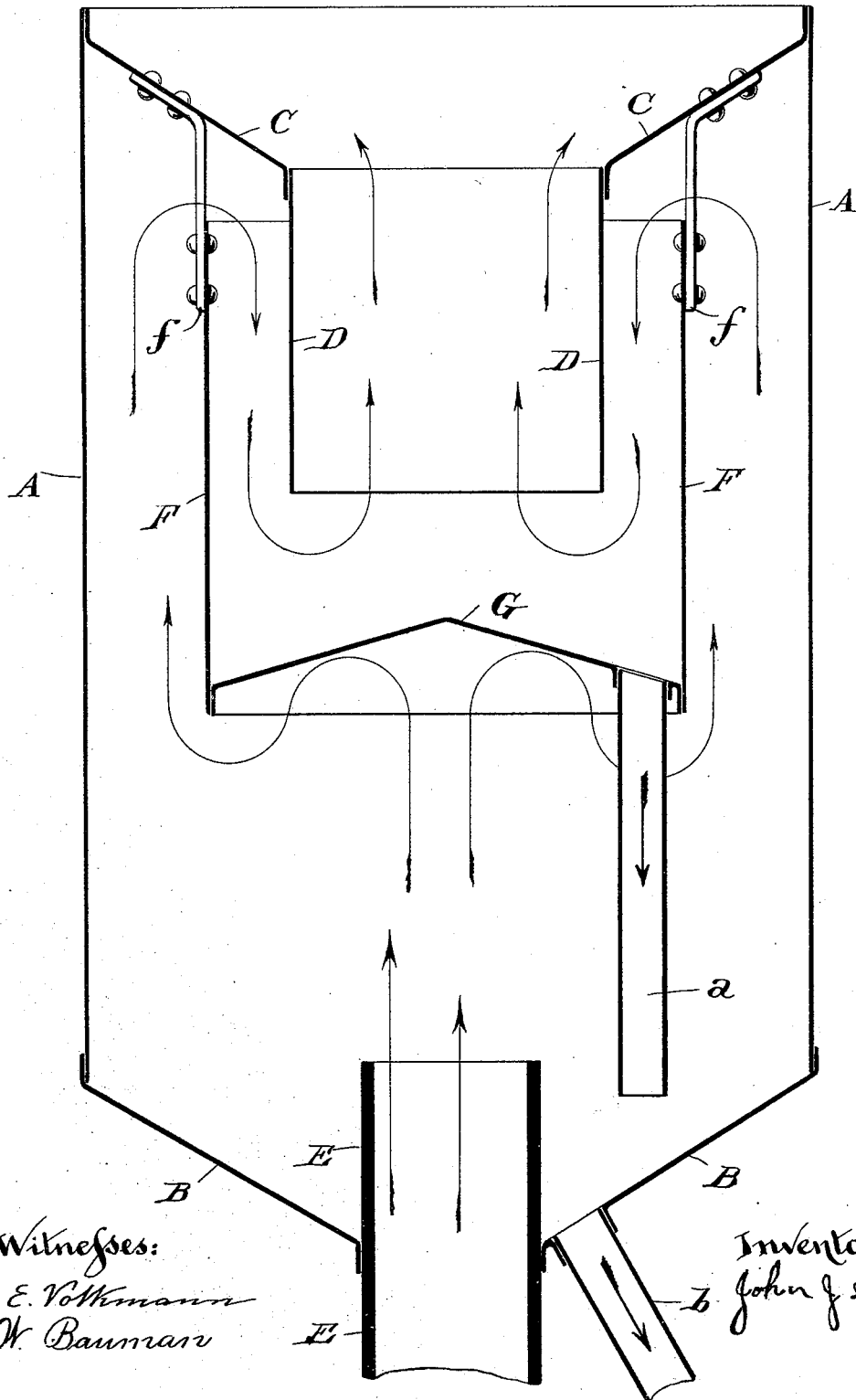


(No Model.)

J. J. STEIN.  
EXHAUST HEAD.

No. 421,017.

Patented Feb. 11, 1890.



Witnesses:

E. Volkmann  
W. Baumann

Inventor:  
John J. Stein

# UNITED STATES PATENT OFFICE.

JOHN J. STEIN, OF BROOKLYN, NEW YORK.

## EXHAUST-HEAD.

SPECIFICATION forming part of Letters Patent No. 421,017, dated February 11, 1890.

Application filed October 14, 1889. Serial No. 326,924. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. STEIN, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Exhaust-Heads for Steam-Escape Pipes, of which the following is a complete description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to that class of appliances which are attached to the top of steam-escape pipes to collect the condensed water in the exhaust-steam and keep it from falling upon surrounding objects; and my invention consists in the particular arrangement and construction of parts herein described, whereby a thorough separation of the water is accomplished and the greatest economy and ease of manufacture are secured.

In the accompanying drawing, which is a vertical section through the center of my exhaust-head, A represents a shell, preferably cylindrical, the bottom of which B is conical and secured centrally to the top of the exhaust-pipe E. The upper end or top C of the shell A is likewise of conical shape; but its apex is turned inwardly, and it has a central opening, with an inwardly-projecting thimble or spout D, which forms the outlet for the steam from the main shell A. Suspended from the top or cover C by means of a suitable number of braces or supports *f* is a bucket F, set at such a height relatively to the spout D, to which it is concentric, that the spout will dip below the rim of the bucket.

The bottom of the bucket F is conical, with the apex pointing upward, so that water will drain toward the sides, and at one side of this bottom piece G is secured a drain-pipe *d*, the discharge of which is into the bottom of the main shell A, but to one side of the exhaust-pipe E. The shell A is likewise provided with a drain-pipe *b*, attached at the lowest point of the conical bottom B, through which all water is drained from the exhaust-head, and which pipe *b* may be led off to any convenient point.

The operation of my exhaust-head may be readily understood by reference to the drawing. The path of the exhaust-steam is shown by the arrows, viz: The steam first strikes

the bottom G and is deflected by it. Then it rises in the annular space between the bucket F and the shell A, is deflected again by the cover C, then flows downward in the annular space between the bucket F and thimble D, and finally escapes through the outlet thimble or spout D into the atmosphere. The direction of the flow of steam, therefore, from the time it leaves the mouth of the exhaust-pipe E until it finally escapes into the atmosphere is reversed four times, and by the action of the centrifugal force exerting itself at each change of direction the water is thoroughly separated. The water separated in the main shell drops direct into the bottom B thereof, while the drippings from the bucket F are likewise led into the main shell through the drain-pipe *d*. From the main shell all the water is drained off through the pipe *b*. While the several changes of direction must affect the velocity of flow of steam somewhat, I make the proportions of all the several parts in relation to the size of the exhaust-pipe sufficiently large to avoid creating back-pressure.

A very essential feature of my invention, as bearing upon the cost of its manufacture, is the manner in which the head is formed and put together. The shell A is made first with its conical bottom B and its drain-pipe *b*. Then I form separately the conical head or top C, with its central outlet-spout D, and the bucket F, with its conical bottom G and drain-pipe *b*. The next operation is to secure together the completed bucket F and the top cover C. This is done by means of the supports or braces *f*, the length of which is adjusted so that the spout D will dip into the bucket F and below the rim thereof. The adjustment of internal parts is thus completed outside of the main shell, and the last operation—viz., the securing of the top C to the shell A, whereby the head is completed—is very easily accomplished.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an exhaust-head composed of a shell A, having a top C, formed with an inwardly-projecting outlet thimble or spout D, dipping below the rim of a concentric internal bucket F, the supports *f*, for fastening the internal

bucket F to the top C, whereby these parts may be finished, built up, attached, and adjusted to each other independently of the shell, to which they are subsequently secured  
5 by the one operation of fastening the top C to the shell, as set forth.

2. An exhaust-head composed of a shell A, with conical bottom or base B, the top or cover C, with inwardly-projecting thimble or  
10 outlet-spout D, the bucket F, concentric with and secured to the top C by means of sup-

ports *f*, and the bucket drain-pipe *d* and main drain-pipe *b*, all as herein above set forth and described.

In witness that I claim the above I have 15 hereunto set my hand this 13th day of July, 1889.

JOHN J. STEIN.

In presence of—

WILLIAM IRVING KEELER,  
JAMES A. JENKISSON.