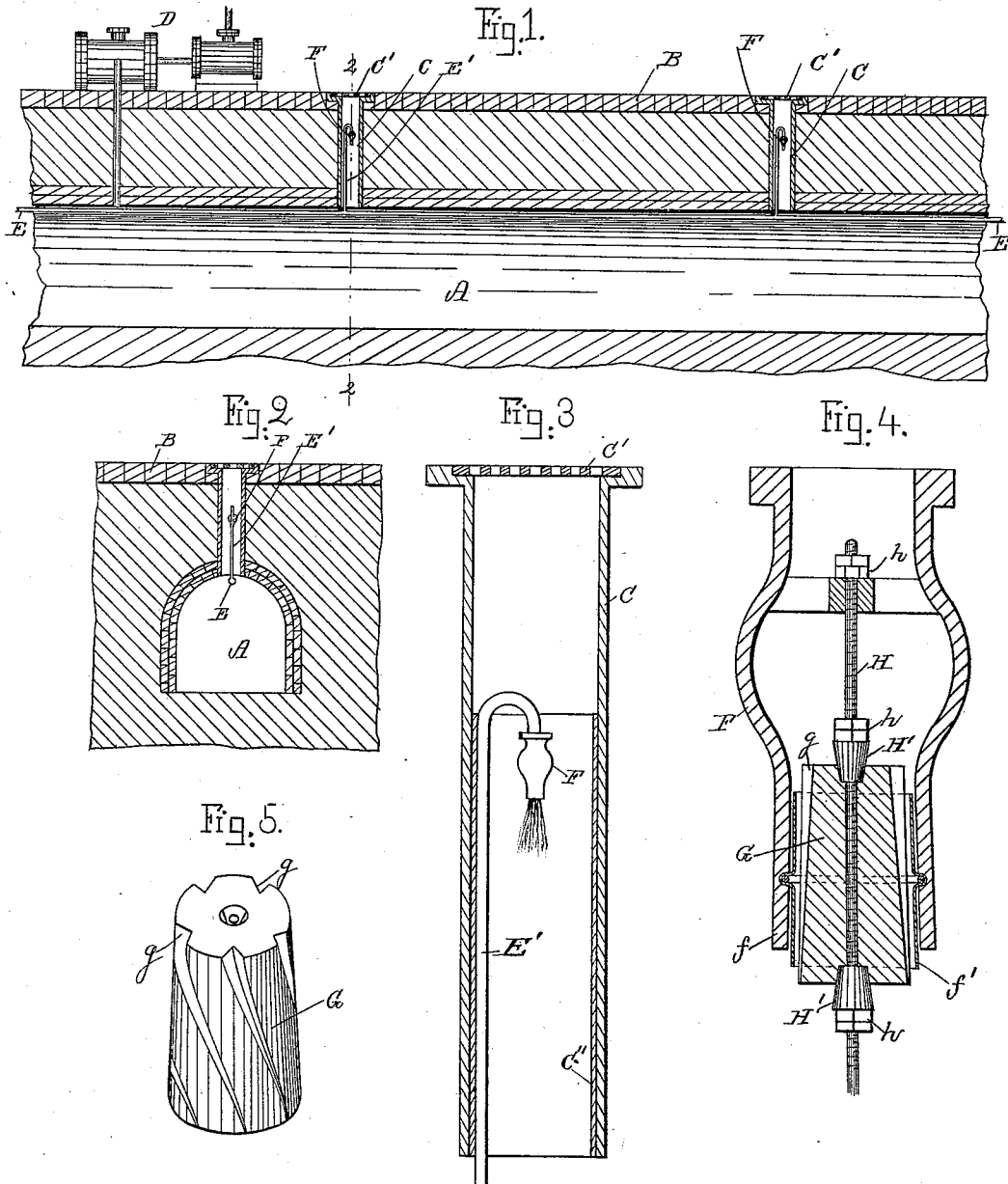


(No Model.)

G. W. LORD.
AIR FORCING DEVICE.

No. 536,932.

Patented Apr. 2, 1895.



Witnesses.

Laurie N. Holder.
Kittie M. Hanson.

Inventor.

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by *Alvan Audrieu* *his atty.*

UNITED STATES PATENT OFFICE.

GEORGE W. LORD, OF BOSTON, MASSACHUSETTS.

AIR-FORCING DEVICE.

SPECIFICATION forming part of Letters Patent No. 536,932, dated April 2, 1895.

Application filed January 26, 1894. Serial No. 498,105. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. LORD, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Air-Forcing Devices, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in air forcing devices and is especially well adapted for the proper ventilation of tunnels, subways, subterranean shafts and the like and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1, represents a longitudinal section of a tunnel or subway provided with my improved air forcing device. Fig. 2, represents a cross section of the same on the line 2—2 shown in Fig. 1. Fig. 3, represents a detail longitudinal section of one of the air supply tubes showing the air ejector arranged therein. Fig. 4, represents a central longitudinal section of one of the improved air ejectors; and Fig. 5, represents a detail perspective view of the adjustable plug arranged within such ejector.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A in Figs. 1 and 2 represents a tunnel or subway that is to be ventilated and supplied with a constant or proper amount of fresh air, and B represents the street or road level above such tunnel as usual. Through the roof of the tunnel are inserted a series of air supply pipes C C open at top and bottom and provided with a suitable grating C' at their upper ends which are on a level with the road-bed or street pavement, or nearly so as fully shown in Figs. 1 and 2.

D represents a suitable air pump or air forcing apparatus of any suitable size, form or construction of which there may be used one or more for each tunnel or subway, as may be found most practical and serviceable.

From the air forcer D leads an air delivery pipe E into the tunnel or subway A as shown, said pipe being preferably located and secured in place directly below the roof of the tunnel as represented in Figs. 1 and 2. Said pipe may be attached to the air forcer in one end and closed in its opposite end, or if so

desired it may have an air forcer attached to each of its ends or otherwise as may be most practical according to the length or arrangement and location of the tunnels or subways that are to be ventilated.

From the air forcing pipe E lead a series of inverted U shaped ejector pipes E' E' which enter the air supply tubes C C as shown in Fig. 1. Each of said ejector pipes E' has attached to its discharge end an ejector F which is fully shown in detail in Figs. 4 and 5.

The lower end of each ejector F is preferably made slightly tapering as shown at *f* in Fig. 4 and within it is located a slightly tapering plug G which is longitudinally adjustable upon a central spindle H secured in a suitable manner within the shell F as shown in Fig. 4. Above and below the plug G are located the tapering bearings H' H' adapted to fit correspondingly shaped recesses respectively in the upper and lower ends of the plug G as shown. The position of the plug G within the tapering shell portion *f* may be adjusted by means of regulating nuts *h h* screwed on correspondingly screw threaded parts of the spindle H as shown in Fig. 4.

On the periphery of the plug G are made a series of spiral grooves *g g* which are gradually tapering from top to bottom being largest at the top and smallest at the bottom as shown in Fig. 5 so as to cause the ejected air that is being forced out through the lower ends of such grooves to become greatly compressed at the point of ejection thus increasing its effectiveness in conducting the fresh air from above the street through the tubes C and to force it into the tunnel or subway.

The plug G may be secured firmly in place upon its spindle or it may be loosely arranged thereon so as to cause it to revolve on said spindle while the air is forced through its spirally arranged grooves.

The plug G may be so adjusted within the shell portion *f* as to fit closely therein or nearly so causing the ejected air to pass out through the spiral grooves *g g* only, or it may be adjusted so as to leave an annular space between the exterior of said plug and the interior of the shell portion *f* through which a portion of the air is ejected in the shape of a thin tubular column so as to still further increase the effectiveness of the ejector.

For the purpose of deadening the noise caused by the passage of the fresh air through the supply tubes C, I provide each of the latter with an internal soft lining C'' made of felt, cloth or other similar soft material; and likewise for the purpose of deadening the noise caused by the ejection of the compressed air at the discharge end of the ejector, I provide the latter with a similar internal soft lining f' extending preferably a short distance below the lower end of the plug G as shown in Fig. 4.

By forcing out the compressed air through the ejectors F F within the air supply tubes C C the fresh air from above is caused to flow in a steady stream through said tubes C C into the tunnel or subway thus causing an ample supply of fresh air to be maintained at all times and causing a proper ventilation of such tunnel or subway to be effected.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. The herein described air forcing device,

consisting of a shell having a central spindle, a longitudinally adjustable plug arranged thereon, and a lining of soft, yielding, sound deadening material arranged upon the interior of said shell and extended beyond the end thereof, substantially as described and for the purpose specified.

2. In an ejector, the combination of a shell provided with a central spindle, and a tapering plug provided with spiral grooves upon its periphery, said grooves gradually tapering in depth and width from top to bottom, said plug being loosely journaled upon the said central spindle and longitudinally adjustable thereon, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, on this 17th day of January, A. D. 1894.

GEORGE W. LORD.

Witnesses:

ALBAN ANDRÉN,
KITTIE M. HANSON.