J. DIXON.

Ventilating of Railway Tunnels, &c.

No. 163,643. Patented May 25, 1875.

Fig. 1

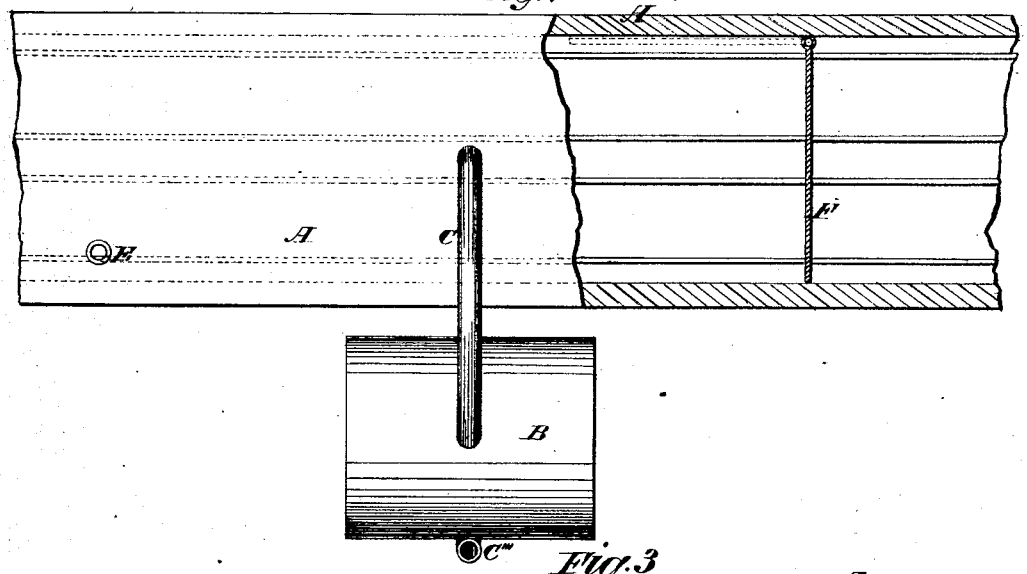


Fig. 3

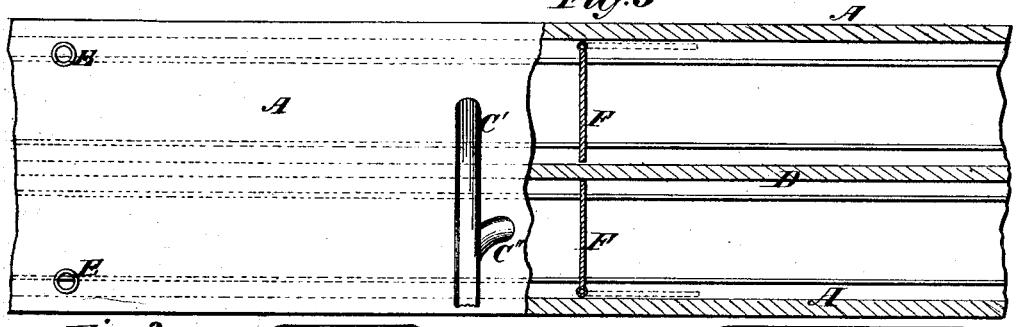


Fig. 2

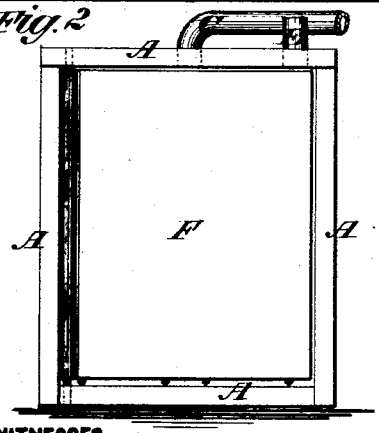
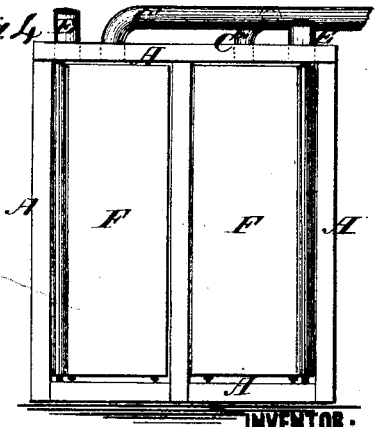


Fig. 4



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UNITED STATES PATENT OFFICE.

JOSEPH DIXON, OF NEW YORK, N. Y.

IMPROVEMENT IN VENTILATION OF RAILWAY-TUNNELS, &c.

Specification forming part of Letters Patent No. **163,643**, dated May 25, 1875; application filed April 24, 1875.

To all whom it may concern:

Be it known that I, JOSEPH DIXON, of the city, county, and State of New York, have invented a new and useful Improvement in the Ventilation of Railway-Tunnels and other Structures, of which the following is a specification:

My improvement is more particularly designed for underground railways, tunnels, &c., in cities where openings to the external air cannot be had without interference with the surface traffic of the street, or without purchasing adjoining lands and using same for ventilating-shafts. So as to deal with a less body of air in long tunnels, I propose to divide the tunnels into sections of a mile, more or less, and to place midway of these sections a suitable fan-blower, connected by suction-pipes, extending right and left into the tunnel, either at the top or at any elevation between the top and bottom of the tunnel that may be deemed most desirable, and to place partitions by means of pivoted or folding doors across the tunnel on either side of said suction-pipes, said partitions occupying the entire space crosswise of the tunnel, as shown in the accompanying drawings—pending the arrival of a train, said partition-doors to remain closed. The said doors may have spring-hinges connecting them with levers lying alongside the rails, said levers extending a suitable distance from said partitions up and down the railway-line, so that the doors may be opened by an approaching train, and closed again immediately after the train has passed; but this opening and closing may be done by a signal-man stationed at the place for this special duty, or the doors may be opened and closed automatically by the train itself operating suitable mechanism placed alongside the track. By thus dividing the tunnel into sections, and placing the ventilating apparatus midway outside the tunnel, either in an underground vault or other structure, the fan, being set in motion by steam or other power, withdraws the foul air from, say, half a mile of tunnel on the left-hand side, and at the same time, and by the same operation, it also acts in like manner on the length of tunnel on the right-hand side, and discharges the foul air from both sections through a pipe of suitable size on the opposite side of the fan, said pipe extending to the surface of the earth, and thence continued up a suitable height above the surface by an ornamental hollow column.

If deemed more desirable, as occupying less space on the surface of a street, two or more small columns may be used instead of one large one.

The principle herein described may be applied both to single tunnels, or to tunnels divided by partition-walls longitudinally.

For the purpose of keeping up an abundant supply of fresh air, hollow columns may be erected above the street surface, midway between the sections hereinbefore described, and connected downward by openings into the tunnel, so that as fast as the foul air is removed by the fan-blower, fresh air will rush down through these columns.

By the method herein described, perfect ventilation is constantly maintained at small cost, and without incurring expense for land and permanently devoting it to ventilating-shafts.

In the accompanying drawings I give examples of my invention.

Figure 1 is a plan view of a single tunnel, showing the application of my invention thereto. Fig. 2 is a sectional end elevation of the same through the line *x x*. Fig. 3 is a plan view of a double tunnel, showing the application of my invention thereto. Fig. 4 is a sectional end elevation of the same through the line *x x*.

Similar letters of reference indicate corresponding parts.

A, the walls of the tunnel, which may be of any suitable form or material; B, blowing-machine, communicating by means of pipes C C′ C″ with the interior of the tunnels. C‴ is the discharge-pipe of the blowing-machine. D is the dividing-wall of the two tunnels shown in Fig. 3. E are pipes for the supply of fresh air. F F F are doors for closing one end of the tunnel. When these doors are closed, as shown in the drawings, and the blower B set in motion, the air contained within the tunnel will be exhausted and de-

livered through pipe C''' into a chimney or other exit, while fresh air will enter at the other end of the tunnel and through the supply-pipes E.

I do not limit or confine myself to the exact form, position, or construction of any of the parts herein mentioned, as they may be varied in many ways without departing from my invention.

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

The combination of one or more partitioning-doors and a blowing apparatus with the tunnel, substantially as herein shown and described.

JOSEPH DIXON.

Witnesses:
T. B. MOSHER,
ALEX. F. ROBERTS.