

(No Model.)

2 Sheets—Sheet 1.

J. A. & J. HOPKINSON.
GUARD FOR WATER GAGES.

No. 519,957.

Patented May 15, 1894.

Fig. 1.

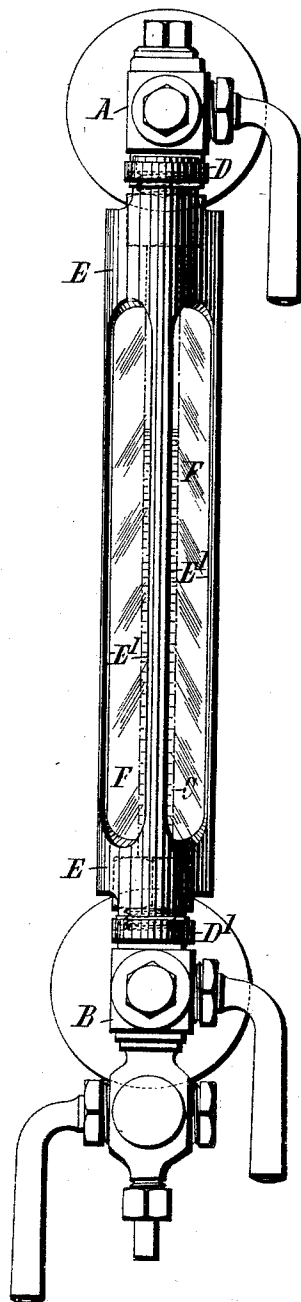


Fig. 2.

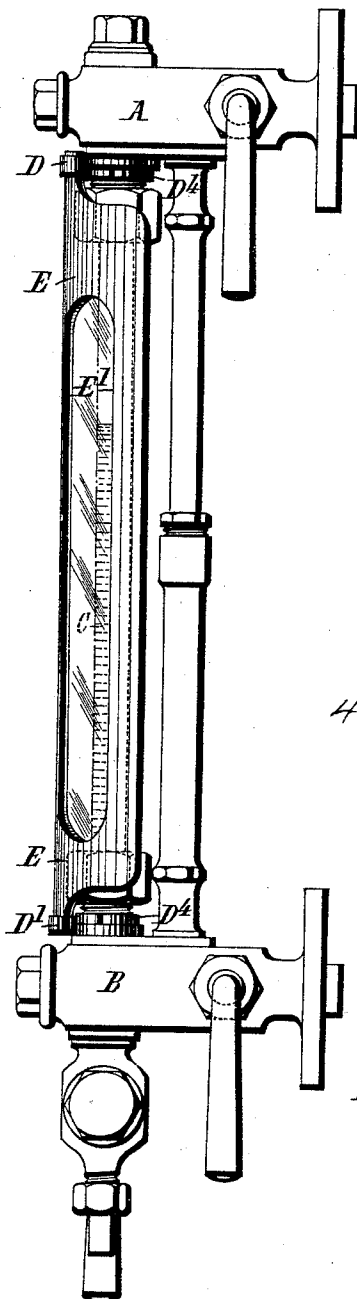


Fig. 3.

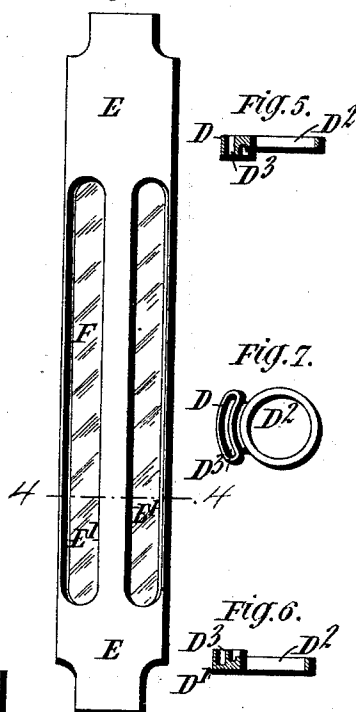


Fig. 4.



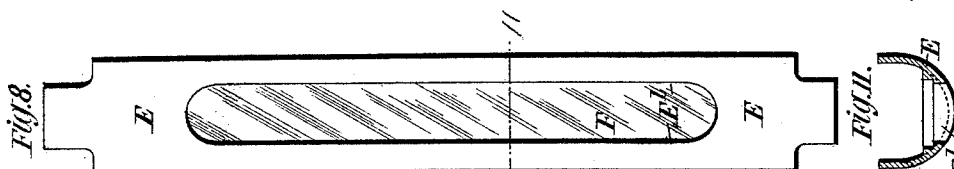
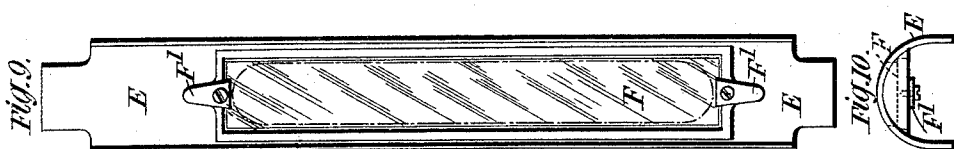
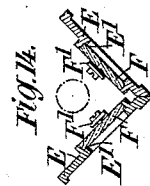
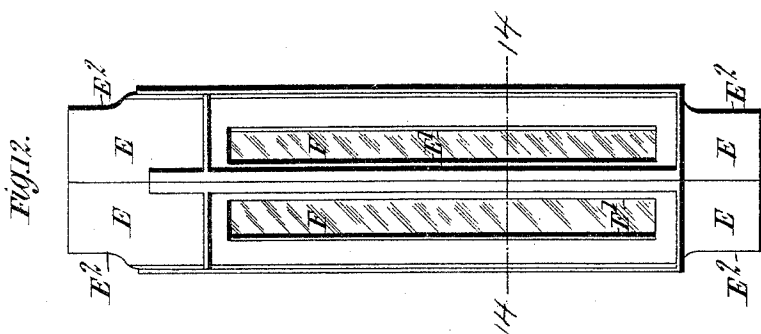
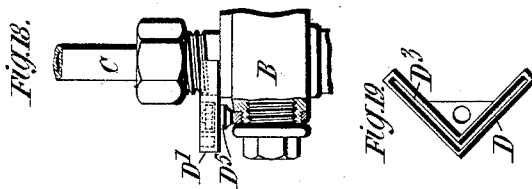
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By James L. Norris, Atty.

UNITED STATES PATENT OFFICE.

JOHN ADDY HOPKINSON AND JOSEPH HOPKINSON, OF HUDDERSFIELD,
ENGLAND.

GUARD FOR WATER-GAGES.

SPECIFICATION forming part of Letters Patent No. 519,957, dated May 15, 1894.

Application filed December 15, 1893. Serial No. 493,797. (No model.) Patented in England February 3, 1893, No. 2,452.

To all whom it may concern:

Be it known that we, JOHN ADDY HOPKINSON and JOSEPH HOPKINSON, engineers, of the firm of J. Hopkinson & Co., subjects of the Queen of Great Britain, and residents of Huddersfield, in the county of York, England, have invented certain new and useful Improvements in and Relating to Shields or Guards for Water-Gages, (for which we have obtained a patent in Great Britain, No. 2,452, dated February 3, 1893,) of which the following is a specification, reference being had to the accompanying drawings.

This invention has for its object to provide improved shields or guards for water-gages, to protect the boiler attendant from the pieces of glass which are scattered about when a gage-glass breaks, and also to shield the gage-glass from drafts and blows.

Our improved shield in the preferred form comprises a metal guard formed in one piece extending vertically in front of the gage-glass from top to bottom thereof, and provided with an opening or with openings in which there is or are placed and held one or more strong strips of glass through which the height of the water in the gage-glass can be seen. Said metal guard is made of a curved transverse section so as to efficiently cover the gage-glass. The strips of glass are kept in place by means of turn-buttons or other means which allow of ready removal of the glass strips for cleaning and other purposes. When we use two or more glass strips we place same at an angle with each other. We mount our said shield between brackets carried by the upper and lower arms of the gage in such a manner as not to interfere in any way with the setting-down of the gland-nuts, or with the removal or insertion of a gage-glass.

An important feature of our invention is that the strips of glass through which the gage-glass is seen are not held rigidly or tightly but are quite free to expand and contract in every direction. They are therefore not liable to break when in use. Moreover they can be easily removed for cleaning, and as readily replaced. The glasses are preferably of plain rectangular section and can therefore be obtained without difficulty from any ordinary glazier.

A further important feature of our invention is the great facility afforded for removing and replacing the entire shield or guard.

Our improved guard is very simple in construction and is durable and efficient and of great practical utility.

In the accompanying drawings we have shown how our invention may be conveniently and advantageously carried into practice.

Figure 1 is a front view, and Fig. 2 is a side view of a water-gage fitted with our improved guard. Fig. 3 is a front view of the guard detached. Fig. 4 is a section of the guard taken on the line 4—4 Fig. 3. Fig. 5 is a detached central section of the top bracket that supports the guard. Fig. 6 is a similar detached section of the bottom guard-supporting bracket. Fig. 7 is a plan view of said brackets. Fig. 8 is a front view, Fig. 9 is a rear view, and Fig. 10 is an end view of a slightly modified form of guard having only one glass. Fig. 11 is a transverse section on the line 11—11 Fig. 8. Fig. 12 is a front view of a further modified form of guard. Fig. 13 is a vertical section of the same, and Fig. 14 is a horizontal section taken on the line 14—14 Fig. 12. Fig. 15 is a plan, and Figs. 16 and 17 are central sections of the top and bottom brackets respectively for supporting said guard. Fig. 18 shows partly in vertical section a portion of a water arm illustrating another mode of carrying the supporting bracket. Fig. 19 is a plan view of the supporting bracket.

Like letters denote corresponding parts in all the figures.

Referring to Figs. 1 to 7 A is the steam arm. B is the water arm of the gage. C is the gage-glass. D, D' are brackets provided with eye pieces D² and mounted respectively on the steam and water arms of the gage, said eye pieces being adapted to pass over the screw threaded parts on which the gland nuts are screwed. D⁴, D⁴ are nuts for holding the brackets D, D' in place. Said nuts may be screwed down tight to lock the brackets in any required position, or may be slacked back to allow the brackets to be turned or adjusted. The top bracket is provided with a curved slot D³ for receiving the upper end of the guard hereinafter described. The bot-

tom bracket is provided with a curved recess D^3 for receiving and supporting the lower end of the guard. E is the metal guard curved in transverse section, as shown more clearly in Figs. 3 and 4, and shaped at its upper and lower ends to enter the curved slot and recess D^3 in the supporting brackets D, D' . The ends of the guard are reduced in width at top and bottom as shown to facilitate the insertion and removal thereof and to avoid unduly enlarging the size of the supporting brackets, and also to provide more room for turning the handle of the gage-cock. To place the said guard in position in front of the gage, the upper end thereof is passed up through the curved slot in the upper bracket D and then the lower end is allowed to drop into the recess in the lower bracket D' . The said guard is formed with two large parallel apertures E' extending nearly from top to bottom thereof, and is constructed to receive two strong flat strips of glass F which fill said openings and are held in the frame by turn buttons F' as shown in Fig. 4, or by other equally simple means, which mode of retention allows of very easy removal and replacement. The glass strips F are arranged at an angle as shown and through them the gage-glass can be seen and the height of the water observed at a glance from either side of the gage. It is obvious that this construction of guard does not materially interfere with the observation of the water level, or with the manipulation of the handles of the steam and water cocks; moreover the entire guard can be instantly removed whenever required for cleaning or other purpose and as easily replaced without interfering with any part of the gage.

In Figs. 8 to 11 is shown a guard fitted with but one glass strip instead of two such as shown in Figs. 1 and 2. In other respects the frame is similar to that above described and need not therefore be further referred to.

In Figs. 12 to 14 we have shown a still further modified form of guard which in this case consists of two flat plates E each having one long aperture fitted with a plain glass strip. For this construction of shield or guard we provide supporting brackets of the kind shown in Figs. 15 to 17. Said brackets are formed with angular slots and recesses D^3 to receive the guard but otherwise are shaped similar to those above described. The corners of the frames are cut away as shown at E^2 so as not to be in the way of the attendant's hand when he is turning the steam and water cocks.

In all the above constructions the nuts may be screwed down tight to lock the guard in any required position, or may be slacked back to allow the brackets to be adjusted. It is obvious from the above description that the guard can be set with the shield or strips at any angle which will best protect the gage-glass from the currents of cold air.

In Fig. 18 we have shown a lower bracket

attached to a support D^5 secured to the front of the water arm instead of to the screwed part on which the gland nut is screwed. This bracket can be removed without interfering with the nuts of the gage-glass. The glass plates or strips are not rigidly held, and are therefore free to expand and contract in every direction, and can be removed and replaced without interfering with the supporting brackets. The slots or grooves in the supporting brackets may be lined with rubber, or other soft, elastic or pliable material, or may be otherwise furnished to prevent rattling or shaking of the guard especially when applied to locomotives. The glass strips or plates should be very carefully annealed so as to be soft and capable of resisting a moderate blow. When in position they form a shield or guard which as above stated does not materially interfere with the view of the gage-glass, nor give any deceptive appearance as to the height of the water. The brackets for supporting the shield are permanently attached to the gage. In some instances we employ brackets cast on or fixed to the gage body.

What we claim is—

1. For a glass water gage, the combination of upper and lower brackets mounted respectively on the steam and water arms of the gage, a frame loosely resting in said brackets, and glass loosely resting in said frame, substantially as described.
2. For a glass water gage, the combination of upper and lower brackets mounted respectively on the steam and water arms of the gage, a frame made in one piece loosely resting in said brackets, and flat glass strips loosely resting in said frame, substantially as described.
3. For a glass water gage, a shield or guard comprising a frame in which readily removable flat glass strips are held by means of turn-buttons, said glass carrying frame being loosely supported in upper and lower brackets carried by the steam and water arms respectively so as to be readily attachable and detachable at any time without requiring the removal or adjustment of any part of the gage, substantially as described.
4. For a glass water gage, a shield or guard comprising a frame in which readily removable flat glass strips are held by means of turn-buttons, said glass carrying frame being loosely supported in upper and lower brackets carried by the steam and water arms respectively, independently of the gland nuts, substantially as, and for the purpose, specified.
5. For a glass water gage, a shield or guard comprising a frame in which readily removable flat glass strips are held by means of turn-buttons, and the ends of which are reduced in width, said glass carrying frame being loosely supported in upper and lower brackets carried by the steam and water arms respectively, independently of the gland nuts, substantially as, and for the purpose, specified.

6. For a glass water-gage a shield or guard comprising a curved glass carrying metal frame loosely supported in upper and lower brackets carried by the steam and water arms respectively independently of the gland nuts, said frame being fitted with flat glass strips or plates which are held safely therein by means of turn-buttons without rigid restriction or pressure, substantially as described.
7. The combination, with a glass water gage, of upper and lower brackets mounted on the steam and water arms independently of the gland nuts, the upper arm being furnished with a through slot, and the lower arm with a recess, and a shield or guard, comprising a frame and readily removable glass strips held therein, loosely received in said slot and recess, substantially as described for the purpose specified.
8. The combination, with a glass water gage, of upper and lower brackets formed with eye pieces that pass over the screw threaded parts of the glands on the upper and lower arms respectively, and are secured thereon by nuts, the upper arm being furnished with a through slot, and the lower arm with a recess, and a shield or guard, comprising a frame and readily removable glass strips held therein, said shield or guard resting loosely in the recess in the lower bracket and being supported laterally by the slotted part of the upper bracket, substantially as described.
9. The combination, with a glass water gage, of upper and lower brackets formed with eye pieces that pass over the screw threaded parts of the glands on the upper and lower arms respectively, and are secured thereon by nuts, the upper arm being furnished with a through slot, and the lower arm with a recess, and a shield or guard, comprising a curved metal frame and readily removable flat glass strips held in said frame without rigid restriction or pressure by means of turn-buttons, said shield or guard resting loosely in the recess in the lower bracket and being supported laterally by the slotted part of the upper bracket, substantially as described.
- In testimony whereof we have hereunto set our hands this 25th day of November, 1893.
- JOHN ADDY HOPKINSON.
JOSEPH HOPKINSON.
- Witnesses:
FRANK C. MCGHEE,
JAMES H. SHAW,
Both of Huddersfield.