

J. J. Miller,

Steam-Boiler Water-Feeder,

No. 43,951,

Patented Aug. 23, 1864.

Fig. 1.

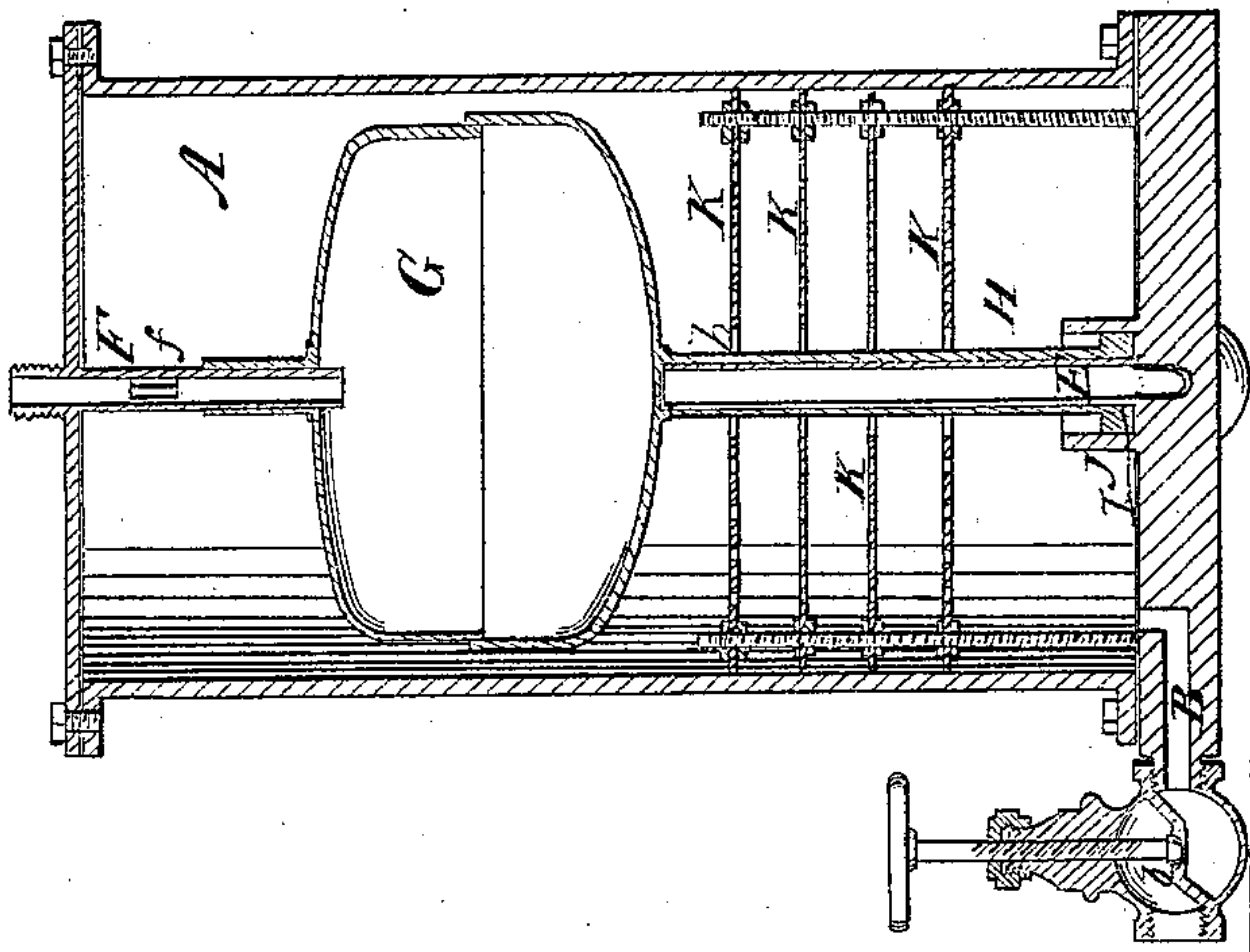
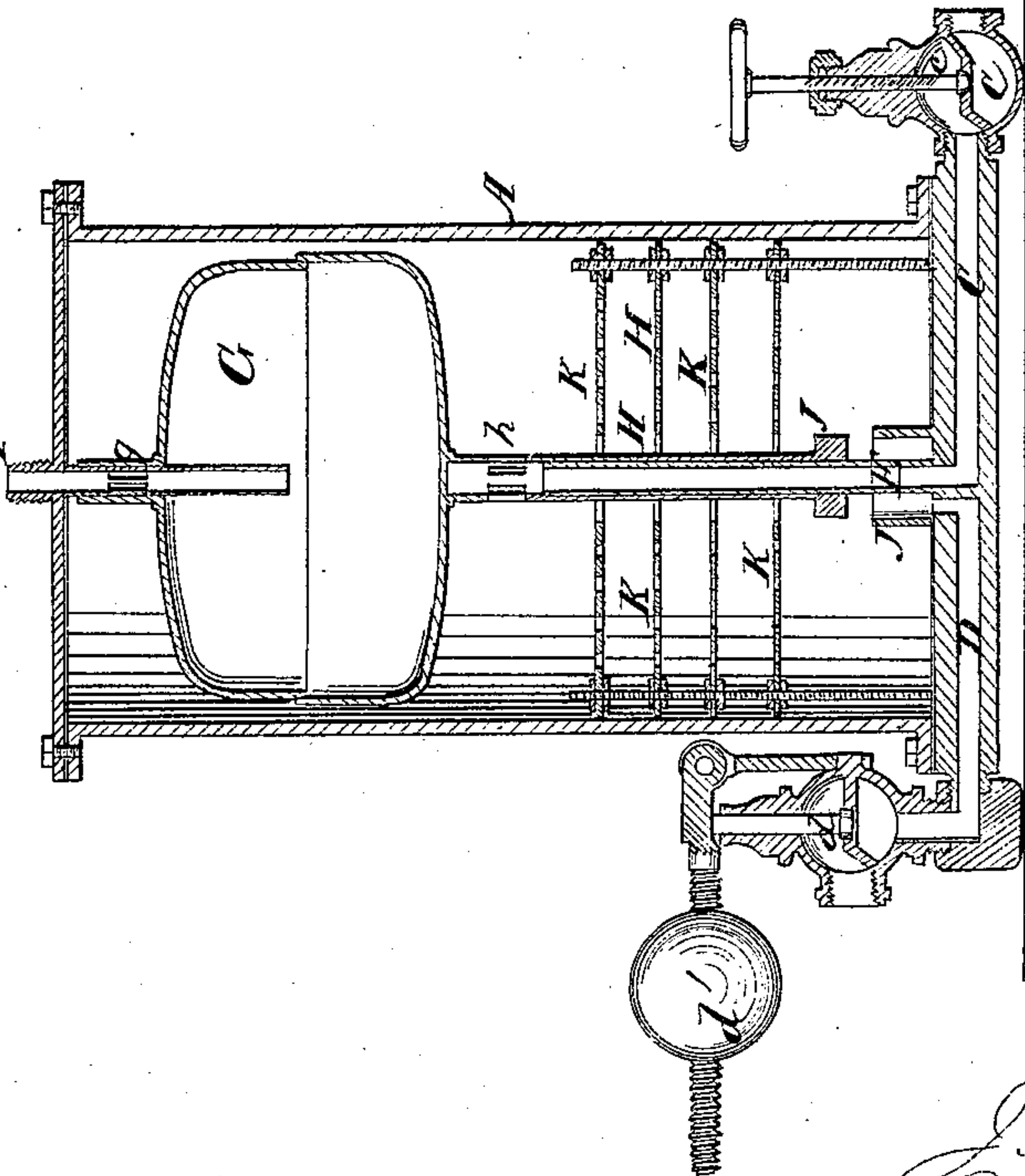


Fig. 2.



Witnesses:
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JOHN JACOB MILLER, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF
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IMPROVED LIQUID-SEPARATOR.

Specification forming part of Letters Patent No. 43,951, dated August 23, 1864; antedated
February 15, 1863.

To all whom it may concern:

Be it known that I, JOHN JACOB MILLER, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Apparatus for Separating Liquids; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a central vertical section of the said apparatus. Fig. 2 is a central vertical section in a plane at right angles to the former and showing the parts in another position.

Similar letters of reference indicate corresponding parts in both figures.

The subject of this invention is an apparatus partly intended to separate pure from impure water discharged from the condenser of a steam-engine, (or, as the case may be, from the condenser and the pump feeding the boiler,) and, in the event of there being an excess over and above the quantity needed to supply the boiler, to take for this purpose only that which is free from impurities.

The action of the apparatus is based upon the following qualities of condensed or distilled water: First, its specific gravity is less than that of other water, because it is free from foreign matters; second, such water being of a higher temperature and more susceptible of influence from heat naturally becomes separated from other water with which it may be partially mixed and forms the upper stratum in the vessel.

The invention particularly consists in the use of a close chamber provided with a float and suitable ports, which operate in such a manner that in the event of an excess of water being taken from the condenser the impure part of it will be discharged and only the pure conveyed to the boiler.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

A is a close cylinder, provided at bottom with a number of valve-guarded ports, B C D. The valves of the ports B and C may be cocks *b c* of common construction, and that of the port D a weighted or "safety" valve, *d*, ad-

justable to open with any suitable degree of pressure by means of the shifting weight *d'*. The port B discharges directly into the lower part of the cylinder, as shown. The port C communicates with an axial pipe, E, which may extend about half-way up the cylinder, more or less.

F is a pipe opening outward through the top of the cylinder, projecting some distance downward therein, and pierced at *f* with a number of apertures.

G is a hollow float provided at top with a short pipe, *g*, fitted to slide over the pipe F, and on its under side with a longer pipe, H, adapted to slide over the pipe E. The float, with its attached pipes, has thus a limited vertical play within the cylinder A.

The two figures illustrate the two extreme positions of the float.

I is an annular-valve attached to the lower end of the pipe H, and fitting a seat, J, constituted of a cylindrical flange projecting upward from the bottom of the main cylinder A. The port D opens within the valve seat J, so that when the valve I is down in its seat the communication of the port D within the cylinder is closed.

h h are a series of apertures formed in the pipe H in such position that they will be closed when the float is in its lowest position and open when it is elevated.

f are apertures in the pipe F, so placed that they will be closed when the float is at its highest position and open when it is down. The port B communicates with the condenser or feed water apparatus, the port C with the boiler, and the port D with the atmosphere or any suitable waste-water way.

K is a perforated disk or sieve, whereof one, two, three, or more may be used, fastened by nuts in a level position upon three or more feet standing on the bottom of the chamber A, so that neither the float in its lowest position nor the annular valve in its highest will touch it.

Operation: The weight *d'* is so adjusted as to equalize or overcome the pressure within the boiler. The water of condensation, condensing-water, together with air and other matters from the condenser, are then forced into the cylinder A through the port B, the said water raising the float G within the cylinder,

and the air escaping through the apertures *f* and pipe *F*. In case the float be lifted high enough to close the ports *f* the ports *C* and *D* will open. The purer or lighter upper strata of water will then flow through the apertures *h* and port *C* to the boiler, provided the force of the pump overcomes the steam-pressure, and can be readily regulated by the faucet *c*. The impure or heavier lower strata will flow off through the port *D* and be discharged. If the boiler should not receive sufficient water, a further opening of the faucet *c* will cause an additional flow therein, and, if need be, suspend the escape through the port *D*; and, on the other hand, if the supply to the boiler be too great, the partial closing of the faucet *c*, producing an excess of pressure within the cylinder, will raise the valve *d* and eject a further quantity of the impure water. The perforated disks *K* operate to prevent the ebullition, and consequent commingling, of the water entering the apparatus, so that it may rise therein without disturbance, and thus become separated, as before explained.

The apparatus will serve equally well to

separate oil and acids in oil-refineries, oil-mills, rendering-establishments, &c. In general, it may be used to separate any and all liquids of different specific gravity, whether two, three, or more have been mingled.

Having thus described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. A float operating within a suitable containing-vessel to open and close ports on different levels in such a manner as to effect the separate and automatic discharge through the said ports of two or more fluids separated in said vessel by their unequal specific gravities.

2. In combination with a float operating within a containing-vessel to automatically open and close ingress or egress ports, the use of perforated plates *K*, to lessen the commingling of the inflowing liquids with those already contained in the vessel, as explained.

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Witnesses:

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