No. 827,107. PATENTED JULY 31, 1906.

E. A. MAYNARD.

ENGINE.

APPLICATION FILED DEC. 6, 1905.

Fig. 1.

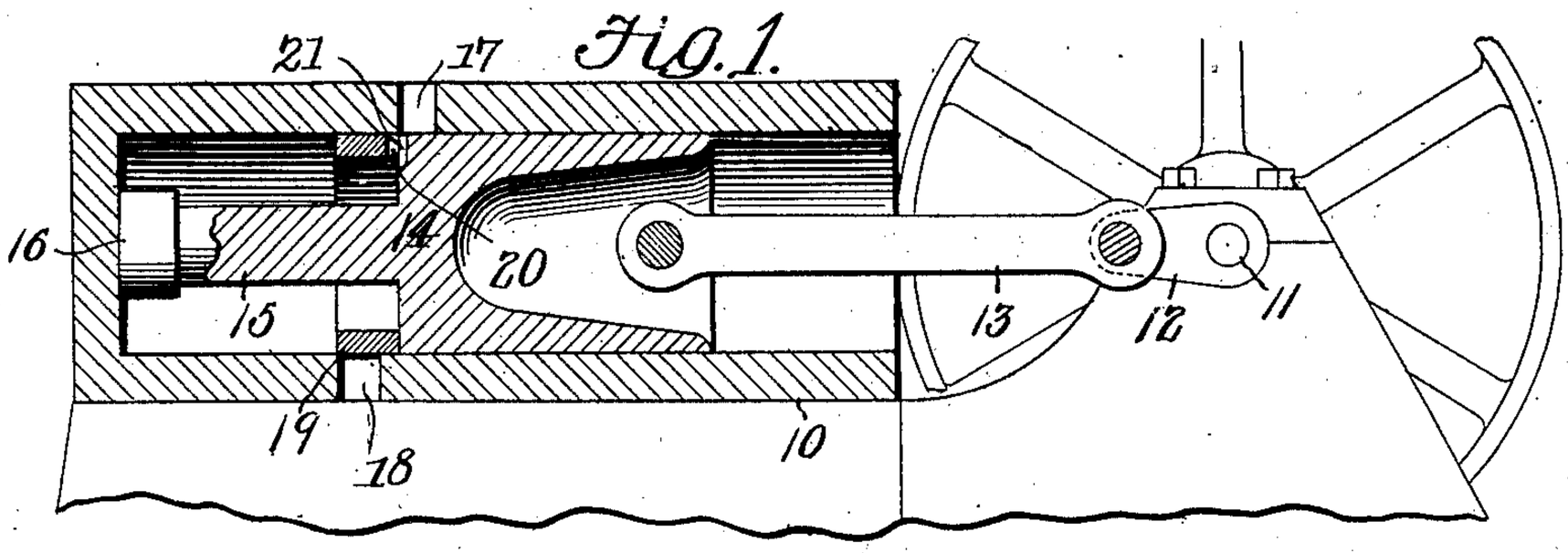


Fig. 2.

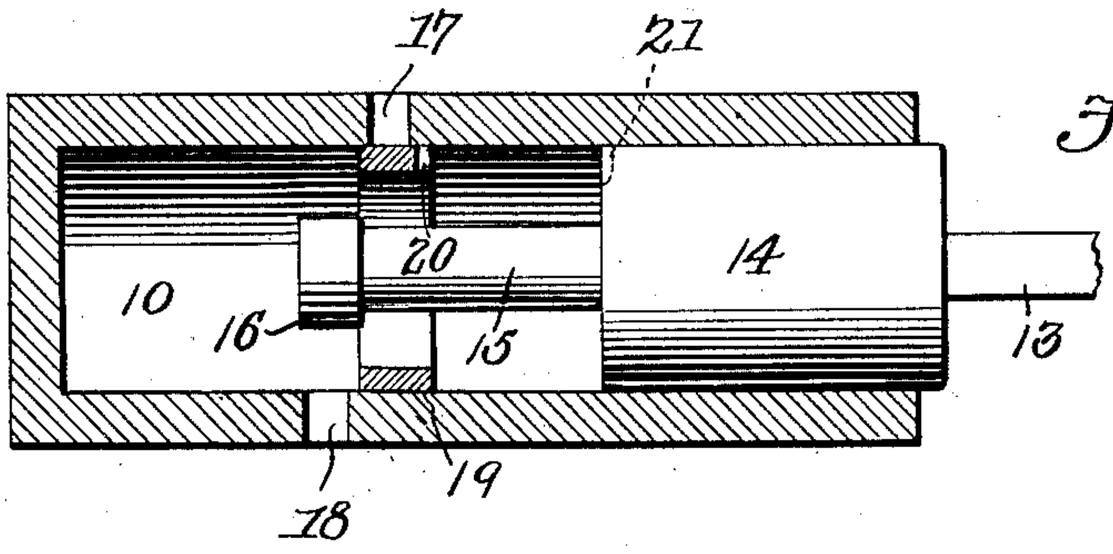


Fig. 3.

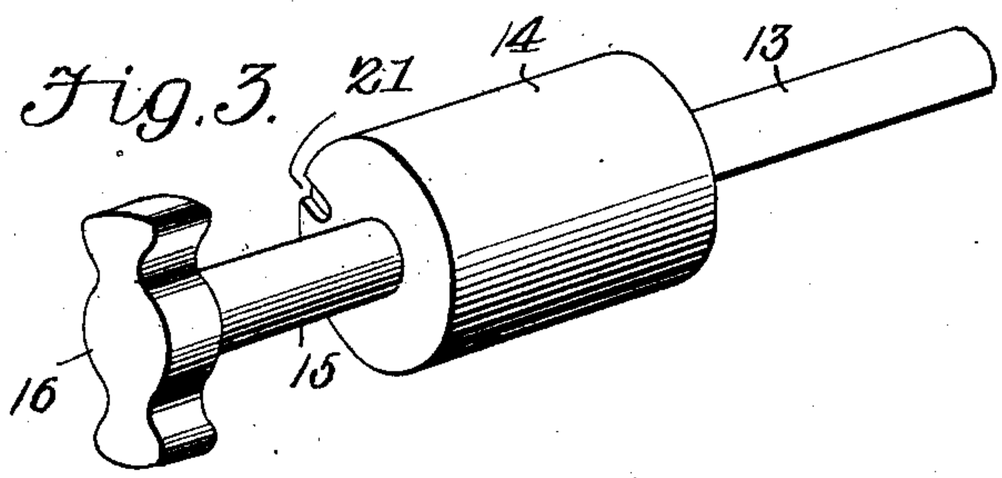
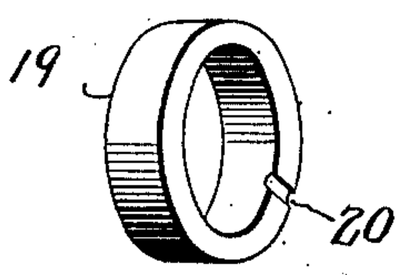


Fig. 4.



WITNESSES:

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ENGINE.

No. 827,107. Specification of Letters Patent. Patented July 31, 1906.

Application filed December 6, 1905. Serial No. 290,630.

To all whom it may concern:

Be it known that I, ELONZO ABLE MAYNARD, a citizen of the United States, residing at Hickory, in the county of Catawba and State of North Carolina, have invented a new and useful Engine, of which the following is a specification.

This invention relates to engines, and has for its principal object to construct a reciprocatory engine which may be operated by any fluid under pressure and in which outside valves, valve-operating mechanisms, and their connections and stuffing-boxes are rendered wholly unnecessary.

A further object of the invention is to provide an engine having a piston-controlled valve which controls both the admission and exhaust of the actuating fluid and in which the inlet and exhaust ports are formed directly in the wall of the cylinder, so that an auxiliary or specially-formed valve-chamber is unnecessary.

A still further object of the invention is to provide a valve which may be made at small cost, may be readily renewed when necessary, and requires no adjustment after once being placed in position.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claim, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of an engine constructed in accordance with the invention, showing the piston at one end of the stroke. Fig. 2 is a similar view of the cylinder, piston, and valve with the piston at the opposite end of the stroke. Fig. 3 is a detail perspective view of the piston detached. Fig. 4 is a similar view of the valve detached.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The engine illustrated is of the single-acting type and includes a cylinder 10 and main shaft 11, carrying a crank 12, which is connected by a rod 13 to a piston 14, the piston shown being of the trunk type and arranged to reciprocate within the cylinder 10.

The inner end of the cylinder is provided with a stem 15, at the rear end of which is a cross-bar 16, extending diametrically across the cylinder and of a width slightly less than the diameter of the piston, so that it may reciprocate freely within the cylinder without coming into contact with the wall of said cylinder.

At one side of the cylinder is an inlet-port 17, that is connected to a boiler, reservoir, or other source of fluid-pressure supply, and at the opposite side of the cylinder is a discharge-port 18, through which the fluid exhausts when its work is completed. The inlet-port 17 is arranged somewhat nearer the crank-shaft end of the cylinder than the port 18, and both of said ports are under the control of a valve 19, which in the present instance is shown in the form of a ring fitting snugly within the cylinder and arranged when moved opposite the ports to entirely cut off communication between said ports and the interior of the cylinder. The outer edge of the ring or that edge which is engaged by the piston proper is provided with a small notch or groove 20, which when the parts are in the position shown in Fig. 1 will insure the passage of air from the inlet-port to the interior of the cylinder at a point to the rear of the piston for the purpose of driving the piston on the outstroke. The piston also may be provided with a groove 21 for a similar purpose, although either the notch or groove will answer. When used in connection with an engine having a fly-wheel or the like for starting or keeping the piston in motion, no groove will be necessary; but when used in connection with a pneumatic or similar tool it is desirable to employ some means for insuring admittance of the actuating fluid to start the piston into motion. As the piston moves outward the cross-bar 16 will engage with the rear edge of the ring 19 as the piston nears the limit of its forward movement, and the valve-ring will then be shifted to the position shown in Fig. 2, closing the inlet-port and opening the exhaust-port 19, so that the air, steam, or other fluid may escape during the return stroke of the piston, such return stroke being accomplished by the balance-wheel, if one is employed, a spring, or other suitable mechanism. During the return stroke the rear face of the piston proper will

engage with the ring and will move the latter from the position shown in Fig. 2 to the position shown in Fig. 1, whereupon the exhaust will be closed and the inlet-port opened for the admission of a fresh quantity of working fluid.

It is obvious that with a valve constructed in accordance with this invention no auxiliary chest is needed, and the valve-ring when worn may be readily renewed at comparatively small expense.

I claim—

The combination in an engine, of a cylinder having inlet and exhaust ports, a piston arranged to reciprocate in the cylinder and provided with a rearwardly-extending stem, a cross-bar carried by the stem, a valve-ring fitting tightly within the bore of the cylinder and movable alternately by the piston and cross-bar to control the inlet and exhaust ports, the valve-ring having a notch extending across one of its edges to facilitate admission of the fluid under pressure through the inlet-port when the piston is at the limit of its instroke.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELONZO ABLE MAYNARD.

Witnesses:

CHAS. W. SHERRILL,

W. J. KENNEDY.