

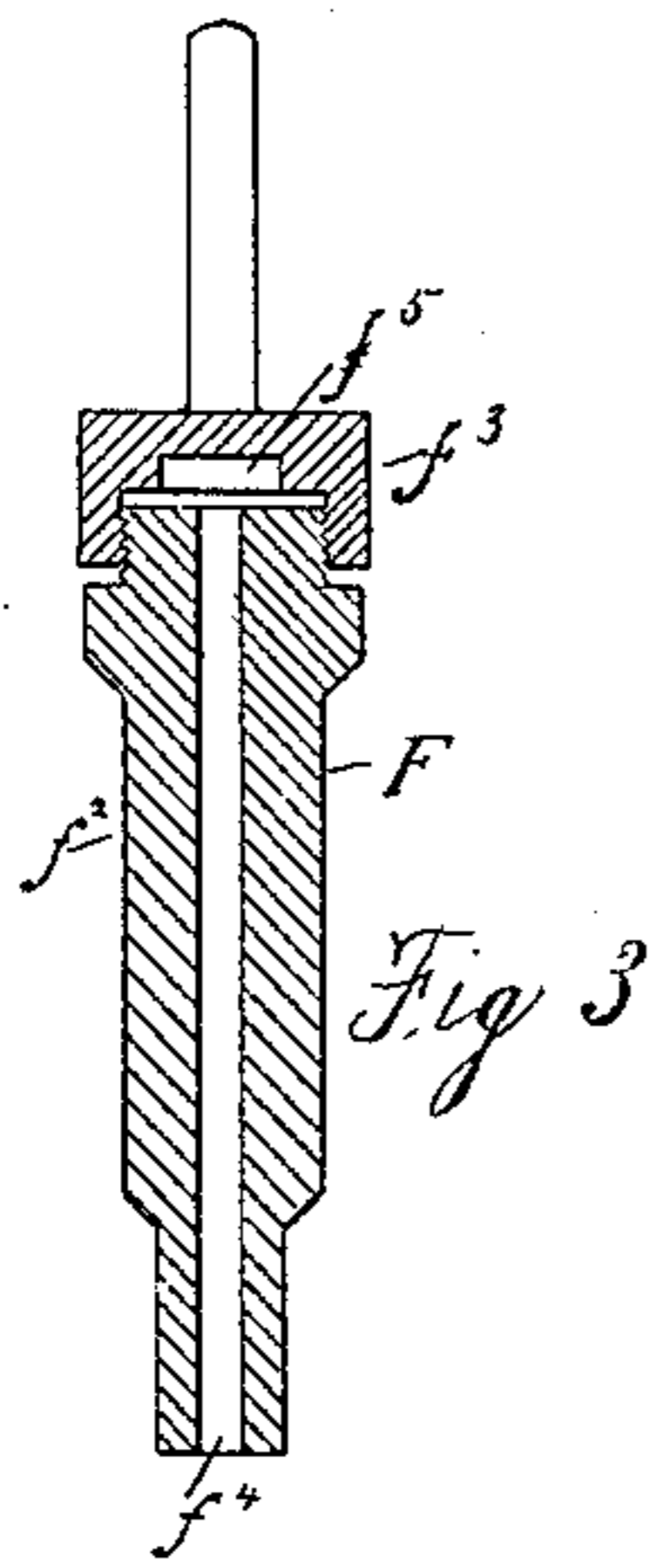
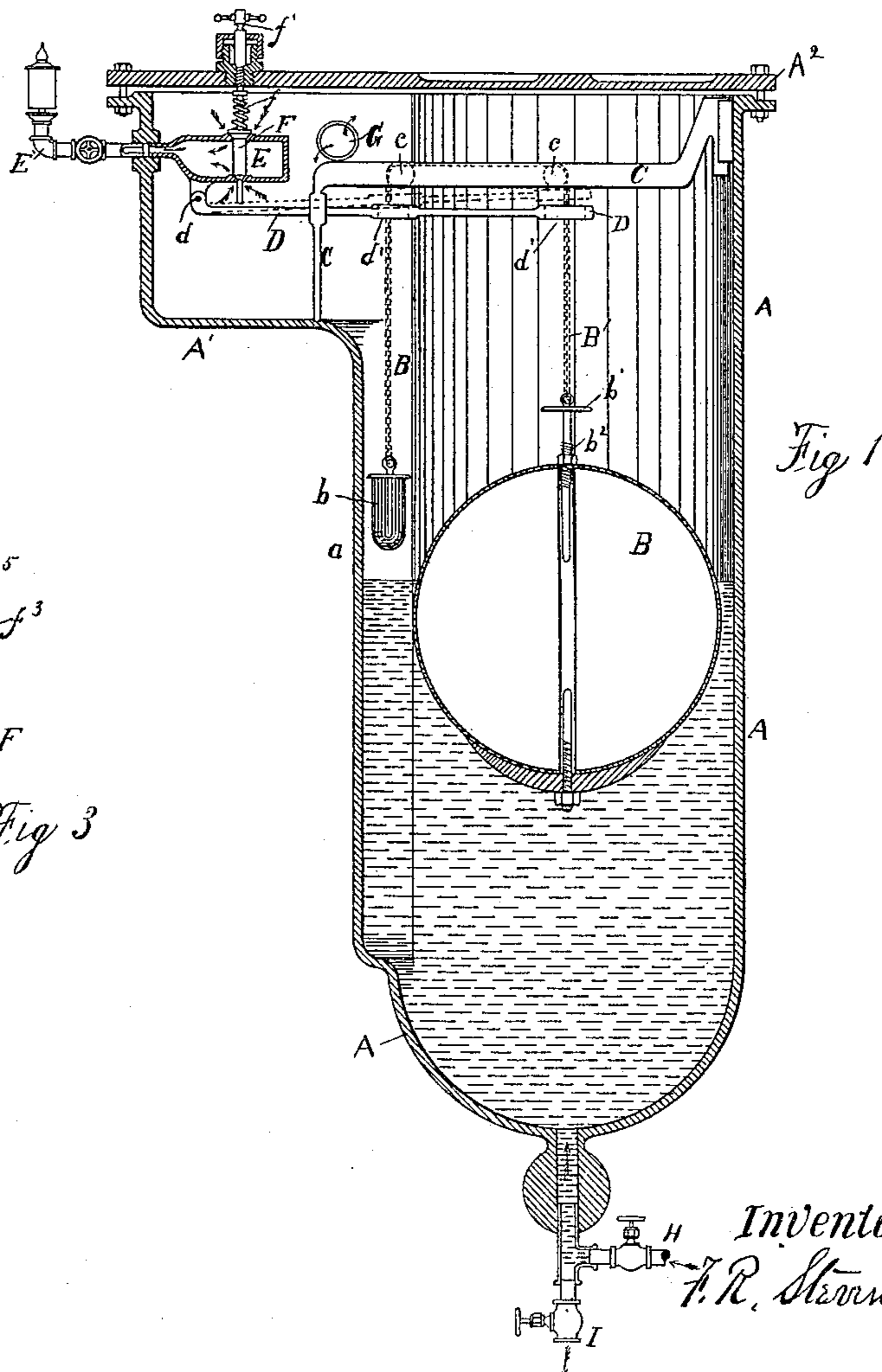
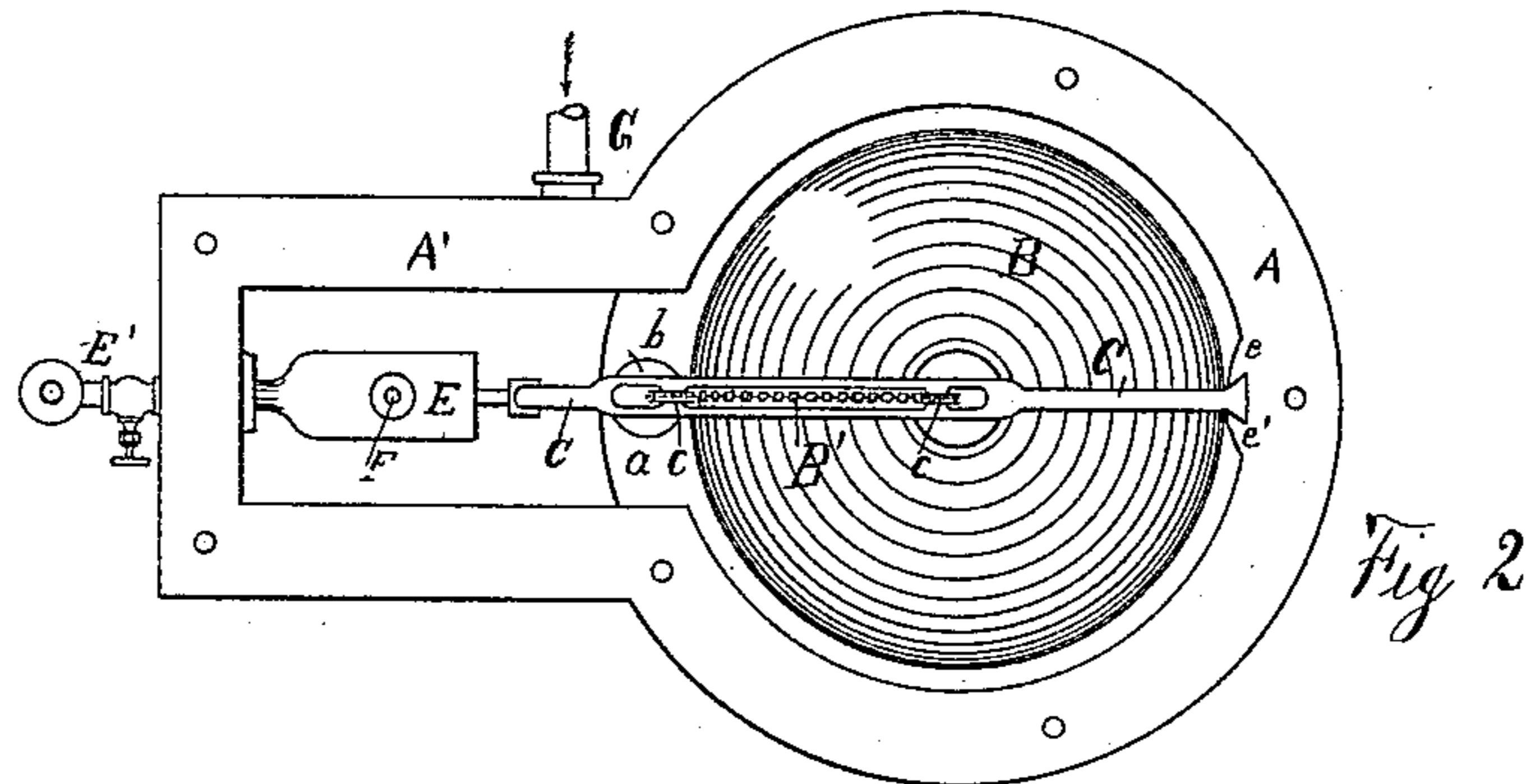
(No Model.)

F. R. STEVENSON.

BOILER WATER ALARM.

No. 353,513.

Patented Nov. 30, 1886.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANCIS R. STEVENSON, OF ERIE, PENNSYLVANIA.

BOILER WATER-ALARM.

SPECIFICATION forming part of Letters Patent No. 353,513, dated November 30, 1886.

Application filed August 20, 1886. Serial No. 211,399. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS R. STEVENSON, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Boiler Water-Alarms; and I do hereby 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 appertains to make and use the same.

This invention relates to devices for sounding an alarm when the water in a steam-boiler becomes too low or too high; and it consists in improvements in the construction thereof, as will be hereinafter fully set forth, and pointed out in the claims.

My device is illustrated in the accompanying drawings, as follows: Figure 1 shows the apparatus in vertical section. Fig. 2 is a top view, looking into the shell, the top or cover being removed. Fig. 3 is a vertical section through the puppet-valve F.

The device consists of a cast-iron body or shell, A, which is connected with the boiler by pipes G and H, and is provided with a steam-tight cover, A², and contains a floating ball and means for sounding an alarm when the float is raised too high or sunk too low.

The construction is as follows: The shell or body A is cylindrical in form, with the bottom closed, and on one side there is a narrow extension or channel, *a*, along the length of the body, and on the same side, at the top, there is a shallow rectangular extension, A'. This shell is cast in one piece, and is covered by a cover, A², which is secured to it by bolts and made steam-tight. A pipe, H, connects with the interior of the shell at the bottom, and when the device is in place on a boiler this pipe connects with the interior of the boiler below the lowest point to which the water should ever be permitted to fall. A second pipe, G, connects with the interior of the shell at the top and enters the steam-space of the boiler.

B is a float of the ordinary kind, which is contained within the cylindrical part of the shell.

C is a cross-beam supported within the shell, across the cylindrical part thereof, at the top, and containing sheaves *c c*.

B' is a chain or metallic cord, which is connected with the float and passes over the sheaves *c c* in the beam C, and has suspended at its end a small weight, *b*. The arrangement of parts is such that the weight *b* hangs within the channel or extension *a*, above mentioned, and can pass the float undisturbed as the float rises or falls. The weight *b* is not a counter-weight, but is made only sufficiently heavy to keep the chain B' taut and insure its movement over the sheaves *c c* as the float rises.

The chain B' is connected with the float B by a screw-bolt, *b*², on the end of which is a disk, *b'*. By turning the screw-bolt, the distance of the disk *b'* from the float can be regulated.

E is a steam-escape chamber. It is something the shape of a flat bottle. It will preferably be made of brass, and will be cast in one piece. Its neck is screw-threaded and screws into an opening through the end wall of the extension A' of the shell, and an alarm-whistle, E', is connected with the same opening from the outside.

A puppet-valve, F, regulates the admission of steam to the chamber E, as is clearly shown in Fig. 1. This valve is kept seated by a spring, *f*, and the tension of the spring is regulated by a screw, *f'*.

In Fig. 3 I have shown the internal construction of the puppet-valve F. It has a central perforation, *f*⁴, and a cap, *f*³, with a chamber, *f*⁵, below it, and in connection with the opening *f*⁴. The object of this construction is to properly balance the valve.

D is a lever fulcrumed at *d* on the under side of the chamber E, and passes under the stem of the valve F, extends under the beam C, and embraces by slots therein at *d' d'* the chain B' below each of the sheaves *c c*.

It will be seen by observing Fig. 1 that if the water in the shell A becomes too low the float will sink and the weight *b* will be drawn up and come in contact with the lever D and lift it, and also that if the water becomes too high the float will be raised so the disk *b'* will come in contact with the lever D and lift it, and also that any such lifting of the lever D will lift the valve F from its seat and permit an escape of steam into the escape-chamber E, as shown by arrows, and this escaping steam will sound the alarm-whistle E'.

It will be noted that all the operative mechanism of the device is contained within the shell and does not have to operate through any packed opening in the walls of the shell, and hence there is no danger of inoperation. The only stuffing-box used is on the stem of the screw *f'*, which regulates the tension of the spring on the valve *F*, and this stem is always operated by hand from outside of the case, and hence in no way affects the action of the operating parts.

I am aware of the construction shown in patent to Dustin, May 8, 1860, No. 28,165, and in patent to Cole, October 13, 1874, No. 155,828, and I do not desire to be understood as claiming as my invention anything therein shown. In the said devices the construction is such that the alarm is only sounded when the water becomes too low, there being no means for sounding the alarm when the water is too high also, as in my construction.

What I claim as new is—

1. In a water-alarm for boilers, the combination, substantially as set forth, of a float, a flexible chain or cord connected with said float, which passes over sheaves and attaches to a weight, so that said weight will move counter to said float in a parallel vertical plane, a steam-escape chamber, a valve regulating admission to said chamber, and a lever for moving said valve, which is arranged with relation to said float, chain, and weight in a manner substantially as shown, whereby the said lever may be moved by the action of said

parts to open said valve when the said float is unduly elevated or depressed.

2. In a water-alarm for steam-boilers, the combination, substantially as shown, of a shell or case, *A*, connected with the boiler by a pipe extending from the top of said case to the steam-space of the boiler, and a pipe extending from the lower part of said case to a point below the low-water line of the boiler, a steam-escape chamber within said case; and having its inlet controlled by a valve and its outlet extending through the wall of said case, a lever for moving said valve, and a float for operating said lever when the said float is unduly elevated or depressed.

3. In a water-alarm for steam-boilers, the combination, substantially as set forth, of the shell or case *A*, connected with the boiler, as commonly, the steam-escape chamber *E*, having its exit through the wall of the main case and its entrance controlled by the puppet-valve *F*, the lever *D*, for moving said valve, the float *B*, the cross-beam *C*, having sheaves *c c* thereon, the weight *b*, and the chain *B'*, connecting said weight and float and passing through slots *d' d'* in said lever *D* and over said sheaves *c c* in said beam *C*.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS R. STEVENSON.

Witnesses:

ROBT. H. PORTER,
JNO. K. HALLOCK.