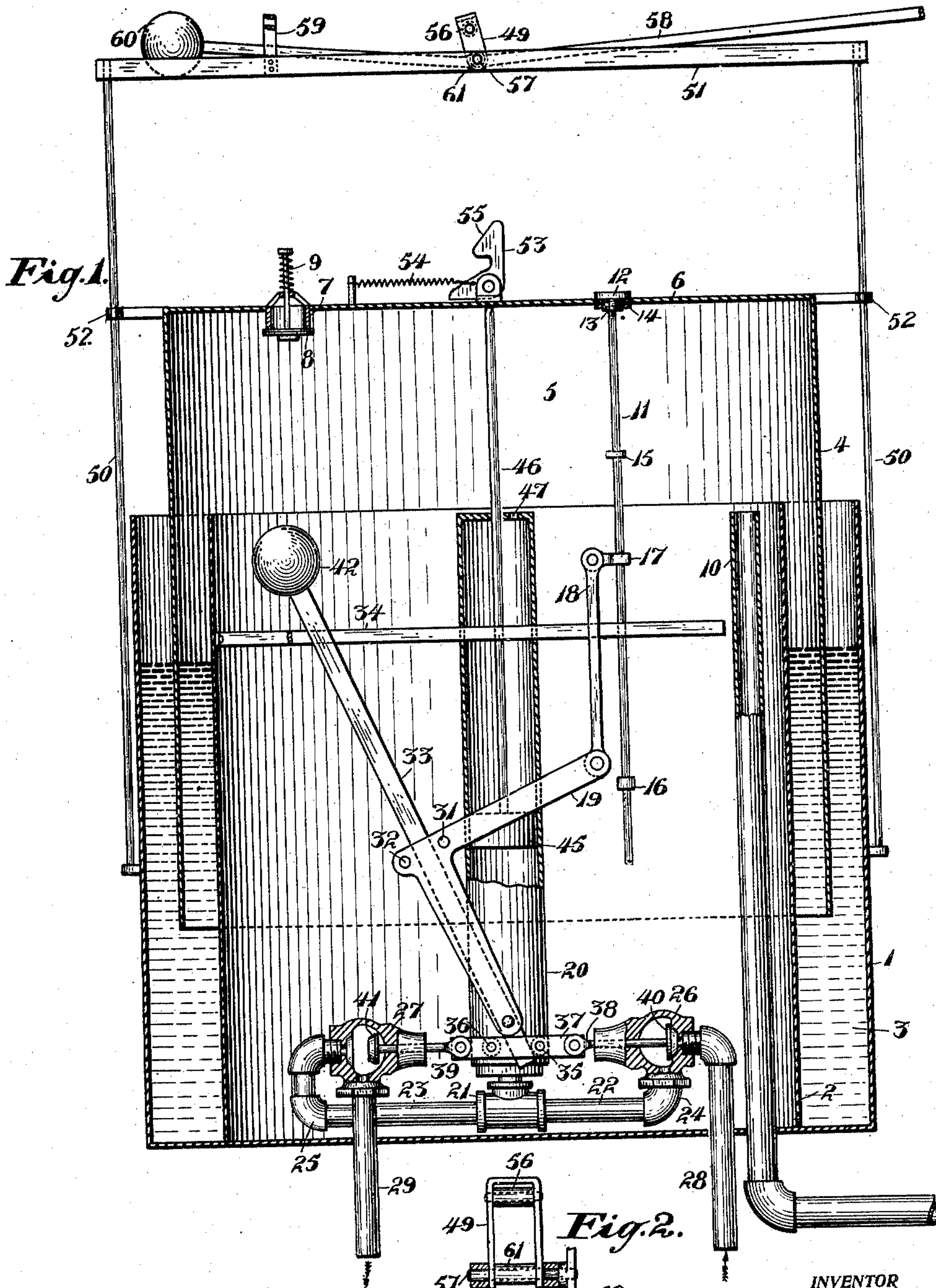


J. A. KENWORTHY.  
AUTOMATIC AIR PUMP.  
APPLICATION FILED AUG. 5, 1909.

967,199.

Patented Aug. 16, 1910.



WITNESSES:

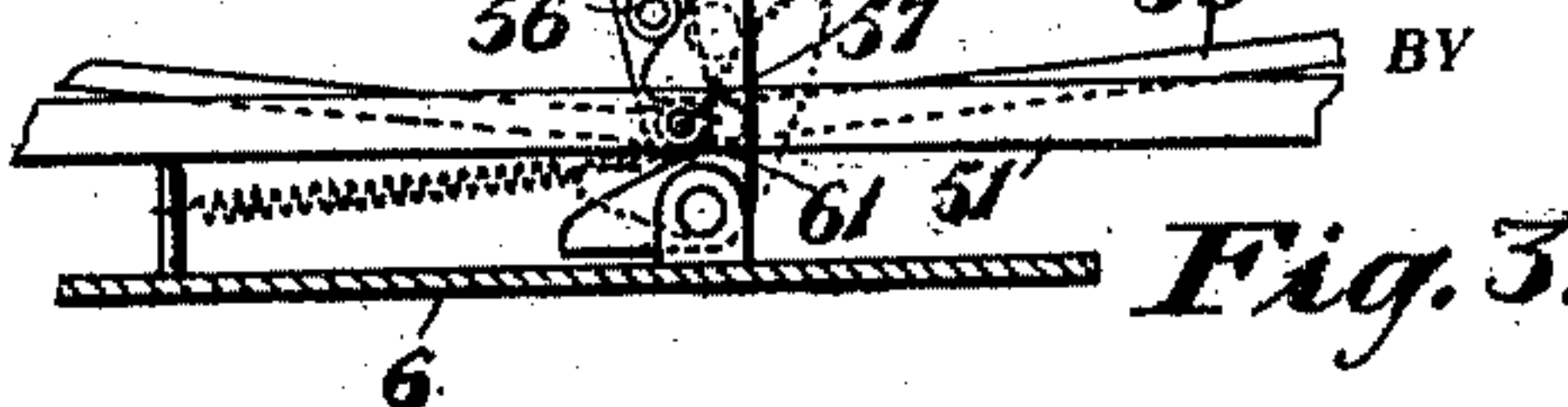
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# UNITED STATES PATENT OFFICE.

JAMES A. KENWORTHY, OF OAKLAND, CALIFORNIA.

## AUTOMATIC AIR-PUMP.

967,199.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed August 5, 1909. Serial No. 511,367.

*To all whom it may concern:*

Be it known that I, JAMES A. KENWORTHY, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Automatic Air-Pumps, of which the following is a specification.

The present invention relates to an improved apparatus for pumping air to force it through oil in carbureting apparatus such as that shown in my United States Patent, granted August 31, 1909, No. 932,871, the object of the invention being to provide an apparatus of this character which will be compact in form, simple in construction, efficient in operation, and which will not readily get out of order.

In the accompanying drawing, Figure 1 is a vertical section of my improved air pump, certain parts being shown in side elevation; Fig. 2 is a cross section on the line 2—2 of Fig. 1; Fig. 3 is a broken vertical section showing certain parts in the position when the receiver is held up.

Referring to the drawing, 1 indicates a cylindrical tank, within which is a cylindrical wall 2, spaced from the wall of the tank to form an annular space 3 adapted to be filled with water or other liquid to form a seal. Depending into said annular space 3 is a cylindrical wall 4 of an inverted air receiver or bell 5. In the top 6 of said receiver is secured a casing 7 of a check valve 8, controlled by a light spring 9, said check valve being adapted to open when the receiver is ascending, to admit air into the receiver, and to close when the receiver is descending, to prevent the escape of air therethrough. When the receiver so descends, it forces the air through a pipe 10 to a carbureter, not shown, in the manner illustrated by the patent above referred to.

In order to produce the vertical reciprocation necessary to take in air through the check valve 8 when ascending, and to force it out to the pipe 10 when descending, there is secured to the top of said receiver an actuating rod 11, said rod being threaded at the top and provided with a head 12, said threaded end screwing into a threaded sleeve 13, which is itself screwed into a short tube 14 secured in the top of the receiver. On said rod are secured upper and lower stops 15 and 16, and, as the receiver descends, the upper stop 15 is adapted to contact with a

sleeve 17, loose upon the rod, and to depress said sleeve with said stop. To said sleeve is pivoted a link 18, the lower end of which is pivotally connected with an L-shaped lever 19, the lower end of which is pivoted on the lower portion of a lifting cylinder 20. Said cylinder is supported on, and connected with, a T-piece 21, connected by tubes 22 and 23 and elbows 24 and 25 with valve casings 26 and 27, which are connected by oppositely directed passages with vertical inlet and outlet pipes 28 and 29, which pass through, and are secured upon, the bottom of the tank 1. The continued descent of said bell 5 and of the rod 11 and upper stop 15 thus imparts an angular movement to said lever 19. Upon said lever are secured two studs or pins, 31, 32, and between them extends a rod or bar 33, pivoted upon the same pivot as the lever 19, and moving between guide rods 34 secured upon a side of the cylinder 20. Said bar 33 is extended below its pivot and passes between two pins, 35 and 36, on a horizontal link 37 outside the valve casings 26 and 27 connected by rods 38 and 39 in alinement with each other, with oppositely directed inlet and outlet valves 40 and 41, respectively, in the valve casings 26 and 27. When the parts are in the position shown in Fig. 1, the link is in its position on the right, the inlet valve is closed, and the outlet valve is open. The upper end of the rod 33 carries an overbalance weight 42. When the angular lever 19 swings, for the reason above stated, one of said studs 31 engages said bar 33 and advances it with said lever to a vertical position, from which it drops on account of the weight 42 to a position on the other side of the vertical, thereby causing the lower end of said rod 33, below its fulcrum, to move away from the pin 35 and to impinge against the pin 36 and move the link 37 of the two valves to the left from the position shown in Fig. 1, closing the outlet valve and opening the inlet valve. Immediately thereupon, the inlet valve being opened, water under city or other pressure flows up through the pipe 28 through the valve casing 26, elbow 24, pipe 22, T-piece 21, into the lifting cylinder 20. In said lifting cylinder is a piston 45 having a piston rod 46 extending through the top of said cylinder, the top of said rod being adapted to contact with the top of the receiver. An aperture 47 is formed in the top of the cylinder to allow the air to pass freely into and



out of the cylinder, as the piston moves down or up. As the piston rises, the top of the rod, ascending with the piston, raises the receiver. As the receiver descends, it forces down the piston, forcing the water out of the cylinder through the valve casing 27 and pipe 29. On the further descent of the receiver it actuates the valve mechanism, in the manner hereinbefore described, to close the outlet passage and open the inlet passage, whereupon the inflowing water actuates the piston 45 to raise the receiver.

Secured upon the sides of the tank are two guide rods 50, connected at the top by two cross-rods 51, and secured upon the sides of the receiver, near the top, are guide brackets 52 through which said rods pass, and whereby said receiver is guided upon said rods.

Pivoted on the top of the receiver is a hook 53 adapted to be pulled in the direction of its point by a spring 54. Said hook is formed with an oblique upper edge 55, which is adapted to be engaged by a roller 56 on the upper part of a yoke 49 secured on a transverse shaft 57, pivoted in the cross rods 51. Secured to said shaft is a long lever 58, the short arm of which is guided on a vertical guide 59, and has a counter-weight 60 which tends to raise the long arm of the lever. However, so long as air is needed in the carbureter, or other place to be supplied by the pipe 10, said lever 58 is depressed, which causes the roller 56 to engage the hook 53 each time that the receiver rises and maintain it out of action, so that the above vertical reciprocation of the receiver continues to pump air through the pipe 10, when said carbureter or other container is filled, so that the lever 58 can rise, it does so on account of the weight 60. On said shaft 57 is also mounted a roller 61, which, when the receiver rises and the hook 53 is no longer maintained inoperative, engages said hook and holds the receiver in its raised position, arresting the operation of the pump. When more air is needed, the lever 58 drops, withdrawing the hook 53.

I claim:—

1. An automatic air pump comprising an inverted air receiver, a tank for said receiver having a water seal therefor, a vertical cylinder within the tank, a piston in said cylinder, means whereby the upward motion of the piston raises the receiver and the downward motion of the receiver depresses the piston, inlet and outlet pipes for said cylinder, valve casings connected to said pipes, pipes leading to the cylinder and having oppositely directed connections with said valve casings, oppositely disposed valves for closing the respective connections with said pipes, valve rods in line with each other and connected to said valves, a link connecting said rods outside of said valve casings, pins on said link, a lever extending between said pins and arranged to reciprocate said link, an over-balance weight on said lever for shifting the same, a vertical rod carried by the receiver, and an operative connection between said rod and lever whereby the reciprocating movement of the receiver produces an oscillating movement in said lever, substantially as described.

2. An air pump comprising an inverted bell-shaped air receiver, a tank having a seal therefor, guide rods for said receiver secured on said tank, a cross rod joining the tops of said guide rods, a pivoted hook on the top of the receiver, a device carried by said cross rod adapted to engage said hook and sustain said receiver in its raised position, a spring arranged to move said hook forward to engage said device, and a lever having a counterbalance weight, and having a part arranged by the movement of the lever to disengage said hook from said device, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES A. KENWORTHY.

Witnesses:

FRANCIS M. WRIGHT,  
D. B. RICHARDS.