

A. F. SMITH & E. B. HARVEY.  
Steam-Blowers.

No. 152,956.

Patented July 14, 1874.

Fig. 1.

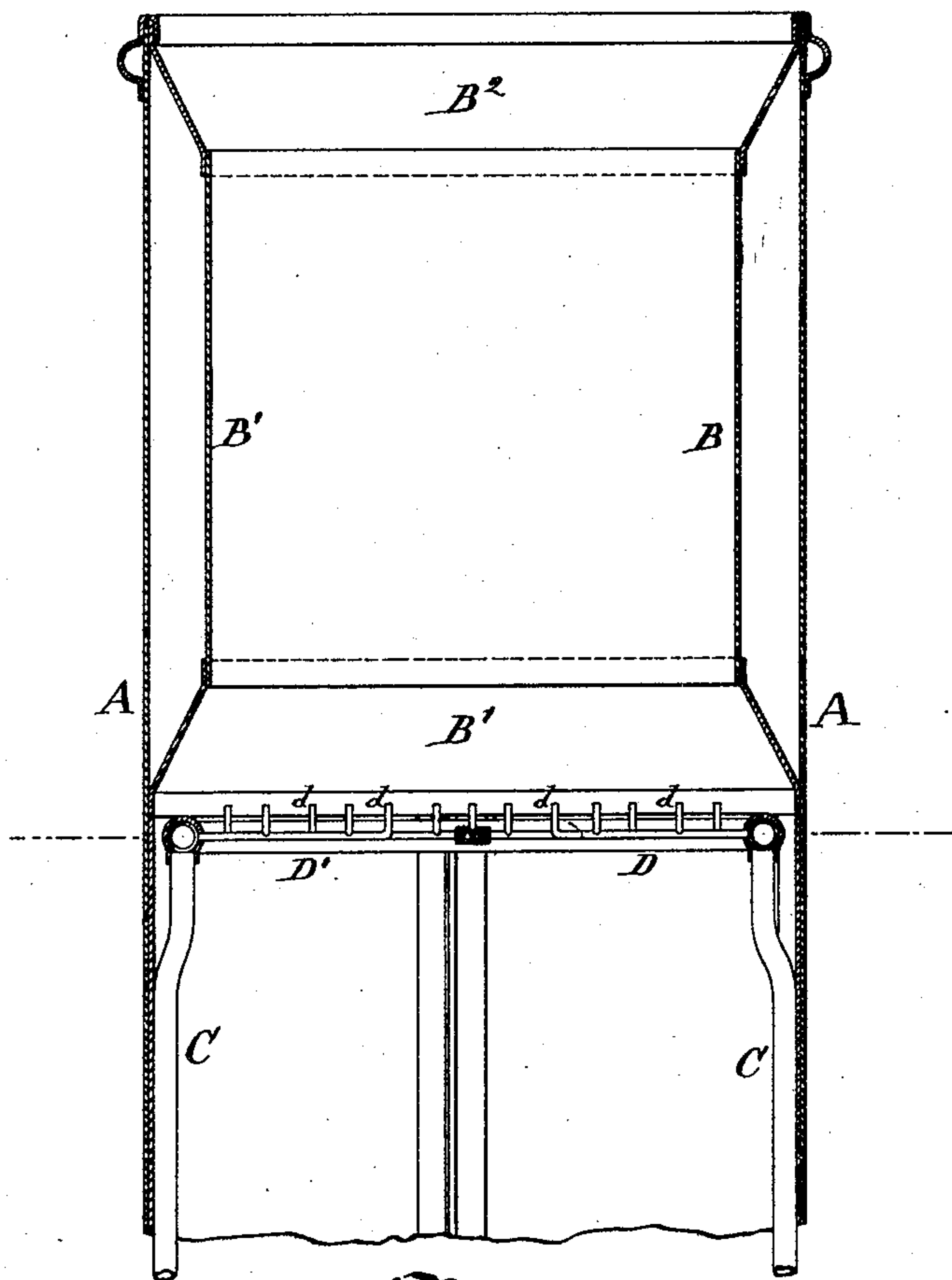
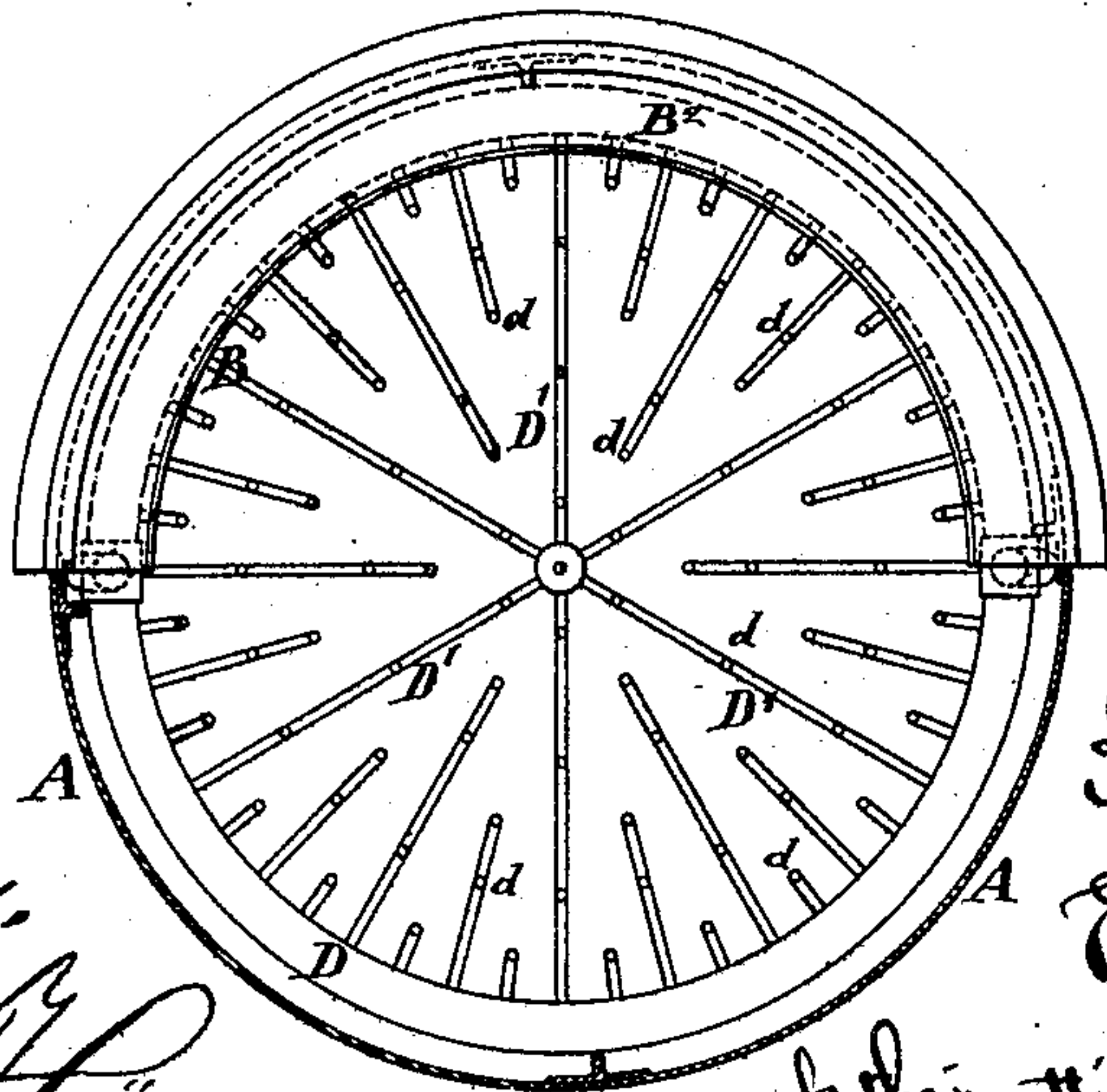


Fig. 2.



Witnesses:

*Wm. C. Gray.*  
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Inventors:

*A. F. Smith*  
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*New York City*

# UNITED STATES PATENT OFFICE.

ALBA F. SMITH, OF NORWICH, AND ELIJAH B. HARVEY, OF SALEM, CONN.

## IMPROVEMENT IN STEAM-BLOWERS.

Specification forming part of Letters Patent No. **152,956**, dated July 14, 1874; application filed February 25, 1874.

*To all whom it may concern:*

Be it known that we, ALBA F. SMITH, of Norwich, Connecticut, and ELIJAH B. HARVEY, chief engineer of the steamboat City of Boston, residing at Salem, New London county, Connecticut, have invented certain Improvements relating to Steam-Blowers, of which the following is a specification:

The invention relates to that class of blowers in which small currents or jets of live steam from the boiler are ejected upward among the products of combustion in the chimney. We have discovered that the jets are more effective when located near the top of the chimney. We construct the chimney with an exterior of a continuous cylindrical form, but place in the interior, a little above the jets, a casing of a smaller diameter, with conical casings leading therefrom to the main outer casing, so as to give a form to the interior stack closely resembling the contraction of the current of water known as the *vena contracta*.

We have succeeded in blowing effectively with a very small consumption of steam, and by means of apparatus which, when the steam is shut off from our apparatus, offers no appreciable obstruction to the natural draft, and involves little weight or cost or liability to derangement.

The following is a description of what we consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a central vertical section, and Fig. 2 is a plan view of the novel parts. The upper half of Fig. 2 is a plan, and the lower half a section of the chimney on the line S S in Fig. 1.

Similar letters of reference indicate like parts in both the figures.

A is the main body or exterior of the chimney of a steamboat. B is the most contracted portion of the interior casing, and B<sup>1</sup> B<sup>2</sup> are, respectively, the lower and upper frustums of cones which connect the parts. The entire exterior of the stack may be of the ordinary dimensions and proportions. The interior casing B B<sup>1</sup> B<sup>2</sup> forms a contracted portion near the top, contracting gradually by the cone B<sup>1</sup>, and enlarging again at the top by the cone B<sup>2</sup>. The length of the entire contraction B B<sup>1</sup> B<sup>2</sup> should be about equal to the exterior

diameter of the chimney. C C are steam-pipes of two inches, more or less, in diameter, conducting steam from the boiler at full pressure up to a ring, D, which may be three inches in diameter, and held by suitable brackets just below the interior contracting casing. Hollow arms D' extend inward from the ring D, some of them joining at the center. Nozzles *d*, discharging steam upward, are thickly distributed over the ring D and the arms D'. The passage of steam from the boiler being controlled by a valve, (not represented,) the blowing is effected, when desired, by simply opening such valve and allowing the steam to jet upward at full pressure from the several nozzles *d* into and through the contracted portion B B<sup>1</sup> B<sup>2</sup> of the chimney.

When the steam is shut off from the pipes C, our apparatus ceases to impel the upward movement of the gases in the stack, and they are allowed to move only by the natural draft due to their levity. Thus conditioned, we find the contraction of the chimney is almost inappreciable in its resistance to the motion. Our arrangement of the pipes D D' a little below the contraction leaves the contracted space entirely free.

When the steam is turned on, and the jets are actively at work issuing from the nozzles *d*, they act on the gases in the contracted portion, and are peculiarly efficient.

Our mode of operation avoids the presence of steam in the chimney; consequently any liability of the steam to condense therein and produce corrosion. It also, by maintaining a partial vacuum in the chimney, causes the air to draw inward through any leaks, and prevents the unsightly appearance sometimes produced by the blowing out of gases through imperfect joints.

We claim as our invention—

The open cluster of nozzles *d* and connecting-pipes D D', in combination with the contracting case B B<sup>1</sup> B<sup>2</sup> and exterior chimney A, as herein specified.

In testimony whereof we have hereunto set our hands this 19th day of February, 1874, in the presence of two subscribing witnesses.

A. F. SMITH.  
E. B. HARVEY.

Witnesses:

H. L. PARKER.  
O. L. JOHNSON, Jr.