No. 678,194. Patented July 9, 1901.

C. K. PICKLES.

CARBURETER.

(Application filed Apr. 18, 1901.)

(No Model.) 2 Sheets—Sheet 1.

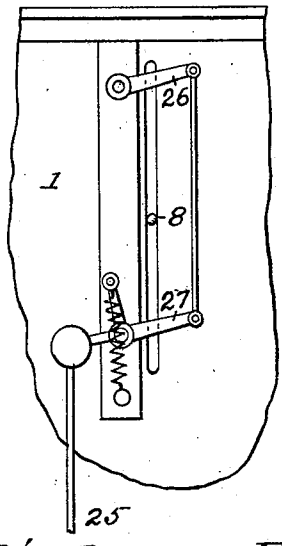


Fig. 2.

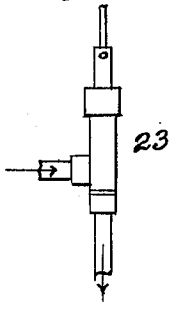
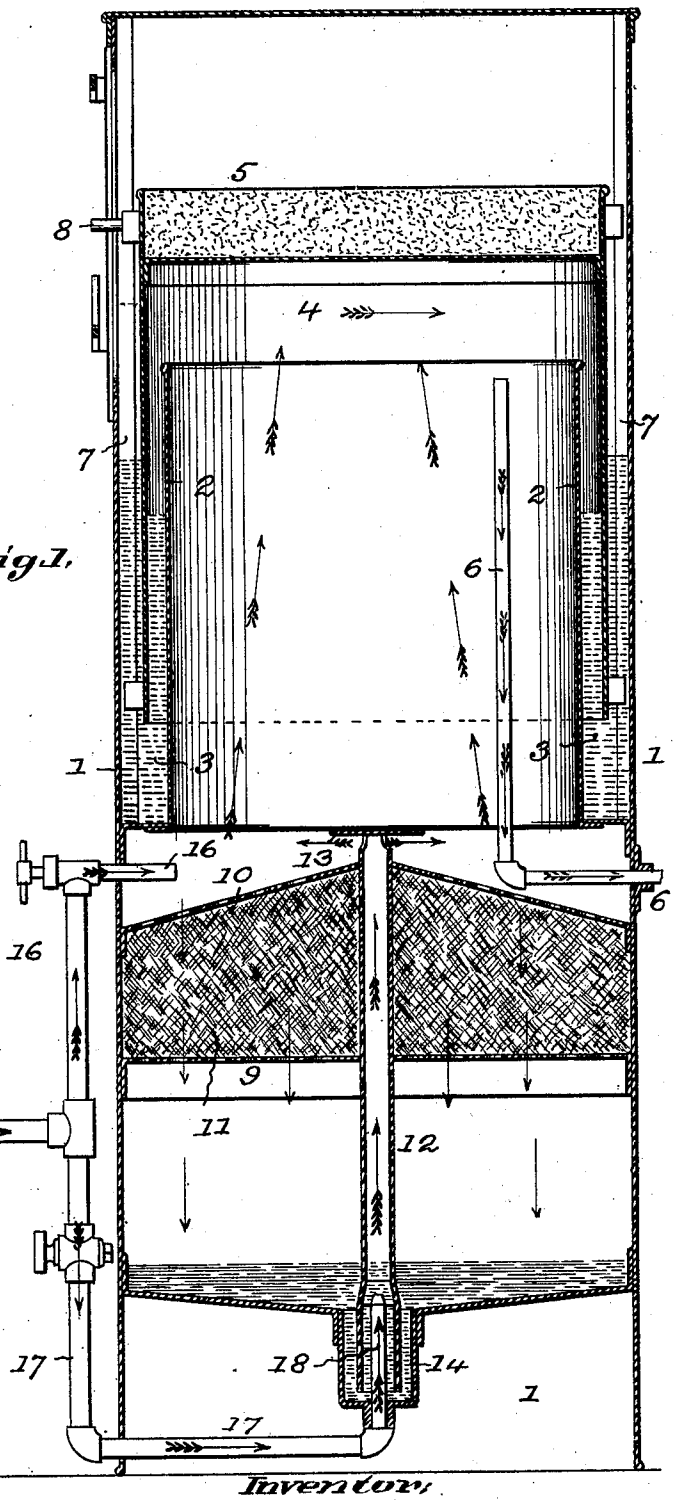


Fig. 1.



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Fig. 3.

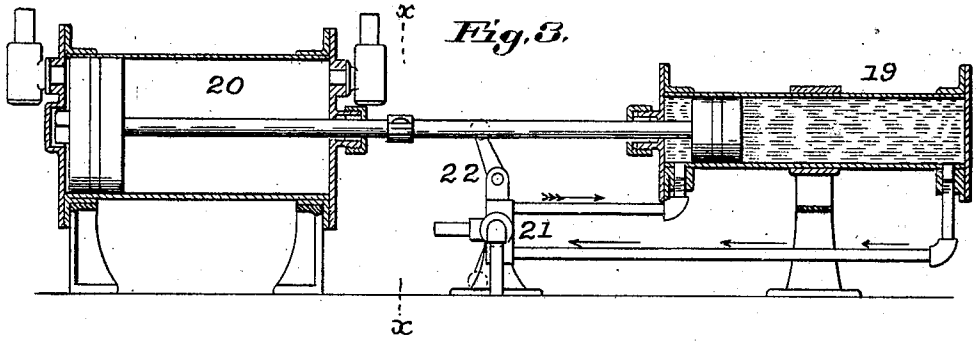


Fig. 4.

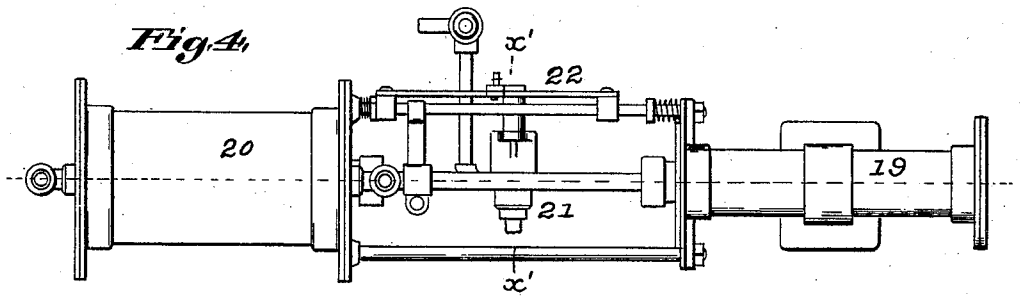


Fig. 5.

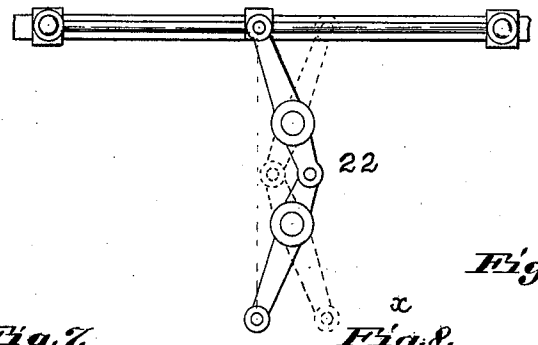


Fig. 6.

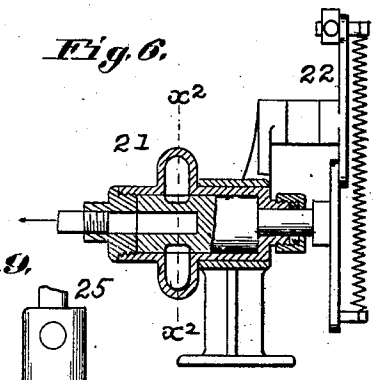


Fig. 9.

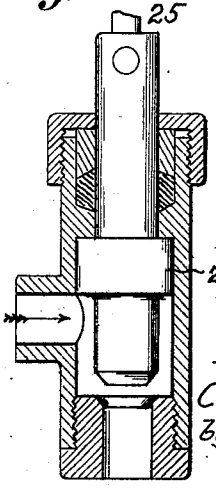


Fig. 7.

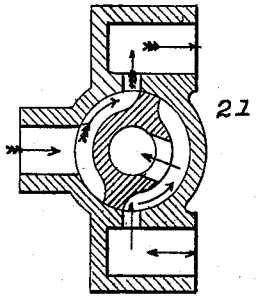
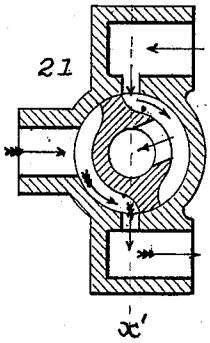


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES K. PICKLES, OF ST. LOUIS, MISSOURI, ASSIGNOR TO ROBERT G. SPEER, OF SAME PLACE.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 678,194, dated July 9, 1901.

Application filed April 18, 1901. Serial No. 56,360. (No model.)

To all whom it may concern:

Be it known that I, CHARLES K. PICKLES, a citizen of the United States of America, and a resident of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Automatic Gas Apparatus, of which the following is a specification.

The present invention relates to that type of gas apparatus in which an automatically-controlled supply of air under pressure is admitted to the carbureting-chamber to be properly carbureted by contact with the volatile hydrocarbon contained therein, after which the combustible carbureted air is stored in a receiver to be delivered to the burners as required.

The object of the present invention is to provide a simple and efficient apparatus in which the operations of the parts are automatically controlled in accordance with the consumption of the carbureted air by the burners, and in which a very effective carbureting of the air is effected in a thorough manner and with very little complication of parts, all as will hereinafter more fully appear and be more particularly pointed out in the claims. I attain such object by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical sectional elevation of the combined carbureting and storage chamber of the present invention, the air-pump being shown in section at line $x\ x$, Fig. 3; Fig. 2, a fragmentary elevation illustrating the automatic mechanism for controlling the supply of motive fluid to the air-pump; Fig. 3, a longitudinal section of the air-pump; Fig. 4, a plan view of the same; Fig. 5, an enlarged detail elevation of the trip mechanism for the reversing-valve of the air-pump; Fig. 6, an enlarged detail transverse section of the reversing-valve of the air-pump at line $x'\ x'$, Figs. 4 and 8; Figs. 7 and 8, enlarged detail sections at line $x^2\ x^2$, Fig. 6, showing the reversing-valve of the air-pump in its two positions; and Fig. 9, an enlarged detail sectional elevation of valve of the automatic mechanism controlling the supply of motive fluid to the air-pump.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents a vertically-arranged casing, preferably cylindrical in shape and constituting in common a carbureting and a storage chamber for the supply of carbureted air.

2 is an annular partition arranged within the upper portion of the casing 1 and forming an annular chamber 3, adapted to contain a liquid seal, as shown.

4 is a tank or holder arranged to have vertical movement within the main casing 1 and constituting the holder for the carbureted air and for such purpose is formed with a closed top and an open bottom and with its circular depending wall arranged to dip into the liquid within the seal-chamber 3, so as to permit of the ready vertical movement of such holder without leakage or friction.

5 is an upturned rim at the top of the holder 4, forming a chamber for containing a body of sand or other like material for increasing the weight or gravity of the holder to maintain the desired pressure upon the confined carbureted air.

6 is an outlet-pipe extending to the burners or heaters supplied by the present apparatus.

7 represents side guides engaged by the holder 4 and adapted to guide the same vertically in its upward and downward movements in a continued use of the apparatus.

8 is a projecting stud or pin on the holder 4, that has movement in a vertical slot in the main casing 1, and which is adapted to actuate the automatic controlling mechanism, hereinafter described, of the motive-fluid supply to the air-pump of the apparatus.

9 is a perforated partition arranged a distance above the bottom of the main chamber, and 10 is a coned partition arranged a distance above the partition 9, such partitions forming a receiving-chamber for a packing of loose fibrous material 11, the purpose of which is to minutely subdivide a limited quantity of hydrocarbon supplied thereto and convert the same into vapor, which mixes with the contained air by diffusion, according to well-known principles of physical science, the purpose of the coned form of the upper

partition 10 being to effect a very even distribution of the hydrocarbon onto the mass of fibrous material 11.

12 is a centrally-arranged pipe extending up through the partitions 9 and 10 and the fibrous filling 11 and provided at top with a horizontal deflection-plate 13 and at bottom with an open and preferably expanded lower end which dips into a body of liquid hydrocarbon in the lower part of the main casing and preferably into a well 14, formed in the bottom of said main casing, as shown.

15 is the air-inlet pipe, connected to any suitable source of air-supply and preferably to an automatic fluid-actuated pump, hereinafter described. In the present improvement the air-supply pipe is formed with two valved branches 16 and 17, the one communicating with the interior of the main casing 3 above the perforated confining-partitions 9 and 10 of the fibrous filling 11 and the other extending to the extreme lower end of the said casing 3 and provided with an escape-nozzle 18, arranged centrally within the lower expanded end of the vertical pipe 12, heretofore described, the arrangement being such that the air escaping through such nozzle will tend to lift the hydrocarbon either in the form of a spray or in the form of succeeding globules of some size, depending upon the pressure and amount of air passing through said jet, the spray or globules being discharged against the deflection-plate 13 to be deflected down onto the coned partition 10 to effect an even saturation of the fibrous filling 11, by means of which the diffusion of the hydrocarbon is effected, as heretofore mentioned.

With the branches having individual controlling-valves, as shown, the regulation of the amount of hydrocarbon lifted and supplied to the fibrous filling 11 can be regulated and controlled to suit any requirement met with in the different uses of the apparatus.

The air pump or compressor illustrated in the drawings as best adapted to the present automatic gas apparatus for use in cities is of the fluid-actuated type, in which the city water-supply affords the power required to operate the pump. No novelty is claimed herein to the special features of construction of pump herein illustrated, the same being quite usual to some forms of hydraulic air-compressors now on the market.

In the construction shown, 19 is the water-cylinder, and 20 the air-compressor cylinder, the respective pistons of which are connected together by a piston-rod common to both pistons. 21 is the reversing-valve for the water-cylinder, having any usual form of reversing-gear 22 operatively connected to the piston-rod, so as to be positively reversed near the end of the stroke of such piston-rod in either direction, as usual in this type of valve-gear. 23 is a valve, preferably of the balanced type, as shown in Fig. 9, arranged in the water outlet or exhaust pipe of the hydraulic air-compressor and adapted to control the escape or waste from the water-cylinder of the same. In the present invention the operating stem or link 25 of this valve is connected to a pair of separated and operatively-connected arms 26 27, that are arranged in the path of the stud or pin 8, carried by the vertically-moving tank or holder 4 of the apparatus, the construction being such that as the said holder reaches a predetermined height its stud 8 will contact with the upper arm 26 to cause the valve 23 to close and prevent further action of the air-compressor, and with a subsequent descent of said holder to a predetermined point the stud 8 will contact with the lower arm 27 to cause the valve 23 to open and permit the air-compressor to recommence its operation of pumping air into the apparatus. When desired, the valve 23 may be arranged in the water-supply pipe instead of in the water-exhaust pipe, as described, without departing from the spirit of the present invention.

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

1. An automatic gas apparatus having a gas-holder, an air-pressure supply and a carbureting-chamber provided with a carbureted-air exit, in combination with a fibrous filling arranged in the carbureting-chamber, a hydrocarbon-supply chamber arranged beneath such fibrous filling, a pipe extending from the lower portion of the hydrocarbon-chamber to a point above the fibrous filling, and an air-jet nozzle discharging into the lower end of said pipe, and adapted to lift the hydrocarbon to effect a saturation of the fibrous filling, substantially as set forth.

2. An automatic gas apparatus having a gas-holder, an air-pressure supply and a carbureting-chamber provided with a carbureted-air exit, in combination with a fibrous filling arranged in the carbureting-chamber, a hydrocarbon-supply chamber arranged beneath said fibrous filling and provided with a central well, a pipe extending from said well to a point above the filling, and an air-jet nozzle discharging into the lower end of said pipe and adapted to lift the hydrocarbon to effect a saturation of the fibrous filling substantially as set forth.

3. An automatic gas apparatus having a gas-holder, an air-pressure supply, and a carbureting-chamber provided with a carbureted-air exit, in combination with a fibrous filling arranged in the carbureting-chamber, a hydrocarbon-supply chamber arranged beneath such fibrous filling, a pipe extending from the lower portion of the hydrocarbon-chamber to a point above the fibrous filling, and an air-jet nozzle discharging into the lower end of said pipe and adapted to lift the hydrocarbon to effect a saturation of the fibrous filling, the air-pressure supply having valved branches connected one above the filling and the other with the jet-nozzle, substantially as set forth.

4. An automatic gas apparatus having a gas-holder, an air-pressure supply, and a carbureting-chamber provided with a carbureted-air exit, in combination with a fibrous filling arranged in the carbureting-chamber, a hydrocarbon-supply chamber arranged beneath such fibrous filling, a pipe extending from the lower portion of the hydrocarbon-chamber to a point above the fibrous filling, a spreader-plate arranged above the open upper end of said pipe, and an air-jet nozzle discharging into the lower end of said pipe and adapted to lift the hydrocarbon above the filling to effect a saturation of the same, substantially as set forth.

5. An automatic gas apparatus having a gas-holder, an air-pressure supply, and a carbureting-chamber provided with a carbureted-air exit, in combination with a pair of separated perforated partitions arranged in the carbureting-chamber, a fibrous filling arranged between said partitions, a hydrocarbon-supply chamber arranged beneath such fibrous filling, a pipe extending from the lower portion of the hydrocarbon-chamber to a point above the fibrous filling, and an air-jet nozzle discharging into the lower end of said pipe and adapted to lift the hydrocarbon to effect a saturation of the fibrous filling, substantially as set forth.

6. An automatic gas apparatus having a gas-holder, an air-pressure supply, and a carbureting-chamber provided with a carbureted-air exit, in combination with a pair of separated perforated partitions, the upper one of which has a cone form, arranged in the carbureting-chamber, a fibrous filling arranged between said partitions, a hydrocarbon-supply chamber arranged beneath such fibrous filling, a pipe extending from the lower portion of the hydrocarbon-chamber to a point above the fibrous filling, and an air-jet nozzle discharging into the lower end of said pipe and adapted to lift the hydrocarbon to effect a saturation of the fibrous filling, substantially as set forth.

Signed at St. Louis, Missouri, this 13th day of April, 1901.

CHARLES K. PICKLES.

Witnesses:
ROBERT BURNS,
JOHN ENDERS, Jr.