

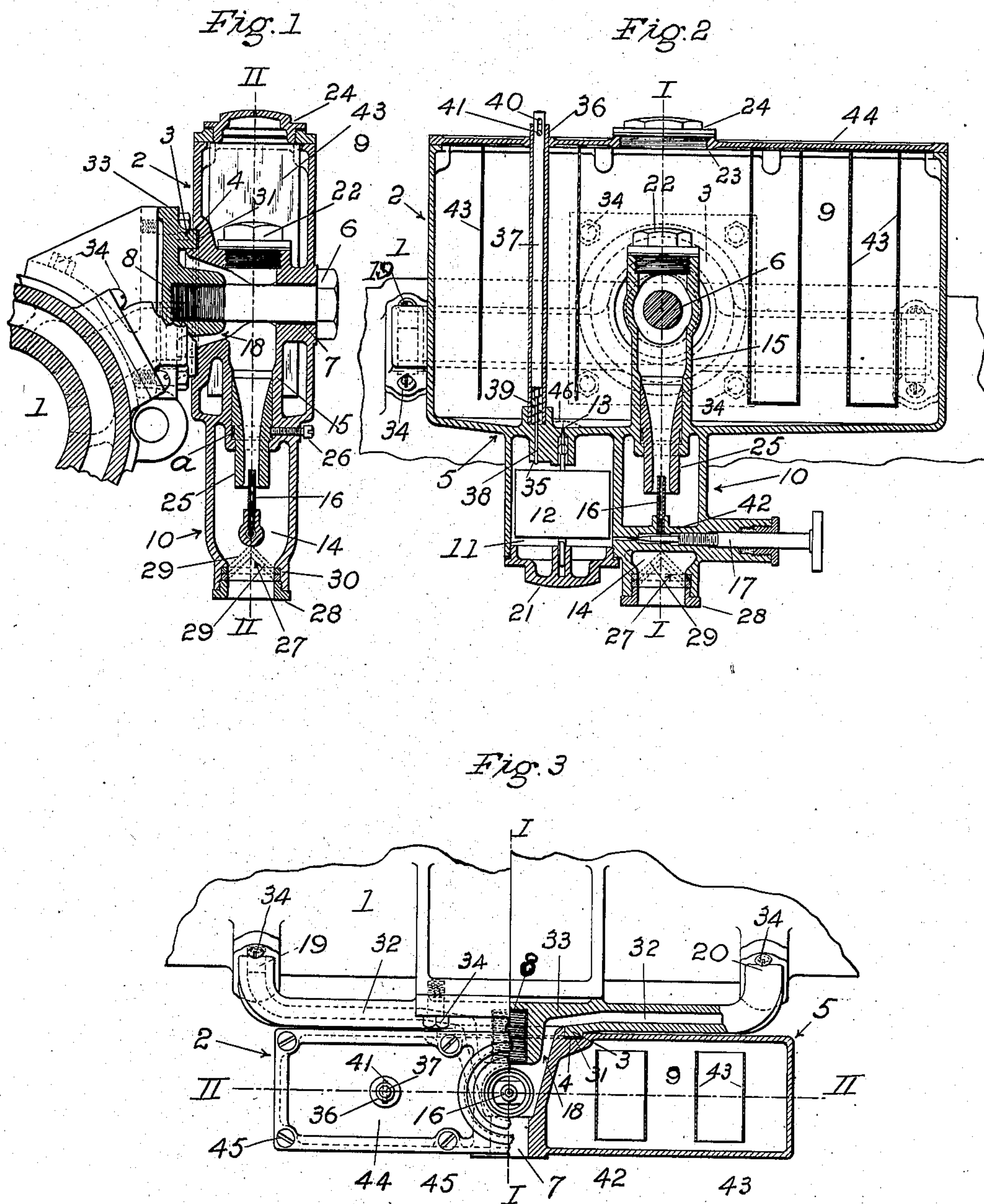
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O. C. DURYEA.

MEANS FOR SUPPLYING EXPLOSIVE VAPORS FOR OPERATING ROCK DRILLS.

APPLICATION FILED MAY 23, 1904.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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MEANS FOR SUPPLYING EXPLOSIVE VAPORS FOR OPERATING ROCK-DRILLS.

No. 858,586.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed May 23, 1904. Serial No. 209,185.

To all whom it may concern:

Be it known that I, OTHO CROMWELL DURYEA, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented
5 new and useful Means for Supplying Explosive Vapors for Operating Rock-Drills and other Tilting Tools, of which the following is a specification.

An object of this invention is to facilitate the convenience of handling and operating explosion actuated
10 rock drills and the like.

Another object is to provide efficient and convenient means for accomplishing the first object above stated.

The class of rock drills to which I more particularly refer is that in which the drill is directly carried and
15 operated by the piston rod of a double acting gas or vapor engine which is swiveled or pivotally mounted on a tripod or other suitable support so that the drill may be tilted and turned and operated in various directions. Drills of this kind are liable to be subjected to frequent
20 and rough handling and an object is to provide strong compact vapor supplying means adapted to fulfil all the requirements of use with such drills without getting out of order.

This invention relates to novel construction, combinations and arrangements of parts whereby the means
25 for supplying the explosive vapors for operating gasoline or naphtha rock-drills and the like will be brought into a most compact and convenient form and made readily operable after rough or other handling, whenever
30 the drill is set up or adjusted for use in any position.

Another object is to make provision for supplying explosive vapors with certainty and uniformity to engines having variable stroke and with small as well as large displacement in the cylinders.

35 Another object is to provide compact explosive vapor supplying means which will supply the vapor to the engine as directly as possible after the explosive mixture has been produced.

In carrying out this invention I provide a combined
40 gasoline or naphtha receptacle and vaporizer; and adjustably connect the same directly to the body of the drill actuating engine. Such connection is preferably pivotal, the combined receptacle and vaporizer being mounted to turn on a substantially horizontal axis
45 and being a practical part of the engine, to be moved about therewith and capable of being brought to approximately level position regardless of the tilt given to the drill.

The invention further relates to specific construction whereby the combined vaporizer and receptacle
50 is adapted to be readily and conveniently attached to and adjusted on the body of the engine and whereby the satisfactory operation of the vaporizer is insured.

It is to be understood that the device is applicable
55 for using alcohol and other inflammable volatile liquids.

The invention may be embodied in various forms.

The accompanying drawings illustrate the invention in the form I at present deem best.

Figure 1 is a vertical section on line I—I, Figs. 2 and 3 showing a device embodying this invention as
60 applied to a swiveled gas or vapor operated rock drill, portions of which, together with the usual tripod, swivel, and accessories are omitted from the view. Fig. 2 is a vertical section on line II—II Figs. 1 and 3. Fig. 3 is a fragmental plan of the same partly in section.
65 The trunnion bolt mixing tube cap and bushing are omitted from this view.

In a general way 1 designates a gas or vapor engine body, and 2 a combined vaporizer and receptacle for volatile inflammable liquids, mounted thereon and
70 arranged to supply vapors thereto.

3 is a circular seat or trunnion formed as an annular flange on the engine body 2 and fitting an annular groove 4 in the body 5 of the combined receptacle and vaporizer, which is pivotally mounted on said engine
75 body by means of said trunnion, and a bolt 6 passed through a hole 7 and screwed into a seat on the engine body.

9 is the chamber for the liquid to be vaporized. To the floor of this chamber is secured the vaporizer 10
80 provided with a float valve chamber 11, a float valve 12 therein for closing the supply port 13, an air inlet or port 14, a vaporizing passage or mixing tube 15, nozzle 16, and needle valve 17 therefor for feeding the volatile
85 liquid to the vaporizing passage the outlet from which is a port or vapor passage 18 within the circular seat or trunnion, and communicates through engine ports 19, 20 with the rear compression chambers, not shown, of the engine.

It will be seen that the annular flange 3 forms a bearing face upon which the vaporizer is adapted to fit and rotate, the inlets to the engine-cylinder being within the periphery of said bearing-face, and the bolt 6 constituting a fastening member located centrally of the turning movement of the vaporizer and adjustably
95 holding said vaporizer in place against the cylinder. It is necessary that the vaporizer be located at the side of the engine-cylinder instead of the end thereof, in order that it may adjust itself to the tilting movements to which the cylinder is subject in the class of engines
100 to which this invention pertains.

Preferably the receptacle and the vaporizer frame are mainly formed of a single piece. For convenience the float valve chamber is a straight tube closed by a screw plug or cap 21. The mixing tube 15 terminates inside
105 the liquid chamber or receptacle 9 and is closed by a screw plug or cap 22 which is small enough to be inserted and removed through the hole 23 in the top of the receptacle which is closed by a vented screw plug 24. The bolt 6 passes through the mixing tube and
110

vapor passage. By unscrewing the bolt from its seat and removing the plugs 24 and 22, the bushing 25 can be inserted and withdrawn, and replaced by other bushings, not shown, having different size bores for regulating the bore of the air mixer.

26 is a screw entering a gain *a* in the bushing for holding the bushing in place.

27 is an air screen held in place across the air port by a screw ring 28. Said screen is preferably formed of a number of wire gauze cones 29 spaced apart by rings 30. These wire gauze cones serve to hold gasolene in starting the vaporizer but may be omitted or used as desired.

31 is a gasket in the groove 4 to prevent leakage at the trunnion joint.

15 Preferably the trunnion 3 and the branches of the vapor passage leading to the engine ports are formed by a piece 33 fastened to the engine body by bolts at 34 but the same may be made integral with the engine body and other changes in the construction may be made without departing from this invention. An advantage of constructing the device in pieces as shown is that by removing the piece 33 and shipping it separate from the engine body convenience and freedom from danger of breakage is secured. In order to operate the float valve, 12 to cause its needle to open the supply port 13 and yet avoid any leakage of the inflammable fluid, a fine hole 35 is made through the floor of the receptacle into the top of the float valve chamber, a tube 36 is inserted through the liquid receptacle and soldered or otherwise secured with tight joints to the floor and the top of the receptacle to form a guide for a shouldered rod 37 which is provided at the lower end with a pin 38 in the hole 35 to push the float down.

39 is a spring for retracting the rod.

35 40 is a slot in the outer end of the rod and 41 is a pin fixed to tube 36 and passing through the slot to hold the rod in the tube. The length of the slot determines the length of the throw of the rod.

42 is a tube cast integral with and extending across the air port 14 and forming the way for the feed valve.

43 designates baffle plates fastened to the cover 44 to prevent sloshing of the liquid. They extend transversely to the axis of the engine body so that the jar from the reciprocating piston will not cause the gasolene or other volatile liquid to either feed irregularly or fail to feed.

In practice, when the bolt 6 is loosened the combined liquid receptacle and vaporizer will, by force of gravity, tend to come to the vertical position shown, regardless of the tilt that may be given the engine body 1 and when the engine is set, the bolt will be tightened, thus fixing the receptacle and vaporizer in upright position. The bolt is located near the center of gravity, though slightly therefrom so that any jar of the engine will not be apt to disturb the adjustment. The vaporizer and receptacle may be readily detached and packed for transportation or storage, and when in place on the engine all the operable parts are convenient to the operator of the engine or drill; and, by removing the bolt 6 and the screw caps or plugs access to the

interior can be gained. The cover may be soldered or otherwise fastened in place. In Fig. 3 screws 45 are shown as fastenings therefor.

46 is a screen over the supply port 13 to prevent clogging of the same.

Having described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. The combination of an engine body provided with a circular bearing face and an inlet within the periphery of said face, a combined vaporizer and receptacle for volatile inflammable liquids engaging said face to turn thereon, and means for holding said vaporizer and receptacle against said face.

2. The combination of an engine body provided with a circular bearing face and an inlet within the periphery of said face, a combined vaporizer and receptacle for volatile inflammable liquids engaging said face to turn thereon, and an attaching member for said vaporizer and receptacle arranged centrally of the turning movement thereof.

3. A gas or vapor engine having a circular seat provided with a port therein for the explosive mixture, a vaporizer mounted to turn in said seat and connected to supply explosive charges to said port, and means engaging said seat axially of the turning movement of the vaporizer for releasably fixing the vaporizer to its seat.

4. A gas or vapor engine having a hollow vaporizer support communicating with its inlet ports and a vaporizer and liquid receptacle journaled on and communicating with the hollow support.

5. The combination of an engine body, a liquid receptacle having a passage leading from the atmosphere and opening through one side of the receptacle, and communicating with ports of the engine, a bolt through the receptacle and passage securing the receptacle to the engine body, and means connected with the receptacle for supplying liquid therefrom to said air passage.

6. A receptacle having a passage therethrough, a float valve chamber fastened to the floor thereof, said floor being furnished with two holes opening into the chamber, a float valve in said valve chamber and controlling the opening through one of said holes, a tube surrounding the other hole and extending through the receptacle, a spring supported rod in said tube having a pin in said hole for moving the float, and means for feeding liquid from said float chamber to said air passage.

7. The combination with an engine body, of a combined liquid receptacle and vaporizer having an air passage supplied with liquid from the receptacle and having a hole in the top and a hole therebeneath in said air passage and means for temporarily closing said holes.

8. A piece constructed for attachment to an engine body and having a passage for supplying explosive vapor thereto, and a combined liquid receptacle and vaporizer swiveled the side thereof opposite the engine body and constructed and arranged to supply explosive vapor to such passage.

9. An engine body provided with a bearing face, a vaporizer having a part adapted to fit said face and rotate thereover, and an adjustable attaching member for said vaporizer in line with the axis of rotation thereof, an inlet being provided within the aforementioned bearing face.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses at Brooklyn in the county of Kings and State of New York this 14th day of May, 1904.

OTHO C. DURYEA.

Witnesses:

JAMES R. TOWNSEND,
ATINA DURYEA.