No. 682,596. Patented Sept. 17, 1901.

R. & W. T. ALDRICH.

CARBURETING DEVICE FOR EXPLOSIVE ENGINES.

Application filed Sept. 8, 1900.

(No Model.)

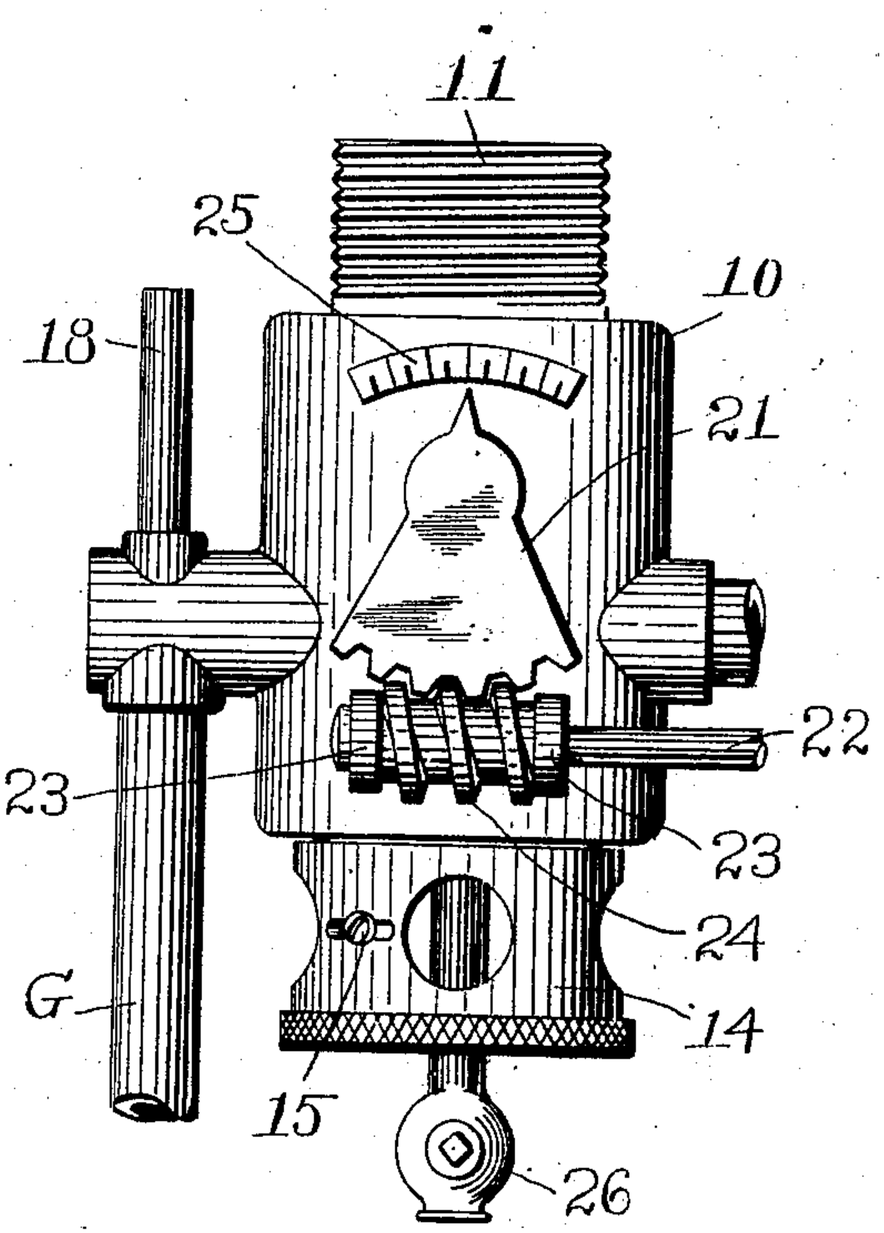

Fig. 1.

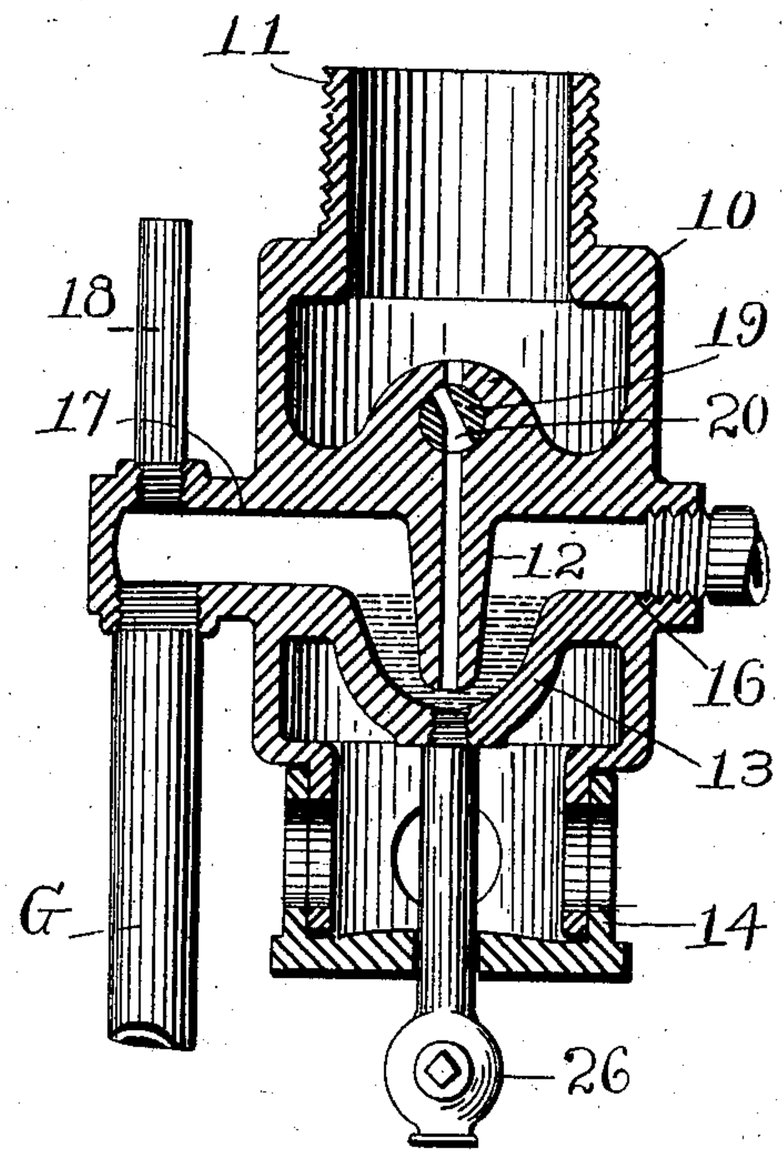

Fig. 2.

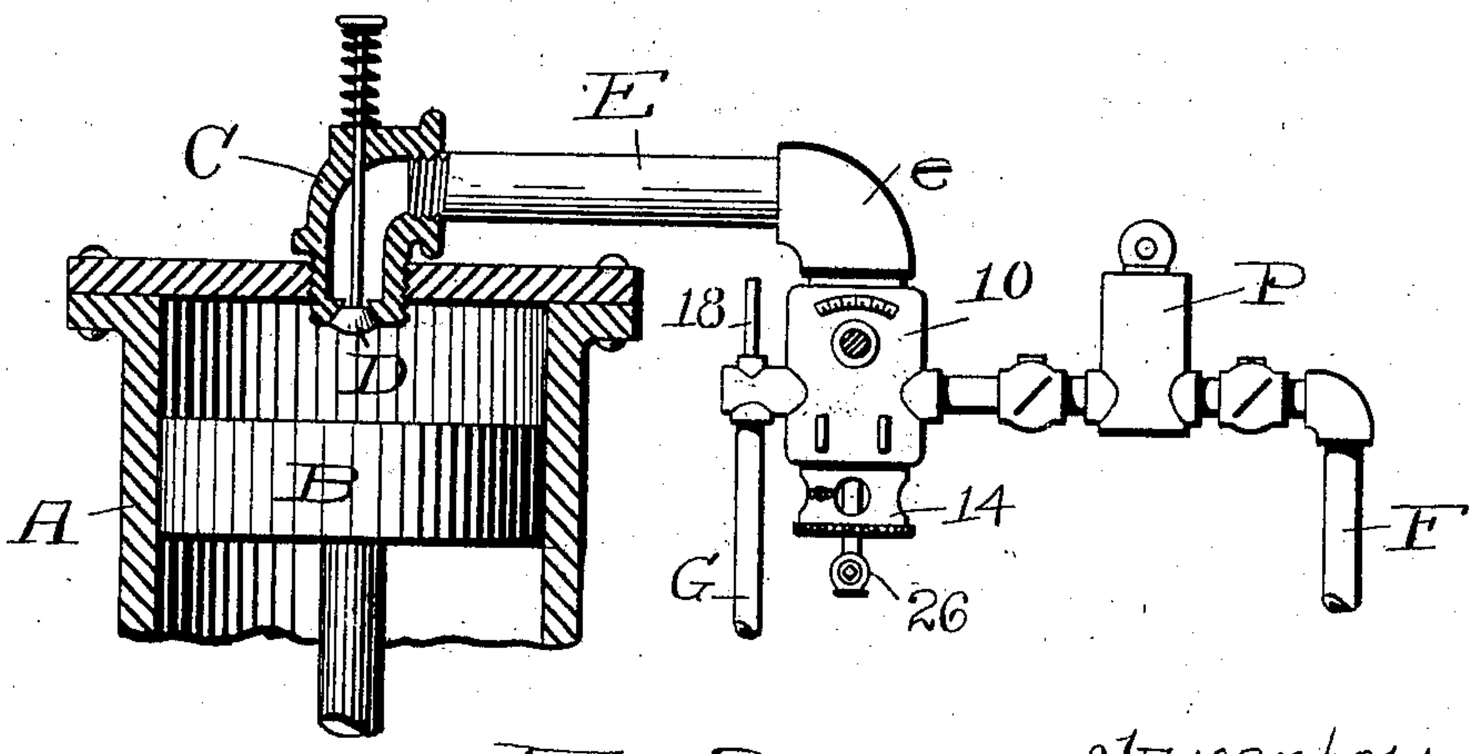

Fig. 3

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UNITED STATES PATENT OFFICE.

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CARBURETING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 682,596, dated September 17, 1901.

Application filed September 8, 1900. Serial No. 29,353. (No model.)

To all whom it may concern:

Be it known that we, ROBERT ALDRICH and WILLIAM T. ALDRICH, citizens of the United States, residing at Millville, in the county of Worcester and State of Massachusetts, have invented a new and useful Carbureting Device for Explosive-Engines, of which the following is a specification.

This invention relates to a device for mixing and regulating the supply of an explosive-engine which has been especially designed for use in automobiles, launches, and in similar locations.

The especial object of this invention is to provide a simple, inexpensive, and reliable device for mixing and regulating the supply of an explosive-engine which will operate efficiently even when rocked or swung to a considerable extent.

To these ends this invention consists of the parts and combinations of parts, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a side view of a device for mixing and regulating the supply of an explosive-engine. Fig. 2 is a sectional elevation of the same, and Fig. 3 is a view illustrating the manner in which the device may be applied to the cylinder of an explosive-engine.

The success and efficiency with which explosive-engines can be operated in a large measure depends upon the accuracy with which the fuel-supply is controlled and the efficiency with which the same is mixed with air to form an explosive mixture—that is to say, in operating an explosive-engine if the liquid fuel is not mixed with exactly the right proportions of air it will form a mixture which will not explode, and on this account the engine will be caused to make one or more idle strokes or in some cases stop altogether.

Many constructions have already been devised for mixing and controlling the supply furnished to an explosive-engine; but there are none of these devices, so far as we are acquainted with the same, the operation of which would not be affected if the same is oscillated or swung to a considerable extent while in use. On account of this difficulty in mixing and regulating the supply for explosive-engines, explosive-engines have not as yet been capable of advantageous use as the motor for an automobile or for use in similar locations where the motor is swung or rocked to a greater or less extent.

The especial object of our present invention is, therefore, to provide a device for mixing and regulating the supply of an explosive-engine which may be swung or oscillated to a considerable extent without interfering with its successful operation. To accomplish this purpose, our device comprises a nipple connecting with the explosive-mixture-supply pipe of the engine, the lower end of the nipple being submerged in a small quantity of liquid fuel, which is held in a basin or reservoir, said parts being arranged so that the depth to which the end of the nozzle is submerged will remain the same when the device is tipped or tilted to a slight extent and so that the end of the nozzle will not be uncovered even when the device is swayed or rocked comparatively violently. The liquid fuel may be supplied to the small basin, preferably by means of a pump, and the excess of fuel is allowed to run back into the fuel-tank. These parts of the device may be supported within a casing, and the lower end of the casing may be provided with a regulator for controlling the admission of air. A valve is preferably provided for controlling the passage from the nipple to the explosive-mixture pipe or intake passage for the engine, and this valve may, if desired, have the form of an ordinary turn-plug, except that the same is preferably counterbored on one side, so that the supply will be regulated by a single throttling edge, and the valve may be operated or turned by any of the usual operating connections.

Referring to the drawings and in detail, 10 designates the shell of a device constructed according to this invention. The shell 10 is provided at its upper end with a threaded nipple 11 for connecting the same with the supply-pipe of the engine. Supported inside the casing 10, and preferably formed in-

tegrally therewith, is a nipple 12. The lower end of the nipple 12 extends down into a small basin or recess 13, so that the lower end of the nipple is submerged in liquid fuel contained in the reservoir. Leading to the basin 13 is a fuel-passage 16, and leading away from the basin 13 is an overflow-passage 17, which may be connected by a pipe G with the oil reservoir or tank. The overflow-passage 17 is also preferably provided with a small vent-pipe, as 18, to prevent back pressure in the overflow-pipe or excess of suction from the engine from drawing liquid from the overflow-pipe up into the engine. A free passage is left around these parts inside the casing 10, and at its lower end the casing 10 is provided with a damper or cap 14, which is removably held in place by screws 15. The damper or cap 14 is provided with holes for registering with the corresponding holes in the casing 10 in the ordinary manner, so that by turning or setting the damper the air-supply may be regulated as desired.

The manner in which a device constructed according to our invention may be used in connection with an explosive-engine is most clearly illustrated in Fig. 3. As shown in this figure, A designates the cylinder of a gas-engine, having a piston B mounted therein in the ordinary manner. Threaded into the cylinder-head is an elbow C, movably mounted, in which is an inlet-valve D, normally held closed by a spring. Threaded into the elbow C is a supply-pipe E, which is coupled to the casing 10 by an elbow *e*. A fuel-pipe F leads from the fuel-tank or other suitable source of supply and is connected with the casing 10 through a pump P. The overflow-pipe G may, if desired, lead back to the same fuel-tank from which the supply is drawn by the pump P.

In the use of the device as thus constructed the pump P is operated to furnish a greater supply of fuel than is ordinarily consumed by the engine, so that the basin or pocket 13 will always be kept full and the end of the nipple 12 slightly submerged below the surface of the fuel.

When the piston B of the engine moves down on its idle or suction stroke, it will open its inlet-valve D and will draw in a mixed supply of air and fuel, the air-supply being regulated by the damper 14 and the fuel-supply being regulated by any desired form of valve for controlling the connection from the nipple 12 to the fuel-supply. As herein illustrated, an ordinary turn-plug, as 19, may, if desired, be used for this purpose, one side of the passage through said turn-plug being counterbored, as at 20, so that the valve will have a single throttling edge. Secured on the outer end of the valve-stem of the valve 19 we preferably provide a sector 21. A controlling-rod 22 is journaled in lugs 23, extending from the casing 10, and secured on the rod 22 is a worm or screw 24, which meshes with the sector 21. The sector 21 may, if desired, be provided with a pointer, as 25, for more clearly showing the position of the valve from an examination of the device. By means of these connections the relative proportions of gas and air can be very accurately regulated and a full mixture thereof secured in the supply-pipe of the engine, and the device may be especially well employed in connection with automobiles or in similar locations, as its efficiency is not interfered with even though the same is oscillated or rocked to a considerable extent. Extending down from the basin 13 is a small drain-plug 26, which may be used, if desired, to draw off all liquid from the basin 13 when desired.

We are aware that numerous changes may be made in our device for mixing and regulating the supply of explosive-engines by those who are skilled in the art without departing from the scope of our invention as expressed in the claims. We do not wish, therefore, to be limited to the construction herein shown and described; but

What we do claim, and desire to secure by Letters Patent of the United States, is—

1. In a supply mixer and controller for explosive-engines, the combination of a casing formed by a casting, and having a main outer chamber or air-passage, means for regulating the admission of air to the lower end thereof, an oil-passage formed integrally with said casing, and extending transversely across the air-passage thereof, said oil-passage having a small central round-bottomed basin for containing a small quantity of oil, and a nipple which extends down concentrically substantially to the bottom thereof, whereby the end of the nipple will be submerged in a small quantity of oil, and surrounded equally on all sides thereby, a valve for controlling the passage from said nipple to the outer chamber, and connections for supplying oil to the oil-passage, substantially as described.

2. In a supply mixer and controller for explosive-engines, the combination of a casing having an outer chamber or air-passage, a damper for controlling the admission of air to the lower end of said outer chamber, an oil-passage extending transversely across the casing, and formed integrally therewith, said oil-passage having a small centrally-located round-bottomed basin for containing a small quantity of oil, a nipple extending concentrically down into said basin substantially to the bottom thereof, a drain-pipe for drawing out the oil from said basin when desired, an oil-supply pipe for the oil-passage, an overflow-pipe having a vent for preventing the pressure of an oil-pump from forcing oil directly up through the nipple, a turn-plug valve controlling the passage from the nipple to the outer chamber, said valve being counterbored so as to have a single edge for throttling said passage, and a sector and worm for adjusting said valve, substantially as described.

3. The combination of an explosive-engine,

a valve-controlled passage for supplying explosive mixture thereto, a supply mixer and controller connected to said passage, and comprising a vertical casing or casting having an outer or main air chamber or passage, a damper controlling the admission of air to the lower end thereof, a transverse oil-passage formed integrally with and extending across said casing, and having a small central round-bottomed oil pocket or basin with a nipple extending down concentrically therein, substantially to the bottom thereof, a throttle-valve controlling the outlet from said nipple to the outer casing, connections for controlling said throttle-valve, an oil-pump for supplying oil to said oil-passage, and an overflow-pipe for draining off the surplus oil from said oil-passage, said overflow-pipe being vented to prevent the pump-pressure from forcing oil up through said nipple, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

ROBERT ALDRICH.
WILLIAM T. ALDRICH.

Witnesses:
PHILIP W. SOUTHGATE,
J. ELMER HALL.