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G. W. STARR & J. H. COGSWELL.

MIXER FOR EXPLOSIVE GASOLENE ENGINES.

APPLICATION FILED JUNE 12, 1901.

NO MODEL.

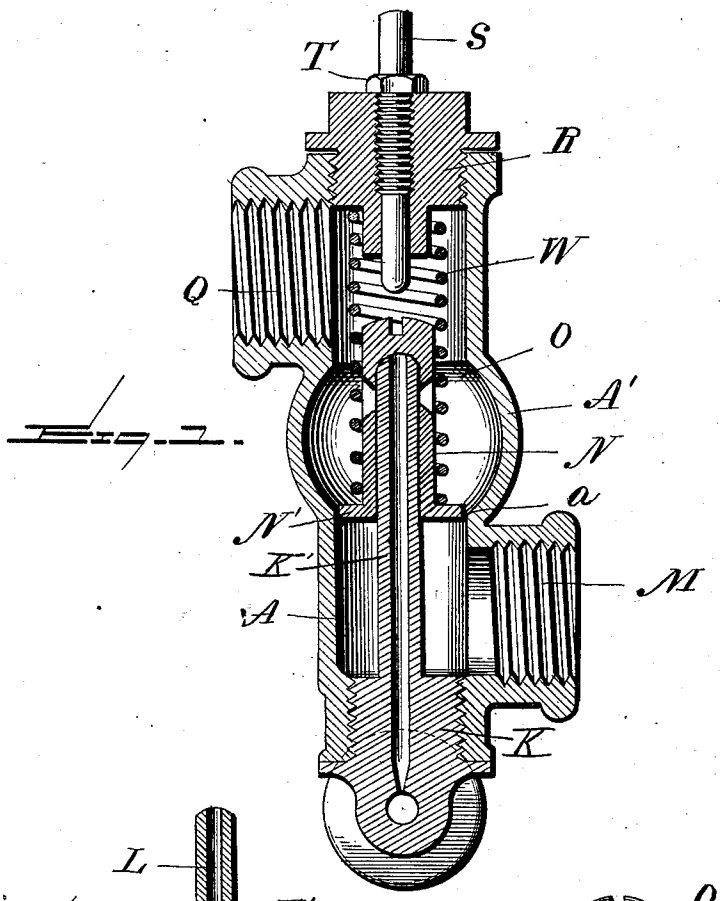


Fig. 1.

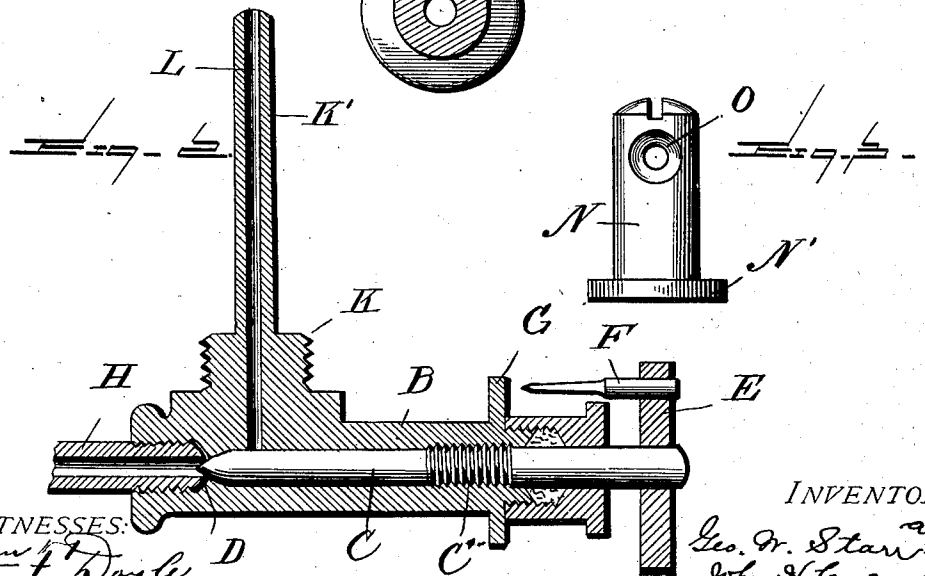


Fig. 2.

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No. 727,476. Patented May 5, 1903.

UNITED STATES PATENT OFFICE.

GEORGE W. STARR AND JOHN H. COGSWELL, OF HAVANA, ILLINOIS.

MIXER FOR EXPLOSIVE-GASOLENE ENGINES.

SPECIFICATION forming part of Letters Patent No. 727,476, dated May 5, 1903.

Application filed June 12, 1901. Serial No. 64,253. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. STARR and JOHN H. COGSWELL, citizens of the United States, residing at Havana, in the county of Mason and State of Illinois, have invented certain new and useful Improvements in Mixers for Explosive-Gas Engines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, 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 new and useful improvements in mixers for explosive-engines; and it consists in the provision of means whereby a complete mixture of air with the gasolene is effected, this being rendered possible by so positioning the air-regulating valve that the latter will open in advance of the passage of the air about the circumference of the valve, the quantity of air first entering the cylinder taking with it a supply of gasolene.

The invention will be hereinafter more fully described and then specifically defined in the appended claim and is illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings—

Figure 1 is a central vertical sectional view through our improved mixer. Fig. 2 is a central sectional view longitudinally through the feeding attachment. Fig. 3 is a detail view of the check-valve for regulating the feed of the gasolene into the air-chamber.

Reference now being had to the details of the drawings by letter, A designates a cylindrical shell having an enlarged portion A′, forming a mixing-chamber in which the air first comes into contact and mixes with the gasolene. This shell is designed to be supported in any suitable manner on the induction-pipe to the engine, (not shown,) and in order to give a free flow of gasolene by gravity the mixing-chamber should be somewhat lower than the supply-tank.

The casing B for the needle-valve C is longitudinally bored to receive the needle-valve, and at the inner end of the bore is a small aperture D, through which the gasolene passes, the supply being regulated by the tapering end of the valve C. This valve C has a portion of its circumference threaded, as at C′, for engagement with the interior threads in the wall of said bore, and to the outer end of the valve-stem is keyed or otherwise fastened the hand-wheel E, carrying the pointer F, the free end of which is located adjacent to the dial G, formed at the end of said casing B. The opposite end of the casing B is recessed to receive the end of the gasolene-pipe H, through which the supply of gasolene is conveyed from the tank (not shown) to and through the needle-valve aperture D.

An integral screw-threaded plug K extends laterally from the casing B and has a portion thereof formed into a feeding-tube K, adapted to extend into the mixing-chamber and provided with a flange N′ at its lower end, controlling the admission of air to the mixing-chamber, through which duct gasolene is designed to pass into the mixing-chamber.

M designates an air-inlet passage-way, and N is a check-valve which is hollow, with its lower end flanged, as at N′. This valve has apertures at points diametrically opposite in its sides O near the upper end of its bore, through which apertures the gasolene is allowed to escape into the interior of the mixing-chamber. The valve, as shown, telescopes over the upper open end of the feeding-pipe K′, which serves as a guide therefor, and the lower flanged end of said valve is adapted to fill the contracted space *a* between the air-inlet passage-way and the lower portion of the mixing-chamber for the purpose of causing the valve to rise sufficiently to allow gasolene to escape through the apertures O by the time that the air from the air passage-way rushes by the flange as the latter enters the mixing-chamber. By this means the first quantity of inrushing air will become mixed with the gasolene before passing into the cylinder, where it is compressed and ignited.

Leading away from the mixing-chamber is an exit passage-way Q, with which communication may be had with the cylinder of an engine, and in the upper end of the shell is fitted a threaded plug R, which plug is centrally apertured to receive the adjusting-stop S, which is threaded and engages the threads

in the wall of said aperture in the plug. A jam-nut T is mounted on the threads of said stop S and bears against the upper end of the plug. Interposed between the flange N′ of said valve and the shouldered portion of the plug R is a coil-spring W, which serves to normally hold the valve seated over the upper end of the feed-pipe K′. By raising or lowering the adjusting-stop S the throw of the valve N may be regulated.

The operation of our apparatus is as follows: After the needle-valve is adjusted to feed the requisite amount of gasolene the valve is raised by suction as the piston in the cylinder is driven forward. As the valve rises air is drawn through the air passage-way, and as the flanged portion of the valve enters the mixing-chamber the apertures O will come adjacent to the upper end of the pipe K′, allowing the gasolene to run through said apertures into the mixing-chamber and in readiness to be taken up by the inrushing air and after becoming atomized to enter the cylinder through the induction-pipe. On the return stroke of the piston in the cylinder the valve will be seated under the influence of the spring W, and the operation is repeated with each forward throw and return of the piston, as will be readily understood.

It will be noted that by our improved apparatus the first quantity of inrushing air is thoroughly mixed with the gasolene, which is an advantage over the constructions of mixers in which the valve regulating the ingress of the oil is located below the air-inlet, in which case a considerable quantity of air is allowed to pass through the mixing-chamber without becoming thoroughly mixed with the gasolene.

Having thus described our invention, what we claim to be new, and desire to secure by Letters Patent, is—

A mixer for explosive-gasolene engines, comprising a cylindrical shell with inlet and exhaust ports, and provided with an enlarged central portion forming a mixing-chamber, a threaded plug K mounted in the lower end of the shell and having a portion thereof formed into a feeding-tube K′ extending into the mixing-chamber and opening thereinto at the upper end, a valve N seating on the upper end of the feeding-tube and having openings in its sides and a flange at its lower end controlling the admission of air to the mixing-chamber, a threaded plug closing the upper end of the shell and carrying an adjustable stop for the valve, and a spring holding the valve to its seat, as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE W. STARR.
JOHN H. COGSWELL.

Witnesses:
DOUGLAS WRIGHT,
EMMA WRIGHT.