

C. STICKLE.  
STEAM TRAP.

APPLICATION FILED JULY 30, 1908.

935,426.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.

Fig-1-

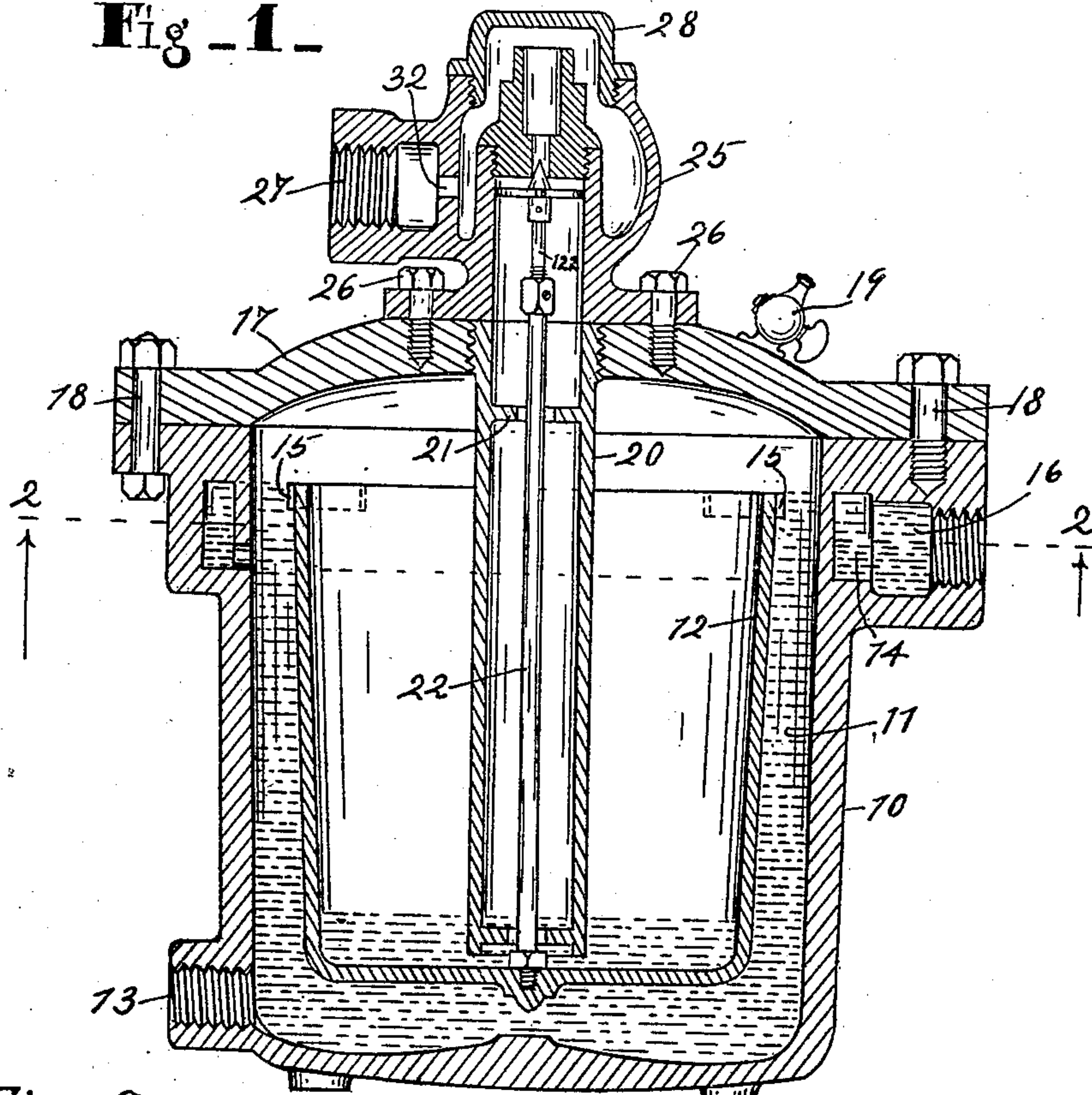
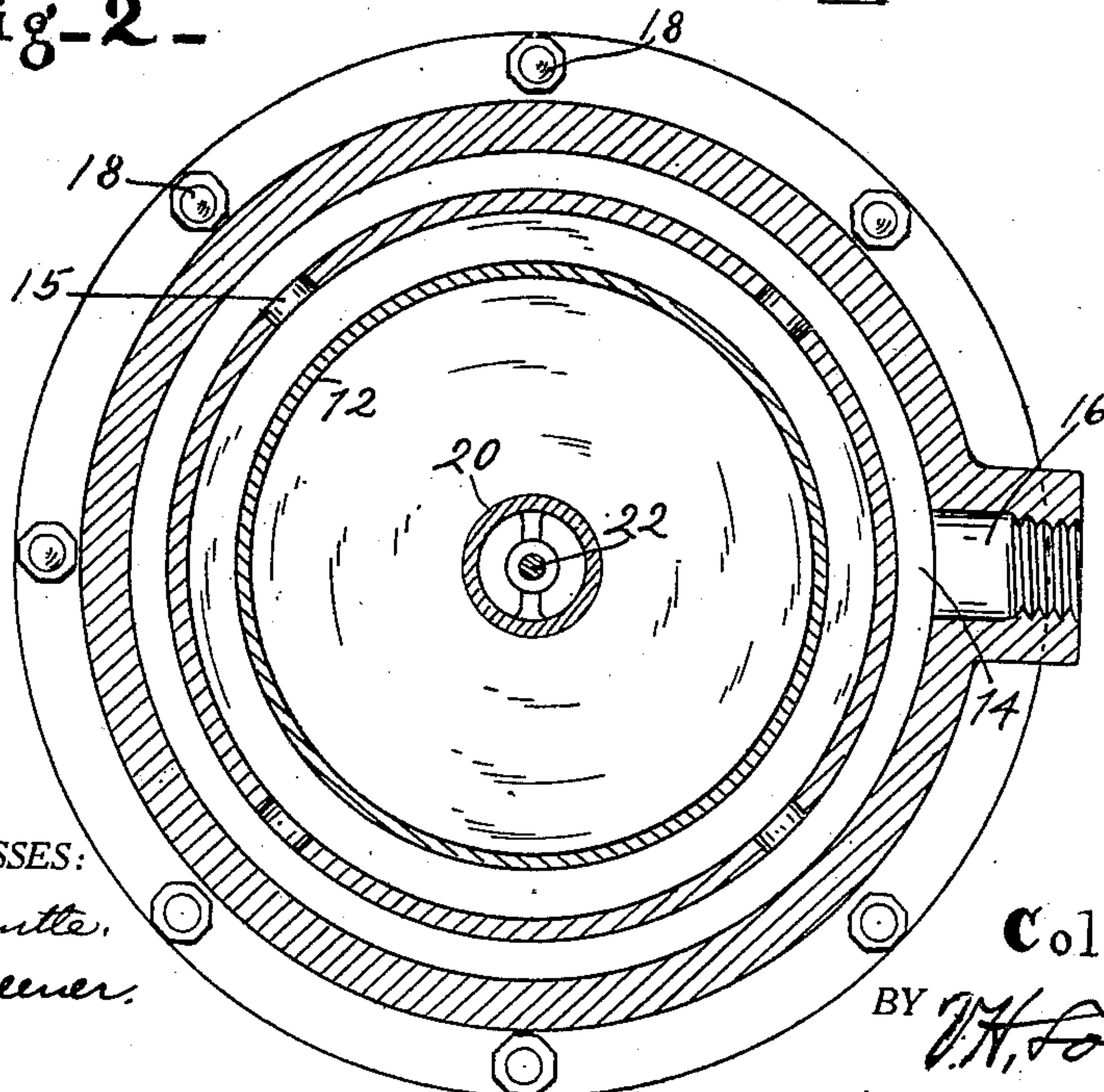


Fig-2-



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2 SHEETS—SHEET 2.

Fig-3-

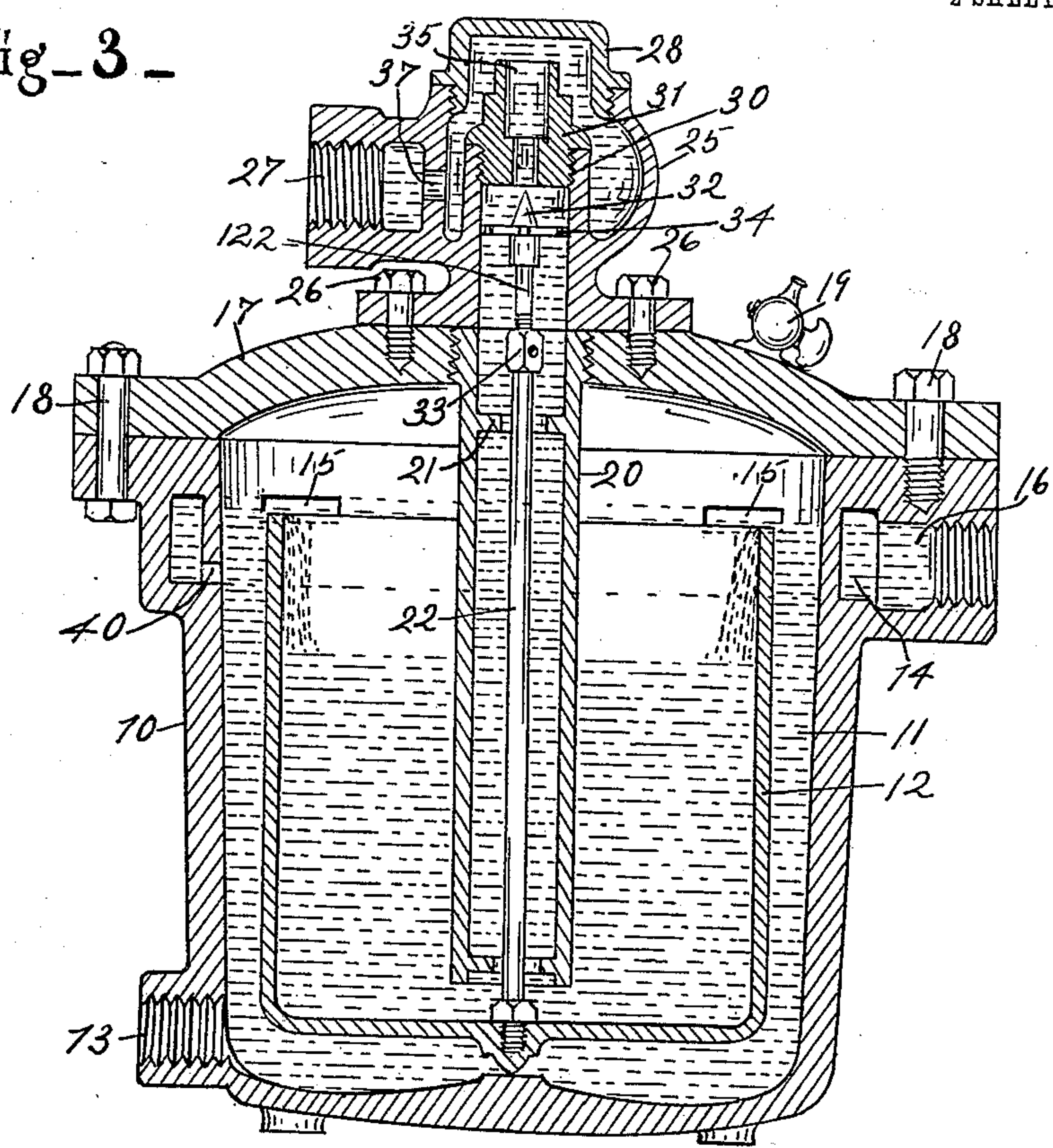
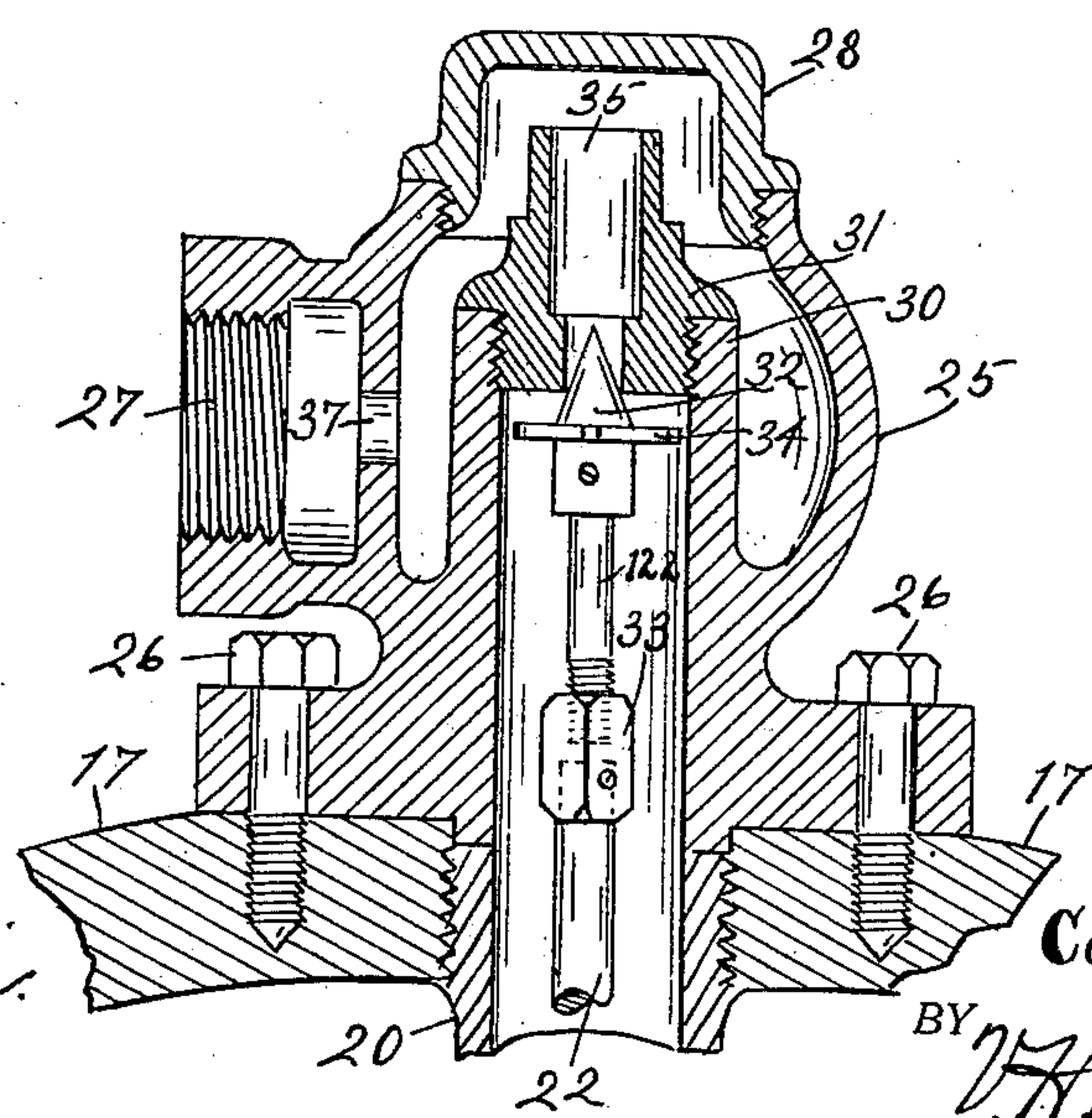


Fig-4-



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# UNITED STATES PATENT OFFICE.

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## STEAM-TRAP.

935,426.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed July 30, 1908. Serial No. 446,064.

*To all whom it may concern:*

Be it known that I, COLE STICKLE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Steam-Trap; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to improve the construction of steam traps.

One feature of the invention consists in providing a chamber for a bucket, the upper portion of which is surrounded by an annular chamber with openings therefrom to the bucket chamber, said openings extending slightly above the bucket when down and on a level with the top of the bucket when up, so that the condensation water accumulates in said chamber and flows therefrom into the bucket chamber on the outside of the bucket and when the outside chamber is filled to the level of the bucket, the water overflows into the bucket, and when sufficient water accumulates in the bucket it descends and through proper connection opens a valve through which the condensation water escapes from the bucket. After enough has escaped to permit the bucket to float, the valve closes and the operation described is repeated, except that the outside remains thereafter normally filled. This water and steam separate in the small annular chamber and thus a large chamber over the bucket is rendered needless.

The details of the invention will be understood by the accompanying drawings and the following description and claims.

In the drawings Figure 1 is a central vertical section through the device with the bucket in its elevated position. Fig. 2 is a horizontal section on the line 2—2, of Fig. 1. Fig. 3 is a section similar to that shown in Fig. 1 with the bucket depressed and the valve open. Fig. 4 is a vertical central section through the valve and retarding chamber on an enlarged scale.

In detail 10 is a casing to provide the chamber 11 for the bucket 12. There is an outlet 13 at the lower end that is normally closed. In the upper part of the casing 10 there is an annular chamber 14 having openings 15 leading into the bucket chamber 11. These openings extend slightly above the top of the bucket when down and on a level with

the top of the bucket when up and the condensation water enters the chamber 14 from the inlet 16.

There is a top or cap 17 for the casing 10 secured thereto by screw bolts 18 that has a safety valve 19. This top is centrally apertured and threaded to receive the tube 20 that extends down centrally into the bucket 12 nearly to the bottom. The tube is open at both ends and has near each end horizontal ribs 21, and these ribs serve as guides for the vertical movement of the valve stem 22 that screws into the bottom of the bucket.

There is a casing 25 secured on the top portion 17 by the bolts 26 and having a lateral outlet opening 27 and a top opening therein closed by a screw cap 28. In a chamber formed by the casing 25 there is a tubular projection 30 threaded to receive the valve seat 31 that screws into the same. This valve seat has a relatively narrow port in the lower end thereof which is adapted to be closed by the tapering valve 32 loosely and adjustably mounted on the upper end of the portion 122 of the valve stem which is threaded at its lower end and screws into the sleeve 33 that fits loosely on the upper end of the rod 22 so as to make the valve stem practically flexible and cause the proper operation of the valve when the steam trap may not be mounted truly vertical and regardless of any irregularities in details of construction and fitting. Wings 34 are secured to the valve that fit very loosely in the tubular portion 30 so as to approximately guide the valve to its port. Such arrangement permits the valve to properly center in the port and such centering is caused by the valve being conical. The valve seat has an outer port or passage-way 35 that is larger than the portion of the port that is closed by the valve. This arrangement for the mounting and guiding of the bucket very materially reduces friction because of the small size of the rod 22 and its central position within the tubular passage-way 20 and its being guided by the two ribs 21.

The valve seat 31 and tubular extension 30 are surrounded by a chamber formed by the casing 25 and top 28 which has an outlet port 37 that leads into the outlet tube 27, this port 37 being reduced so that it tends to retard the movement of the condensation



water, and keep it from being too rapid. An opening 40 leads from the lower part of the annular chamber 14 into the main chamber 11 for the passage of the sediment and the like from said chamber 14.

In operation, the condensation water enters the annular chamber 14 and passes out through the horizontal openings 15 into the chamber 11 containing the bucket. When the water accumulates sufficiently in this chamber 11 outside the bucket, it overflows into the bucket, as shown in Fig. 3. After the water has accumulated in the bucket to the desired extent, the bucket descends to the position shown in Fig. 3, thus lowering the valve 32 and opening the port in the valve seat 31 that has been closed by said valve. Then the steam in the upper part of the chamber 11 forces the water out of the bucket through the tube 20 and the ports in the valve seat into the chamber within the casing 25 and from that through the port 37 into the outlet 27, until the water has been exhausted from the bucket or at least sufficiently removed to cause it to buoy upward and close the valve. The steam and water separate in the annular chamber 14 and the steam enters the main chamber through the upper part of the openings 15 while the water enters the main chamber through the lower part of said openings. This maintenance of the water and steam separate is a great advantage in the operation of the device as it causes positive action. The chamber 11 outside the bucket is normally maintained full of water up to the top of the bucket and the steam entering above the water does not spray the water or interfere with the column of water about the bucket but leaves it in its homogeneous liquid condition. With the opening 40 from the lower part of the annular chamber 14 to the main chamber 11, said annular chamber will be automatically cleaned of mud and sediment. The removal of the sediment occurs when the valve is opened and the condensation water discharges above. Then there is a temporary inrush of water into the chamber 14 which forces water out through the open-

ing 40, and the water carries the sediment with it thus cleaning the chamber 14 at each operation of the valve. The upper edge of the openings 15 should be on a level with the upper edge of the bucket when the bucket is in its upper position so that a portion of the openings 15 would extend below the level of the top of the bucket when in its lower position. With this arrangement the steam and condensation water which enter the openings 15 cut across the upper surface of the body of the water in the outer chamber 11 against the top of the bucket so as to affect the buoyancy of the bucket or disturb the water in the chamber 11.

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

1. A steam trap including an outlet, a bucket, means controlled by the bucket for opening and closing the outlet, and a casing provided with a chamber for the bucket having an annular chamber surrounding said bucket chamber into which annular chamber the condensation water initially enters and openings provided from the upper part of said annular chamber into the bucket chamber that are on a level with the top of the bucket, substantially as set forth.

2. A steam trap including an outlet, a bucket, means controlled by the bucket for opening and closing the outlet, and a casing provided with a chamber for the bucket having an annular chamber surrounding said bucket chamber into which annular chamber the condensation water initially enters and openings at the upper part of said annular chamber into the bucket that are on a level with the top of the bucket, and an opening also from the lower part of said annular chamber into the bucket chamber for the removal of sediment and the like from said annular chamber.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

COLE STICKLE.

Witnesses:

MAUD NEILL,  
V. H. LOCKWOOD.