L. GRASSO.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED AUG. 11, 1913.

1,086,161.

Patented Feb. 3, 1914.

2 SHEETS—SHEET 1.

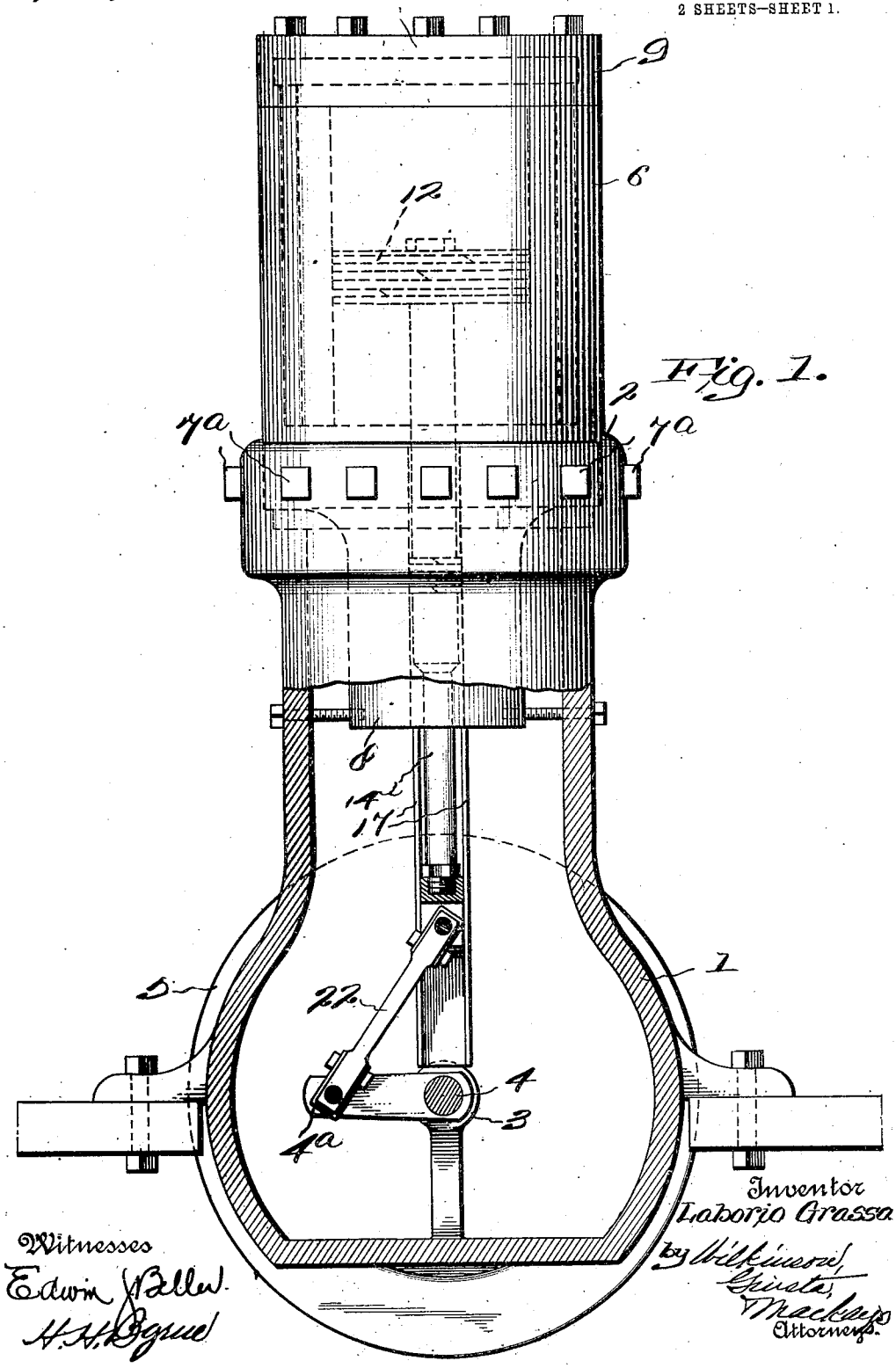


Fig. 1.

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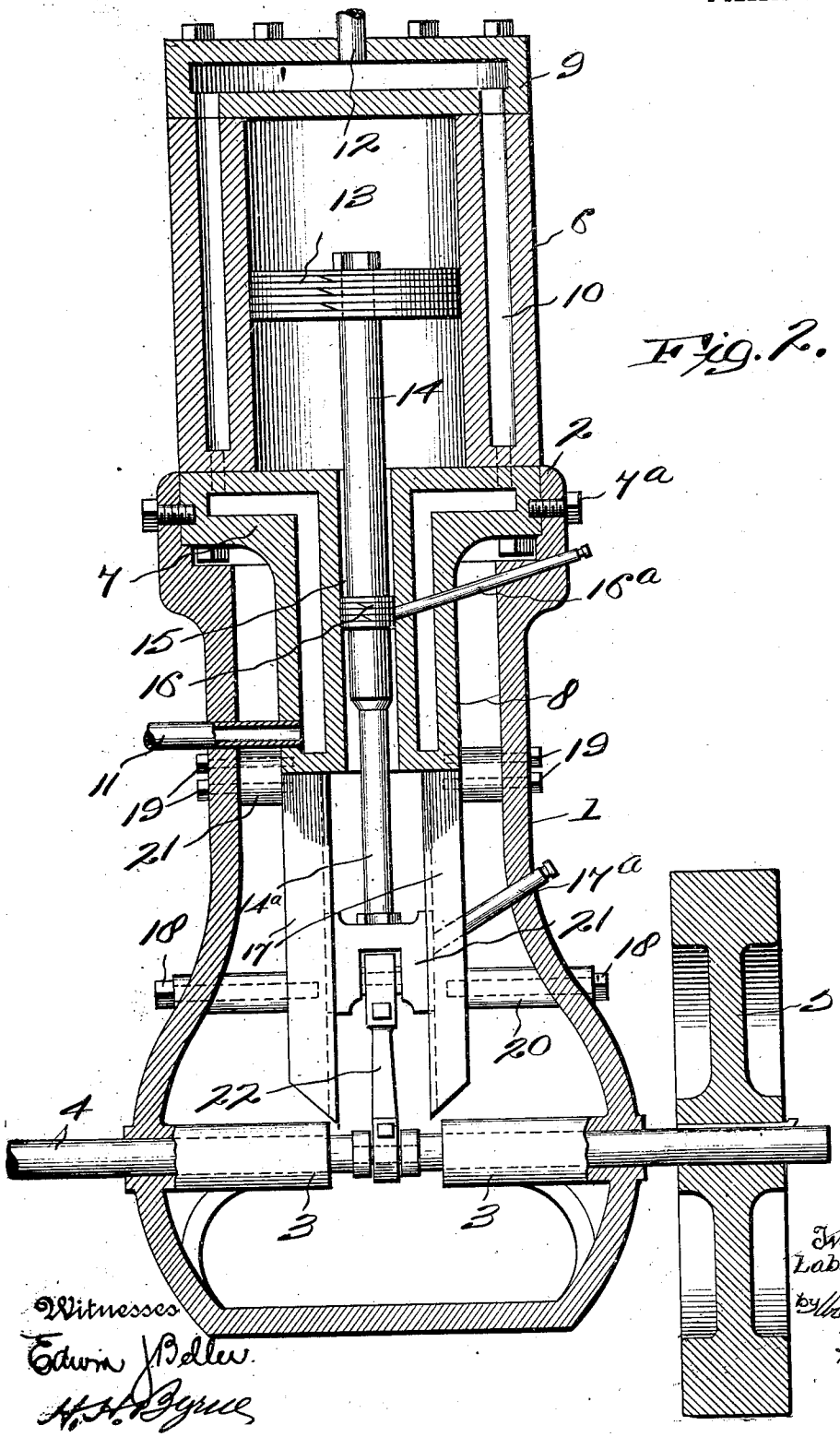


Fig. 2.

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UNITED STATES PATENT OFFICE.

LABORIO GRASSO, OF BILOXI, MISSISSIPPI.

INTERNAL-COMBUSTION ENGINE.

1,086,161. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed August 11, 1913. Serial No. 784,195.

To all whom it may concern:

Be it known that I, LABORIO GRASSO, an Italian subject who has announced his intention of becoming a citizen of the United States, residing at Biloxi, in the county of Harrison and State of Mississippi, have invented certain new and useful Improvements in Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to engines, and has for its purpose to provide a construction of engine wherein no packing rings, or stuffing boxes, are required for the piston rod, to the end of greater ease and efficiency in operation.

The invention has for its further purpose to construct an engine of this type especially adapted for operation with combustible fuel, and wherein the cylinder head provides a bearing for the piston rod, and which, with the cylinder proper, is designed to form a single water jacket.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claim.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a side elevational view, with the casing partly in section, of an engine constructed in accordance with the present invention; and Fig. 2 is a sectional view, with parts in elevation, of the engine.

Referring to the construction in further detail, 1 designates a closed casing which has an open end formed with a recess 2, and has suitable bearings 3 for the crank shaft 4. The usual fly wheel 5 is mounted on said crank shaft.

The engine cylinder 6 is mounted on the casing 1 and fits within the recessed end 2 thereof through the medium of the cylinder head 7 in the manner shown. Said cylinder head 7 has an inwardly-disposed or projecting portion 8, fitting within the chamber of the cylinder 1, and at its opposite end the cylinder is provided with a head 9 of the usual type. The cylinder head 7 is secured by a plurality of bolts 7^a, and the head extension 8 may be constructed separately or cast integrally with the head 7, the latter arrangement being preferred.

The cylinder member and cylinder heads 7 and 9, together with the extension 8, are suitably recessed to provide a single water jacket 10, to which the water is supplied through the pipe 11 and carried off through the pipe 12.

A piston 13 is mounted to operate in the cylinder 6, and carries a piston rod 14 which passes through a central opening 15 formed in the cylinder head 7 and extension 8, and the walls of said opening provide a bearing surface for the bearing ring or sleeve, 16 secured to the piston rod 14, as illustrated. With this provision, the usual stuffing boxes or packing rings for the piston rod are dispensed with, and thereby provide a minimum wearing or frictional surface, and also produce a better balance for the piston and piston rod.

The rod 14 passes through the opening 15 with sufficient clearness to avoid friction and the bearing ring 16 is lubricated through the tube 16^a. A similar lubricating tube 17^a is provided for the cross head 21.

A pair of guides 17 are mounted within the casing 1 through the medium of a plurality of bolts 18 and 19 which pass through said casing and engage said guide ways. The bolts 19 are located at the juncture of the cylinder head extension 8 and said guideways, and sleeves 20 and 21 are mounted on said bolts 18 and 19, respectively, and form the necessary spacing elements between the engine casing, the cylinder extension and said guideways.

The usual cross head 21 is mounted to operate within the guideways 17 and connects with the piston rod extension 14^a, and with the crank 4^a of the crank shaft 4 through the pitman 22.

I have illustrated and described satisfactory constructions, but changes could be made within the spirit and scope of my invention.

I claim:—

In an engine, the combination of a closed casing having an open and recessed end; a cylinder mounted on the casing and having a head fitting within the recess of said open end, said head having an integral portion

projecting a considerable distance within the casing; and said projecting portion and head providing a jacket, and having a central opening therethrough; a piston operable in said cylinder; a piston rod carried by said piston and passing through said central opening; a cross-head having guideways and connected to the piston rod; and a crank shaft connected to said cross head, substantially as described.

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

LABORIO GRASSO.

Witnesses:
T. J. ROSELL,
W. G. HODGINS.