

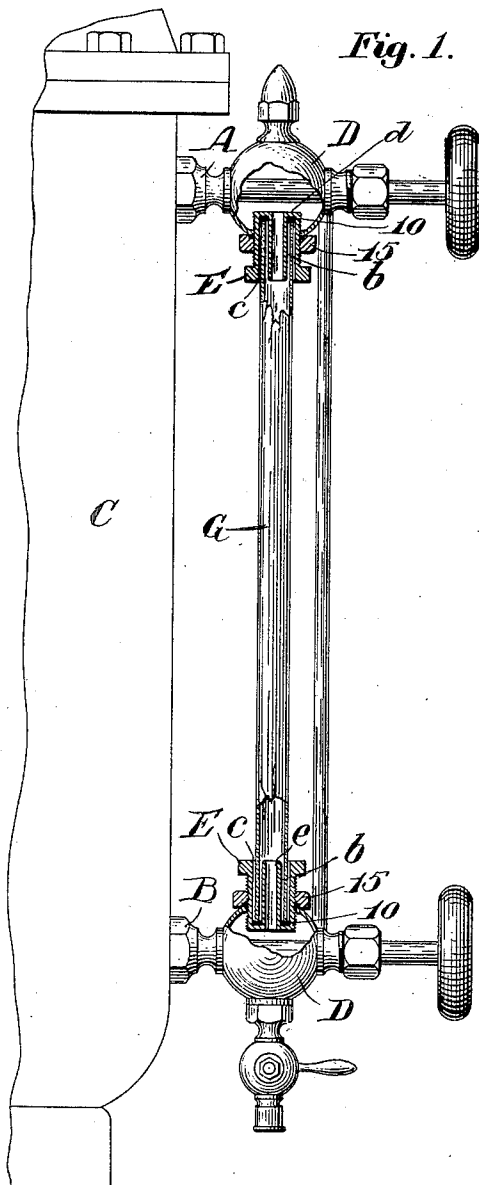
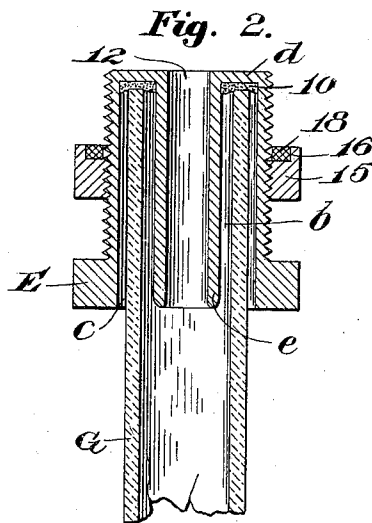
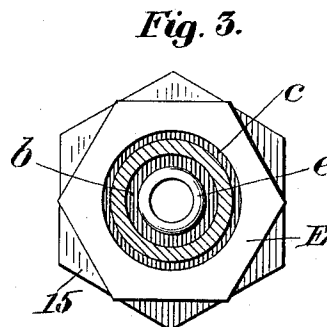
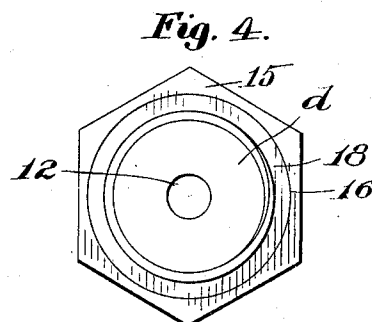
No. 707,943.

Patented Aug. 26, 1902.

D. W. ROCKWELL.
WATER GAGE FOR STEAM BOILERS.

(Application filed Dec. 17, 1901.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID W. ROCKWELL, OF BROCKTON, MASSACHUSETTS.

WATER-GAGE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 707,943, dated August 26, 1902.

Application filed December 17, 1901. Serial No. 86,326. (No model)

To all whom it may concern:

Be it known that I, DAVID W. ROCKWELL, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain Improvements in Water-Gages for Steam-Boilers, of which the following is a specification.

In water-gages as heretofore constructed the end of the glass gage-tube is closely confined within the socket or coupling by which it is attached to the valve-casing or steam-arm which enters the water-column and is directly exposed to the steam, which acts chemically on the glass and eats or cuts it away at this point, rendering it thin and weak, so that it is liable to break at any moment, many serious accidents often resulting from this cause. To overcome this difficulty by preventing the steam from impinging on the end of the tube, as heretofore, and also to provide means whereby the air is permitted to contact with the outside of that portion of the tube within the coupling or socket, thus keeping it cool, is the object of my invention, which consists in a coupling or socket provided with a chamber of sufficient diameter to receive the end of the glass gage-tube and leave an open air-space all around the outside of the same, whereby it is kept cool, said chamber being tightly closed at its inner end to exclude the steam therefrom and provided with a steam-inlet nozzle or tube centrally arranged within said chamber and adapted to project into the glass tube, whereby the steam as it issues in a small jet from said nozzle is directed away from the end of the glass tube, which is thus prevented from being eaten or cut away in grooves by the chemical action of the steam thereon, as heretofore, and the liability of accident from the breaking of the tube thereby reduced to a minimum.

In the accompanying drawings, Figure 1 is sectional elevation of a water-gage embodying my invention. Fig. 2 is an enlarged sectional detail of the tube socket or coupling with the end of the gage-tube therein. Fig. 3 is an enlarged plan view of the front end of the tube-socket. Fig. 4 is an enlarged rear view of the same.

In the said drawings, A B represent the upper and lower arms of a water-gage adapted

to be screwed as usual into the water-column C and each provided with a valve D, into the casing of which is screwed a socket or coupling E for holding the end of the glass gage-tube G and connecting it with the shell or casing of the valve. Within the coupling E is formed a chamber *b* for the reception of the end of the glass gage-tube G, said chamber, which is tightly closed at its inner end to exclude the steam therefrom, being of larger diameter than the tube, whereby an open annular space *c* is formed between the exterior of said tube and the walls of the chamber *b* for the admission of the outer air, which thus tends to cool the end of the tube which is protected from the chemical action of the steam by the closed end *d* of the chamber *b*, which prevents the steam from impinging on the end of the tube. A suitable packing-ring 10 is interposed between the end of the chamber and the end of the gage-tube to make a steam-tight joint.

Projecting outwardly from the inner solid end or bottom *d* of the chamber *b* and made integral therewith is an inlet-nozzle *e*, communicating with the interior of the valve-casing through an opening 12, Fig. 4, and extending into the end of the gage-tube, the length of the nozzle being about equal to the depth of the chamber, whereby the steam as it issues from the small orifice at the end of said nozzle is caused to enter the gage-tube at some little distance from its end, which is thereby protected from the chemical action of the steam, which eats or cuts away the glass in grooves when permitted to come into contact therewith, while the central position of the nozzle causes the force of the steam-jet to be expended in the line of the axis of the gage-tube, so that it will strike the water in the tube and then be diffused within said tube instead of first expending its force against the sides of the same, as is the case where the steam is admitted directly into its open unprotected end, as heretofore. Consequently the gage-tube is prevented from becoming unduly heated, and as its end is protected from the chemical action of the steam, as above described, its liability to become broken is reduced to a minimum and its durability materially increased.

The construction of the lower socket E,

which contains the water end of the gage-tube, is similar to that of the upper socket; but, if desired, a shorter inlet-nozzle may be used for the lower socket on account of the
 5 absence of steam at this point.

When the gage-tube is in place, its ends are forcibly pressed against the packing-rings 10 to make steam-tight joints by slightly unscrewing one or both of the couplings E, after
 10 which they are clamped in place by means of check-nuts 15, applied to their threaded exterior surfaces and screwed tightly against the valve-casings, each of said check-nuts being provided on its rear side with an annular
 15 groove 16, containing a soft-metal packing-ring 18, which is adapted to be forced against the valve-casing around the opening into which the coupling is screwed, thus making the joint steam-tight.

20 What I claim as my invention, and desire to secure by Letters Patent, is—

A water-gage comprising upper and lower arms each provided with a valve, gage-tube sockets or couplings screwed into the valve-casings and provided with chambers closed 25 at their inner ends, a gage-tube having its ends fitted within said chambers, inlet-nozzles projecting from the inner ends of said chambers and extending into the end portions of the gage-tube, packing-rings interposed be- 30 tween the ends of the gage-tube and the closed ends of the chambers, and check-nuts turning on the exterior threaded portions of the sockets and adapted to be screwed against the valve-casings. 35

Witness my hand this 13th day of December, A. D. 1901.

DAVID W. ROCKWELL.

In presence of—

ROBBINS B. GROVER,
 CHAS. O. EMERSON.