R. P. DOUDNEY.

CARBURETING APPARATUS.

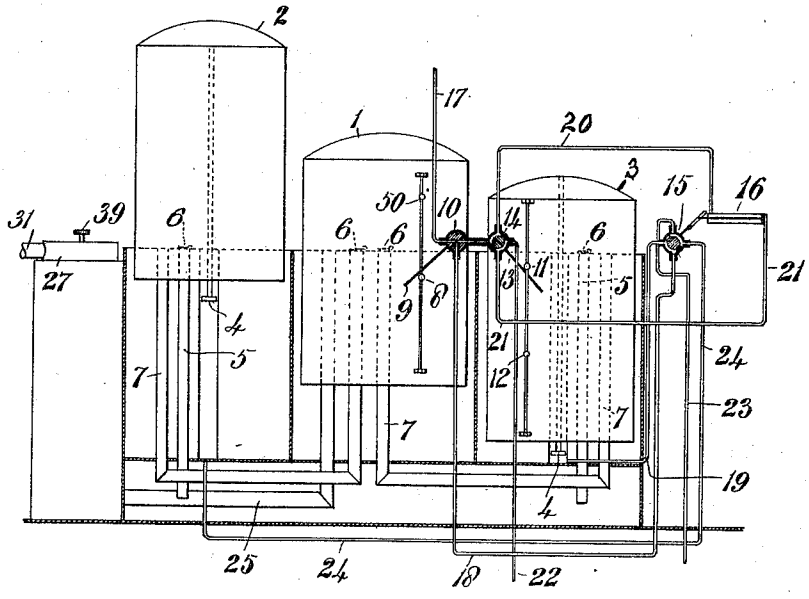
APPLICATION FILED DEC. 5, 1910.

**1,019,309.**

Patented Mar. 5, 1912.

2 SHEETS—SHEET 1.

*Fig: 1.*




Witnesses

Inventor

Raymond Pelly Doudney

by

Attorney.

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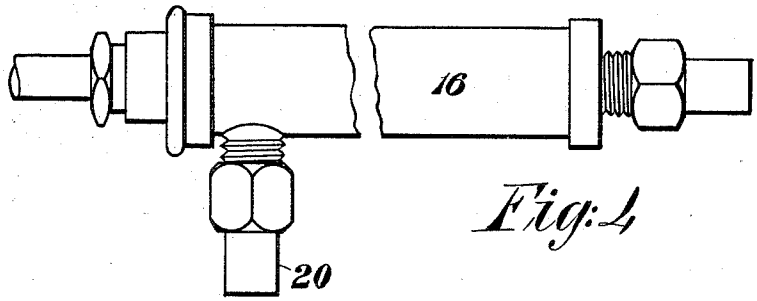


Fig: 1.

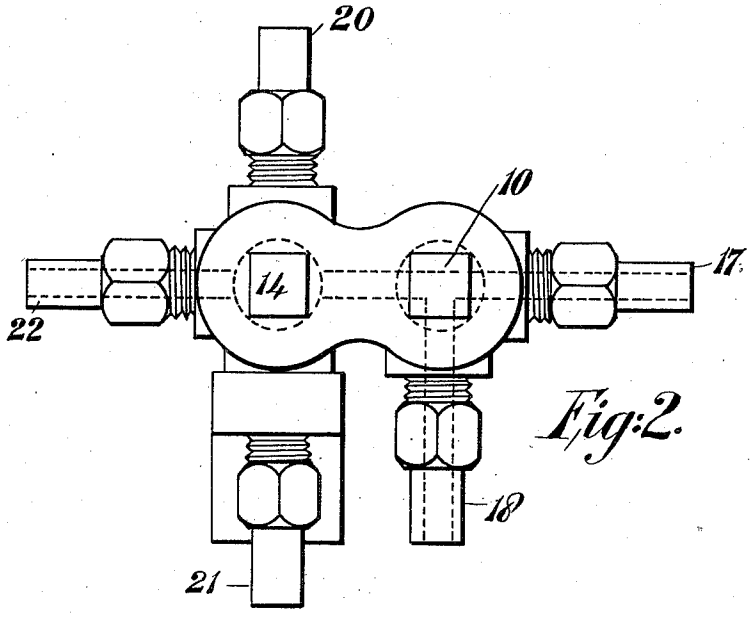


Fig: 2.

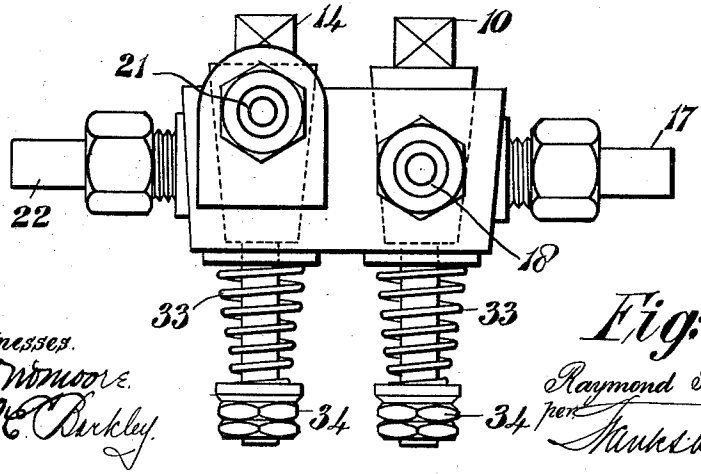


Fig: 3.

Witnesses.
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# UNITED STATES PATENT OFFICE.

RAYMOND PELLY DOUDNEY, OF FARINGDON, ENGLAND.

## CARBURETING APPARATUS.

1,019,309. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed December 5, 1910. Serial No. 595,652.

*To all whom it may concern:*

Be it known that I, RAYMOND PELLY DOUDNEY, a subject of the King of Great Britain, residing at Shellingford Rectory, Faringdon, Berkshire, England, motor engineer, have invented new and useful Improvements in and Relating to Carbureting Apparatus, of which the following is a specification.

My invention relates to improvements in carbureting apparatus for the production of air gas.

My invention is illustrated in the accompanying drawings in which—

Figure 1 shows a diagrammatic view of the air bells and water valves controlled by said bells. Fig. 2 shows a plan view of the pair of valves through which the water passes from the water main, controlled respectively by the central air bell and by one of the pumping bells. Fig. 3 shows a side view of Fig. 2. Fig. 4 shows a side view of the auxiliary hydraulic piston controlling a third valve.

Referring now to Fig. 1 of the drawings, in which I show a central reservoir bell 1 adapted to receive air from two pumping bells 2 and 3. The bell 2 is shown in its top position while the bell 3 is shown in its lowest position. As shown in dotted lines each of said bells is provided with a hydraulic piston 4 and an inlet pipe 5 provided with a non-return flap valve 6, which may conveniently be formed of rubber, and an outlet pipe 7 leading to the main reservoir bell 1 which is also provided with a non-return valve 6. The main reservoir bell is provided with a projecting arm 8 in a suitable position, adapted to engage with an arm 9 adapted to turn a valve 10, which will be more particularly described hereinafter with reference to Figs. 2 and 3.

The pumping bell 3 is provided with a pair of projecting arms 11 and 12 adapted to engage, according to the position of said bell, with an arm 13 projecting from and adapted to turn a valve 14. A third valve 15 is controlled by an auxiliary hydraulic piston 16. The valves 14 and 15 are provided with two-way passages adapted to connect sets of four water pipes respectively leading to said valves and from said valves to the hydraulic pistons. The operation of said bells is as follows: The water passes from the water main through the supply pipe 17 to the valve 10 and from said valve through the valve 14, pipe 20 to the auxiliary hydraulic piston 16, thereby moving its piston to the position shown in Fig. 1 of the drawings and consequently moving the valve 15 to the position illustrated and thus opening a passage for the water from the valve 10 through the pipe 18 as will be hereinafter described. When the valve 15 has been moved by the auxiliary piston 16 to the position shown in Fig. 1, the water at the other end of said piston is exhausted through the pipe 21, valve 14 and exhaust pipe 22. When the valve 15 is in the position shown in Fig. 1 the water passes from the pipe 18 through the valve 15 and pipe 19 to the hydraulic piston 4 of the bell 3, thereby lifting said bell and causing air to pass into it from the atmosphere through the pipe 5 and non return valve 6. Meanwhile the valve 15 has opened to the exhaust pipe 23 the pipe 24 leading to the cylinder of the hydraulic piston 4 of the bell 2 thereby allowing said bell to fall, consequently closing the non-return valve 6 and forcing the air which has passed into said bell through the pipe 7 into the central air bell 1. When the bell 3 has reached its top position the projection 12 on said bell will come into engagement with the arm 13 and turn the valve to a position in which the pipe 20 leading to the auxiliary hydraulic piston 16 is connected with the exhaust pipe 22 while the pipe 21, leading to the other end of said auxiliary hydraulic piston 16, is connected with the main, thereby moving, through said hydraulic piston, the valve 15 to a position in which the pipe 18 is connected through the pipe 24 with the cylinder of the hydraulic piston 4 of the bell 2, while the exhaust pipe 23 is connected with the pipe 19, leading to the cylinder of the hydraulic piston of the bell 3. In this manner the bell 2 is again raised and the bell 3 is lowered with the result that the air which has passed into said bell 3 is forced from thence through its pipe 7 into the central bell 1 and finally, when said bell has reached its lowest position, its projecting arm 11 engages with the arm 13 and moves the valve 14 back again to the position shown in Fig. 1 of the drawings.

It is obvious, in view of the foregoing, that the auxiliary piston cylinder 16 is provided with an intake port 20 and an exhaust port 21 at each end thereof; also that through the arrangement of valves 10, 14

and 15 and their combination with the actuating means as described, the said ports are reversible with regard to their respective functions, inasmuch as they alternately serve as intake and exhaust ports respectively, and the piston cylinder 16 may therefore be termed "double acting."

In Figs. 2 and 3 I show plan and side views of a preferred form for the pair of valves controlled respectively by the central air bell 1 and the pumping bell 3. As shown in Fig. 3 of the drawings these valves are cone shaped and retained in their seatings by springs 33 which can be adjusted by nuts 34. The sides of the valve 14 are provided with a pair of grooved waterways adapted to connect the pipe leading from the valve 10 either with the pipe 20 or the pipe 21 and said pipes 20 and 21 with the exhaust pipe 22.

As the main reservoir bell rises it gradually turns, through its arm 9, the valve 10 and when it has reached its highest position this valve is turned to a position in which the water from the main is shut off. The arm 9 is weighted and consequently as soon as the bell 1 begins to fall the said arm falls with it.

In order to provide for the valve 10 sticking from any reason in the closed position I prefer to provide a second arm 50 which in such a case will come into engagement with said arm 9 after the bell 1 has fallen a certain distance.

What I claim is:

1. In hydraulically operated air pumps for carbureting apparatus, the combination of a reservoir air bell adapted to supply the carbureter with compressed air, an air bell adapted to pump air into said reservoir bell, a hydraulic piston actuating said pumping bell, an auxiliary hydraulic piston and a series of valves through which the head of water is admitted to and exhausted from said hydraulic pistons, said auxiliary hydraulic piston being reciprocable in a piston cylinder having intake and exhaust ports adapted to have their functions alternately changed, and means connected with the piston and with one of said valves for automatically actuating the latter.

2. In hydraulically operated air pumps for carbureting apparatus, the combination of a reservoir air bell adapted to supply the carbureter with compressed air, two air bells adapted to pump air into said reservoir bell one of said pumping bells being adapted to rise simultaneously with the fall of the other pumping bell, two hydraulic pistons respectively actuating said pumping bells, an auxiliary hydraulic cylinder having piston therein and having a port at each end portion in such relation to the piston that water is admitted to said cylinder and exhausted therefrom to said ports alternately, said piston being operatively connected with the valve for alternately opening and closing the same.

3. In hydraulically operated air pumps for carbureting apparatus, the combination of a reservoir air bell adapted to supply the carbureter with compressed air, an air bell adapted to pump air into the said reservoir bell, a hydraulic piston actuating said pumping bell, an auxiliary hydraulic piston, a valve controlling the water passing from the water main provided with two water passages leading respectively to a second and a third valve, water passages in said second and third valves adapted to connect sets of water pipes through which the head of water is admitted to and exhausted from said hydraulic pistons, the first of said valves being controlled by said reservoir bell, the second of said valves being controlled by said pumping bell and the third valve being controlled by said auxiliary hydraulic piston which is itself controlled by said second valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RAYMOND PELLY DOUDNEY.

Witnesses:

LEONARD E. HAYNES,

ALONZO S. WITHERDEN.