W. F. ROTHE.

CARBURETER.

APPLICATION FILED MAY 28, 1909.

973,882.

Patented Oct. 25, 1910.

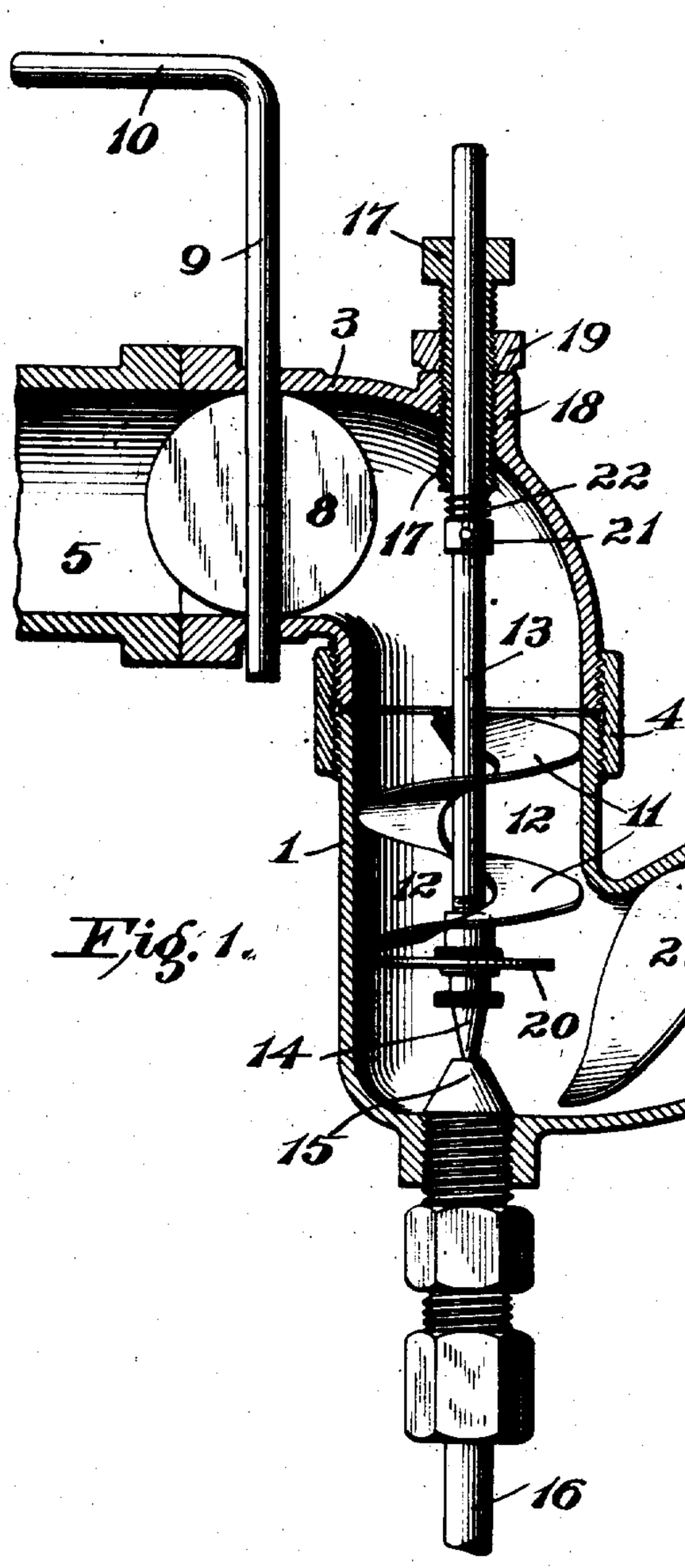

Fig. 1.

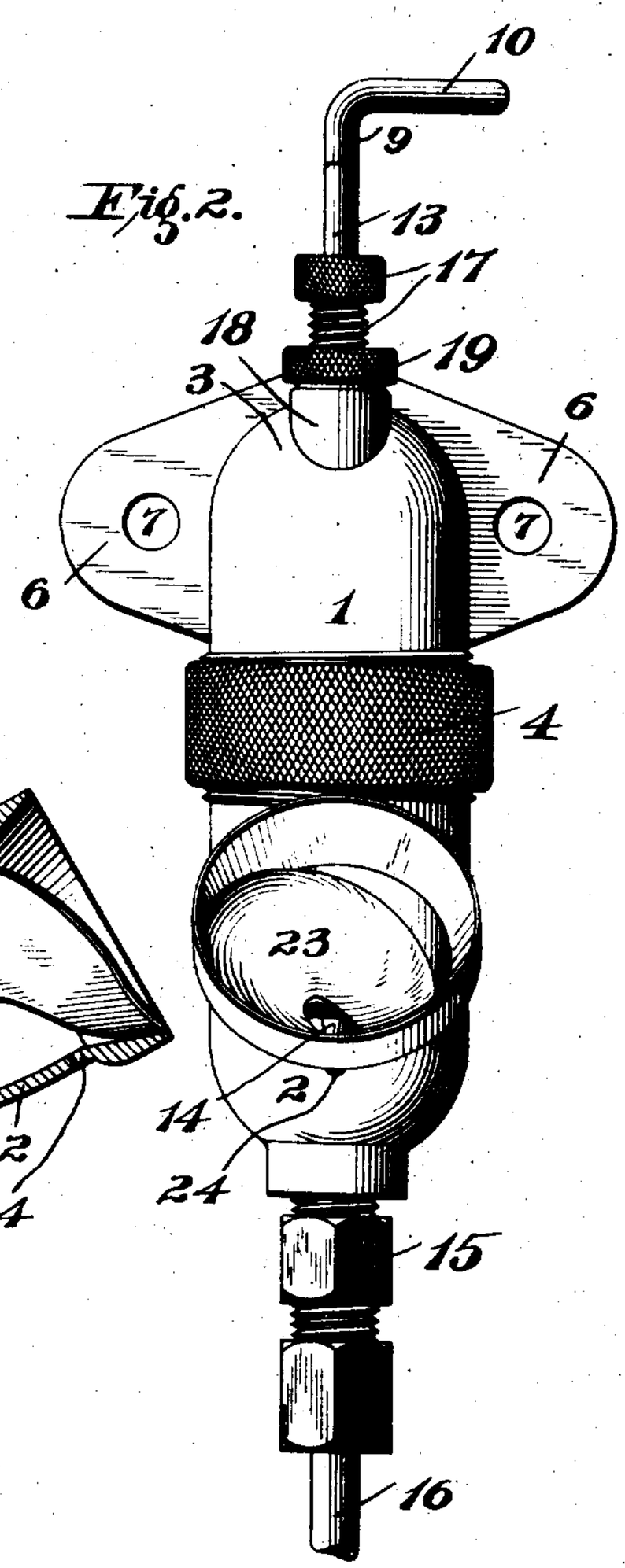

Fig. 2.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

973,882. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed May 28, 1909. Serial No. 498,835.

To all whom it may concern:

Be it known that I, WILLIAM F. ROTHE, a citizen of the United States, and a resident of the city of East St. Louis, county of St. Clair, State of Illinois, have invented a new and useful Improvement in Carbureters, of which the following is a specification.

This invention relates to carbureters, and more particularly to devices for vaporizing and mixing the working fluid used in the propulsion of gas and hydrocarbon engines.

Internal combustion or explosion engines are usually started by a mechanical device operatively connected with the main shaft of the engine whereby the operator may rotate the shaft and thereby cause a priming charge of the working fluid to be drawn into the combustion chamber. It frequently happens that several successive actuations of the mechanical starting device are necessary owing to the imperfect vaporization and mixture of the working fluid in the priming charge, thereby causing delay in starting and a great amount of exertion on the part of the operator.

The principal objects of the present invention are to secure perfect vaporization and thorough mixture of the air and gases; to facilitate the priming and quick starting of the engine; to simplify the construction; to provide for readily applying the carbureter to the fuel inlet of hydrocarbon engines of any ordinary construction without material alteration; and to attain certain other advantages hereinafter more fully appearing.

The invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing forming part of this specification and wherein like symbols refer to like parts wherever they occur, Figure 1 is a view partly in vertical section and partly in side elevation of a carbureter embodying my invention; and Fig. 2 is a front elevation of the same.

As shown in the drawing, the carbureter comprises a hollow shell 1 whose intermediate portion is cylindrical, the end portions 2, 3 being bent or curved laterally. The shell or casing is preferably made in two separate sections or elbows having their meeting end portions right and left hand screw-threaded, respectively, to fit a correspondingly screw-threaded coupling ring 4, whereby the end portions 2, 3, may be set at different angles and the two sections locked together. The end portion 3 may be connected in any desirable manner to the fuel inlet of a gas or hydrocarbon engine. In the drawing, it is illustrated as being secured to the end of a pipe 5. The meeting end portions of the pipe and carbureter are provided with lateral ears 6 having alining perforations 7 to receive suitable securing bolts, not shown.

In the end portion 3 of the shell is a disk-valve or throttle 8 which is mounted on a rod 9 swiveled in the shell and having its upper end portion 10 bent laterally to constitute a handle or arm to coöperate with any suitable controlling or manipulating device.

In the intermediate portion of the shell is mounted a spiral strip 11 whose peripheral portion touches the cylindrical inner face of the shell, thereby forming a spiral passageway or mixing chamber 12. The central portion of the spiral 11 is open to permit the passage therethrough of a longitudinally-movable rod 13 on the lower end of which is a needle-valve 14. The needle-valve projects into and normally closes the discharge opening in the end of a nozzle 15 which is fitted in the bottom of the casing. Connected to the nozzle is a pipe 16 which may communicate with any suitable source of supply of hydrocarbon.

The upper end portion of the rod 13 extends through a tubular member or guide-sleeve 17 which is screw-threaded into a boss 18 on the upper portion of the casing. The sleeve 17 has a jam nut 19 threaded thereon and adapted to be tightened against the upper face of the boss 18 so as to lock the sleeve in vertically adjusted positions. Mounted on the rod 13 above the needle-valve is a circular plate or diaphragm 20 which is adapted to lift the rod when a suction is created through the carbureter and thereby lift the needle-valve and open the discharge opening in the nozzle. On the rod 13 is a collar 21 which is arranged to cooperate with the inner end of the sleeve 17 to limit the upward movement of the rod. Preferably, a light spring 22 is coiled about the rod between the collar and sleeve so as to bear against the ends thereof and yieldingly hold the needle-valve seated in the discharge opening of the nozzle; and by ad-

justing the sleeve 17 vertically the distance the needle-valve is raised may be varied to regulate the discharge of the fluid from the nozzle.

In the lower end portion 2 of the casing is a short spiral 23. This spiral is arranged to deflect the incoming air downwardly in a whirling motion so that the air will act upon the bottom side of the diaphragm 20 to raise the same and also to direct the air well into the oil at the bottom of the casing to partially vaporize the same and commingle therewith before it enters the spiral mixing chamber 12. The atomization and mixture is then completed in the chamber 12 whence it is drawn into the engine in a highly combustible or explosive state.

When the carbureter is used in connection with a hydrocarbon engine and it is desired to supply a priming charge in starting the engine, the rod 13 is manipulated to lift the needle valve and permit the oil to flow into the concavity in the bottom of the casing. The amount of oil is controlled by an overflow opening 24 in the bottom of the casing. The starting device is then forcibly actuated to rotate the engine shaft and thereby create a suction through the carbureter. The inrushing air will be first directed into the pool of oil and atomize the same and then more thoroughly commingle with the vapors therefrom in the spiral mixing chamber 12 before entering the combustion chamber.

By the arrangement of carbureter shown, a properly proportioned mixture is furnished throughout all ranges of the throttle and the engine may be quickly started with a little exertion on the part of the operator and the annoyance of excessive "cranking" or manual operation of the starting device is obviated.

Obviously, the device admits of considerable modification without departing from my invention and therefore I do not wish to be limited to the specific construction and arrangement shown.

What I claim as my invention and desire to secure by Letters Patent is:

1. A carbureter comprising a substantially vertical tubular casing having laterally turned end portions and whose bottom portion constitutes an oil receptacle, means for supplying oil to said receptacle, said casing having a spiral air inlet passageway in its lower end portion and having an outlet at its opposite end, said spiral air inlet passageway being arranged to deflect the air to the bottom of said oil receptacle in a whirling motion.

2. A carbureter comprising a tubular casing whose end portion is turned laterally and having a spiral passageway through its body portion, said casing having a receptacle for oil at the inner end of said spiral passageway, and means for supplying oil to said receptacle, said casing having a spiral air inlet passageway in its laterally turned end portion which is arranged and adapted to deflect the air to the bottom of said oil receptacle in a whirling motion.

3. A carbureter comprising a tubular casing having a spiral passageway through the body portion thereof, and having an oil receptacle at the inner end of said spiral passageway and an oil inlet opening into said receptacle, and a resiliently supported valve for said oil inlet having a diaphragm thereon, said casing having an air passageway opening into said oil receptacle, a spiral deflector arranged in said air passageway so as to deflect the air downwardly into said oil receptacle in a whirling motion and against said diaphragm.

4. A carbureter comprising a tubular casing having a spiral passageway through the body portion thereof, and having an oil receptacle at the inner end of said spiral passageway and an oil inlet opening into said receptacle, and a resiliently-supported valve for said oil inlet having a diaphragm thereon, said casing having a laterally-extending air inlet passageway at its inner end and an outlet at its opposite end, said air inlet passageway having a spiral deflector extending into said oil receptacle and arranged to deflect the air downwardly into said oil receptacle in a whirling motion and against said diaphragm.

5. A carbureter comprising a casing having a mixing chamber, inlet and outlet passageways located respectively at opposite ends of said mixing chamber, an oil receptacle at the bottom of said mixing chamber and said inlet passageway, and a spiral deflector arranged in said inlet passageway and extending into said oil receptacle so as to direct the incoming air to the bottom of said oil receptacle in a whirling motion.

Signed at St. Louis, Mo., May 25, 1909.

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Witnesses:

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