W. E. EDWARDS & F. J. GRACIER.

Bellows-Nozzle.

No. 198,932. Patented Jan. 8, 1878.

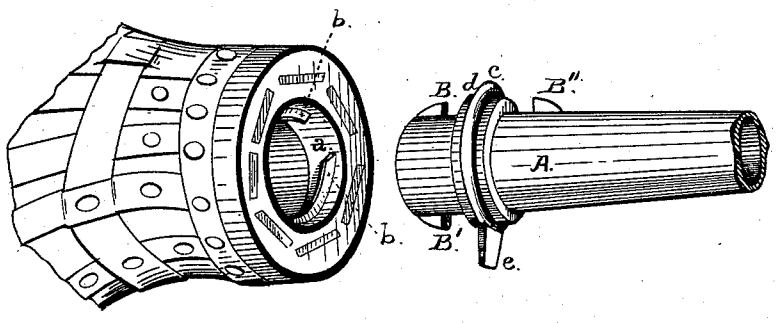


Fig. 1.

Fig. 2

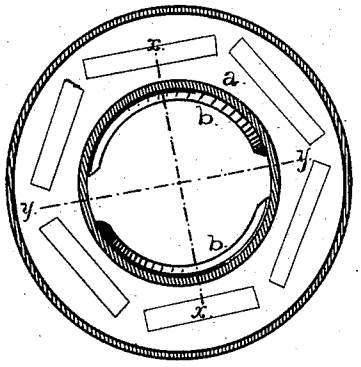
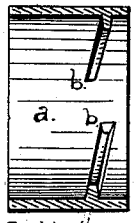
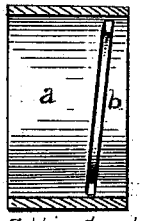


Fig. 3



Section through line x.x. fig. 2.

Fig. 4



Section through line y. y. fig. 2.

Fig. 5

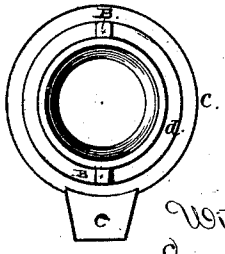
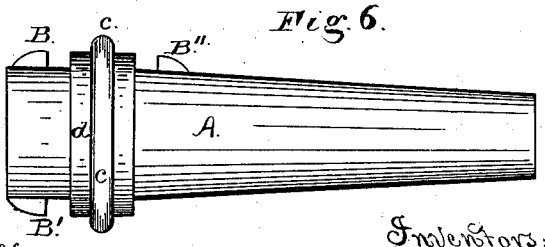


Fig. 6.



Witnesses:

Edward C. Osborn

William W. Osborn.

Inventors:

William E. Edwards.

Frank J. Gracier.

By C. M. Smith.

their Attorney

N. PETERS. PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM E. EDWARDS, OF OAKLAND, AND FRANK J. GRACIER, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN BELLOWS-NOZZLES.

Specification forming part of Letters Patent No. **198,932**, dated January 8, 1878; application filed October 3, 1877.

To all whom it may concern:

Be it known that we, WILLIAM E. EDWARDS, of the city of Oakland, county of Alameda, and FRANK J. GRACIER, of the city and county of San Francisco, both in the State of California, have made and invented a new and useful Improvement in Bellows-Nozzles, which invention is fully set forth in the following specification and accompanying drawing.

In the said drawing, Figure 1 is a perspective view of the head of a bellows with our invention applied thereto, and with the nozzle detached. Fig. 2 is a plan view of the head of the bellows with the nozzle removed. Fig. 3 is a sectional view of the inner rings through the line *x x*, Fig. 2. Fig. 4 is a sectional view of the same through the line *y y*. Figs. 5 and 6 are views of our improved nozzle, the same being an end and a side view, respectively.

Our invention has for its object to provide a better means for placing and securing the nozzle within and upon the head of a bellows without the use of screws or bolts; and in such a manner is our invention constructed that the nozzle, when loosened, may be set up and tightened in place without damage to the head, and the need of introducing plugs or wedges into the end wood of the head is dispensed with. The nozzle can be detached, also, for purposes of transportation, and readily secured into the head at any time.

To this end our invention consists in the construction and application within the head of the bellows of a sleeve or ring provided with the segments of a screw-thread on its interior surface, and arranged to receive and hold the end of the nozzle, the exterior surface of the nozzle at this point being provided with lugs or projections, which engage and work beneath the threads within the sleeve, whereby the end of the nozzle is, by the action of these threads, drawn against the head and held firmly in place.

In the accompanying drawing, Fig. 1 shows the end or head of a bellows of the ordinary construction, within which is applied our improved sleeve or ferrule *a*. This sleeve fits within and surrounds the opening formed in the head, and it is made with two parts or segments of screw-threads upon its interior surface, extending round for about the half-circumference, and placed opposite to each other.

A space between the ends of the segments is left for the admission of the lugs B B′, which are formed on the cylindrical or shorter end of the nozzle A, so that on the introduction of this end within the opening the lugs will, by a turn of the nozzle, be brought beneath these segments, and, by virtue of their inclination, the nozzle will be drawn and held down tightly to its seat against the head.

The screw-thread segments *b b* are placed at opposite sides in the ring *a*, so that one engages one lug, B, and the other one the lug B′. This shorter end of the nozzle is not in contact with the interior of the cylinder or sleeve *a*, except at the points where the lugs B touch, and a space is left between the parts, which the air fills, and thus keeps the parts of the head from becoming unduly heated by the nozzle. These lugs could be replaced by a screw thread or segment, which would hold the nozzle equally as secure; but more of the nozzle would thus be brought in contact with the ring *a*, and for this reason I prefer the construction shown.

The nozzle A has a flange, *c*, at proper distance from the end that is placed within the nozzle ring or sleeve, and a collar, *d*, behind it, of the same size as the inside circumference of the ring, which fits tightly within it when the nozzle is locked in position, at which time the flange *c* is brought down and held against the edge of the ring and the wood surrounding it, and thus the escape of the air from between the head and the nozzle is prevented.

As thus constructed and applied, our invention removes all necessity of plugging up the wood in the head of the bellows to tighten the screws or bolts now employed to hold the nozzle in place, for, the end grain of the wood being presented at the head of the bellows, the screws are not held firmly within it, and the nozzle soon works loose; but in our manner of constructing the head the wood, when once properly wedged up between the outer and inner rings

or ferrules, is not weakened or broken by the introduction of screws, and the inner ring is kept tightly in place.

The nozzle A has a projecting nib or ear, *e*, on the flange, to allow the nozzle to be set up, whenever it becomes loosened, by the use of a hammer, a few blows being all that is required to tighten it; and the nozzle is likewise provided with a lug, B″, in front of the flange, to serve as a locking device to hold the nozzle in place on the bellows when it is reversed, and its longer end is inserted within the opening in the head, for purposes of transportation and shipment. In this position the lug B″ engages with and works beneath the screw-segments.

Having thus fully described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. A self-locking and removable nozzle for bellows, provided with locking-lugs B B′, and flange and collar *c* and *d*, and combined and adapted to be used with a ring, ferrule, or other equivalent device, which is inserted and fixed within the opening in the bellows-head, and which is provided with segments of a screw-thread, to engage and hold the lugs B B′, substantially as herein described and specified.

2. In combination with a bellows, the ring or sleeve *a*, fixed within the opening in the head, and provided with separate segments of a screw-thread, which are adapted to engage with and hold the lugs or projections formed upon the larger end of the nozzle, the same being constructed, for this purpose, substantially as herein described and specified, whereby the use of screws or bolts is dispensed with.

3. A bellows-nozzle constructed, substantially as herein described, with the lugs or projections B B′ B″, and the flange and collar *c* and *d*, and the nib or ear *e*, combined and used in connection with the ring or ferrule *a*, formed as described, and fixed within the opening in the bellows-head.

4. In combination with a ring or ferrule, *a*, fixed within the opening in the head of a bellows, and provided with separate segments of a screw-thread, as described, the nozzle A, having its larger end of less diameter than the size of the ring or ferrule, and provided with lugs B B′ upon this end, whereby, when the nozzle is inserted and locked within the head, an air-space will be left between these metal parts, except at the points where the lugs B B′ touch the surface of the ring or ferrule, as herein described, for the purpose set forth.

In testimony that we claim the foregoing we have hereunto set our hands and seals this 1st day of September, 1877.

WILLIAM E. EDWARDS. [L. S.]
FRANK J. GRACIER. [L. S.]

Witnesses:
EDWARD E. OSBORNE,
WILLIAM HARNEY.