Sine, Frank Urich, Frank Smurdel, John Paulich, find that the said parties came to their deaths in Primero, said County and State, on the 23rd day of January, A.D. 1907, by an explosion in the Primero mine and that the cause of said explosion is unknown to this Jury.

IN TESTIMONY WHEREOF, The said Jurors have set their hands, at Primero, Colorado, this 26th day of January, A.D. 1907.

Chas. Trew
Jesse Shaw
Suic Santstavin
Henry Brown, X, his mark.
Franch Stagner
Chas. Thomas

John R. Guilfoil, Coroner of Las Animas
County, Colorado

An Inquisition holden at Primero in Las Animas County, State of Colorado, on the 7th day of February, A.D. 1907, before John R. Guilfoil, Coroner of said County, upon the body of Rees J. Lumley, there lying dead, by the Jurors whose names are hereunto attached, said Jurors upon their oaths do say that Rees J. Lumley came to his death by an explosion of gas in the mine of Primero in said County and State, 23rd day of January, A.D. 1907. Cause of said explosion unknown to this Jury, and the body found is the body of Rees J. Lumley beyond a doubt.

Chas. Trew
Franch Stagner
Suic Santstavin
Chas. Thomas
Jesse Shaw
Henry Brown

John R. Guilfoil, Coroner of
Las Animas County, Colorado.

Report on the Explosion in
Primero Mine
Colorado Fuel & Iron Company
Trinidad, Las Animas County, Colorado
January 23, 1907
by
John D. Jones
State Mine Inspector

Denver, Colo., March 12, 1907.

HON. HENRY A. BUCHEL,

Governor of Colorado.

Dear Sir:

In compliance with your instructions regarding the explosion which occurred at the Primero mine on Jan. 23rd, 1907, and resulting in twenty four persons losing their lives, I beg to state that I made a careful investigation of the workings of the mine and the probable cause of the disaster, and I herewith submit to you my report on the same:

TABLE OF PERSONS KILLED.

NAME	NATIONALITY	OCCUPATION	MARRIED AGE OR SINGLE
Angelo pella-Maddalena	Italian	Day-man	24--Single
Omobono Muffatti	Italian	Day-man	24--Single
Costante Casagrande	Italian	Day-man	21--Single
Enrico Stifel	Italian	Day-man	28--Single
Modesto Formolli	Hungarian	Day-man	24--Single
Arcangelo Pisetta	Hungarian	Day-man	34--Single
Dominco Pisetta	Hungarian	Day-man	22--Single
Fortunato Giacomozzi	Hungarian	Day-man	52--Married
Andrea Varga	Hungarian	Miner	40--Married
Gioanni Bozo	Hungarian	Miner	36--Married
Luigi Sipos	Hungarian	Miner	21--Single
Guiseppi Sipos	Hungarian	Miner	20--Single
Gioanni Tokar	Hungarian	Miner	42--Married
Gionni Toth	Hungarian	Miner	24--Single
Gioanni Hannusek	Hungarian	Miner	28--Single
Giulio Rudolf	Hungarian	Miner	35--Single

Gioanni Fatur-----	Hungarian-----	Day-man-----	29---	Single
Roberto Fatur-----	Hungarian-----	Day-man-----	24---	Single
Frank Ursich-----	Hungarian-----	Day-man-----	30---	Single
Gioanni Sajn-----	Hungarian-----	Day-man-----	30---	Single
Frank Smaldei-----	Hungarian-----	Miner-----	34---	Single
Frank Hubat-----	Hungarian-----	Day-man-----	24---	Single
Gioanni Paulich-----	Hungarian-----	Miner-----	24---	Single
Rees Lumley-----	Welsh-----	Fire-boss-----	46---	Married

LOCATION AND GEOLOGICAL FEATURES: The primero mine is located at the terminus of a three mile branch, to the north, off the Colo. & Wyo.R.R. 18 miles west of Trinidad, Las Animas County. It is owned and operated by the Colorado Fuel & Iron Co. and the officials in charge are: Messrs. J.T.Kebler, general manager, Robert O'Neil, division supt., and Wm.Morgan, local supt. The mine is worked through five independent openings, four drifts and one slope and all the coal is delivered at one tipple. development of the property was commenced in June 1901 and by December of that year it had attained the distinction of being the largest producer in the State and which supremacy it maintained to the date of the accident now under consideration.

The seam under exploitation belongs to the upper of three series of workable veins contained in the Laramie cretaceous measures. It has a mean thickness of 7 ft. and the coal is of the bituminous coking variety.

DESCRIPTION OF MINE AND MODE OF WORKING: The explosion occurred in the "Main North" which is the most extensively developed opening of the five, and is equipped for an output of 1,500 tons daily. It

is opened by two parallel drifts, haulage-way and air-course, both entering upon the outcrop of the vein and driven in a direct course until they have reached their present depth of 4,400 ft. from the entrance. The drifts run practically level for 1,600 ft. at which point the measures assume a slight forward dip and the inclination gradually increases from thereon to the face where the pitch is four per cent.

The method of working is double entry room and pillar. There are nine pairs of cross-entries branching off the Main, six to the left which are designated on the accompanying map as "A" entries, and three to the right called "B" entries, but the present productive workings are embraced within the territory lying from A-6 inward, and all the entries and their tributary rooms lying from A-6 outward including B-3 and 4, have been worked out and are abandoned. The cross entries are turned at intervals of 600 to 800 feet apart and are driven at nearly right angle to the Main and along the strike of the measures, the rooms are 16 ft. wide with 24-ft. pillars, and mining is done by undercutting and blasting. Giant powder was used in the entries and rooms, and black powder in the pillars, illumination was accomplished by naked lights exclusively.

VENTILATION: Is effected by a 12 X 10-ft. direct-connected Capell fan, which type in power and effectiveness ranks with the highest mine ventilators manufactured. A feature that should be mentioned is the excellent condition of the main air-way leading from the fan to the interior of the mine. This air-way is nearly uniform in dimensions, free from angles and curves and has a minimum area of 100 square feet, these alone are important factors in contributing towards minimizing the resistance to the air current and hence greatly assist in securing good ventilation. At the time of this department's last general inspection previous to the explosion, made on the 4th of Nov.

1906, by Mr. D. J. Griffiths, deputy inspector, the mine was perfectly free from any explosive gas and the total volume of air entering the mine was 108,500 cubic feet per minute at fan revolutions 125. Of this total quantity, 60,700 cubic feet passed in through the Main ~~MAX~~ North Entry and was utilized in ventilating the A districts and the balance of 47,800 entered the first east and was used to ventilate the workings of B-5 and 6. Final distribution of the air with the maximum number of men supplied during day shaft by each split was approximately as follows:

Location	Number of cu. ft. per min.	Number of men
A-6.....	10,000.....	12
A-7 & 8.....	25,500.....	60
A-9 & 10.....	19,200.....	30
A-11, 12 & main entries.....	2,000.....	2
B-5 & 6.....	47,800.....	44

Considering the volume of air circulating, the mode of distribution and its careful conduction through the workings, it stands amongst the best ventilated mines in the State. The map shows by arrows the direction and ^Sdistribution of the air. In 1904 the officials of the company established a rule to the effect that "all shots are to be fired by shotlighters, and the firing to be done when all other employes are withdrawn from the mine." This rule, although not a requirement of the mining law, I am informed was strictly observed by the day shift, but not always by the night firers.

HYGROMETRIC CONDITIONS: As nearly all the water that the mine makes is issuing from the coal, the greatest amount of moisture is found in the advanced workings, yet all the dip rooms and a majority of other rooms as well as cross entries, that have encountered and passed through local stratigraphical depressions, which occur quite frequently, contain more or less standing water and the coal loaded

from many of the rooms and entries is so saturated with water that the loaded cars are dripping while being hauled out. There are two electric portable pumps used in drainage and these are kept running 12 out of every 24 hours, also three syphons are in continuous service to transfer the water from different points to the pump stations. The discharge pipe that conveys the water from the pumps to the surface, is laid along the main air course. This pipe is fitted with hydrants located 300 feet apart to which a hose ~~is~~^{was} attached, and the main entry which is naturally dry from A-9 back, was sprinkled as often as required, and according to the testimony of Mr. Wm. Easton, pumpman, this was done twice a week and three times when found necessary. Besides, to every rope trip hauled from B-5 and 6 entries, about eight each day, was attached a tank full of water bailed out of the dip rooms in B-6, and when the trip was on its outward run, the tank valve was thrown open and the contents allowed to escape along the roadway, thus the floors of the haulage-ways were kept in an almost constant condition of humidity.

RESCUING: The explosion occurred at 4 A.M. mine time, or 3-15 Standard, and shortly before the night shift was ready to leave. The concussion created by its tremendous force was such that it severely shook the entire camp and soon afterwards scores of men gathered at the entrance of the mine. Among the first to arrive, was Supt. Morgan, who instantly realized the extent and seriousness of the catastrophe, and at once directed a corps of men to repair the fan casing which had been totally disorganized by the force of the explosion. Clouds of smoke were then issuing through the mouth of the main entry. Morgan accompanied by Wm. Kilpatrick, Rees Pritchard and others, made an effort to enter through the air course but soon discovered that both entry and air course were so impregnated with after damp that it was impossible to proceed but a short distance. In the

meantime a force of men was engaged in rebuilding blown-out stoppings. After three and a half hours of quick and skillful work, the fan was placed in working order and started. At 9 A.M. a third attempt was made by Morgan and his corps to enter by way of the air-course and this time succeeded in getting as far as B-3, where they crossed into the main entry and found the body of Casagrande, driver, who was killed on his way out. At 11 A.M. they reached B-5 pass-by and found three of the four men that were killed at this point. After getting this far all hope of recovering any of the men alive, was given up, although the effort to rescue was vigorously continued until the last body was found. At this time Mr. Robert O'Neil, div. supt. had arrived and taken full charge of the work.

I was notified of the accident about 9-30 the morning it occurred and instructed Deputy Griffiths to take the first available train for primero. He arrived there at 10 P.M. the same day. Four bodies had been taken out. Mr. Griffiths rendered all possible assistance rescuing and was present when all the other bodies, excepting that of Lumley, were recovered. Being much engaged in completing some important work of the department which had to be done, I was unable to reach there until the morning of the 26th. At this time the work of rescuing was concentrated in A-7 and 8 in search of fire-boss Lumley, who at the time of the accident was making his rounds examining the mine preparatory for the day shift.

Immediately after arriving I entered the mine accompanied by Deputy Griffiths and Mr. Joseph Ball, div. supt. District No. 2 of the C.F. & I. Co. In A-7 and 8 I found several groups of men engaged building temporary stoppings in the cross-cuts to restore the ventilation as they advanced into the mine. From the fact that the roof was badly broken and caved and that considerable quantities of fallen rock and timber had to be removed, the work was hazardous and the

progress slow, the utmost caution and attention had to be exercised for the safety of the men and to avoid further accidents. When we got as far as room ~~room~~ No.52, which point was reached at 11 P.M. Jan. 31st. we found both entries from thereon filled with explosive gas, the air current had become so feeble, due to the many leakages and obstructions from falls, etc. that it was unable to dilute and remove the gas, and this made further advance impossible. It was then decided to suspend the work of rescue and engage in re-inforcing the stoppings and try to make a passage over the large falls/that blocked the entry near the mouth of A-8 so as to increase the volume of air circulating. A retreat was made and the work outlined begun and in forty eight hours afterwards, the current had sufficiently improved to allow the men to proceed as far as room No.63 and at ten thirty P.M. Feb. 2nd, the body of Lunley was found lying between rooms Nos. 62 and 63 on A-7. But it was March 2nd. before the entries were sufficiently cleared for me to penetrate far enough into the district to complete my investigation.

DAMAGE TO THE MINE: The greatest amount of damage to the mine was done in those entries where the "drawslate", which intervenes between the coal and a stratum of sandrock above, had been left standing and was supported by timber. This slate varies from a few inches to eight or ten feet in thickness, and when the timbers were blown out, the slate fell and in some places completely filling the passages. Practically all the cross-cut stoppings, over-casts and doors in the mine were blown out and destroyed, and all the sheave-wheels guiding the haulage-ropes through the different entries were put out of order.

CAUSE AND ORIGIN OF EXPLOSION: As all the men in the mine were killed and no one left to tell how and in what part of the mine the explosion started, or what the existing conditions were immediately

prior to its occurrence, the only clue available to assist in trying to determine these facts, were the direction in which timbers were strewn and other marks left along the paths invaded by the explosion indicating the course taken by the forces, and the sources from which they issued, and these were both indécisive and conflicting. In several places along some of the cross entries I found evidences indicative of two forces having come in contact with each other, and this manifestation was repeatedly in evidence along the first six hundred feet of A-9 and also in many parts of A-7 and 8. The cause for such an intermixture was due to the energetic action of the coal dust in the adjoining rooms at the time of the explosion. The greatest eruptive force, as was clearly shown by the condition the various places were left in, occurred in A-7 and 8, A-9 and 10, B-5 and the main entry. The last two acted as the outlets or relieving passages for the pressure generated in the other entries.

DISTRICT A-9 and 10: Commencing at the face of A-9 and 10, the only entries, excepting the two in A-12, where mining was done on this fatal "shift", the direction of the force was as follows:

Outward for the entire length of 10, except that the wall of the over-cast at its entrance was blown in, and also 9 as far back as room No. 10 with nearly all cross-cuts blown into 10. From room No. 10 to the mouth of A-9, it was badly mixed with a slight advantage in favor of an ingoing force. From A-10 it traveled out through the Main and also through B-5.

DISTRICT A-7 AND 8: The wall of the over-cast at the mouth of A-7, a door frame located between first and second south and a trestle supporting the track at a down-throw fault near room No. 50, points located on A-7 2,000 and 400 feet apart respectively, were blown inward for distances varying from thirty to forty feet. yet many props which were left standing at the intervening spaces between the points

enumerated above, leaned outward and some otherwise. A-7 entry was very little disturbed for its first thousand feet, but was marred by intermittent falls from there to the face. Props and guiding sheave-wheel arrangements at the entrance to A-8 were blown in, but the condition of a trip of loaded cars standing on the "pass-by" 1,400 feet further in, strongly indicated that the force was outward, and the conditions for some distance both in and outside of this "pass-by" were mingled and indecisive. Fire-boss Lumley was the only one in this district at the time of the explosion. Very little damage was done to the rooms, although they were nearly all invaded by intense heat as was shown by the abundant amount of cokings left adhering to the props and sides. The heaviest cokings were found on the props and cross-cuts corners in the pillar workings of A-10, rooms Nos. 40, 41 and 42 A-7 and in the first south. Some cokings were found scattered on the entries. Rees Lumley's safety lamp was open but not the least damaged. The lamp was of the "Wolf" type, fire-boss size. Its sections were separated with the upper frame lying on the south side of the entry and the oil vessel and glass near the center of the roadway, all about eight feet inside of where he was located. Owing to the lamp being open, some men were of the opinion that this was the initiatory point of the explosion and that its ignition was caused by Lumley. I am informed that the course usually taken by Lumley while making his morning examination was, first to A-6 and through room No. 20 to A-7, then through first and second south back into A-7 and along this entry as far as room No. 50 at which point an impassable pool of water stood on the entry. From here through a cross-cut into A-8 and along this entry to the face and returning through 7 to where he was found. From the point where Lumley's body lay to the furthest working chambers on A-7 the distance is about 300 feet and the men occupying these places, worked there until quitting time (about 5 P.M.) the day before, and they were also

visited by Shotlighter John Franks about 7 P.M. when everything appeared to be at normal condition. Mr. Wm. Easton, pumpman, who was stationed at room No. 36 A-8 and the last to leave the mine prior to the explosion, stated in his testimony at the inquest that "at 2 o'clock, or two hours before it happened, the air current passing along A-8 was the same as usual."

Rees Pritchard, timberman, who was present when Lumley's body was found, testified that he believed Lumley's clothes were burned a little on his shoulders, while all the others who testified as to the condition of the body, stated that he was not burned, his hair or mustache were not even singed. All the others, according to the undertaker's report, were more or less burned, except A. Pisetta, Giacomozzi, Rudolf, Bozo, R. Fatur, Toth, Della-Maddalena and Hubat. The fire-boss daily record book showed that Lumley had reported gas in room No. 61 A-8 and room No. 6 first south, Jan. 20th.

In all other explosions occurring during the time in which I have been coal mine inspector, I have been able to come to a definite conclusion as to the inception and point of origin. This can usually be determined even in the absence of any testimony of witnesses, by tracing the direction of the forces. I have given in detail what my deputy and I found after the explosion. These evidences of the conflicting forces make it a most difficult task to come to any absolute conclusion as to the origin of this explosion.

On the day shift preceding the accident, there were in the Main North at least 175 men working with naked lights distributed throughout the entire portion of the mine wherein the effects of the explosion are shown. Among these 148 miners who had been working in rooms widely distributed through the same district. After the day shift had left the mine, the shotlighters passed through practically all the workings with their naked lights and fired the shots of the

148 miners, and then came out about 7 o'clock. The conclusion to be drawn from this condition is that the mine was reasonably safe at 7 o'clock. When the shotlighters finished their work of firing, the night shift consisting of twenty men went into the mine and the explosion occurred at 4 o'clock the next morning. The testimony of Mr. Easton, pumpman, as referred to above and who was in the mine until 2 o'clock in the morning and stated that the air circulating in the usual manner, so that the conditions which brought about the explosion apparently arose shortly before it occurred. The night engineer testified ^{that the fan} was continuously in motion at a speed of 115 revolutions per minute until it was disabled by the concussion.

AFTER THE EXPLOSION: When Mr. Griffiths, deputy inspector, entered A-9 and 10 on the morning of Jan. 24th, both these entries had filled with firedamp to a distance of 400 feet back from the face. When the gas was removed and the faces reached, numberless small "blowers" of gas could be heard buzzing as it issued from the faces and sides, and the water over the road-beds was dotted with bubbles of gas issuing from the floor, showing that the place generated gas quite freely. The same condition was also found at the faces of first and second south and in ^A 5 and 6. A door left open and the air circuit cut off from such places for a length of time would result in their filling up with gas. The occupants of A-9 and 10 were driving a cross-cut through the pillar to meet each other near the face of their entries. The two who worked in 10 were the shotlighters for the night shift, and they ^{had} already fired their own shots and also those of A-9. Both these rounds had done their work in a satisfactory manner and neither of them showed any sign of having been a "blown-out" shot, and this was all the blasting done on that shift. There were several holes already drilled and one charged in the pillars of 3, 4 and 5 off A-10, but none fired. I found three "blown-out" shots in room No. 22 A-10 and

one in the 3rd south off A-7. Had these holes been fired on this memorable shift, I ~~was~~ would have been inclined to attribute the cause of the explosion to one of them, but these places were not working on the night shift and it was positively proven that they ~~WERE~~ fired the night before.

I submit in detail these facts for a record of the circum-
stances surrounding this explosion and ^{what} that are necessarily essential in determining its cause. Different theories may be advanced to account for such an explosion, but I am not able now and probably never will be able to determine with any degree of certainty its initiatory point or to definitely support any conclusion by reasons concerning the same. However, it is safe to state that the large amount of dust cokings deposited and this found at so widely separated localities, proves conclusively that in spite of the wet condition of the road-ways, the dust took an important part in augmenting the explosion and I believe that its transmission from the starting point to the other remote districts was wholly due to this same agency. (Thus showing that sprinkling of road-beds only is not an absolute preventative against the exploding of dust and that the roof and sides should be sprinkled as well.

Before this accident, my deputy and I had made several inspections and we had always considered this one of the safest mines in the State. Our inspection is directed to the safety and sanitary condition of the mine, which includes the general workings together with the ventilation. In this respect the mine was adequately equipped to force the air into all working places. The detail of continuously conducting the air to faces of all the places must of necessity be left to the operators. Should this urgent detail be omitted as to a number of places producing explosive gas, then disasters are

liable to occur, notwithstanding, the mine may be fully equipped to cope with any directions and instructions I may have given.

Of the twenty four victims, only three showed any signs of having lived any time after the explosion, viz.; The two Sipos and Lumley. The former two worked in A-12. Their coats and dinner pails were left at their dining quarters close their working places, but their bodies were found 300 feet further out on the main entry, which distance they no doubt traveled in their effort to escape and were there overcome by the deadly afterdamp. The entry stood intact along this part and no sign of force or heat was left, except that their tool box had been moved a few feet towards the face and both bodies were burned. It is also possible that Lumley lived a few seconds, as the position in which he lay with one arm resting on some timber that had been blown by the explosion, and his lamp lying a few feet inside suggested the probability that he walked some distance after it occurred.

Very respectfully,

John D. Jones,

State Coal Mine Inspector.