No. 790,246.

PATENTED MAY 16, 1905.

F. X. ATZBERGER.

FEED WATER REGULATOR.

APPLICATION FILED FEB. 25, 1905.

Fig. 1.

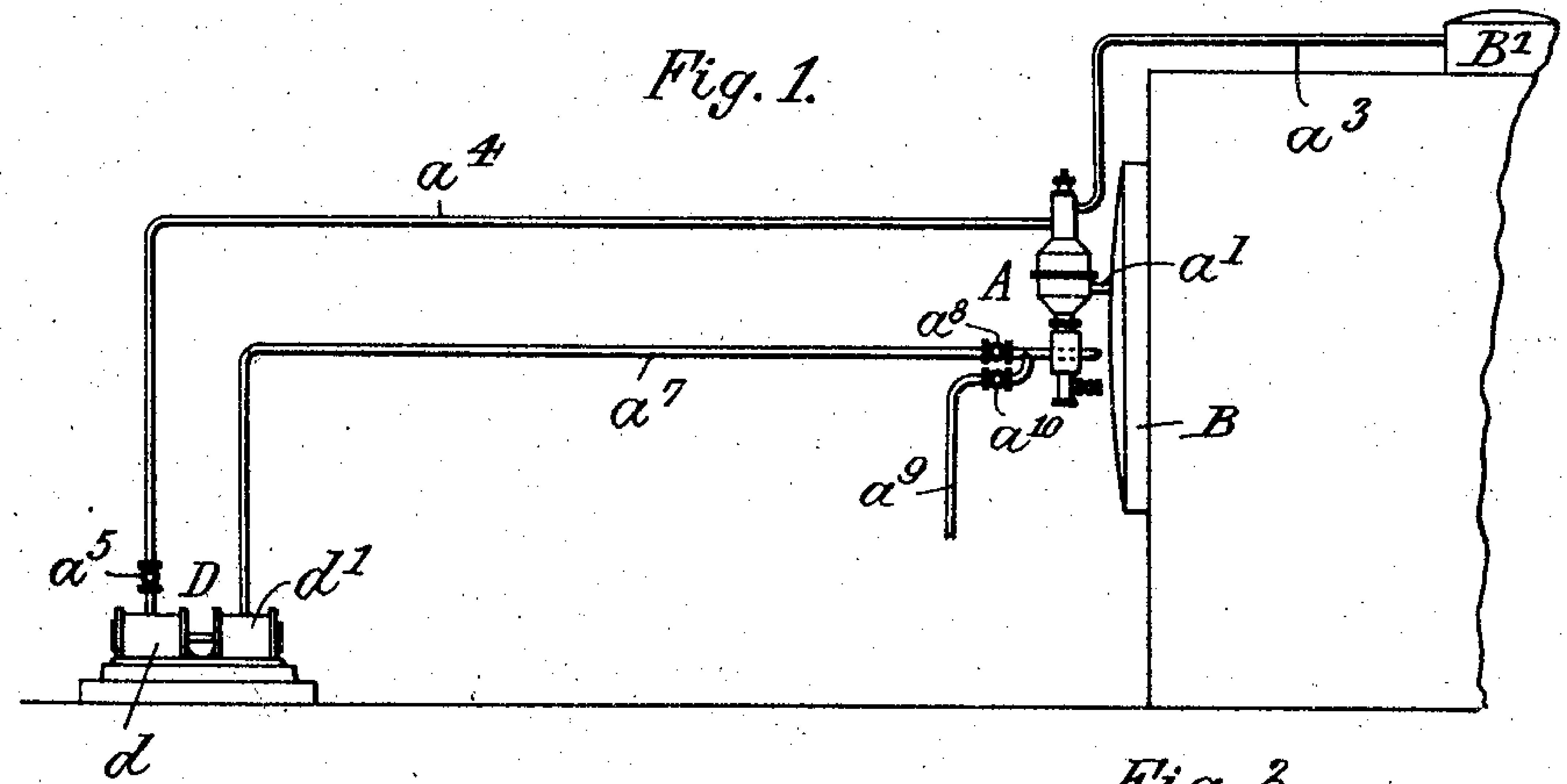


Fig. 2.

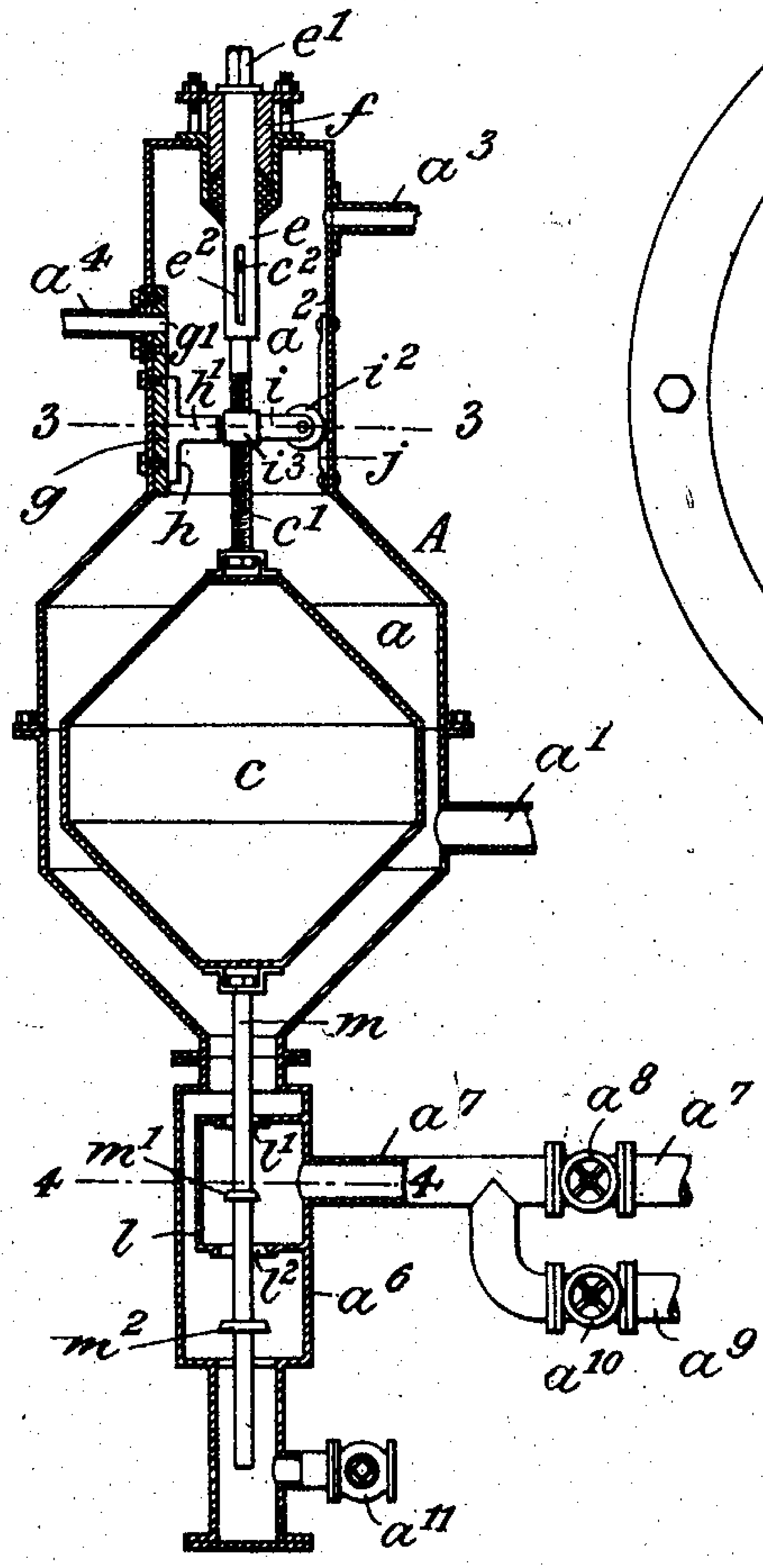


Fig. 3.

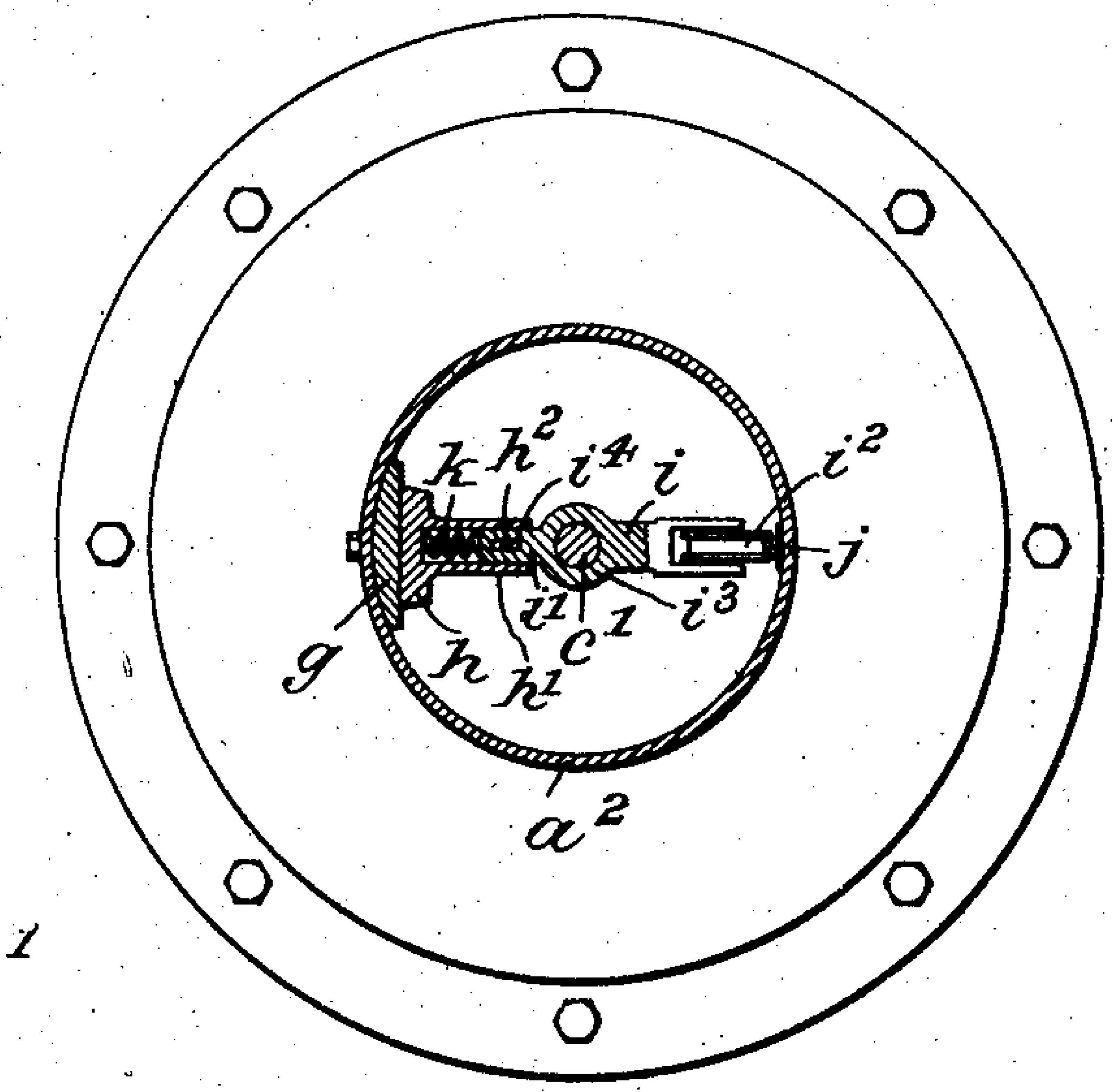
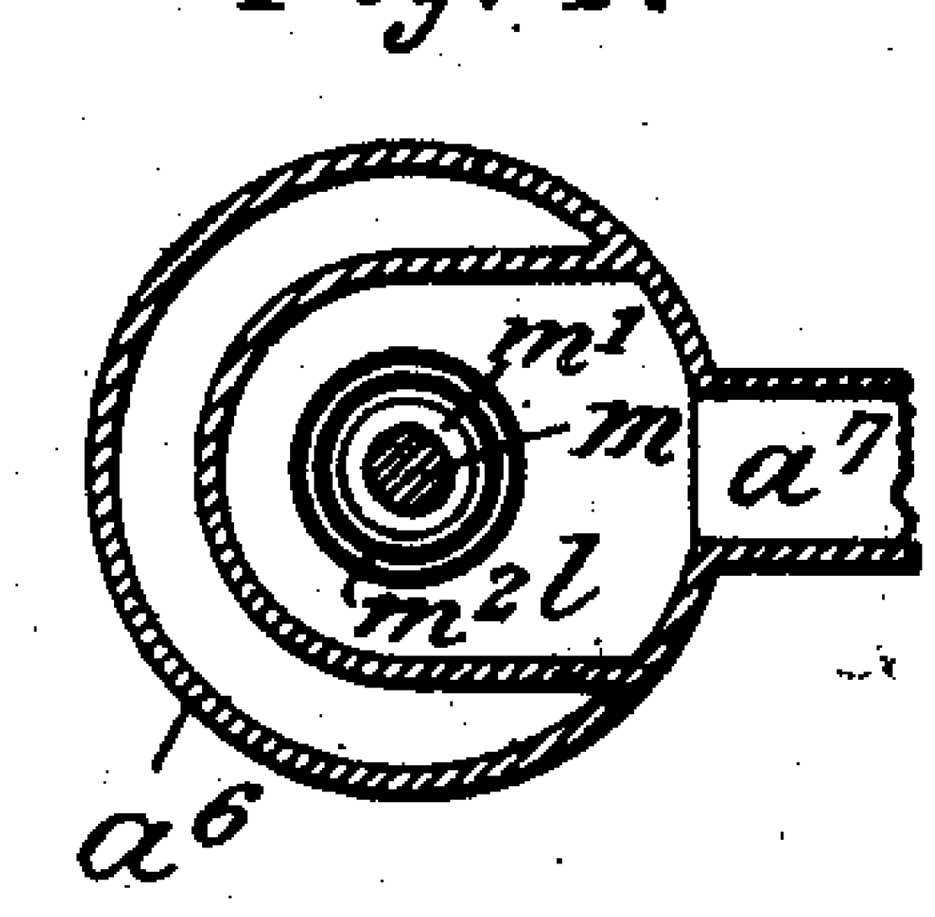


Fig. 4.



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by [signature] Att'y

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UNITED STATES PATENT OFFICE.

FRANK X. ATZBERGER, OF NEW YORK, N. Y.

FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 790,246, dated May 16, 1905.

Application filed February 25, 1905. Serial No. 247,261.

To all whom it may concern:

Be it known that I, FRANK X. ATZBERGER, a citizen of the United States, residing at New York city, Manhattan, county and State of New York, have invented new and useful Improvements in Feed-Water Regulators, of which the following is a specification.

This invention relates to a feed-water regulator for boilers which is so constructed that the water may be supplied either by a pump or by a service-pipe in such a manner that the normal water-level will always be maintained.

In the accompanying drawings, Figure 1 is a side elevation of part of a boiler provided with my improved feed-water regulator; Fig. 2, a vertical longitudinal section through the regulator; Fig. 3, an enlarged cross-section on line 3 3, Fig. 2; and Fig. 4, a similar cross-section on line 4 4, Fig. 2.

The letter A represents a casing which is enlarged at its center to form a chamber a, containing a float c. The lower end of this chamber communicates by a feed-water or inlet pipe a' with a boiler B below the lowest water-level of the latter. The upper cylindrical section a^2 of casing A communicates by a steam-inlet pipe a^3 with steam-dome B′ and by steam-outlet pipe a^4, having cock a^5, with the steam-cylinder d of a pump D. The top of float c is connected to the lower threaded end of a spindle c', the upper end of which is loosely embraced by a tubular sleeve e, passing through a stuffing-box f and having a squared head e'. The spindle c' is vertically movable within sleeve e, but is connected thereto in such a manner that the rotatory movement imparted to the sleeve will be transmitted to the spindle. To obtain this result, the sleeve is provided at its lower end with a longitudinal slot e^2, which engages a pin c^2, projecting laterally from spindle c'. Within section a^2 of casing A is secured a rest g, that projects above pipe a^4 and is perforated in alinement with such pipe to form a steam-outlet port g'. Along rest g is free to move a slide-valve h, which in its raised position closes port g', and consequently pipe a^4. The valve h has a tubular extension h' to receive a pin i'', projecting from one end of a horizontal arm i. The other end of this arm is forked to form the bearing of a guide-roller i^2, movable along a rail j, which is fitted within section a^2 opposite rest g. The arm i has a tapped hub i^3, that engages the threaded section of spindle c', so that any vertical movement imparted to the spindle will be transmitted to the arm, and consequently to valve h.

To effect a proper engagement between valve h and rest g and between roller i^2 and rail j, respectively, a spring k, inclosed by tubular extension h', bears with one end against valve h and with its other end against pin i''. To prevent tilting of the valve, its extension h' is traversed by a pin h^2, that passes through a slot i^4 of pin i''.

The bottom of chamber a communicates with a lower cylindrical section a^6 of casing A. This lower section a^6 contains a valve-box l, that communicates with section a^6 by an upper port l' and a lower port l^2. Valve-box l receives the feed-water by a pipe a^7, having cock a^8, from the barrel d' of pump D. It is also connected by a branch a^9, having cock a^{10}, to a water-service pipe. (Not shown.) A blow-off cock a^{11} in the lower contracted end of section a^6 serves for the ejection of accumulated sediments.

From the bottom of float c depends a stem m, carrying a pair of disk valves m' m^2, adapted to close ports l' l^2, respectively.

The relative position of the parts is such that when the steam is cut off from pump D by the raising of float c the valves m' m^2 remain still open.

The operation is as follows: When the boiler is to be fed by pump D, cock a^{10} is closed, while cocks a^5 a^8 are opened. The water-level in the boiler B is of course the same as that in chamber a. As long as such level is normal the float c will remain raised, so that the valve h closes port g', and thus cuts off the steam from the pump. When the water-level falls, the float c will descend to open port g' and admit steam to pump D, whereby the latter is started to force feed-water through pipe a^7 into valve-box l. This water will flow through open ports l' l^2 into casing A and thence through pipe a' into the boiler. As soon as the proper water-level has been re-

established the port g' will be again closed by the rising of float c. When the boiler B is to be fed from the service-pipe, the cocks a^5 a^8 are closed, while the cock a^{10} is opened. The water will now again flow through the ports l' l^2 into casing A and thence through pipe a' into the boiler. Under an excessive supply of water the float will be raised to close valves m' m^2, and thus cut off the further flow of water.

The height of the water-level in the boiler may be regulated by turning sleeve e, and thereby adjusting the distance between valve h and float c.

What I claim is—

1. In a feed-water regulator, the combination of a casing having a steam-port with a float, a spindle projecting therefrom, a slide-valve for closing the port, means for adjustably connecting said valve to the spindle, and a rotatable sleeve embracing the upper end of the spindle, substantially as specified.

2. In a feed-water regulator, the combination of a casing having a steam-port with a float, a threaded spindle projecting therefrom, a tapped arm engaging the spindle, a guide-roller journaled to the arm, and a spring-actuated slide-valve connected to the arm and adapted to close the port, substantially as specified.

3. In a feed-water regulator, the combination of a casing having a steam-outlet and a water-inlet with a float, a threaded spindle projecting upwardly therefrom, a tapped arm engaging the spindle, a spring-influenced slide-valve connected to the arm, a rotatable sleeve embracing the upper end of the spindle, a valve-box having a water-inlet port, a stem depending from the float, and a disk valve on said stem adapted to close said port, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 23d day of February, 1905.

FRANK X. ATZBERGER.

Witnesses:
H. H. ROBSON,
F. R. GRAVES.