

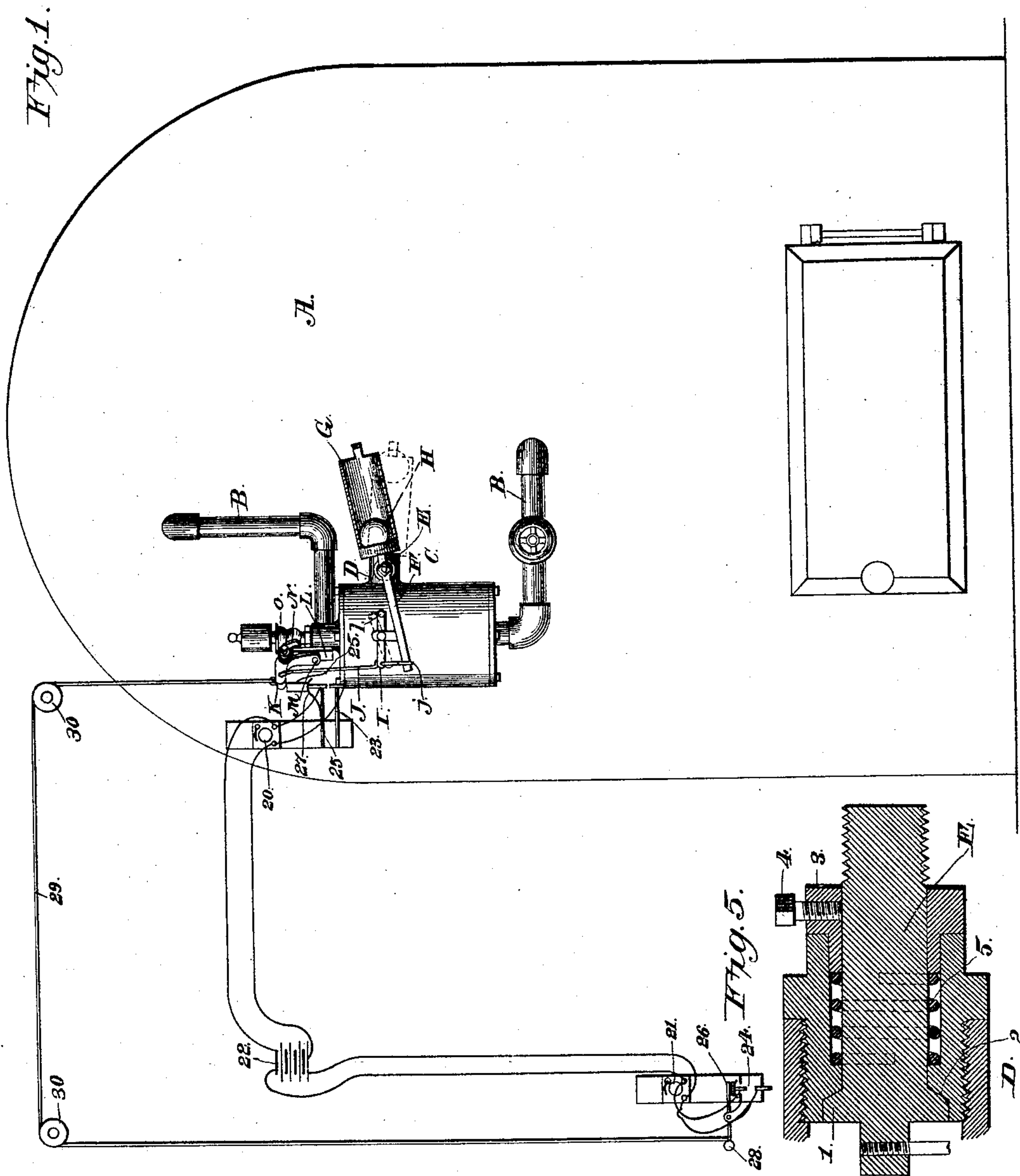
(No Model.)

2 Sheets—Sheet 1.

A. W. GILFILLAN.
STEAM BOILER ALARM.

No. 452,437.

Patented May 19, 1891.



Witnesses

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M. Fowler

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Inventor

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By his Attorneys,

Cañon Viejo.

(No Model.)

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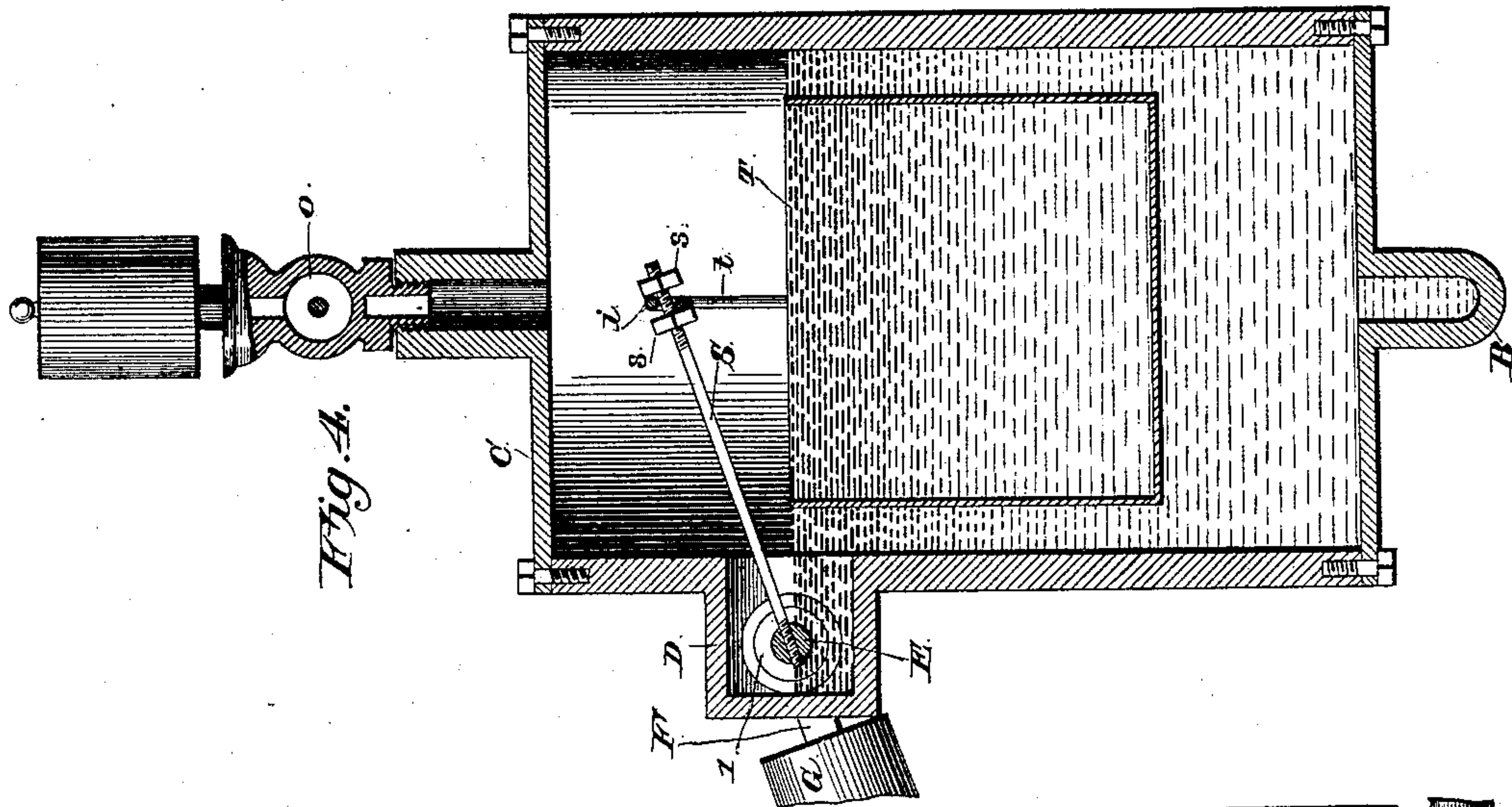


Fig. 4.

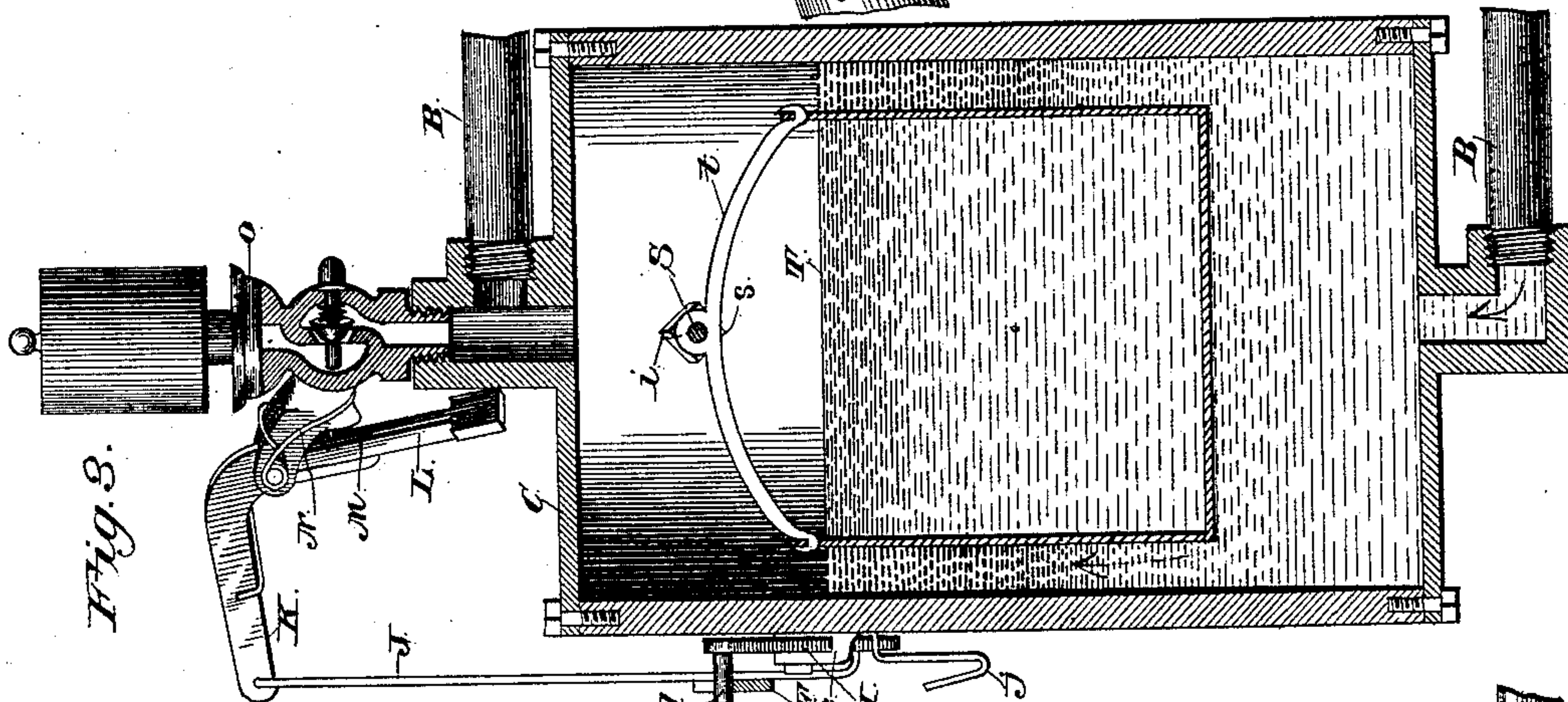
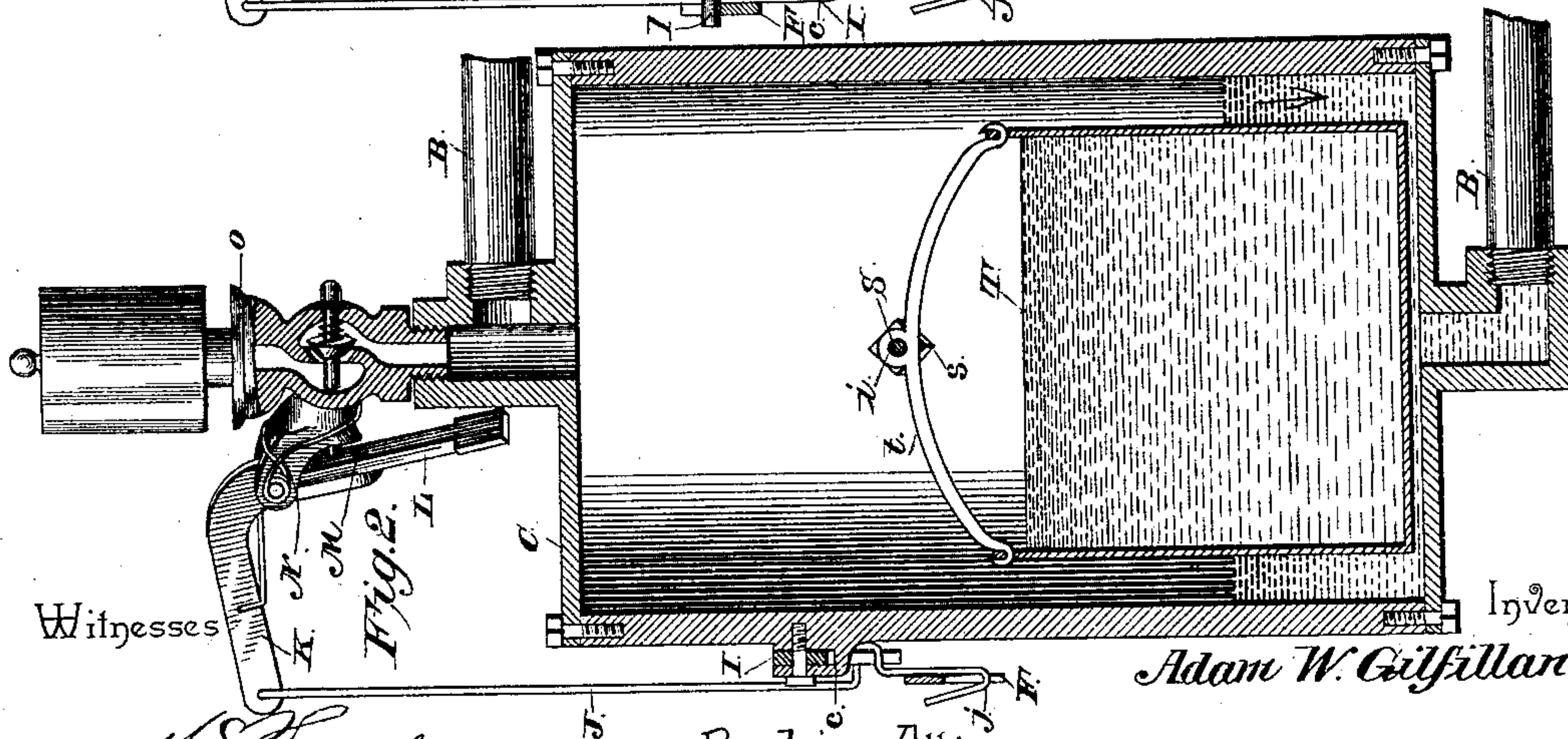


Fig. 3.



UNITED STATES PATENT OFFICE.

ADAM WILLIAM GILFILLAN, OF EUREKA, CALIFORNIA.

STEAM-BOILER ALARM.

SPECIFICATION forming part of Letters Patent No. 452,437, dated May 19, 1891.

Application filed May 15, 1890. Renewed April 22, 1891. Serial No. 389,916. (No model.)

To all whom it may concern:

Be it known that I, ADAM WILLIAM GILFILLAN, a citizen of the United States, residing at Eureka, in the county of Humboldt and State of California, have invented a new and useful Steam-Boiler Alarm, of which the following is a specification.

This invention relates to steam-boilers, and more especially to that class thereof known as "indicators;" and the object of the invention is to provide such a device adapted to be connected to a steam-boiler, and which will sound an audible alarm when the water within the boiler becomes either too high or too low.

To this end the invention consists of the specific details of construction hereinafter more fully described, and as illustrated in the drawings, in which—

Figure 1 is a front elevation of a boiler with my improved alarm attached thereto, the outer end of the lever being sectioned to show the shifting weight therein. Fig. 2 is a central vertical section of the cylinder and the bucket therein, showing the water as falling and the device in position to sound an alarm. Fig. 3 is a similar section showing the water as rising and the device also sounding an alarm. Fig. 4 is a central transverse section through the cylinder. Fig. 5 is a section through my preferred form of steam-pipe packing for the shaft E.

Referring to the said drawings, the letter A designates a steam-boiler of any preferred construction, to which are connected pipes B above and below the normal position of its water-line, and C is a cylinder, to whose upper and lower ends said pipes are connected in any preferred manner.

D is a hollow boss formed upon one side of the cylinder C, within which is fitted an oscillating shaft E, so arranged by washers and packing as to prevent the escape of steam around it. To the outer end of this shaft is rigidly connected at about its center a lever F, whose inner end stands adjacent to the front side of the cylinder C, and whose outer end G in the present instance is made tubular to receive a heavy ball or weight H, although it will be understood that the part G may be a track, and H a weight carried by a wheel rolling upon said track, or that any

other suitable traveling weight can be used instead of that shown and described, provided it operates in substantially the same manner.

At the inner end of the oscillating shaft E, which inner end stands within the hollow boss D, is connected a threaded rod S between nuts s, on which is adjustably mounted an eye *i* of the bail *t* of a bucket T, the latter being of a size to fit loosely within the cylinder C. By the use of these nuts the connection of the eye with the bail can be adjusted farther from or nearer to the oscillating shaft E, as occasion and necessity may require. Pivoted at about its center in a bifurcated lug *c* upon the front of the cylinder C is a short lever I, having an elbow *l* at one end, and leading upwardly from the other end of this lever is a rod J, which is pivotally connected at its upper end to the whistle-lever K. The latter is pivoted to a standard projecting from an ordinary steam-whistle O, and is retained normally in position by a spring N.

L is a plate or arm pivoted at M to the lower member of the whistle-lever K, against which plate the piston of the steam-whistle rests, as shown in the drawings. The lower end of the rod J is hooked, as at *j*, and stands normally below the inner end of the lever F.

With this construction of parts it will be understood that the boiler is filled or partially filled with water, and a fire being started beneath the boiler steam is generated therein, which of course passes into the cylinder C at the top, while the water passes thereinto at the bottom, as will be understood. The water rises within the cylinder until the bucket T is filled. At any time that the cylinder C is also filled with water (or, in other words, when the bucket is submerged) and the shifting weight H is at the inner end of the tube G, a short distance from the fulcrum of the lever F, such weight will slightly overbalance the weight of the inner end of the lever and of the bucket itself. If the water should all run out of the cylinder, or if it should fall too low therein, the bucket will of course descend by reason of the weight of the water therein until it rests upon the bottom, and the inner end of the lever F will engage the hook *j*, trip the whistle O, and sound an alarm. When the

water rises within the cylinder, however, the bucket will not be moved until it (the water) reaches the upper edge of the bucket and communicates with the water therein, at which moment it will be seen that the weight of the water in the bucket will become ineffectual, and the bucket will therefore be raised by the slightly-heavier shifting weight II as rapidly as the water rises within the cylinder. When the bucket has reached such a position that the lever F passes a trifle beyond the horizontal, so that the tube G is slightly inclined, the shifting weight II passes to the outer end thereof, as will be clearly understood, and thereby increases the leverage of the lever supporting the bucket, and raises the latter such a distance in the water that the specific gravity of the water that stands within the bucket above the general water-level within the cylinder will equal the added weight. This movement, however, of the lever F brings its inner arm near the elbow I of the pivoted lever J, so that when the water further rises within the cylinder said elbow will be sooner struck by the lever F. As soon as it is so struck the pivoted lever J is turned, the rod J is drawn downwardly, the whistle tripped, and an alarm sounded. It will thus be seen that whether the water rises too high or falls too low within the boiler an audible alarm is sounded, which will give notice thereof.

The operator, approaching and admitting or drawing off water, as the case may require, naturally desires to stop the noise of the whistle before the time when the addition or subtraction of water to or from that in the boiler would sufficiently raise or lower the bucket to turn the lever F and throw its inward end out of engagement with the hook J or the elbow I, respectively, as the case may be. To do this all that is necessary is to turn the plate L upon its pivot M, so that the end of the whistle-piston will be allowed to slip from the end of the plate L, and the noise of the whistle will of course be stopped.

When it shall be desired to sound an alarm at a point distant from the room in which the boiler to which my invention is attached is located, this may be accomplished by means of the electric bells and circuit shown in the drawings hereto annexed.

20 and 21 designate electric bells of ordinary construction, which are located at points where it shall be desired to sound the alarm. Said bells are in circuit with the battery 22 and with the circuit-closers 23 24, which are operated by the levers 25 and 26, respectively. The lever 25 is held automatically raised from the contact-point by the action of the spring 27, and the lever 26 is likewise normally held raised from the contact-point by means of a weight 28. The lever 25 is arranged directly below the outer end of the arm or lever K, which operates the whistle of my improved boiler-alarm. The outer end of said arm or lever is also connected with the lever 26, by means of which the circuit-closer of the elec-

tric bell 21, which is located at a distant point from the boiler-room, is operated by a cord or wire 29, passing over suitably-arranged guides or pulleys 30.

It will be seen that when the lever K is thrown into action in the manner which has been hereinbefore described it will operate to close the circuit of the electric bells 20 and 21, thus sounding the alarm at the points where said bells are located. It is obvious that these bells may be multiplied, so as to give warning of the state of the water in the boiler simultaneously in a number of places without regard to the distance of said places from the boiler-room.

In Fig. 5 I have illustrated in section my preferred form of steam-tight packing surrounding the shaft E within the boss D. In this case the shaft is formed with an annular enlargement 1, having a beveled face, and the boss is formed with an oppositely-beveled ring 2, constituting a seat against which the annular enlargement strikes. A collar 3 is adjustably connected to the shaft E at the other end of the boss by a set-screw 4, and between the inner end of this collar and the inner end of the annular ring 2 is a spiral spring 5, surrounding the shaft E within the body of the boss D. The expansive force of this spring presses the collar 3 and enlargement 1 in one direction and forces the ring 2 in the opposite direction against said enlargement, thereby forming a steam-tight packing. I prefer this construction to that described above, although it is not essential to the successful operation of the device.

Having thus described my invention, what I claim is—

1. The combination, with a cylinder communicating at its upper and lower ends with a steam-boiler above and below the water-level therein, a float therein, a lever connected with said float and extending to the exterior of the cylinder, and a shifting weight connected to the outer arm of said lever, of a lever pivoted at its center to said casing and having an elbow at one end standing normally above said weight-carrying lever, a rod connected to the other end of said pivoted lever and having a hook at its lower end standing normally below said weight-carrying lever, and an alarm connected to the upper end of said rod, substantially as described.

2. The combination, with a steam-whistle carrying a bifurcated arm, an operating-lever pivoted in said arm, a spring for holding said lever away from the whistle, and a plate pivoted in the lower end of the arm, with its upper end bearing normally upon the whistle-piston, of a float and connections between the float and the outer end of said lever, each and all substantially as described.

3. The combination, with a steam-whistle, a spring-actuated operating-lever pivoted thereto, and a plate pivoted in the lower end of the arm, with its upper end bearing normally upon the whistle-piston, of a float, a

lever connected thereto, a centrally-pivoted
lever having an elbow at one end standing
normally above said float-lever, and a rod
connecting the whistle-operating lever with
5 the pivoted lever and carrying a hook stand-
ing below said float-lever, the whole adapted
to operate substantially as described.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
presence of two witnesses.

ADAM WILLIAM GILFILLAN.

Witnesses:

R. W. RIDEOUT,
PAT FLANIGAN.