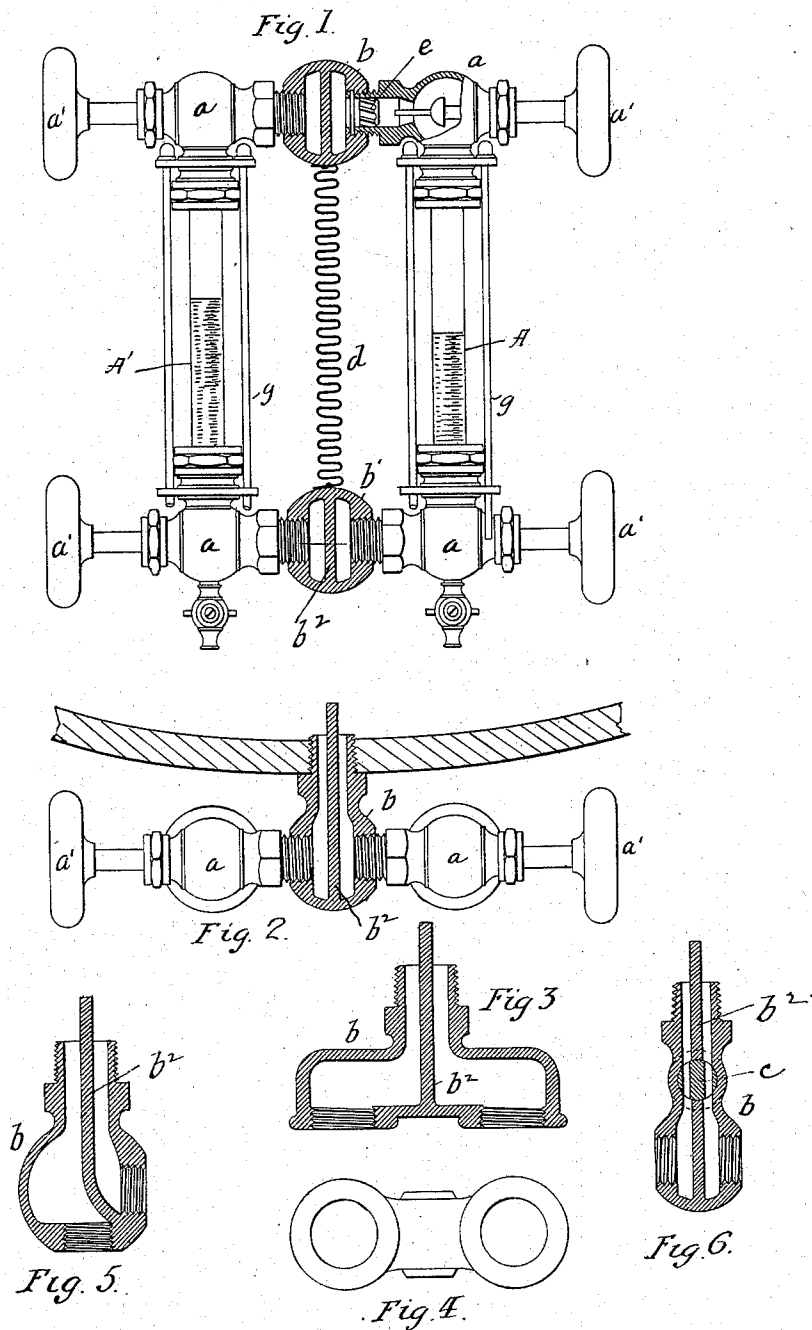


F. M. ASHLEY.
WATER GAGE.

No. 565,714.

Patented Aug. 11, 1896.



Witnesses
D. Bogdanoff.
C. Edwards.

Inventor
Frank M. Ashley
By his Attorney
Wm. H. Rosenthal

(No Model.)

3 Sheets—Sheet 2.

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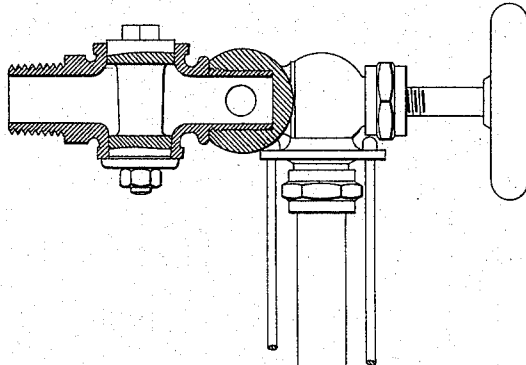


Fig. 7.

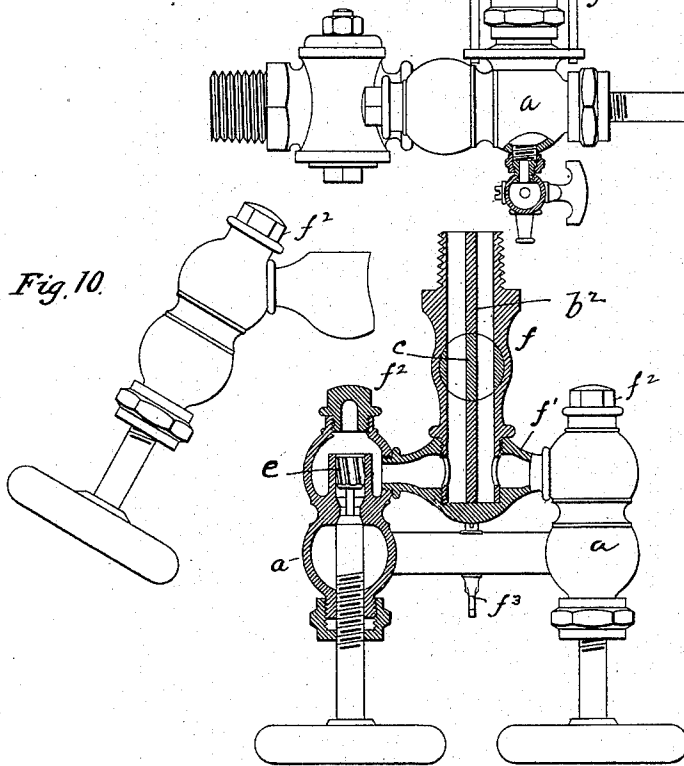


Fig. 8.

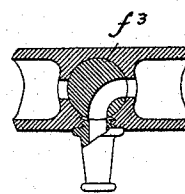


Fig. 9.

Witnesses
D. Bogdanoff.
C. W. Edwards.

Inventor
Frank M. Ashley
By his Attorney
M. A. Rosenbaum

(No Model.)

3 Sheets—Sheet 3.

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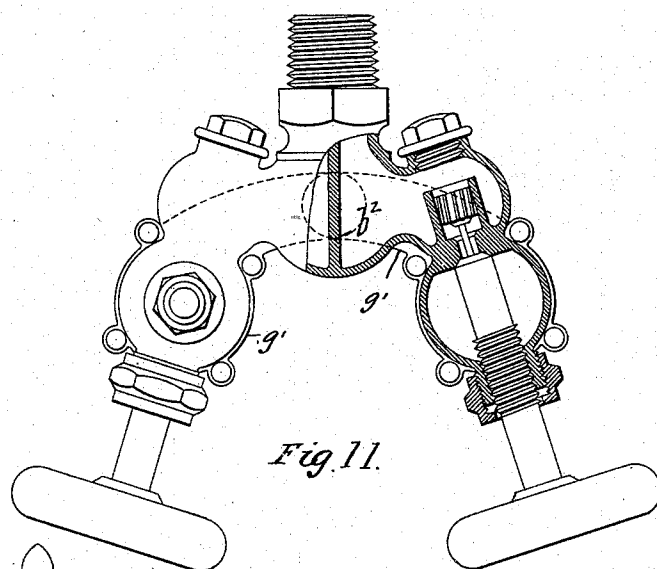


Fig. 11.

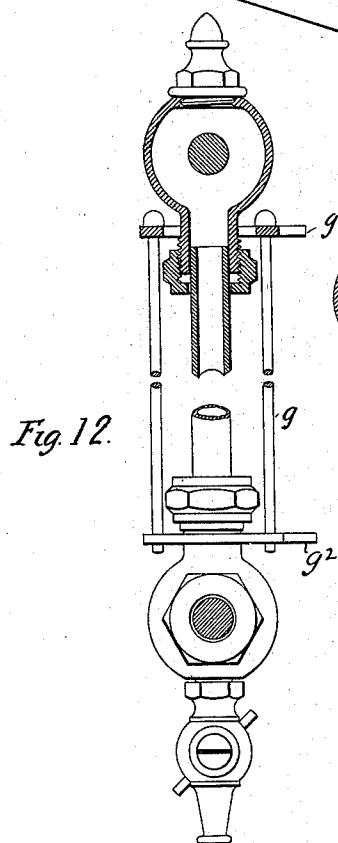


Fig. 12.

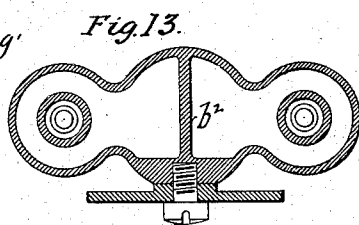


Fig. 13.

Witnesses
D. Bogdanoff.
C. W. Edwards.

Inventor
Frank M. Ashley
By *W. H. Rosentau* Attorney

UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF HAWTHORNE, NEW JERSEY.

WATER-GAGE.

SPECIFICATION forming part of Letters Patent No. 565,714, dated August 11, 1896.

Application filed March 16, 1895. Serial No. 541,966. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, residing at Hawthorne, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Water-Gages, of which the following is a full, clear, and exact description.

This invention relates to water-gages especially adapted for steam-boilers, the object being to render more certain the action of such devices, thereby increasing the element of safety which they are intended to supply.

In general terms my invention consists of a duplex gage; that is, a gage having two indicating-glasses with separate passages leading from each to the boiler.

It is well understood that many explosions of steam-boilers are not prevented because the water-gage gives an incorrect indication of the water-line. The sediment in the boiler often plugs up the passages leading to the gage, and hence the water in the gage does not rise and lower in the same proportion that it does in the boiler itself. Under those conditions, if the water-gage is depended upon solely by the engineer, the water in the boiler may drop so low as to cause the burning out of the plates or tubes or the total destruction of the boiler. With a duplex gage in which the glasses stand side by side at the same level and which communicate with the boiler through separate passages it is extremely unlikely that the passages to both gages would become closed at the same time, and owing to this fact it is evident that when the water stands at the same level in both gages the indication is correct. If, however, the water in one gage is higher than that in the other, the engineer, while not knowing absolutely which is the correct indication, is warned that one of the gages is plugged up, and if steps are taken immediately to clear it out a catastrophe may be averted. Thus it will be seen that with two gages constructed as described an engineer may be always certain of the quantity of water in the boiler, and with an indicator of this character the other safety appliances of a boiler may be dispensed with.

I am aware that it is common to place a plurality of water-gages upon a steam-boiler,

but so far as known to me they have always been placed at widely-separated locations, so that a view of them may be obtained at different points; but it has never been proposed to so construct and arrange a plurality of gages that a comparison may be made between them, nor has it ever been proposed to place a plurality of gages upon a boiler with separate passages leading from each glass to the boiler in such a way that the boiler is tapped at only two points, this being another feature of my invention.

In the accompanying drawings, Figure 1 is a front view of my improved gage with parts shown in section. Fig. 2 is a plan of the same with a part in section. Figs. 3, 4, and 5 are details of couplings for securing various relative positions of the water-glasses. Fig. 6 is a section of coupling with a double cut-off valve. Fig. 7 is a side elevation, with parts in section, of a gage equipped with an automatic cut-off valve. Figs. 8 and 9 are details of the same. Fig. 10 is a detail of the same gage, showing a modification in the form of coupling. Figs. 11, 12, and 13 are details of a form wherein the couplings are each made in single integral pieces.

Referring to the drawings by letter, A and A' respectively represent the two indicating-glasses of the two gages. These are held in the ordinary manner by end pieces *a*, in which are placed suitable packing-boxes and the usual cut-off valve *a'*. Ordinarily these end pieces are screwed into the openings in the boiler; but in my invention they are screwed into the opposite sides of two couplings *b* and *b'*, respectively, the couplings being in turn screwed into the openings in the boiler. Each of these couplings is divided into two chambers or passages by a partition *b²*, and the end pieces of the gages communicate, respectively, with these chambers. The partition extends entirely through the coupling, so that the two passages are entirely separate throughout the length of the coupling, and both enter directly into the boiler. There is therefore an independent passage for the water and steam in the boiler through each gage.

The general construction of the duplex gage is fully given in the preceding description; but I have shown various modifications

and attachments for the gage which render it more efficient and desirable and which will be hereinafter described.

It will be observed that each gage acts exactly the same as a single gage. If the passages which lead to either gage become clogged up by the sediment of the boiler, the water in that particular gage will not stand at the proper level, and as the engineer notices a difference between the levels he is aware at once that one of the gages is out of order. He can then blow off the gages by opening the ordinary blow-off cocks.

In Fig. 1 the gages are set with the axes of their end pieces in line with each other, while in Fig. 3 a form of coupling is shown for setting the gages with the axes of their end pieces parallel to each other. Fig. 5 shows a form of coupling for setting the gages with the axes of their end pieces at right angles to each other. These various forms of couplings are designed to meet all the conditions under which gages are used.

It may be that the gage must stand in a corner or adjacent to some other device, which would make it necessary to alter the relative position of the gages.

Fig. 6 shows the coupling with a single cock *c* in it, by means of which both passages may be simultaneously closed and either or both gages removed from the boiler while steam is on. Fig. 1 also shows a sheet of corrugated material *d*, arranged between two water-glasses to protect either of them from escaping steam or flying glass if the other breaks. In Fig. 1 also there is shown an automatic self-grinding valve *e*, which flies to its seat under pressure of steam in case the glass breaks.

Figs. 7 and 8 show a form of construction wherein the coupling is made in two parts *f* and *f'* and the end pieces are placed with their axes parallel, which makes it possible to place screw-plugs at the points *f*², by the removal of which the automatic valves *e* may be reached without taking off the entire gage. This figure, in connection with Fig. 9, also shows a single two-way cock *f*³, by means of which either of the gages may be blown off at will.

Fig. 10 shows the same general form of gage, but with the axes of the end pieces placed obliquely.

Figs 11, 12, and 13 are details of a form of double gage in which the end pieces and couplings are cast in one piece and of such form that they may be provided with the screw-plugs *f*². This construction is an especially good one, because it embodies the entire double gage except the glasses in only two parts. In these figures another good feature of the apparatus is shown. The protecting side rods *g* for both glasses are held by two plates *g'* and *g*², each serving to hold

the ends of the rods for both glasses and the plates being secured to the coupling in the manner shown in Fig. 13.

In Figs. 2, 3, 5, and 6 the diaphragm or wall between the two passages of the end couplings is extended beyond the end of the coupling and into the boiler, so that the two passages will be still further isolated from each other and the liability of both passages becoming clogged at once will be lessened.

It will be observed that when the construction shown in Figs. 1 to 6 is adopted two ordinary gages may be used in connection with the couplings. The purchaser might then procure the couplings only and apply gages which he may have on hand.

Having thus described my invention, I claim—

1. The combination with a steam-boiler, of a plurality of water-gages and two couplings fitted to the boiler, the gages being attached to the couplings and separate passages leading to and from each gage through the couplings to and from the boiler, substantially as described.

2. The combination with a steam-boiler, two couplings connected therewith, a plurality of entirely independent passages in each coupling communicating with the boiler, a valve in each coupling controlling all of its passages, and a plurality of water-gages connected with said couplings in such a manner that independent passages lead through each to and from the boiler.

3. The combination with a boiler, of a coupling attached thereto through a single perforation in the boiler-shell, a plurality of gages attached to said coupling and a corresponding number of independent passages extending through the coupling from each gage directly to the boiler, for the purpose set forth.

4. The combination with a steam-boiler of two couplings connected therewith, said couplings forming the upper and lower supports respectively for two gages, two passages extending entirely through the couplings one passage for each gage, and a diaphragm projecting into the boiler from the couplings and located between the two passages substantially as and for the purpose set forth.

5. The combination with a steam-boiler, of two water-gages attached thereto, the connections to the boiler being made through two openings therein, only the passages from and to the boiler through the respective gages being separate.

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

FRANK M. ASHLEY.

Witnesses:

FRANK S. OBER,
JOHN KRAEGER.