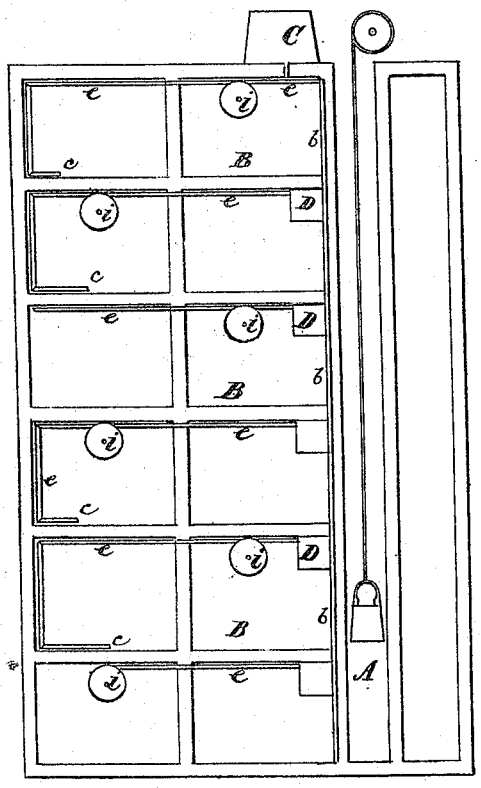
L. J. HENRY.

Process for Ventilating, Purifying and Cooling the Atmosphere of Mines.

No. 162,920. Patented May 4, 1875.

Fig. 1.



Witnesses
Geo. H. Strong.
John L. Boone

Inventor
Levi J. Henry
By his Atty's
Dewey & Co.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

LEVI J. HENRY, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN PROCESSES FOR VENTILATING, PURIFYING, AND COOLING THE ATMOSPHERE OF MINES.

Specification forming part of Letters Patent No. **162,920**, dated May 4, 1875; application filed July 30, 1874.

To all whom it may concern:

Be it known that I, LEVI J. HENRY, of San Francisco city and county, State of California, have invented a Process for Ventilating, Purifying, and Cooling the Air of Mines, Wells, and Sewers; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to an improved method for ventilating, purifying, and cooling the air of mines; and it consists in the combination of devices hereinafter described and claimed, and by means of which a spray of water is thrown into the mine. This spray, when falling down the shaft, will carry, mechanically entangled with it, a considerable amount of air, which serves the purpose of ventilation, while similar spray-jets in various parts of the space below serve to cool the air and refresh the operator. In the case of fire these spray-jets serve to condense and throw down the carbonaceous matter contained in the smoke, and by being thrown into the face, will enable the person to escape suffocation.

I will first describe my invention as applied and used in mines and shafts, and will describe one form of apparatus which can be used, although it will be manifest that various methods may be employed for the use of the water in different locations, which will readily suggest themselves.

The figure in the drawing, making a part of this specification, represents a portion of a mining-shaft with my device in position.

At the top of a mining-shaft a connection with a hydrant or a tank of water, C, should be made (the tank being large enough to meet the requirements) through the medium of any metallic pipe, *b*, or a hose of india-rubber, leather, or any similar material. The pipes or medium used for the main supply of water should be permitted to descend the shafts. At every one hundred or two hundred feet a jet or nozzle, *c*, is securely connected with the pipes or hose, so that in its downward course it may be thrown out in the form of spray. Such irrigators may be connected with said pipes in numerous places throughout one or more shafts, as the mine may require, there being no limit to the system.

The action of a spray of water in purifying the atmosphere is too well known to require any further explanation.

In addition to this cooling of the air I gain a further advantage in the forcing downward of a body of cool air on account of its becoming mechanically entangled with the falling spray, thus furnishing a certain amount of air for the purpose of ventilating the lower level of the mines. This spray of falling water is also very valuable as a protection against fire in such mines or shafts as are excessively dry, and the full strength of the timbers will be better preserved by this wetting.

The pipes or hose may be made to pass through the wooden arches and the water allowed to fall upon the timber in a spray at suitable points, thus keeping it moist.

In order to increase the circulation of cool air in the mine, I further utilize the water which passes down the pipes by connecting the pipes at certain points with the box or case *i* of a water-wheel, said wheel being turned by the momentum of the passing water. The pipes are continued below the wheel-case, and the different discharge-openings below will cause a sufficient current to rotate the wheel. This wheel is connected with a fan-blower at a suitable point, so that this fan will take a portion of the air cooled by the spray and force it downward through pipes to different points where it can be used in the mine.

The water to be used, as above described, may be taken either from the surface or it may be collected in tanks D at different parts of the mine or shafts, care being taken that sufficient fall is given to produce the necessary result.

For local use by the miners and other operators in low levels of deep mines, where the temperature is elevated and the air close and stifling, flexible tubes are connected with the main pipe or with the tanks, and these tubes are provided with spray-nozzles, which are always within easy reach of the operator, and

may in some cases be attached to the body, so that, if desired, a spray of water can be thrown over the person.

Extra faucets or cocks are connected with the pipes which pass through the timbers, and which, in case of fire in the timber, can, at a moment's warning, be turned on by the workmen, thus giving a sense of safety in the event of a fire in the mine.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination of a water-pipe with jets, tanks, wheels, and blowers, as hereinbefore described, for the purpose of ventilating, purifying, and cooling the air in mines.

In witness whereof I hereunto set my hand and seal.

LEVI J. HENRY. [L. S.]

Witnesses:
JNO. L. BOONE,
C. M. RICHARDSON.