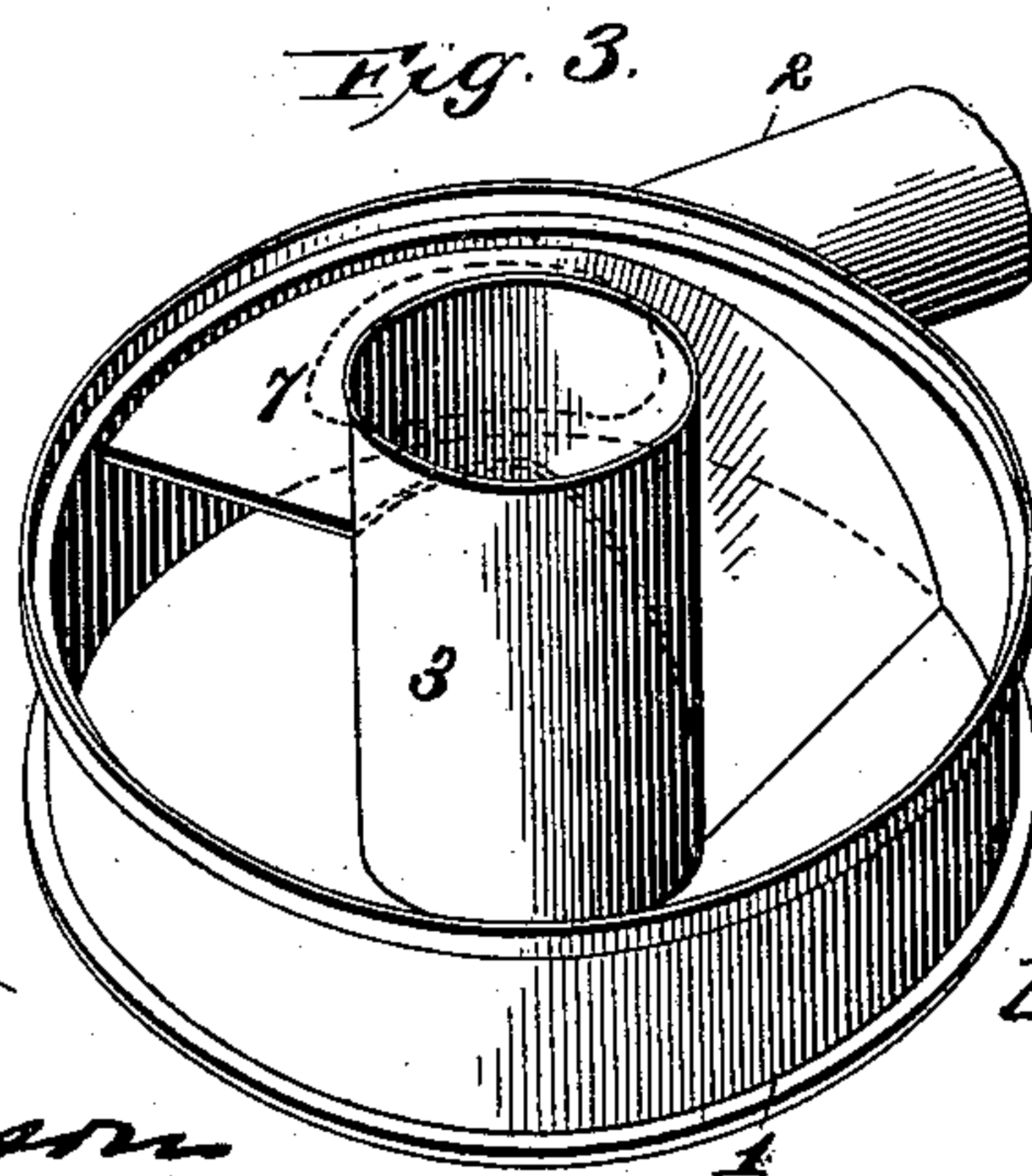
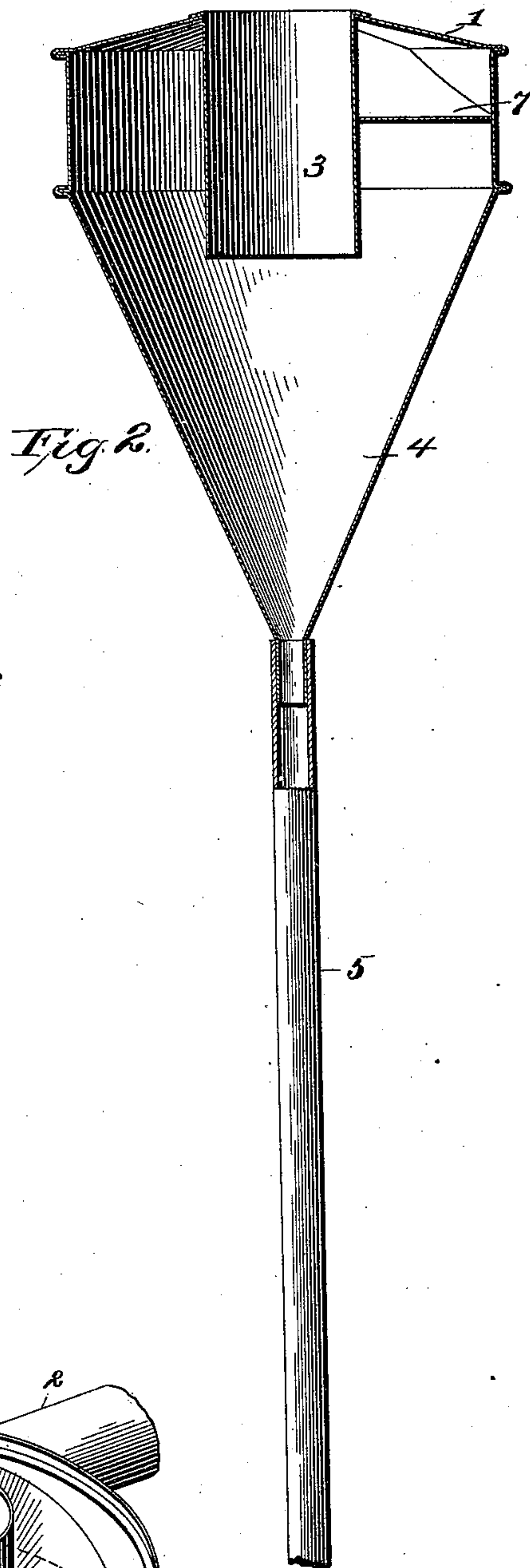
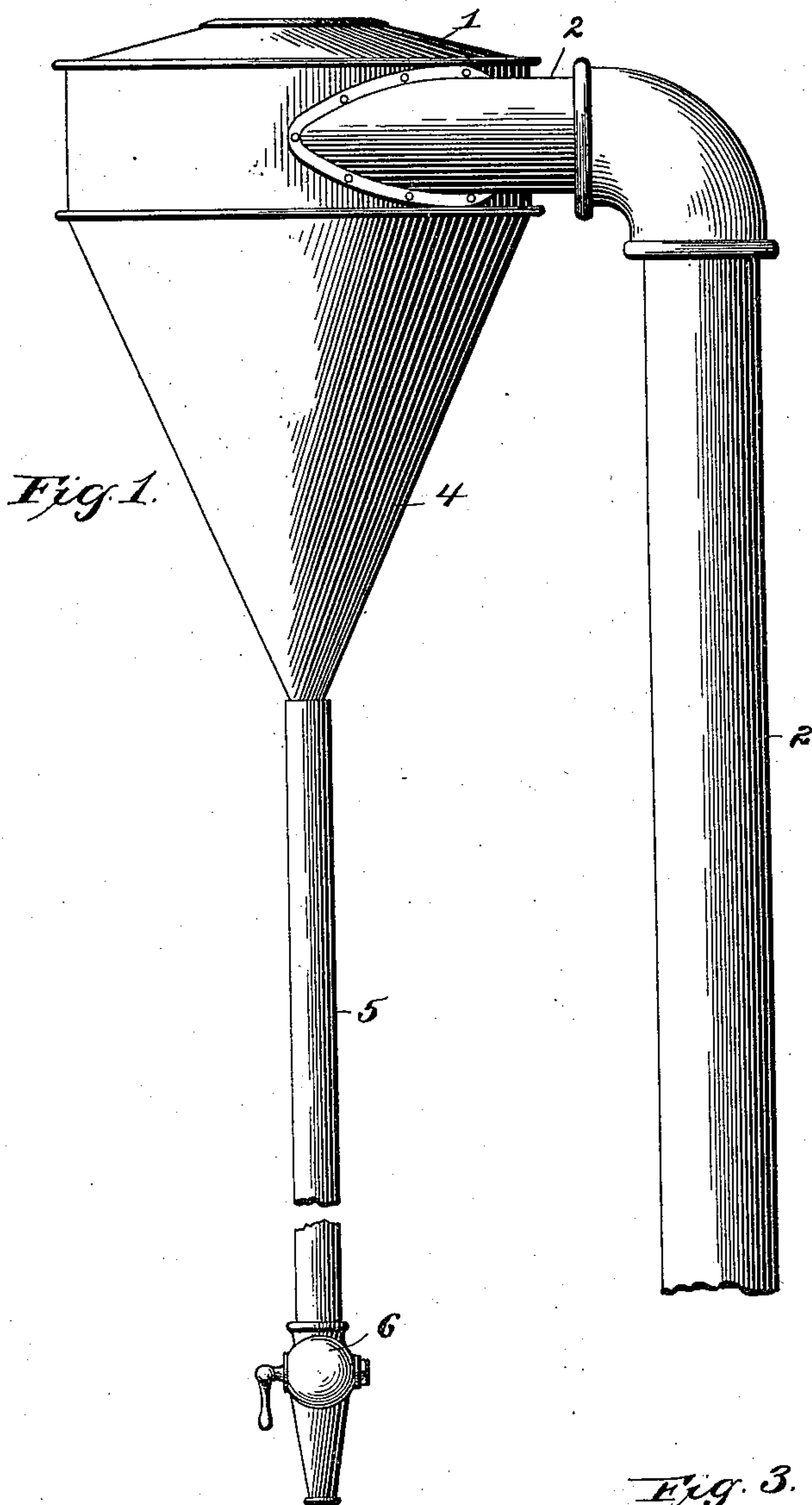


(No Model.)

R. BINGHAM.  
STEAM EXHAUST HEAD.

No. 575,561.

Patented Jan. 19, 1897.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ROBERT BINGHAM, OF PHILADELPHIA, PENNSYLVANIA.

## STEAM-EXHAUST HEAD.

SPECIFICATION forming part of Letters Patent No. 575,561, dated January 19, 1897.

Application filed January 17, 1896. Renewed November 25, 1896. Serial No. 613,470. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT BINGHAM, 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 Steam-Exhaust Heads, of which the following is a specification.

My invention relates to a new and useful improvement in steam-exhaust heads, and has for its object to so construct such a device as to obviate the difficulties which are now experienced therein, such as back pressure, imperfect drainage, and separation of oil from the steam.

With these ends in view my invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which my invention appertains may understand how to make and use the same, I will describe its construction and operation in detail, referring by numbers to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side elevation of my improved exhaust-head; Fig. 2, a central vertical section thereof, and Fig. 3 is a perspective of the upper portion of the head inverted to show the spiral partition for deflecting the exhaust.

Similar numbers denote like parts in the several views of the drawings.

The head 1 is of cylindrical shape, into which the exhaust-pipe 2 enters and from which the discharge-pipe 3 leads. The lower portion of this head is closed by the inverted cone 4, from the apex of which leads a drip-pipe 5, which terminates with a suitable valve 6, by means of which the water of condensation and oil and other foreign substances carried thereby may be thrown off in a suitable receptacle.

A partition 7 is arranged within the cylindrical head between its outer wall and a portion of the discharge-pipe, so as to form a spiral baffle-plate, just beginning behind the exhaust-inlet and extending preferably about half-way around the head. This arrangement causes the steam which is exhausted into the head to pass in a circular path, thus

adding to the centrifugal motion given it by the tangential exhaust-inlet until the partition 7 is reached, when it will take a spiral direction downward into the cone, from whence it will gain access to the atmosphere through the discharge-pipe.

As will be understood, the steam entering the head will, by centrifugal action, circulate in contact with the outer walls of the cylinder and cone, which, on account of their exposure to the surrounding temperature, will absorb a large amount of heat from this steam, thus causing considerable condensation, which acts to a certain extent as a condenser, by means of which not only is back pressure in the cylinder avoided, but a partial vacuum created, which to that extent adds to the effective working pressure of the live steam. It will also be understood that this partial condensation of the exhaust-steam will free said steam from all of the foreign substances, such as oil, which may be suspended therein, and as the steam takes a general downward course upon entering the head and comes to partial rest before turning and passing upward through the discharge-pipe these substances will be precipitated with the waters of condensation to the bottom of the inverted cone and from thence drawn off, as before described, through the drain-pipe 5. By so proportionating the head relative to the cylinder of the engine connected therewith that its capacity shall be sufficient to receive all of the steam exhausted from said cylinder upon a stroke of its piston the most effective results are attained, in that the beneficial functions of the head are not crowded, and therefore the steam exhausted therein will be more perfectly free from the foreign substances held in suspension thereby and the steam permitted to pass into the outside air with little or no force; consequently with no noise.

In practice it has been found when a head is thus proportionated the noise usually produced by the puffing of the exhaust is considerably lessened and that which remains is so muffled as to be hardly perceptible. This is largely due to the fact that the steam in passing into the head meets with no resistance from the baffle-plate, and as a partial condensation takes place the sound emanat-



ing from the steam entering the head is rather that of suction, similar to the sound made by steam entering the condenser of a low-pressure engine.

5 As my improvement obviates the usual disadvantages of exhaust-heads, in that little or no water of condensation is permitted to escape to deteriorate the surrounding roofs and walls of buildings, the disagreeable smell of  
10 oil is prevented by the separation of all oil from the steam before passing to the atmosphere, and the annoying puffing sound of exhaust-steam being prevented, it will be seen that a very desirable exhaust-head is pro-  
15 duced thereby.

Having thus fully described my invention, what I claim as new and useful is—

1. In a device of the character described, a cylindrical head, an exhaust-inlet tangen-  
20 tial thereto, a discharge-pipe passing through the center of the head and terminating below the level of the bottom of the head, an inverted cone closing the bottom of the head having a drip-pipe leading therefrom, and a

partition within the head between its wall 25 and the discharge-pipe, said partition being of a helical shape and beginning just behind the exhaust-inlet whereby the steam passes nearly around the head and secures increased centrifugal action before striking the helical 30 partition, as and for the purpose described.

2. In a device of the character described, a cylindrical head, an exhaust-inlet to said head, a discharge-pipe passing through the head, an inverted cone closing the bottom of 35 the head, a helical partition between the wall of the head and the discharge-pipe and beginning just behind the exhaust-inlet whereby the steam passes nearly around the head and secures increased centrifugal action be- 40 fore striking the helical plate.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

ROBERT BINGHAM.

Witnesses:

S. S. WILLIAMSON,  
A. P. RUTHERFORD.