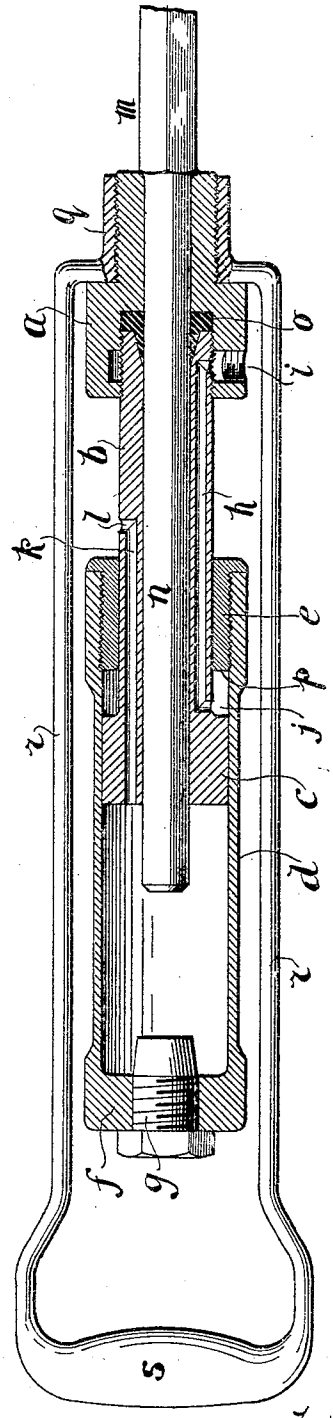
W. MAUSS.

PERCUSSION MACHINE.

APPLICATION FILED MAR. 18, 1908.

910,560. Patented Jan. 26, 1909.



Witnesses
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UNITED STATES PATENT OFFICE.

WILHELM MAUSS, OF BRAKPAN, TRANSVAAL.

PERCUSSION-MACHINE.

No. 910,560. Specification of Letters Patent. Patented Jan. 26, 1909.

Application filed March 18, 1908. Serial No. 421,763.

To all whom it may concern:

Be it known that I, WILHELM MAUSS, a subject of the King of Great Britain, and residing at The Victoria Falls Power Company, Brakpan Branch, Brakpan, Transvaal, have invented new and useful Improvements in Percussion-Machines, of which the following is a specification.

The present invention relates to fluid-actuated percussion machines applicable to rock-drilling, chipping, calking and like operations; such machines being of the type in which the cylinder is caused to reciprocate and deliver the blows.

The purpose of the present invention is to provide an improved machine of this class, the characteristic feature of which is that the tool projects through the hollow piston rod and into the rear space of the cylinder, so that the latter may operate directly upon or through it, while at the same time it is rigidly supported by or, as the case may be, forms a rigid support for the machine. Special holding and protecting means to suit this style of construction are provided.

The invention further provides for operating a machine of the class in question upon the system in which constant pressure is used on the working stroke, and the return stroke is effected by fluid intermittently admitted and usually also expanded; the machine being preferably constructed without a valve but so as to minimize the cushioning effect usually resulting therefrom.

In the accompanying drawing the invention is shown embodied in a valveless machine of the hammer type, the drawing showing a longitudinal section thereof.

a represents a block, suitably supported, into which is screwed the piston rod *b*. The piston *c* is fitted within the cylinder *d*, the cylinder cap *e* being removable for this purpose. The blow is delivered by the closed end *f* of the cylinder which is therefore made of considerable weight and strength and is preferably fitted with a renewable striker *g* which projects into the cylinder cavity as shown. *h* is a port by which full pressure working fluid (hereinafter referred to as air) from the inlet *i*, is constantly supplied to the annular space *j* in front of the piston; *k* is a port leading from the rear cylinder space and having a mouth *l* opening upon the periphery of the piston rod.

The tool *m* which may be a rock drill, calking tool or otherwise according to the work to be accomplished, has a cylindrical shank *n* which passes through the block *a*, the piston rod *b*, and the piston *c*, so as to project a convenient distance to the rear of the latter. Leakage of air from the cylinder along the tool is prevented by a packing *o* which may conveniently be secured within the block *a* by screwing in the piston rod *b* onto it.

In operation, the parts being in the position shown and the back of the cylinder being open to atmosphere through port *k*, air is admitted through inlet *i* and port *h*, and acting on the shoulder *p* drives the cylinder forward and causes it to deliver a blow upon the tool shank. During such stroke mouth *l* of the port *k* becomes covered by the cylinder cap *e* and consequently compression takes place in the rear of the cylinder, but owing to the large volume of dead space arising from the projection of the drill shank beyond the piston and the counter projection of the striker *g*, such compression is prevented from rising to such a degree as to seriously impair the force of the blow. Immediately before impact the port *k* is caused to open into space *j* whereby live air flows to the back of the piston, driving the cylinder back and operating expansively as soon as the cap again covers the mouth *l*. Upon the port *k* being once more opened to atmosphere the expanded air exhausts from behind the piston and the operation is repeated.

In order to adapt the machine for hand use, there may be secured to the block *a* a frame *q* having two or more longitudinal members *r* terminating beyond the rear end of the cylinder in a hand grip *s*. It will be evident that such frame also serves to protect the working parts of the machine from injury, and it may obviously be elaborated to any extent which the necessity of more effectively performing this latter function may render desirable.

What I claim is:—

1. In combination, a fixed piston and piston rod bored to permit a tool shank to be passed through them and a cylinder reciprocable upon the piston and adapted to deliver blows through the tool.

2. In combination, a fixed piston and piston rod, having a central aperture to permit a tool shank to be passed through them, a tool shank passing through said aperture and projecting beyond the rear of the piston,

and a cylinder reciprocable upon the piston and adapted to deliver blows upon the projecting end of the tool shank.

3. In a percussion machine, a reciprocable cylinder having a renewable striker projecting within the cylinder for the purpose of forming dead space therein.

4. In combination, a fixed piston and piston rod, a cylinder reciprocable thereon and operating as a percussion member, said piston rod projecting forwardly beyond the cylinder, means for supplying constant air pressure to the annular cylinder space surrounding the piston rod, the working stroke of the cylinder being effected by such pressure, a port in the piston and piston rod communicating with the rear cylinder space and opening upon the piston rod periphery, said port being arranged to communicate alternately with the atmosphere and with the cylinder space aforesaid.

5. In combination, a fixed piston and piston rod a cylinder reciprocable thereon, said piston rod being extended forwardly beyond the cylinder and being bored to receive a tool shank and holding means comprising a part fixed to the piston rod, longitudinal members extending to the rear of the cylinder and a hand grip in which said longitudinal members terminate.

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

WILHELM MAUSS.

Witnesses:

WILLIAM H. VINCENT,

ALFRED L. SPOOR.