

(No Model.)

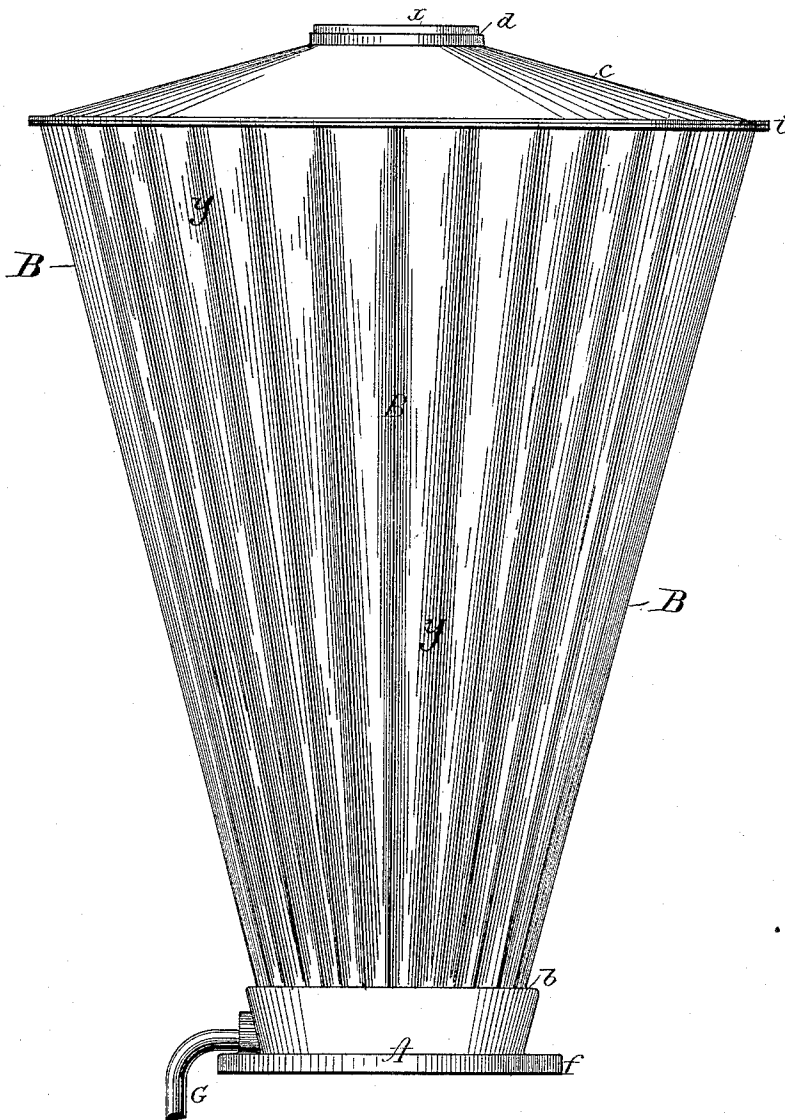
2 Sheets—Sheet 1.

W. L. SIMPSON.
EXHAUST STEAM HEAD.

No. 395,184.

Patented Dec. 25, 1888.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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EXHAUST STEAM HEAD.

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Patented Dec. 25, 1888.

Fig. 2.

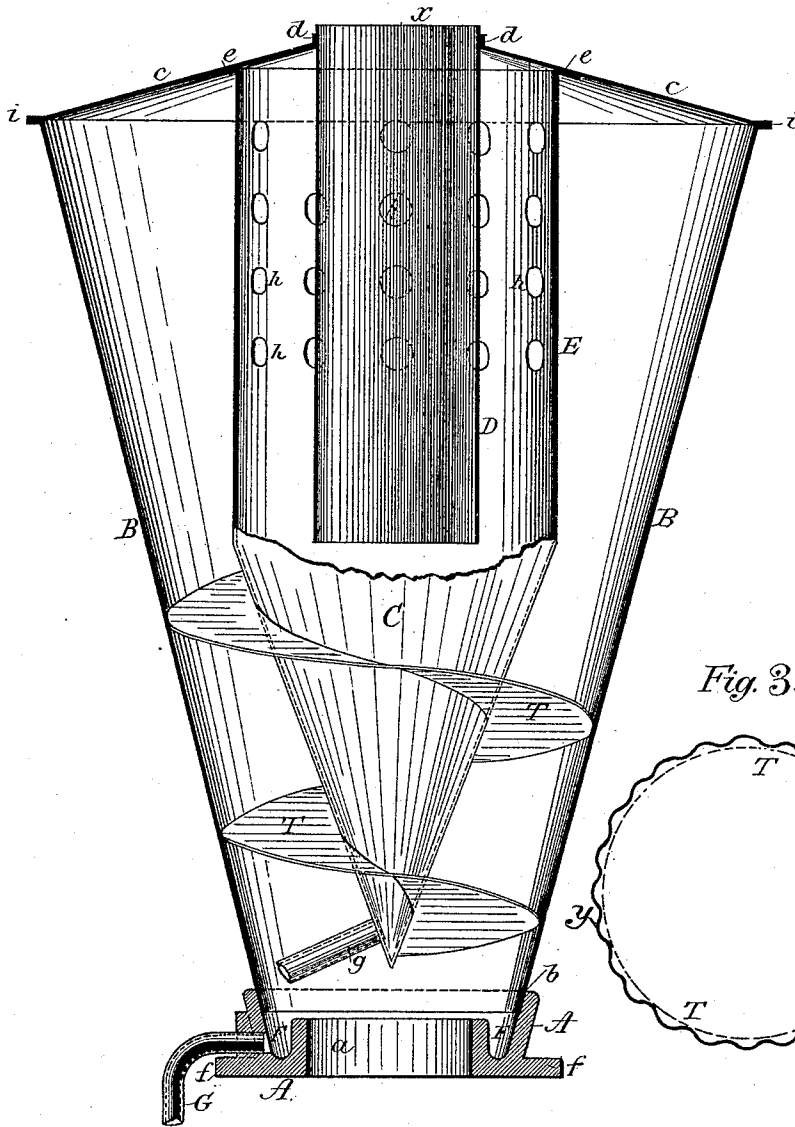
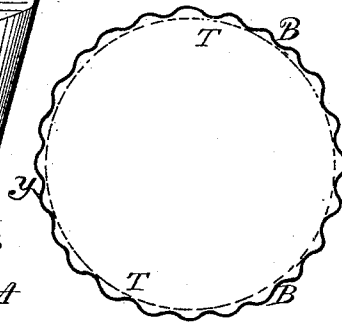


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM L. SIMPSON, OF PHILADELPHIA, PENNSYLVANIA.

EXHAUST-STEAM HEAD.

SPECIFICATION forming part of Letters Patent No. 395,184, dated December 25, 1888.

Application filed April 4, 1888. Serial No. 269,543. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. SIMPSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Exhaust-Steam Heads; which invention or improvement is fully set forth and illustrated in the following specification and accompanying drawings.

10 The object of this invention is to make a more efficient exhaust-head, while securing durability, simplicity, and moderate cost.

The invention consists of the parts and combinations of parts, as hereinafter particularly described, and set forth in the claims.

15 In the accompanying drawings, Figure 1 shows in elevation an exterior view of the exhaust-head ready for attachment to an exhaust-steam pipe. Fig. 2 shows a longitudinal vertical section of the head, taken diametrically through Fig. 1. Fig. 3 shows the corrugations in cross-section.

In said figures the several parts are indicated by letters, as follows:

25 The letter A indicates a base-piece, shaped as shown in the drawings, which may be of cast metal suitable for the purpose. Said base is provided with a central opening or bore, *a*, which may be screw-threaded or tapped out to receive the exhaust-pipe; or said base may be bolted through its flange *f* to the flange of an exhaust-pipe. Said base is also provided with an annular chamber, F, and a drip-pipe, G. The base A is secured by rivets or otherwise to the shell B of the exhaust-head at *b*. Said shell is in shape, as shown in the drawings, that of an inverted truncated cone, and is preferably made of galvanized sheet-iron of suitable thickness, depending upon the size of the structure. The top *c* of the shell B is slightly inclined or arched downwardly from the center, through and from which depends the pipe D, secured by rivets *d* or otherwise to the top *c*. Said top may be made flat, if preferred, or may be made concave instead of convex, if desired. Exterior to the pipe D, and surrounding the same, is the pipe E, secured by rivets *e* to the top *c* and terminating below in the cone C, provided with a drip-pipe, *g*. Secured to said cone C are spiral helical threads of sheet metal, T, which

threads nearly fill the space between the outside of the cone C and the inside of the outer shell, B, leaving preferably about from one-sixteenth to one-eighth of an inch clearance between the exterior edges of said threads and the shell B for the condensed water to run down the inside of said shell. The cylindrical part E above the cone C has therein numerous holes, *h*, as shown in the drawings. The aggregate area of said holes should exceed the respective areas of the entrance *a* and exit *x* for the steam, and said holes may have a diameter each of about three-fourths of an inch to one inch, or smaller or larger, depending upon the size of the head.

The course of the exhaust-steam in entering and passing through this head is as follows: Entering at *a*, it passes upward spirally and centrifugally around the cone C in the space between the threads T, some passing up the sides of the shell B outside of the edges of said threads. Having escaped above the threads T, the steam enters through the holes *h* in the pipe E, striking the outersides of the pipe D at right angles. Thence descending toward the mouth of the cone C and below the mouth of the pipe D, the steam turns upward and freely escapes up the pipe D through its exit *x* into the atmosphere. By this time all entrained water entering the head with the steam and all water therein condensed has been deposited or trapped out of the steam, and only dry steam escapes into the atmosphere. All the water that reaches the annular chamber F runs out of the drip-pipe G. The water that falls to the bottom of the cone C passes into the chamber F through the pipe *g*.

A marked feature of this head is that through so much of the space which the steam traverses it must impinge on wall-surface, either helical, conical, or cylindrical, or all three successively. Such surfaces have a cohesive attraction for the water condensed upon them, and the particles of water roll or fall back, descending in a film down said surfaces to the drain-pipes below, instead of following the body of the steam through its upward and outward course, thus leaving it to escape practically free from condensed water.

The helical threads T give to the entering

steam a centrifugal course, throwing the steam and any water escaping with it against the sides of the shell B, down which the water runs back, while the steam rises with a helical twist still imparted to it after leaving said threads. The steam thus escaping into the atmosphere will not scatter water and spray upon surrounding objects or persons passing near, and roofs, through which so many exhaust-pipes pass, particularly in cities, will be kept dry in summer and free from ice in winter, which is impossible unless the exhaust-pipes be efficiently trapped. These results are of much importance and much sought after, but have not heretofore been attained to the perfection accomplished by the improvement herein described.

For strength and lightness, as well as for another purpose below mentioned, the sides B of the exhaust-head may be made of corrugated metal, as shown on a reduced scale, in Fig. 3 in cross-section, and in Fig. 1 in elevation, the corrugations being indicated by the letter *y*. The wave-line, as viewed in plan, formed by these corrugations running vertically, makes a shape affording excellent channels where the threads T touch or approach the side walls, B, for the condensed water to trickle down past the edges of said threads, thus affording water-ways as well as attractive surface for leading downward the water centrifugally separated from the steam.

Having thus fully described my said improvement, as of my invention I claim—

1. An exhaust-steam head consisting of a hollow truncated cone provided with an interior cylindro-conical pipe perforated at its upper or cylindrical portion and having a drip-pipe at its lower or cone end, said pipe secured to the top of the head and surrounding an exit-pipe depending from said top, substantially as and for the purposes set forth.

2. An exhaust-steam head consisting of a hollow truncated cone provided with an interior cylindro-conical pipe perforated at its upper or cylindrical portion and having spiral threads helically disposed upon the exterior of its lower or conical end and a drip-discharge from its interior, said pipe secured to the top of the structure or trap and surrounding an exit-pipe depending from said top, substantially as and for the purposes set forth.

3. In combination with an exhaust-steam head having corrugated sides or walls, a helical thread forming spiral passages with said corrugated walls, whereby vertical passages or ducts are provided for leading downward the water separated from the steam, substantially as set forth.

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