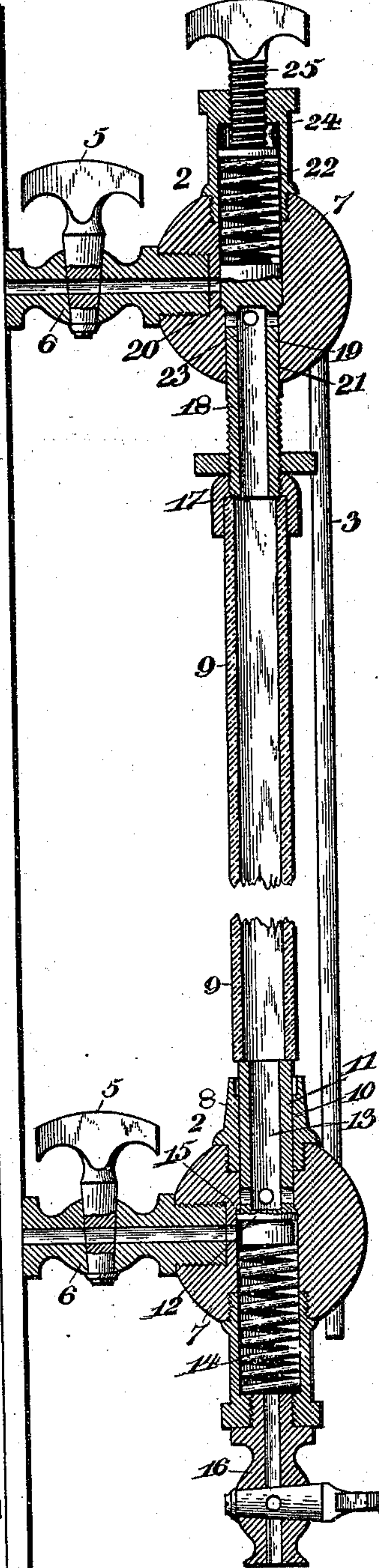
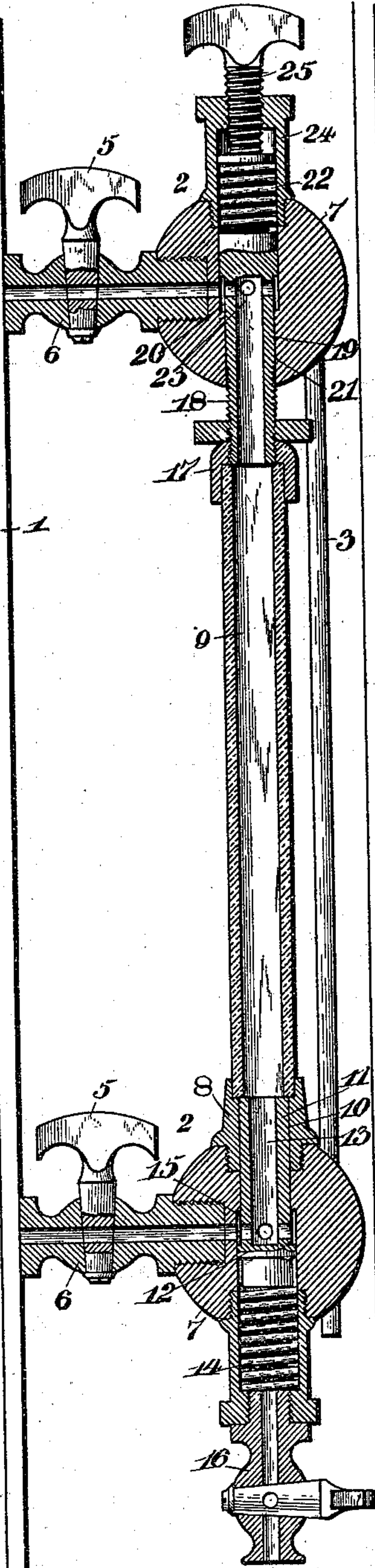
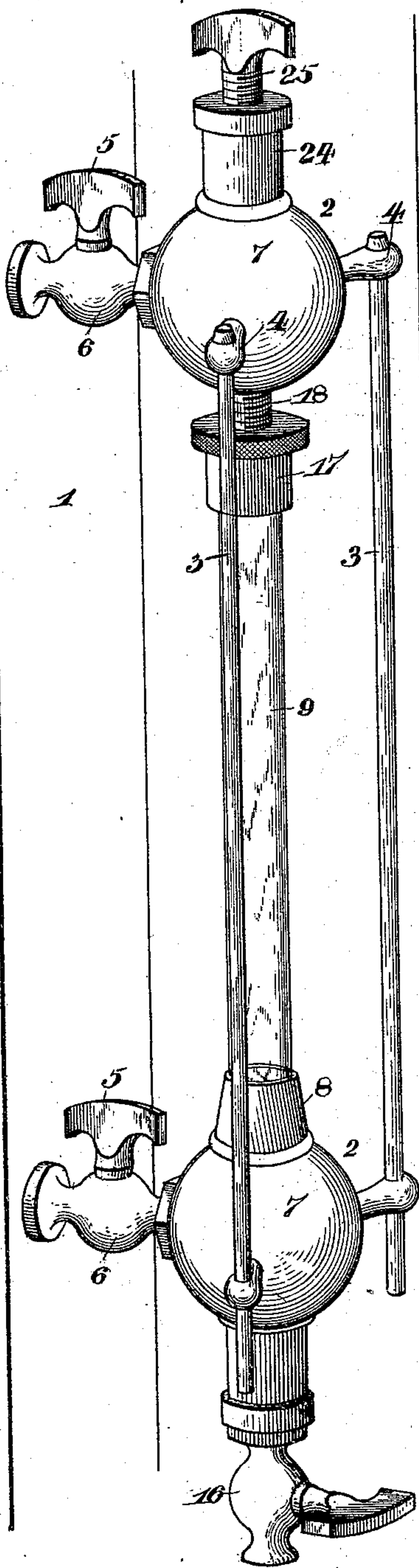


(No Model.)

B. LONG & H. RIEDEL.  
WATER GAGE.

No. 554,283.

Patented Feb. 11, 1896.



Witnesses H. E. I.

*H. Doyle*  
*[Signature]*

By H. E. I. H. E. I. H. E. I. Inventors,

By *Their Attorneys.* *Barnett Long and*  
*Henry Riedel.*

*C. Snow & Co.*



# UNITED STATES PATENT OFFICE.

BARNETT LONG AND HENRY RIEDEL, OF GREENCASTLE, PENNSYLVANIA,  
ASSIGNORS OF ONE-THIRD TO IRA DECKER, OF SAME PLACE.

## WATER-GAGE.

SPECIFICATION forming part of Letters Patent No. 554,283, dated February 11, 1896.

Application filed March 28, 1895. Serial No. 543,500. (No model.)

*To all whom it may concern:*

Be it known that we, BARNETT LONG and HENRY RIEDEL, citizens of the United States, residing at Greencastle, in the county of Franklin and State of Pennsylvania, have invented a new and useful Water-Gage, of which the following is a specification.

Our invention relates to a water-gage for steam-boilers; and it has for its object to provide improved means for seating the ends of the transparent tube, whereby when said tube breaks the escape of water and steam is prevented, and whereby the seating of a new tube is facilitated.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a water-gage embodying our invention. Fig. 2 is a vertical central section of the same, showing the transparent tube in place. Fig. 3 is a similar view showing the parts in the positions which they assume when the tube breaks.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a section or portion of a steam-boiler, and 2 the spaced valve-casings communicating with the interior of the boiler and connected by the rods 3, which are fitted in lateral ears 4 projecting from said casings. The valves 5 are preferably in the form of stop-cocks of the ordinary construction, which are fitted in transverse openings in the shanks 6 of said valve-casings, and the heads or globes 7 of the casings are provided with aligned bores, which communicate with the bores of the shanks intercepted by said valves.

The lower head or globe is provided in its upper side with a seat 8 for the reception of the lower end of the transparent tube 9, and projecting up through a central bore or opening 10 in this seat is the stem 11 of a valve 12. This stem is provided with a channel 13, which communicates with the tube and with the interior of the valve-casing to provide a free passage of the water. In contact with the lower end of the valve is an actuating-

spring 14, the tendency of which is to raise the valve to its seat 15 and cut off escape from the valve-casing through the bore or opening 10. This spring-actuated or check valve is normally held out of contact with its seat by the pressure of the tube upon the upper end of the stem 11. A blow-off or drain cock 16 communicates with the valve-casing at its under side, as in the ordinary construction of devices of this class.

The seat for the upper end of the tube consists of a cup 17, arranged below and outside of the valve-casing and carried by the stem 18 of a check-valve 19, said valve being similar in construction and operation to that above described. This valve is adapted, when the tube is removed or broken, to be forced against the seat 20 around the bore or opening 21 by means of the actuating-spring 22, which is normally held repressed by the contact of the tube with the seat carried by the stem 18.

The stem 18 is provided with a steam-channel 23, as described in connection with the stem 11, one end thereof communicating with the interior of the tube and the other with the interior of the valve-casing. Inasmuch as these channels are formed in the stems of the check-valve they are outside of or beyond the valve-seats when the valves are in their closed position.

From the above description it will be seen that the lateral ports in the casing with which the shanks 6 communicate are adapted, when the valves are repressed, to communicate directly through the lateral ports in the valve-stems with the channels or bores of the stems, said ports in the stems being arranged contiguous to the planes of the valves. The valve-stems fit snugly in the aligned bores or openings of the casings, whereby, when the valves are unseated to allow communication between the lateral ports and the channels of the stems, the escape of fluid between the exterior surfaces of the stems and the walls of the aligned bores is prevented without the use of auxiliary valves to close the outer ends of the bores.

A removable cap 24 is arranged upon the upper side of the upper casing, and fitted



therein is an adjusting or tension screw 25 to bear against the end of the upper spring and vary its tension.

The valves are imperforate to form suitable  
5 seats for the inner ends of the actuating-springs, and by arranging the inlet-openings of the casings in the sides thereof, and communicating directly with the enlarged portions of the bores contiguous to the valve-  
10 seats, and between the planes of the valve-seats and the outer ends of the valves, the fluid admitted through said inlet-openings is prevented from reaching the outer ends of the valves, and hence the passages in the  
15 casing are direct and are readily accessible for cleaning.

The construction of the above-described device enables a broken tube to be replaced by inserting its lower end in the socket of the  
20 lower valve-casing and repressing the upper socket sufficiently to receive the upper end thereof.

Further advantages of the construction will be apparent to those skilled in the art to  
25 which this invention appertains, and it will be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of  
30 the advantages of this invention.

Having described our invention, what we claim is—

1. In a water-gage, the combination of upper and lower valve-casings provided with  
35 aligned bores having enlarged outer and reduced inner portions to form intermediate valve-seats, imperforate valves arranged to operate in the enlarged outer portions of the bores in operative relation with said seats and  
40 provided with inwardly-extending tubular stems projecting through the seats and fitting snugly in the reduced inner portions of the bores, said stems being provided adjacent to the planes of the innersides of the valves with  
45 lateral ports which are closed when the valves are seated and said stems are arranged in the reduced portions of the bores, direct lateral inlet-openings communicating with the casings slightly beyond or outside of the valve-  
50 seats in the enlarged portions of the bores and being covered and closed by the valves when the latter are seated, said inlet-openings being arranged between the planes of the valve-seats and the outer ends of the valves in either  
55 the seated or unseated positions of the latter, actuating-springs arranged in alignment with the bores with their inner ends in contact with the outer surfaces of the valves, to insure the seating of the latter when released, and a  
60 transparent tube arranged to repress and hold

the valves unseated against the tension of said actuating-springs, substantially as specified.

2. In a water-gage, the combination of upper and lower valve-casings provided with lateral ports and aligned bores surrounded by  
65 valve-seats, valves arranged in operative relation with said seats and having channeled stems extending through the bores, springs arranged in operative relation with the valves to press them toward their seats, a drain-cock  
70 removably secured to the lower valve-casing in alignment with the lower spring, a cap removably fitted to the upper valve-casing in alignment with the spring, a tension-screw  
75 arranged in the cap for varying the tension of the upper spring, and a transparent tube arranged to repress said valve-stems to hold the valves normally unseated, substantially as specified.

3. In a water-gage, the combination of upper and lower valve-casings having aligned bores enlarged to form valve-seats communicating with the bores, and also provided with lateral ports communicating with the enlarged  
85 portions of the bores, valves arranged in the enlarged portions of the bores and adapted to occupy a position upon either side of the planes of the lateral ports, said valves having inwardly-extending tubular stems provided contiguous to the planes of the valves with  
90 lateral openings adapted when the valves are unseated and arranged beyond or outside of the lateral ports in the casing to align with said lateral ports, and adapted when the valves are seated to be closed by the walls of the  
95 bores, a fixed transparent tube-seat arranged in alignment with the bore of one of the casings and having an opening in alignment with said bore through which the contiguous valve-stem projects, a transparent tube-seat carried  
100 by the other valve-stem and movable therewith, and a transparent tube fitted at its extremities in said seats, the interior diameter of said tube being smaller than the exterior diameter of the stem which projects through  
105 the fixed tube-seat, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

BARNETT LONG.

HENRY <sup>his</sup> × RIEDEL.  
mark

Witnesses for Barnett Long:

WM. F. DIEHL,  
SAMUEL S. EASTON.

Witnesses to mark of Henry Riedel:

D. S. PENSINGER,  
J. H. LIGHT.