(No Model.) 2 Sheets—Sheet 1.

J. PRATT.

VAPORIZER AND MIXER FOR GASOLENE ENGINES.

No. 567,253. Patented Sept. 8, 1896.

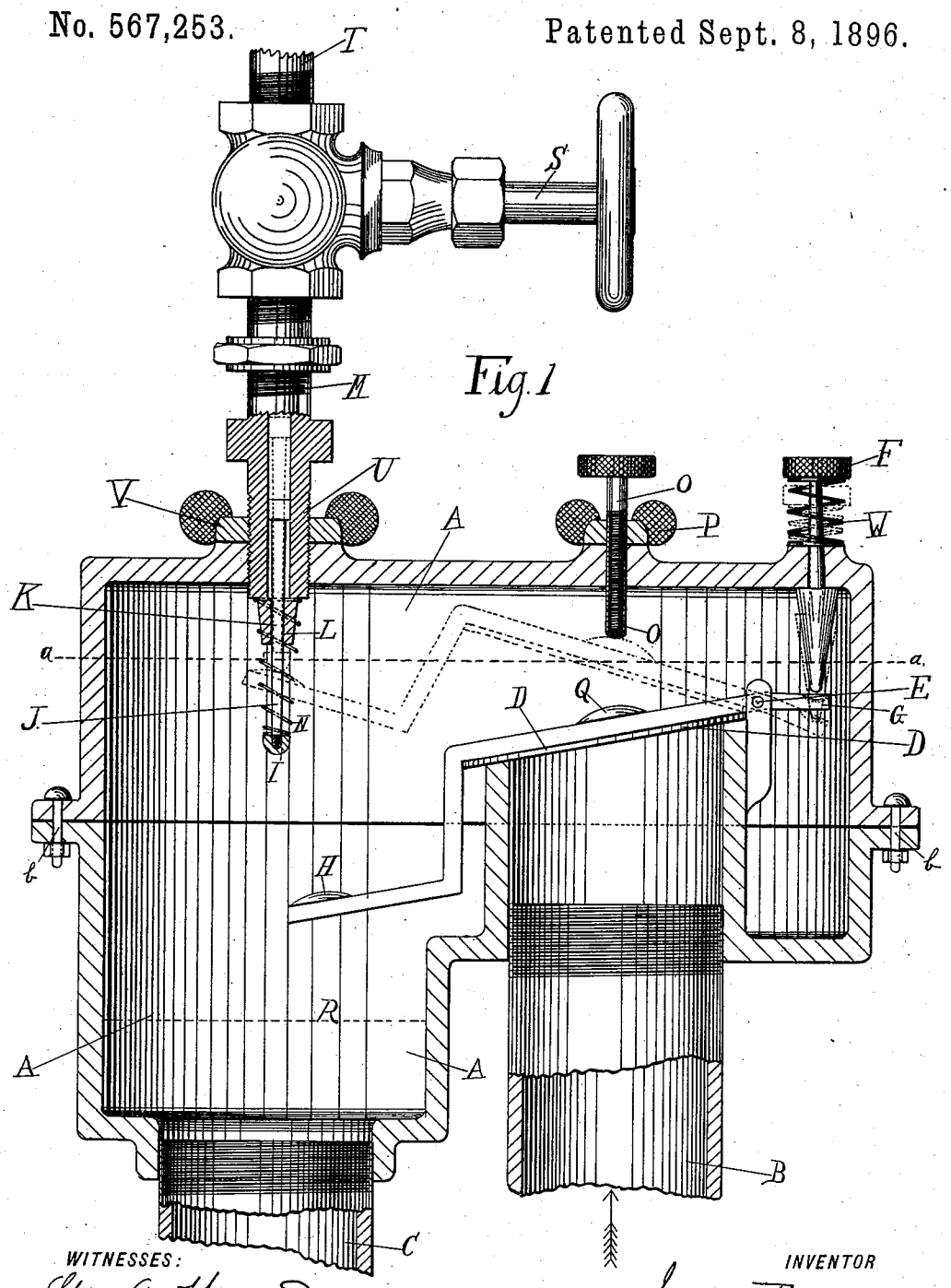

Fig. 1

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Fig. 2.

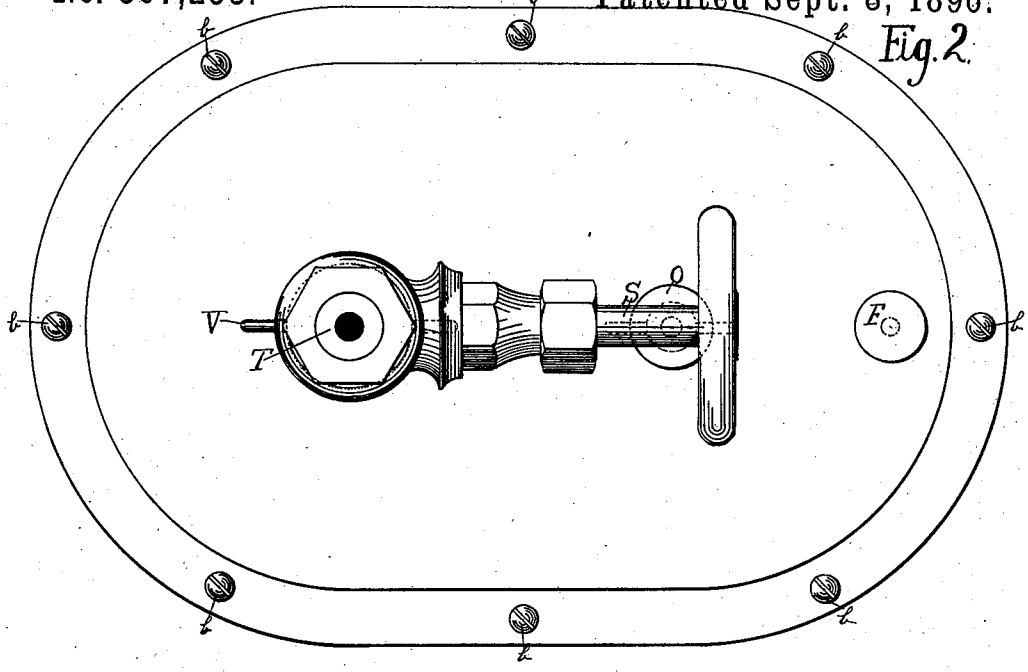
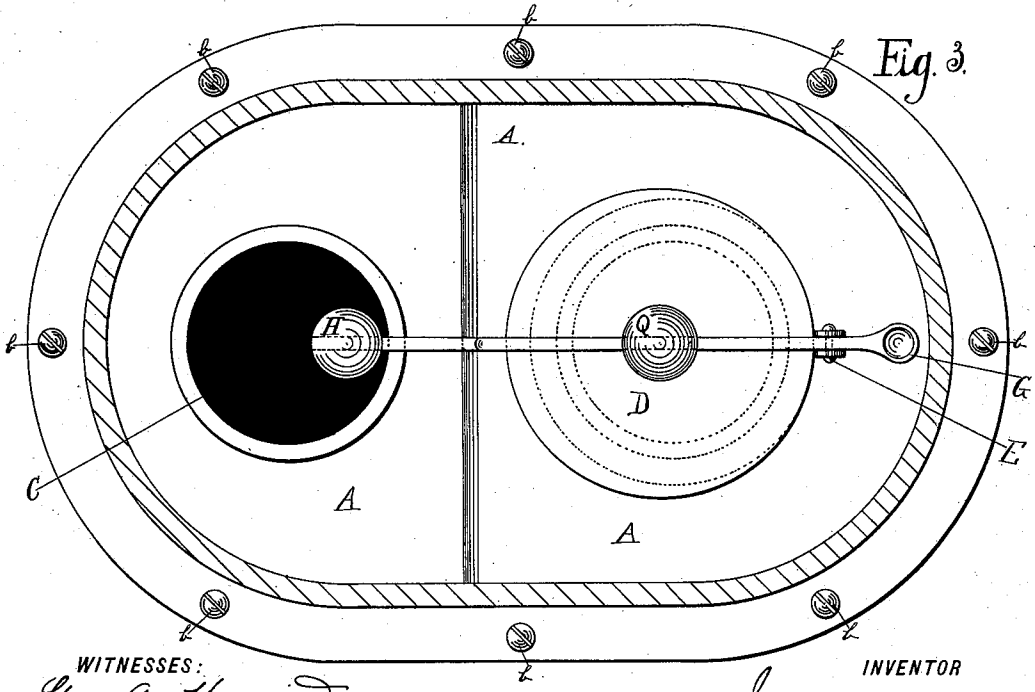


Fig. 3.



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UNITED STATES PATENT OFFICE.

JESSE PRATT, OF MONROVIA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO GEORGE L. CLARK, OF LOS ANGELES, CALIFORNIA.

VAPORIZER AND MIXER FOR GASOLENE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 567,253, dated September 8, 1896.

Application filed February 25, 1895. Serial No. 539,623. (No model.)

To all whom it may concern:

Be it known that I, JESSE PRATT, a citizen of the United States, residing at Monrovia, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Vaporizers and Mixers for Gasolene-Engines, of which the following is a full, clear, and exact description or specification, reference being had to the accompanying sheets of drawings, and to the letters marked thereon.

The object of my improvements is to render more effectual the mixing of heated air and gasolene in the chamber of the vaporizer or mixer prior to its being drawn into the cylinder or cylinders of gasolene-engines. For this purpose I employ within the chamber of the vaporizer a flap-valve which alternately lifts from and rests upon its seat, this seat constituting the upper end of the pipe within the vaporizing-chamber, by which the air from the external atmosphere passes through the heater and thence into the chamber of the vaporizer or mixer. This flap-valve is hinged to a fulcrum at one side of the seat and has a short lever projecting rearward from the said fulcrum. This lever, when depressed by the finger-piece at the starting of the engine, causes the flap-valve to rise off its seat and to admit air into the mixing and vaporizing chamber from the heater on the exhaust-pipe of the engine. Out from the other side of this flap-valve, that is to say, out from the side directly opposite the fulcrum, an arm carrying a striking-piece projects sufficiently far that when the flap-valve is, at the starting of the engine, opened by the finger-piece, as above described, the striking-piece of this arm hits against the bottom of the stem of a conical valve carried in the tubular passage connected with the tank by which the gasolene is supplied to the vaporizer and mixer. The raising of this valve-stem in the manner described from its valve seat allows a small quantity of gasolene to pass down this tubular passage into the vaporizing or mixing chamber, wherein it meets with the hot air which has passed into the said chamber from the heater by reason of the raising of the flap-valve. The gasolene and the hot air thus become mixed, and, passing downward through a wire-gauze into the cylinder or cylinders of the gasolene-engine, the hot air and the gas not only become thoroughly commingled, but the gasolene in passing through the meshes of the wire-gauze becomes broken up, while the heat of the warmed air vaporizes at the same time the gasolene, thus producing the requisite combustible mixture for explosion in the cylinder or cylinders of the gasoline-engine. The finger-piece hereinbefore referred to is used only for starting the flap-valve into operation, and after the engine is in operation the action of the apparatus becomes automatic.

In the accompanying drawings, Figure 1 is a vertical section of my improved vaporizer or mixer. Fig. 2 is a plan of the same. Fig. 3 is horizontal section of the same on the line *a a*, Fig. 1.

In the figures, the vaporizing or mixing chamber is marked A. The chamber A is constructed in two portions, an upper and a lower portion, respectively, as shown upon the drawings, which are formed with flanges and joined together so as to form a suitable tight joint by means of bolts and nuts *b b*. The pipe through which air is admitted from the heater is marked B, and the pipe whereby the mixed air and gasolene is drawn into the cylinder of the engine is marked C. The upper part of the pipe B is screwed into an orifice, as shown in Fig. 1, which orifice is formed inclined at the top and constitutes the seat for the flap-valve D. The flap-valve D is carried by the fulcrum E, upon which it is free to move, as indicated by the dotted lines in Fig. 1.

In starting the gasolene-engine and the apparatus shown upon the annexed drawings into operation the finger-piece F is depressed and the short lever G attached to the flap-valve D is also depressed, so that the whole valve D and its connections are upraised into the position shown in dotted lines in Fig. 1. The striking-piece H, attached to the projection on the forward end of the valve D, in this act of being upraised by the depression of the finger-piece F strikes against the nut I at the lower part of the valve-stem J and raises it, together with the slightly conical valve K, out of its seat L into the position also shown in dotted lines at Fig. 1. That

portion of the valve-stem above the conical valve K is made more or less square in section, so that a passage is formed between the gasolene-supply pipe M and the valve-seat K. At the moment when the valve K is lifted the gasolene situated in the passage formed by the square or flat sides of that portion of the stem situated above the valve K, together with such further supply as may be required from the gasolene-tank, immediately drips down into the chamber A.

The upper part of the spiral spring N rests against the upper portion of the valve-seat L, and the lower portion of the said spiral spring bears against the nut I, so that the moment the valve D with its connections returns to their normal position the valve K is shut and the flow or drip of the gasolene into the mixer or vaporizing chamber is stopped.

So soon as the charge of mixed air and gasoline has been drawn out of the chamber A by the action of the piston in the cylinder or cylinders of the gasolene-engine, the partial vacuum formed by the action of the piston or pistons in the chamber A causes the flap-valve D to be again lifted and the striking part H to hit the nut I, which admits of more gasolene dripping through or around the conical seat of the valve K, thus producing a mixture of gasolene with the heated air that now fills the chamber A in readiness for being drawn into the cylinder or cylinders of the gasolene-engine at the next operating stroke, and in this way the action of the apparatus becomes automatic.

For the purpose of governing the extent to which the flap-valve D shall rise from its seat, an adjusting-screw O is passed through the upper part of the chamber, provided with a check-nut P. The upper part of the flap-valve D is formed with a striking-piece Q, which touches or hits against the lower part of the adjusting-screw O at the upper movement of the flap-valve D, and thus a limit to the upward movement of the flap-valve and its connections is set, whereby the quantity of air and the quantity of gasolene admitted into the mixing-chamber A is regulated at every stroke.

At the position marked R in Fig. 1 a piece of wire-gauze is stretched across the chamber A, which breaks up the gasolene in fine particles in passing through the wire-gauze and also causes it to become well mixed with the air on passing to the pipe B. The valve formed at the upper end of the stem S is of ordinary conical construction, so that according to the extent to which the valve is moved to or from its seat so the quantity of gasolene supplied by or through the pipe T is regulated. For the purpose of further adjustment the whole stem within which the valve K is carried is formed with a long screw U, provided with a clamping-nut V, as shown at Fig. 1, so that the position of the valve K and its striking-piece I, relatively with the striking-piece H and the adjustment-screw O, are capable of being varied or regulated from time to time, as required.

The finger-piece F is provided with a spiral spring, which raises it to its normal position the moment after the finger-piece has been depressed and released from operating the flap-valve D when starting the gasolene-engine into operation.

On referring to Figs. 1 and 3 especially, it will be noticed that the diameter of the flap-valve D is larger than the valve-seat on which it rests. The purpose of this arrangement is that as it sometimes happens that a premature explosion takes place, whereby considerable pressure would be generated in the chamber A, this pressure when so generated in the chamber A of the vaporizer acts upon the under side of that portion of the flap-valve D, extending beyond the seat on which it rests, and causes the valve to be lifted, so that any undue pressure due to the premature explosion is allowed to escape outward through the pipe B into the atmosphere through the heater.

Having now described the nature of my said invention and the manner of carrying the same into practical effect, I desire to observe that what I consider to be novel and original and as the invention to be secured to me by Letters Patent is as follows:

1. The combination of the flap-valve with the portion extending beyond the seat of the valve for the purpose of causing said valve to be lifted in order to produce a release of pressure in the chamber of the vaporizer and mixer when a premature explosion takes place, substantially as set forth.

2. The combination of the vaporizing and mixing chamber, the upwardly-opening flap-valve, the action of which opens and regulates the extent of opening of the gasolene-valve; the finger starting-piece and spring for the air-valve; the adjusting-screw for regulating the lift of the flap-valve and therefore, the lift of the gasolene-valve; also, the check-nut on the stem containing the gasolene-valve, whereby, the said gasolene-valve is adjusted relatively with the wire-gauze; all operating together in the manner and for the purposes, substantially as set forth.

In testimony whereof I have hereunto set my signature in presence of two subscribing witnesses.

JESSE PRATT.

Witnesses:
ST. JOHN DAY,
P. R. MOORE.