No. 852,781. PATENTED MAY 7, 1907.

F. W. FISHER.

WATER GAGE FOR BOILERS.

APPLICATION FILED DEC. 21, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

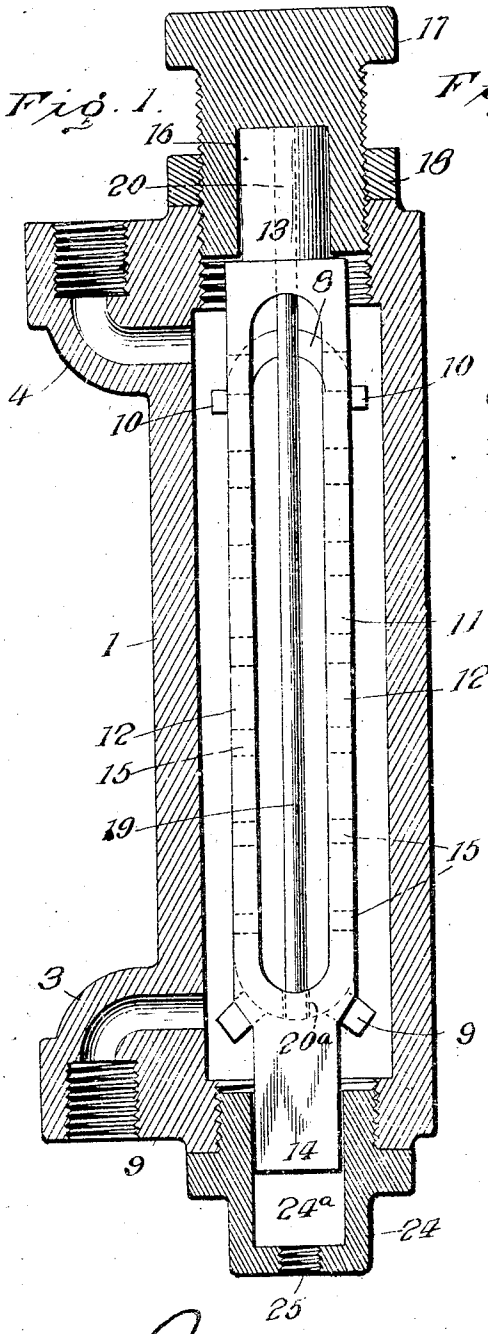
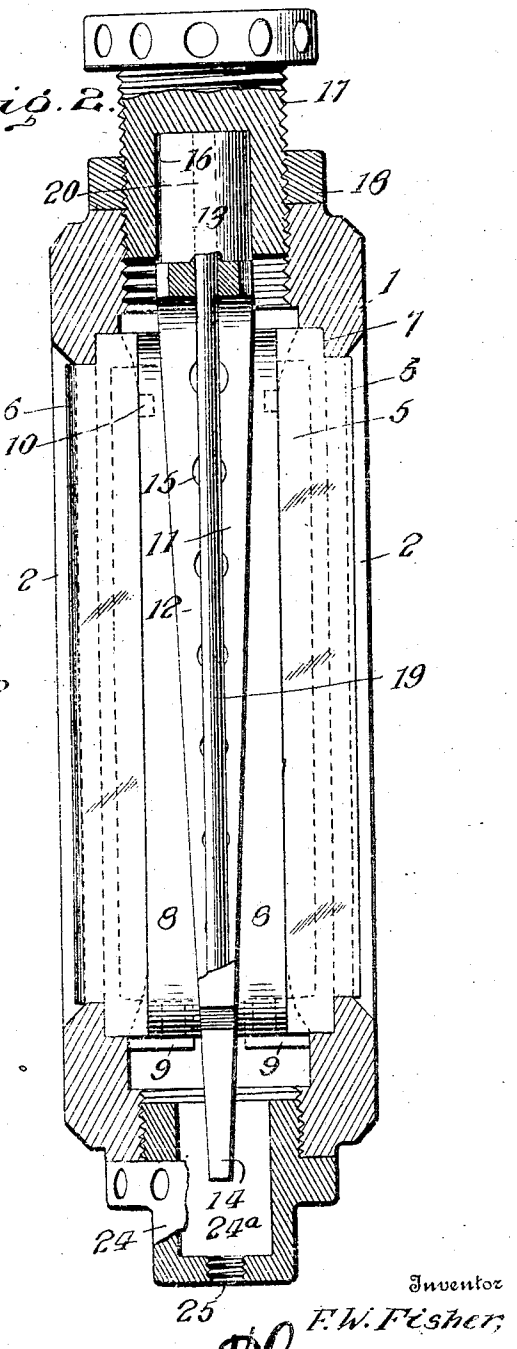


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

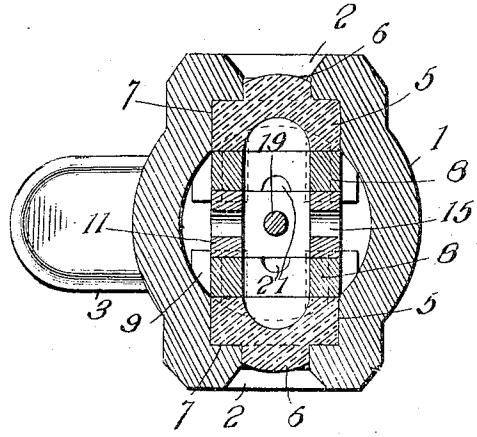


Fig. 6.

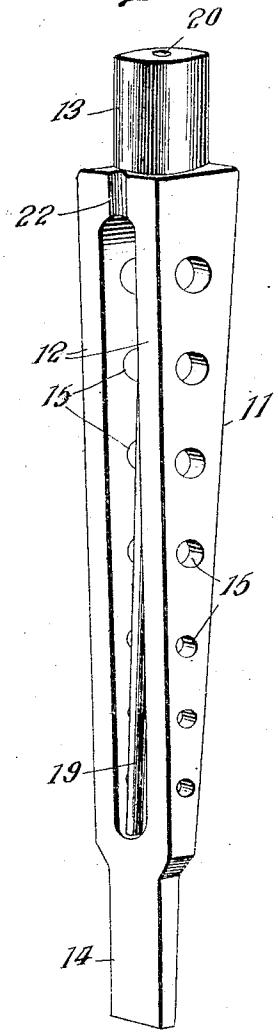
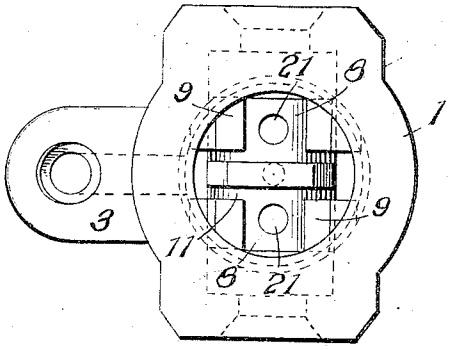


Fig. 4.



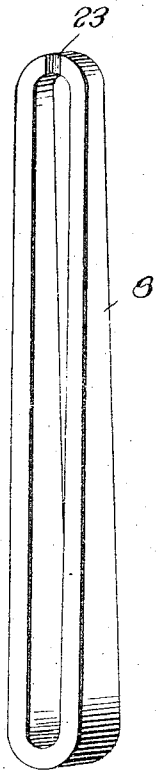
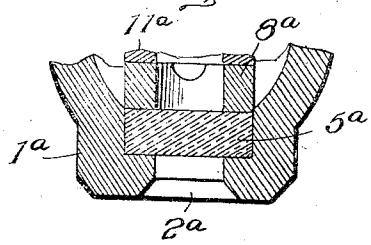


Fig. 7.

Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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WATER-GAGE FOR BOILERS.

No. 852,781. Specification of Letters Patent. Patented May 7, 1907.

Application filed December 21, 1906. Serial No. 349,002.

To all whom it may concern:

Be it known that I, FREDERICK W. FISHER, a subject of the King of England, residing at Collingswood, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Water-Gages for Boilers, of which the following is a specification.

This invention contemplates certain new and useful improvements in water gages for steam boilers, and the object of the invention is to provide a simple and durable construction of water gage which will efficiently withstand the most severe conditions of service under the highest known pressure or any increase thereof that is likely to occur within reasonable limits, and also one which will be reliable and which will facilitate the determination of the water level and which may be readily secured in place and removed.

With this and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain constructions and arrangements of the parts hereinafter specifically set forth and particularly pointed out in the appended claims.

Reference is to be had to the accompanying drawing, in which:

Figure 1 is a longitudinal sectional view of my improved water gage for boilers, the interior parts being shown in side elevation. Fig. 2 is a similar view taken substantially at right angles to Fig. 1. Fig. 3 is a horizontal sectional view. Fig. 4 is a bottom plan view. Fig. 5 is a sectional fragmentary view illustrating a slight modification. Fig. 6 is a detail perspective view of the hollow wedge employed and hereinafter specifically described. Fig. 7 is a similar view of one of the tapered blocks used in connection with the said wedge.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the case of my improved water gage, said case being hollow and provided in opposite sides with an alined sight opening 2 extending longitudinally, as shown. The gage connection to the boiler may be effected in any desired manner, and in the present instance I have shown for this purpose the case 1 of the gage as provided with nipples 3 and 4 forming passages communicating with the interior of the case and screw threaded for connection with the boiler, the said nipples being constituted by off-sets from the case and opening outwardly in opposite directions, as shown.

5 designates the gage glasses adapted to fit within sockets 7 formed within the case 1, and provided with flat inner faces and outer bulged portions 6, that are convex on their outer surfaces and concave on their inner walls, as best seen in Fig. 3. In order to positively insure that these glasses will form a perfectly tight joint at the sight openings 2 and with the walls of the case 1, without depending upon the boiler pressure for this purpose, I provide two tapered blocks 8 that are adapted to be inserted through one end of the case and rest with their thicker ends upon guide lugs 9 preferably formed integrally with the lower case at the lower end thereof. In connection with these lugs 9, upper lugs 10 are used to accurately guide the taper blocks to their place, and co-acting with the said blocks and interposed between them is a wedge 11, also adapted to be inserted into the case from one end of the latter. As best seen in Fig. 2, the taper blocks 8 are tapered on their inner surfaces only, and the said taper corresponds exactly to the taper of the two faces of the wedge, so that as the said wedge is forced down between the two blocks, it will spread them apart in two horizontal planes and a uniform and equal pressure is insured over the entire joint face of both glasses at every stage of the tightening operation.

As best seen in Figs. 6 and 7, the taper blocks 8 are of link form, that is, they are hollow, while the wedge is also hollow and is composed of two side members 12, the edges of which form the tapered faces of the wedge, and which are integrally connected together at their upper ends by means of a preferably cylindrical head 13 and at their lower ends by a tapered tongue 14. Each side member 12 of the wedge is provided with a series of apertures 15 through which water may freely circulate, and the opening or slot in the wedge substantially corresponds in width and in area to the openings through the taper blocks. In order to accurately and gradually move the wedge 11, down between the two tapering blocks, and to accurately guide the wedge during this movement, I provide a compression plug 17, which is adapted to screw into the upper end of the case 1 and which is provided with a cylindrical socket

16 within which the said head 13 accurately fits. The lower end or tongue 14 of the wedge is also designed to fit snugly in and be guided by the walls of a socket 24ª in a hollow plug 24 which is screwed in the opposite end of the case and which is provided with a blow-off port 25 which may be plugged or valved in any desired manner.

18 designates a lock nut which is mounted on the threaded exterior of the compression plug 17 and is made adjustable so as to secure a steam tight joint for said plug. This lock nut and both of the plugs referred to may be provided with a series of spanner holes, as shown, for the insertion of a tool to turn them.

In order to facilitate the reading of the water level within the case and between the two glasses 5, I provide a column 19 which may be constituted by a rod of porcelain, glass, or similar material, which is preferably colored (say, red) so as to impart a decided contrast to the water within the case. This column or rod 19 is held centrally between the two members 12 of the wedge 11 and is, therefore, in alinement with the opening or passage that is produced between the two glasses through the two tapered blocks and the said wedge. In order to preclude the possibility of cracking, owing to the expansion and contraction of the wedge, due to varying temperatures and the varying contraction which must ensue owing to the fact that the rod is of different material or substance from the block, I mount said rod loosely within the wedge, so as to allow it to expand longitudinally. In the present instance, to secure this result, the wedge is provided with an opening 20 extending entirely through its head 13 and through which the said rod is inserted, and I further provide the wedge at its opposite end with a socket 20ª in which the lower end of the said rod rests.

As best seen in Fig. 4, the thicker ends of the two tapered blocks 8 have orifices 21 extending therethrough so as to provide for the free circulation of water through these portions and for the same purpose, the wedge 11 is provided at its thicker end with a groove or opening 22 and the tapered blocks are formed at their adjacent ends with similar openings 23.

From the foregoing description in connection with the accompanying drawings, it will be seen that I have provided a very simple and durable construction of water gage, peculiarly adapted for use in connection with high pressure boilers. As the wedge 11 presses outwardly upon the two tapered blocks 8 in a true horizontal line, and as the wedge is accurately guided down between the two tapered blocks by means of the plugs 17 and 24 before described, it is obvious that the several parts of the device acting in correlation will so stiffen the gage body as to make it impossible to "rain-bow" or get out of a straight line and so prevent a very common cause of breakage. The arrangement of parts hampers in no wise the contraction of the glasses by permitting them to "slide" for the difference of expansion, and the provision of the colored column 19 and its location between the glasses, as before described, will materially assist in showing at a glance the water level, and this action also will be materially assisted by the concavo-convex form of the two glasses and their oppositely disposed arrangement, as a light may be placed behind one glass and the level viewed through the other, in an obvious manner, although I believe that this will only be necessary under peculiar conditions and in rare instances.

Fig. 5 illustrates a modification in which the case 1ª is substantially similar to the case 1, with the sight openings 2ª and in which the glasses are preferably rectangular, as shown, without the swelled portions of the form of glass before described. In this modification the tapered block is designated 8ª and the wedge 11ª.

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

1. In a water gage, the combination of a hollow case arranged for connection to a boiler and provided with oppositely alined sight openings and with sockets adapted to receive glasses, glasses fitted within said sockets, tapered blocks adapted to abut against the inner faces of the respective glasses and provided with openings, substantially as described, a hollow wedge provided with an opening designed to register with the openings of said tapered blocks and adapted to be interposed between said blocks, whereby to press the same outwardly against the glasses, one end of said wedge being provided with a round head, and a compression plug adapted to screw in the end of the case and provided with a socket in which the said head snugly fits.

2. A water gage, comprising a hollow case provided with sight openings and sockets adapted to receive glasses at said sight openings, glasses adapted to fit in said sockets, link shaped tapered blocks adapted to fit against the inner faces of said glasses, said blocks being tapered on their opposing faces, only, a hollow wedge consisting of two spaced members connected together and said members tapered on their side edges and the said taper corresponding to the taper of the said blocks, the said wedge being adapted for interposition between the two tapered blocks, and means for moving said wedge downwardly between the blocks.

3. A water gage, comprising a hollow case provided with sight openings and with sockets adapted to receive glasses at said sight openings, the case being also provided at its

ends with guide lugs, taper blocks adapted to be guided down within the case between said lugs and to rest at one end upon sundry of said lugs, a wedge to force said tapered blocks apart, the tapered blocks and said wedge being hollow and providing an opening from one glass to another, and means for forcing said wedge down between said blocks.

4. A water gage, comprising a hollow case provided with sight openings and sockets adapted to receive glasses at said sight openings, glasses mounted in said sockets, tapered blocks adapted to abut against the inner faces of said glasses, a wedge adapted to be interposed between said tapered blocks and force the same apart against said glasses, said wedge and the said blocks being hollow and providing a space from glass to glass, a column held centrally within said wedge, and means for forcing said wedge between said blocks.

5. A water gage, comprising a case provided with sight openings and sockets adapted to receive glasses at said sight openings, glasses in said sockets, tapered blocks adapted to abut against the inner faces of said glasses, a hollow wedge arranged to be interposed between said tapered blocks and force the same apart, means for holding said wedge between said blocks, and a rod loosely mounted in said wedge, as and for the purpose set forth.

6. A water gage, comprising a case provided with sight openings and sockets adapted to receive glasses at said sight openings, glasses in said sockets, tapered blocks adapted to abut against the inner faces of said glasses, a hollow wedge arranged to be interposed between said tapered blocks and force the same apart, means for holding said wedge between said blocks, the said wedge being provided with an opening extending therethrough at one end and with a socket at its other end, and a rod adapted to be inserted through the said opening and rest with its end in the said socket.

7. In a water gage, the combination of a hollow case provided with oppositely alined sight openings extending longitudinally thereof, plugs secured to each end of said case and each plug provided with a socket, glasses mounted within the case at said sight openings, tapered blocks adapted to abut against the inner surface of said glasses, and a hollow wedge interposed between said tapered blocks and adapted to force the same outwardly, said wedge being provided at one edge with a head snugly fitting in the socket of one plug, and said wedge also provided at its opposite end with a tongue snugly fitting within the socket of the other plug, whereby to accurately guide the wedge as it is moved downwardly between the tapered blocks.

8. In a water gage, the combination of a hollow case provided with oppositely alined sight openings and with sockets adapted to receive glasses at said sight openings, glasses mounted in said sockets, hollow tapered blocks abutting against the inner faces of said glasses, a hollow wedge arranged to be interposed between said tapered blocks and force the same outwardly, means for moving the wedge downwardly between said blocks, and a column or rod mounted in said wedge, the wedge being composed of integrally connected spaced side members, each of which is formed with a plurality of openings providing passages for the free circulation of water, and the tapered blocks being formed in their lower ends with openings for the circulation of water.

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

FREDERICK W. FISHER. [L. S.]

Witnesses:
FREDERICK E. FISHER,
HARRY W. DILKES.