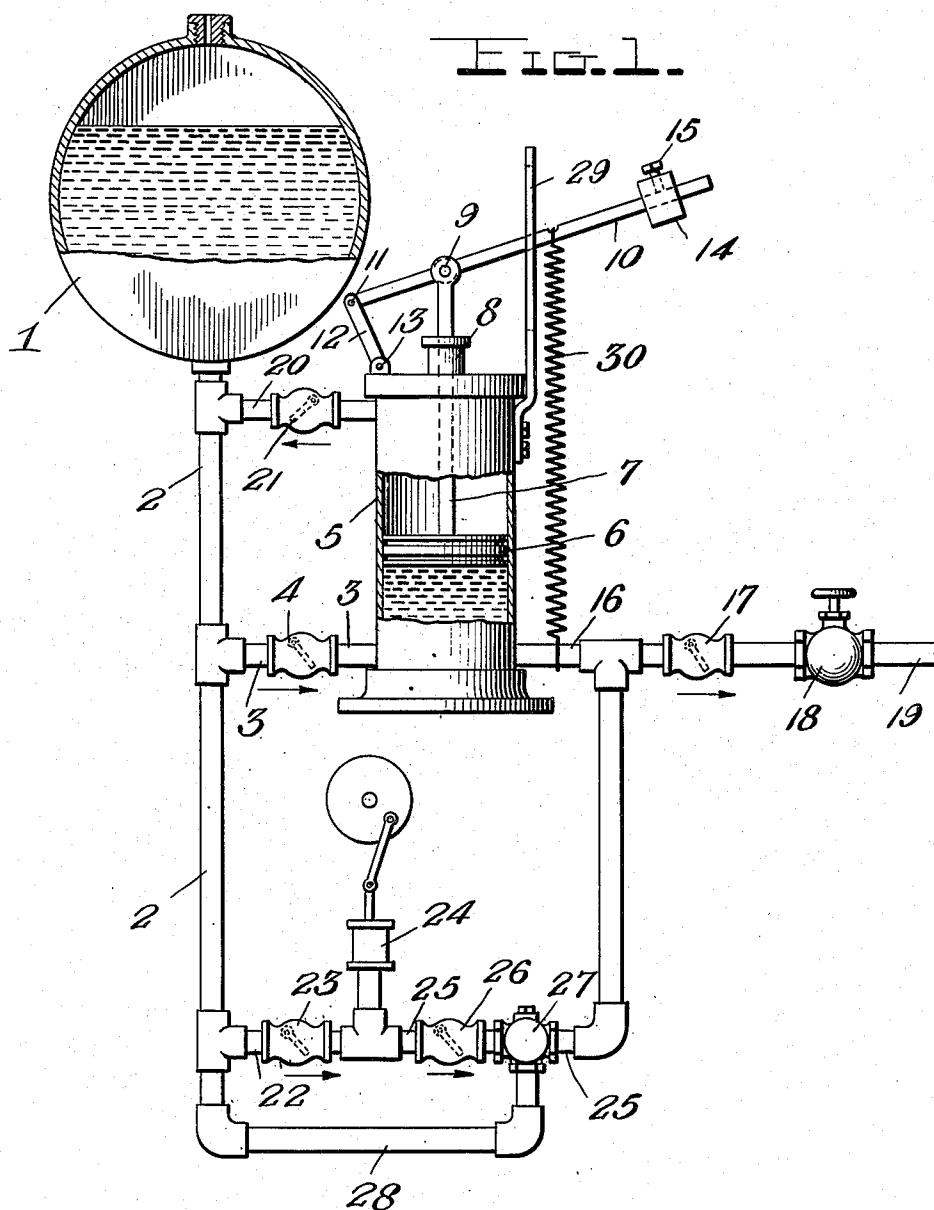


R. PUTNAM.
FUEL FEEDING APPARATUS.
APPLICATION FILED MAR. 25, 1909.

941,587.

Patented Nov. 30, 1909.

2 SHEETS—SHEET 1.



Witnesses

Chas. L. Griesbauer.
E. M. Rickette

Inventor
Reginald Putnam
By Watson E. Coleman
Attorney

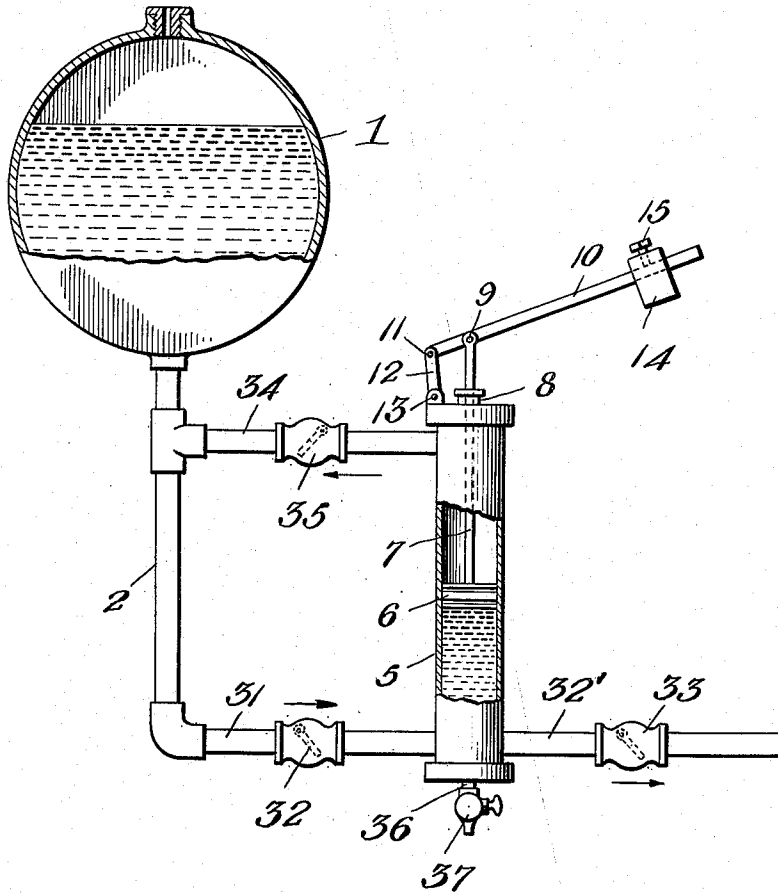
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FIG. 2.



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UNITED STATES PATENT OFFICE.

REGINALD PUTNAM, OF CORCORAN, CALIFORNIA.

FUEL-FEEDING APPARATUS.

941,587.

Specification of Letters Patent.

Patented Nov. 30, 1909.

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To all whom it may concern:

Be it known that I, REGINALD PUTNAM, a citizen of the United States, residing at Corcoran, in the county of Kings and State of California, have invented certain new and useful Improvements in Fuel-Feeding Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates particularly to force feed apparatus for fuel for automobiles driven either by gasoline or steam.

In automobiles now in use which are operated by liquid fuel it is necessary to maintain a pressure upon the fuel in order to properly feed it to the burner and it has been usual to use a hand pump as a part of such fuel feeding apparatus. This has been found objectionable in practice and the particular object of my invention is to entirely dispense with the use of hand pumps in fuel feeding apparatus of this character.

In carrying out this general object a special object of my invention is to provide simple and efficient fuel feeding mechanism in which the liquid will be kept under a predetermined pressure which may be readily regulated and controlled and accidents due to leakage of fuel be prevented.

Further objects of my invention will appear hereinafter.

With the specified objects in view my invention consists in the improved construction, arrangement and combination of parts of the apparatus which I shall now proceed to describe, the specific points of novelty being particularly pointed out in the claims hereto appended.

In order that my invention may be properly described, I have illustrated the same in the accompanying drawings, in which—

Figure 1 is a diagrammatic view, partly in section, illustrating the apparatus from the fuel tank to the burner supply pipe, Fig. 2 is a similar view of a slightly modified form of my invention illustrating a construction which may be used as a force feed for lubricators of the cylinders of steam engines.

Referring specifically to the drawings 1 indicates the fuel tank of an automobile which may be constructed in any approved manner of any suitable form, size or material. The tank is situated in a position sufficiently elevated, which is usual, to permit of the flow of fuel therefrom downwardly

through a pipe or tube of any usual construction.

Branching in a substantially horizontal direction from the pipe 2, and connected thereto by any suitable fittings, is a pipe 3, provided with a check valve 4, leading into the lower end of an upright cylinder 5 preferably made of brass in which is fitted to reciprocate vertically, a piston 6 whose rod 7 passes out through the upper end of the cylinder, through a suitable stuffing box 8 and is pivoted at 9 to a lever 10, which is in turn pivotally connected at 11 to the upper end of a link 12 pivoted at 13 on the upper head of the cylinder. The lever 10 projects a suitable distance beyond the pivot 9 and is fitted with a sliding weight 14 which is adjustable along the lever and may be suitably secured in a well known manner by a set screw 15.

From the cylinder 5, near its lower end and substantially diametrically opposite to the pipe 3, leads a pipe 16 which is provided with a check valve 17 and a globe valve 18 and beyond said globe valve, as at 19, is extended to the burner, to which it may be connected in any usual manner. The burner may be of any suitable form and the construction thereof, forming no part of my invention, is not herein illustrated.

From the pipe 2 above the pipe 3 a pipe 20 extends to the cylinder near its upper end and is provided with a check valve 21. The pipe 2 is extended below the point where it is joined by the pipe 3 and below said latter pipe, another pipe 22 is connected, which is provided with a check valve 23 and leads to a force pump 24, such as is usually used in automobiles and operated by the machinery thereof. As a substantial continuation of the pipe 22, a pipe 25 leads from the pump 24, being provided with a check valve 26 and communicating at its opposite end with the burner pipe 16. The pipe 25 is provided with a check valve 26 and beyond this check valve with a safety valve 27, from which safety valve a pipe 28 leads back to the pipe 2 hereinbefore mentioned. Mounting upon and extending upwardly from the upper portion of the cylinder 5 are guide arms 29, on opposite sides of the lever 10 and a spring 30 connects said lever with any suitable rigid stationary portion of the apparatus, in this instance, with the pipe 16.

The operation of my device as before described is as follows: It being desired to

furnish fuel to the burner, the lever 10 is raised by hand, raising the piston 6 in the cylinder 5, which will draw the liquid fuel from the tank 1 through pipe 2, pipe 3 and check valve 4, into the cylinder below the piston, the check valve 4 being arranged to open only in the direction indicated by the arrow and to close in the opposite direction. This raising of the lever 10 is of course against the force of the spring 30 and of weight 15. As a consequence the spring and weight, both exerting their force upon the lever 10 will cause the lever to tend to force the piston 6 downward in the cylinder upon the fuel and thus establish a pressure thereupon by means of which the fuel will be forced through the pipe 16, check valve 17, globe valve 18 and pipe 19 to the burner. This will afford a force feed for the fuel to the burner for a considerable length of time and will prevent the feed ceasing when the machine is stopped. The check valve 17 is set to open in the direction of the arrow and it is obvious that the globe valve may be opened or closed at will to permit or prevent the passage of oil to the burner.

While the machine is running, as hereinbefore stated, the pump 24 will be operated in a well known manner by the machine itself. On the up stroke of this pump oil will be drawn into it from the tank 1 through the pipes 2 and 22 and check valve 23, the latter being arranged to open in the direction of the arrow and close in the opposite direction. Upon the down stroke of the pump, the check valve 23 closing, the check valve 26 will open and fuel will pass through pipe 25 to pipe 16 and thence to the burner.

Should the pump pressure exceed the degree to which the safety valve 27 is set, that valve will open and instead of forcing all the fuel through pipe 25 to the burner, the excess will be shunted through pipe 28 back through pipe 2 to the tank 1.

Any of the liquid fuel which may leak past the piston and get above it in the cylinder, will, upon the up strokes of the piston, be forced through pipe 20 and check valve 21 to the tank 1, said check valve being arranged to open in the direction of the arrow and close in the opposite direction. The pressure upon the piston when the spring alone is used, will of course be governed by the size of the spring which will be suited to its use in this position and when the weight alone is used, the pressure will be regulated both by the size of the weight and by the distance to which it will be adjusted from the fulcrum of the lever 10. Obviously when the spring and weight are used together a spring of less power may be used and the pressure of the weight regulated in the same manner.

The cylinder will always be placed slightly lower than the tank to insure a free flow of

the fuel from the tank and to obviate the necessity of expending a portion of the pressure of the piston or the force of the pump in order to overcome gravity.

In the modification of my invention which is illustrated in Fig. 2, by means of which the apparatus is used as a feed for forcing lubricants to the cylinders of steam engines, the tank is indicated at 1 and from which a pipe, in a manner similar to that of the apparatus hereinbefore described, leads downward and connects with a pipe 31 provided with a check valve 32, opening in the direction of the arrow and closing in the opposite direction, said pipe 31 leading into a cylinder 5 in which is fitted a piston 6 on the lower end of a piston rod 7 which passes out through a suitable stuffing box 8 in the upper head of the cylinder and pivotally supports at 9 a lever 10, which in turn is pivoted at 11 to a link 12 pivoted at 13 on the head of the cylinder, the lever 10 being provided with a slidable weight 14 and a set screw 15 as hereinbefore described with relation to the construction of Fig. 1.

Pipe 32' leads from the cylinder 5 below the piston head 6 to the usual sight feed glasses and thence to the cylinders, the pipe 32' being provided with a check valve 33 opening in the direction of the arrow and closing in the opposite direction. A pipe 34 leads from the cylinder 5 above the piston head 6, back to the tank 1 and is provided with a check valve 35 opening in the direction of the arrow and closing in the opposite direction, whereby lubricant which may leak past the piston head will be returned to the tank. The drain pipe 36, provided with a suitable valve 37, leads from the bottom of the cylinder.

In the use of this apparatus the lubricant passes downward from the tank 1 through pipe 2, pipe 31 and check valve 32 into the cylinder below the piston head as the piston head is raised by lifting the lever 10 by hand. The lever 10 being released, the weight 15 brings its regulated pressure upon the piston and tends to force it downward upon the lubricant, forcing the latter through pipe 32 and check valve 33 to the sight feed glasses.

The cylinder will be made of a suitable size to contain sufficient lubricant to last for a considerable length of time so that constant attention thereto will not be necessary.

The lubricant under the pressure of the piston as described may be led by suitable pipes to any desired number of separate sight feeds, one on each engine, pump, or cylinder of the whole or any portion of a large plant. To accommodate this application of the invention, the piston would not probably exceed one inch in diameter but would be quite long, to accommodate a very long piston rod and heavy weights on the

lever 10 in order to overcome back pressure from the sight feed lubricators.

It will be obvious that no pump will be necessary when the apparatus is used as a feed for lubricators.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus of the character described, the combination with a tank for containing liquid of a cylinder located below the level of the tank, a downwardly pressed piston in the cylinder, a pipe leading from the tank to the cylinder below the piston having a check valve opening toward the cylinder, a delivery pipe leading from the cylinder below the piston, having an outwardly opening check valve and a pipe leading from the cylinder above the piston to the tank and having a check valve opening toward the tank.

2. In an apparatus of the character described, the combination with a tank for containing liquid, of a cylinder located below the level of the tank, a downwardly pressed piston in the cylinder, a pipe leading from the tank to the cylinder below the piston having a check valve opening toward the cylinder, a delivery pipe leading from the cylinder below the piston, having an outwardly opening check valve, a pipe shunting the cylinder and leading from the cylinder to the delivery pipe, a check valve in the shunting pipe closing toward the tank, and a pump in the shunting pipe between the check valve and the delivery pipe.

3. In an apparatus of the character described, the combination of a tank for containing liquid, a delivery pipe below the level of the tank, a pipe leading downward from the tank, a pipe leading thence to a pump, check valves in the pipe on both sides of the pump one opening toward the pump and the other away from it, a safety valve between the pump and the delivery pipe and a pipe leading from the safety

valve back to the pipe leading to the tank and shunting the pump.

4. An apparatus of the character described, comprising a tank for containing liquid, a cylinder below the tank, a piston in the cylinder, means for exerting downward pressure on the piston, a pipe leading from the tank to the cylinder below the piston, a forwardly opening check valve in said pipe, a pipe leading from the tank to the cylinder above the piston, a rearwardly opening check valve in the last mentioned pipe, a delivery pipe leading from the cylinder below the piston, a forwardly opening check valve in said delivery pipe, a controlling valve in said delivery pipe, the pipe having one end connected to the first mentioned pipe and its other end connected to the delivery pipe, a force pump in communication with the pipe 22, forwardly opening check valves in the pipe 22 on opposite sides of said pump, a safety valve in the pump discharge end of the pipe 22, and the shunt pipe 28 extending from said safety valve to the first mentioned pipe.

5. An apparatus of the character described comprising a tank for containing liquid, a cylinder below the tank, a pipe with a forward opening check valve, leading from the tank to the cylinder, a piston in the cylinder, a delivery pipe leading from the cylinder with a forwardly opening check valve, and a cut-off valve, a pivoted lever pivotally connected with the piston rod, a slidable weight on the lever, a spring drawing downwardly upon the lever, and a pipe leading from the upper part of the cylinder to the tank, having a check valve opening toward the tank.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

REGINALD PUTNAM.

Witnesses:

A. G. OLOAN,
GEO. H. BUCKLEY.