

No. 850,050.

PATENTED APR. 9, 1907.

A. S. POWELL.  
WATER GAGE.

APPLICATION FILED MAY 10, 1906.

Fig. 4.

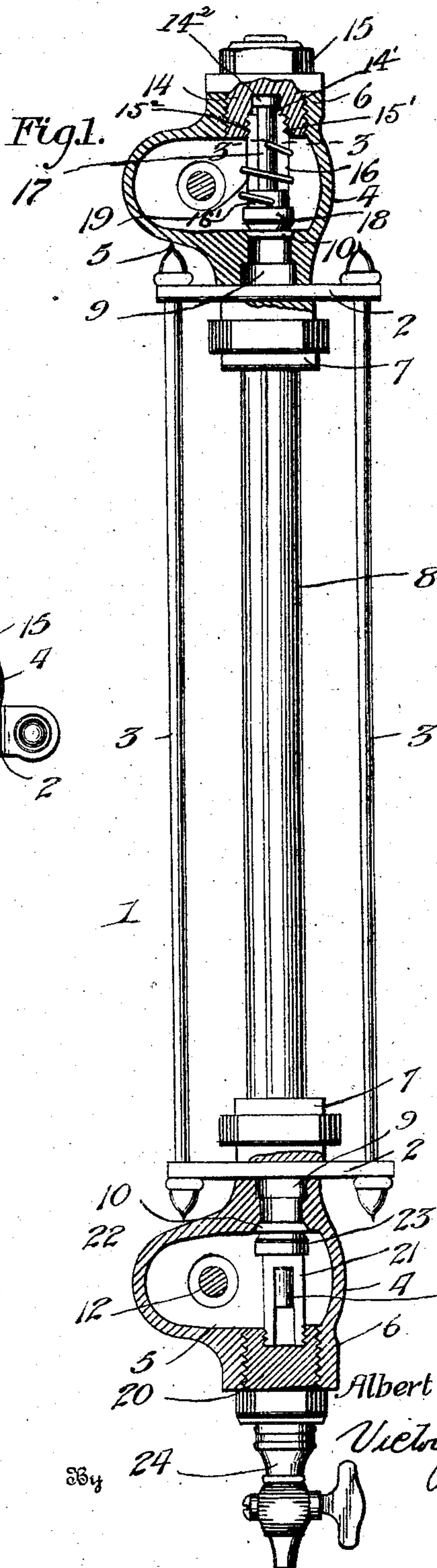
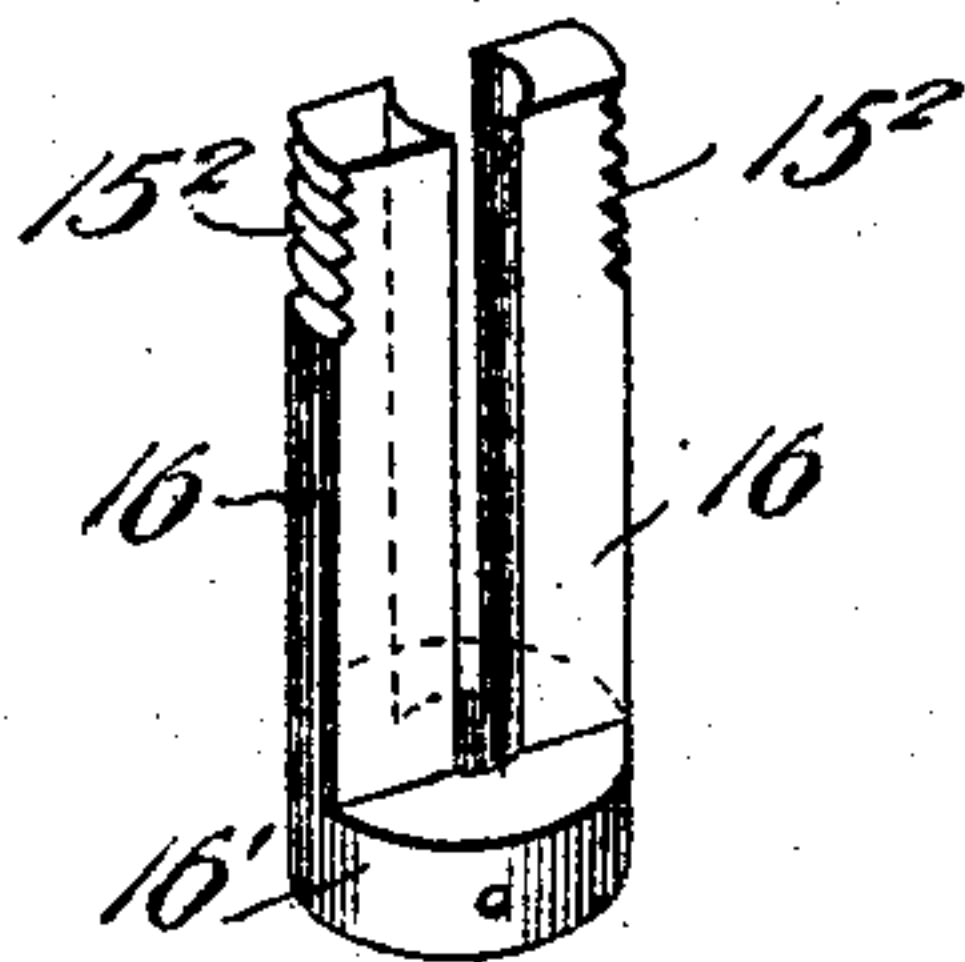


Fig. 2.

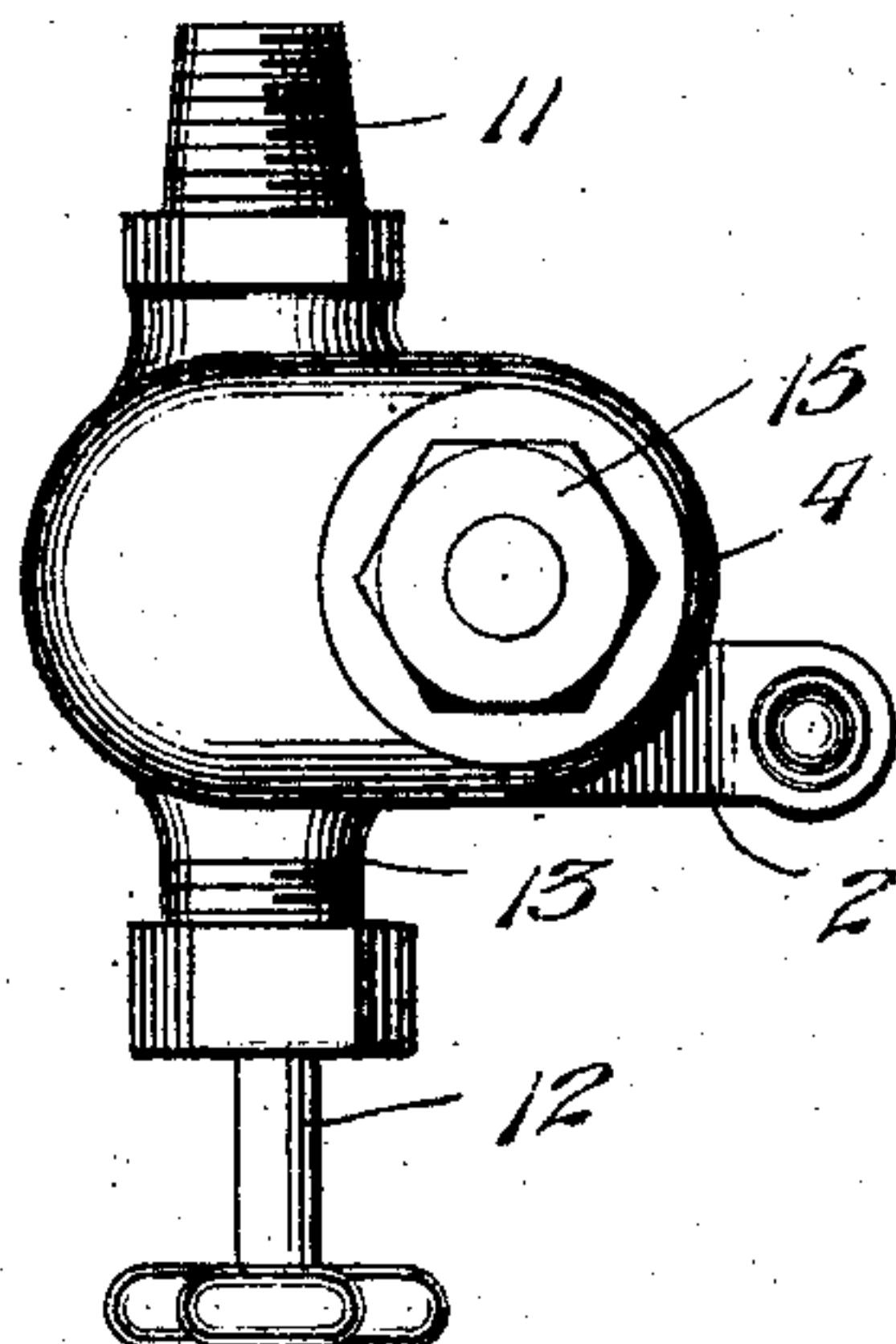
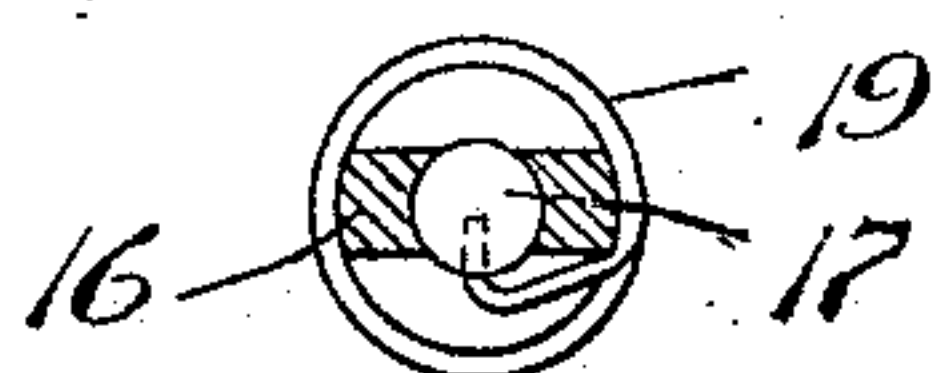


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## WATER-GAGE.

No. 850,050.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed May 10, 1905. Serial No. 259,810.

*To all whom it may concern:*

Be it known that I, ALBERT S. POWELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Water-Gages, of which the following is a specification.

This invention relates to water-gages for boilers, and has for its objects to produce a comparatively simple inexpensive device of this character in which the steam and water from the boiler will be readily admitted to the gage-tube, one wherein in the event of the tube breaking or becoming otherwise defective the flow of water and steam to the tube will be automatically cut off, and one in which the cut-off or check valves may be readily removed to permit cleaning or repairing of the tube.

With these and other objects in view the invention comprises the novel features of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a boiler-gage embodying the invention. Fig. 2 is a top plan view of the same. Fig. 3 is a detail section transversely through the upper check-valve, taken on the line 3 3 of Fig. 1. Fig. 4 is a perspective view of the guide for the valve-stem.

Referring to the drawings, 1 designates a gage-supporting frame of usual construction comprising end members or plates 2 and vertical parallel rods 3, connected at their ends with said plates, to which latter there is also connected hollow valve-casings 4 identical in construction and each consisting of a casting having an internal chamber 5 and an outer internally-threaded reduced neck 6, said valve-casings 4 being provided with inner reduced necks 7, to which are coupled the ends of a glass gaged tube 8, disposed within and extending longitudinally through the frame 1. Leading from the chamber 5 of each casing 4 and through the reduced neck 7 is a port 9, communicating with the adjacent end of the tube 8 and having at its inner end a beveled valve-seat 10, there being formed upon each valve-casing a tubular externally-threaded nipple 11, adapted for connection with the engine-boiler and constituting a port leading to the chamber 5, said port being adapted to be closed by a suitable valve, the stem 12 of which extends through a tubu-

lar bearing 13, also formed upon the casing 4 and in line with the nipple 11.

Threaded into the reduced neck 6 of the upper valve-casing is a plug 14, equipped with a polygonal head 15, said plug being provided with an internal-screw-threaded portion 15', and arranged above said screw-threads and within the plug is a recess 14'.

The numeral 16' designates a base-piece having a central opening therein, and on the upper surface of this base and contiguous with the opening thereof is a spaced-apart guide 16, constructed in two sections, having semicircular inner surfaces and rounded outer surfaces and flat front and rear faces, the upper end of the two sections being externally threaded at 15<sup>2</sup> to engage the internal-screw-threaded portion 15' of the plug. A stem 17 with a valve 18 on its lower end is slidably mounted in the opening of the base 16', and said stem is also interposed between the semicircular inner faces of the two sections of the guide, said valve serving to contact with a seat 10 in the upper casing to close the same. The upper end of the stem is provided with a disk 14<sup>2</sup>, which serves in connection with the recess to regulate the movement of said valve 18. A spring 19 is lapped to the rounded sides of the sections of the guide in coiled position and has one end secured in a perforation of the stem 17, its other end being secured in a perforation of the base 16'.

Threaded into the neck 6 of the lower casing 4 is a plug 20, into which is tapped one end of an inwardly-projecting guide 21, having slidably disposed therein the stem 22 of a lower check-valve 23, designed to close upon the adjacent seat 10 and normally maintained in opened position through gravity, there being connected with the plug 20 a petcock 24, through the medium of which the lower chamber 5 may be drained from time to time, as circumstances require, it being understood that the lower casing 4 is equipped with a nipple 11, adapted for engagement with the boiler and constituting a port leading to the chamber, said port being designed to be closed by a valve, the stem 12 of which works in an extension in line with the nipple, as in the instance of the upper casing 4 above described and as shown in Fig. 2.

In practice the upper casing 4 is connected with the boiler at a point above the water-



level, or, in other words, with the steam-space of the boiler, while the lower casing 4 is connected with the latter at a point below the water-level, whereby when the controlling-valves are opened the water and steam will flow into the tube 8 and through the equalization of pressure indicate in the latter the water-level of the boiler, as is usual in devices of this character. In the event of the tube 8 becoming broken or a leakage occurring at the point of its connection with either of the necks 7 the equalization of the pressure in the tube as compared with that in the boiler will of course be destroyed, and the increased pressure exerted by the water and steam entering the chambers 5 will automatically actuate the valves 18 and 23 for closing the ports 9, leading to the tube, under which conditions the valves will close firmly upon their seats 10. As soon as the check-valves close the flow of water and steam from the boiler to the tube will of course be cut off, and in order to repair the damage it is only necessary to close the ports 11 by means of their cut-off valves, whereupon the defective joint of the tube may be remedied or a new tube mounted in the frame 1, after which operation and upon opening the cut-off valves the check-valves will automatically return to open position, the upper valve being moved through the medium of the spring 19 and the lower valve 23 by gravity, as heretofore explained. At such times as it may be desirable to clean or for other purposes to gain access to the interior of the tube 8 the plugs 14 and 20 may be readily unscrewed and removed from the necks 6, carrying with them their respective valves 18 and 23, which are connected to the plugs through the medium of the guides 16 and 21.

It is to be particularly noted that in my improved device the tube 8 is disposed at

one side of the valve-stem 12, whereby interference of the latter with the proper movements of the check-valves is obviated and at the same time a clear unobstructed passage through the tube 8 is presented when the plugs 14 and 20 are removed. It will further be observed that under my construction the tube 8 may be cleaned or a new tube introduced by merely operating the cut-off valves to stop the flow of water and steam to the tube, thus obviating the necessity for allowing the steam-pressure in the boiler to fall during the cleaning or repairing operation of the gage.

Having thus described the invention, what is claimed as new is—

A water-gage comprising a glass tube with casings at opposite ends having valve-seats therein, plugs tapped into the walls of the casings, a recess in one of the plugs, a guide having a base with a central opening therein, and provided with spaced-apart sections rising upwardly therefrom, each having semicircular inner faces and rounded outer faces, a stem mounted in the opening of the guide-base, a valve on the lower end of the stem to engage the valve-seat, said stem having vertical movement in said semicircular faces of the guide and its base, a spring lapped to the rounded outer faces of the guide-sections and having its ends secured respectively to the stem and the base of the guide, and a disk on the upper end of the stem having movement in said recess of the plug to regulate the action of the valve-stem, substantially as specified.

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

ALBERT S. POWELL.

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