

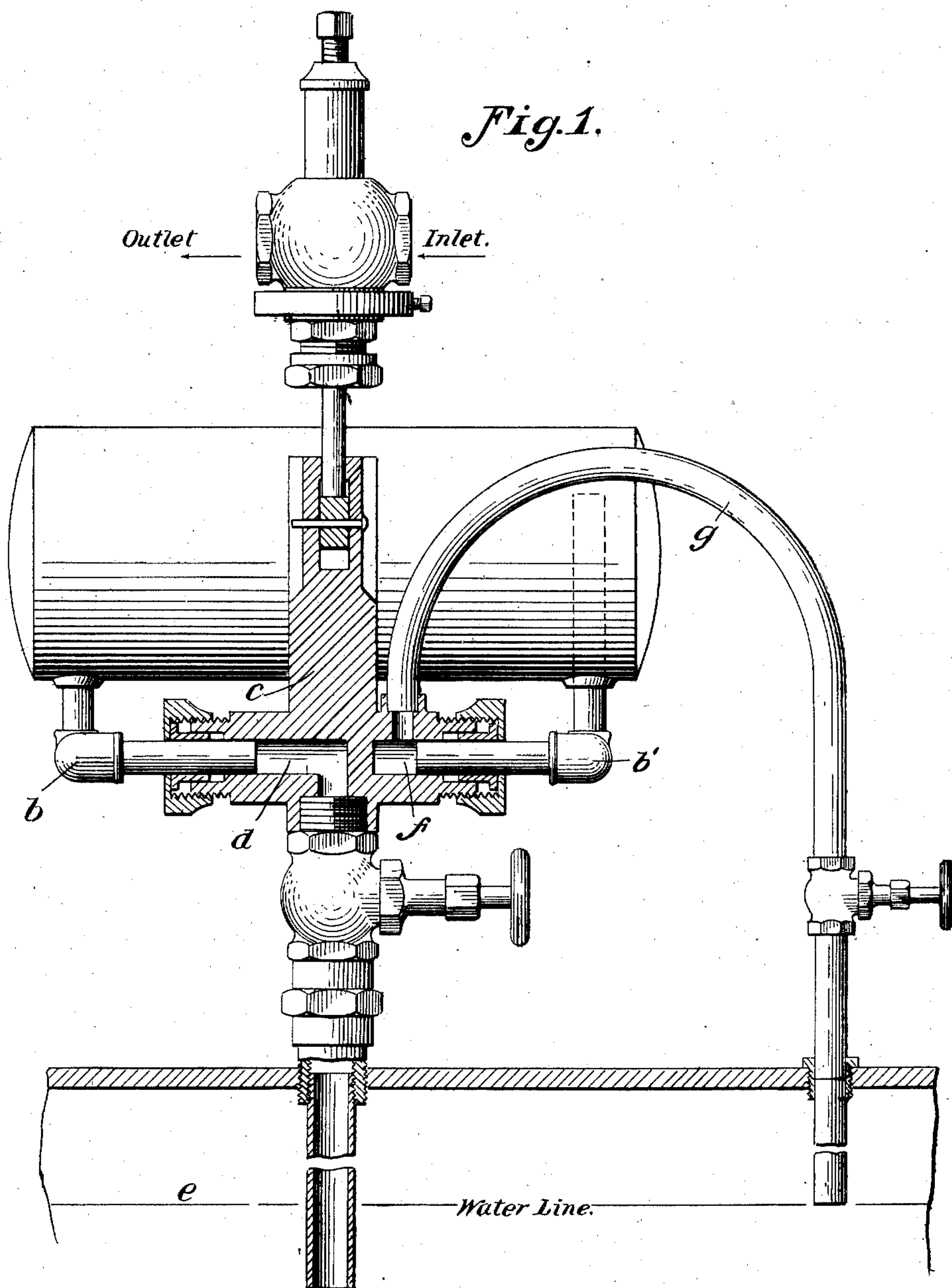
No. 864,807.

PATENTED SEPT. 3, 1907.

J. F. SENTER.
BOILER FEEDER.

APPLICATION FILED APR. 15, 1907.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 2.

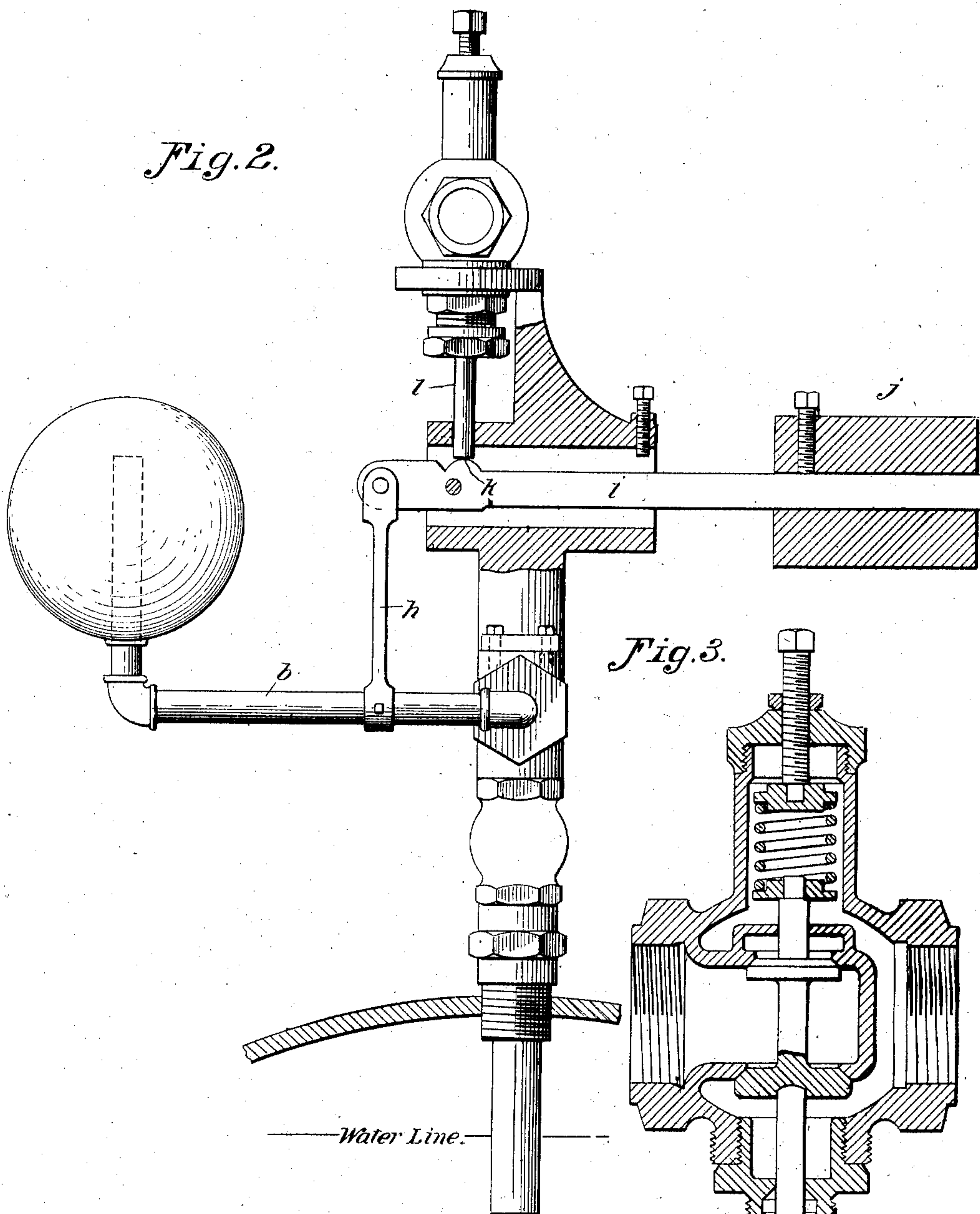
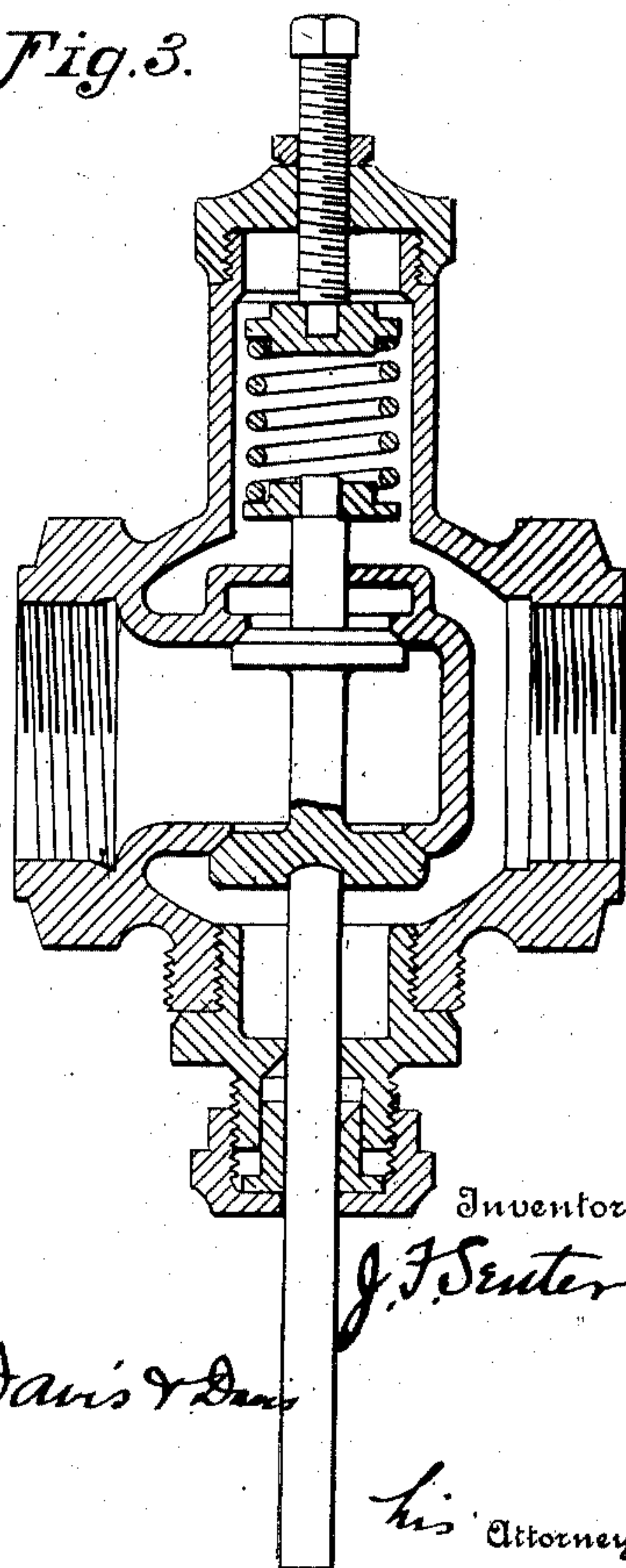


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN F. SENTER, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO SENTER MANUFACTURING COMPANY, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE.

BOILER-FEEDER.

No. 864,807.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed April 15, 1907. Serial No. 368,289.

To all whom it may concern:

Be it known that I, JOHN F. SENTER, a citizen of the United States of America, and a resident of the city of Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Boiler-Feeders, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view partly in side elevation and partly in vertical section showing my apparatus applied to a boiler; Fig. 2 a view taken at right angles to Fig. 1 and being partly in elevation and partly in vertical section; and Fig. 3 a detail vertical section of the pump valve.

The object of this invention is to provide a compact, simple and reliable automatic boiler feeder of that type employing a gravitating tank arranged above or on the level of the water-line of the boiler and adapted by its vertical movement to control the opening and closing of the pump valve, as more fully hereinafter set forth.

Referring to the drawings annexed by reference characters, *a* designates a water tank which is supported in a horizontal position by a pair of pipes *b* and *b'* arranged parallel with each other and having their outer ends turned upward and connected to the bottom of the tank, the end of the pipe *b'* being carried up into the tank to a point above the normal water-level therein. The opposite ends of these pipes *b* and *b'* are turned inward toward each other and extended through stuffing-boxes into oppositely projecting horizontal portions of a standard or support *c*, these inwardly extending portions of the pipes serving as pivots or trunnions, permitting the tank to rise and fall.

The pipe *b* communicates with a passage *d* which leads down through a pipe which is attached to and supported upon the top of the boiler. This supporting pipe or tube is provided with an extension *e* which depends into the boiler to a point below the low water level. The other pipe *b'* has its inner end in communication with a passage *f*, which passage is connected at its upper end to a pipe *g* which extends above the normal water level in the governing tank, its lower end extending down through the top of the boiler far enough to bring its lower open end to a point about coincident with the normal water level in the boiler.

Attached to the pipes *b* and *b'* is an up-standing arm *h* whose upper end is pivoted to the shorter arm of the lever *i*, this lever being pivoted in a transverse slot in the upper end of the support and having its free end provided with an adjustable counter-weight *j*. Just back of the pivot of this lever *i* the upper edge of the lever is formed into a cam *k*, which, when the weighted end of the lever is elevated, impinges against the lower end of a valve stem *l* and lifts the same. This valve stem extends up into the pump controlling valve which

is of the twin disk balanced type and is normally forced open by means of a coil spring *m* confined in the casing extending upwardly from the valve casing and which has its tension regulated by means of a suitable set screw.

With the construction above described, it will be observed that while the water in the boiler is above the desired level, the pressure will force the water up into the tank. When the tank is filled or nearly filled with water the weight thereof overbalances the counter-weight thus causing the cam *k* to hold the pump-control valve closed but when the level of the water gets below the end of the pipe *g* steam will pass up through said pipe into the tank and permit the water therein to flow back by gravity into the boiler, thus reducing the weight of the tank and allowing the counter-weight *j* to overbalance and raise it. The falling of the counter-weight causes cam *k* to descend and thus permit the spring *m* to open the pump valve.

It will be observed that my invention is exceedingly compact and simple in construction and further that it will be entirely automatic as well as efficient in operation.

It will be understood that where it is desired to control the pump (as is the case where only one boiler is in the plant) the steam to the pump is piped through the control valve so that the apparatus will shut off and turn on the steam to the pump, and also that where the apparatus is to be used on a heating system where there is a low pressure, the water supply from the main or the tank is piped through the control valve.

By extending the pipe *g* above the normal water-level in the governing tank water will be prevented from flowing upward through said pipe to the governing tank, as it will require less pressure to force the water up through the column and pipe *d*.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is—

In combination with a generator, a tubular standard mounted thereon and having a pipe connected at its lower end and extending into the generator below the required level, a pair of horizontal outwardly extending tubular projections on said standard, the interior of one of said projections being in communication with the interior of the standard, a governing tank, a pipe connected to one end of said tank at the bottom thereof and provided with a horizontal portion extending into one of the tubular extensions of the standard and placing said tank in communication with the interior of said standard, a second pipe connected to the bottom of the tank, and extending upward therein to a point near the upper side thereof, said pipe being provided with a horizontal portion extending into the other tubular extension of the standard, a pipe connecting the interior of this latter tubular projection to the generator and terminating at the liquid level therein, said pipe between the standard and the generator extending above the normal water level in the governing tank

and placing the interior of said tank in communication
with the interior of the generator, and the pipes connect-
ing the standard to the governing tank supporting the
same and permitting said tank to have an up and down
5 swinging movement, a lever pivoted on the standard and
carrying a counter-balance weight at one end, a link con-
necting the shorter arm of said lever to the tank arms,
a pump-controlling valve provided with a depending valve
stem, a cam on the lever adapted to engage said stem,
10 and means for normally tending to force said valve to its

open position, the cam portion of the lever being adapted
to close said valve when the governing tank over-balances
the counter-weight on the lever.

In testimony whereof I hereunto affix my signature in the
presence of two witnesses this 8 day of April 1907.

JOHN F. SENTER.

Witnesses:

P. J. CASEY,

F. W. SENTER.