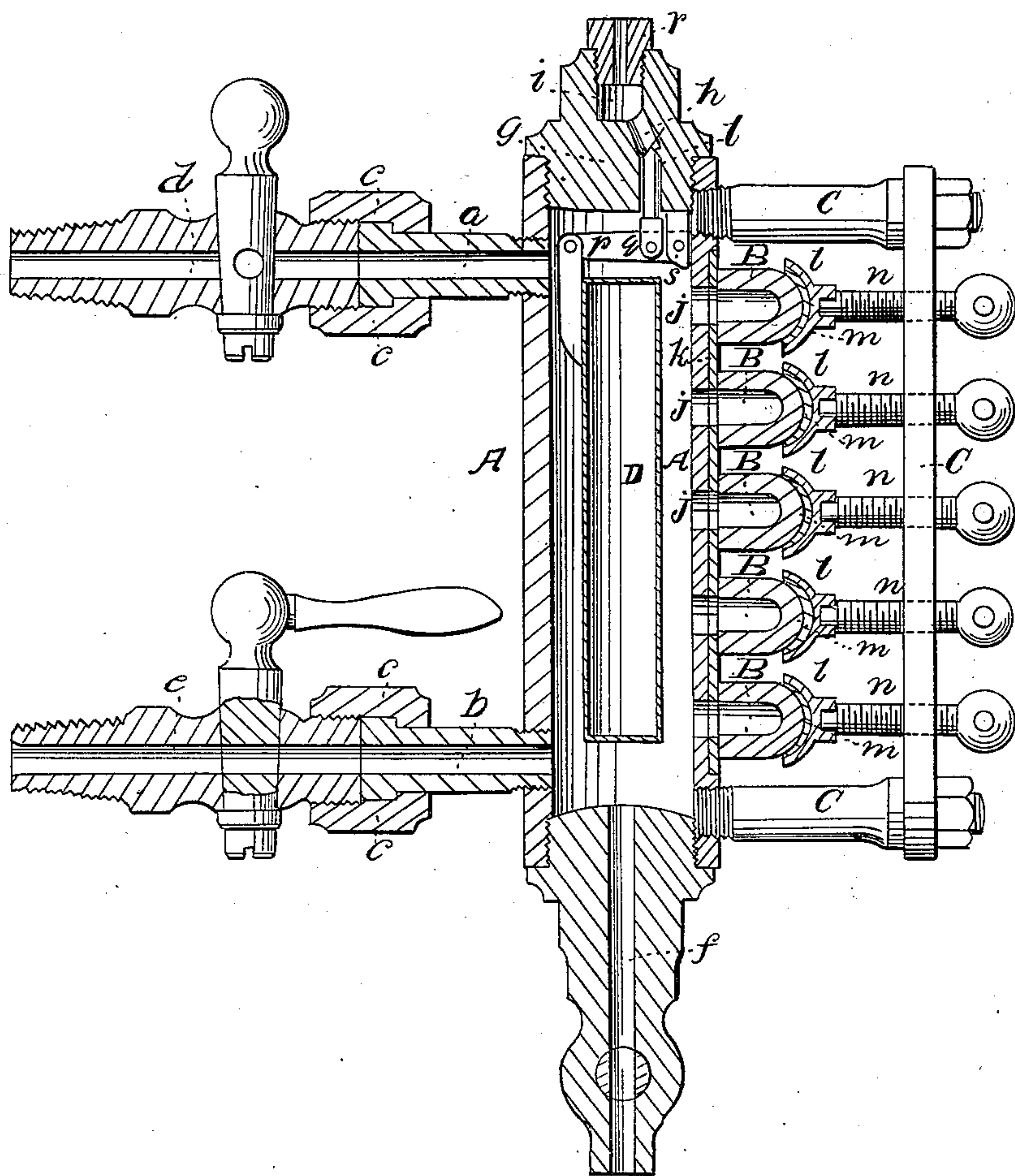


*G. Mann, Jr.,*  
*Steam-Boiler Indicator.*  
*No 40,272.      Patented Oct. 13, 1863.*



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

GEORGE MANN, JR., OF OTTAWA, ILLINOIS.

## IMPROVED WATER-GAGE FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **40,272**, dated October 13, 1863; antedated September 25, 1863.

*To all whom it may concern:*

Be it known that I, GEORGE MANN, Jr., of Ottawa, in the county of La Salle and State of Illinois, have invented a new and Improved Water-Gage for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, said drawings representing a central vertical section of the gage.

This invention consists in a vertical metal tube having its upper and lower parts connected with the boiler, and having in one side arranged, one above another, a number of openings covered with a corresponding number of glass cups, which are secured in place by caps, screws, and a yoke, as hereinafter explained, and are severally filled with steam or water, according to the level of the water in the boiler, and so give an indication of such level.

It also consists in the arrangement within such metal tube of a float so combined with a valve in the top of the said tube as to keep the said valve closed while the water in the water in the boiler is at or above a certain level, but to open the said valve and permit the escape of steam, and so give an alarm when the water is below such level.

To enable others skilled in the art to make and apply my invention, I will proceed to describe its construction and operation.

A is the vertical metal tube, having rigidly connected with it at right angles, near the top and bottom, and on the same side thereof, two tubes, *a* and *b*, which are connected by coupling-nuts *c c* with two cocks, *d e*, which are secured into the boiler to open and close a communication between the water and the steam spaces of the boiler and the interior of the tube A. The lower end of the tube A is fitted with a cock, *f*, which is only opened to blow it out for the purpose of cleaning it, and the glass cups, which will be presently described, and the upper end of the tube has screwed into or otherwise secured to it a head, *g*, in which is provided an opening, *h*, fitted with a conical or other valve, *t*, which opens with a downward movement. Above the opening *h* there is a larger opening, *i*, fitted with a hollow plug, *r*, to which a steam-whistle might be attached if desired.

One side of the tube is made flat externally nearly from end to end, and in the flattened portion are the openings *j j*, of which there may be any desirable number—say, five or six—arranged one above another. B B are the glass cups covering the said openings *j j*, and communicating through said openings with the interior of the said tube. These cups are made stout enough to resist the highest pressure of steam which the boiler is to carry, and there is interposed between their mouths and the flattened portion of the exterior of the tube A a strip, *k*, of india-rubber or other steam-packing, said packing having openings corresponding with and opposite the openings *j j*. The said cups are held in place by means of metal caps *l l*, lined with india-rubber *m m* or other soft material, and screws *n n*, screwing through tapped holes in a yoke, C, which is secured rigidly to the tube A, the said screws pressing against the said caps *l l* and causing the caps to keep the mouths of the cups pressed closely against the packing *k*, which is thus made to keep the cups steam and water tight at their connection with the metal tube A.

D is the float, of cylindrical form, arranged within the metal tube A, and attached at its upper part to a lever, *p*, which is arranged within the upper part of the said tube, where it is attached by a suitable fulcrum, *s*, to the head *g*. This lever has the valve *t* connected with it at *q*. The float D is so arranged and its buoyancy such that when the water in the boiler and that in the tube A—which is at the same level as that in the boiler—is at or above a certain level it will keep the valve *t* closed, and the weight of the said float is such that when the water is above such level it will, by its action on the said lever, pull down and open the said valve and allow the escape of steam through the hollow plug *z*, to give an alarm. The float may be of metal and hollow, or of wood or other light material and solid.

The gage is attached to the head of the boiler by the pipes *a* and *b*, couplings *c c*, and cocks *d e* at such a height that the middle of the length of the tube A will be nearly opposite the most desirable water-level. The upper part of the tube A then being in communication with the steam-space, and the lower

part in communication with the water-space of the boiler, the said tube will be filled with water up to the same height as the boiler itself, and the lower cups, B B, below the water-level, will be filled with water, and the upper ones with steam, or one of the said cups may be partly filled with water and partly filled with steam, and will thus show the level of the water in the boiler. When the water is up to or above a desirable level, the valve *t* will be closed, and no steam will escape at the plug *r*; but when the water gets below such level the weight of the float will open the valve and allow the escape of steam to give an alarm.

The advantages of this gage over the glass-tube gage is that the cups B B are much less liable to be broken than the glass-tube, while they give an equally good indication of the level of the water, and in case of one being accidentally broken it is very easily replaced

by unscrewing its respective screw *n*, removing it, applying a new one, and screwing up the screw *n* again; and the advantage of arranging the float and alarm-valve in the tube A is that the low-water alarm is combined with the gage in a very compact form and enabled to be easily applied.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The cups B B, attached and secured to the tube A by means of the caps *l l*, screws *n n*, and yoke C, the whole combined substantially as herein specified.

2. The float D and valve *t*, applied within and in combination with each other and the gage-tube A, to operate substantially as and for the purpose herein specified.

GEORGE MANN, JR.

Witnesses:

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