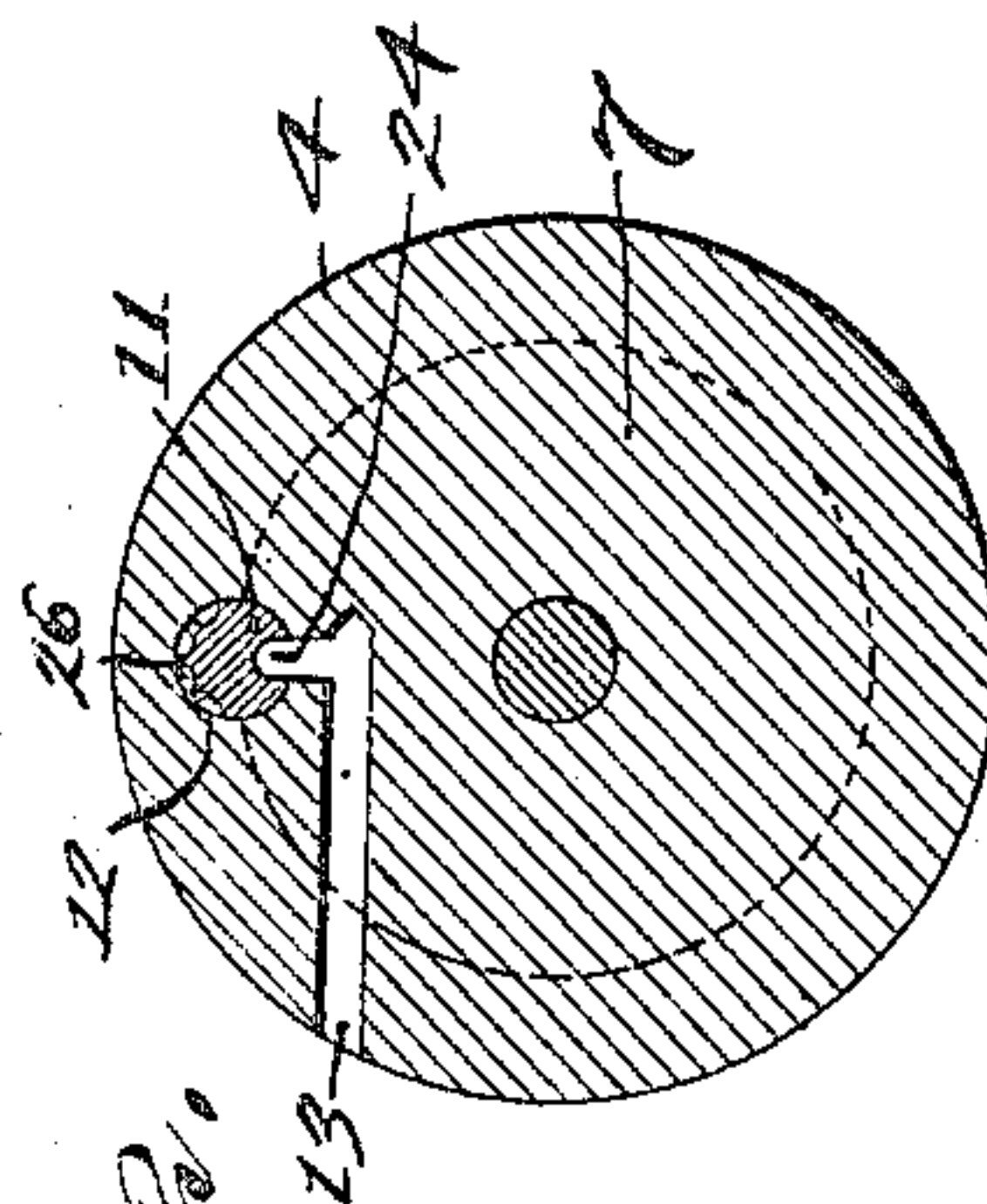
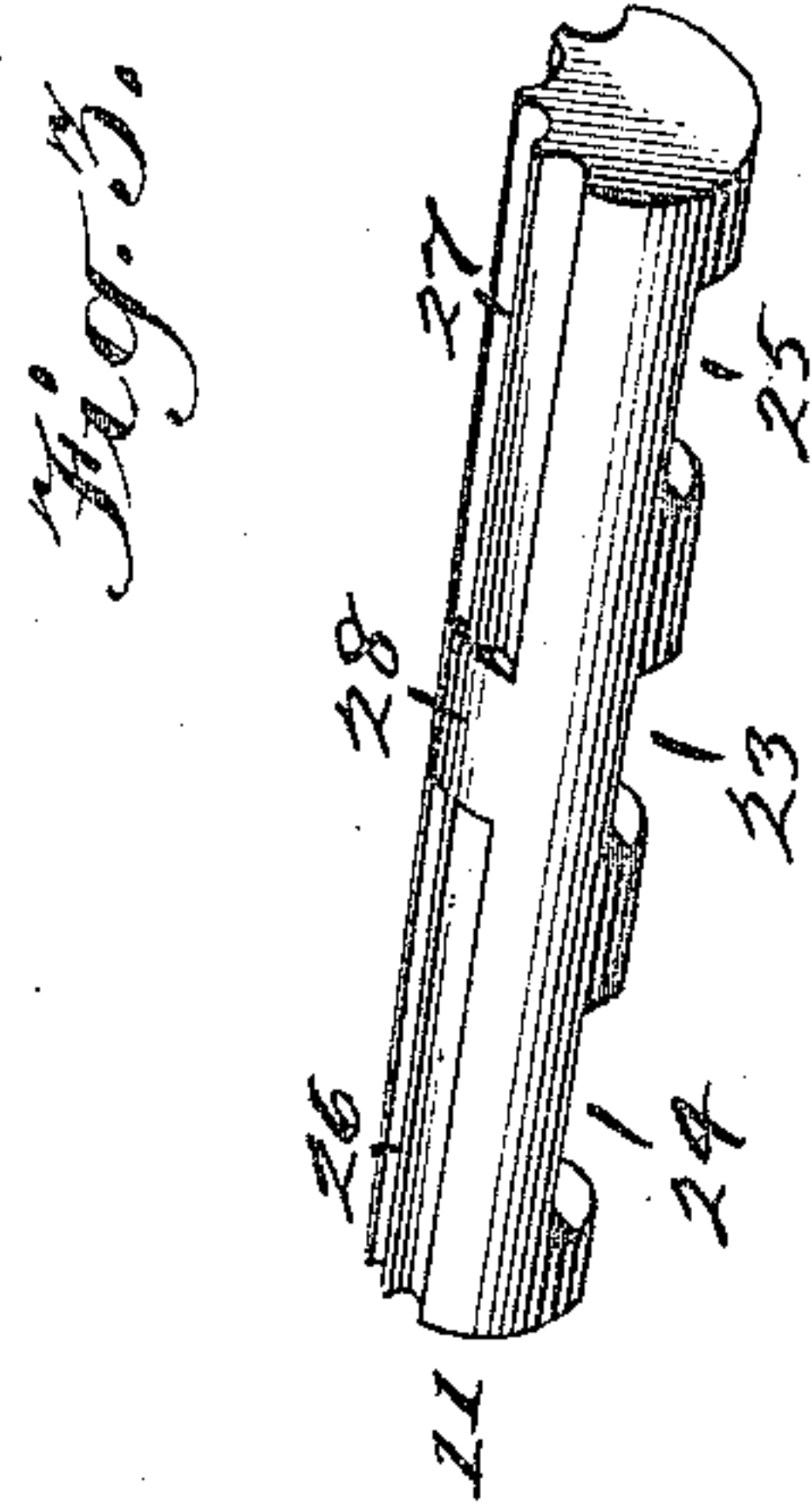
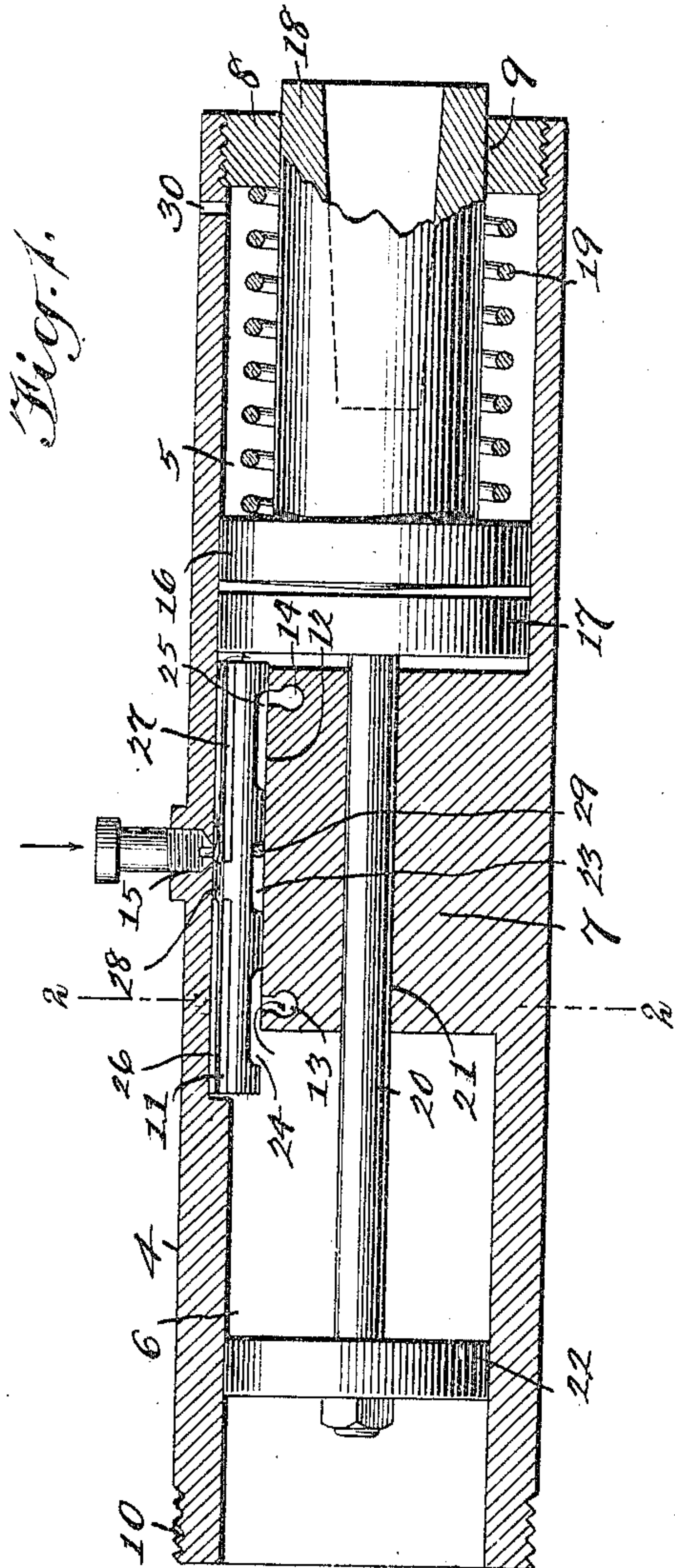


M. SHANER.
PNEUMATIC HAMMER.
APPLICATION FILED AUG. 27, 1914.

1,155,282.

Patented Sept. 28, 1915.



WITNESSES

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MACONIUS SHANER, OF BETHLEHEM, PENNSYLVANIA.

PNEUMATIC HAMMER.

1,155,282.

Specification of Letters Patent.

Patented Sept. 28, 1915.

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To all whom it may concern:

Be it known that I, MACONIUS SHANER, a citizen of the United States, and a resident of Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Hammers, of which the following is a specification.

My invention relates to tools adapted to be vibrated by compressed air, steam, exploding gases, or the like, and the object thereof is to provide a device wherein a rapidly reciprocating element is controlled by means of a valve actuated by said element, and which may not only be used for tools, but may also serve as an engine, or for rapidly striking a gong on street or other cars provided with a compressed air tank to serve as an alarm, thus avoiding the present necessity on the part of a motorman for banging his foot down repeatedly on the present gong striker actuating means, as merely a push button would suffice and the ringing of the gong would continue as long as the pressure was maintained on the said push button.

A further object is to provide a device of this class which is very simple in construction; which is composed of but few parts whereby the possibility of derangement is minimized; which renders the parts easy of access; and which is very low in initial cost of manufacture, and in maintenance.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which the separate parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a central, vertical, longitudinal, section taken through the barrel of a pneumatic tool constructed in accordance with my invention; Fig. 2 is a section taken on the line 2—2 of Fig. 1; and Fig. 3 is a detached view of a slide valve which I employ.

In the drawings forming a part of this application I have illustrated a present preferred form of embodiment of my invention, comprising a barrel 4 provided with end bores 5 and 6 with a partition 7 therebetween, the outer end of the barrel, in the position of the bore 5, being internally threaded to engage a plug 8 having a central opening 9 therethrough, and the oppo-

site end of the barrel is externally threaded at 10 for connection with the head or handle member, not shown.

The partition 7 is bored, in line with the side of the bore 5, to receive a slide-valve 11, said bore being designated 12, said barrel being transversely bored at 13 and 14 to communicate with the bore 12, and said barrel is also bored at 15 directly in line with the bore 12, the last named bore being approximately in the central, transverse, plane of the partition 7, whereas the bores 13 and 14 are adjacent corresponding ends of said partition and, consequently, at the approximate ends of the valve bore 12.

Slidable in the cylinder formed by the bore 5 are two pistons 16 and 17, the former of which is connected with a tool socket or clutch 18 slidable in the opening 9 of the plug 8, and normally held in inward position by means of a coil-spring 19, whereas the latter piston, 17, is connected with a piston rod 20 slidable in the partition 7, through a bore 21, and in turn connected with a piston 22 movable in the cylinder formed by the bore 6, the length of the piston rod 20 being considerably greater than that of the partition 7 to allow reciprocation of the said rod and connected pistons.

The slide-valve 11 consists of a cylindrical bar having three transverse grooves, 23, 24, and 25, therein, of which 23 is centrally arranged and the others adjacent the ends of the valve, and each of said grooves is of such longitudinal diameter as to permit the operation hereinafter described; these grooves are in the lower surface of the valve 11, and the upper surface thereof is longitudinally fluted from each end thereof, as shown at 26 and 27, to provide channels for the actuating fluid, a partition 28 dividing the fluted ends and being in the exact center of the valve but of such length as to permit of its clearing the inlet port formed by the bore 15, on each side thereof, in the reciprocation of said valve, and such reciprocation is limited by a pin 29 held in the barrel 4, within the groove 23, and which also serves to maintain the valve against rotary movement.

The parts are in position, in Fig. 1, for admitting the actuating fluid to the cylinder 5, between the partition 7 and piston 17, and for exhausting spent gases through the groove 24 and bore 13 leading to the outer air and, if the fluid be at this time admitted,

the piston 17 is forced outwardly, as is also the piston 16 and tool holder 18, the air passing into and out of the space between the piston 16 and plug 8 through a vent 30, until the piston 22 strikes the end of the valve 11 and moves the same to its alternate position, as determined by the pin 29; with the valve in this alternate position, the cylinder 6 is now open to the inlet port 15 and the cylinder 5 is open to the exhaust port 14 through the groove 25, and the piston 22 is forced to the left and carries the piston 17 therewith until it strikes the valve 11 and returns the same to the initial position shown and, as soon as the piston 17 moves inwardly, the spring 19 forces the piston 16 and connected tool holder inwardly, ready for another impact by the piston 16.

When I use my device in connection with a gong, the spring 19 serves the additional purpose of forcing the hammer away from the gong to avoid deadening the vibrations of said gong, which would be very likely to occur when the pressure of the fluid held the hammer against the gong, said spring being made of sufficient strength to overcome the fluid pressure when at its point of greatest expansion, and the independence of the hammer from the piston 17 assists this result; when said piston is driven forwardly, it moves the piston 16 and tool carrier forwardly, the momentum of the piston 16 carrying it faster than the movement of the piston 17 as it approaches its extreme outward stroke, thus permitting the hammer to strike the gong and rebound therefrom, the spring maintaining it in its backward or rebound position.

Inasmuch as the piston 17 is the one performing the effective work, I prefer to make the cylinder 5 of a larger bore, transversely, than that of the cylinder 6, but this is arbitrary, as I will probably make the cylinders of equal bores when I use the device for other purposes, as for an engine.

In view of the state of the art, I have not considered it necessary to show the fluid conduits, nor the starting and stopping lever, these being not only old but being also subject to considerable latitude in choice, but I do disclose the very simple method of

manufacturing the device, and the very apparent simplicity of the device as a whole, and I also wish to draw particular attention to the very simple, though highly efficient, valve 11, and the means for maintaining the same in the desired position, and for limiting its stroke.

As stated, the device is applicable to various uses, and I reserve the right to make any necessary changes over the details of construction shown and described, within the scope of the following claim, to accommodate the device to such other uses.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is:—

A device of the class described, comprising a barrel provided with a cylinder in each end and with a centrally arranged inlet port, a partition arranged centrally of said barrel and provided with an outlet port adjacent each end thereof, a piston in each cylinder, a rod connecting said pistons, a supplemental piston in one of said cylinders adapted to be outwardly actuated by the corresponding one of said joined pistons, a spring for moving said supplemental piston inwardly, a tool carrier connected with said supplemental piston, and a valve controlling said ports and slidable in said partition by the impact of said joined pistons thereon, alternately, said valve comprising a cylindrical bar having three transverse grooves in one side thereof, the outer ones of which are adapted for alternate communication with the corresponding piston chambers and exhaust ports, and forming guiding flanges therebetween, and said bar having longitudinally arranged grooves from each end thereof to a predetermined point at each side of the center of said bar to form a partition between the two series of end grooves, and adapted to place the inlet port in communication with the two piston chambers, alternately.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MACONIUS SHANER.

Witnesses:

HARRY C. COPE,

BRIDGET A. SHARKEY.