

(No Model.)

2 Sheets—Sheet 1.

A. E. BURROWS & W. E. CLARK.  
AUTOMATIC PUMP CONTROLLING DEVICE.

No. 507,211.

Patented Oct. 24, 1893.

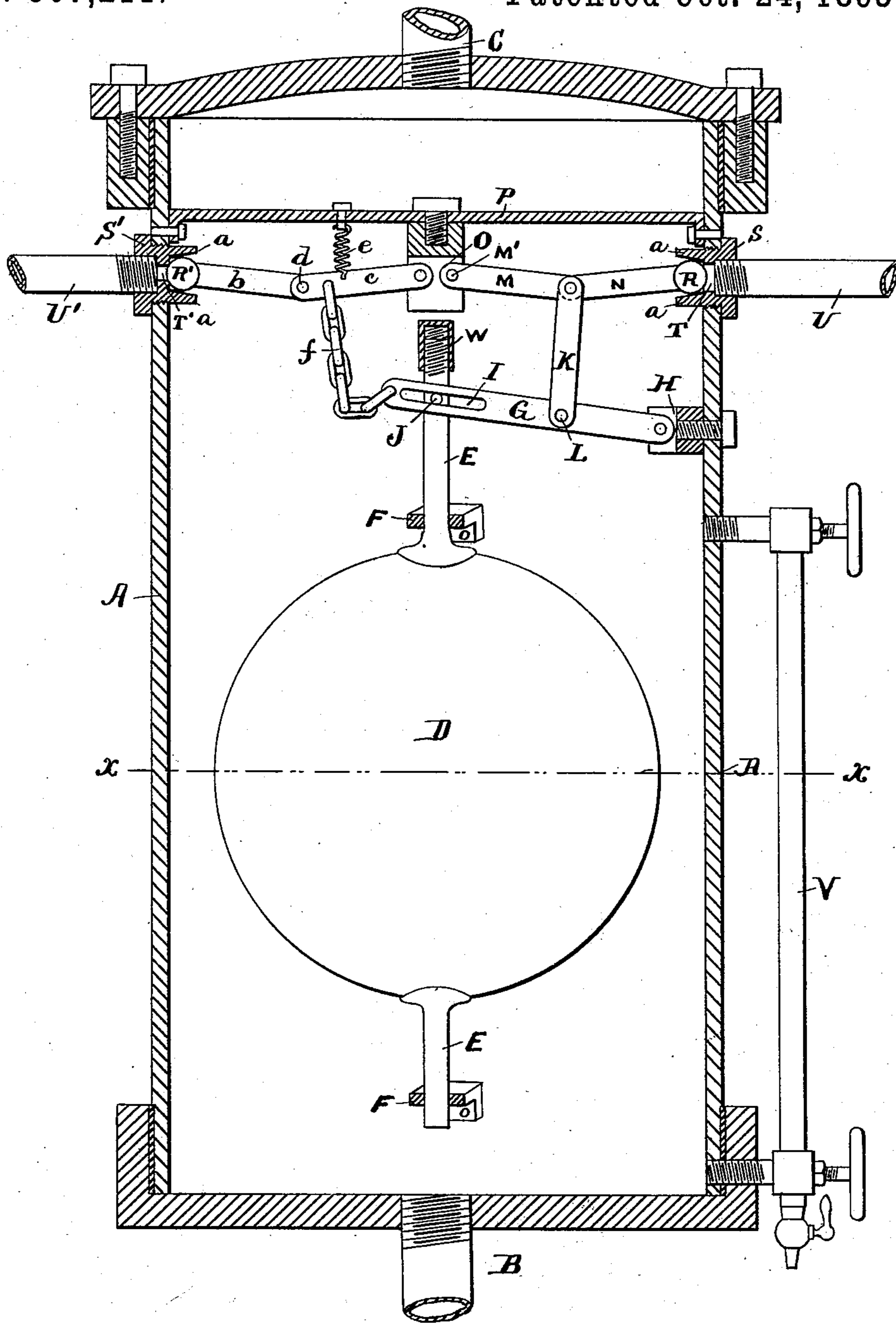


FIG. 1.

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*Walter E. Clark*  
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Amos E. Burrows  
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# UNITED STATES PATENT OFFICE.

AMOS E. BURROWS AND WALTER E. CLARK, OF PICTURE ROCKS,  
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## AUTOMATIC PUMP-CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 507,211, dated October 24, 1893.

Application filed March 10, 1893. Serial No. 465,445. (No model.)

*To all whom it may concern:*

Be it known that we, AMOS E. BURROWS and WALTER E. CLARK, citizens of the United States and residents of Picture Rocks, Lycoming county, Pennsylvania, have invented a certain new and useful Automatic Pump-Controlling Device, of which the following is a specification.

Our invention relates to improvements in devices for automatically operating pumps for feeding water to steam boilers.

Our device consists of a closed vessel which is placed at the side of, or near, a boiler, and the lower part of which is, by means of a suitable connection, in free communication with the water in the boiler and the upper part of which is, by means of a pipe or tube, in free communication with the steam in the boiler. The water in this vessel and the water in the boiler are always at the same level. Within the vessel we have a float, preferably a hollow metal ball, which floats upon the water in the vessel and rises and falls with the rise and fall of the water; this float is furnished with a stem passing through its vertical axis, and guides extending across the vessel, and through which this stem passes, cause the float and stem to always rise and fall vertically. The rise and fall of the float operates, by means of suitable levers and connections, a valve or valves in the upper part of the vessel which control the flow of steam from the boiler and vessel to a feed water pump and to an alarm whistle as hereinafter described.

In the accompanying drawings forming part of this specification, and in which similar letters of reference indicate similar parts throughout the several views, Figure 1. is a central sectional elevation of the vessel or case of our automatic pump operating device, showing the operating mechanism partly in elevation and partly in section; Fig. 2. a similar view of the upper part of the vessel or case showing a modified device for operating the whistle; Fig. 3. an enlarged side elevation of the socket or valve body, and Fig. 4, an end view of Fig. 3.

A. is a vessel or case secured to the side or end of a boiler or to some suitable place near a boiler, which is not shown. A pipe B, connected to the lower part of the vessel A con-

ducts water from the boiler to the vessel, and a pipe C. connects the upper or steam space of the boiler with the upper or steam space of the vessel A. The same conditions as to steam and water therefore exist in the vessel and in the boiler and the water always stands at exactly the same level in the vessel A as in the boiler.

D. is a float carried by the water in vessel A; E. a stem carried by float D; F. guides extending across vessel A. and through which a stem E passes and which insure the movements of the float and stem being always vertical.

G. is a lever one end of which is pivoted to the side of the vessel.

I. is a slot in the outer end of lever G through which a pin J. carried by stem E passes.

K is a link the lower end of which is pivoted to lever G. at L. and the upper end of which is pivoted to the ends of the two levers M. N. The inner end of lever M. is pivoted at M' to a hanger O which is carried by a bracket or stringer P. which extends across and is carried by the sides of the vessel A. The outer end of lever N is furnished with a ball R which lies between and is supported by the fingers *a* of the valve body S, and the ball R, when the water is at the proper height in the boiler, is forced in by the levers and closes the steam port T in valve body S.

U. is a steam pipe leading from valve body S to the pump which is not shown.

V is a water gage of the usual construction which is attached to the vessel or case A and which shows the height of water in the vessel or case.

W. is a cap or nut which is secured upon the upper end of stem E. which is threaded for this purpose, and which may if necessary be adjusted so as to engage the lower end of the hanger O to limit the upward movement of the float D.

When the water is at the proper height in the boiler and vessel A. the float is raised as shown in the drawings and the valve S is closed shutting off steam from the pump. When the water level falls the float falls with it. The pin J on stem E draws down lever G,

which draws down link K, which draws down the end of levers M, N, to which it is attached and ball R is drawn away from and opens steam port T and steam is admitted to pipe 5 U, and to the pump, which is thereby thrown into action and forces water to the boiler; as the water level is raised the float rises and the action of the levers is reversed and when the proper level has been reached the ball R 10 closes the port T and steam is shut off from the pump which then ceases to operate.

If for any reason the pump should fail to operate and the water level continue to be lowered, notice of this is given by means of 15 a whistle of the ordinary construction, but not shown, which is connected to a pipe U' which is connected with a valve body S', similar in all respects to the valve body S already described.

20 *b. c* are levers pivotally connected at *d* as shown. The outer end of lever *b* is furnished with a ball R'. and the inner end of lever *c* is pivotally connected to hanger O. A spring *e* connected at one end to one of the levers *b. c* 25 and at the other to bracket P. or to some other convenient place, normally tends to raise these levers and to force the ball R' into its seat and prevent access of steam to pipe U'. A chain *f* is attached at one end to one of the 30 levers *b. c* and at the other to end of lever G. Should the float continue to fall without the pump acting the chain *f* will presently become straight and draw down the levers *b. c* withdrawing the ball R' from its seat and steam 35 will be admitted to pipe U' and thence to the whistle which will give notice that the pump needs attention.

In Fig. 1 the normal water level is indicated by the line *x-x*.

40 In Fig. 2 a modified apparatus for operating the whistle is shown. *g* is a bell crank lever pivoted at *h*. the upper end of this lever pivoted to one end of an arm *i* upon the other end of which is a ball R' operating in a seat 45 as already described.

*e* is a spring the lower end of which is secured to the lower arm of the bell crank *g* and the upper end to a projection *j* carried by bracket P and which operates ordinarily to 50 keep the ball R' in its seat and prevent the action of the whistle. Should the pump fail to act the float D in falling will draw down lever G the end of which will presently engage the lower end of bell crank *g* which will 55 be depressed. Its upper end will be thrown inward and will draw the ball R' from its seat and steam will be admitted to pipe U' and thence to the whistle.

The valve body is best shown in Figs. 3 and 60 4. It is preferably furnished with four fingers *a* which catch the ball and prevent it falling when it is withdrawn from its seat as already described, and which also act to guide the ball back to its seat when the float raises the 65 levers.

*k* is a nut found upon the outer extremity

of the valve body and *l* a screw thread upon it which is adapted to be screwed into a corresponding female threaded hole in the side of vessel A. 70

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination in an automatic pump controlling device of a closed vessel or case, 75 connections leading from the top and bottom of said case to the steam and water spaces of a steam boiler, a float carried by the water within said case, a vertical stem carried by said float, guides through which said stem 80 passes, a lever pivoted at one end as shown, a slot in this lever, a pin carried by stem of float and passing through said slot, a link pivoted at one end to said lever and at the other to the ends of two other levers, a hanger 85 to which the inner end of inner lever is pivoted, a bracket for carrying this hanger, a ball upon the outer end of outer lever, a valve body having a port adapted to be closed by said ball, fingers projecting from said valve 90 body and surrounding said ball and a steam pipe leading from said valve body to a pump.

2. The combination with a closed vessel or case having a connection at its upper end with the steam of a steam boiler and a con- 95 nection at its lower end with the water of the boiler, of a float, a stem carried by and moving with said float, a lever G pivoted at one end to the side of the vessel, a slot at the outer or free end of said lever, a pin carried 100 by said stem and passing through said slot in said lever, a valve body carried by the vessel or case, a steam pipe leading from said valve body to a whistle, a steam port and valve seat in said valve body, inwardly pro- 105 jecting fingers from said valve body, a ball adapted to close the port in said valve body, levers connected to said ball, a spring for supporting said levers and keeping said ball in its seat, and means whereby said levers may 110 be operated by the fall of the float and lever to withdraw the ball from its seat and admit steam to the whistle.

3. The combination with a closed vessel or case connected at its top and bottom respect- 115 ively with the steam and water spaces of a steam boiler, of a float, a stem projecting vertically from said float, guides in which said stem works, a lever G pivoted at one end to the side of the vessel or case, a slot in the 120 free end of this lever, a pin carried by stem of float and passing through said slot, a valve body and a valve, a steam pipe leading from said valve body to a whistle, and mechanism substantially as described operated by the le- 125 ver G for opening said valve substantially as and for the purposes set forth.

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