

REPORT OF THE HASTINGS EXPLOSION

Denver, Colorado, July 13, 1912.

Hon. John F. Shafroth,
Governor of Colorado.

Sir: I herewith submit my report to you on the Hastings explosion:

The Hastings explosion occurred on the 18th of June, 1912, at 9:30 p. m., and caused the death of twelve men and injured one man badly.

The mine is situated two miles from Ludlow and fifteen miles nearly due north from the town of Trinidad, Las Animas County, on the Colorado Southeastern Railroad. The property is owned and operated by the Victor-American Fuel Company, with head offices in Denver: W. J. Murray, general manager; William McDermott, division superintendent, and James Cameron, local superintendent; with John Yates as mine boss.

MANNER OF OPENING BY SLOPES

The Hastings mine is opened by three parallel openings. Two of the openings are used as return airways. One of the return airways is the main haulage road, and the other return airway is used as a traveling-way by the men in going to and coming from their work. One of the openings is used as an intake airway.

The new slope to the B seam turns off the main slope at an angle of 35°, 1,300 feet from the surface. The dip of the new slope varies from 5 to 7 per cent, and at a distance of 850 feet off the main slope a rock tunnel is driven down into the lower seam, known as the B seam. The stratum between A and B seams is forty feet.

In this section of the mine the explosion occurred. From the inside of the rock tunnel two parallel entries are driven down the dip a distance of 3,400 feet, from the junction with the third south and main slope. Three pairs of entries are turned off on each side of the slope. The distance of these entries is approximately 500 feet.

Cross-entries are driven to the raise in the second south, also the second north, up a distance of 200 feet. On the third north no cross-entries have yet been started, but on the third south two cross-entries have been driven up a distance of 200 feet. The two parallel slopes are driven below the third north 250 feet.

VENTILATION

The ventilation is produced by a 94" x 72" Sirocco fan. This fan is driven by electric power from Trinidad. The lower speed of the fan is 117 revolutions per minute, producing from 93,000 to 95,000 cubic feet per minute; the higher speed, 220 revolutions per minute, producing from 110,000 to 115,000 cubic feet of air per minute. The fan-house stands 100 feet north of the main haulage slope, and is built of concrete floor, sides, and roof; in fact, it is fireproof. The fan is run as a blowing fan, but can be changed in a few minutes to an exhaust fan.

Two electric motors are installed, and in case anything should go wrong with the electric power applied, or the working motor injured in any way during the day, a change can be made to the other motor, or a different electric power applied, in a few minutes.

A gong at the blacksmith shop gives notice to the men on top whenever the fan stops, and they at once make the change necessary. During the night the fan is visited once every hour by the night watchman, who records his visits. The night engineer also visits the fan every hour.

The new slope, or B seam, is ventilated by a split of air from the main intake at the sixth south, main slope, and the air travels south to a point where the two parallel dip entries begin. On the lower, or B, seam a shaft forty feet in depth is put down, which forms the intake for the B seam. This intake airway lies to the north of the new slope, which is the return airway for the B seam.

MANNER OF CONDUCTING THE AIR ON THE B SEAM

The air is split at the first south. An overcast is built by six twenty-four-inch galvanized pipes, with concrete walls. The air continues down the intake, and at each pair of entries goes in one entry, returning to the main intake on the other entry, and in this manner all the other entries are ventilated; that is to say, only one continuous current around the workings. After the air passes the first south, it returns to the main haulage road to the surface.

MODE OF WORKING

The B seam, or lower seam, is what is known as the Berwind seam. It is five feet thick and is a coking coal. At present the workings in the B seam are not extensive. So far, only entry work has been done, except that on the first south four rooms were turned off; but on account of the coal being bad and faulty, the first and second south, as also the first north, have been abandoned.

MANNER OF HAULAGE

Mules are used in taking coal from the working face to the double partings at the slope. An electric hoist, situated between

the second and third south entries, delivers coal to this point, wherefrom the surface engine takes it to the tippie.

NUMBER OF MEN AT WORK THE NIGHT OF THE EXPLOSION

Thirty men were working in the A seam, or upper seam, the night of the explosion, but only two men felt the shock of the explosion. All the men in the A seam got out of the mine in safety.

On the lower, or B, seam thirteen men were at work that night, and twelve men met death from the effect of the explosion. One man, whose name is George Pappas, a rock man, who was working on the slope near the first north entry, was taken out alive.

PRECAUTIONS TAKEN BY THE COMPANY

Only safety and electric lamps were used in the mine in both seams. Safety lamps were used by the fire bosses and the company's inspectors. Electric lamps were used by the workmen. Permissible powder was used in the mine exclusively. Clay only was used for tamping the holes. Shots were fired by an electric hand battery.

Two fire bosses were employed in the lower, or B, seam. One fire boss inspected the places before the day shift went to work; the other fire boss inspected the places before the night shift went to work.

The company employed an inspector, whose duty it was to inspect the B seam once a day. The company also employed a chief inspector, who inspected the mine two or three times a month.

When the news of the catastrophe reached me at 7:45 a. m. on the morning of the 19th of June, 1912, I was in Trinidad, and, making all possible haste, took the first train and reached the scene of the disaster at 9 o'clock a. m. In company with Mr. McDermott and Mr. Griffith, we entered the mine about 9:30 a. m. and went, by way of the intake, down as far as the third north entry. The helmet men had explored the third north and had located some of the bodies, but the air was so feeble that it could not remove the gas, so the brattice men had to go over the brattice stoppings again. After some time we were able to get into the third north.

Near the inside cross cut we found Pietro Dictuazzo and Joe Mattina, who were burned a little. Going through the cross-cut, we discovered a light burning. Thinking it might be a feeder burning, for a moment we stopped while Messrs. Reese and Griffith went to the light, and found it was an electric lamp still burning. An electric lamp had been found burning in the third north by the previous shift.

In turning to the left to go out of the back entry of the third north, I found three bodies about four feet apart, and

farther out the back entry, outside the haulage cross-cut, I found another body; these being all of the bodies of the men found, who had been working in the third north.

I went down into the slopes, as far as I could get for the water, but found nothing there. We then proceeded to the third south entry, to get into which we had to put up a curtain between the third south main and back entries. Getting the gas diluted to the first cross-cut, or run-around, we there found a great quantity of smoke, and, thinking there might be feeders of gas burning under some coal (as this section of the mine gives off gas from feeders in the bottom), we again raised the curtain on the slope, to allow the air to go up the slope, instead of forcing it into the third south.

We then sent the helmet men to make a run into the entries, to ascertain if there was any fire. After waiting some time, the helmet men made the run of the two main entries to the face. In doing so, two of the men were overcome by the exertion of the work.

Not being satisfied, I asked Mr. D. Reese to make the run of the cross-entries; which was done, no fire being discovered.

We again turned the air into the third south back entry, but, the ventilation being feeble, the removal of the gas was very slow. We knew there were yet four bodies to be removed, they having been located by the helmet men. Before the other shift came on, we reached as far into the back entry as the second inside cross-cut. We then returned to the surface at 5:45 p. m. to get our dinner. Before 3 o'clock the next morning the rest of the bodies were found and taken to the surface.

NAMES, NUMBERS, AND LOCATIONS WHERE BODIES WERE FOUND

No. 10, George Cgontos, a rock man; in a cross-cut at the first north back entry; burned on head.

No. 6, Lorenz Springhetti, pump man; near the pump station at the mouth of the return of the third north; badly burned.

No. 3, Pietro Dictuazzo; body found thirty feet outside the inside cross-cut of the third north main entry; burned slightly.

No. 2, Joe Mattina, miner; body found ten feet outside the inside cross-cut of the third north main entry; burned slightly.

No. 4, Ben Benedetto, miner; body found five feet outside the inside cross-cut on the back or return air-way of the third north; very slightly burned.

No. 7, Pete Sertori, miner; body found nine feet outside the inside cross-cut on the back or return airway of the third north; very slightly burned.

No. 1, Jim Vellotti, miner; found fourteen feet outside the inside cross-cut on the back or return airway of the third north; very slightly burned.

No. 5, Emanuel Ferazzo, miner; body found five feet outside from haulage cross-cut on third north back entry; very slightly burned.

No. 9, Pete Milirh, miner; body found in corner of inside cross-cut on third south main entry; badly mangled and burned.

No. 8, Louis Asti, driver; body found at face of third south entry; mangled, but not badly burned.

No. 11, Bude Orlich, miner; body found close to the coal face on the lower side of the third south entry; mangled and burned.

No. 12, John Thomas, fire boss; body found at the mouth of the second cross-cut, off the second cross-entry, off third south; badly burned.

A mule was found twenty feet outside the inside cross-cut on the third south entry, badly burned and the entrails torn out of the body, driven under a rail for ten feet.

EFFECTS OF THE EXPLOSION

On the morning of the 20th of June, in company with the manager of the Victor-American Fuel Company, Mr. W. J. Murray; Mr. McDermott, Mr. Griffith, the company's inspector; Mr. Dalrymple, State Inspector of Coal Mines; Messrs. Oberding and Graham, deputy state inspectors of coal mines; also Mr. Roberts, of the United States rescue car, I entered the mine for the purpose of finding, if possible, the cause of the explosion.

In going down the intake, the effect of the explosion was very slight, except where there was a cross-cut between the intake and the return airways. At all such cross-cuts the force came through, but seemed to be spent on the intake. Very little coking was found on the intake airways, but the force seemed to pass across the intake airway, going into the first north, a distance of 200 feet, with slight coking.

The force of the explosion again crossed the intake at the second north, traveling into the second north 500 feet, going up the first cross-entry to the first cross-cut, and back down the second cross. Force was spent at the bottom of the second cross-entry on the second north entry, slightly coking for the first 300 feet. The force and flame again passed through the intake air, going into the third north main entry to the parting, where some of the cars were thrown from the track. The force seemed to come off the slope, traveling into the third north at a point 200 feet from the slope. A place is turned off to the right and driven a distance of forty feet, and twenty feet from the face we found coke on the roof—not cakes, but in small grains—where it would seem the force had been cushioned with the compressed air and there left its deposit of coke. Stoppings between the third north entries were blown out for a distance of 300 feet from the slope.

At the inside cross-cut the force went into the back entry, returning to the slope intake. The force and flame seemed to travel down the slope for 125 feet, here again spending itself, when nearing the face of the slopes. On the main slope, between the third north main entry and the third south back entry, we found three cars badly smashed, and that the force had driven those cars to the north side of the main slope. The cars were turned around by the force.

It would seem to me that the cars must have been standing on the third south run-around (or the back or intake entry of the third south), and were blown toward the third north, which is nearly opposite at this point. It appears the strongest force came out of the third south intake airway. The force seemed to split here, one part going into the third north, and the other part going up the main slope or the main return.

We then traveled into the third south by way of the intake airway to the face of the entry, and went through the inside cross-cut, which is twenty feet from the face of the third south. At this point the forces seemed to be great, as the men found here were badly mangled and burned, and about twenty feet outside this inside cross-cut the mule was also burned and driven under the track for ten feet. There must have been a shot fired that night in this entry, as the coal was thrown against a car which was standing near the face, and on each side the coal was thrown out past the car for ten feet. Yet it would seem that the explosion must have taken place after this shot was fired, because of the fact that the two entry-men and driver were found close against the coal face, and that some of the drilling tools must have been driven out of the cross-cut onto the main road, showing that the force came from the back entry to the main entry; also because of another fact, namely, that the shots in this section are fired by a hand electric battery, and, according to evidence, that electric battery was found in the first cross-cut on the second cross-entry, off the main third south. The fire boss, as a rule, fires the shots, but on the night shift the mule-driver sometimes fired shots.

The gas was so strong that we could not get any farther on the main third south entry. We started to go out by way of the main slope, but, not being able to get over the falls, we turned back, going out by way of the intake airway to the surface.

On the 21st day of June the gas was not removed from the third south cross-entries, and on the 22nd day of June we again entered the mine. The gas was then removed, so that we could get into the cross-entries off the third south entry. There we found flame marks, up near the face of the entry, and a little coking. It was in the second cross-cut of this entry that the fire boss was found. (This entry is called the second cross entry.) He went up to this cross-cut, apparently to put up a

brattice to clean out some gas that was found by the company mine inspector that day.

The lamp which was found near the body of John Thomas must be considered a defective lamp, inasmuch as the asbestos washer on top of the glass cylinder was turned or doubled to the inside a distance of one and one-half inches, which caused an open space between the washer and glass cylinder.

We went up the main slope, which was very badly torn up by the force of the explosion, out to the surface. The force terminated about 150 feet above the fourth south of the A seam. This fourth south is used as a return for a part of the air from the A seam, and this increased volume of air may have been the cause of the termination of the force.

THE CAUSE OF THE EXPLOSION

To my mind, the explosion was caused by gas. Dust did not play much of a part in the explosion, because of the wet condition of the mine. The mine inspector for the company stated that he found a small quantity of gas that day in the blind cross-cut on the second cross of the third south entry. A small quantity of gas might start an explosion with a defective safety lamp placed in it, but a small quantity of gas could not cause such a violent explosion unless the air current was at the explosive point, which could be caused by a derangement of the air current, or by a sudden increase of gas due to a fall of the barometric pressure, or by an outburst of gas, or by encountering a large feeder of gas.

A derangement of the air current could be caused by a door being left open or a canvas curtain torn down, which would prevent the air from going into that section.

Any of the above-stated causes might have occurred the night of the explosion, and the gas might have been of sufficient quantity to have been ignited by John Thomas' defective lamp. I think the defective lamp might have ignited the fire-damp, but I also believe the condition of the air current at the time of the explosion was not due to the negligence of Fire Boss Thomas, as this place was stopped that day on account of gas by the company inspector.

The quantity of air in that section of the new slope was, at the time of the explosion, inadequate to dilute the gases given off and render such gases harmless.

REMARKS

In a mine such as the new slope at Hastings, where such a quantity of gas is generated, the air current should be at all times uniform and continuous. Doors and curtains should be used when it is impossible to conduct the air current otherwise.

I last inspected this mine on May 11, 1912, and at that time I considered the mine in fair condition, but found the quantity

of air was less than on my previous visit. I ordered the cloth curtains repaired at several places, and waited until they were repaired.

The new slope has always generated considerable gas, and I thought it was as well handled as was possible under the system of ventilation in the mine. This mine was inspected by Deputy Inspector Oberding, accompanied by Al Thompson, company inspector, on August 9, 1911. During this inspection the second south entries of the new slope were visited twice. On the first visit no explosive gas was found. Thirty minutes later, upon re-entering those two entries, they discovered fire-damp back to the inner cross-cut—a distance of from fifty to sixty feet from the face. This accumulation was due to a door having been left open, which caused a short circuit in the ventilation. Recommendations were made at this time to have all shooting done by shot-firers after all other employes had left the mine, and that double doors be used to prevent the air from being short-circuited.

Here I wish to thank David Reese and his helmet crew, of the Victor-American Fuel Company instruction car, for the advance runs they made into the third south entries.

[Signed] HENRY P. KING,
Deputy State Coal Mine Inspector.

Approved:

JAMES DALRYMPLE,
State Inspector of Coal Mines.

Name	Age	Occupation	Nationality	Married Number	
				Single	Children
Lorenz Springhetti	47	....Pumper....	Austrian-Tyrolese.....	Married.....	5
Ben Benedetto	25	....Miner	Austrian-Tyrolese.....	Single.....	..
Emanuel Ferazzo	25	....Miner	Austrian-Tyrolese.....	Single.....	..
Jim Velotti	36	....Miner	Austrian-Tyrolese.....	Single.....	..
Louis Asti	28	....Driver.....	Italian.....	Married.....	1
Pete Sertori	30	....Miner	Italian.....	Married.....	2
Joe Mattina	31	....Miner	Italian.....	Married.....	1
Pietro Dietuazzo	30	....Miner	Italian.....	Married.....	1
Bude Orlich	40	....Miner	Slav.....	Married.....	1
Pete Milirh	36	....Miner	Slav.....	Married.....	4
George Cgontos	24	....Rockman..	Greek.....	Single.....	..
John Thomas	40	....Fire boss	Welsh.....	Married.....	3

VERDICT OF JURY

State of Colorado, County of Las Animas, ss.

An inquisition holden at Trinidad, in Las Animas County, State of Colorado, on the 26th day of June, A. D. 1912, before B. B. Sipe, coroner of said county, upon the bodies of (see list attached), there lying dead, by the jurors whose names are here-to subscribed: Said jurors upon their oaths do say that the above-named persons, whose bodies were taken from the Hastings mine of the Victor-American Fuel Company at Hastings, in said county and state, on or about the 19th day of June, A. D. 1912, came to their death as the result of an explosion in said mine about 9:30 o'clock on the night of June 18, 1912.

From the evidence adduced the cause of said explosion cannot be positively determined. The mine was known to generate explosive gas, but not in dangerous quantities. We further find that the mine was well ventilated. On the afternoon of June 18 a small feeder of gas was discovered in one of the working places in said mine, and the fire boss was ordered to increase the ventilation at that point. It is possible that in doing so he ignited the gas from his lamp. This is made plausible from the fact that after the explosion the lamp of the fire boss was found improperly put together. The explosion might have been the result of any one of several other possible causes, but the present condition of the lamp of the fire boss is the only fact ascertainable which affords any basis for a conclusion as the possible cause of the disaster. The lamp of the fire boss, unlike those of the other employes of the company, which are inspected daily, was entirely in his keeping, and the company is in no wise culpable. As a matter of fact, it was not properly put together and was the real cause of the explosion.

In Testimony Whereof, The said jurors have hereunto set their hands, the day and year aforesaid.

JOHN C. BALDWIN, Foreman;
HENRY ANDREWS,
W. W. JONES,
GABRICK NICCOLI,
PETER J. BACCO,
RETEL MILLER,

Jurors.

Attest:

B. B. SIPE,

Deputy Coroner of Las Animas County.