J. G. TALMAGE.

GAGE GLASS.

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1,142,540. **Patented June 8, 1915.**

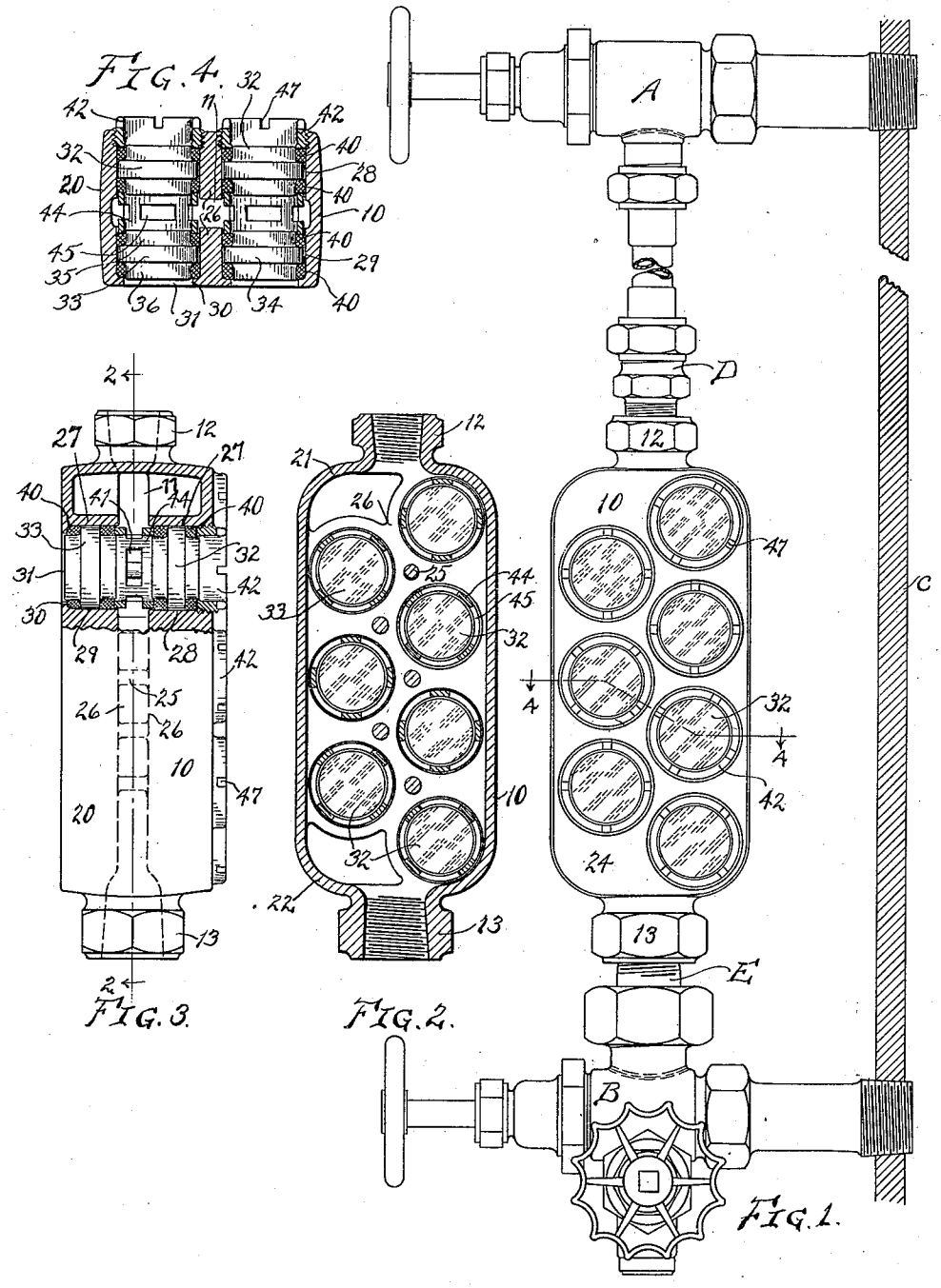

FIG. 1.

FIG. 4.

FIG. 3.

FIG. 2.

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GAGE-GLASS.

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To all whom it may concern:

Be it known that I, JOHN G. TALMAGE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Gage-Glasses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to gage glasses of the type wherein there is a casing carrying a series of bull's eyes or roundels, enabling the level of water in the casing to be observed. Such gage glasses have the advantage of greater strength and less liability to breakage than the standard glass tube.

One of the objects of my invention is to simplify and cheapen the construction and to render the gage more efficient in service, reducing to a minimum the danger of breakage of any roundels, or the leakage thereat, and eliminating the chance of sediment obscuring the observation.

Another object is to so arrange the roundels that the water level is always visible through some roundel, thus increasing the accuracy of observation.

Still another object of the invention is to provide for the easy removal of the roundels for cleaning or replacing them, or replacing their gaskets.

My invention is hereinafter more fully described in connection with a preferred embodiment thereof, as shown in the accompanying drawing.

In the drawing, Figure 1 is a side elevation of my gage glass mounted between the usual fittings; Fig. 2 is a vertical central section of the gage glass proper in a plane parallel with Fig. 1, as indicated by the section line 2—2 on Fig. 3; Fig. 3 is a side elevation of the gage glass proper, partly broken away and sectioned; Fig. 4 is a cross section on offset planes passing through the centers of adjacent roundels, as indicated by the line 4—4 on Fig. 1.

As shown in each figure, 10 indicates the casing or body of the gage comprising a rectangular member of the form shown, having a central vertical rectangular cavity 11, and nipples 12 and 13 at the opposite ends, the bores of which are internally threaded, and communicate with the cavity 11. A and B, in Fig. 1, indicate the usual shut off valves connected with the boiler shell C, and having the usual connections D and E with the nipples 12 and 13, as is well understood.

Specifically describing the casing 10, it will be seen that it is a single integral member, which may conveniently be a casting. It has vertical parallel edge walls 20, preferably rounded at their tops and bottoms to merge into the top wall 21 carrying the nipple 12, and the bottom wall 22 carrying the nipple 13.

Connecting the edge walls described are parallel sides having outer vertical faces 24 and inner vertical faces 26. These sides are preferably braced intermediately by cross pieces or stay bolts 25. Through the respective side walls are substantially cylindrical recesses 28 and 29 located comparatively close together and thus leaving between them portions 27 of the sides, which may be designated webs. The recesses 28 on one side of the central plane are in alinement with the corresponding recesses 29 on the other side.

Adjacent to the outer end of the recesses 29 are inwardly projecting annular flanges 30, which form openings 31 of less diameter than the recesses. Accordingly, the series of cylindrical openings are obtained, leading from one side of the structure through the casing almost to the opposite side, but there interrupted at the surface by the annular flange.

32 and 33 indicate two sets of roundels occupying the recesses 28 and 29, respectively. All of the roundels are preferably alike, and each consists of a solid piece of glass having a central cylindrical portion 34 of a diameter only slightly less than that of the recesses and on opposite sides of this portion smaller cylindrical portions 35 and 36. At the junction of the larger and

smaller cylindrical portions there are preferably slight fillets, as shown in Figs. 3 and 4.

40, in Figs. 3 and 4, indicate gaskets which surround the smaller cylindrical portions of the roundels, respectively. As two roundels are employed in each of the two alined recesses 28 and 29, there are four of these gaskets in such recesses. The outermost gasket in the recess 29 rests against the flange 30. The outermost gasket on the opposite side is compressed by a thimble 42 screw threaded into the outer portion of the recess 28. The intermediate gaskets bear against and are separated by a distance sleeve 44, which has openings 45 through its wall.

An inspection of Figs. 3 and 4, together with the above description, shows that the two alined roundels, together with their gaskets and holding parts, may be put in place through the open end of the recess 28 and clamped tightly in place by screwing in the thimble 42 compressing the four gaskets against their respective bearing surfaces. The portions 35 and 36 of the roundels having a diameter smaller than the interior diameter of the thimble 42, or the distance sleeve 44, or the opening 31, and, accordingly, the glass does not bear directly on the metal, but is clamped at all points against the elastic gaskets. This elastic clamping insures long life of the glass. If, however, any roundel becomes broken, or it is desired to remove any of them for replacing the gaskets or cleaning, it is only necessary to screw out the thimble 42 (spanner notches 47 being provided for this purpose), and then shove out from the opposite side the alined roundels, distance sleeve and gaskets. The stay bolts or cross bars 25 act to prevent any of the gaskets dropping down into the intermediate space should they become separated from the roundels in this replacement.

As shown in the drawings, the roundels are placed in four vertical tiers, two tiers on each side of the casing directly opposite each other. The roundels in adjacent tiers on either side are staggered, so that a roundel of one tier extends higher or lower than the adjacent roundel of the adjacent tier. This overlapping necessitates the water level being visible through some roundel if the water is in the casing at all. The result is that as continuous and accurate an observation may be made of the water level as if a single glass tube were employed.

My gage is very simple and cheap to construct. The body may be simply cast as one integral piece and the seats for the gaskets bored out, and the threads turned for the thimbles. This, with the threading of the nipples, is all the machine work that need be done on the casing. The placing of the roundels, the gaskets, and the thimbles is, of course, a very simple matter. In the case of leakage, it is only necessary to tighten the corresponding thimble.

It should be noted that there is no chance for sediment in the water to obscure the vision, the openings 45 in the distance sleeves allowing any such sediment to drop to the bottom of the casing.

Having thus described my invention, what I claim is:

1. In a gage glass device, the combination with a pair of transparent members, of a casing having an internal space for liquid and spaces on opposite sides of the liquid space for the transparent members, the latter spaces being uninterrupted intermediately and one of them uninterrupted externally whereby both transparent members may be put in place from one side without disturbing the casing, and means for clamping said member in place from one side.

2. The combination of a casing having an internal space for liquid and having a series of individual alined openings through the opposite walls of the casing, transparent members in the openings, means for clamping them in place, and space bars within the intermediate space bracing the walls and preventing the transparent members being dropped into such space while such members are being removed.

3. In a gage glass construction, the combination of a casing having an internal space for liquid and alined openings through the opposite walls of the casing, said openings being uninterrupted intermediately and one of them uninterrupted externally, transparent members in the openings, gaskets therefor, and devices acting on the gaskets and adapted to compress the gaskets in both walls from the same side of the casing.

4. In a gage glass construction, the combination of a casing having an internal space for liquid, alined openings through the walls of the casing, an internal annular flange adjacent to the outside of one of the openings, a thimble screwing into the outer portion of the opposite opening, roundels on opposite sides of the liquid space between said flange and thimble, and distance pieces between the opposed roundels.

5. In a gage glass construction, the combination of a casing having an internal space for liquid, alined openings through the walls of the casing, and an internal annular flange adjacent to the outside of one of the openings, a thimble screwing into the outer portion of the opposite opening, roundels on opposite sides of the liquid space between said flange and thimble, and a distance member between the two roundels.

6. In a gage glass construction, the combination of a casing having an internal

space for liquid, alined openings through the walls of the casing, and an internal annular flange adjacent to the outside of one of the openings, a thimble screwing into the outer portion of the opposite opening, roundels on opposite sides of the liquid space between said flange and thimble, a distance sleeve between the two roundels having an opening through its wall, and gaskets between such sleeve and the respective roundels.

7. In a gage glass construction, the combination of a casing having an internal space for liquid, alined openings through the walls of the casing, and an internal annular flange adjacent to the outside of one of the openings, a thimble screwing into the outer portion of the opposite opening, roundels on opposite sides of the liquid space between said flange and thimble, a distance sleeve between the two roundels, and four annular gaskets located respectively between one roundel and the flange, between said roundel and the distance sleeve, between the distance sleeve and the other roundel, between the last mentioned roundel and the thimble, all of the gaskets, roundels and the distance sleeve being removable through the opening normally occupied by the thimble.

8. The combination of a casing having an internal liquid space, alined openings through the wall of the casing on opposite sides of the liquid space, said openings being cylindrical, one of the openings having an internal flange adjacent to its outer end, and the other opening having an internal thread adjacent to its outer end, two roundels occupying the respective openings, each having an intermediate enlarged portion and two extreme reduced portions, gaskets surrounding the four reduced portions of the two roundels, a distance sleeve between the two intermediate gaskets, and a thimble engaging the screw thread mentioned.

9. In a gage glass construction, the combination of a casing made of a single integral casting and having edge walls and side walls, the side walls having their inner faces spaced apart to provide a water space but connected and braced by cross members, nipples at the upper and lower ends of the casing having bores communicating with the water space, there being cylindrical openings arranged in each of the walls, the openings in one wall being opposite the corresponding openings in the other wall, roundels occupying the respective openings and each consisting of an intermediate cylindrical portion of only slightly less diameter than the opening and two smaller extreme portions, gasket rings surrounding the extreme portions, and thimbles compressing the rings.

10. In a gage glass construction, the combination of a casing having an internal space for liquid and having openings opposite each other through the walls of the casing, one of the openings having an unrestricted outside entrance, transparent members adapted to be put in place in said openings from one side through the last-specified opening, a removable distance piece between the transparent members adapted to be put in place through one of said openings, and means for clamping the transparent members and distance piece from one side.

11. In a gage glass construction, the combination of a casing having an internal space for liquid and having opposite openings through the walls of the casing, there being an inwardly extending shoulder adjacent to the outside of one of the openings, the other opening having an unrestricted entrance, a pair of transparent members and an intermediate distance piece adapted to be put in place through the opening opposite the shoulder, and means for clamping the transparent members and distance piece in place, the shoulder receiving the thrust of such clamping action.

12. In a gage glass construction, the combination of a casing having an internal space for liquid, there being opposite openings through the walls of the casing, a pair of transparent members adapted to substantially fill said openings, one of said openings having an unrestricted entrance to allow the insertion therethrough of both members, means for maintaining said members separated, and means for clamping them in place.

13. In a gage glass construction, the combination of a casing having an internal space for liquid and opposite openings through its walls, an inwardly projecting shoulder adjacent to the outer side of one of the openings, the corresponding side of the other opening being unrestricted, a pair of transparent members adapted to be inserted into such openings through the opening having the unrestricted outer entrance, means for maintaining the transparent members separated, and means for clamping both of them in place from one side.

14. In a gage glass construction, the combination of a casing having an internal space for liquid and having opposite openings through the walls of the casing, a pair of transparent members adapted to be passed through one of the openings and seat in the respective openings, means for preventing said members passing out of the far opening, a thimble screwing into the near opening, and means separating the transparent

members while allowing liquid to stand between them, whereby said thimble may clamp both members in place from one side.

15. The combination of a single integral casing having an internal space for liquid and spaces on opposite sides of the liquid space for transparent members, said spaces being uninterrupted intermediately and one of them uninterrupted externally whereby both members may be put in place from one side, there being a shoulder preventing the members passing out of the other side, means separating the members, and means operable from the side from which they are put in place to clamp them in place.

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

JOHN G. TALMAGE.

Witnesses:
JUSTIN W. MACKLIN,
J. B. HULL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."