

March 22, 1932.

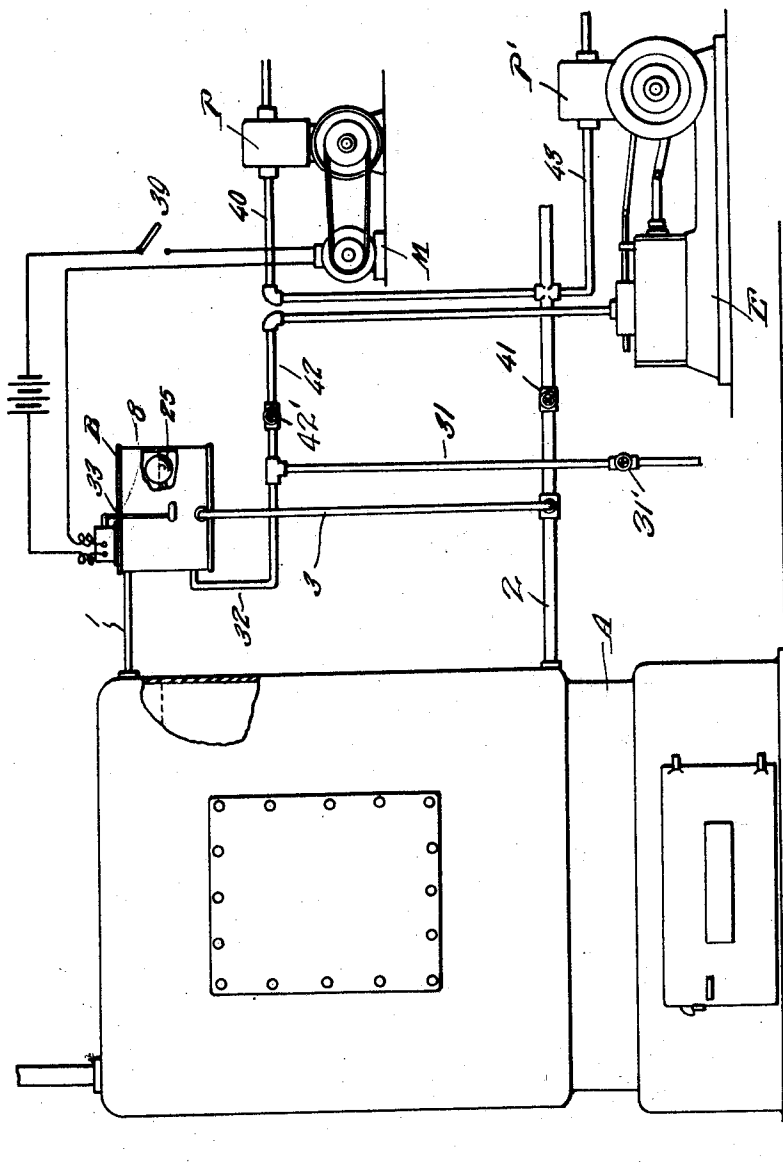
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1,850,159

AUTOMATIC WATER CONTROL

Filed Jan. 19, 1931 3 Sheets-Sheet 1

Fig. 1.



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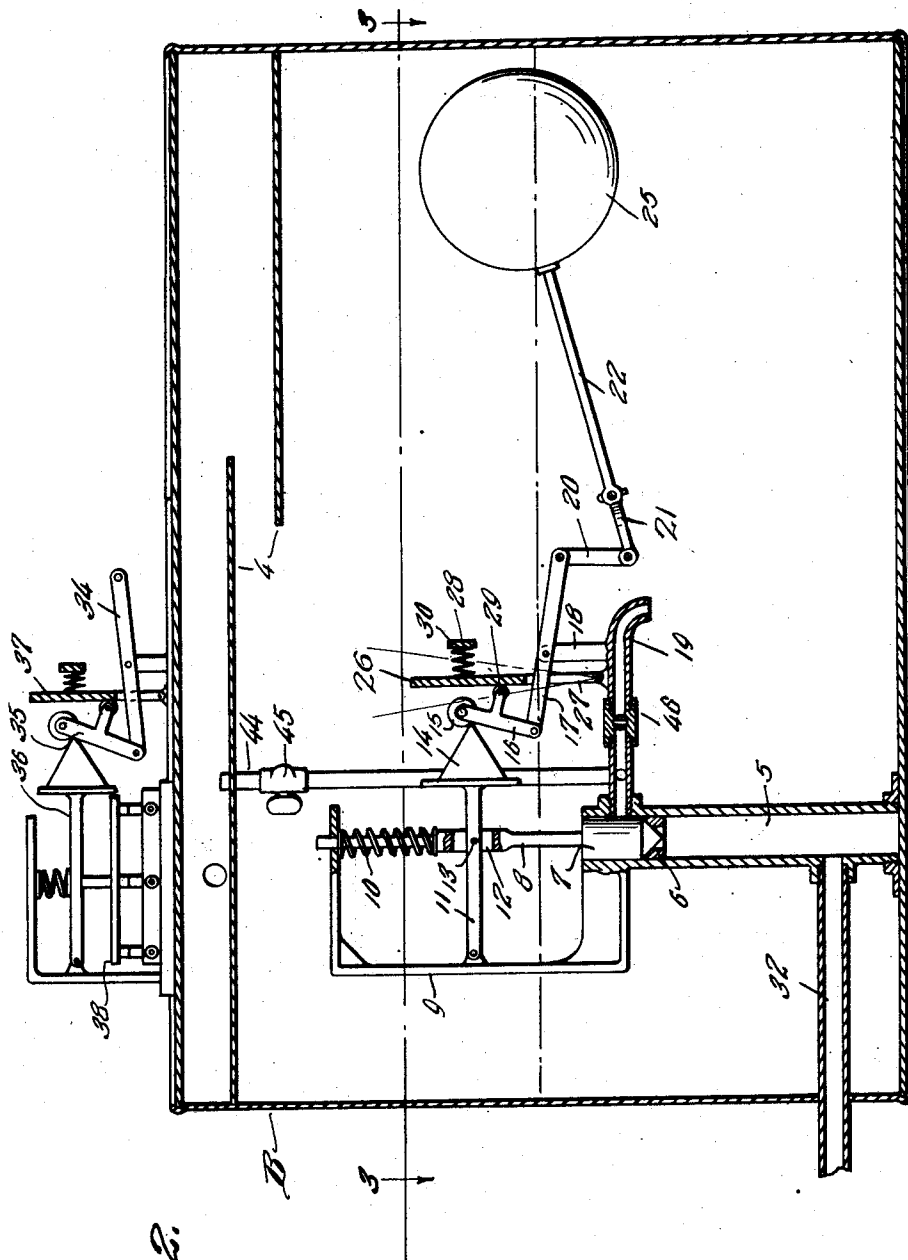


Fig. 2.

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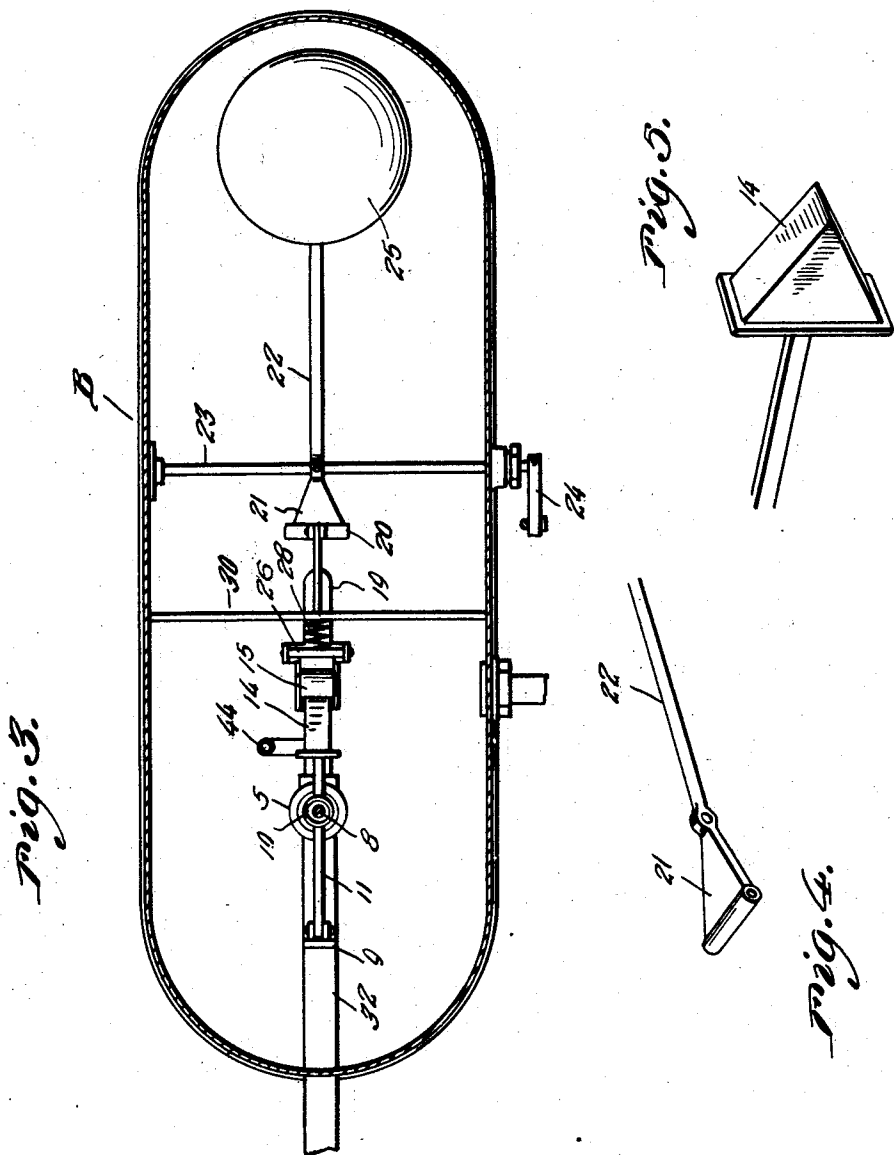
March 22, 1932.

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Filed Jan. 19, 1931 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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AUTOMATIC WATER CONTROL

Application filed January 19, 1931. Serial No. 509,831.

This invention relates to means for automatically controlling the flow of water into a tank, boiler or the like and is especially designed in the feeding of water into a steam boiler, the general object of the invention being to provide a control tank which is in communication with the water supply line and which contains a float operated valve for controlling the flow of water to the boiler, the float being operated by the level of water in the tank, the water level in the tank being the same as that in the boiler.

Another object of the invention is to so arrange the parts that the device will control the flow of water into a boiler or the like when the same is pumped into the boiler by an electric motor, a steam motor, a gas engine or a low pressure system.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is an elevation, largely diagrammatic, showing the invention in use for supplying water to a boiler.

Figure 2 is a vertical sectional view through the control tank and showing the parts associated with said tank.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a detail perspective view of part of the float lever.

Figure 5 is a similar view showing the wedge member.

In these drawings, the letter A indicates the boiler, the letter B the control tank which has its top part connected to the steam space of the boiler by a pipe 1. The supply pipe for supplying water to the lower part of the boiler is shown at 2 and the pipe 3 connects this supply pipe 2 with the bottom part of the tank B. Thus these pipes 2 and 3 place

the tank in communication with the boiler so that the water level in the tank is the same as that in the boiler and the pipe 1 permits steam to flow from the boiler into the top of the tank. Water in the tank is under the same pressure as that in the boiler. Horizontal baffle plates 4 are placed in the top of the tank to partly separate the steam space from the water space.

A stand pipe 5 extends upwardly from the bottom of the tank and terminates well below the normal water level of the tank and the upper part of this stand pipe has a valve seat 6 therein for the valve 7, the stem 8 of which has its upper end guided in a bracket 9, a spring 10 being located on the upper part of the stem bearing against the top of the bracket and a part on the stem for normally holding the valve in closed position. A lever 11 is pivoted to an upright part of the bracket 9 and passes through an opening 12 in the stem and the lever is pivoted to the stem as shown at 13 with the outer end of the lever formed with a wedge shaped head 14 which is engaged by roller 15 on a member 16, the end of the member being pivoted to one end of a lever 17 pivoted intermediate its ends to an upright 18 attached to a pipe 19 which has one end connected to and in communication with the stand pipe 5 and its other end turned downwardly and opened into the tank. The link 20 connects the other end of the lever 17 with the wide end of a wedge shaped part 21 of a float lever 22 which is fastened to a cross shaft 23 which passes through one side of the tank. This shaft is journaled in the tank and its projected end is formed with an arm 24 and a float is shown at 25 on the long part of the lever 22. An upright plate 26 has its lower end pivoted to the pipe 19 and has an opening 27 in its lower part through which the lever 17 passes. A spring 28 tends to press this plate against a roller on an arm 29 of the member 16, the spring being carried by a support 30.

As shown in Figure 2 when the valve 7 is in closed position the roller 15 on the member 16 will be engaging the lower end of the upper side of the wedge head 14. When the water level drops in the tank the float of

course will drop with it so that the float lever 22 will rock on its pivot thus causing the link 20 to rock the lever 17 which pulls the member 16 downwardly so that the roller 15 will
 5 ride over the point of the wedge head 14 and then the spring 28 will cause the plate 26 to move the lever or member 16 forwardly so that the roller 15 acting on the under face of the wedge 14 will swing the lever 11 upward-
 10 ly and thus cause said lever 11 to raise the valve off its seat. Thus water will flow from the supply pipe 31 into the pipe 32 which is connected with the stand pipe 5 and from this pipe 5 the water will pass through the
 15 pipe 19 into the tank. As the water rises in this tank the float will raise and thus the lever 17 will be rocked in an opposite direction from that first described so that the roller 15 on the member 16 will ride over the
 20 wedge 14 and permit the spring 10 to lower the valve and the valve is held in lowered position by said spring 10 also by the pressure exerted on the wedge 14 by the roller 15 which is acted on by the spring pressed plate 26.
 25 As before stated the tank is in communication with the lower part of the boiler by means of the pipes 2 and 3 so that water flowing into the tank will pass through said pipe into the boiler.

30 The arm 24 on shaft 23 is connected by a link 33 to the end of the lever 34 which is pivoted to a part on top of the tank. This lever is connected to a roller carrying member 35 similar to the member 16 and is caused
 35 to engage the wedge shaped head on a lever 36 by the spring pressed plate 37, these parts being similar to those before described but in this case the lever 36 controls a switch shown generally at 38 for controlling an electric
 40 circuit 39 which may be connected to an electric motor M for operating a pump P or this circuit 39 may be a part of the ignition circuit of a gas engine which is used to operate a pump. The outlet of the pump is
 45 connected by a pipe 40 with the pipe 2 so that the water from the pump will flow into the pipe 2 which is provided with a check valve 41 which is located beyond the pipe 3. Thus in this case current to either an electric motor
 50 or a gas motor is automatically controlled by the operation of the float so that the control device in this case also automatically controls the flow of water to the boiler. It will of course be understood that when water is being
 55 supplied from the pump P the supply pipe 31 is not used and may be disconnected or closed by the valve 31' therein.

The device can also be used with a steam engine E which operates a pump P'. In this
 60 case the valve of the steam engine is connected by the pipe 42 with the pipe 32 which now becomes a steam pipe as the supply pipe 31 is not in use. The pipe 43 which is connected with the outlet of the pump P' is connected
 65 with the pipe 2. In this case a pipe

44 has its lower end in communication with the pipe 19 and this pipe extends into the steam space of the tank and is provided with a valve 45. The pipe 19 is also provided
 70 with a valve 46 for preventing the steam passing through the outlet end of the pipe 19 when the steam engine is to be used the valve 45 is open and the valve 46 closed, but when the steam engine is not in use, the valve 45 is
 75 closed and the valve 46 opened. In using the device with the steam engine when the valve 7 opens during lowering of the float steam will pass through the pipe 44 into the pipe 19 and the steam will pass through the
 80 open valve into the stand pipe 5 and then flow through the pipes 32 and 42 to the valve of the steam engine. Thus the steam engine will operate the pump P' which will pump water through the pipe 43 into the pipe 2.

As soon as the float rises, the valve is lowered so as to cut off the steam supply to the engine. When the steam engine is not being
 85 used, the valve 42' in the pipe 42 is closed. From the foregoing it will be seen that I have provided means for automatically controlling the flow of water to a boiler or the like, such means being effective whether the supply is from a low pressure system or pump
 90 operated by steam engines, electric motors or gas motors. The pipes are provided with suitable valves wherever necessary in order to use one system while the other systems are not being used.

It is thought from the foregoing description that the advantages and novel features
 100 of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several
 105 parts, provided that such changes fall within the scope of the appended claim.

Having thus described my invention, what I claim as new is:

An automatic water control comprising a tank, a float in said tank, a lever to which the float is connected, a second lever, means for
 110 connecting the first mentioned lever with one end of the second lever, a roller carrying member connected with the opposite end of the second lever, a spring pressed plate, a roller carrying arm on the member engaging
 115 said plate, a third lever having a wedge shaped head engaged by the roller of said member, a boiler, pipes connecting the boiler with the tank whereby the water level in the tank is the same as that in the boiler, means for supplying water to the boiler, and means
 120 operated by the movement of the wedge carrying lever for controlling the water supply means.

In testimony whereof I affix my signature.
 THOMAS L. SCOVEL.