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MEANS FOR AUTOMATICALLY FLUSHING FLUID TANKS

Original Filed Feb. 15, 1933

FIG. 1.

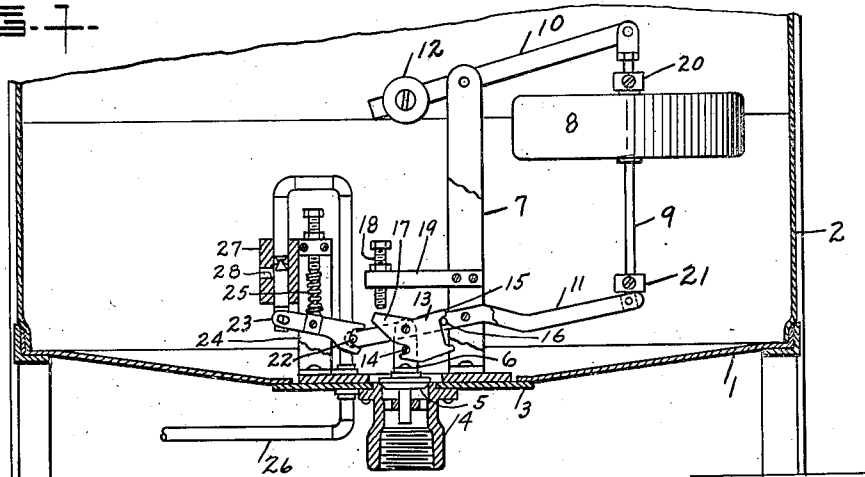


FIG. 2.

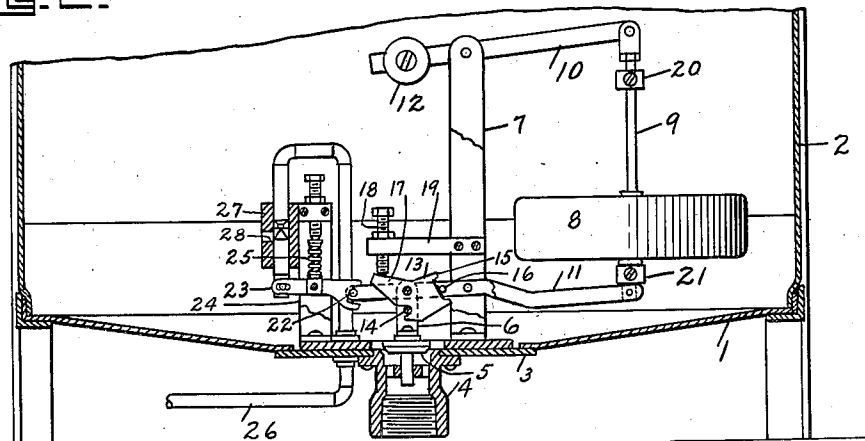
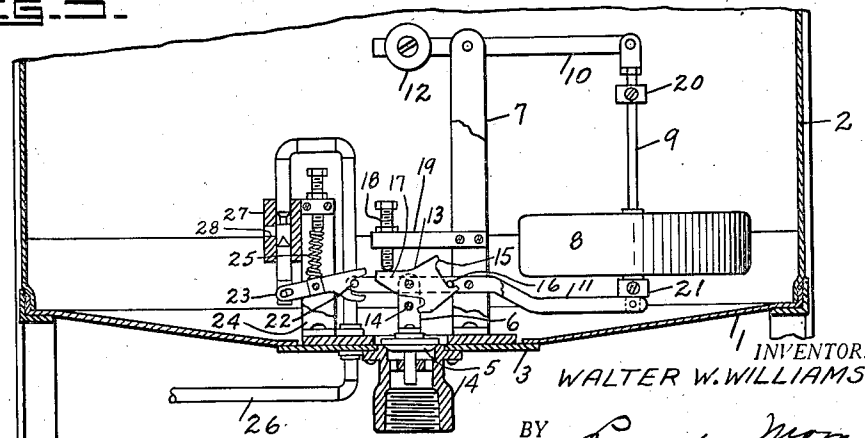


FIG. 3.



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MEANS FOR AUTOMATICALLY FLUSHING
FLUID TANKS

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Original application February 15, 1933, Serial No.
656,817. Divided and this application Decem-
ber 26, 1933, Serial No. 704,059

3 Claims. (Cl. 137-163)

This invention relates to a means for automati-
cally flushing the bottom of a fluid tank when
the level of the fluid therein reaches a predeter-
mined degree below its normal level and there-
after filling the tank with fresh fluid until the
fluid therein reaches the normal level.

This application is a division of this applicant's
prior co-pending application Serial No. 656,817,
filed February 15, 1933 which bears Patent No.
1,950,345, dated March 6, 1934. While this
mechanism was disclosed in the said prior appli-
cation as applied to a water cooling tower for
reducing the temperature of water employed in
condensers, it may be used for any other purpose
wherein the level of a fluid in a tank is reduced
by any cause whatsoever and it is desired, when
the level reaches a predetermined low, to flush
the bottom of the tank and thereafter refill to
the normal level.

A device of this character is of particular ad-
vantage when applied to water cooling towers in
which the water is circulated through a con-
denser and air passed therethrough to cool the
same because a certain amount of dirt and dust
will be collected from the air which will settle
at the bottom of the tank, causing the water
therein to become foul or muddy and when cir-
culated through the condenser will reduce the
efficiency thereof.

With these and other objects in view, reference
is made to the accompanying sheet of drawings
illustrating an embodiment of this invention with
the understanding that minor changes may be
made without departing from the scope thereof.

In the drawing:

Figure 1 is a view in central vertical section
through the bottom of a water tank illustrating
the application of this invention, partly in sec-
tion and partly in elevation, showing the position
of parts when the water is at the normal level.

Figure 2 is a similar view illustrating the po-
sition of the parts when the level of the water
has descended sufficiently to open the flushing
valve.

Figure 3 is a similar view after the tank has
been flushed and the receding water level has
closed the flushing valve and opened the water
inlet valve.

In the embodiment of this invention illustrated,
the bottom closure 1 of the water tank 2 is pref-
erably depressed at the center of one side there-
of, cut out, and a plate closure 3 secured to the
underside thereof, which plate is perforated for
the entrance of a tank valve casing 4 secured to
the underside of the plate 3 and providing a
valve seat on the upper side of said plate. The
lower end of the tank valve casing is connected
to a discharge pipe, not shown, leading to the
sewer. A reciprocating tank valve 5 having a
depending guide stem passing through a spindle

within the valve casing and spaced apart straps
6 extending upward therefrom into the storage
tank is mounted to co-act with the seat provided
therefor in the valve casing 4.

At one side of the valve two spaced-apart ver-
tical parallel pivot supports 7 extending into the
tank are mounted upon the plate 3. A float 8 is
mounted to slide upon a vertical guide rod 9
which is mounted for vertical movement by be-
ing pivoted at each end to the pivoted arms 10
and 11 respectively. The upper arm 10 is piv-
otally mounted between the supports 7 and pref-
erably extended therebeyond to mount an adjust-
able counterweight 12 to regulate the sensitive-
ness of the operation of the float, as hereinafter
described. The lower arm 11 is likewise pivoted
between the supports 7 and is extended there-
beyond and between the straps 6 secured to the
upper side of the tank valve head 5. The lower
arm 11 is preferably formed of two parallel
spaced-apart similar members which mount be-
tween them a pivot latch 13 adapted to engage a
pin 14 passing horizontally through the straps 6.
This latch 13 is provided on one side with spaced-
apart stops 15 adapted to engage a pin 16 be-
tween the members of the lower arm 11 to limit
its pivotal movement in both directions and is
also provided with an extension 17 on the side
opposite said stops 15 adapted to be engaged with
an adjustable stop 18 in the form of a bolt
threaded through the horizontal arm 19 extend-
ing thereabove from the support 7.

These parts are so arranged that when the
water in the tank is at its normal, the float 8
will have travelled upward over the guide 9 and
engaged a stop 20 on said rod causing the arms
10 and 11 to be rotated about their pivots, and in
so doing, the latch 13 will be moved to its lower-
most position and will be in engagement with
the pin 14 of the tank valve 5 and the valve will
be resting upon its valve seat, as shown in Fig-
ure 1. As the water level descends on account
of evaporation or from other causes, the float 8
will travel downward upon its guide 9 until it
engages the stop 21 on the lower end thereof
which will cause the latch 13 to move upward
and carry with it the tank valve 5, as shown in
Figure 2, which allows the water in the tank to
flush the bottom closure 1 as it passes through
the casing 4 into the sewer.

The end of the arm 11 extending beyond the
latch 13 is provided with a pin 22 adapted to
make a sliding connection with a pivoted lever 23
mounted between spaced-apart parallel supports
24 also carried upon the plate 3. The pivoted
lever 23 is provided with spaced-apart stops
adapted to be alternately engaged by the pin 22
to rotate the lever about its pivot. A coil com-
pression spring 25 is mounted between an anchor
on the upper side of the lever 23 directly above

its pivot and an anchor in vertical axial alignment with said pivot depending thereabove from the support 24, whereby whenever the lever 23 is rotated in either direction, as soon as the spring 25 is thrown off center, it will carry the movement in the same direction until one of the stops engages the pin 22 upon the arm 11. These parts are so arranged that when the float has reached its upper limit of travel, the lower arm 11 will be rotated to engage the lower stop upon the pivoted lever 23 and rotate the same to the position shown in Figure 1. When the float has descended to the position shown in Figure 2, the pin 22 will have travelled in the direction of the opposite stop so that upon the water being discharged from the tank, the float will descend further, causing the latch 13 by engagement with the adjustable stop 18 to be rotated until its stop 15 engages the pin 16 whereby the latch 13 will become disengaged from the valve head straps allowing the tank valve to close by gravity and the pressure of water thereabove, and at the same time causing the lever 23 to rotate and throw the spring 25 off center on the opposite side. The stops 20 and 21 on the float guide 9 are adjustable so that the travel of the float 8 may be predetermined thereby.

A water supply pipe 26 enters through plate 3, passes about the supports 24 and communicates with a supply valve casing 27 mounted upon said supports which valve casing has a discharge port on one side thereof and mounts a reciprocating supply valve 28 having a pivotal connection with the end of the pivoted lever 23, whereby when the said lever has been rotated by the float reaching its upper limit of travel, the supply valve will be seated and will remain seated until the float reaches its lower end of travel and just before the discharge valve 5 is closed and thereafter water will be discharged through the supply valve casing 27 until the float 8 has reached the upper limit of its travel and thrown the lever 23 to seat the supply valve 28.

What I claim is:

1. In a water tank for a water cooling tower, a normally closed tank valve in the bottom of the water tank, a normally closed supply valve within the water tank connected to a source of independent water supply, a float operated mechanism periodically actuated as the level of the collected water rises as a result of the dehydration of the circulated air to first open the tank valve, then close the tank valve and open the water supply valve, then as the water level becomes normal to close the water supply valve, including a catch pin mounted upon the tank valve extending within the tank adapted to be engaged by a pivoted latch, a lever carrying said pivoted latch pivotally mounted upon a support extending upward from the bottom of the tank and extending therebeyond, a horizontal float guide pivoted to the free end of said lever, a float mounted to slide upon said guide, adjustable stops upon the guide above and below the float adapted upon engagement by the float to impart rotation to the lever, an adjustable stop carried upon the support adapted to be engaged by the latch to release the tank valve at the lower end of travel of the float, said latch adapted to engage said catch at the upward end of travel of the float whereby the descent of the float to en-

gage the lower stop and continued movement in that direction lifts the tank valve from its seat.

2. In a water tank for a water cooling tower, a normally closed tank valve in the bottom of the water tank, a normally closed supply valve within the water tank connected to a source of independent water supply, a float operated mechanism periodically actuated as the level of the collected water rises as a result of the dehydration of the circulated air to first open the tank valve, then close the tank valve and open the water supply valve, and then as the water level becomes normal to close the water supply valve, including a pivoted lever mounted upon a support extending upward from the bottom of the tank with a portion passing over the tank valve mounting means for alternately connecting and disconnecting the lever to said valve and a float carried upon the other extremity of said lever adapted to impart rotation thereto, a pivoted water supply valve operating arm having a pivotal connection at one end with the water supply valve and a lost motion connection at the other end with the free end of that portion of the lever carrying the tank valve attachment whereby, in the lowermost position of that end of the lever, both tank valve and water supply valve are simultaneously closed and upon rotation of the lever the tank valve is opened before the water supply valve is opened.

3. In a water tank for a water cooling tower, a normally closed tank valve in the bottom of the water tank, a normally closed supply valve within the water tank connected to a source of independent water supply, a float operated mechanism periodically actuated as the level of the collected water rises as a result of the dehydration of the circulated air to first open the tank valve, then close the tank valve and open the water supply valve, then as the water level becomes normal to close the water supply valve, including a catch pin mounted upon the tank valve extending within the tank adapted to be engaged by a pivoted latch, a lever carrying said pivoted latch pivotally mounted upon a support extending upward from the bottom of the tank and extending therebeyond, a horizontal float guide pivoted to the free end of said lever, a float mounted to slide upon said guide, adjustable stops upon the guide above and below the float adapted upon engagement by the float to impart rotation to the lever, an adjustable stop carried upon the support adapted to be engaged by the latch to release the tank valve at the lower end of travel of the float, said latch adapted to engage said catch at the upward end of travel of the float whereby the descent of the float to engage the lower stop and continued movement in that direction lifts the tank valve from its seat, a pivoted water supply valve operating arm having a pivotal connection at one end with the water supply valve and a lost motion connection at the other end with the free end of that portion of the lever carrying the tank valve attachment whereby, in the lowermost position of that end of the lever, both tank valve and water supply valve are simultaneously closed and upon rotation of the lever the tank valve is opened before the water supply valve is opened and upon rotation of said lever in the opposite direction the water discharge valve is closed after the tank valve is closed.

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