(No Model.)

G. ALDERSON.

GAS MIXER.

No. 581,930. Patented May 4, 1897.

Fig 1.

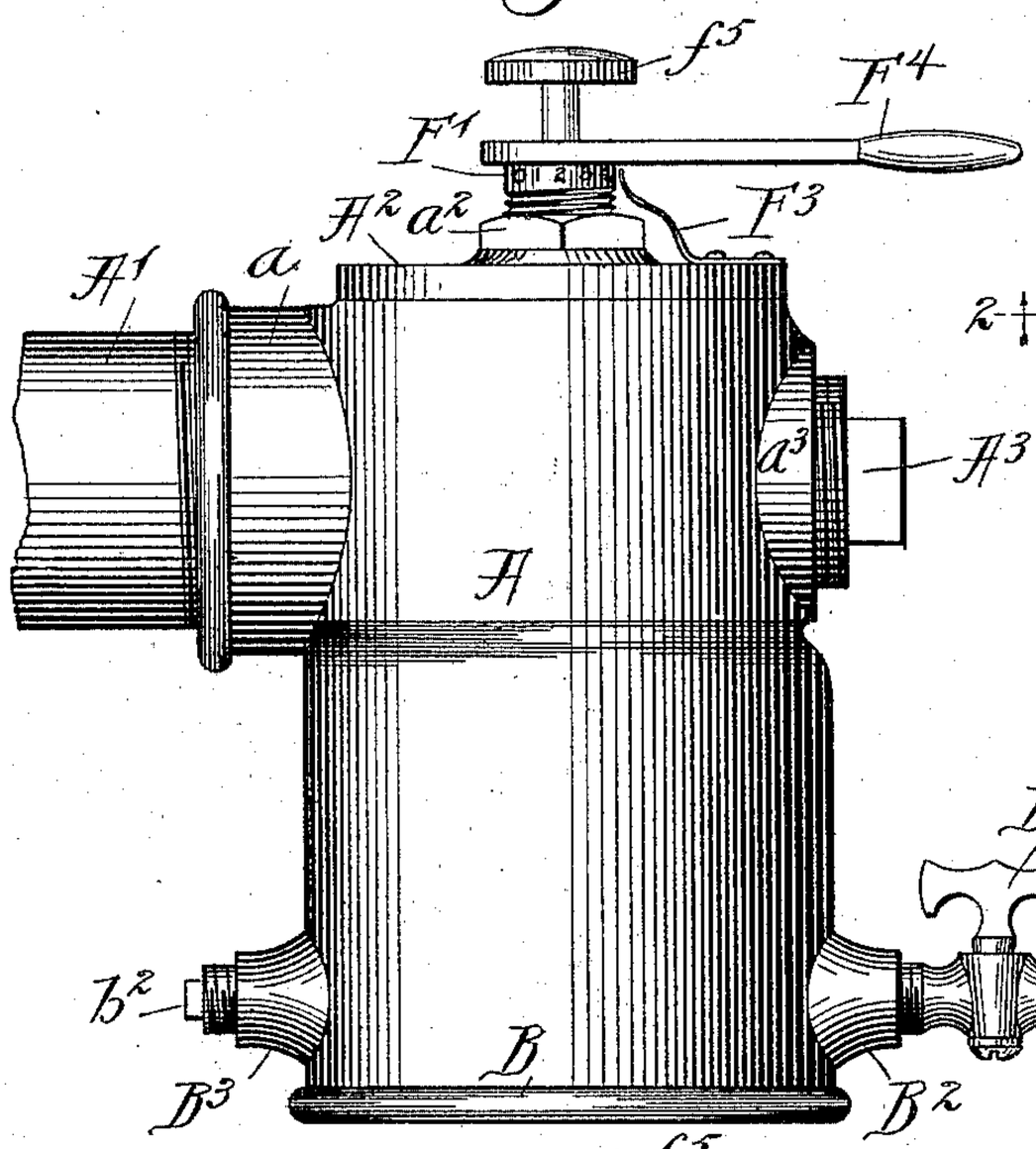
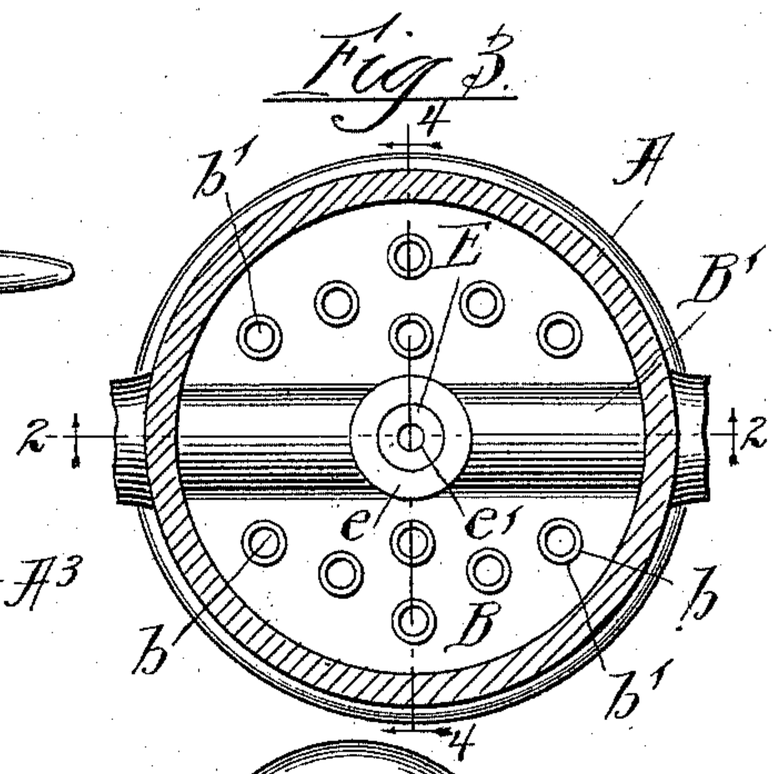


Fig 3.



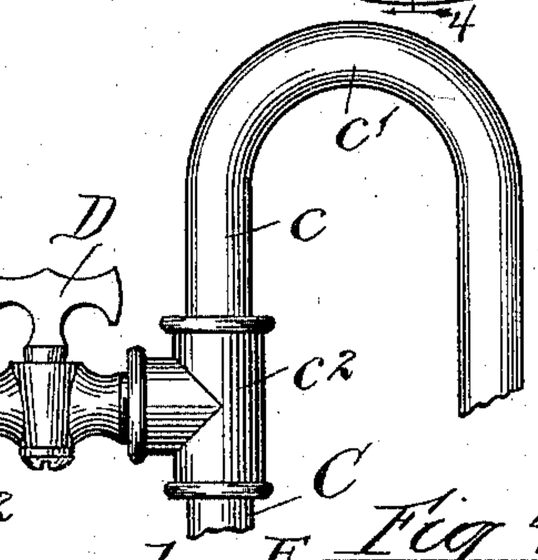


Fig 4.

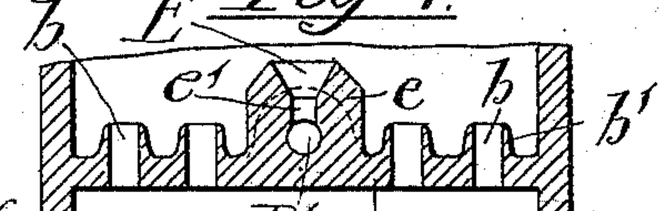


Fig 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE ALDERSON, OF LA SALLE, ILLINOIS, ASSIGNOR TO CHARLES BRUNNER, OF PERU, ILLINOIS.

GAS-MIXER.

SPECIFICATION forming part of Letters Patent No. 581,930, dated May 4, 1897.

Application filed May 6, 1895. Serial No. 548,285. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ALDERSON, of La Salle, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Gas-Mixers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to mixers for gas or vapor engines; and it consists in the novel devices and combination of devices illustrated in the drawings and more particularly pointed out in the appended claims.

One of the objects of the invention is to produce a compact device that may be used between the gas-supply and the cylinder of the engine and which shall be so constructed that either gas or oil may be used separately or both may be used at the same time.

A further object of the construction about to be described is that the supply of gas may be shut off and the supply of oil opened without affecting the operation of the engine in the least.

A further object is to produce a device of the character above described which shall be simple and thus not liable to easily get out of order, but which also shall be durable and of reasonably cheap construction.

In the drawings, Figure 1 illustrates an outside view of the mixer, connected, however, only with the source of oil-supply. Fig. 2 is a central vertical sectional view of the device, showing the gas adjustment connected in proper position. Fig. 3 is a horizontal sectional view of the bottom of the mixer, showing the construction of the bottom plate. Fig. 4 is a vertical sectional view of the latter, taken upon the line 4 4 of Fig. 3.

A represents the body portion proper of the mixer provided with an outwardly-extending way *a*, interiorly screw-threaded to receive the end of the pipe A′, which latter communicates directly with one end of the cylinder of the engine. (Not shown in the drawings.) The bottom B of the mixer is provided with a plurality of apertures *b*, whereby communication between the interior *a′* of the mixer and the atmosphere is established. Each aperture *b* is surrounded upon the inner side of the bottom B with a raised hub *b′* for the purpose hereinafter to be described. A transverse passage-way or conduit B′ communicates at each end with the threaded interior of the radial hubs B^2 B^3, the latter being closed by the plug b^2.

C is a pipe leading from any suitable source of oil-supply and provided, preferably, with a curved return portion *c*, the upper end *c′* of which is located at a remove or distance above the hub B^2. An ordinary plug-valve D connects the pipe C with the conduit or passage-way B′ by having one end inserted within the hub B^2 and its other end inserted within a T-coupling c^2, which latter also joins the pipes C and *c*. Oil may be supplied to the pipe C either by a pump or from an elevated tank or in any other convenient manner.

Centrally of the bottom B a valve-seat E is formed within a raised hub *e*, which valve-seat is connected at its lower end with the conduit B′ by a short passage-way *e′*. A valve F is arranged to fit upon the seat E and is provided with an annular plate or flange *f*, which extends within the space *a′* of the mixer. A shoulder is formed in the valve-stem *f′* by a second annular flange f^2, while a second shoulder f^3 is formed by reducing the diameter of the valve-stem, as shown at f^4.

f^5 is a button or any convenient thumb-piece for the end of the valve-stem. Surrounding the valve-stem above the flange f^2 is a sleeve F′, which sleeve is constructed at its upper end so as to form a snug bearing therethrough of the reduced portion f^4 of the stem. The end of the sleeve F′ affords a shoulder at f^6, and within the space between the reduced stem f^4 and the interior of the sleeve F′ is a normally expansive spring F^2, resting at its lower end upon the shoulder f^3 and pressing at its upper end against the shoulder f^6. The sleeve F′ is exteriorly screw-threaded, whereby it is adjustably secured within a secondary interiorly-screw-threaded aperture in the cap A^2 of the mixer and is held in proper position therein by means of a jam-nut a^2.

From the above construction it will be readily understood that the amount of vertical

movement given to the valve F will correspond with the space left between the flange f^2 in the valve-stem and the extreme end f^7 of the sleeve F′ and that this distance or throw of the valve F may be regulated as desired by simply unloosening the jam-nut a^2 and raising or lowering the sleeve F′ the desired distance and then tightening up the jam-nut a^2. In order that this adjustment may be more readily effected, a scale or division-marks (indicated by the characters "0 1 2 3 4," &c., Fig. 1) are placed about the periphery of the upper end of the sleeve F′, and a suitable index finger or pointer F^3 is arranged so that by turning any given number opposite said finger F^3 the operator will understand how great a distance exists between the end f^7 of the sleeve and the flange f^2 on the valve-stem. To more conveniently effect this adjustment, a handle F^4 may be connected with the top of the sleeve F′, as shown, but of course it will be manifest that the handle F^4 may be dispensed with and any other convenient means provided for rotating the sleeve F′. It will also be understood that the scale and the index-finger F^3 are not necessarily located as illustrated in the drawings. For example, the index-finger F^3 may be secured to the handle F^4 and the scale marked upon the face of the cap A^2 instead of upon the sleeve F′.

The operation of the device is as follows: The end of the valve-stem a^5 is elevated by hand until the flange f^2 strikes the end of the sleeve F′, whereupon a sufficient quantity of oil for the first charge will pass through the aperture e' and through the space between the valve-seat E and the valve F, overrun the hub e, and spread itself out over the bottom B, the hubs b', surrounding the apertures b in said bottom, serving to retain the oil charge within the mixer and preventing it from running out through the apertures b. The operator will then let go of the valve-stem f^5, whereupon the spring F^2 will force the valve F firmly upon its seat. The engine may then be operated by hand, and the first outstroke of the piston will cause a suction through the interior of the mixer and in the direction indicated by the arrow in the pipe A′, which suction will draw the oil charge and the air upward and outward through the pipe A′. At the same time the suction will be sufficient to lift the valve F from its seat against the action of the spring F^2. This lift of the valve F by the drawing action of the piston of the engine will permit a second charge of oil to enter the mixer. The return stroke of the engine-piston will of course close the valve F; but to insure a positive action in this respect the valve is not only positioned vertically, so that gravity may act to close the valve, but the spring F^2 is employed. The operation is thus repeated as long as desired.

The hub B^2 is shown, and in practice will ordinarily be used, in order that the connection with the oil-pipe C may be conveniently made on either side, as desired. When one side is used for the connection, as shown in Fig. 2, the other side of the passage-way B′ will be closed, as by the plug b^2. It will be observed that in this construction the oil may be supplied constantly to the mixer and will only be taken into the latter as required, and if the return-pipe c be used with the part c' at an elevation above the passage or conduit B′ a sufficient amount of oil will be insured to supply a charge to the interior of the mixer at all times.

The gas-supply to the mixer is afforded by the following means: In the upper part of the mixer an outwardly-extending hub a^3 is provided, with a screw-threaded aperture therethrough communicating with the interior of the mixer, and when oil alone is used the aperture will be filled by a plug A^3. (Shown in Fig. 1 of the drawings.) When gas is to be used, the plug A^3 will be removed and a tubular shell G, exteriorly screw-threaded, will be inserted in lieu of the plug. The inner end of the shell G is recessed to form a valve-seat g, against which a valve G′ will rest. The valve G′ is secured to one end of the valve-stem g', which latter passes through a suitable guide or bearing roll g^2 near one end of the interior of the shell G, and at its other end passes through a tubular extension G^2 of the shell G. The interior diameter of the tubular extension G^2 is greater than the diameter of the stem G′, thus affording opportunity for the placing of the spiral spring G^3, surrounding the stem g' and within the tubular extension G^2. The extreme outer end of the stem g' is screw-threaded and provided with an adjusting-nut G^4. One end of the spring G^3 presses against the nut G^4, and the other end presses against a shoulder g^3, formed at the inner end of the tubular extension G^2. The effect of the construction is such that the spring G^3 will tend to hold the valve G′ firmly against its seat g, and when the movement of the piston of the engine creates a suction in the direction indicated by the arrow in the pipe A′ the valve G′ will be drawn away from its seat g in opposition to the action of the spring G^3, the amount of the throw or movement of the valve being regulated by the nut G^4, the end g^4 of the tubular extension G^2 corresponding to the end f^7 of the sleeve F′ and the nut G^4 in the valve-stem corresponding to the flange f^2 in the valve-stem f'.

Gas is admitted to the interior of the shell G through an aperture g^5, which when gas is not to be used may be closed by a plug g^6, as shown, but which may be connected to the suitable source of gas-supply by a pipe connection, (indicated by the dotted line g^7 in Fig. 2). The action of the horizontally-arranged valve G′ is thus precisely similar to that of the vertically-arranged valve F. When gas is to be used, the oil may be shut off by simply turning the plug of the valve

D, and when oil is to be used and not gas the nut G^4 may be turned down upon the seat g^4, and thus the valve G′ held securely upon its seat g, while when gas and oil are to be used together simply the proper adjustment will be made, and the operation will be obvious.

I claim as my invention—

1. A gas-mixer, comprising a substantially closed receptacle provided in its bottom with an oil-inlet and a plurality of air-inlets each of which terminates in a boss raised above the general level of the bottom, a valve controlling the oil-inlet, an exit-passage for the carbureted air and means for operating the valve, substantially as set forth.

2. A gas-mixer comprising a closed receptacle provided in its bottom with an oil-inlet and air-inlets which terminate within the receptacle in bosses raised above the general level of the bottom, a valve controlling said oil-inlet, an exit-passage for the carbureted air, an oil-supply passage communicating with the oil-inlet and with a source of supply elevated above the level of the bottom of the receptacle and mechanism for actuating the valve operated by the exhaust of gas mixture from the receptacle, substantially as set forth.

3. A gas-mixer comprising a closed receptacle provided in its bottom with an oil-inlet and air-apertures which terminate in bosses elevated above the general level of the bottom of the receptacle, a valve controlling said oil-inlet, a gas-inlet and a second valve controlling the same, an exhaust-passage, and means for operating said valves, substantially as set forth.

4. A gas-mixer comprising a closed receptacle provided in its bottom with an oil-inlet and air-apertures which terminate in bosses elevated above the general level of the bottom of the receptacle, a valve controlling said oil-inlet, a gas-inlet and a second valve controlling the same, an exhaust-passage, and means for operating said valves comprising mechanism operated by the exhaust of gas mixture from the receptacle, substantially as set forth.

5. A gas-mixer comprising a closed receptacle, provided in its bottom with oil and air inlets which terminate in bosses elevated above the general level of the bottom of the receptacle, an exhaust-passage, a valve controlling said oil-inlet provided on its stem with a flange or vane arranged to stand transversely to the direction of the currents of gas in their passage to the exhaust-passage of the receptacle and means for holding the valve normally to its seat, substantially as set forth.

6. A gas-mixer comprising a closed receptacle, provided in its bottom with oil and air inlets which terminate in bosses elevated above the general level of the bottom of the receptacle, an exhaust-passage, a valve controlling said oil-inlet provided on its stem with a flange or vane arranged to stand transversely to the direction of the currents of gas in their passage to the exhaust-passage of the receptacle, means for regulating the throw of the valve, and means for holding the valve normally to its seat, substantially as set forth.

7. A gas-mixer comprising a closed receptacle, an air-inlet, oil and gas inlets opening therein at different points, spring-pressed valves arranged to normally close said oil and gas inlets, means for adjusting the tension of said springs independently of each other to regulate the throw of the valves, and an exhaust-pipe connected with the receptacle, whereby the exhaust of vapor from the mixer acting in opposition to the tension of said springs will open said valves.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 2d day of May, A. D. 1895.

GEORGE ALDERSON.

Witnesses:
W. S. MASON,
MAE GEIB.