(No Model.)

2 Sheets—Sheet 1.

E. BEGGS.

LIQUID OR WATER GAGE.

No. 292,532. Patented Jan. 29, 1884.

Fig. 1.

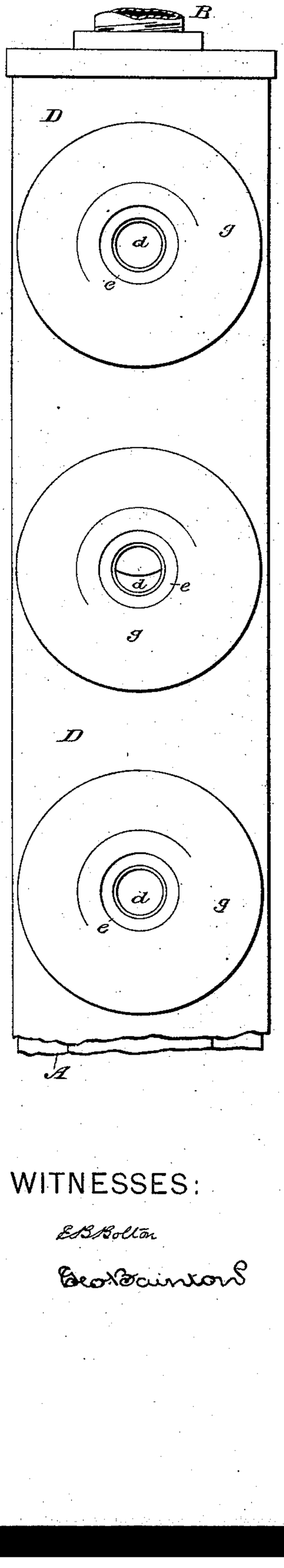


Fig. 2.

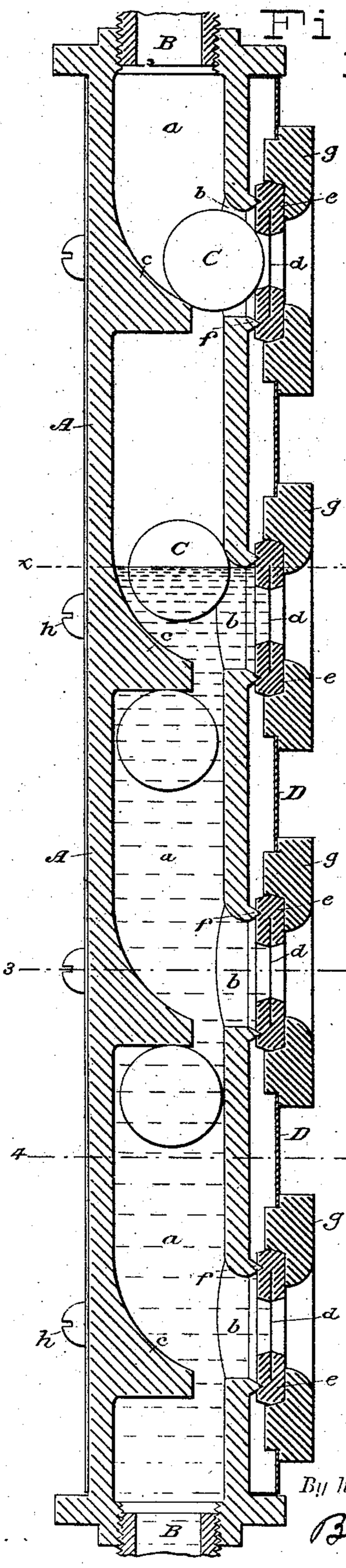


Fig. 3.

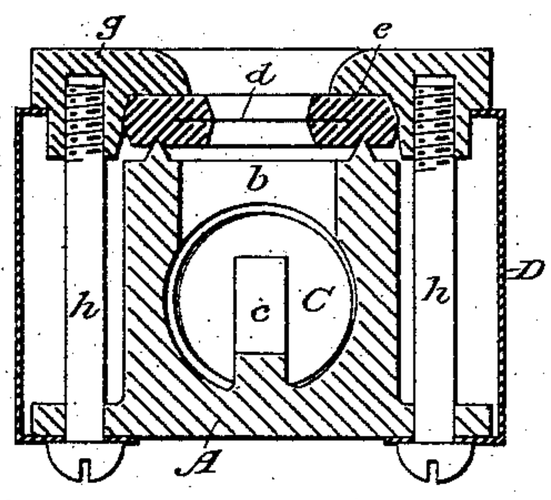
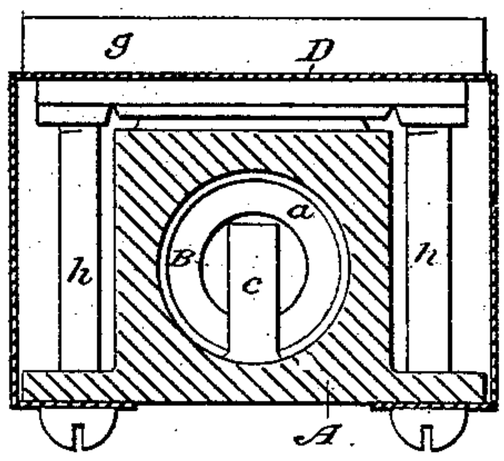


Fig. 4.



WITNESSES:

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Geo Bainson

INVENTOR:

Eugene Beggs

By his Attorneys,

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(No Model.) 2 Sheets—Sheet 2.

E. BEGGS.

LIQUID OR WATER GAGE.

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Fig. 5.

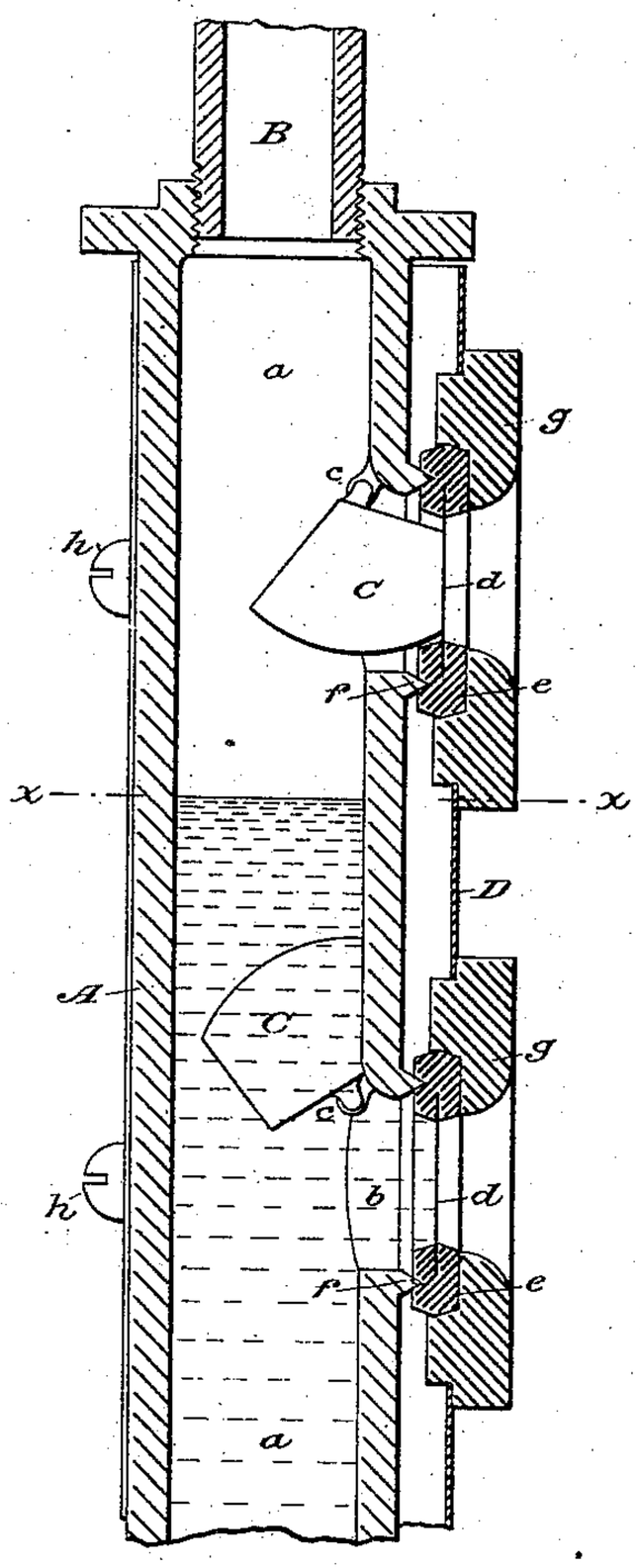


Fig. 6.

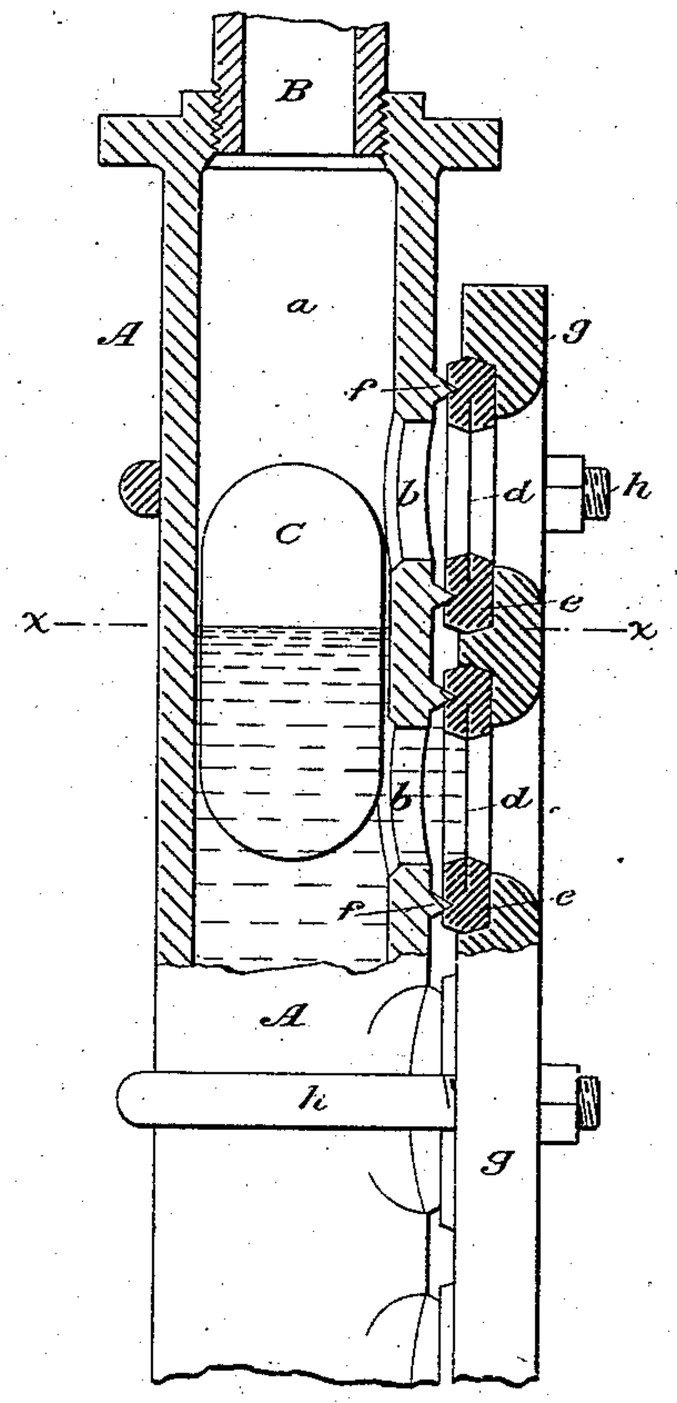
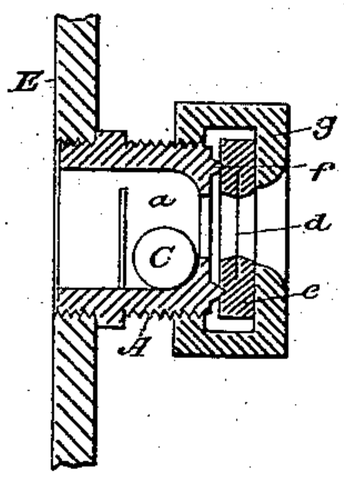


Fig. 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EUGENE BEGGS, OF PATERSON, NEW JERSEY.

LIQUID OR WATER GAGE.

SPECIFICATION forming part of Letters Patent No. 292,532, dated January 29, 1884.

Application filed June 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, EUGENE BEGGS, a citizen of the United States, residing at Paterson, Passaic county, New Jersey, have invented certain Improvements in Liquid or Water Gages, of which the following is a specification.

My invention relates to improvements in that class of gages or instruments designed to indicate the level of the liquid in a holder or receptacle—as, for example, the water in a steam-generator; and it consists, partly, in providing an upright tube or chamber with sight-holes at different levels, covered with glass, mica, or other transparent medium, and arranging in said tube or chamber floats which show themselves at the different sight-holes, said floats being confined each to its particular section of the chamber.

It also consists in adapting these floats to serve as valves to cut off the escape of steam should the transparent cover of the sight-hole be accidentally broken; and it consists, also, in the various peculiarities of construction of the gage, all as will be more particularly hereinafter set forth.

My invention is designed, primarily, to take the place of the ordinary glass-tube gage, which is objectionable because of the ease with which it may be shattered, especially when employed on locomotives and in other places where it is liable to be subjected to concussion or collision. My tube or chamber may be made from metal or other stout opaque material, and the transparent material employed is of such a character and construction as not to be broken under any ordinary circumstances.

In the drawings, which serve to illustrate my invention, Figures 1, 2, 3, and 4 illustrate the preferred form and construction; and Figs. 5, 6, and 7 illustrate modifications of the same. These last will be referred to more particularly hereinafter.

Fig. 1 is a front view of a gage for a steam-generator provided with my improvements, and Fig. 2 is a longitudinal vertical section of the same, taken in the plane of the line 2 2 in Fig. 1. Figs. 3 and 4 are respectively cross-sections on lines 3 3 and 4 4 in Fig. 2.

A represents the tube of the gage, which may be of cast metal, and B B the tubes or pipes which connect it, above and below, with the steam and water spaces in the boiler, respectively. This tube or chamber A has a preferably cylindrical bore, *a*, and is provided with a suitable number of preferably circular sight-holes or apertures, *b*, arranged at intervals in its front.

C C are ball-floats—one for each sight-hole *b*—arranged in the bore *a*, and *c c* are deflectors formed on or attached to the interior wall of the said bore *a*. These deflectors are made curved or inclined on their upper sides, and perform two functions which will be set forth hereinafter. The apertures or sight-holes *b* are each covered by a disk or plate, *d*, of mica, glass, or other transparent material. I prefer to mount these disks in frames *e*, of lead or other similar soft metal, by casting the said metal around them, as described in a pending application of mine; but I make herein no claim to this mode of mounting, nor do I limit myself to it. These soft-metal frames *e* rest on sharp-edged raised seats *f*, formed on A around the sight-holes; and to hold them in place, so as to form a tight joint, I provide rabbeted frames *g*, of metal, by preference, which take over the frames *e*, as clearly shown, (see Fig. 3,) and are secured to A by screws *h*, which may pass through from the back.

D is simply a thin metallic housing, designed to enhance the appearance of the gage, but which performs no other function. It is held in place by the screws *h*.

In Fig. 2 I have supposed the water-line to be at the level of line *x x*. The two lower balls, C, have risen until checked by the under side of the deflectors *c;* the upper ball, being above the water-line, has fallen by gravity and been deflected by the upper curved surface of the deflector until it rests in the sight-hole *b*. The margin of the opening in the frame *e* forms a valve-seat, in which the ball rests in the manner of a valve. Should the glass or mica *d* be accidentally broken, the ball will instantly close the aperture. This seat also prevents the ball from touching and rubbing the disk *d*, but permits it to lie close to it, so as to be readily seen. The ball at the water-line has been partly raised above the level of its sight-hole, but its lower part is still visible, as shown in Fig. 1. By inspection, then, the engineer sees at a glance that the water-

level is a little above the sight-hole next below the upper ball that is visible.

The balls C, I make, by preference, of thin metal, and I prefer to polish or nickel-plate them, so that they may be easily seen when brought opposite to the sight-hole.

As before stated, the deflector *c* serves a double purpose—that is to say, they serve to keep the balls C separate, confining each to its proper section of the bore *a*; and they also serve to deflect the balls toward the transparent disks *d*, so that they may be readily seen.

Fig. 5 is a sectional view illustrating a modification, in which the floats C are hinged to the wall of the bore *a* in such a way as to fall down in front of the disks *d* when the water falls below their level. The float, in this case, might be a simple sphere, or hemisphere, connected to the wall of *a* by a simple link or short chain. In this construction the hinge or other attaching device performs the same function as the deflectors *c* in Fig. 2.

Fig. 6 illustrates another modification, in which a single float is employed, preferably elongated, which is free to play through the entire length of bore *a*, and which becomes visible as it rises at all of the sight-holes in succession. This construction is not so satisfactory as that before described, as it is not possible to bring the float close up to the transparent plate *d*. The water interposed between the float and *d* tends to obscure the former.

I might in some cases arrange sight-holes in the back of A and opposite to those in front, when the float would interpose its square body at the water-level, between the opposite disks *d;* but for most purposes this will not be necessary.

In some cases, especially where there is no pressure except that due to the liquid contained therein, I may arrange the sight-holes in the side of the vessel itself and place the floats in the liquid in the vessel, confining them in place by suitable guides. Therefore, in referring to the chamber A, it may be considered indifferently as a separate chamber or as a part of the vessel containing the liquid.

In Fig. 7 I have shown a gage designed to indicate only slight fluctuations. This consists of a small chamber with but one sight-hole and ball-float. This may be elongated vertically, and the plate *d* be also elongated. This view also illustrates another made of screwing on the frames *g*. By employing a series of these—say four—arranged in a vertical plane, they serve the same purpose as my gage, as illustrated in Figs. 1 and 2.

The transparent mediums of water-gages are apt to become coated, and require frequent cleaning to enable the engineer to distinguish the water-level readily. My disks *d* are readily removable for cleaning, and for giving access to the chamber A for the same purpose. When the gage, as shown in Figs. 1 and 2, is employed, the engineer should gage by the two middle holes, taking care to keep the upper float always in sight and the lower one out of sight.

My gage may be made of any length, and the balls or floats also prevent, in some degree, minor fluctuations, while they readily indicate the real level of the water in the boiler.

Having thus described my invention, I claim—

1. A liquid or water gage comprising a chamber provided with sight-holes in its face covered with some transparent material, floats arranged in said chamber, one for each sight-hole, and means, substantially as described, for confining these floats each to its proper section of said chamber, substantially as set forth.

2. A liquid or water gage comprising a chamber, A, provided with a bore, *a*, sight-holes *b*, and deflectors *c*, the transparent plates or disks *d*, arranged over said sight-holes, and floats C, all constructed and arranged to operate substantially as set forth.

3. The combination, in a liquid-gage, of the chamber A, provided with sight-holes, deflectors, and sharp-edged seats *f*, the floats, the transparent plates *d* and their soft-metal frames, the annular frames *g*, and the securing-screws, all constructed and arranged substantially as described.

4. The chamber A of the gage, provided with deflectors *c*, having curved or inclined upper faces to deflect or guide the float up to the transparent plate over the sight-hole, substantially as set forth.

5. The chamber A of the gage, provided with means, substantially as described and shown, for confining the floats each to its proper section of said chamber, and for guiding each float, when acted on by gravity, up to the transparent plate which covers the sight-hole, substantially as set forth.

6. A liquid-gage provided with a sight-hole covered with a transparent material, a spherical float, and a frame or margin around said sight-hole, constructed as a valve-seat, to receive the float in case the transparent plate is accidentally broken, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EUGENE BEGGS.

Witnesses:

ARTHUR C. FRASER,

A. S. BROWN.