(No Model.)

W. O. GUNCKEL.

PUMP REGULATOR.

No. 433,680. Patented Aug. 5, 1890.

Fig. 1.

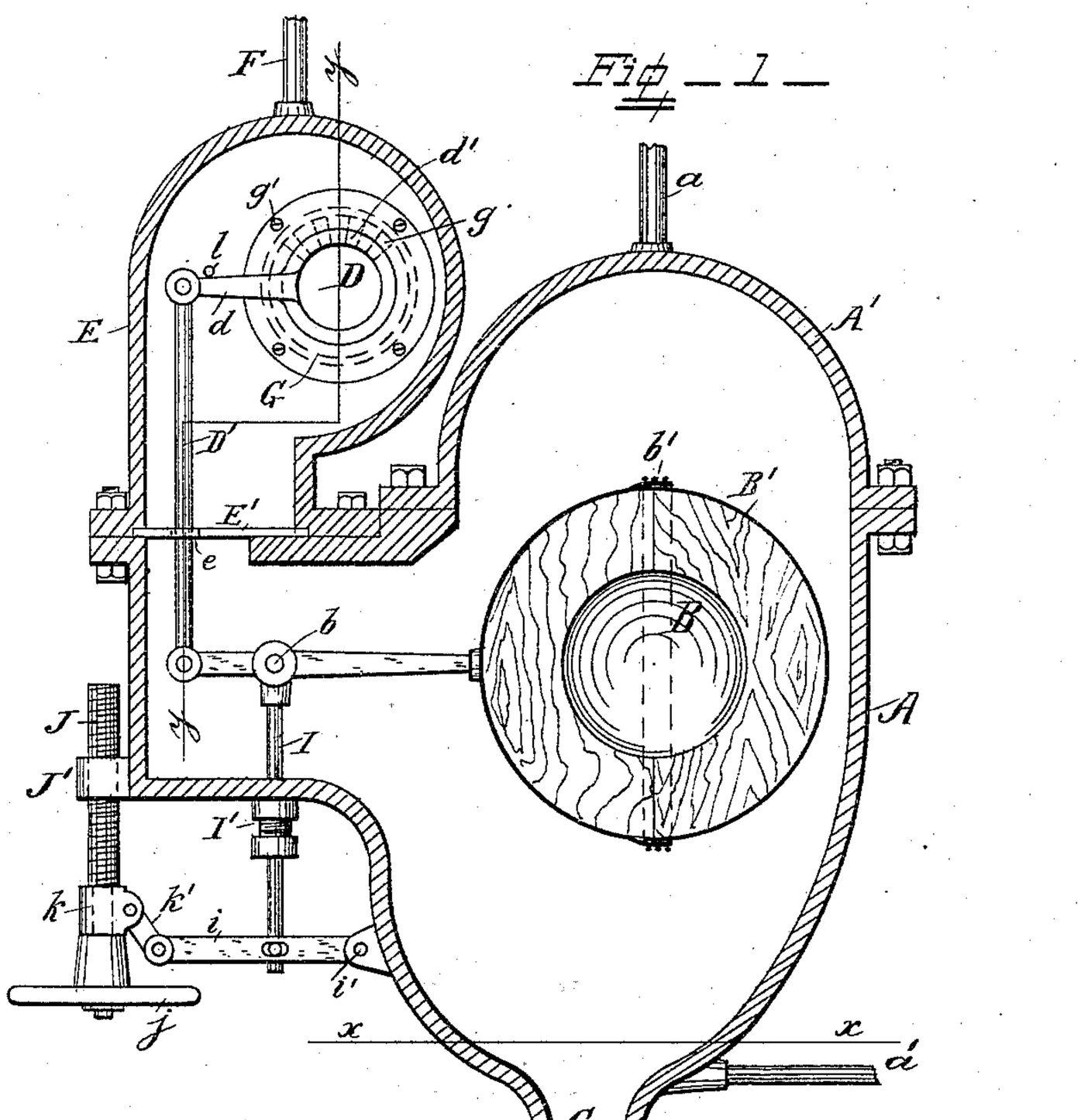


Fig. 3.

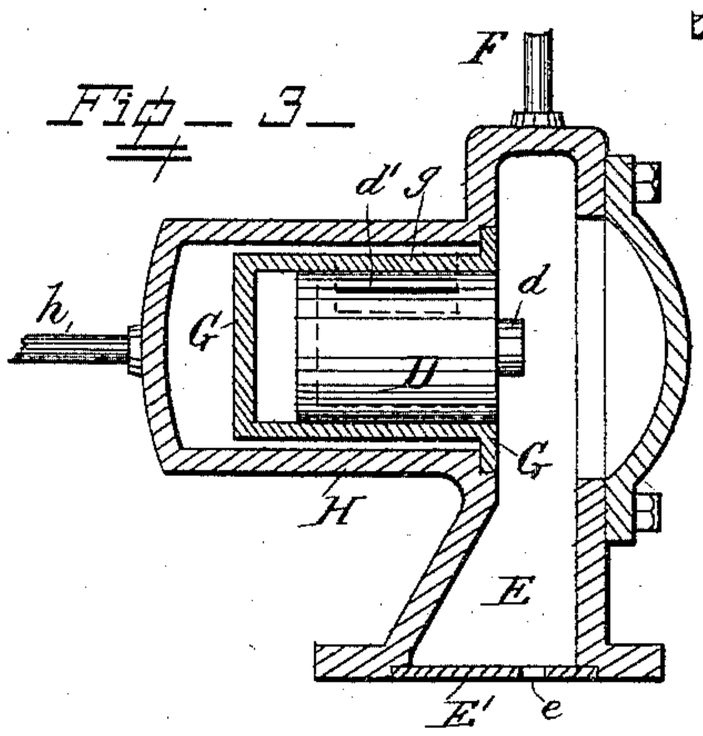
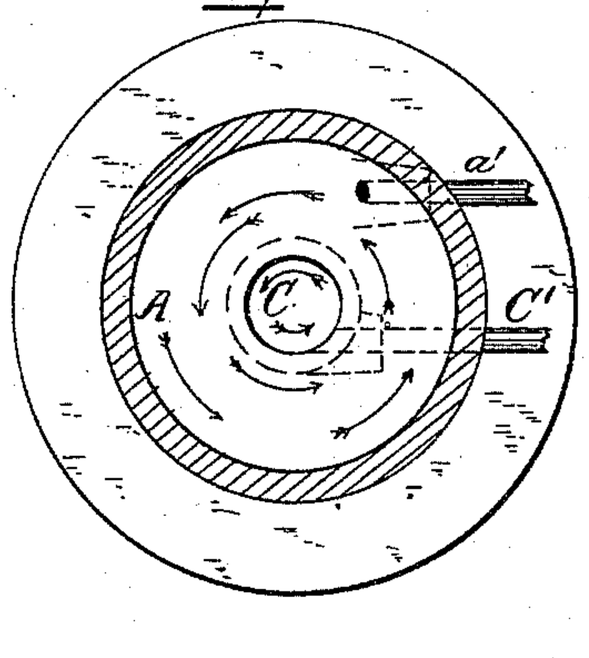


Fig. 2.



WITNESSES

Walter Allen

F. A. Hopkins

INVENTOR

W. O. Gunckel.

by Herbert W. J. Jenner.

Attorney

UNITED STATES PATENT OFFICE.

WINFIELD O. GUNCKEL, OF TERRE HAUTE, INDIANA.

PUMP-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 433,680, dated August 5, 1890.

Application filed August 24, 1889. Serial No. 321,887. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD O. GUNCKEL, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Pump-Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to boiler-feed-pump regulators; and it consists in the novel construction and combination of the parts, as hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical section through the regulator. Fig. 2 is a sectional plan view from above taken on line *x x* in Fig. 1. Fig. 3 is a vertical cross-section taken on line *y y* in Fig. 1.

A is the float-casing provided with a steam-tight cover A′. A pipe *a* connects the upper part of the casing with the steam-space of the boiler, and *a′* is a second pipe connecting the lower part of the casing with the water-space of the boiler, to the shell of which it is preferably attached at a short distance below the water-level. The lower part of the float-casing is provided with converging sides and with the mud-trap C at the bottom.

C′ is a pipe provided with a blow-off valve *c*. The pipe C′ is connected to the mud-trap upon one side of the center of the casing, and the pipe *a′* is connected to the casing above said pipe C′ and parallel with it, but upon the opposite side of the center of the casing. As the boiler is hotter than the casing A, and as pipe *a′* is connected to the boiler near the water-level, the scum in the boiler tends to pass down pipe *a′* and settle in the mud-trap C. When the valve *c* is opened, the water runs down pipe *a′* and whirls around in the lower part of the casing and in the mud-trap, as indicated by the arrows in Fig. 2, before passing out by pipe C′, and thereby effectually clears away all accumulations of dirt.

B is the float provided with an ordinary float-lever pivotally supported inside the float-casing on the fulcrum-pin *b*. The pin *b* may be secured to the float-casing; but it is preferably made adjustable and supported by the stem I, so that the working water-level of the float may be varied.

I′ is a stuffing-box, and *i* is a lever supporting the stem I and pivoted to the outside of the casing by the pin *i′*.

J is a screw engaging with the screw-threaded boss J′ on the casing and provided with the hand-wheel *j*.

k is a sleeve, journaled at the base of the screw J, and pivotally connected with the end of lever *i* by the link *k′*.

The float B consists of an internal shell of wood or other light material adapted to resist compression, and an outer covering B′ of a material which is practically water-proof. The internal shell is preferably made hollow, so that the float may be proportioned in size and weight, and it is made in two halves, so that the internal hollow portion may be turned in it. The outer covering B′ is also made in two parts, having overlapping edges, as shown. When thin metal is used, these edges are soldered together; but when a non-metallic covering is used—such as india-rubber, which cannot be soldered—the edges may be secured by lapping them with wire *b′*, or in any other convenient manner. The ordinary spherical copper float-ball has been found apt to collapse when exposed to the high-pressure steam and water in the casing unless made excessively thick, and the hollow wooden ball covered with a very thin metallic shell is found preferable, both for cheapness and efficiency in action and adjustment.

D is the steam-regulating valve, consisting of a hollow open-ended cylinder provided with ports *d′*. An arm *d* projects from one end of said valve, and D′ is a spindle which pivotally connects the said valve-arm to the float-lever.

E is a casing which supports the steam-regulating-valve seat, and which is secured to the upper part of the float-casing.

E′ is a plate separating the steam-spaces in the float-casing and in the valve-casing. This plate is provided with a hole *e*, which is rather larger than the valve-spindle which passes through it, and permits a small amount of steam to pass through it around the spindle in either direction to maintain equilibrium,

but prevents the pulsations in the steam-supply of the pump, due to the action of its piston, from being transmitted to the float in the casing.

F is the steam-supply pipe secured to the top of said casing above the valve, and L is a pin projecting from the casing above arm *d*, to prevent the reclosing of the steam-ports of the valve.

G is the valve-seat, which is provided with ports *g*, corresponding with the ports in the valve. Its rear end is closed, and its front end is secured tightly to the casing E by a flange and the screws *g'*, so that no steam can pass except through the ports.

H is a hollow cap, which incloses the valve-seat, and which forms a part of the said casing, and *h* is the steam-pipe leading from said cap to the pump which supplies the boiler with feed-water.

In operation the feed-pump takes all its supply of steam through pipe F, the balanced valve, and pipe *h* and forces feed-water into the boiler. When the water-level in the boiler rises above the normal, it raises the float and partially closes the steam-supply valve of the pump, and the converse of this occurs when the water-level sinks.

What I claim is—

1. The combination, with a float-casing provided with a mud-trap at the bottom, of a water-pipe for connecting the lower part of said casing with the boiler, and a blow-off pipe provided with a valve and connected to the mud-trap below the level of said water-pipe and to one side of it, whereby the water is caused to whirl around in the mud-trap when said valve is opened and remove all accumulations of dirt.

2. The combination, with a float-casing provided with a converging lower end and a mud-trap at the bottom, of a water-pipe secured to the lower part of said casing upon one side of its center for connecting it with the boiler, and a blow-off pipe provided with a valve and connected to the mud-trap parallel with the said water-pipe, but at a lower level and upon the opposite side of the center of the casing, whereby the water is caused to whirl around in the mud-trap when the said valve is opened and remove all accumulations of dirt.

3. The combination, with a float provided with a float-lever, of the adjustable stem pivotally supporting said float-lever and projecting through the float-casing, a revoluble adjusting-screw engaging with a stationary screw-threaded lug on the float-casing, a sleeve journaled on the spindle of said screw, a lever supporting said stem and pivoted at one end to the float-casing, and a link pivotally connecting the other end of said lever with the said sleeve, substantially as and for the purpose set forth.

4. A float consisting of an internal sphere of light material, such as wood, an outer covering of india-rubber formed of two hemispheres having overlapping edges, and the wire wound upon said overlapping edges and securing said hemispheres tightly upon the said sphere, substantially as and for the purpose set forth.

5. The combination, with the float-casing and the pump-regulating-valve casing secured thereto and provided with a horizontally-projecting hollow cap and steam inlet and outlet pipes, substantially as set forth, of a float-lever pivoted in the said float-casing, a valve-seat secured in said horizontal cap, an oscillating regulating-valve provided with a laterally-projecting arm and with steam-ports registering with corresponding ports in the valve-seat, and a vertical rod connecting the said arm and float-lever, whereby the supply of steam to the pump may be controlled by the height of the water in the float-casing.

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

WINFIELD O. GUNCKEL.

Witnesses:

W. H. SOULE,

AUG. STUKENBERG.