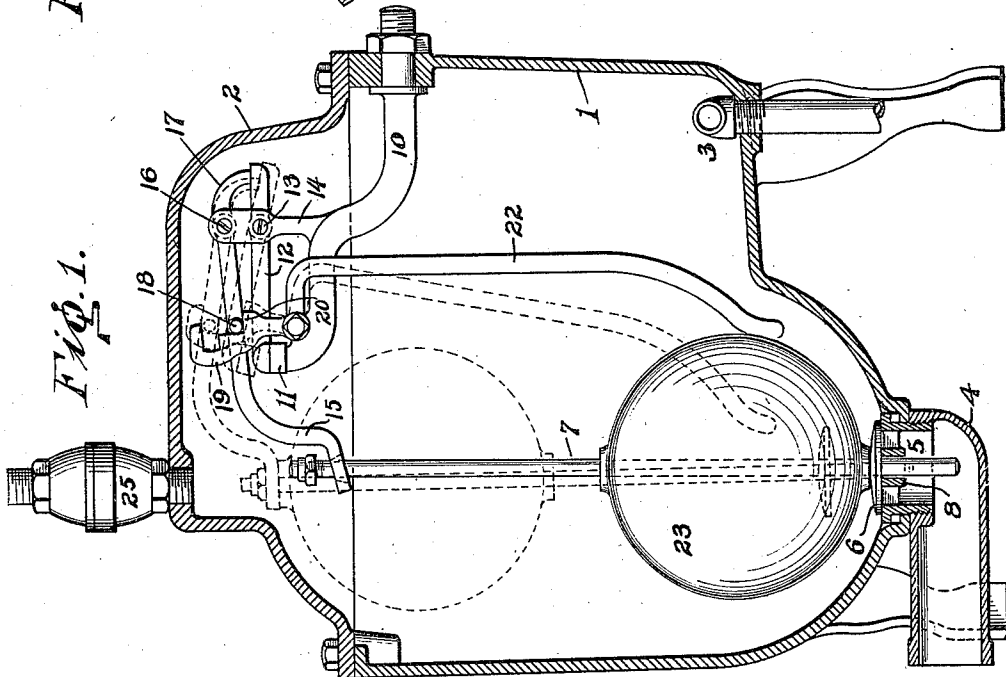
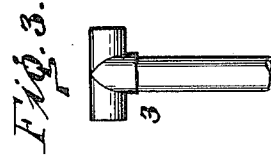
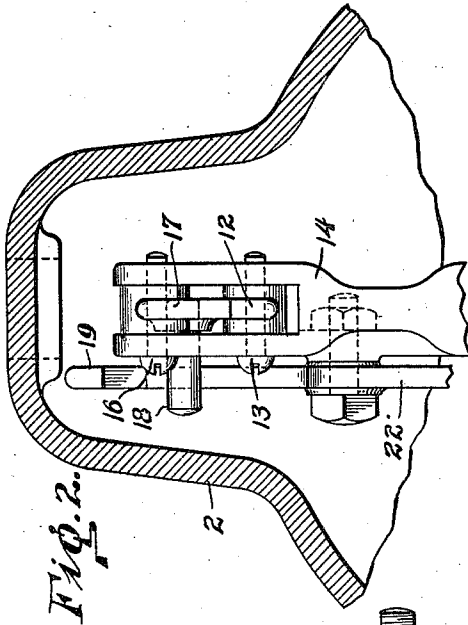


W. U. GRIFFITHS.
AIR COMPRESSING APPARATUS.
APPLICATION FILED JULY 9, 1908.

1,011,189.

Patented Dec. 12, 1911.



Inventor

Witnesses
Carrie E. Klinefelder.
Daniel Webster, Jr.

William U. Griffiths

By Strawbridge & Anderson
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM U. GRIFFITHS, OF PHILADELPHIA, PENNSYLVANIA.

AIR-COMPRESSING APPARATUS.

1,011,189.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed July 9, 1908. Serial No. 442,775.

To all whom it may concern:

Be it known that I, WILLIAM U. GRIFFITHS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Air-Compressing Apparatus, of which the following is a specification.

My invention relates to an improvement in air compressing apparatus, and its object is to provide an apparatus of this character which operates to compress and dispose of successive charges of air by the successive filling and emptying of a tank with a suitable fluid, preferably water.

A convenient embodiment of my invention is illustrated in the accompanying drawings forming a part of this specification, but it will be understood that changes in the details of construction may be made without departing from the scope of my invention.

In the drawings,—Figure 1 is a longitudinal sectional view of an apparatus provided with my invention, certain of the parts being shown in elevation; Fig. 2 is a sectional view of the upper portion of an apparatus provided with my invention, such view being taken at right angles to the plane on which Fig. 1 is taken and certain of the parts being shown in elevation; and Fig. 3 is a view showing the upper end portion of the inlet pipe for water or other fluid.

Referring to the drawings,—1 designates a tank, preferably of metal, having a cap or cover 2 of smaller transverse area than the tank 1.

3 designates a water inlet pipe, and 4 designates a water outlet pipe communicating with a port or opening 5 in the bottom of the tank which is adapted to be closed by means of a valve 6 secured to a rod 7, the lower end of the rod 7 projecting through an opening in a guide 8.

For admission of air into the tank 1, I have provided an air inlet pipe 10 which serves also at intervals as an air outlet pipe as will be described more fully hereinafter. The opening of the air inlet pipe 10 within the tank is closed by means of a valve 11 secured upon a suitable support 12. In the construction shown, the support 12 consists of a lever which is pivoted at 13 upon an upright bracket or support 14 which is supported preferably, though not necessarily, on the pipe 10. In the construction illustrated, the bracket is bifurcated as is clearly

shown in Fig. 2 of the drawings, and the lever 12 is pivoted between the bifurcations and its end projects beyond the same as shown.

The upper end of the rod 7 is loosely connected to a lever 15 which is also pivoted at 16 between the bifurcations of the bracket or support 14 and its end is projected beyond such support and is turned downwardly, as indicated at 17, into contact with the projecting end of the lever 12. The rod 7 projects through an opening in the end of the lever 15 and the said lever is prevented from sliding off of the said rod by means of a nut or equivalent device 21 secured upon the upper end of the said rod. The upper side of the lever 15 is located a short distance below the lower side of the nut 21 upon the rod for a purpose which will be hereinafter stated.

The lever 15 is adapted to be engaged by a pivot detent or catch 19 preferably, though not necessarily, connected to and supported by the air inlet pipe 10. In the specific construction shown, the said detent or catch engages a projection 18 extending laterally from the lever 15 but, as is obvious, it is immaterial in what manner the detent or catch 19 engages the said lever 15 for supporting it at intervals during the operation of the device. The detent or catch 19 is also provided with a shoulder 20 which is adapted to support the lever 15 when the rod 7 occupies its lowermost position, as indicated in full lines in Fig. 1 of the drawings. Such shoulder is not, however, essential to the operation of the device, because it is not necessary that the said lever be supported in the manner indicated, but it may be permitted to drop down so that the curved or bent end 17 thereof is not in contact with the outer end of the lever 12 when the rod 7 is in the position shown in full lines in Fig. 1 of the drawings.

The position of the detent or catch 19 is controlled by a swinging depending lever 22, which is integral with or otherwise connected to the detent or catch 19.

A floating ball 23, which may be designated as a float, is slidably supported upon the rod 7 and is adapted to move upwardly on the said rod as the tank is filled with water and to move downwardly on the said rod as the water is emptied from the said tank. When the float 23 moves upwardly it comes into contact with the lower side of

the lever 15 and lifts the same into contact with the nut 21 or equivalent device, upon the upper end of the rod. The initial movement of the lever and by reason of the fact that the downwardly bent projecting portion 17 of the said lever is in contact with the projecting end of the lever 12 occasions upward movement of the valve 11 to open the inlet pipe 10. As soon as the valve 11 is moved so as to open the pipe 10, the air which is under compression in the upper portion of the tank rushes out through the said pipe so as to equalize the air upon the inside and the outside of the tank. The release of the pressure of the air in the said tank removes the pressure of the same from the float 23 and permits it to move upwardly to the position indicated in dotted lines in Fig. 1 of the drawings, such upward movement, after the lever 15 has been brought into contact with the nut 21, occasioning movement of the rod 7 and the valve 6 connected thereto to open the port 5 in the bottom of the tank 1. The combined force due to the weight of the valve 6, the rod 7 and parts connected thereto, and the downward pressure of the compressed air, would be sufficient to prevent the float 23 from raising the valve 6 but immediately upon the opening of the valve 11 to reduce the pressure of the air within the said tank, the float moves quickly upward to raise or open the valve 6. Upon the upward movement of the float 23 on the rod 7, it passes out of engagement with the lever 22. The relation of this lever and the detent or catch 19, which is connected thereto, to each other and their relation to their pivotal support are such that they tend to swing by gravity into the dotted line position shown in Fig. 1 in which the supporting shoulder of the detent or catch 19 is underneath the part 18. Such a swinging movement is prevented, however, by reason of the contact of a side of the said detent or catch with the projection 18 until the lever 15 has moved upwardly into its dotted line position so as to bring the projection 18 into alinement with the notch in the upper end of the detent or catch. When the said lever has been moved into this position, the detent 19 and the lever 22 move into the dotted line position indicated in Fig. 1 of the drawings, in which position the detent or catch is in engagement with the part 18 so that the lever 15 and the various parts associated therewith are held or retained in their uppermost position with the valve 6 open while the water is emptied from the tank. As the water empties from the tank the float 23 moves downwardly upon the rod 7 as previously stated and comes into contact with the lower end of the lever 22 and returns it to the full line position shown in Fig. 1, occasioning movement of the detent or catch 19 from under-

neath the projection 18 and permitting the lever 15 and the parts connected and operatively related thereto to resume their full line position shown in Fig. 1, in which position the valves 6 and 11 are closed.

With the valve 6 closed and the water flowing into the tank, the space therein above the water becomes gradually less so that the air is compressed and escapes by being forced through the air outlet 25 to be utilized in any manner for any desired purpose for which air under compression may be used. The air outlet is provided with a check valve of any suitable known construction.

It will be seen that the apparatus operates automatically, the water entering and leaving the tank successively, each filling of the tank with water forcing a charge of air through the outlet 25.

Having thus described my invention, I claim:—

1. In an air compressing apparatus, the combination of a tank having a water inlet, a water outlet, an air inlet, and an air outlet, with a valve for closing the said water outlet, a rod connected to said valve, a valve for closing the air inlet, a pivoted lever for supporting said air inlet valve, a pivoted lever having connection upon one side of its pivot with the said rod, the said last mentioned pivoted lever having a part upon the opposite side of its pivot in contact with the first-named pivoted lever, a float movably supported upon the said rod, and adapted to move upwardly on the said rod as the tank fills with water to engage the second-named lever to lift it upwardly to occasion movement of the first-named lever to open the valve for closing the air inlet.

2. In a device of the character described, the combination of a tank having a water inlet pipe, a water outlet pipe, an air inlet pipe, and an air outlet pipe, with a valve for closing the said water outlet pipe, a rod to which the said valve is connected, a valve for closing the said air inlet pipe, a pivotal support for the said valve, a pivotally supported member connected to the said rod, the said member being associated with the said support, a float movably supported upon the said rod and adapted to contact with the said member to occasion movement thereof, which movement occasions movement of the said support with which the said member is associated to open the valve of the air inlet pipe.

3. In a device of the character described, the combination of a tank having a water inlet pipe, a water outlet pipe, an air inlet pipe and an air outlet pipe, with a valve for closing the said water outlet pipe, a valve for closing the air inlet pipe, a support for the said last mentioned valve, a movable member having contact with the

said support, a rod connected to and supporting the water outlet valve, the said rod being connected to the said movable member, a movable float supported upon the said rod, the said float being adapted to move longitudinally on the said rod and being adapted to contact with the said movable member and move it upwardly to occasion movement of the said support to open the air inlet valve, a movable detent or catch adapted to engage the said movable member and hold it in elevated position to retain the said valves in an open position during the downward movement of the said float, a movable depending member connected to said detent, the said detent being disengaged from the said member by the contact of the said float with said depending member.

4. In an air compressing apparatus, the combination of a tank having a water inlet, a water outlet, an air inlet and an air outlet, with valves for closing the water outlet and the air inlet, a rod connected to the water outlet valve, means interposed between the air inlet valve and the said rod and being connected to the latter, a float movable upon the said rod and adapted to contact with said means to occasion the opening of the air inlet valve, a detent for engaging the said means and holding the said air inlet valve open, and a depending member which is adapted to swing into position to carry the said detent into position to engage the said means, the said member being adapted to contact with the said float and to be moved by it into position to disengage the said detent from the said means.

5. In an air compressing apparatus, the combination of a tank having a water inlet, a water outlet, an air inlet and an air outlet, a valve for closing the water outlet, a rod connected to said valve, a valve for closing the air inlet, a pivoted lever for supporting said air inlet valve, the said lever having a projection beyond its pivot, a pivoted lever having connection with the said rod, the said last mentioned pivoted lever having a pro-

jection beyond its pivot which extends laterally into contact with the projection from the first-named lever, a float movably supported upon the said rod and adapted to move upwardly on the said rod as the tank fills with water to engage the second-named lever to lift it upwardly to occasion movement of the first-named lever to open the air inlet valve.

6. In an air compressing or charging apparatus, the combination of a tank having a water inlet, a water outlet, an air inlet, and an air outlet, a valve for closing the water outlet and a valve for closing the air inlet, a pivoted lever supporting the said air inlet valve, the said lever having a projection beyond its pivot, a pivoted lever for occasioning movement of the lever which supports the air inlet valve to open and close the latter, the end portion of the said pivoted lever upon one side of its pivot being bent toward and into contact with the projecting end of the air inlet valve carrying lever, a rod connected to the said second named lever upon the opposite side of its pivot and to the water outlet valve, a float movably supported upon the said rod and adapted to contact with the end of the said lever which is connected to the said rod to occasion movement thereof, a pivoted gravity lever having its upper end portion provided with a supporting shoulder or stop which is adapted to engage the second named lever to hold the air inlet valve open, the opposite lower end portion of the said gravity lever extending at such time into the path of movement of the said float whereby as the float descends it occasions pivotal movement of the said gravity lever to release the said shoulder or stop.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 8th day of July, A. D. 1908.

WILLIAM U. GRIFFITHS.

In the presence of—

S. SALOME BROOKE,
CYRUS N. ANDERSON.