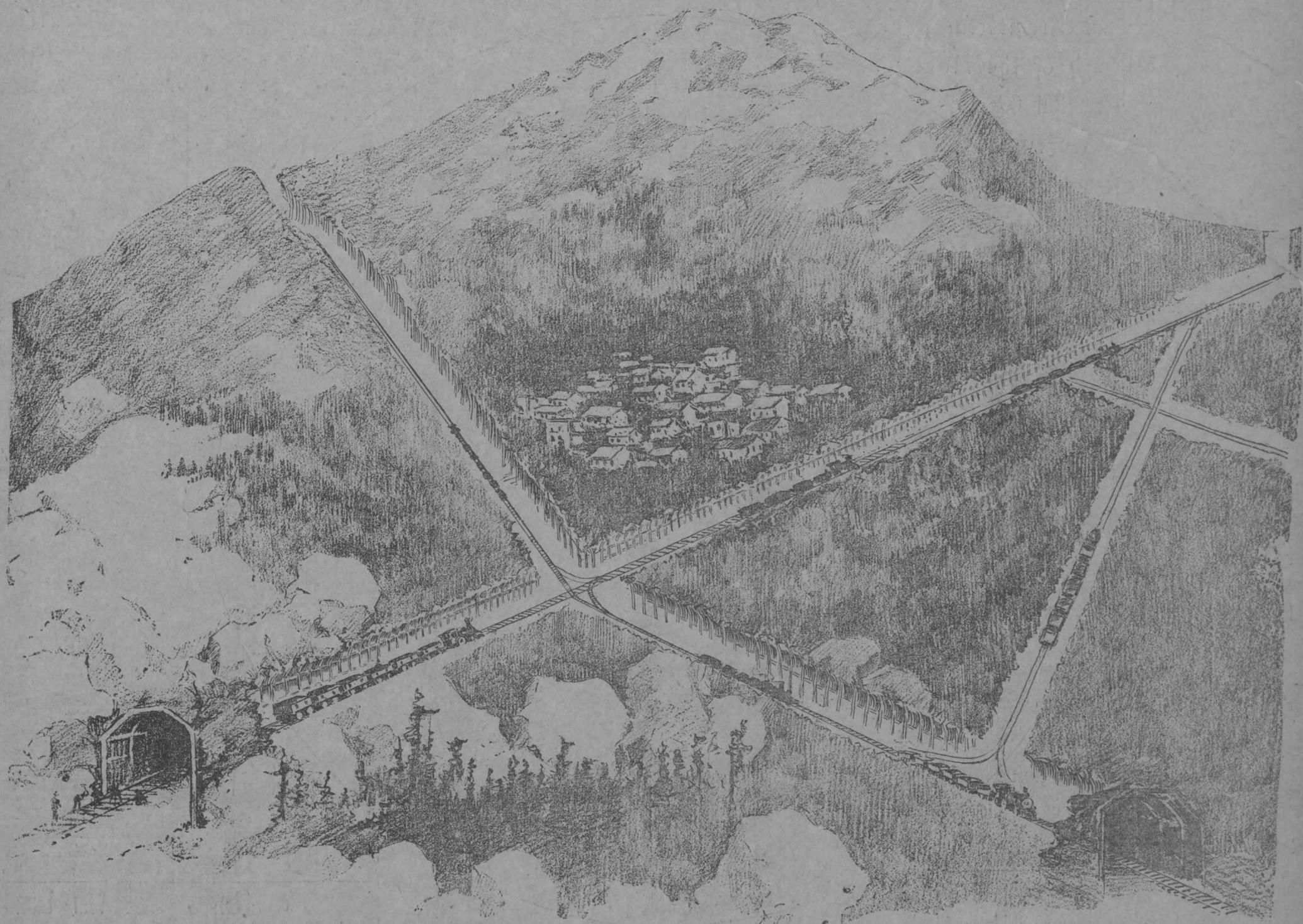


# LONGEST TUNNEL IN THE WORLD, TWENTY MILES UNDER PIKE'S PEAK



Fifty Miles of Railroad Will Gridiron the Mountain Bottoms, and Over These Freight Trains Will be Run, Bringing All the Mining Towns in the Neighborhood Within Easy Communication.

## PIKE PEAK'S BIG HOLE IN THE GROUND

Two gangs of workmen have just begun digging, out in Colorado, the longest tunnel which man ever attempted to construct. The main bore will be twenty miles long, and, connecting with this, are subsidiary tunnels with a total length of thirty miles. So, in reality, the task that has been put under way is that of digging fifty miles of tunnels, and every foot of this vast system will be beneath Pike's Peak and the mountains that tower on each side.

The starting point of the main tunnel is at the foot of the mountain leading up to Pike's Peak, near the old town of Colorado City. This point is but a short distance from the railroads which span the country between Colorado Springs and Manitou. From here it runs almost due southwest. The further end of the tunnel is at the edge of the mountains on Four Mile Creek, over in Fremont County, Col., six miles south of Cripple Creek, and near the little town of Snuol. Two gangs of men, as stated, are working on the tunnel, one at each end. Just at present, they are making progress at the rate of thirty feet a day. It is believed that the mammoth task they have undertaken will be completed in seven years from the first of the present month.

The main tunnel will pass directly under the cone of Pike's Peak at a depth of nearly 7,000 feet, and 2,700 feet beneath the town of Victor. Its average depth from the surface will be 2,900 feet, and it is designed to test the mineral deposits of the territory at these great depths. Thirty miles of laterals are contemplated, and these will pass underneath all the Cripple Creek district at an average depth of 2,900 feet. Cripple Creek, Victor, Gillette, the various small towns, and a thousand mines are to be made tributary to this vast system of subterranean passages.

The work that it will be necessary to do before this system, which will gridiron the interior of the earth below Pike's Peak, Cripple Creek and adjoining sections, is complete, and will be so enormous that it would seem at first blush as if twenty years, rather than seven, would be required before the men who are working steadily from each end, could strike down the obstructions separating them. At the eastern terminal sandstone, porphyry and limestone are already in sight, and it is known that the general formation of the earth through which the tunnel must pass is largely of a similar nature. An immense amount of blasting will, therefore, surely be necessary.

At the western extremity of the tunnel porphyry and granite have also been encountered. The contractors say they expect that in the depth of the mountain they will meet with primary granite, which will give dynamite plenty to do in forcing it from the path of the tunnel. In spite of all this, the company that is to carry the project to completion is confident that in seven years freight trains will be running all the way from Colorado Springs to Cripple Creek, through the longest tunnel which was ever planned, much less carried out. Incidentally, it is of interest to know that under present circumstances the distance, the shortest way, from Colorado Springs to Cripple Creek, is fifty-four miles. By way of the tunnel, the two cities will only be sixteen miles apart. This is one of the features of the enterprise which shows that it is likely to revolutionize the freight feature of railroads in that section of Colorado.

It is estimated by the contractors that the average cost per foot of excavation will be \$80. This makes the total probable expense of digging the tunnel and its subsidiary branches \$20,520,000. All of this sum the tunnel people expect to crush out of the ore they workmen will break while excavating or clear from the nuggets which may fall out of secret pockets so far below the earth's surface.

Another object of the tunnel which is of the greatest importance is the fact that the whole fifty miles will act as a great drainage system for the entire mining section of Cripple Creek and vicinity. Beneath the flooring of the tunnel is a concrete waterway, 4x4 feet, and into this will flow the water from the countless springs that honeycomb a great section of the country.

Experts making calculations on the basis of moisture as afforded by Cripple Creek experiences say that the gain of water will be millions of inches—for out in Colorado water that flows in ditches, or laterals as they are called in irrigation vernacular, is reckoned by inches, just as if it were an addition to a man's nose.

As to the detailed construction of the tunnel itself, there is nothing that makes it very dissimilar in appearance to the ordinary affairs of the sort that the railroad has made familiar. Its dimensions will be 18x18 feet in the clear, making it of sufficient size for the heaviest and largest freight cars to pass through it.

The vast system which goes to make up the tunnel as a whole strikes, at one place or another, not only every existing mining point in the great section which it under-

lies, but it is so arranged and laid out as to tap almost any spot that might become a mining centre, although now a comparative wilderness. The saving of distance in the haul of ore of thirty-eight miles is something tremendous.

A feature of the transportation system of the tunnel as it is planned is that electric locomotives will be the power before the freight trains. The tunnel will, of course, be lighted by electricity.

George H. Proctor, the president of the company, who is a resident of New York, said of the enterprise: "Unless Providence interferes, the transportation feature of the tunnel will be complete in seven years."

### PIETY AND COOKING.

Bishop Paret illustrates How Religion May Be Carried into the Affairs of Every Day Life.

Bishop Paret, of Maryland, relates an incident which shows how piety and cooking may be mingled.

Some time ago he was the guest of an Episcopal family in West Virginia. Learning from the Bishop that he liked hard-boiled eggs for breakfast, his hostess went

to the kitchen to boil them herself. While so engaged she began to sing the first stanza of a hymn. Then she sang the second stanza, the Bishop, who was in the dining room, joining in.

When it was finished there was silence, and the Bishop remarked, "Why not sing the third verse?" "The third verse?" replied the lady, as she came into the dining room carrying the steaming eggs: "Oh, that's not necessary." "I don't understand," replied Bishop Paret. "Oh, you see," she said, "when I am cooking eggs I always sing one verse for soft-boiled and two for hard-boiled."

## NEW YORK GAS THIEVES AND THEIR TRICKS.

There are several ways to be robbed by a gas company.

When you pay your bill, and it seems like robbery, you usually say it to one of two causes: The meter is "crooked" or the figures have been deliberately altered.

But there is another method by which the company gets the better of the customer. How many millions of dollars have been wrested from the public in this way no one can tell, but the sum is enormous; and it has been paid without one cent's worth of benefit to the customers.

Be it understood, this does not apply to false returns of meters, to guesswork as to the amount of gas burned, to the outrageous charges which are sometimes made. It refers wholly to the waste caused by over pressure, under the operation of two scientific laws governing the flow and candle power of any illuminating gas.

Suppose the gas to be burned in what is called a five-foot burner. This is a burner through which, at a standard pressure, five feet of gas will pass in one hour. Ordinarily speaking, this is supposed to give a light equivalent to twenty standard candles, burning 120 grains of sperm-candle in the hour. Suppose, further, that the standard pressure is five inches of water; that is, is equivalent to the weight of five inches of water standing in a tube. Now, if this pressure be doubled, the amount of light will be but very slightly increased, while the amount of gas passing through the burner will be nearly twice as much as before. A child could cry her out the result: The customer pays for nearly double the amount of gas, but does not get anything like double the amount of light.

It is apparent no man buys gas, except for the light or heat—he may obtain from it. Every foot of gas paid for from which he gets neither is just so much money taken from him without an equivalent. How much money have the gas companies of this city taken from the people in this way? No man can tell. What any man can tell, however, is that this money, be the sum small or large, has been just as much stolen as though it had been picked from the pockets of those who paid it.

As a rule, the pressure on all gas mains is too high, and this would seem to be as well known in other countries as it is here. At least in England patent depends upon this fact. The invention is very

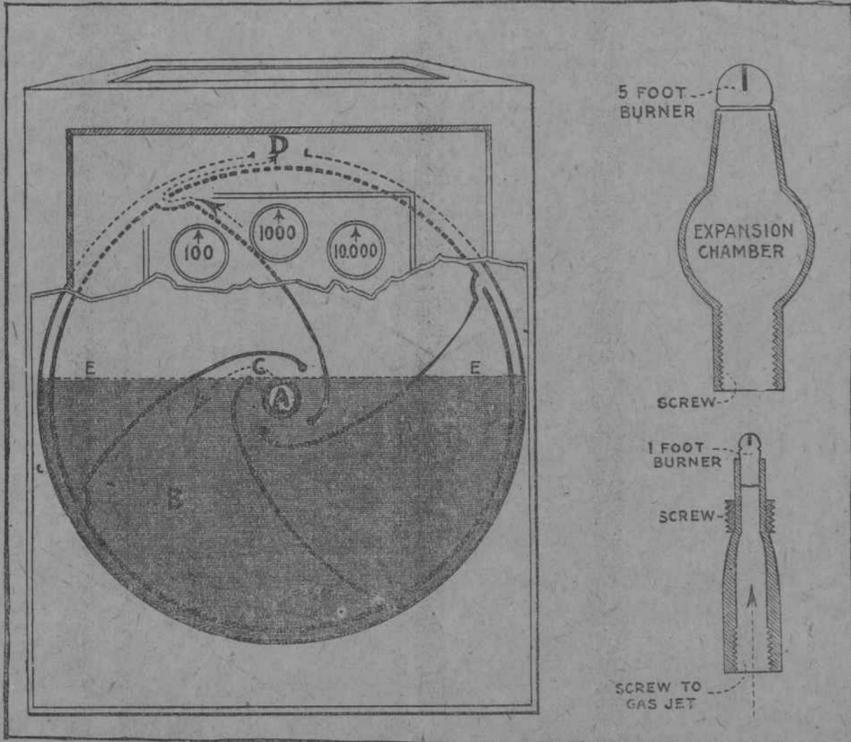
simple. A one-foot burner has a five-foot burner screwed over it, with a small expansion chamber between. The gas being turned on, only the amount which can pass through the small one-foot burner is liberated. This expands, reducing the pressure and burns after passing through the five-foot burner above. It is a fact, not a theory, that the candle power resulting is as high—that is, the light is as bright—as when the five-foot burner was screwed direct to the gas jet and five times the amount of gas was being consumed.

Every person is practically acquainted with this fact that the increased flow of gas resulting from high pressure on the mains does not increase the amount of light. When people light the gas in the evening it will often "flare." When this happens the gas is turned down, reducing the supply, until the "flare" stops and the flame assumes the regular "fish-tail" shape. This gives more light than all the flaring column of flame, yet the amount of gas is less than it was before.

It is the flaring of the gas when the pressure is inordinately high and the resulting turning off of the supply which is the only protection the customers have. It is apparent that the pressure is wholly regulated by the gas companies and is controlled in the gasometers, those great iron structures holding the gas, which are so familiar a sight about the gas works. The customer has no control over the pressure, at all, nor does the meter help him.

Unfortunately there exists between the point where the pressure is light and that at which the gas will "flare" a good deal of difference. The pressure may easily be such that one and a half feet more per hour is passing through the burner than will give the maximum light. This would not create a "flare," yet it needs but a moment's thought to see what it means. The five-foot burner is giving a five-foot flame from six and a half feet of gas, and the customer who pays the bill loses a fraction over twenty-five per cent; that is, nearly 25 cents in every dollar he hands over to the company is wasted; is paid for nothing except a greater supply of carbonic acid gas in the room.

The companies understand this pressure question perfectly. They put on "the pressure" at a time in the afternoon or evening varying with the daylight. On a dark day in winter this is about 4 o'clock in the afternoon, while on a bright day in summer it may be as late as 7:30. The expense is given in that as the people begin to light up greater pressure is needed to drive gas rapidly through the mains and maintain the supply.



### HOW A GAS METER IS SUPPOSED TO WORK.

In this section of a gas meter, A is the inlet for the gas. After covering the gas passes through the opening C into the chamber B. When a sufficient amount reaches B, it raises the chamber above the water line E.E. and when the opening reaches the top of the meter the gas flows out and passes into the house pipe.