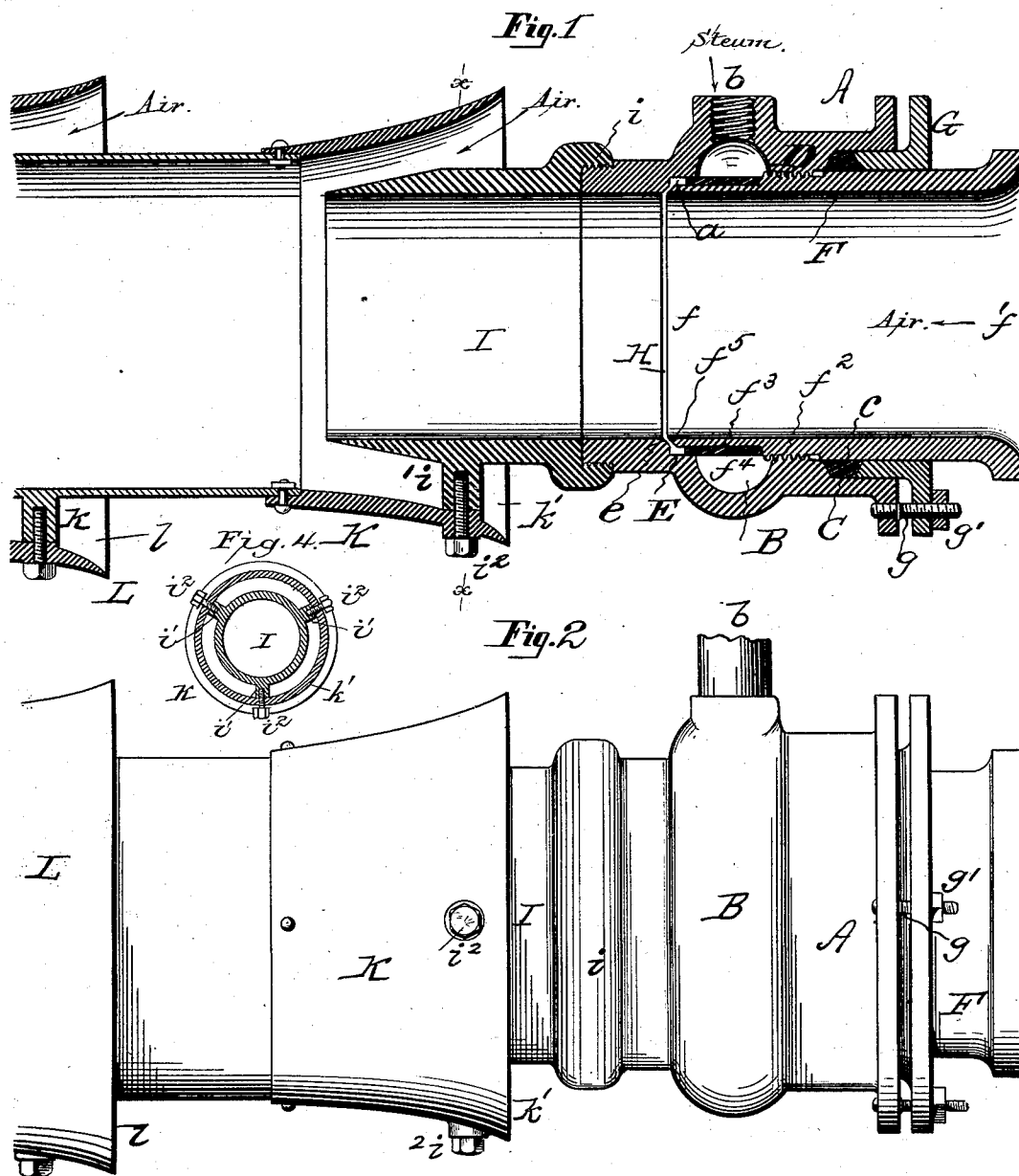


H. W. NORWOOD.
AIR INJECTOR.

Patented June 12, 1883.



WITNESSES:
W. Haw Hom.
C. Williams

INVENTOR
H. W. Norwood
By S. J. VanStavoren
Attorney.

UNITED STATES PATENT OFFICE.

HORACE W. NORWOOD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE NORWOOD SPARK PREVENTIVE AND SMOKE CONSUMING COMPANY,
OF CAMDEN, NEW JERSEY.

AIR-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 279,269, dated June 12, 1883.

Application filed April 2, 1883. (Model.)

To all whom it may concern:

Be it known that I, HORACE W. NORWOOD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Air-Injectors, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section of an injector embodying my improvements. Fig. 2 is an elevation of the same. Fig. 3 is a broken detail elevation.

My invention has relation to air-injectors, and has for its object to simplify and cheapen their construction and to increase their efficiency.

My invention accordingly consists of the novel combination, construction, and arrangement of parts, as hereinafter more specifically described and claimed.

Referring to the accompanying drawings, A represents the shell or casing, which is cylindrical or tubular in outline, having an annular steam-chamber, B, with lateral supply or pipe opening, *b*, an internal stuffing-box, C, for the reception of a packing, *c*, a threaded section, D, interposed between said steam-chamber and stuffing-box, and a bearing-surface, E, terminating in an annular tapering or inclined edge, *e*.

F represents a tube fitting within the bore of the shell A, and has open ends *f* *f'* and an exterior screw-thread, *f*², which meshes with the threaded section D of shell A.

Surrounding tube F is a gland, G, which enters the stuffing-box C and is forced upon or against the packing *c* by means of bolts *g* and nuts *g'* to form a tight joint between the shell A and tube F. The external periphery of the latter at its end *f* is reduced at *f*³, and provided with three or more radial lugs, *f*⁴, which rest upon the bearing-surface E of shell A to form a support for the end *f* of tube F, and also to provide spaces or openings *a* between said shell and tube for the passage of steam from chamber B to the jet-opening H. The latter is formed by the inclined side *e* of shell A, and the beveled edge *f*⁵ on the end *f* of

the tube F. The bevel of said edge *f*⁵ corresponds to the taper of said side, *e*, so that when the former impinges upon the latter the jet-opening H is closed and the operation of the injector ceases.

I represents a nozzle screwed to the shell A at *i*, and is provided with three or more external radial lugs, *i'*, to which is secured a hood or funnel, K, by means of screws *i*². Said funnel may be of any desired construction and of any suitable material. If desired, it may be provided with lugs *k* *k*, to which is secured a second hood or funnel, L.

The operation is obvious. By rotating the tube F by means of a lever or handle (not shown in the drawings) the edge *f*⁵ is withdrawn from the side *e* of shell A to form the annular jet-opening H, the area or depth of which depends upon the extent of the rotation of the tube F. When the jet-opening is formed the steam from chamber B passes therethrough to the bore of shell A and nozzle I to produce a suction therein and cause air to be drawn thereinto through the end *f'* of tube F. At the same time air is sucked through the ends *l* and *l'* of the hoods L and K, respectively, which air is carried along by the steam and fed into a furnace or otherwise disposed of, as desired. By reversely rotating the tube F the jet-opening H is closed to stop the operation of the injector.

I have described my invention as an injector for feeding air; but it is obvious that it may be used for feeding, lifting, or conveying water, sand, mud, or other materials.

What I claim is—

1. The shell or casing A, having lateral steam-chamber B, bearing-surface E, tapering edge *e*, threaded section D, and stuffing-box C, with gland G, in combination with tube F, having screw *f*², reduced portion *f*³, with lugs *f*⁴, and beveled edge *f*⁵, substantially as shown and described.

2. The shell A and tube F, constructed substantially as shown and described, in combination with an external nozzle, I, detachably secured to said shell, and having external radial lugs, *i'*, for supporting a hood or funnel, K, substantially as set forth.

3. The shell or casing A, having an annular steam-chamber terminating in a bearing-surface and inclined edge, a threaded section and a stuffing-box, in combination with a tube located within the bore of said shell and having a screw which engages with the threaded section of the shell, and a reduced end provided with radial lugs and terminating in a beveled edge, substantially as shown and described.
- 10 4. A casing or shell, A, having in its bore a steam-chamber, a bearing-surface with inclined

edge, a threaded section and stuffing-box and gland, in combination with a tube fitting in said bore and having an external screw, a reduced portion with radial lugs and a beveled end, substantially as shown and described. 15

In testimony whereof I affix my signature in presence of two witnesses.

HORACE W. NORWOOD.

Witnesses:

S. J. VAN STAVOREN,
CHAS. F. VAN HORN.