944,811.

W. E. NAGEBORN.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED JULY 3, 1908.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

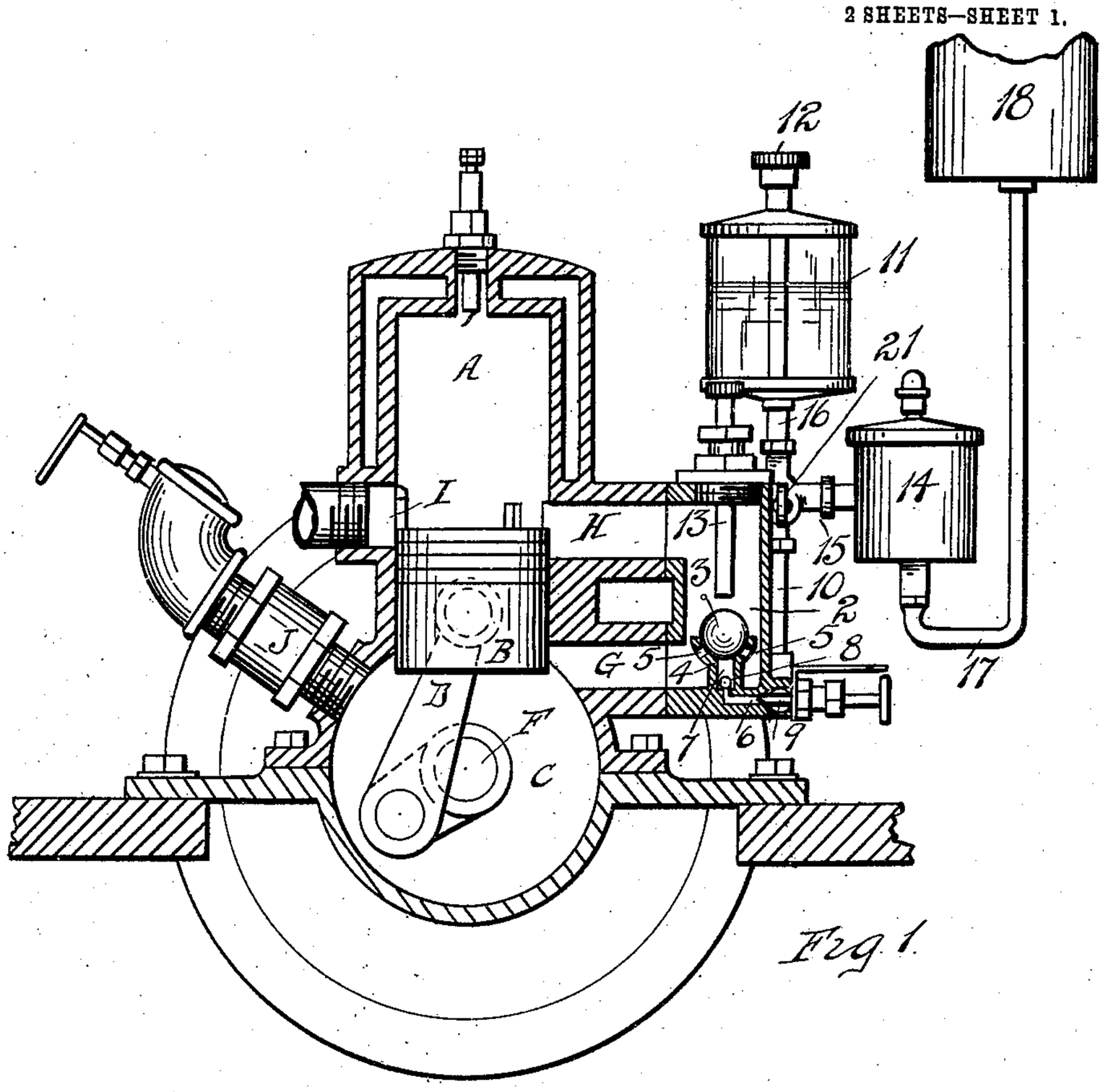

Fig. 1.

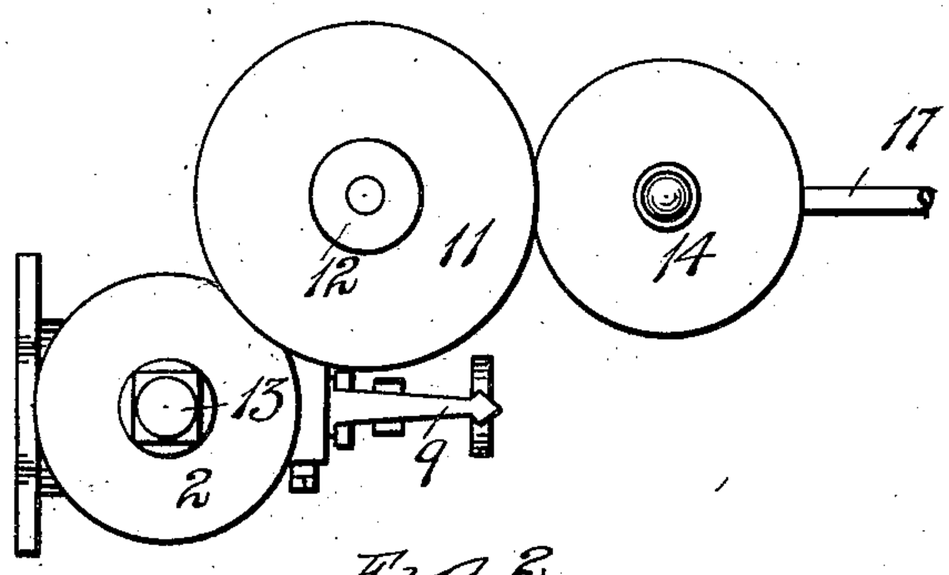

Fig. 2.

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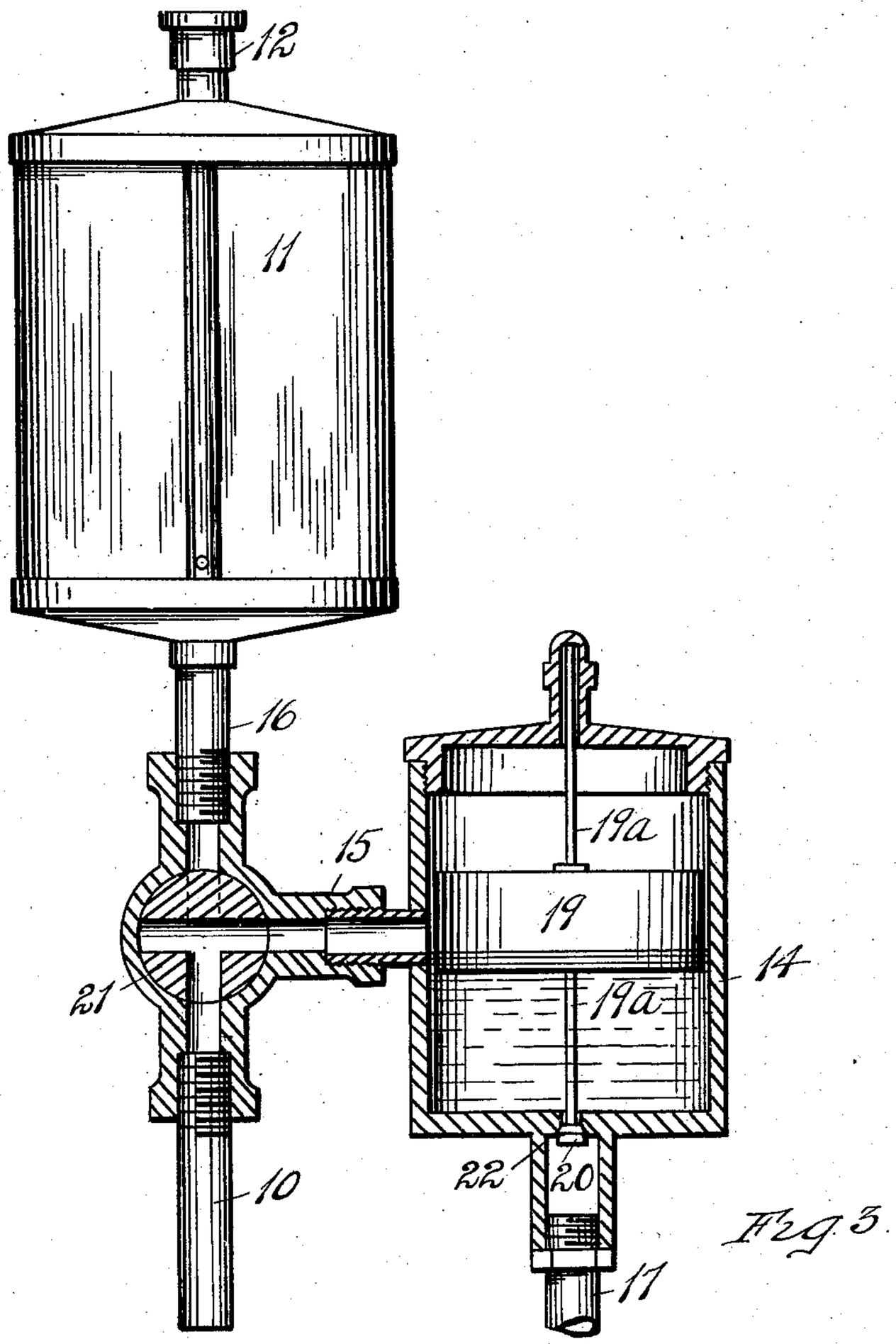

Fig 3.

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UNITED STATES PATENT OFFICE.

WILLIAM E. NAGEBORN, OF DETROIT, MICHIGAN.

INTERNAL-COMBUSTION ENGINE.

944,811. Specification of Letters Patent. **Patented Dec. 28, 1909.**

Application filed July 3, 1908. Serial No. 441,765.

To all whom it may concern.

Be it known that I, WILLIAM E. NAGEBORN, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Internal-Combustion Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to internal combustion engines, and has for its object to provide an improved means for feeding the liquid fuel to the engine.

In the accompanying drawing:—Figure 1, is a sectional elevation of a two cycle engine, with an apparatus embodying my invention attached thereto. Fig. 2, is a plan view of the apparatus embodying my invention. Fig. 3, is a sectional detail illustrating a part of the apparatus embodying my invention.

A is the cylinder; B the piston; C the crank case; D the connecting rod, and F the shaft of a two cycle gas engine.

J represents the intake pipe, which includes an inwardly opening nonreturn valve, as in the usual construction.

G is a conduit leading from the crank case, and H is a conduit leading into the cylinder above the piston when the latter is at the lower end of its stroke.

I represents the usual exhaust port.

2 is a casing adapted to be secured upon a faced-off surface at the side of the engine, and when so secured to connect the conduits G and H as illustrated in Fig. 1.

4 is a raised valve seat extending from the bottom of the casing 2 up adjacent or within the vertical passage in said casing between the conduits G and H.

5, 5, represent two apertures, a number of which are formed through the valve seat 4.

3 is a ball resting within the semi-spherical valve seat 4.

13 is a rod extending through the upper end of the casing 2, its lower end coming adjacent to the ball 3. The distance the ball 3 may rise from its seat may be regulated by adjusting the rod 13 so that its lower end shall come a greater or less distance from the ball 3.

7 represents a passage extending downward from the center of the valve seat 4, and communicating with a passage 6 through which the liquid fuel is fed. There is a valve seat in the passage 7 and upon this valve seat a ball valve 8 is adapted to rest.

9 is a needle valve by which the area of the passage 6 may be adjusted.

10 is a pipe adapted to feed liquid to the passage 6 to supply it to the engine.

21 is a three-way cock in the pipe 10.

11 is a reservoir adapted to be filled, or partly filled, with liquid at 12. The interior of the reservoir 11 communicates by pipe 16 with the pipe 10.

14 is a reservoir communicating by a pipe 15, extending from its side with the pipe 10. The passage through the pipe 16 may be put into communication with the pipe 10 to feed the fluid from the reservoir 11 to the engine, or the pipe 15 may be put into communication with the pipe 10 by turning the three-way cock 21 to a different position.

18 is a source of gasolene supply; this source communicates with the reservoir 14 by the pipe 17. In the bottom of the reservoir 14 is a port 22 surrounded by a valve seat, through which fluid may flow from the source of supply 18 and pipe 17. In the reservoir 14 is a float 19 having a guide stem 19^a.

20 is a valve on the lower end of the valve seat 19^a. When the reservoir 14 is filled to such a level that the liquid may flow out through the pipe 15, the valve 20 comes against the valve seat surrounding the port 22, and prevents the oil from running into the reservoir 14. When the liquid is used so as to lower the level, the valve 20 descends and allows more liquid to flow in. Thus a uniform head of liquid is maintained in the reservoir 20, securing an even feed of the fluid to the engine.

If it is desired to use liquid from the reservoir 11, the three-way cook 21 is turned to such a position that the liquid is fed through the pipe 10 to the engine. When it is desired to use liquid from the reservoir 14, the cock 21 is turned to put the pipe or passage 15 into communication with the pipe 10, when a regular uniform feed of the fluid will take place.

What I claim is:—

1. In an apparatus of the kind described, the raised seat 4 provided with a passage adapted to admit liquid fuel and having an approximately semi-spherical face, and a ball resting in said face, said face being sup-

plied with apertures 5, 5 extending through said seat.

2. In an apparatus of the kind described, the raised seat 4, provided with a passage adapted to admit liquid fuel and having an approximately semi-spherical face, a ball resting in said face, said face being supplied with apertures 5, 5 extending through said face, and means for limiting the upward movement of said ball.

In testimony whereof, I sign this specification in the presence of two witnesses.

WILLIAM E. NAGEBORN.

Witnesses:

ALECIA TOWNSEND,

ELLIOTT J. STODDARD.