D. B. MEDANICH.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED JAN. 27, 1916.

1,247,983.

Patented Nov. 27, 1917.

2 SHEETS—SHEET 1.

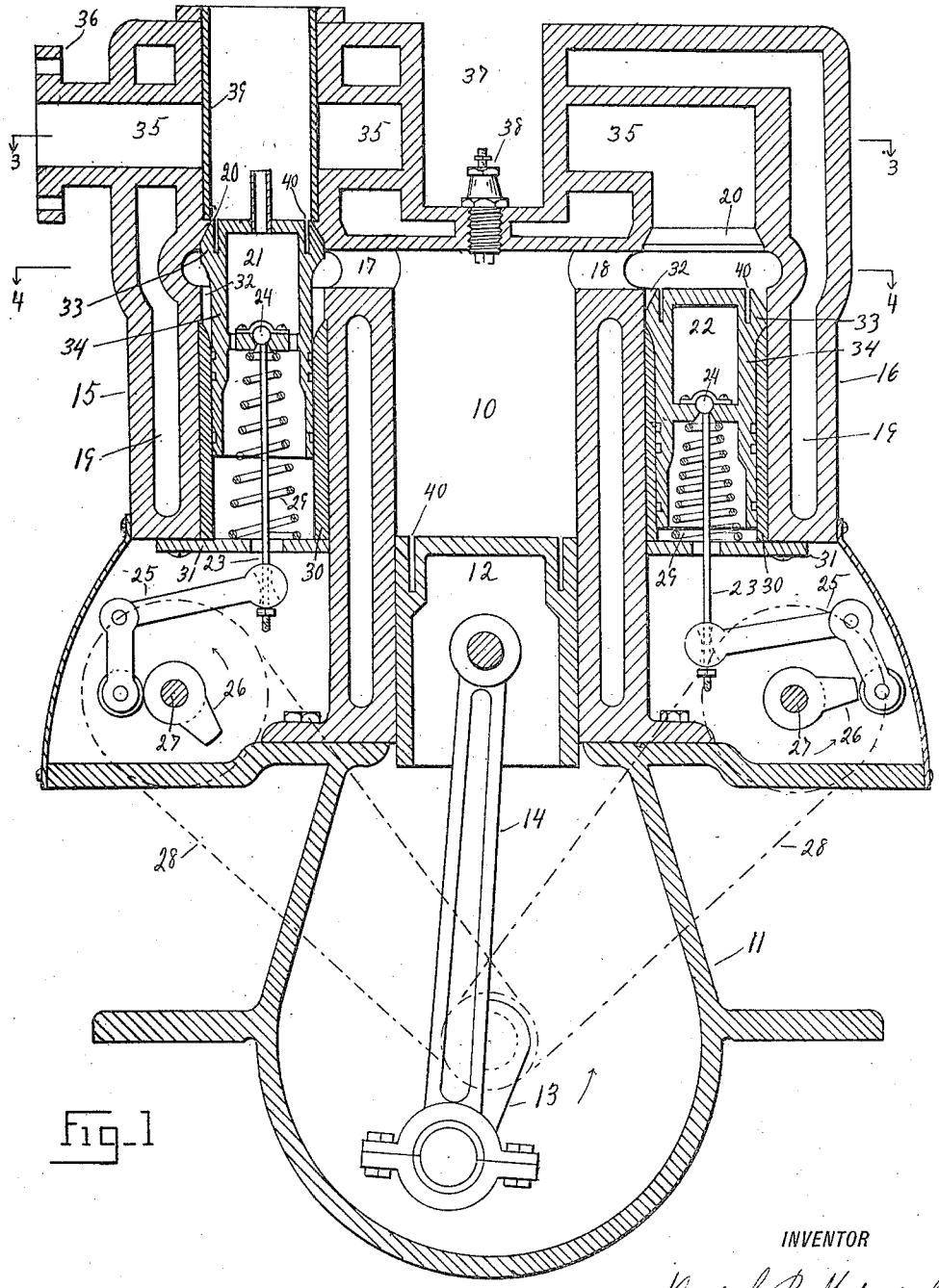


Fig. 1

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2 SHEETS—SHEET 2.

Fig 2

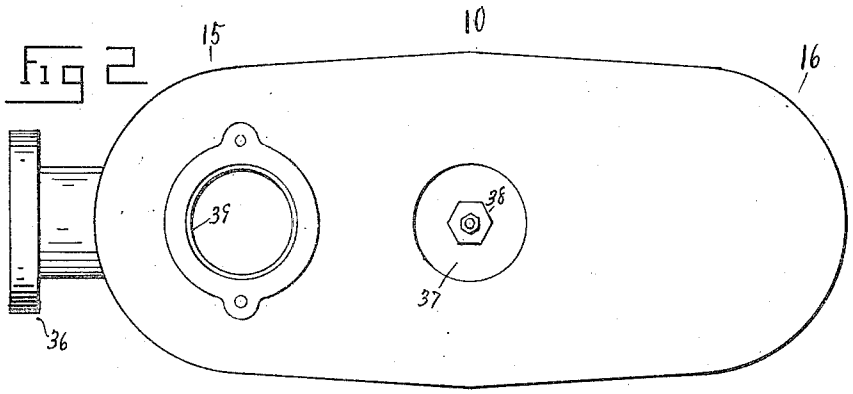


Fig 3

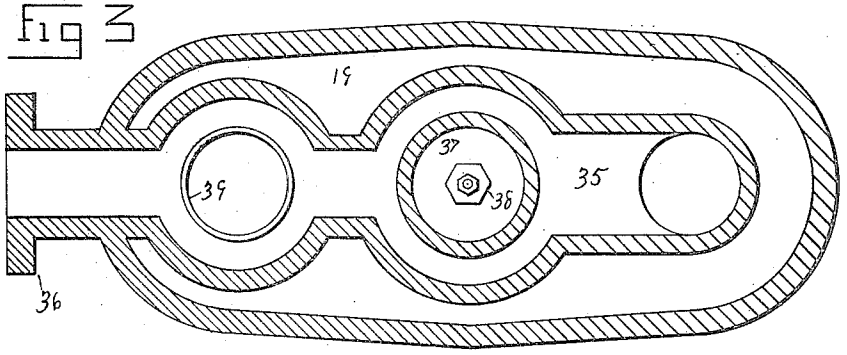
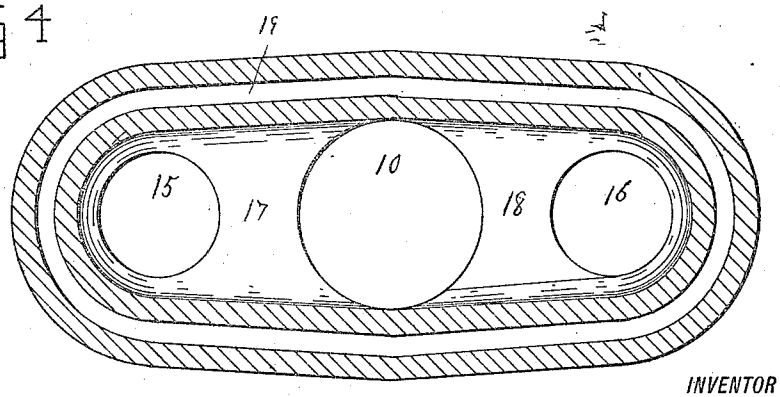


Fig 4



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INTERNAL-COMBUSTION ENGINE.

1,247,983. Specification of Letters Patent. Patented Nov. 27, 1917.

Application filed January 27, 1916. Serial No. 74,697.

To all whom it may concern:

Be it known that I, DANIEL B. MEDANICH, a citizen of the United States, residing at Buechel, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines, and an object is to provide an improved construction of valves and pistons therefor.

A further object is the provision of means for facilitating the combustion of liquid hydrocarbons.

With the foregoing and other objects in view the invention consists of the novel construction and arrangement of parts illustrated in the accompanying drawings, wherein is set forth an embodiment of the invention, but it is to be understood that such changes and modifications may be resorted to as come within the scope of the claims appended hereunto.

Referring to the drawing wherein similar reference characters designate like parts in the several views Figure 1, is a transverse sectional view of a single cylinder engine embodying my invention; Fig. 2, is a top plan view; Fig. 3, a section on line 3—3 of Fig. 1; Fig. 4, a section on line 4—4 of Fig. 1.

In the embodiment of my invention illustrated in the accompanying drawings —10— designates a power cylinder which is mounted upon a crank case —11—, of approved construction, within which are movable, respectively, a piston —12— and a crank —13— the latter being connected to the piston by means of a connecting rod —14— whereby motion is transmitted from the piston to the crank shaft. The engine is preferably of the pattern popularly known as T head, exhaust and intake valve cylinders —15, 16— being disposed, respectively, on opposite sides of the power cylinder, communicating therewith by means of ports —17, 18—. A water jacket —19— envelops the power cylinder and valve-cylinders. The valve cylinders are open at the lower end to the atmosphere. In each of the valve cylinders there is an internal annular valve seat —20— on a line with, or just above the upper end of the power cylinder, against which piston valves —21, 22— seat. Valve rods 23 flexibly connected to the valves by means of ball joints —24— depend into position to be actuated in one direction, through the medium of levers —25—, by means of cams —26— which are secured on shafts —27—, said shafts receiving motion from the crank shaft by suitable means such as belts —28—. Springs —29— serve to return the valves to the closed position. A sleeve —30— which reduces the bore thereof, is disposed in each valve cylinder, being retained therein by suitable means such as plates —31— which are suitably secured to the lower end of the valve cylinder. These sleeves extend from the lower end of the cylinder to within a spaced distance of the ports 17 and 18. By this arrangement a chamber —32— is formed between the upper end of the sleeves and the valve seat 20 in which the heads —33— of the valves operate. The body —34— of the valve is of reduced diameter to fit the bore of the sleeves. An advantage of this construction is that in case of wear new sleeves may be inserted, instead of having to re-bore the cylinder. The length of the chamber 32 is such as to permit the heads of the valves to properly clear ports 17 and 18 before they contact with the upper ends of the sleeves. It is to be observed that the gases from the power cylinder find their way all around the body of the valves, below the heads, thus subjecting them to equal pressure on all sides, avoiding wear and friction due to side pressure. The inlet valve cylinder communicates at its upper end with a transverse passage —35—, in the head of the engine, which at its outer end is provided with means, such as a flange —36—, for the attachment of a conduit leading to a suitable source of fuel supply. The passage 35 divides, and passes around a well —37— within which is positioned a spark plug —38—. An exhaust tube —39— passes through the passage 35, the arrangement being such that the incoming fuel impinges upon the tube and is heated thereby. As ordinarily constructed pistons of internal combustion engines are "relieved" that is are slightly reduced in diameter at the head, this is done to prevent the pistons, when they get hot, from sticking in the cylinders, as they otherwise would do, due to the fact that the head, on account of the mass of the web forming it, expands to a greater degree than the body which is hollow. I overcome this

difficulty and avoid reducing the diameter of the piston, thus insuring an accurate fit at all times, by providing an annular slot —40— which extends longitudinally into the side wall of the piston from the head thereof. This slot is concentric with and suitably spaced from the edge of the piston, and the depth thereof is greater than the thickness of the web constituting the head of the piston. With this construction, expansion of the head closes the slot but does not affect the external diameter of the piston.

Having thus described my invention so that anyone skilled in the art pertaining thereto may make and use the same, I claim:

1. A valve cylinder having an internal annular recess near its upper end, a removable sleeve extending from its lower end to within a spaced distance of said recess, and a piston valve comprising a portion operating in said sleeve and a portion operating in the main bore of the cylinder.

2. A valve cylinder open at its lower end to the atmosphere, an internal annular valve seat in the upper end thereof, said cylinder having an internal annular recess below said seat, a removable reducing sleeve within the cylinder extending from the lower end thereof to within a spaced distance of said recess, and a piston valve having a body portion operating in said sleeve and an enlarged head operating in the main bore of the cylinder and adapted to close on said valve seat.

3. A valve cylinder having an exhaust passage leading from its upper end, the lower end being open to the atmosphere, an internal annular valve seat in the upper end thereof, a tubular piston valve, and a reducing sleeve in the lower portion of said cylinder, said valve comprising a body portion and an enlarged head, said head moving in the main bore of the cylinder and the body in the sleeve.

4. In an internal combustion engine, a power cylinder, valve cylinders disposed on opposite sides of the power cylinder, one of said valve cylinders having an inlet passage leading from its upper end transversely across the top of the power cylinder and the other valve cylinder, and an exhaust tube extending from the other valve cylinder through said transverse inlet passage.

5. In an internal combustion engine, a power cylinder, an exhaust valve cylinder on one side and an inlet valve cylinder on the other side of said power cylinder, an internal annular valve seat in the upper end of each of said valve cylinders, a reducing sleeve in the lower portion of each valve cylinder, a tubular piston valve in each of the valve cylinders the heads whereof are adapted to close on said seats, the valves each comprising a head adapted to fit in the bore of the cylinder and a reduced body adapted to fit in said sleeve, the inlet valve cylinder having an inlet passage leading from the upper end thereto transversely across the upper end of the power cylinder and the exhaust valve cylinder, and an exhaust tube leading from the upper end of the exhaust valve cylinder, in prolongation of the axis thereof, through said transverse inlet passage.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."