

No. 615,881.

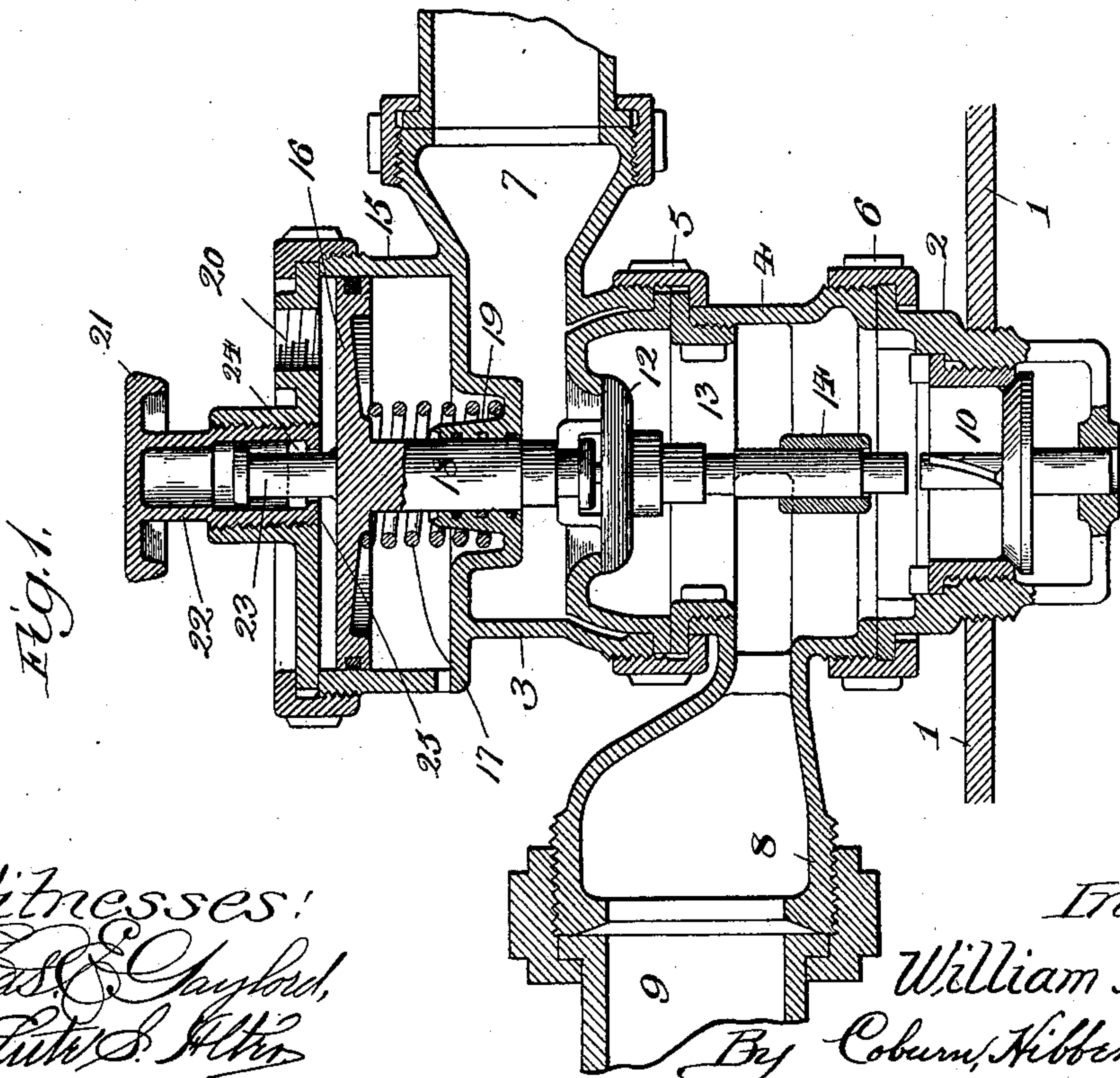
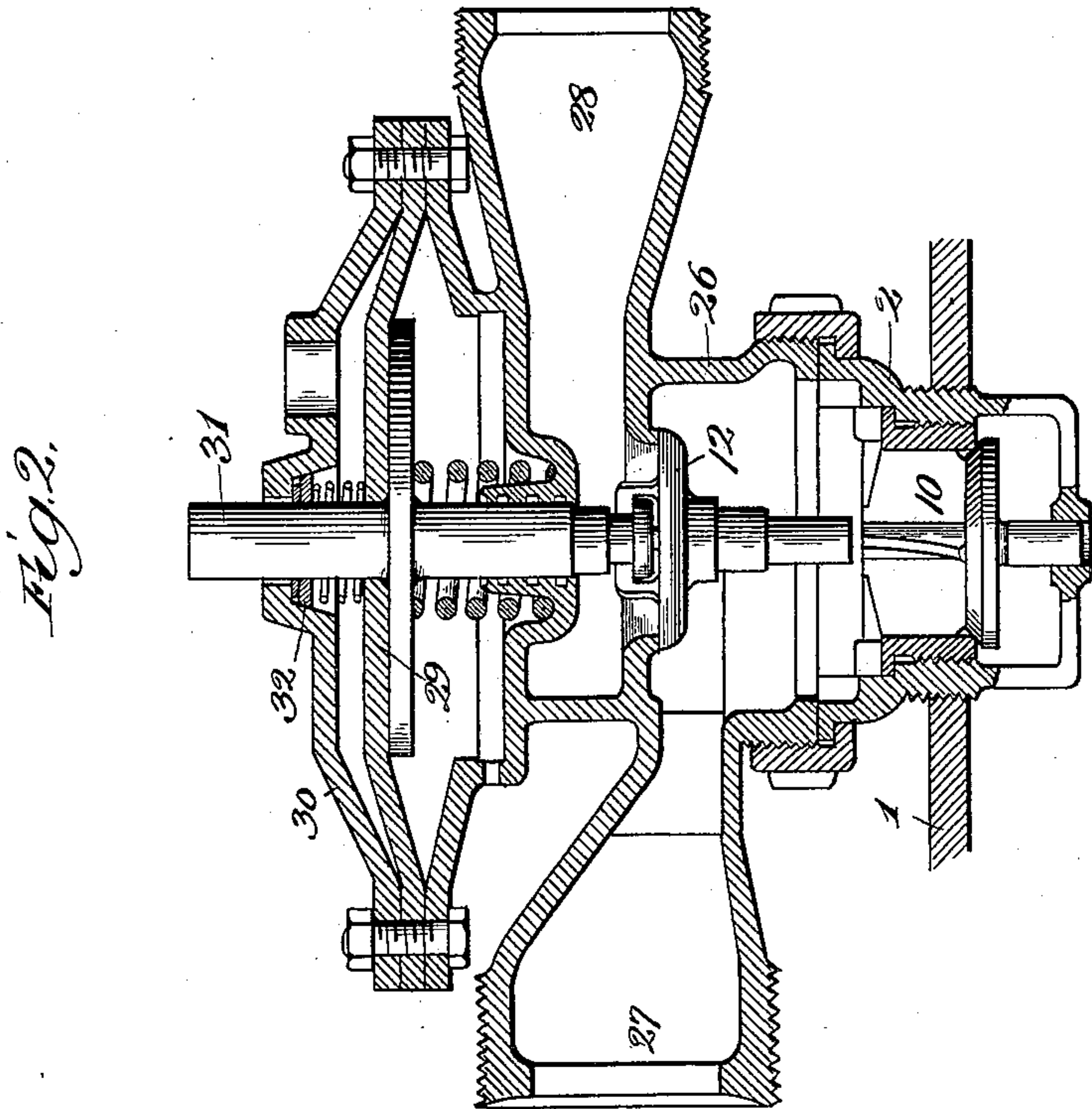
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W. McINTOSH.

COMBINED BOILER CHECK AND BLOW-OFF COCK.

(Application filed Feb. 14, 1898.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

WILLIAM MCINTOSH, OF WINONA, MINNESOTA.

## COMBINED BOILER-CHECK AND BLOW-OFF COCK.

SPECIFICATION forming part of Letters Patent No. 615,881, dated December 13, 1898.

Application filed February 14, 1898. Serial No. 670,202. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM MCINTOSH, residing at Winona, in the county of Winona and State of Minnesota, have invented a Combined Boiler-Check and Blow-Off Cock, of which the following is a specification.

The object of my invention is to provide a combined boiler-check and blow-off cock preferably so constructed and operated that the boiler may be blown off at the same point where the water is fed into the boiler.

My preferable form of device embodies features of safety whereby in case of any injury thereto or of its stripping from the boiler by accident the boiler will not be allowed to be blown off.

My invention is particularly applicable to locomotive-boilers; but I do not confine myself to such application, as I contemplate its use and adoption to any boiler or the like.

In the drawings, Figure 1 is a side elevation of my combined boiler-check and blow-off cock, and Fig. 2 a sectional elevation thereof.

My device is adapted to be inserted in place in a port or opening located at any suitable point in the boiler-shell 1 and comprises a valve-casing which is preferably, though not necessarily, composed of three portions—namely, a foundation-plug 2, an outer portion 3, and an intermediate portion 4. The plug is secured in the boiler-port by screwing therein or in any other desired manner. The other portions are secured to each other and to the plug by means of suitable clamping-rings 5 and 6. I prefer to divide the casing into three parts and to clamp them together, so that the position of the water-inlet and the discharge-passage, as hereinafter described, may be adjusted with respect to the plug as well as to each other.

The casing is provided with a discharge-passage 7 and with a water-inlet passage or connection 8, adapted to be coupled to a supply-pipe 9, leading from a water-injector, (not shown,) or it may be connected to any other suitable water-supply pipe. These passages communicate with the interior of the casing, and the flow of water into and out from the boiler is controlled by suitable valve mechanism in the casing. A valve 10 is seated in

the port in the boiler-shell and permits water to enter the boiler freely from the injector-pipe, but checks its return. An independent valve 12 governs the flow from the interior of the casing to the atmosphere and is provided with a stem 13, preferably sliding in a suitable guide 14.

In operating the device as a blow-off the valves are actuated by fluid-pressure mechanism comprising a cylinder 15, located at the upper end of the casing and having a piston-head 16, which is held in its outward position by a spring 17. The piston-head has a stem 18 passing through a suitably-packed guide 19 and carries the valve 12 at its end.

In assembling or attaching my preferable form of construction, as shown in the drawings, the plug is first screwed into place. The intermediate casing is then put into position with the connection 8, adjusted or pointed in the right direction, depending upon the location of the injector-pipe, after which it is clamped by the ring 6. The outer casing is then positioned and adjusted with reference to the position of the discharge-opening and clamped by the ring 5. It is obvious, therefore, that the connections 7 and 8 may be adjusted or pointed in any desired position, depending more particularly upon the place of use or attachment of the device.

When the device is working as a boiler-check, the water forced through the injector-pipe opens the valve 10 and enters the boiler. In the blow-off operation the fluid pressure, either air or steam, under the control of the engineer or operator, by means of any suitable admission-valve, (not shown,) is admitted through a port 20 on top of the piston 16, which is thereby caused to open the valves 12 and 10, which latter valve is contacted by the stem 13 of the other valve and forced off its seat. My device, which is compact and simple, is thus a combined boiler-check and blow-off cock. Only one opening is required in the boiler-shell, and, moreover, great advantages are obtained by blowing off the boiler at the same point where it is fed. The usual trouble with boiler-checks is their tendency to clog and become inoperative, which tendency is aggravated to a considerable degree



since the general use of soda-ash, which precipitates the minerals held in solution. These precipitates and other impurities collect in the check-chambers and thereabout in the form of mud. In my device the blowing-off operation cleans out all collected matters and permits of the proper operation of the device as a boiler-check at all times; and, furthermore, the separate inside valve provides the feature of absolute safety in operation both as a boiler-check and blow-off cock, inasmuch as the casing may be injured or broken without disturbing that valve in its function of governing the port in the boiler.

I prefer to provide my device with a hand-wheel 21, whose hollow stem 22 may be screwed into the cylinder so as to contact the piston-head and operate the valve mechanism, if for any reason no fluid-pressure is obtainable. This hollow stem has a side opening 24, so as to allow the enlarged end or head of the projecting stem 23 to enter therein, being provided at its inner end with flanges 25 to engage the enlarged head and provide a positive means to close the valve in case the fluid-pressure should become inoperative or the spring should fail to return the valve to its seat. When such mechanism is employed, it is thus possible to operate the device either manually or by fluid pressure.

In Fig. 2 I have shown a modified form of construction in which the intermediate portion of the casing is dispensed with, as before alluded to. In this form the casing 26 is provided with both the injector connection 27 and the discharge-passage 28 and is secured to the foundation-plug by the same clamping-ring as used to attach the intermediate section to the plug in the other form, Fig. 1. Furthermore, I have substituted a flexible diaphragm 29 for the piston shown in Fig. 1, but the operation is the same in both instances. The diaphragm is clamped in place in its cylinder or chamber by the end plate 30, which closes the end thereof. This diaphragm is connected to and operates the valve 12 in the same manner as the piston. A stem 31 is attached to the diaphragm and projects through the end plate, being packed in any suitable manner, as by the packing 32, so that the valve mechanism may be manually operated when desired by forcing the stem inward. While I have in some of the claims spoken of a piston, it will be understood that its equivalent (the flexible diaphragm) is included and covered thereby.

Although I have described more or less precise forms and details of construction, I do not intend to be understood as limiting myself thereto, as I contemplate changes of form, the proportion of parts, and the substitution of equivalents, as circumstances may require or render expedient, without departing from the spirit of my invention, and, furthermore, I contemplate using my invention wherever ap-

plicable and do not limit myself to its particular use as shown and described.

I do not herein claim the means shown and described for manually operating the piston-head, but reserve the same as part of the subject-matter of an application filed by me on November 19, 1898, Serial No. 696,855.

I claim—

1. The combination, with an injector and a boiler having a port through its shell, of a casing communicating with the injector and arranged over such port, and mechanism therein for governing both the water fed from the injector to the boiler and the blowing off of the boiler to the atmosphere through such port.

2. The combination, with a boiler, of a valve governing the port in the boiler and normally permitting water to be fed therein, and fluid-pressure-controlled means for opening the valve to blow off the boiler to the atmosphere.

3. The combination, with a boiler, of a casing secured in an opening in the boiler and having communication respectively with the boiler, a water-supply and the atmosphere, and a valve located within the casing and governing the passage of water into the boiler but preventing its return and also governing its discharge therefrom through the casing to the atmosphere.

4. The combination, with a boiler having an opening or port through its shell, of a casing arranged over such port and provided with a passage communicating with an injector-pipe and leading to the boiler through the port and also provided with a passage leading from the port through the casing to the atmosphere, and valve mechanism governing said passages.

5. The combination, with a boiler, of a casing secured in an opening in the boiler and having communication respectively with the boiler, the water-supply and the atmosphere, a valve governing said opening and permitting the flow of water into the boiler from the water-supply, and a second valve normally closing the discharge to the atmosphere but adapted to open the same and actuate the first valve to blow off the boiler.

6. A combined boiler-check and blow-off cock comprising a casing located over an opening in a boiler and having communication respectively with the boiler, a water-supply and the atmosphere, a valve governing said opening in the boiler normally permitting the boiler to be fed from the water-supply, a second valve governing the discharge to the atmosphere and provided with a stem which, when its valve is moved, forces the first valve from its seat, and fluid-pressure mechanism for operating such second valve.

7. A combined boiler-check and blow-off cock comprising a valve-casing located over an opening in a boiler and comprising a plug 2, an outer portion 3 and an intermediate portion 4, a valve 10 governing the boiler-open-



ing; a water-supply connection 8 in the intermediate portion of the casing, a discharge connection 7 in the outer portion, a valve 12 having a stem 13 adapted, when moved, to  
5 actuate the valve 10, and a piston 16 having a stem 18 actuating the valve 12.

8. The combination with a boiler having a port through its shell, of a casing communi-

cating with such port and a combined boiler-check and blow-off cock arranged in such casing and adapted to control the boiler-feed and the blow-off.

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