

## CRIPPLE CREEK DRAINAGE TUNNEL

Started—Enthusiasm and Optimism Mark the Notable Inauguration Ceremonies

Written for "Mines and Minerals," by R. L. H.

The deep-throated roar of mine whistles, the siren shriek of the fire-alarm, and the cheers of hundreds assembled at the station was our welcome to the Cripple Creek district, Saturday noon, May 11. From all parts of Colorado we had come nearly 2,000 strong to witness the starting of the great drainage tunnel which is to rejuvenate the Cripple Creek mines. Five special trains had pulled us over the great scenic "Short Line" route to the gold camps and each in turn had been greeted with the welcoming uproar.

Debouching from the trains, the Midland Band, from Colorado Springs, and Cool's Drum Corps, from Denver, livened the air with martial music while the long procession of teams received its load of visiting "boosters."

Then, headed by Lieutenant-Governor Harper's carriage, and others containing the orators of the day and the feminine

rich and others get experience," now enters on a new wealth-producing career.

On a slight eminence to the left of the shallow jagged hole marking the tunnel portal stood Master of Ceremonies Nelson D. Franklin and with him the orators and beauties of the day.

The first speaker introduced was Mayor Van Tilborg, of Cripple Creek, who congratulated the audience that the troubles of the past were over and Cripple Creek could now boldly announce to the world that life and property were safe within its confines. The new tunnel, he said, would result in lengthening the life of the district by at least 50 years, and would restore the fame of Cripple Creek as a mining camp in the eyes of the world.

Then following the brief speech of A. J. Spengel, representing Denver and its mayor, Robert Speer, came the eloquent oration of the day by Victor C. Alderson, President of the Colorado School of Mines.

"The greatest undertaking that has been started in Colorado in a decade, and there will be none greater in the next decade, is this great drainage tunnel. The completion of this tunnel will mean that the financial life of this great district will be increased to fully a half billion dollars. It means that Colorado will hold its supremacy as a gold-producing state; it means that



MINES & MINERALS

NAMING THE ROOSEVELT TUNNEL

beauties to grace the occasion, the long procession started for the tunnel portal. Six miles from the city, down the gulch worn by the tumbling waters of the Cripple Creek, stand the rough temporary buildings which cluster about its site. Here in the narrow cliff-walled flat known as Gatch Park, the conveyances discharged their animated passengers.

In a brief space of time the lower park was jammed with vehicles of every description from carriages to ore wagons improvised into busses. The cosmopolitan, good-natured, jostling crowd thronged the space fronting the tunnel and here was the scene of many old-time comrades exchanging greetings. Here the sleek polished stock broker from Colorado Springs slapped the back of the old bewhiskered miner in corduroys and top boots. There the beautiful women of fashion from Denver and the Springs warmly shook the hands of the boys in flannel shirts from the mines of the hills.

Every one, from the Lieutenant-Governor down to the rough-clad, rough riding youths of the camps, wore a smile as expansive as that of the cloudless heavens themselves. For the thought uppermost in every mind, and emphasized by speech on every hand, was "this camp, where many men get

this Cripple Creek district, which has already given forth over \$200,000,000 has its greatest offerings for the future."

Smiling his acknowledgments at the hearty clapping and cheering which marked his close Dr. Alderson gave way to Lieutenant-Governor Harper.

The Governor praised the courage and enterprise of the men who had first planned the big tunnel and said that those men who were now prepared to push the work to completion were heroes in their business and represented the best type of American citizenship. The great American quality of push was exemplified by these men in this great tunnel as never before in this state, and it was a work of which the loyal citizens of Colorado might well be proud.

At this point the beautiful Miss Marguerite Frey, of Denver, accompanied by her maids of honor, had advanced to a great rock overhanging the tunnel portal. Looking down to the Governor below and the thronging crowd at his back she said:

"In the name of Colorado, for the future glory of the Cripple Creek district and in honor of the men who proposed and who will complete this great enterprise, I christen thee the Roosevelt Tunnel."

Smash went the ribbon-decked bottle on the rock and immediately thereafter the inclosing cliffs of the park reechoed the throbbing pulse beat of the air compressor. The Governor had pressed the gold button which started the ponderous machinery and the great work of draining the Cripple Creek district had begun.

The tunnel specifications, submitted to a number of the big contractors of the state; call for a bore 15,500 feet in length extending from the Gatch Park portal 1,000 feet beyond the shaft of the El Paso Mine, to a point near the Elkton Mine regarded as the main water channel of the district.

Waldemar Lindgren, in his report on Cripple Creek geology recently issued by the Geological Survey, compares the drainage situation to a water-soaked sponge set in a glass cup. In this the water-soaked sponge represents the rock plug of the old volcano composed of breccia, and eruptive rocks containing all the mineral-bearing fissures of the district. To continue the simile the inclosing glass represents the relatively impervious granites, shists, etc., of the prevolcanic plateau.

In order to properly drain the mineral bearing area, it is therefore necessary to pierce the inclosing granite with a tunnel at the proper level. The last enterprise of this kind known as the El Paso tunnel, nearly a mile in length, was completed in 1903 and efficiently drained the mineral area to an elevation of about 8,770 feet.

The elevation of the new Roosevelt tunnel's portal is 8,020 feet, and the estimated depth thus unwatered by it is 740 feet.

The tunnel is to be 7 feet wide and 10 feet high in the clear, the specifications calling for a rate of construction not less than 300 lineal feet during each month.

The company, known as the Cripple Creek Drainage and Tunnel Co., furnishes the power, machinery, buildings, and materials specified such as rails, pipe, etc., while the contractor is expected to furnish labor, materials not specified, and buy electric power for air compression, etc., at actual cost from the company. The contract for construction has not been awarded at this writing although expected at an early date. D. W. Brunton, engineer for the company, estimates two and one-tenth years as the time required for completing the tunnel.

The present machinery equipment is as follows:

**Power.**—One 175-horsepower, 3-phase, 30-cycle, induction motor speeding at 600 revolutions per minute, General Electric type. This receives its power from the steam generator plant of the Colorado Light and Power Co., at Cañon City via the substation at Fairview, near Cripple Creek. From Cañon City to Fairview, a distance of 25 miles, the line carries 20,000 volts transformed down at the latter substation to 6,600 volts. At the tunnel plant this voltage is further stepped down to 500 volts by three 50-kilowatt Westinghouse transformers, at which voltage power is supplied to both the motor and the electric-lighting system. The lamps on this last are at present wired in series but will soon be placed in parallel after the installation of another transformer to supply them at the usual 110 volts.

**Air Compression.**—The motor is belt connected to a twelve 3½-inch drill compound Norwalk Iron Works air compressor of the latest type mounted on a concrete base. This supplies air via the usual reservoir to the drills through a 6-inch main feedpipe. The drills used are of the 3½-inch Ingersoll-Sergeant type.

The directors of the tunnel company, which is capitalized for 1,000,000 shares of the par value of \$1 each, are as follows: A. E. Carlton, F. F. Castello, F. G. Peck, F. J. Campbell, C. C. Hamlin, William Lennox, John T. Milliken, Sherwood Aldrich, and S. S. Bernard. Officers: S. S. Bernard, president; F. G. Peck, vice-president; F. F. Castello, treasurer, and E. D. Marr, secretary.

### Electric Wiring in Mines

The State Mining Department of Ohio, has recently issued the following instructions in regard to electric wiring in the mines, and in regard to the transportation of explosives:

All electric wires in mines must be placed as near the roof and the rib of the entry room in which they are run as possible, the live wire next to the roof, and the negative wire as near it as it can conveniently be placed.

All wires crossing entries, room necks, breakthroughs, or places where it is necessary for employes to travel under them must be encased or trenched into the roof in such manner as to prevent persons inadvertently coming in contact with them.

In no case shall an electric wire be attached to a line of pipe in any part of the mine. Any mine using a pipe line as a negative conductor for electric power must discontinue it at once and use wire instead. All pipe lines must be protected from contact with bonded rails or wires used for conducting power for motor haulage or any other purpose.

In the opening of all new mines, or in any old ones where electric motors are to be installed, we recommend that double wire be used instead of using the rail as a return wherever it is practicable and possible to do so, and that the motor power and the power to operate mining machines be separate and distinct lines, and that where a ventilating fan is run with electric power it should be on an independent line.

Powder, explosives, and working tools shall not be taken down or up a hoisting shaft in a cage when men are going down or up, neither can they be carried down or up a stairway in a shaft used for ingress and egress.

Blasting powder or explosives must not be taken in or out, or moved from place to place in a mine along any entry or haulway where there are electric wires, while the power is on the wires. They should be taken in in some way either before the power is put on in the morning, or after it is off in the evening, or at such time as is most in keeping with the surroundings, safety of all concerned always being the first consideration.

**NOTE.**—We have often been appealed to, to give directions how powder and explosives should be taken into mines, but there is such a diversity of conditions that it would be impossible for this Department to advise any uniform system of transmitting powder or explosives into a mine; besides, it is a matter that belongs to operators and miners themselves to adopt a system that would be the most convenient and satisfactory to all concerned. Last year seven fatal and thirty-two serious accidents resulted from premature explosions of powder or other explosives, principally from the carelessness in handling of them.

It is hoped the time is not far distant when the keg method of taking powder into mines will be replaced by an arrangement to carry powder in small quantities in rubber bags or insulated cans, or sacks of some kind, which will reduce the danger to a minimum.

### Illinois Coal Statistics

Through the courtesy of the Hon. David Ross, secretary of the Bureau of Labor Statistics, we are enabled to print the following summary of Illinois coal statistics for the year ending June 30, 1906:

|   |              |
|---|--------------|
| Number of counties producing coal.....                                | 54           |
| Number of mines and openings of all kinds.....                        | 1,018        |
| New mines or old mines reopened during the year.....                  | 151          |
| Mines closed or abandoned since last report.....                      | 123          |
| Total output of all mines, in tons of 2,000 pounds.....               | 38,317,581   |
| Number of shipping or commercial mines.....                           | 419          |
| Total output of shipping mines, tons.....                             | 37,122,811   |
| Number of mines in local trade only.....                              | 599          |
| Output of local mines, tons.....                                      | 1,194,770    |
| Total tons of mine-run coal.....                                      | 9,777,905    |
| Total tons of lump coal.....  | 16,878,088   |
| Total tons of egg coal.....   | 1,850,427    |
| Total tons of nut coal.....   | 1,931,988    |
| Total tons of pea coal.....   | 6,622,087    |
| Total tons of slack coal.....   | 1,257,086    |
| Total tons shipped.....   | 33,096,110   |
| Tons supplied to locomotives at the mines.....                        | 1,035,344    |
| Tons sold to local trade.....   | 2,539,678    |
| Tons consumed (or wasted) at the plant.....                           | 1,646,449    |
| Average days of active operation for shipping mines.....              | 189.6        |
| Average days of active operation for all mines.....                   | 172          |
| Average value per ton all grades at shipping mines.....               | \$1.025      |
| Average value per ton of mine-run coal at shipping mines.....         | \$.983       |
| Average value per ton of lump coal at shipping mines.....             | \$1.292      |
| Average value per ton of egg coal at shipping mines.....              | \$1.224      |
| Average value per ton of nut coal at shipping mines.....              | \$.991       |
| Average value per ton of pea or screenings coal at the mines.....     | \$.504       |
| Average value per ton of slack at the mines.....                      | \$.319       |
| Aggregate home value of total product.....                            | \$39,895,802 |
| Number of mines in which mining machines are used.....                | 85           |
| Number of mining machines in use.....                                 | 962          |
| Number of tons undercut by machines.....                              | 9,563,230    |
| Number of tons mined by hand.....                                     | 28,754,351   |
| Average number of miners employed during the year.....                | 42,920       |
| Average number of other employes underground.....                     | 11,605       |
| Average number of boys employed underground.....                      | 1,499        |
| Total employes.....   | 62,283       |
| Number of persons at work underground.....                            | 56,024       |
| Number at work on surface.....  | 6,259        |
| Average price paid per gross ton for hand mining, shipping mines..... | \$ 5.702     |
| Average price paid per gross ton for machine mining.....              | \$.762       |
| Number of kegs of powder used for blasting coal.....                  | 1,027,273    |
| Number of kegs of powder used for other purposes.....                 | 2,749        |
| Number of pounds of dynamite.....                                     | 41,137       |
| Number of men accidentally killed.....                                | 155          |
| Number killed inside the mines.....                                   | 147          |
| Number killed outside of the mines.....                               | 8            |
| Number of men injured so as to lose a month or more of time.....      | 480          |
| Number of gross tons mined to each life lost.....                     | 247,210      |
| Number of employes to each life lost.....                             | 402          |
| Number of deaths per 1,000 employed.....                              | 25           |
| Number of gross tons mined to each man injured.....                   | 79,828       |
| Number of employes to each man injured.....                           | 130          |