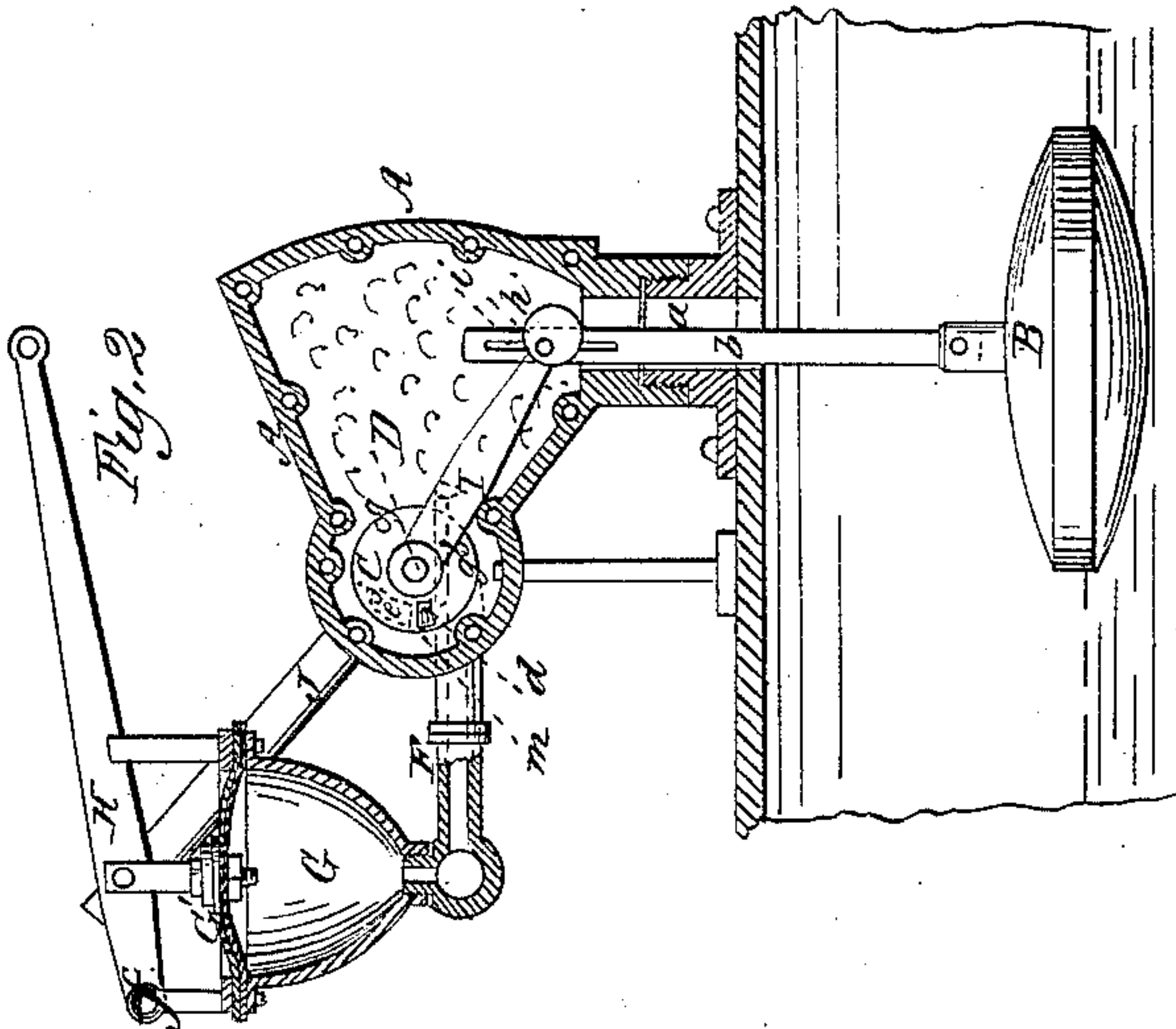
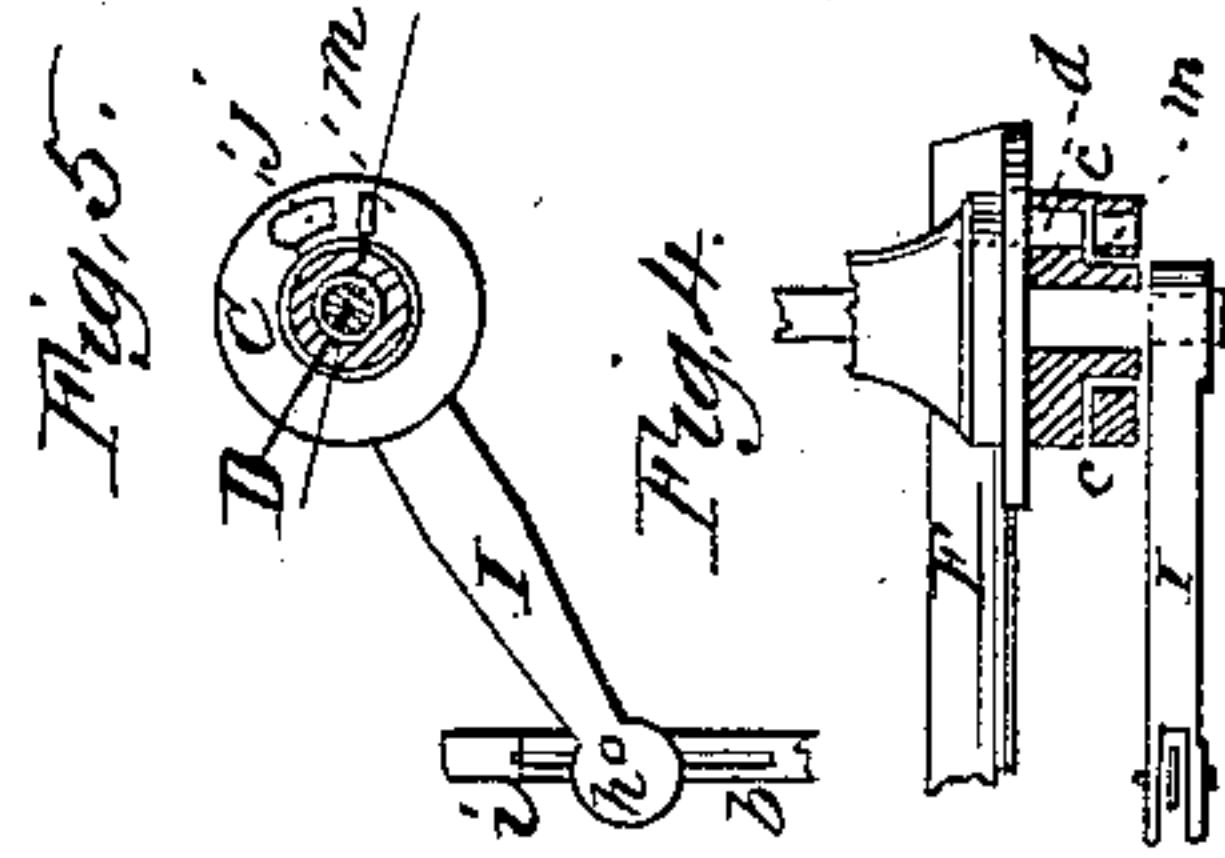
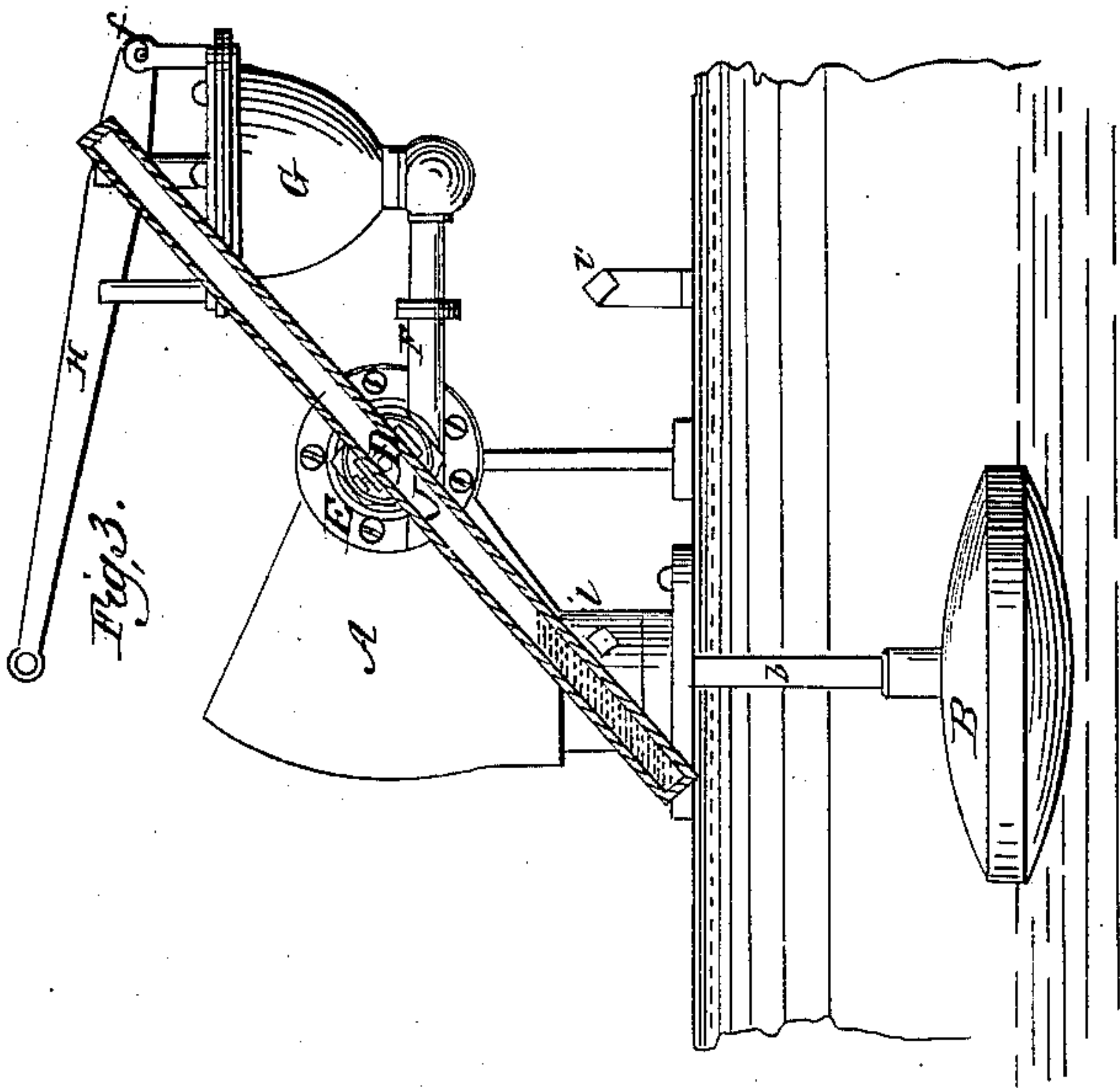


*J. Stowell,*

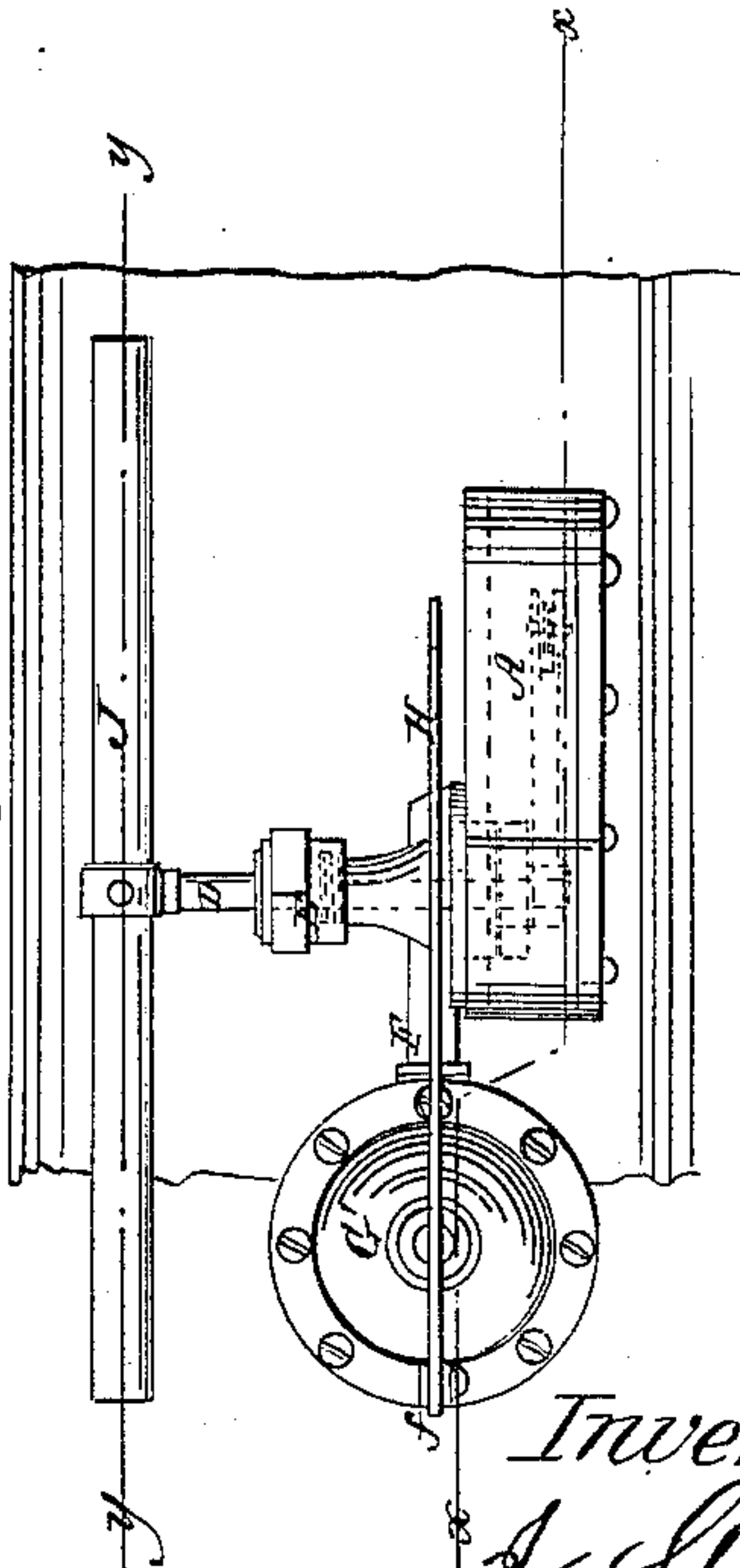
*Steam-Boiler Water-Feeder*

*No 27,601,*

*Patented Mar. 20, 1860.*



*Fig. 1.*



*Witnesses.*  
*J. W. Coombs.*  
*R. S. Spencer.*

*Inventor.*  
*J. Stowell*  
*per Murray & Co.*



# UNITED STATES PATENT OFFICE.

JOHN STOWELL, OF CHARLESTOWN, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND DANIEL F. WHITE, OF SAME PLACE.

## FEED-WATER REGULATOR FOR STEAM-BOILERS.

Specification of Letters Patent No. 27,601, dated March 20, 1860.

*To all whom it may concern:*

Be it known that I, JOHN STOWELL, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Feed-Regulator 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, making a part of this specification, in which—

Figure 1, is a top view; and Figs. 2 and 3, are vertical sections taken in the planes indicated by the lines *x, x*, and *y, y*, and seen looking in opposite directions. Fig. 4, is a horizontal section of the valve and its seat. Fig. 5 is a face view of the valve.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to control the action of the feed pump either by shifting a belt which drives it, from a loose to a fast pulley and vice versa, on one of the shafts by which it is driven, or by operating on any other means, starting and stopping the pump or other feed apparatus; and it consists in certain means employed in combination with a float whereby this result is produced very promptly and certainly at the instant of the water in the boiler falling or rising to certain levels.

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

A, is a steam tight box, arranged above the boiler or above a float tank attached to the boiler, and having an opening *a*, in its bottom, by which it has constant communication with the steam space of the boiler, and through which passes the rod or stem *b*, to which the float B is attached. At the back of this box at the opposite end to where the opening *a* is situated, there is formed an upright seat *c, c*, to which is fitted a disk valve C, which is fitted to turn about a central horizontal shaft D, which works through a stuffing-box bearing E, in the back of the box. The valve seat *c, c*, contains two ports *d* and *e* of which the latter leads through the side of the box directly to the atmosphere, and the former communicates with a pipe F, which leads to a steam tight vessel G, the head G' of which is made of india rubber or other flexible steam tight material, and is connected with a lever H, one end of which is attached to a fixed ful-

crum *f*, and the other to the belt shipper or other contrivance for starting and stopping the feed pump. The valve C, has an opening *m* right through it, which may be brought opposite to the port *d* or *e* by turning it on the shaft D, and has a cavity *j* in its face of suitable form to constitute a means of communication between the ports *d e* of the seat. It has also, projecting from its back, two pins *g, g'*, one above and the other below the arm I, which is secured to the shaft D, and which has connected with it the rod *b* of the float, the connection being made by a pin *h*, secured in the arm and a slot *i* in the rod, the said slot being long enough to permit the arm to move independently of the rod and along with the valve, the whole distance the valve is required to move, as will be presently described. To the outer end of the shaft D, there is attached a lever J, whose fulcrum is the said shaft, said lever having two arms of equal length and weight, such lever being composed of a tube with closed ends and containing a quantity of mercury, less than half of what is sufficient to fill it; and two fixed stops *l, l'*, are provided to form resting places for the said lever.

The connection of the lever H, with the belt shipper or its equivalent is such that the pump will be set in operation by the rise of the lever and thrown out of operation by its descent, and the operation is as follows: When the pump is not in operation the arm I, is near the top of the box A, in contact with the upper pin *g* of the valve, in which position it is held by the mercury in the lever J, which then rests upon the stop *l'*. The valve is then in such position as to close the port *d*, to the steam in the box A, and exclude steam from the vessel G, and to form a communication by means of its cavity *j* between the ports *d* and *e* and so keep the vessel G, open to the atmosphere. As the water level in the boiler descends, the float, which must be heavy enough to overcome the effect of the weight of the mercury in the lever J, descends and draws down the arm I, the valve in the mean time remaining stationary till the said lever just passes a horizontal position by which time the arm I, comes in contact with the pin *g'*; but as soon as the said lever has passed the horizontal position, the mercury in the lever runs toward its lower end, and so causes



that end to descend very rapidly till the said lever is arrested by the stop *z*. The mercurial lever by this rapid movement causes the arm *I*, by its action on the pin *g'*, to move the valve to such a position as to cut off the communication between the ports *e* and *d* and bring its opening *m*, opposite to the latter port, thus closing the vessel *F*, to the atmosphere and opening it to the steam in the box *A*, and the steam then filling the vessel *G*, by its pressure upon the flexible head *G'*, of the said vessel, forces up the lever *H*, and sets the pump in operation.

Figs. 2 and 3, represent the apparatus in the condition just described, in which condition it remains till the level of the water in the boiler rises so high that the float by its ascent raises the arm *I*, far enough to make the lever *J*, just pass the horizontal position again, which brings the said arm into contact with the pin *g* and so causes the rapid descent of the lever in the opposite direction to that last described, which shifts the valve to the position first mentioned, shutting off steam from the vessel *G*, and opening the said vessel to the atmosphere to permit the exhaust of the steam which it had previously contained, and the descent of the lever *H* to stop the operation of the pump, the lever being of itself heavy enough or suitably loaded to produce such

descent. It will be seen that the movement of the valve is accomplished entirely by the sudden fall of the lever *J*, produced by the weight of the mercury, after it has passed the horizontal position, and hence is almost instantaneous, and the action on the pump is consequently very prompt.

The slot *i* in the rod *b*, is for permitting the above movement of the said lever *J*.

By this regulator the lever of the water in the boiler is confined within such limits as may be determined upon and the feed never stopped till it gets above or started till it gets below such limits.

I will here remark that the apparatus is capable of operating with a lever having a relatively fixed weight so applied as to make it fall in one direction or the other as it passes a certain position, but such a lever will be less prompt and certain in its operation than the mercurial lever *J*.

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

The combination with the float *B*, and steam box *A*, of the slotted rod *b*, arm *I*, valve *C*, vessel *G*, lever *H*, or its equivalent, and a loaded lever *J*, the whole applied and operating substantially as herein described.

JOHN STOWELL.

Witnesses:

I. A. STEVENS,

A. L. ARNOLD.