

No. 808,701.

PATENTED JAN. 2, 1906.

D. H. STREEPER & J. W. OELENSCHLAGER.  
STEAM SEPARATOR AND AUTOMATIC SHUT-OFF.

APPLICATION FILED JULY 6, 1905.

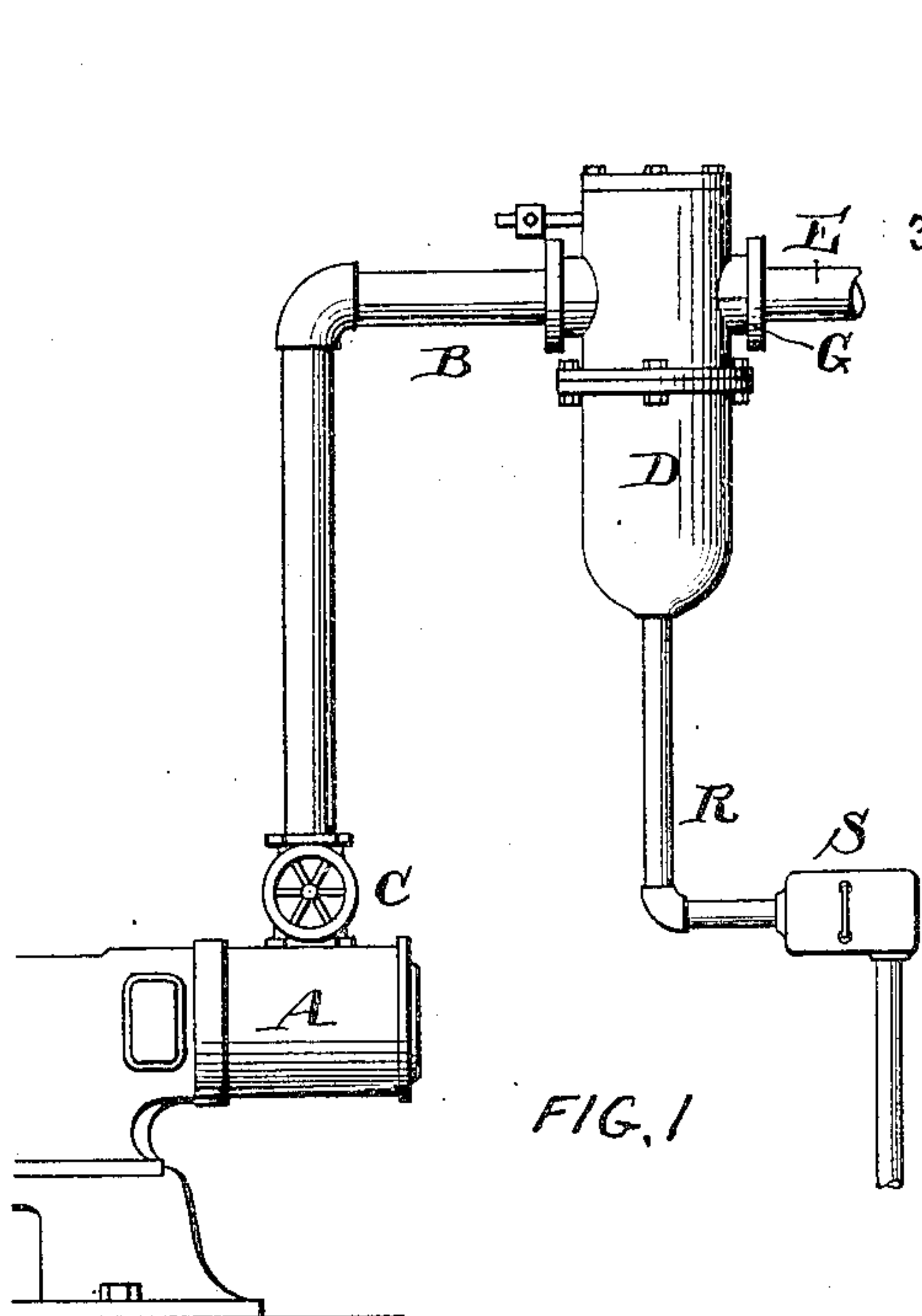


FIG. 1

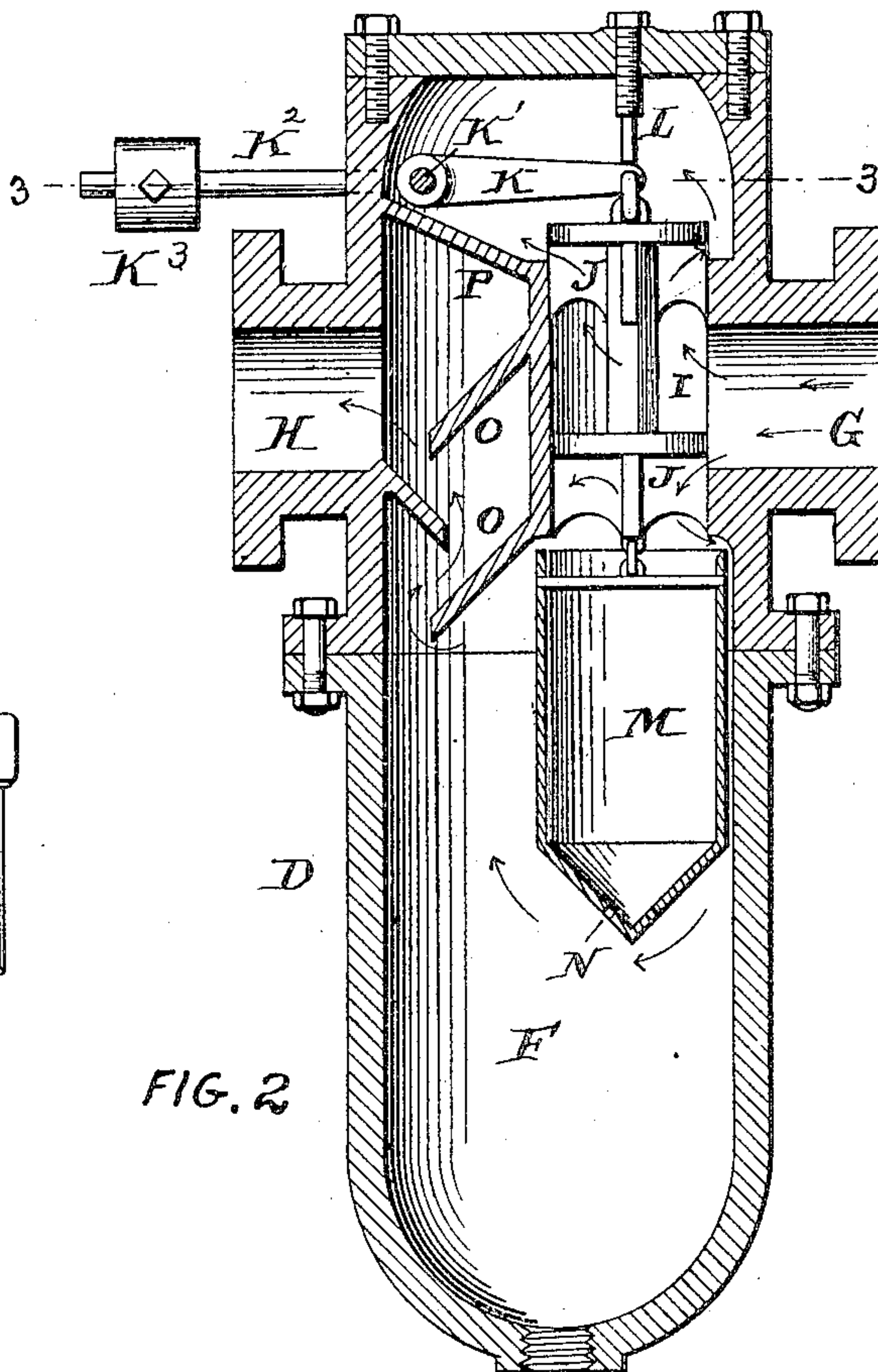


FIG. 2

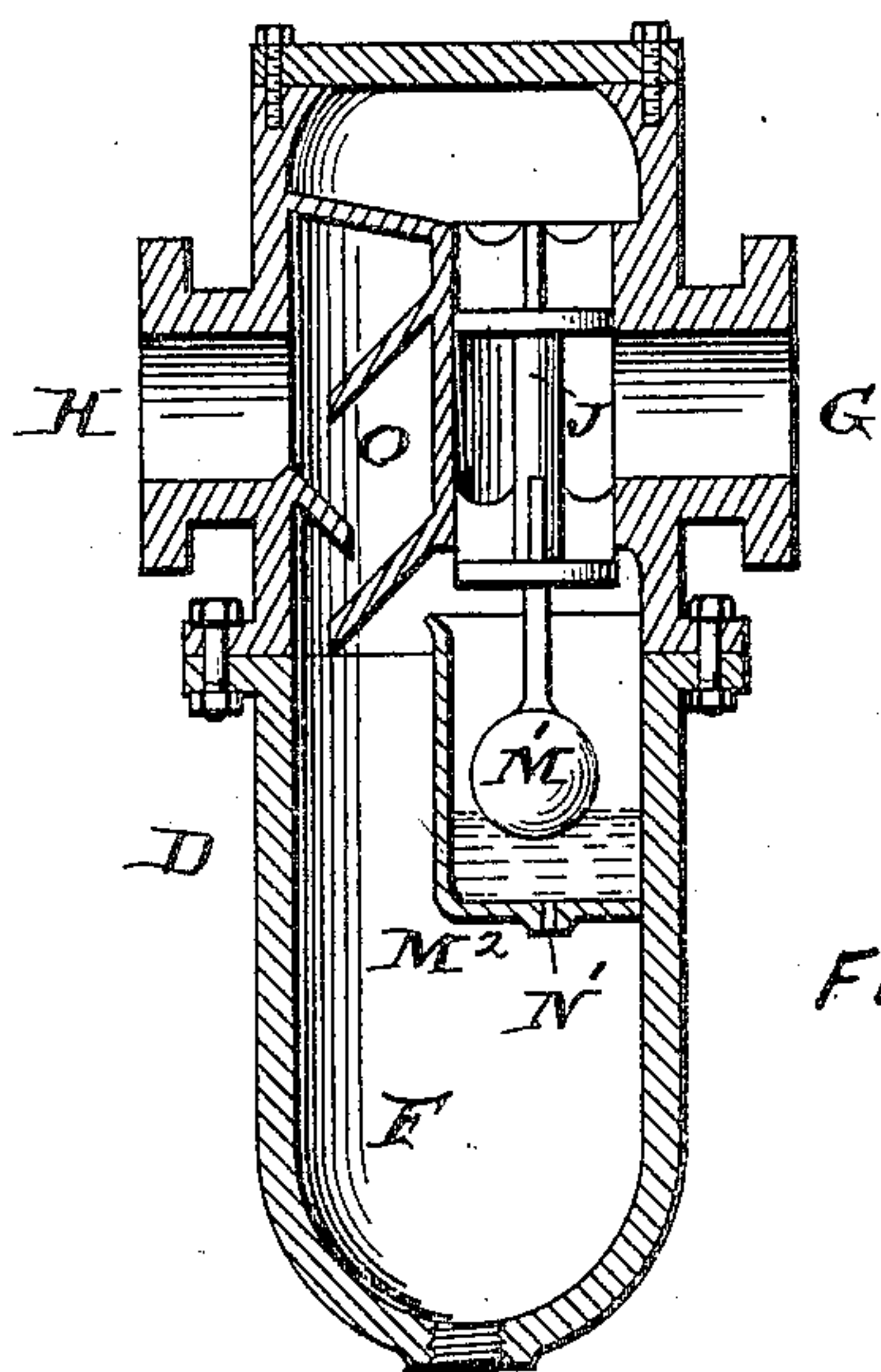


FIG. 4

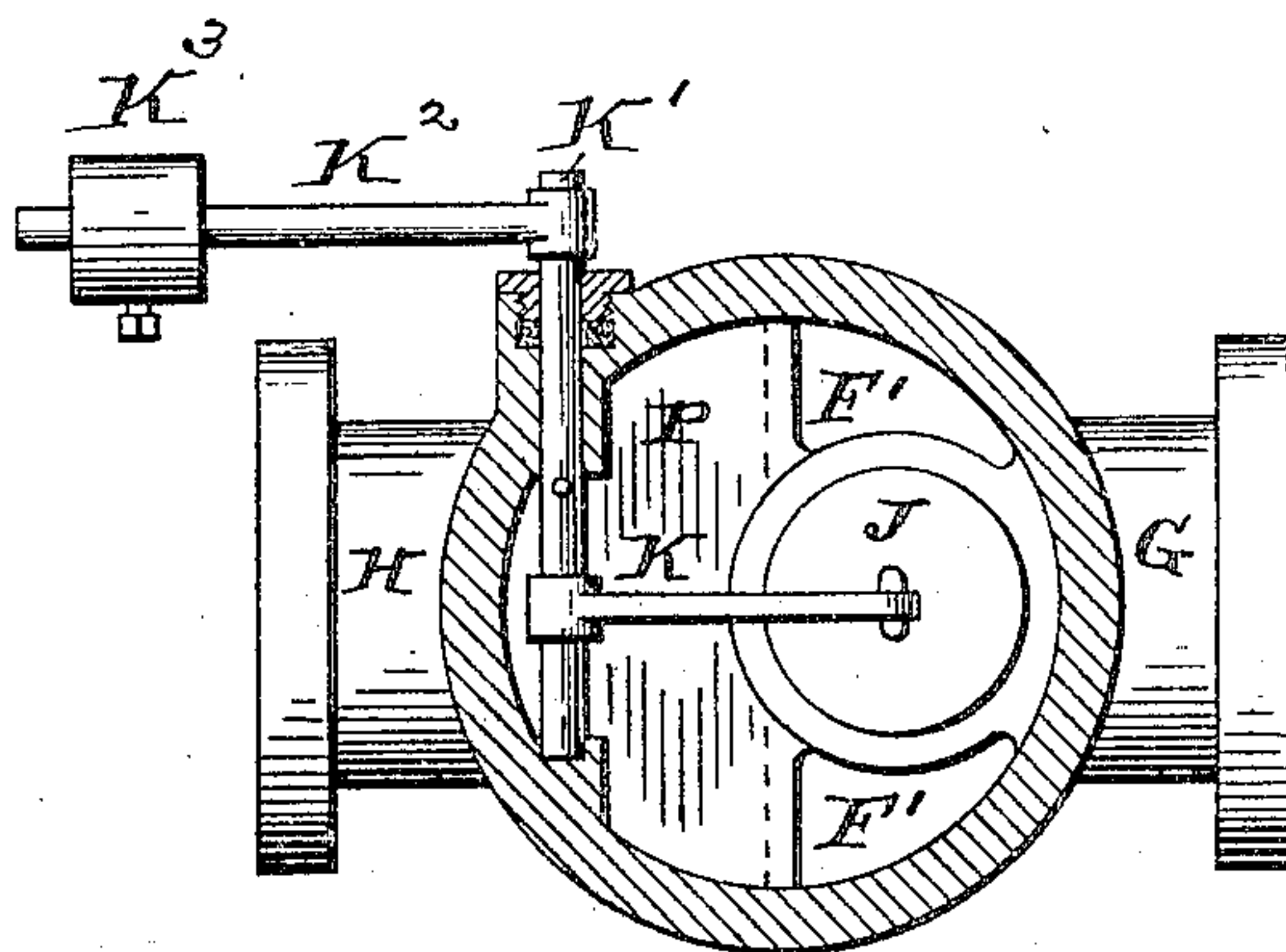


FIG. 3

WITNESSES

D. Webster, Jr.  
Wm. Rooney.

BY

INVENTORS  
Daniel H. Streeper and  
John W. Oelenschlager  
*[Signature]*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

DANIEL H. STREEPER AND JOHN W. OELENSCHLAGER, OF NORRISTOWN,  
PENNSYLVANIA.

## STEAM-SEPARATOR AND AUTOMATIC SHUT-OFF.

No. 808,701.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed July 6, 1905. Serial No. 268,416.

*To all whom it may concern:*

Be it known that we, DANIEL H. STREEPER and JOHN W. OELENSCHLAGER, of Norristown, county of Montgomery, and State of Pennsylvania, have invented an Improvement in Steam-Separators and Automatic Shut-Offs, of which the following is a specification.

Our invention has reference to steam-separator and automatic shut-off for steam-engines; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

In the operation of high-speed engines great danger frequently results from flooding the engine with water brought in with the steam, said water being caused by unobserved carelessness in flooding or priming in the steam-boilers.

The object of our invention is to provide automatic means which shall operate to automatically shut off the water and steam from the engine should any excessive quantity of water be carried into the steam-supply pipe leading to the engine. Our object also comprehends the separation of the water from the steam which passes to the engine, whereby the apparatus may operate automatically as a shut-off against the passage of excessive quantities of water and as a separator for eliminating the water from the steam before it reaches the engine.

In carrying out our invention we provide the steam-supply pipe with a valve mechanism arranged to be automatically closed by the presence of incoming water due to the boilers priming or flooding, so as to shut off the supply-pipe between the boiler and engine, and said devices may be used separately or in combination with a steam-separator. Our improvements also include means for automatically discharging the incoming water in an intermittent manner until the same is eliminated.

Our invention also comprehends details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which—

Figure 1 is an elevation showing the arrangement of our improved steam-separator

and automatic shut-off in the steam-supply pipe to the engine. Fig. 2 is a sectional elevation of our improved steam-separator and automatic shut-off. Fig. 3 is a cross-section of same on line 3 3, and Fig. 4 is a modification of our improved device.

A is the engine, and B is the steam-supply pipe connecting the engine with the outlet side of the separator and shut-off D.

C is the throttle controlling the engine, and E is the pipe leading from the boiler to the inlet of our improved separator and automatic shut-off. The interior chamber F of the separator is provided adjacent to the inlet with a valve-chamber I, in which a balanced valve J reciprocates to control the passage of steam and water from the inlet G into the interior of the body of the separator and automatic shut-off. The valve J is hung from an arm K, secured to a rock-shaft K', which extends transversely from the separator-body through a stuffing-box and is secured to the counter-shaft K<sup>2</sup>, having an adjustable weight K<sup>3</sup>. In this manner the valve may be so counterweighted as to normally remain open under the flow of steam. An adjustable stop L in the cap of the separator-body limits the upward movement of the valve. Suspended to the under part of the valve is a bucket M, having one or more perforations N at the bottom, so that any water which enters this bucket may gradually run out of the bottom thereof in the lower portion of the chamber F and thence by a pipe R discharging through a steam-trap S of any ordinary construction. The steam which passes under the upper portion of the valve into the space F<sup>2</sup> cannot pass into the outlet because of the transverse diaphragm P and is caused to flow downward on each side of the valve-chamber into the lower chamber F of the body and there commingle with the steam passing from the inlet below the lower portion of the valve J. The steam then passes upward around the inclined baffle-plates O, giving up any water which it might contain, and thence passes by the outlet H into the steam-pipe leading to the engine.

It is immaterial to our invention what the particular construction of the separator por-



tion may have, as it may be modified in various ways, so long as it is adapted to separate the water from the steam, as will be understood in such class of device. So long as steam without any appreciable quantity of water passes from the boiler to the engine the valve J remains elevated and the steam-separator acts in the ordinary manner. If, however, from priming or flooding of the boilers an excess of water should suddenly rush through the steam-pipe E into the inlet G, it will on account of its heavy weight fall directly into the bucket M, which will overload the valve and cause it to close, thereby completely shutting off the steam and water from the pipe B, leading to the engine, and by slowing down of the engine the engineer will be notified that something is wrong and have an opportunity to close the throttle C before any damage could result. As the water runs out of the bucket N the weight of the water decreases until finally the valve J will open slightly and a further supply of water will pass into the bucket, and this operation might be repeated a number of times; but at no time could the water be carried through in volume to the engine. As the water collects in the bottom of the chamber F it passes by pipe R into the steam-trap S, thereby discharging without loss of steam.

It will be observed that in the operation of this device the weight of the water is that which controls the automatic valve to close it, and this may be accomplished by other means than the bucket—such, for example, as a float M' in a tank M<sup>2</sup>, having a drainage-outlet N', as shown in Fig. 4. In this case the automatic valve opens downwardly to permit the passage of the steam and upwardly for the closing of the valve under the buoyancy of the float M' in the water which may collect in the tank M<sup>2</sup> from any inrush of water from the inlet G. In this case the volume of the water operates through the buoyancy of the float to close the valve, whereas in the construction of Fig. 2 the volume of the water by its dead-weight operates to close the valve. In both, however, the mass of water is that which directs the closing of the valve.

While the constructions shown are excellently adapted for the purpose of our invention, we do not limit ourselves to the minor details, as they may be modified in various ways without departing from the principles of the invention.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an automatic shut-off for controlling the supply of steam and water, the combination of a steam-passage, a normally open valve to control the said passage, and means

operated by the mass of water passing through the inlet side of the valve for automatically closing the valve when said water is in excess.

2. In an automatic shut-off for controlling the supply of steam and water, the combination of a steam-passage, a normally open valve to control said passage, and means operated by the mass of water passing through the inlet side of the valve for automatically closing the valve when said water is in excess consisting of a bucket connected to and arranged below the valve to receive the water passing through the valve.

3. In an automatic shut-off for controlling the supply of steam and water, the combination of a steam-passage, a normally open valve to control said passage, means operated by the mass of water passing through the inlet side of the valve for automatically closing the valve when said water is in excess consisting of a bucket connected to and arranged below the valve to receive the water passing through the valve and having a drainage-aperture for permitting the water collected in the bucket to gradually escape therefrom, and means to open the valve when the water is sufficiently drained from the bucket.

4. In an automatic shut-off for controlling the supply of steam, the combination of a steam-passage, a valve to control said steam-passage, a counterweight for normally holding the valve in an open position, and means operating by an accumulation of water on the inlet side of the valve for automatically closing the valve.

5. In an automatic shut-off for controlling the supply of steam, the combination of a steam-passage containing baffle-plates to separate the water from the steam, a valve to control said steam-passage, a counterweight for normally holding the valve in an open position, and means operating by an accumulation of water on the inlet side of the valve for automatically closing the valve.

6. In an automatic shut-off for controlling the supply of steam, the combination of a steam-passage, a valve to control said steam-passage, a counterweight for normally holding the valve in an open position, means operating by an accumulation of water on the inlet side of the valve for automatically closing the valve, and means for draining and removing the excessive water accumulations from the steam-passage whereby they are gradually removed.

7. The combination with the engine and steam-pipes B and E, of the automatic water-shut-off device D of the character described, the drain-pipe R from the bottom of the said automatic shut-off device, and a steam-trap S connected to said drain-pipe.

8. In an automatic shut-off for controlling the supply of steam and water, the combination of a steam-passage, a normally open balanced valve to control the said passage and  
5 means operated by the mass of water passing through the inlet side of the valve for automatically closing the valve when said water is in excess.

In testimony of which invention we hereunto set our hands.

DANIEL H. STREEPER.  
JOHN W. OELENSCHLAGER.

Witnesses:

R. M. HUNTER,  
R. M. KELLY.