No. 646,022. Patented Mar. 27, 1900.

J. A. & S. FLETCHER.

WATER GAGE.

(Application filed Nov. 11, 1899.)

(No Model.) 2 Sheets—Sheet 1.

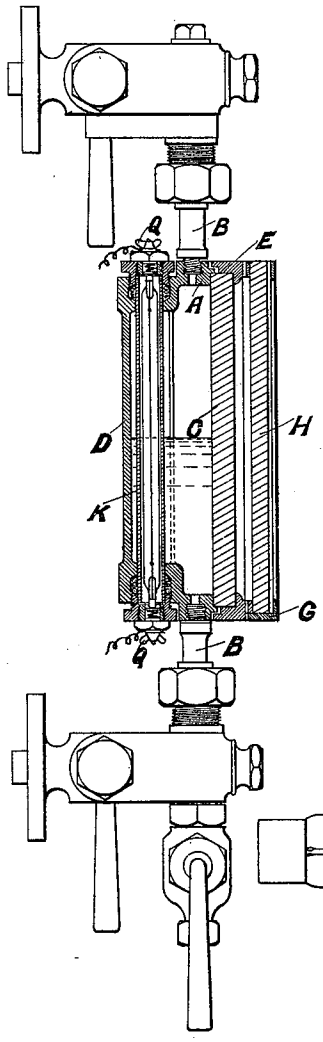

FIG. 1.

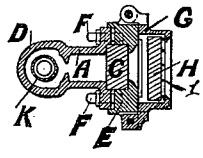

FIG. 2.

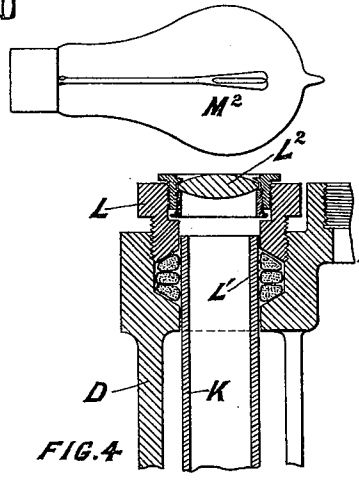

FIG. 4

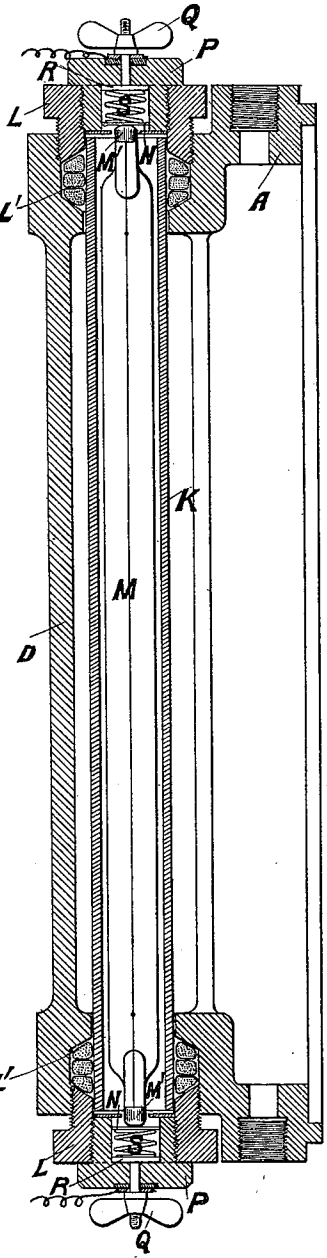

FIG. 3.

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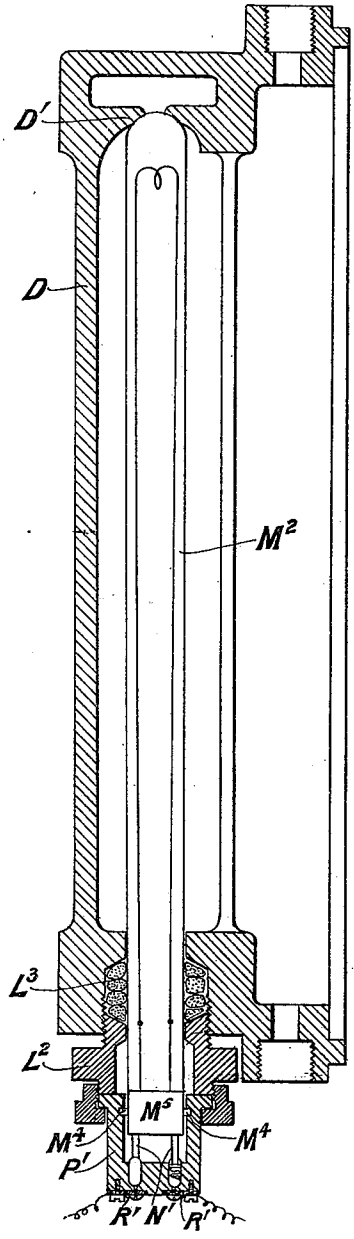

FIG. 5

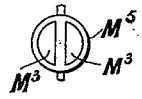

FIG. 5a

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UNITED STATES PATENT OFFICE.

JAMES ASHTON FLETCHER AND SAMUEL FLETCHER, OF ASHTON-UNDER-LYNE, ENGLAND.

WATER-GAGE.

SPECIFICATION forming part of Letters Patent No. 646,022, dated March 27, 1900.

Application filed November 11, 1899. Serial No. 736,635. (No model.)

To all whom it may concern:

Be it known that we, JAMES ASHTON FLETCHER and SAMUEL FLETCHER, engineers, subjects of the Queen of Great Britain and Ireland, and residents of Ashton-under-Lyne, in the county of Lancaster, England, have invented certain new and useful Improvements in and Relating to Water-Gages, (for which we have made application for Letters Patent in Great Britain, No. 7,810, bearing date April 13, 1899,) of which the following is a specification.

This invention relates to water-gages for steam-boilers and other apparatus where the level of the liquid is indicated by external glass tubes or their equivalents; and the object of the invention is to facilitate the observation of the liquid-levels by an improved arrangement of artificial light or lights.

To this end the invention comprises a gage-glass having a tube extending throughout the length thereof with means for illuminating the tube.

Referring to the accompanying sheet of drawings, which illustrate the method of carrying our invention into effect according to one modification as applied to a water-gage constructed with a flat gage-glass, Figure 1 is a sectional elevation, and Fig. 2 is a central sectional plan, of our improved water-gage. Fig. 3 is an enlarged detail view of Fig. 1, and Fig. 4 illustrates a modification of the arrangement shown in Figs. 1 and 3. Fig. 5 is an enlarged view of the back portion of a gage fitted with the modified form of incandescent lamp, and Fig. 5^a is a plan of the top of the lamp.

The metallic casing A is provided with the usual nozzles B for attachment to the gage-arms, and the flat gage-glass C is held tightly to the front of the casing A by the frame E and screws F. The frame E carries a hinged door G, fitted with a protecting-glass H, covered with wire-netting *l*. The back of the casing A is formed with an enlargement D, which is open top and bottom to admit of the insertion of a glass tube K. The tube K is provided with gland-rings L and packing, which take into gland-recesses L′ in the casing for the purpose of maintaining the exterior of the tube steam and water tight against the pressure in the gage. An elongated incandescent electric lamp M is introduced within the tube K and held between the two metallic plates N, which are carried by the hollow plugs P and which contact with the metallic terminal caps M′ of the lamp. The plugs P are constructed of porcelain, vulcanite, or other suitable insulating material, and they are removably secured in the gland-rings L, in the present instance a screw-threaded connection being used, so as to permit of ready removal and replacement of the lamp. Wing-nuts Q or other suitable terminal connections are provided upon the plugs for connection of the lamp in the circuit of a suitable source of electric current, the connection from the wing-nuts to the lamp being effected through the metal plates R, which connect with the contact-plates N through the springs S.

According to a further modification of the arrangements above described, as illustrated in Fig. 4, we place the lamp M^2 of the ordinary incandescent electric type or other suitable source of light at one end of the tube K and fit the gland-ring L with a lens L^2, so as to direct a beam of light along the axis of the tube, thereby illuminating it.

In order to secure a uniformly-diffused light in the gage, the glass tube K or the lamp may be ground, painted, or otherwise similarly treated.

In the modification of our invention illustrated in Figs. 5 and 5^a the tube-container K is dispensed with and an elongated electric incandescent lamp M^2 is substituted. The glass wall of this lamp is made sufficiently thick to withstand the pressure of steam within the gage, and it is fitted with an ordinary loop filament, the ends of which connect with two insulated terminal plates M^3, Fig. 5^a. The lower end of the lamp passes through a gland-ring L^2, which maintains a water-tight joint around the tube by pressure upon the packing-ring L^3. The upper end of the enlargement D is closed and a cupped projecting ring D′ is cast upon the inside of the enlargement to form a support for the upper end of the lamp when in position. The connections for the lamp are carried by a removable cap P′, which is constructed of suitable

insulating material and is fitted with slots, forming in the usual manner a bayonet-joint with pins M^4, carried by the cap M^5, provided on the end of the lamp. The connections consist of springy contact-pieces N′, which bear at their inner ends upon the lamp-contacts M^3, and are metallically connected at their outer ends to the insulated terminal contact-plates R′.

In a gage constructed as described the water-level can be read with great distinctness against the bright ground produced by the illuminated tube.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination in a water-gage, a casing suitably connected to the boiler or the like, a sight-plate therein and an illuminating-tube extending longitudinally of the casing within the same and means for illuminating the tube.

2. In combination in a water-gage, a casing suitably connected to the boiler or the like, a sight-plate therein and a tube means for illuminating the same extending longitudinally of the tube within the same, said tube being removable, and packing around the ends of said tube to prevent leakage, substantially as described.

3. In combination in a water-gage connected to the boiler or the like, and a tube extending longitudinally of the gage within the same, said tube being removable, and fitted with an artificial light, and packing around the ends of the said tube to prevent leakage, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

JAMES ASHTON FLETCHER.
SAMUEL FLETCHER.

Witnesses:
FRANK WILLIAMSON,
HUGH MOTTRAM.