

No. 683,110.

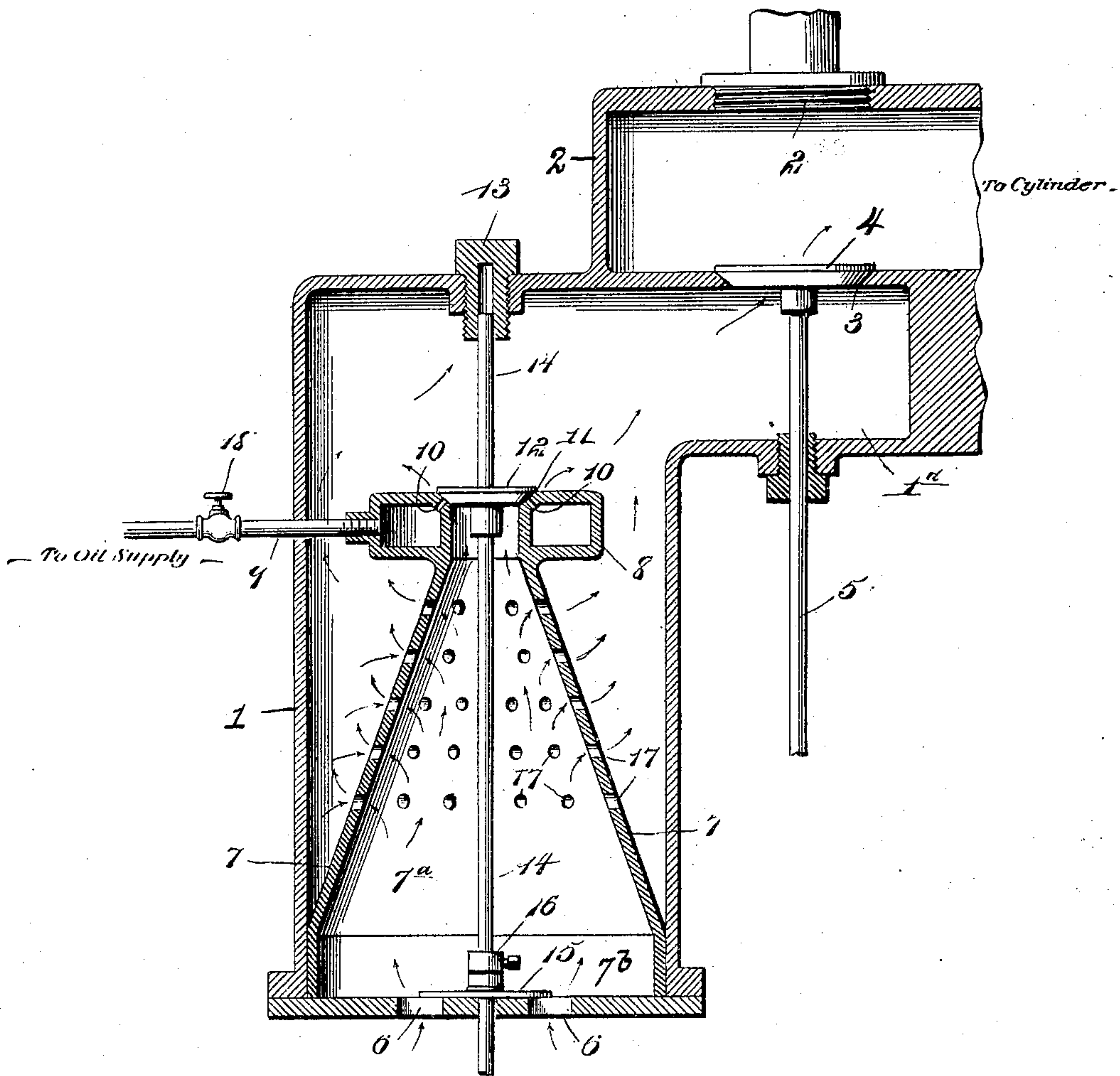
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F. W. FELBAUM.

MIXING AND VAPORIZING DEVICE FOR EXPLOSIVE ENGINES.

(Application filed May 21, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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MIXING AND VAPORIZING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 683,110, dated September 24, 1901.

Application filed May 21, 1900. Serial No. 17,384. (No model.)

To all whom it may concern:

Be it known that I, FRED W. FELBAUM, clergyman, a citizen of the United States, residing at Dayton, in the county of Tippecanoe and State of Indiana, have invented new and useful Improvements in Mixing and Vaporizing Devices for Explosive-Engines, of which the following is a specification.

This invention relates to that class of engines operating by virtue of the force of successive explosions of the vapor generated from suitable vaporizing oils, and has particular relation to the means for vaporizing the oil.

The invention has for its objects the automatic controlling of the flow of oil into the vaporizing-chamber, so that it will be fed according to the requirements of the speed at which the engine may be operated, as well as to automatically cut off the oil flow to prevent the flooding of the vaporizing-chamber should the engine for any cause come to a stop unobserved, the distribution of the oil flow within the vaporizing-chamber whereby to more readily expose the oil to currents of air for its quick and thorough vaporization, and finally the making of such provision whereby a supply of oil may be contained in the vaporizing-chamber for the immediate source of the feed and not be displaced or otherwise affected by the force of the vaporizing air-currents.

The invention consists in certain novel features in the arrangement and construction of parts, all as hereinafter described and claimed.

The accompanying drawing, forming a part of this specification, represents a vertical section taken through the vaporizing-chamber, the oil-feeding receptacle, and the distributing-cone.

The vaporizing or oil-mixing chamber 1 is located, preferably, below the chamber 2, a portion of which only is shown, and by which the oil-vapor is conducted from the vaporizing-chamber to the combustion-cylinder of the engine after the usual well-known manner. The opening 3, by which chambers 1 and 2 communicate, is closed by a valve-disk 4, which is operated automatically by suitable connection with the engine, which imparts reciprocating motion to the valve-stem 5, on which

said valve-disk is mounted. For the purpose of operating the valve-disk 4 from the vaporizing-chamber said chamber is formed at its top with a lateral right-angle portion 1^a, and through which extends the valve-stem 5. The major portion of the vaporizing-chamber is preferably in cylindrical form and has its bottom provided with air-inlets 6. Supported on the bottom of this chamber is a hollow conical frustum 7 of a diameter at its lower end preferably equal to the inner diameter of the bottom of said chamber, the said frustum being provided with a circular base 7^b and forming an interior chamber 7^a to receive the incoming air and bring it in contact with the oil which is fed onto the inner face of the chamber. Supported on the top of this conical frustum is an annular receptacle 8, which is preferably formed integral with the frustum. This receptacle is connected by a pipe 9 with a suitable oil-supply so elevated above the receptacle as to cause the oil to flow from said receptacle through the outlet 10 by force of gravity. The oil-outlet is either in the form of a circular slot or of separate openings made aslant in the inner upper edge of the receptacle, the said edge being beveled to form a seat 11 for a valve-disk 12, which being in the form of a puppet-valve closes the outlets 10 when resting in its seat without entirely closing the central opening through the annular receptacle.

Extending through the center of the bottom of the vaporizing-chamber and throughout the length of said chamber and fitting within a screw-plug 13, inserted through the top thereof, is a rod 14, mounted to have a slight reciprocating movement, and upon which are secured the valve-disk 12 for controlling the oil-feed openings 10 and the valve-disk 15, which has its seat on the bottom of the vaporizing-chamber over the openings 6, but which only partially closes said openings. This valve-disk 15 is loose on the rod 14 and has slight vertical play, that being limited by the collar 16, adjustably secured to the valve-rod.

The walls of the oil-mixing chamber 7^a are provided with a large number of perforations 17, formed horizontally therein for the purpose of increasing the angle which the air-currents must take in escaping therethrough,

by virtue of which angle greater resistance is made to the air-currents and the oil more thoroughly exposed to the same. A suitable globe-valve 18 is located in oil-supply pipe 9, by which the pressure of the oil may be regulated.

The operation is as follows: On the suction-stroke of the engine the valve-disk 4 is mechanically raised, opening the communicating passage between chambers 1 and 2, controlled by said valve-disk. As the valve-disk 4 travels with the outward stroke of the valve-stem 5, a slight vacuum is produced in the chamber 1, and the atmosphere tending to equalize conditions forces through the partially-closed openings 6 and raises the valve-disk 15 and in so doing raises the valve-rod 14 and its valve-disk 12. The force of the air-pressure will be sufficient only to effect a quick rising movement of the valve-disks, when from gravity they will immediately seat themselves. During the rising and closing of the valve-disk 12, which will occur synchronously with the operation of the engine's piston-stroke or the stroke of the valve-stem 5, operating valve-disk 4, the oil will be fed from the oil-receptacle 8, which contains a supply of oil to respond in its flow to the varying requirements of the engine's feed, as the periodicity with which the valve-disk 12 will operate will be automatically governed thereby. The oil-receptacle having its outlet above the highest point of the oil-containing space, the jar or commotion of the air within the vaporizing-chamber is prevented from displacing the oil or having any disturbing effect upon its natural flow. The oil flowing down on the inner side of the oil-receptacle through the central opening there-through continues down in a stream on the inner wall to the conical chamber 7^a and by the increasing surface is distributed so as to form a very thin film. The air rushing in at openings 6 is thus not only brought into contact with a large surface onto which the oil has been spread, but is choked by the converging sides of the chamber, as in the manner heretofore stated, and caused to escape through the perforations 17 with sufficient force to break up the particles of oil and make the vaporization not only the more rapid, but very thorough.

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

1. A mixing and vaporizing device for explosive-engines comprising an oil-vaporizing chamber having communication with the outer air at its lower end and with the combustion-cylinder at its upper end, a hollow chamber having a perforated wall providing an interior chamber and oil-distributing inner surface, a valve-disk controlling communication between the vaporizing-chamber and the combustion-cylinder, an oil-feed having a feed-outlet and located in the vaporizing-chamber, a valve-disk controlling the feed-

outlet and means for operating said valve-disk of the oil-feed by the air-pressure caused by the suction of the combustion-cylinder. 7c

2. A mixing and vaporizing device for explosive-engines comprising an oil-vaporizing chamber having communication with the outer air at its lower end and with the combustion-cylinder at its upper end, a hollow conical chamber having a perforated wall providing an interior chamber and oil-distributing inner surface, a valve-disk controlling communication between the vaporizing-chamber and the combustion-cylinder, an oil-feed having a feed-outlet and located in the vaporizing-chamber, an upper valve-disk controlling the feed-outlet, a lower valve-disk controlling the communication with the outer air, and a sliding rod connecting the upper and lower valve-disks. 75 80 85

3. A mixing and vaporizing device for explosive-engines comprising an oil-vaporizing chamber having communication with the outer air at its lower end, and with the combustion-cylinder at its upper end, a hollow conical chamber having a circular base and perforated wall providing an interior chamber and oil-distributing inner surface, and an oil-feed adapted to feed the oil onto the said inner surface of the conical chamber. 90 95

4. A mixing and vaporizing device for explosive-engines comprising a vaporizing-chamber having communication with the outer air and with the combustion-cylinder, a valve-disk controlling the communication to said combustion-cylinder, a conical chamber arranged within said vaporizing-chamber to receive the incoming air as said valve-disk is operated, and an oil-receptacle arranged to feed the oil onto the upper part of the interior surface of said conical chamber, and automatically-operating means for controlling the flow of oil, substantially as described and for the purpose set forth. 100 105 110

5. A mixing and vaporizing device for explosive-engines comprising a vaporizing-chamber having communication with the outer air and with the combustion-cylinder, a valve-disk controlling the communication to said cylinder, a perforated conical chamber arranged to receive the incoming air as said valve-disk is operated, and having an opening at its smaller end, an oil-receptacle arranged to feed the oil onto the interior surface of said conical chamber through its smaller end opening, and automatically-operating means for controlling the oil flow, substantially as described and for the purpose set forth. 115 120

6. A mixing and vaporizing device for explosive-engines comprising a vaporizing-chamber having communication with the outer air and with the combustion-cylinder, a valve-disk controlling the communication to said cylinder, an open-ended conical chamber arranged to receive the incoming air as said valve-disk is operated, an annular oil-receptacle supported at the top of said conical chamber and having outlets leading to 125 130

the opening therethrough, a reciprocating rod extending through the end opening of the conical chamber, having a valve-disk to receive the pressure of the incoming air and a valve-disk closing the oil-outlets, substantially as described and for the purpose set forth.

7. A mixing and vaporizing device for explosive-engines comprising a vaporizing-chamber, having communication with the outer air and with the combustion-cylinder, a valve-disk controlling the communication to said cylinder, an oil-receptacle arranged within said vaporizing-chamber, having its

outlet above the highest point of the oil-supply therein, an open-ended interior chamber adapted to receive the incoming air and distribute the oil in the top thereof, and means for automatically controlling the oil flow, substantially as described and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRED W. FELBAUM.

Witnesses:

LE ROY C. SLOCUM,
WM. E. FELBAUM.