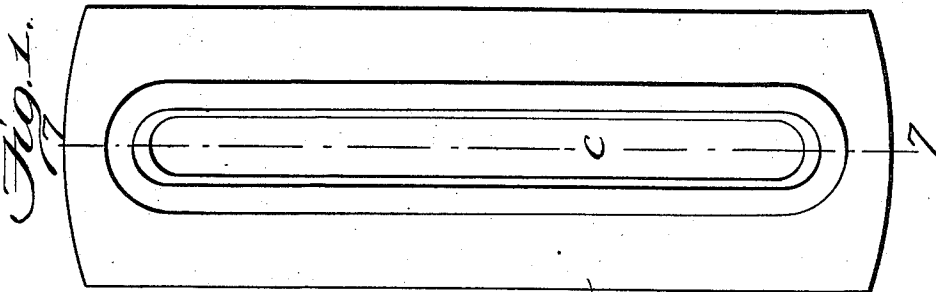
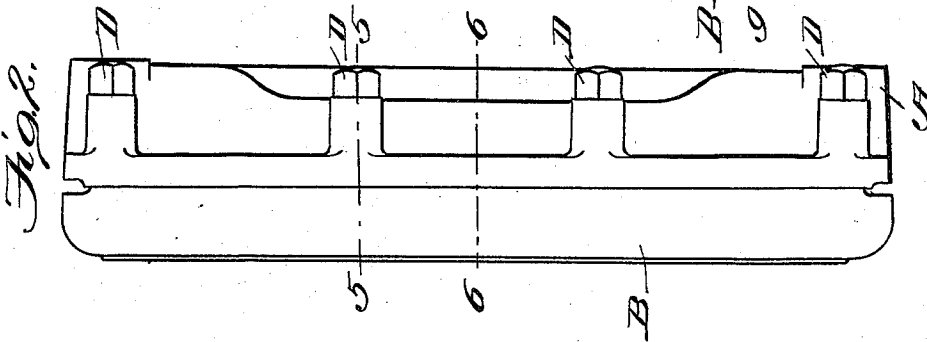
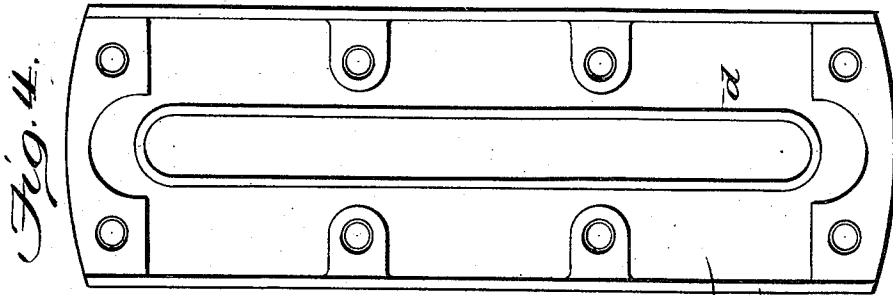
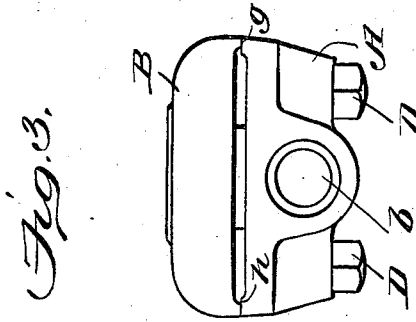


P. PANHORST.
LIQUID GAGE.
APPLICATION FILED AUG. 14, 1911.

1,013,809.

Patented Jan. 2, 1912.

2 SHEETS—SHEET 1.



Witnesses:
C. K. Kessler
H. B. Marston.

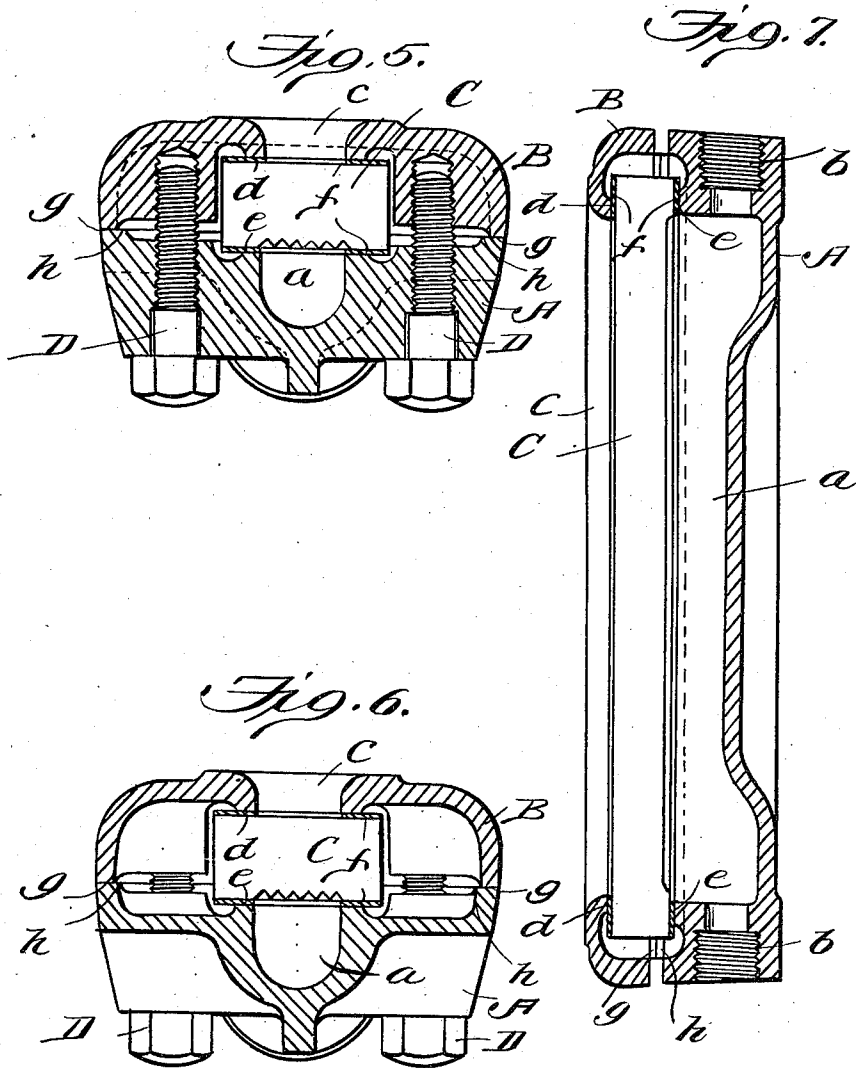
Inventor
Paul Panhorst
by *Manuel Dury*
Att'y.

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Witnesses:
E. S. Kessler
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UNITED STATES PATENT OFFICE.

PAUL PANHORST, OF NEW YORK, N. Y., ASSIGNOR TO NATHAN MANUFACTURING COMPANY, OF NEW YORK, N. Y.

LIQUID-GAGE.

1,013,809.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed August 14, 1911. Serial No. 643,946.

To all whom it may concern:

Be it known that I, PAUL PANHORST, a citizen of the United States, and resident of the borough of Bronx, in the city and State of New York, have invented a new and useful Improvement in Liquid-Gages, of which the following is a specification.

My invention has relation to liquid gages, comprising an observation glass and a metallic casing—as illustrated for example in the Klinger U. S. Patent, No. 470,858 of March 15, 1892. It has to do more particularly with a gage of the type set forth in said patent, known commercially as the Klinger Reflex Water Gage; and it has reference to an improved construction of the metallic casing of the gage. In a gage of this type the metallic casing consists of two parts, a body part and a cap part, between which the glass is placed, and is held by bolts which pass from the body into the cap and draw these two parts toward each other and upon the outer edges of the interposed observation glass, there being a longitudinal opening in the cap to expose the glass. Heretofore the cap and body of the casing have had no contact with one another, but have contacted only with the outer edges of the opposite faces of the interposed glass, upon which they bear. The drawing bolts, which secure the parts together, are of course outside of the glass, between the longitudinal edges of the latter, and the outer edges of the casing; and as the parts of the casing which extend beyond the glass at each side, have no bearing against or contact with one another, it results that the cap (which is of lighter weight and construction than the body) is drawn or distorted by the tightening of the bolts in such manner as to tilt its bearing faces away from the glass, bringing the pressure to bear upon the extreme longitudinal edges of the glass, instead of distributing the pressure uniformly over the whole bearing surface area, and breaking and chipping the glass along these angle edges, resulting often in the cracking of the glass itself and the leaking of the gage. This difficulty has been experienced, even though the weight of the cap be increased within practical limits.

The object of my invention is to remedy this trouble, and to so modify the structure as to maintain at all times, and under any

drawing action of the bolts, an even pressure upon the glass throughout the whole bearing area of the cap, and also to permit this result to be attained with a less weight of material in the cap, and with saving in the cost of manufacture. This result I attain by providing the cap and body at their outer edges with longitudinal bearing surfaces which meet when the two parts are drawn together upon the glass—these parts thus having two sets of bearing faces, the inner ones contacting with and embracing between them the glass, the outer ones contacting with one another. The bolts on each side are located between these inner and outer bearing faces, and operate to draw the outer bearing faces against one another at the same time they draw the inner bearing faces against the interposed glass. Under these conditions, the outer bearing faces resist and prevent the springing and distortion of the cap, and operate to hold the inner bearing faces tight and even upon the glass, with the pressure distributed over the entire area of these bearing faces.

In the accompanying drawing, to which I shall now refer for a better understanding of my invention—Figure 1 is a front elevation of a gage embodying my invention. Fig. 2 is a side elevation, and Fig. 3 is an end elevation of the same. Fig. 4 is an elevation of the cap looking at it from the inside. Fig. 5 is a section on line 5—5 of Fig. 2. Fig. 6 is a section on line 6—6 of Fig. 2, and Fig. 7 is a longitudinal section on line 7—7 of Fig. 1.

A is the metallic body of the casing; B is the metallic cap; C is the faceted observation glass. In the body are formed the longitudinal bore *a* (covered by the glass) to receive the steam and water, and the end screw-threaded openings *b*, to which are applied the fittings through which the gage communicates with the boiler. The glass is of the kind described in Klinger's patent heretofore referred to. The cap has in it the usual longitudinal central opening *c*, to expose the glass to view, and on its inside, surrounding this opening, is a bearing rib or face *d*, shown more completely in Fig. 4 (see also Figs. 5 and 6). A corresponding bearing rib or face *e* (Figs. 5 and 6) is formed upon the inside of the body A. Packing gaskets *f* are interposed between the two bearing faces *d*, *e*, and the portions

of the opposite faces of the glass with which they respectively are in contact. D are the bolts—in this instance eight in number—by which the two parts of the metallic casing are drawn and held together. Thus far there is nothing essentially new in the gage.

Along the outside edge of the cap and body of the casing are formed bearing ribs or faces lettered *g* and *h*, respectively. The bearing ribs or faces *g* on the cap B are shown clearly in Figs. 4, 5 and 6. Corresponding ribs or faces *h* are formed on the body A, as indicated in Figs. 4 and 5. These outside ribs or bearing faces *g*, *h*, extend substantially the entire length of the casing, and are the only portions of the two portions A and B of the casing which contact with one another; and they meet and bear against one another only when the two parts of the casing are fitted and drawn together upon the interposed glass C. The drawing bolts D are located in the casing on each longitudinal side of the glass, in a line extending lengthwise of the casing intermediate the inner and outer bearings *d*, *e* and *g*, *h*. No matter how hard these bolts are drawn up, they cannot spring or distort the cap in such manner as to make the joint at this point imperfect, the outer bearing faces *g*, *h* resisting any such tendency and serving to hold the cap tight on the glass, with pressure uniformly and evenly distributed over the whole bearing surface.

Other advantages growing out of the above described structure, over the old style of gage, are that the gage will withstand higher pressures, and that the number of bolts, and consequently the number of holes bored and tapped to receive the same, can

be considerably reduced, and that less metal is required in the casing, thus materially reducing the cost of manufacture.

Having described my invention and the best way now known to me of carrying the same into practical effect, I state in conclusion that I do not limit myself strictly to the structural details hereinbefore set forth in illustration of my invention, since manifestly the same can be varied somewhat without departure from the principle of the invention; but

What I claim herein as new and desire to secure by Letters Patent is as follows:

In liquid gages of the class described, the combination with a glass, of a casing consisting of a body and cap between which the glass is interposed and held, said parts contacting with each other along their outer edges only and being provided for this purpose with outer bearing ribs or faces extending practically the length of the casing which meet when the two parts of the casing are fitted together, and being also provided with inner bearing faces which take upon the outer edges of the opposed faces of the glass, and fastening bolts located between the outer and inner sets of bearing faces on each side of the glass, and operating to draw the same together, the outer faces upon each other and the inner faces upon the glass, substantially as and for the purposes hereinbefore set forth.

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

PAUL PANHORST.

Witnesses:

GEORGE T. HARRIS,
JAMES E. MURPHY.