(No Model.) 3 Sheets—Sheet 1.

J. F. GUILD.

FLOAT.

No. 461,383. Patented Oct. 13, 1891.

Fig. 1.

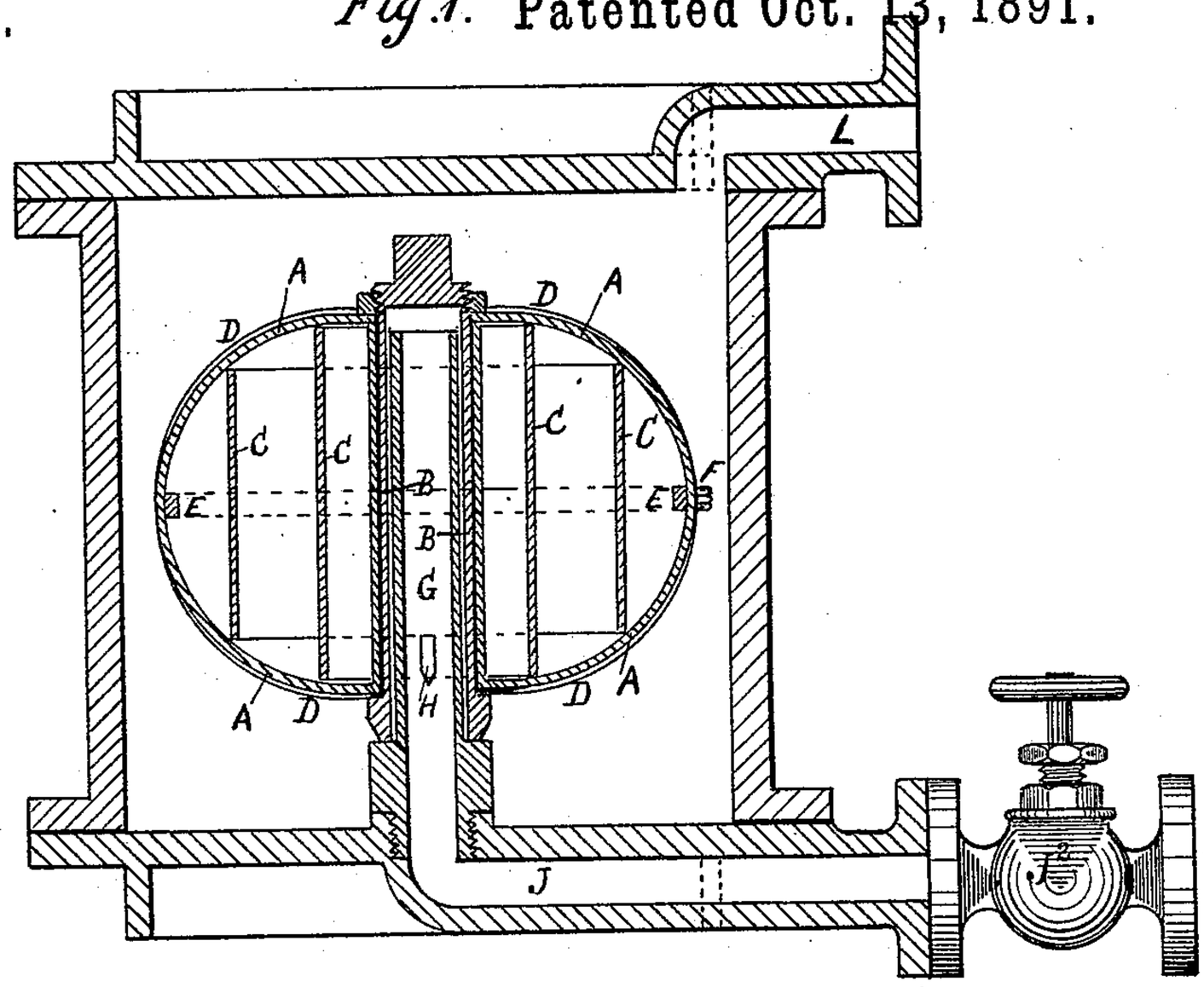


Fig. 2.

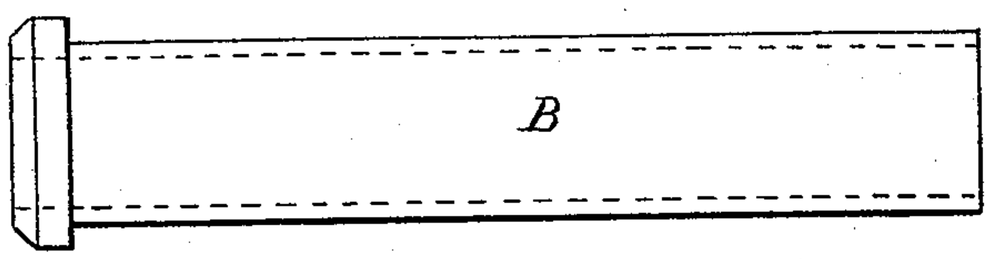
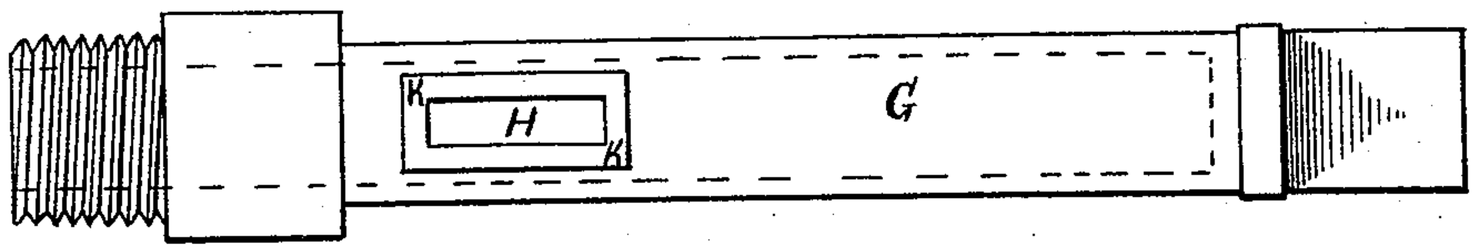


Fig. 3.



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(No Model.) 3 Sheets—Sheet 2.

J. F. GUILD.

FLOAT.

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Fig. 4.

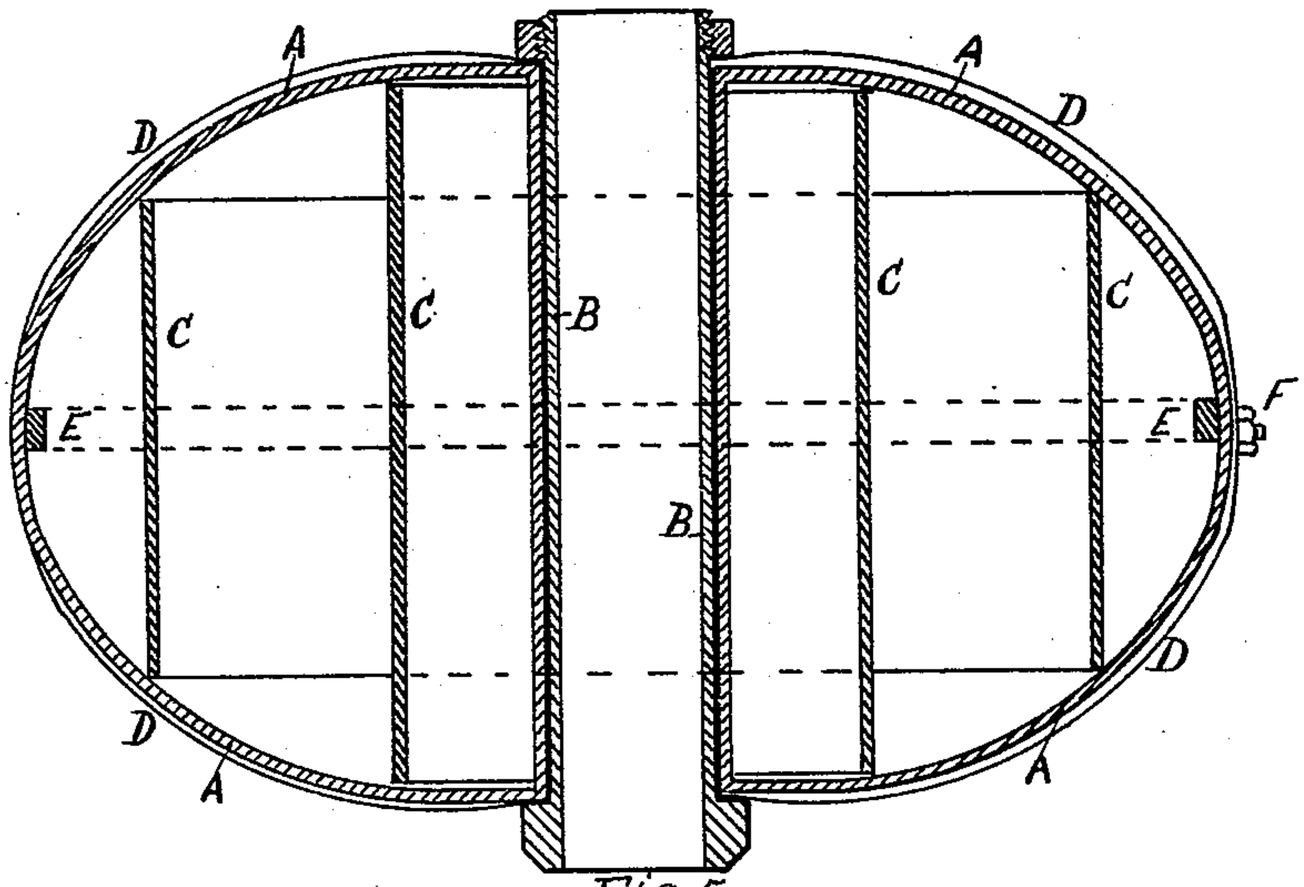

Fig. 5.

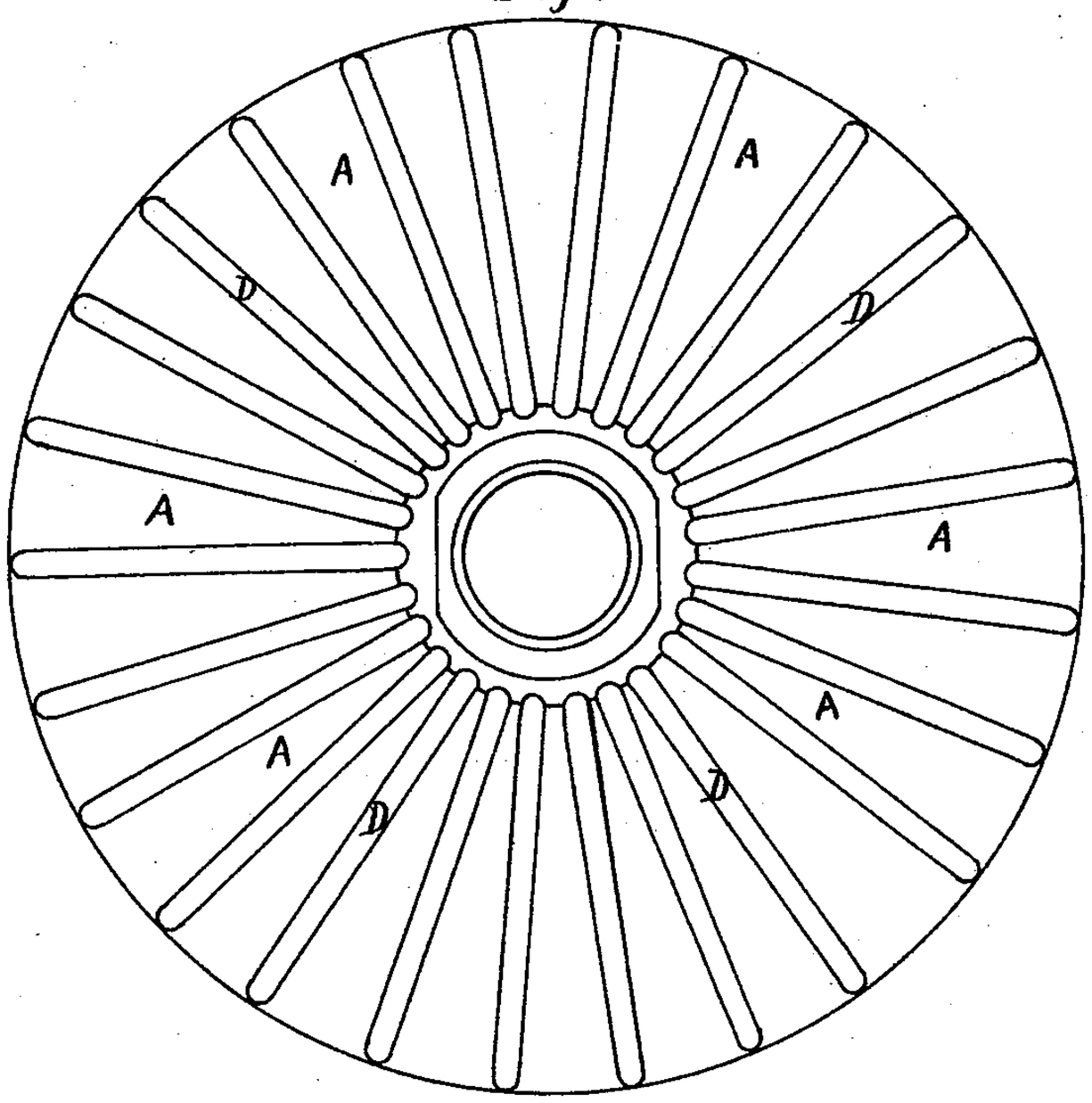

Fig. 6.

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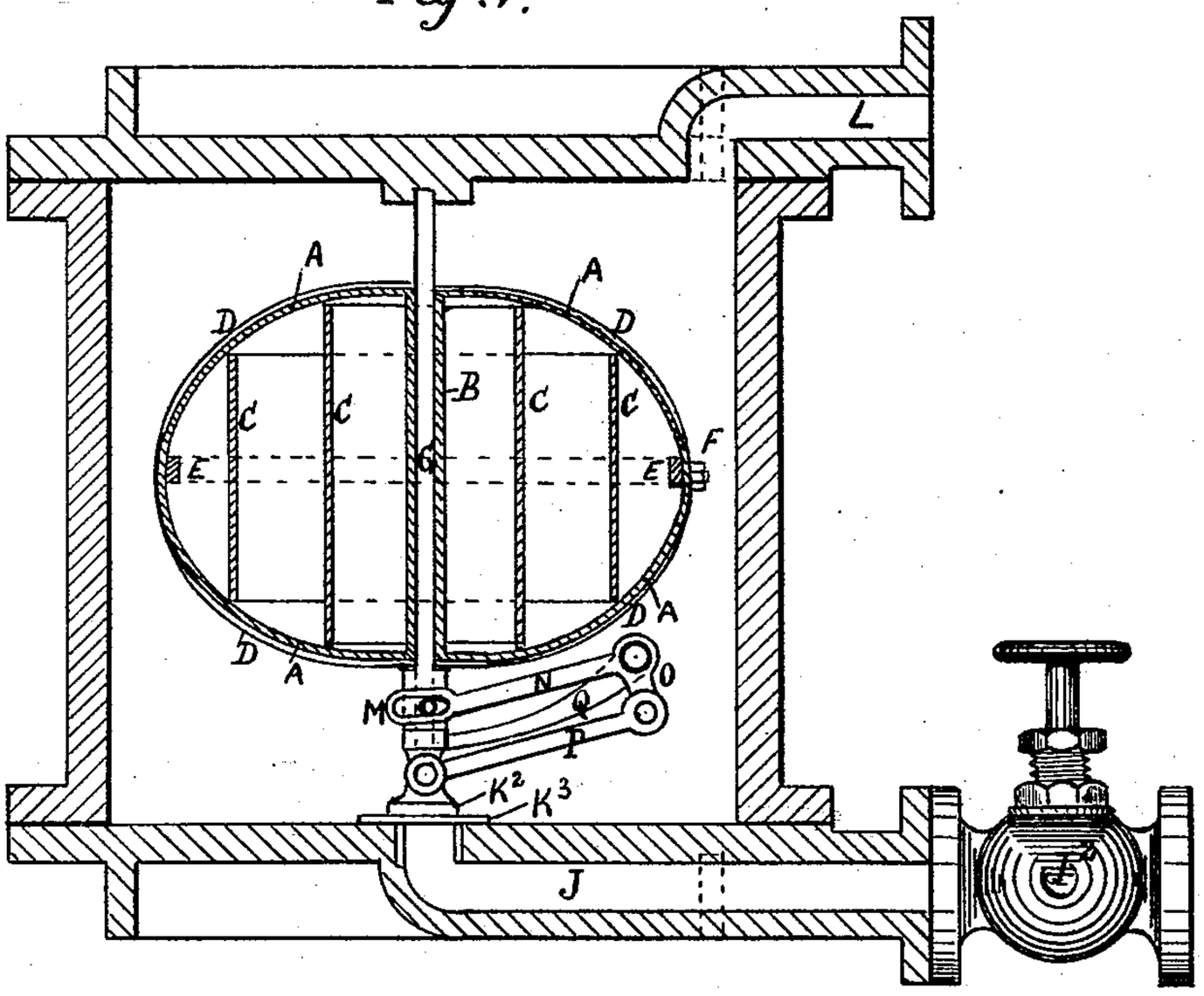
(No Model.) 3 Sheets—Sheet 3.

J. F. GUILD.

FLOAT.

No. 461,383. Patented Oct. 13, 1891.

Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES F. GUILD, OF DUNDEE, COUNTY OF FORFAR, SCOTLAND.

FLOAT.

SPECIFICATION forming part of Letters Patent No. 461,383, dated October 13, 1891.

Application filed February 24, 1891. Serial No. 382,471. (No model.)

To all whom it may concern:

Be it known that I, JAMES FINDLAY GUILD, M. I. N. A., consulting engineer and steamship surveyor, a subject of the Queen of Great Britain, residing at 18 Dock Street, Dundee, in the county of Forfar, Scotland, have invented new and useful Improvements in Floats, of which the following is a specification.

The object of this invention is to drain off water and moisture condensed from steam during its expansion in cylinders, valve-chests, &c., and to return the same to the boiler at a high temperature, so that the efficiency of the engine or engines may be increased by the removal of water and moisture from the steam before or during expansion in the cylinder, &c., and also that a considerable quantity of water may be returned to the boiler direct at a high temperature, instead of passing the same through the condenser in the ordinary manner.

The invention is only applicable to engines where the steam is worked expansively.

During the expansion of the steam in each of the cylinders there is a rapid condensation, and it is to carry away the water so produced and to render the steam comparatively dry when it commences its work in the next cylinder that my invention is produced.

To carry my invention into practical effect, I connect the valve-casing of each cylinder to a steam-trap or water-extractor by means of suitable pipes or tubes, the steam-trap being placed beneath or at a lower level than the cylinder-valve casing, so that any water or moisture which may be condensed from the steam will flow by gravitation into the steam-trap. After the steam has been expanded in the first cylinder the water produced by the condensation I drain off at the valve-chest of the second cylinder, so that the steam is comparatively dry to commence its work in that cylinder, and so on with the succeeding cylinders. By this means I remove the condensation from the steam at the various stages of expansion, leaving the steam comparatively dry at the commencement of its work in each cylinder.

In Figure 1 of the accompanying drawings I have shown a sectional elevation of one form of steam-trap or water-extractor, and in Figs. 2 to 6 the details of its construction. Fig. 7 shows a modified form of steam-trap.

The water-extractor I prefer to use automatically discharges the extracted water by means of a float valve. The float is made with an outer shell A, of an ellipsoidal shape, from sheet metal and corrugated, so as to give additional strength. Fig. 4 shows a section, and Fig. 5 a plan, of this float. Passing through the minor axis of the ellipsoid, I place a tube or socket B, and onto this I affix one or more thin iron cylinders C, which act as stays to the shell A.

D D are the corrugations on the shell, and E is a strengthening-band passing round the center of the shell and secured by screws, bolts, or other equivalent fastenings F, at the end or ends of the major axis of the ellipsoid.

Fig. 6 shows a section of the corrugated metal from which the shell is made. The tube or socket B is placed on a central vertical stem G, over which it is free to slide vertically by flotation.

Figs. 2 and 3 show detached views of the socket B and stem G, respectively. The stem G is partly tubular, and is provided with an aperture or apertures H, through which the collected water may pass into the tubular portion of the stem G, and from thence passes to an outlet J in the cover of the steam-trap or water-extractor, fitted with a non-return valve J^2, through which it is discharged into a tube leading direct to the boiler or to the hot well, engine-feed pump, or into a special pump or injector. The apertures H are formed with a projection K all round to form a valve-face, and the sliding tube or socket B is ground or otherwise truly fitted to the said valve-face K, so as to form the valve which regulates the flow of water by opening and closing the passage or passages H when the float rises and falls, respectively.

The inlet L and outlet J are cast or rigidly affixed to the top and bottom covers, respectively, of the steam-trap or water-extractor, which said covers may be set at any angle in their respective planes to suit various general arrangements.

In the modification shown in Fig. 7 the sliding tube or socket B forms part of the float, and is attached by means of a pin and slot

M, or their equivalents, to a bell-crank lever N, whose other end O is pivoted to a connecting-rod P, to the other extremity of which the valve K^2 is pivoted. Q is a fixed bracket carrying the bell-crank lever, and K^3 is the valve-face. As the float rises the valve K^2 is moved horizontally over the face, so as allow the collected water to pass into the outlet J. As the float falls the valve is brought back over the valve-face again into the normal position shown in Fig. 7.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A float having a central stem or tube passing through its center, one or more cylindrical stays, a circumferential strengthening-ring formed upon the interior of said float, and a valve adapted to be automatically opened and closed by the movement of said float, substantially as described.

2. A corrugated float having a central tube or stem passing through its center, one or more cylindrical stays, a circumferential strengthening-ring formed upon the interior of said float, and a valve adapted to be automatically opened and closed by the movement of said float, substantially as hereinbefore set forth.

3. A float having a central tube or socket to slide vertically on a central stem in the steam-trap and provided with one or more cylindrical stays extending vertically from top to bottom of the float and with a circumferential strengthening-ring, substantially as described.

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