

No. 764,816.

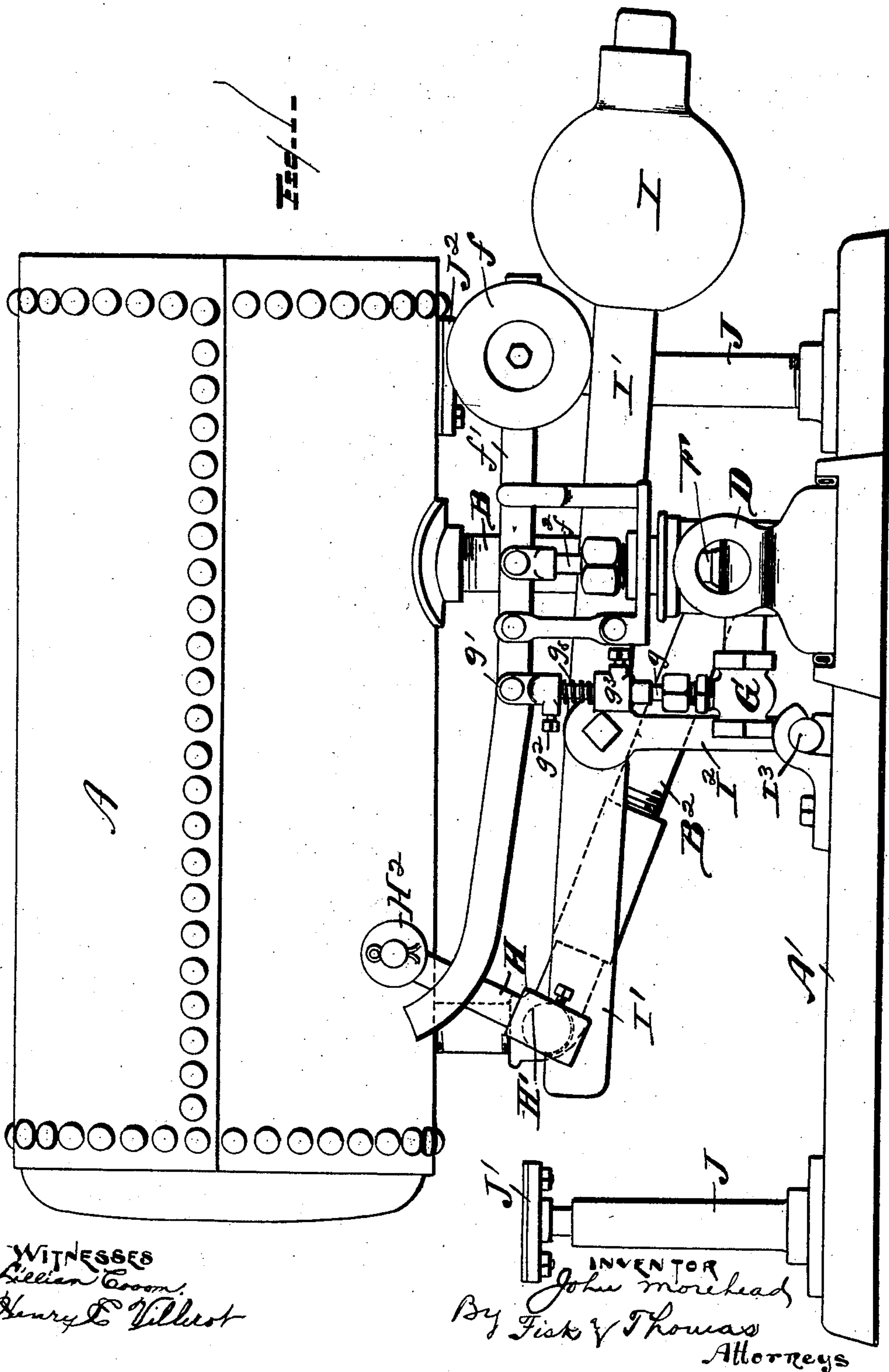
PATENTED JULY 12, 1904.

J. MOREHEAD.
STEAM TRAP.

APPLICATION FILED JULY 11, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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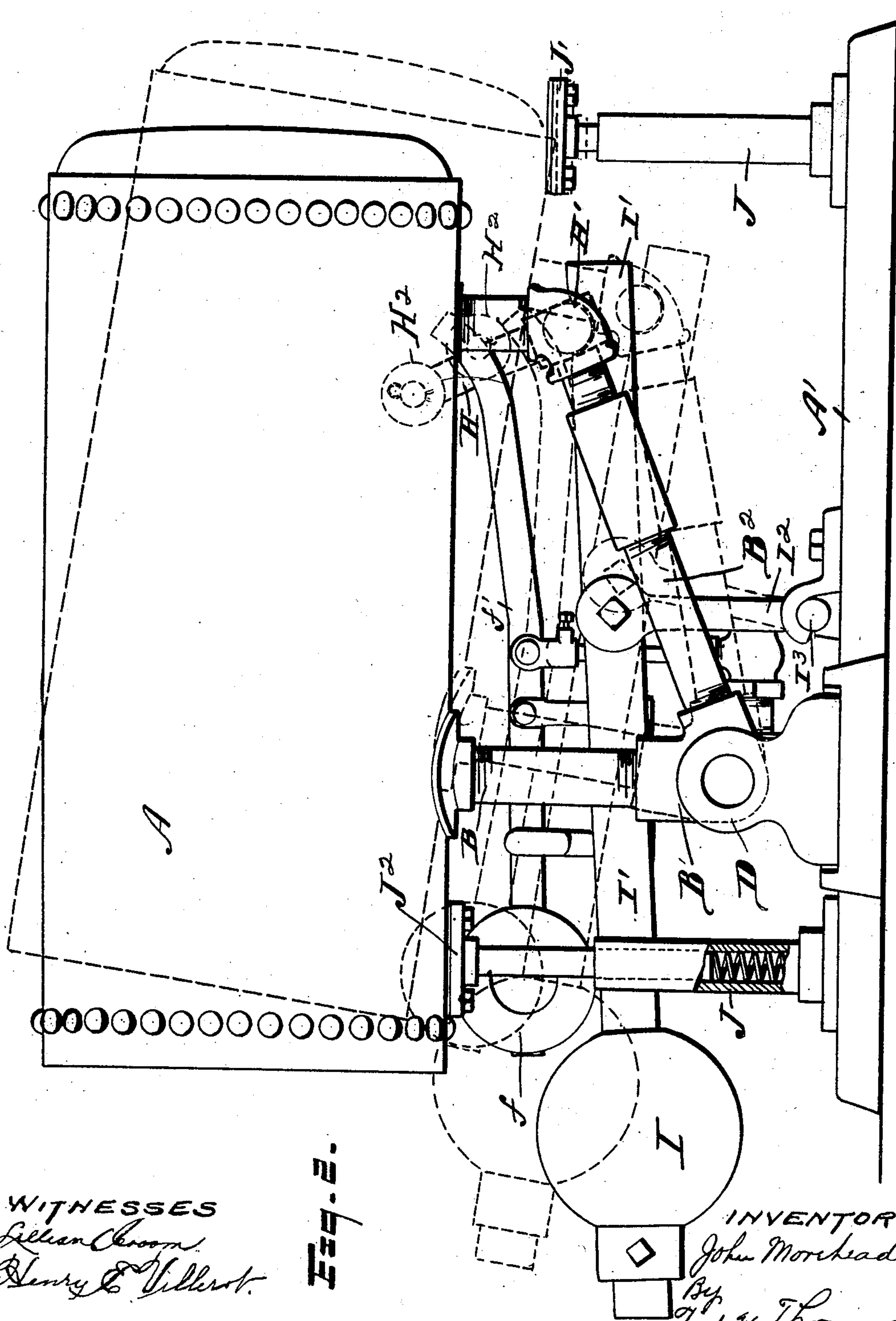
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3 SHEETS—SHEET 2.



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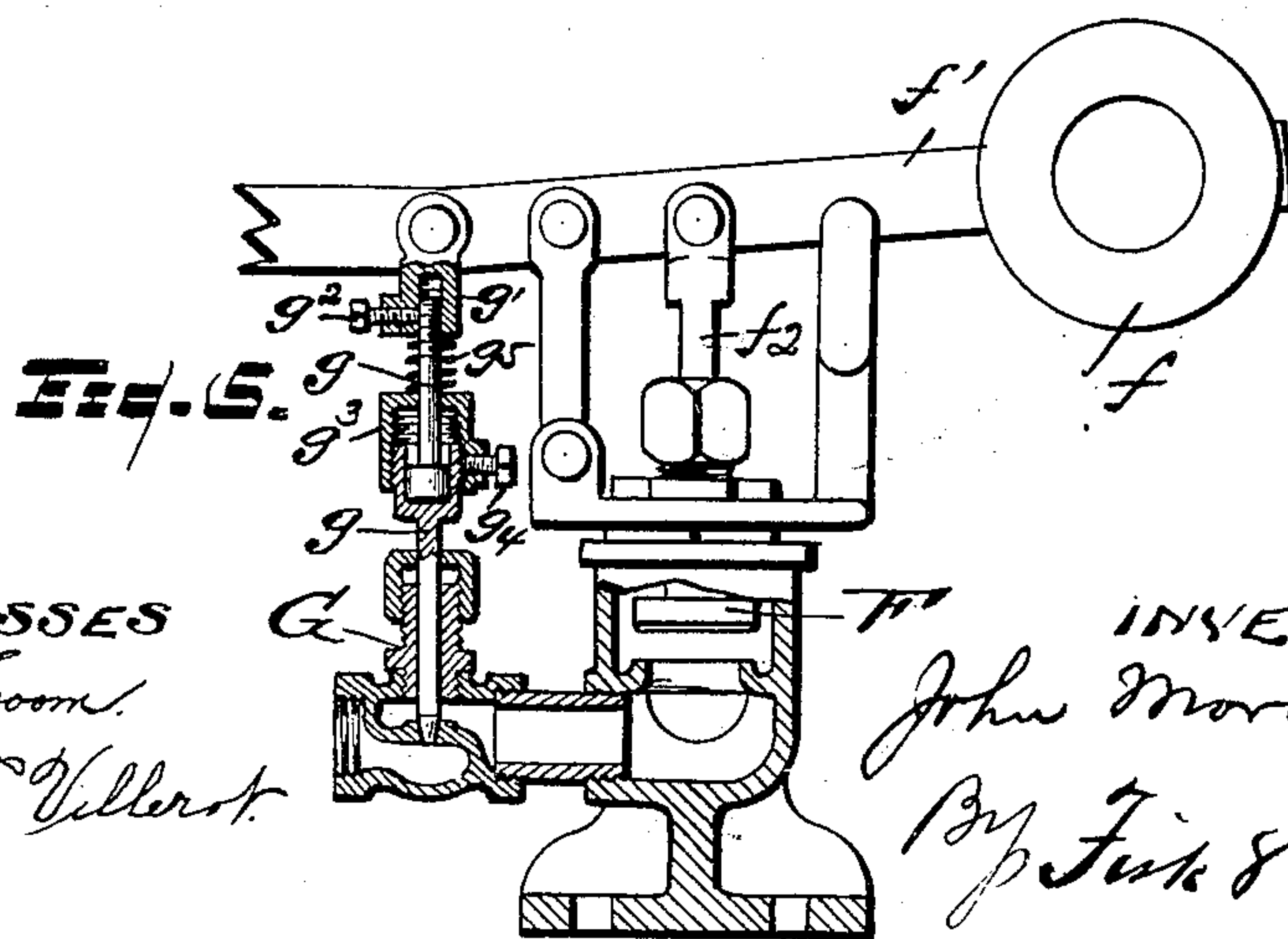
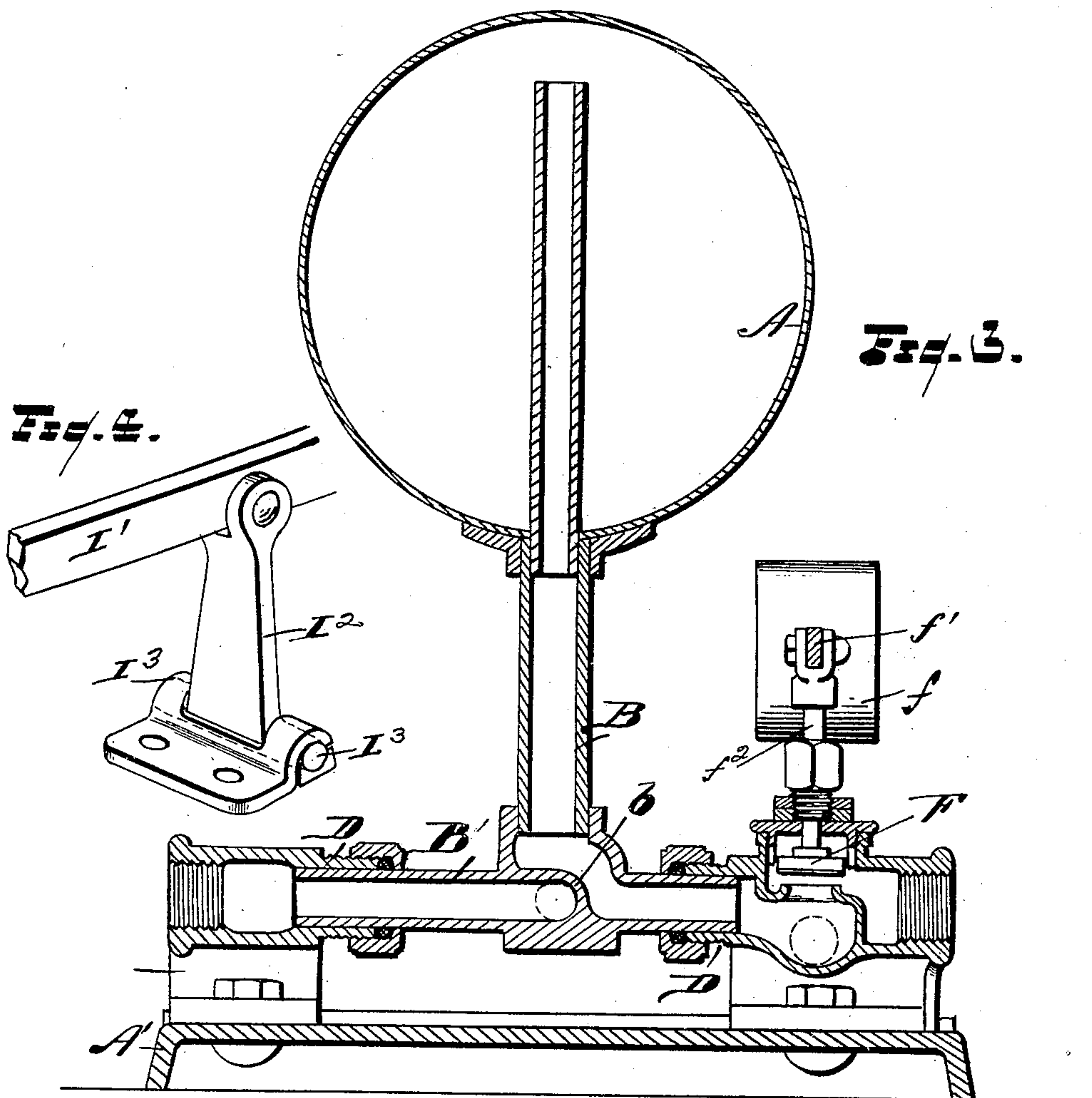
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN MOREHEAD, OF DETROIT, MICHIGAN.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 764,816, dated July 12, 1904.

Application filed July 11, 1903. Serial No. 165,113. (No model.)

To all whom it may concern:

Be it known that I, JOHN MOREHEAD, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Steam-Traps; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in steam-traps, shown in the accompanying drawings and more particularly set forth in the following specification and claims.

In the drawings, Figure 1 is side elevation of my invention. Fig. 2 is a similar elevation from the opposite side, showing in dotted lines the position of the tank when the water of condensation is about to be returned to the boiler. Fig. 3 is a cross-sectional view showing the steam and water inlets. Fig. 4 is a detail view showing the link on which the weighted lever supporting the tank is fulcrumed. Fig. 5 is a cross-sectional view through the air-relief valve and valve for controlling the admission of steam to the tank.

My invention has for its object an improvement in steam-traps for freeing steam-pipes of the steam that condenses therein, and more especially on certain features of construction in the patent granted to me September 16, 1902, No. 709,347. In the patent referred to the weighted lever is engaged with the end of the tilting tank. This form of construction greatly extends the length of the tank, and the constant jar caused by the prop secured to the weighted arm striking the base has a tendency to loosen the weighted arm from its engagement with the end of the tank. In the present construction the weighted lever is located beneath the tank, the end of the lever bearing against a lug formed on the pipe connections leading to the tank on the under side.

Another feature of my invention is the means employed for adjusting the relief-valve and the arrangement of the means for operating the same.

Another improvement consists in the single operating means for controlling the steam and air-relief valves.

Other features of the invention will appear by reference to the following specification and claims.

Referring to the letters of reference shown on the drawings, A is the receiving-chamber of the trap, which is preferably constructed of boiler-iron and supported by the steam-pipe B at one side of its center of gravity.

A' is a suitable supporting-base.

B' designates a horizontal pipe and fitting from which the pipe B rises and which also serve as trunnions for the receiving-chamber that it may tilt when the weight of the water of condensation in said chamber overcomes the action of the adjustable weight arranged to keep it at a horizontal position to receive the water.

D D are bearings in which the pipe B' is mounted. The pipe B' is divided by a wall *b*, one end of said pipe serving as a steam-inlet, the other end as a connection between the receiving-chamber A and the pipe for returning the water of condensation to the trap and the pipe leading the water from the trap to the boiler, there being the usual slip-joint connection between the pipe B' and the pipes adjoining it.

B² is a pipe leading from the horizontal pipe B' to the under side of the tank A to deliver the water of condensation into the trap and through which it also passes in returning to the boiler when the tank is tipped.

F is a steam-inlet valve controlling the admission of steam from the boiler by way of the pipes B and B'. This valve is held closed normally by the weight *f*, adjustably mounted on the pivoted arm *f'*, bearing on the steam-valve stem *f*².

G is an air-relief valve, also under the control of the weighted arm *f'*. The valve-stem *g* is made in sections for the purpose of adjustment, the upper section having a screw-threaded engagement with a link *g'*, engaging the lever *f'* and provided with a suitable set-screw *g*² to secure the same after adjustment.

*g*³ is a sleeve free to move on the upper sec-

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tion of the valve-stem g , but having a screw-threaded engagement with the lower portion of the stem. The sleeve g^3 is also provided with a set-screw g^4 to secure the same when
5 adjusted.

g^5 is a spring coiled around the upper portion of the valve-stem g and having a bearing on the sleeve g^3 , the action of the spring holding the valve to its seat when not raised by the
10 movement of the weighted lever.

H is an adjustable arm secured to the projecting lug H' (shown in dotted lines) and formed integral with the pipe-fitting connecting the pipe B² with the tank. H² is a
15 spool or friction-roll loosely mounted on said arm. By adjusting the arm H the weighted lever f' may be given more or less movement, as required.

I is a weight mounted on the lever I', which
20 is fulcrumed on the link I², supported by trunnions I³. This lever is provided with a recess to engage the lug H'. The action of this weighted lever supports the tank in a horizontal position until overcome by the weight
25 of the water in the tank.

J J are tubular standards in which are mounted spring-supported buffers J' and J² to receive the impact of and support the tank at the limit of its movement.

30 I will now explain the operation of the device. The trap is located at some convenient point above the water-line in the boiler. The water of condensation being conducted by return-piping to the trap passes through suitable check-valves (not shown) and enters the
35 chamber A of the trap by way of the pipes B' and B². When the volume of water in the receiving-chamber reaches such proportion that it overcomes the action of the adjustable
40 weight I, the receiving-chamber tilts, coming in contact with the buffer J', which takes up the jar. The action of tilting causes the water in the end of the chamber A nearest the adjustable weight I' to rush to the opposite
45 end of the chamber, thereby assisting in maintaining it in its tilted position until sufficiently relieved of the water therein contained. The action of the chamber in tilting causes the spool H² to come in contact with the end of
50 the lever f' , forcing it down, and thereby raising the steam-valve F, while at the same moment the air-relief valve is closed by the combined action of said lever and the spring
55 g^5 . The admission of steam from the boiler through the valve F into the tilting chamber above the water in the tank by way of the pipe B establishes a boiler-pressure therein and closes the check-valve through which the water passed into the tank. The water in
60 the tank then passes out by way of the pipes B' and B² to the boiler through a suitable check-valve (not shown) employed in the water-pipe connection between the trap and the boiler. When the receiving-chamber is suf-
65 ficiently free from the water of condensation,

the action of the weight I will return it to its normal position, its reverse movement permitting the weighted lever f' to close the steam-valve F and to open the relief-valve G, as will be readily understood.

By providing the relief-valve with means whereby it may be adjusted I can adapt the same so as to relieve the tank of steam under varying conditions of pressure.

Having thus described my invention, what
I claim is—

1. In a steam-trap, the combination of a tilting receiving-chamber mounted on a suitably-supported transverse rocking-pipe, a weighted lever fulcrumed directly below, and independent of the receiving-chamber, the short arm of said lever acting against the under side of the receiving-chamber to hold it in position to receive the water of condensation until the weight of the water overcomes the action of
85 the weighted lever, substantially as described.

2. In a steam-trap, the combination of a tilting receiving-chamber mounted on a suitably-supported transverse rocking pipe, a weighted lever mounted directly below the receiving-
90 chamber, a swinging link to which the said lever is pivoted, the forward end of said lever having a bearing against the under side of the tank, the action of said lever being to hold the receiving-chamber in position to receive the
95 water of condensation until the weight of the water overcomes the action of said weighted lever, substantially as described.

3. In a steam-trap, a tilting receiving-chamber supported on a transverse rocking
100 pipe having a divided wall, a pipe connection between one section of said rocking pipe and the receiving-chamber to deliver water of condensation to and from said chamber, a pipe connection between the other section of
105 said rocking pipe and the receiving-chamber, a weighted lever mounted directly below the receiving-chamber to maintain it in a horizontal position until overcome by the weight of the water therein, a valve for controlling
110 the admission of steam to the receiving-chamber, an air-relief valve, a weighted lever to control the action of both the air and steam valves, and means for engaging said weighted lever to operate said valves when the receiving-
115 chamber is tilted, substantially as described.

4. In a steam-trap, an air-relief valve, the valve-stems g g , the link g' to engage the operating-lever, said link having a screw-threaded engagement with the upper valve-stem g , a sleeve g^3 free to move on one of the stems and having a screw-threaded engagement with the other, substantially as described.

5. In a steam-trap, an air-relief valve, a
125 divided valve-stem g g , a link g' having a screw-threaded engagement with the upper section of the valve-stem g , an operating-lever f' to control the movement of the valve and connected therewith by the link g' , a
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sleeve g^3 free to move on the upper section of the valve-stem and having a screw-threaded engagement with the lower section of the valve-stem g , a spring bearing on the sleeve g^3 to hold the valve to its seat when not raised by the operating-lever, substantially as described.

6. In a steam-trap, an air-relief valve provided with a divided valve-stem, an operating-lever, a link engaging said operating-lever and having a screw-threaded engagement with the upper section of the valve-stem g , a set-screw g^2 to fix the upper valve-stem when adjusted, a sleeve g^3 free to move on the upper section of the valve-stem and having a screw-threaded engagement with the lower section of the stem, a set-screw g^4 to secure the same when adjusted, and the spring g^5 coiled around the upper section of the valve-stem and bearing upon the sleeve to force the valve to its seat when not raised by the operating-lever, substantially as described.

7. In a steam-trap, a tilting tank, an air-relief valve, a steam-valve, a weighted lever to control the action of both the air and steam valves, and an adjustable tripping means for controlling said weighted lever operated by the tilting of the tank, substantially as described.

8. In a steam-trap, a tilting tank, a relief valve, a valve controlling the admission of steam to the tank, an independently-supported weighted lever operated by the tilting of the tank, said lever being connected with the relief-valve on one side of its fulcrum and with the steam-valve at the opposite side of its fulcrum whereby said valves may be opened and closed alternately, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN MOREHEAD.

Witnesses:

S. E. THOMAS,
HENRY E. VILLEROT.