No. 891,519. PATENTED JUNE 23, 1908.

R. L. AMBROSE.

ROD PACKING.

APPLICATION FILED DEC. 4, 1906.

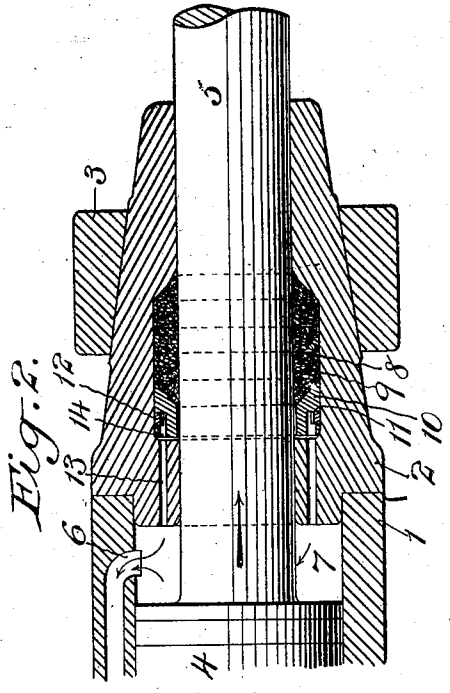


Fig. 2.

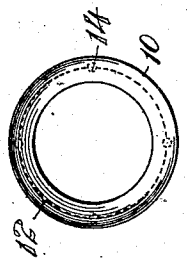


Fig. 6.

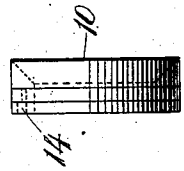


Fig. 5.

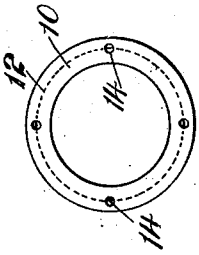


Fig. 4.

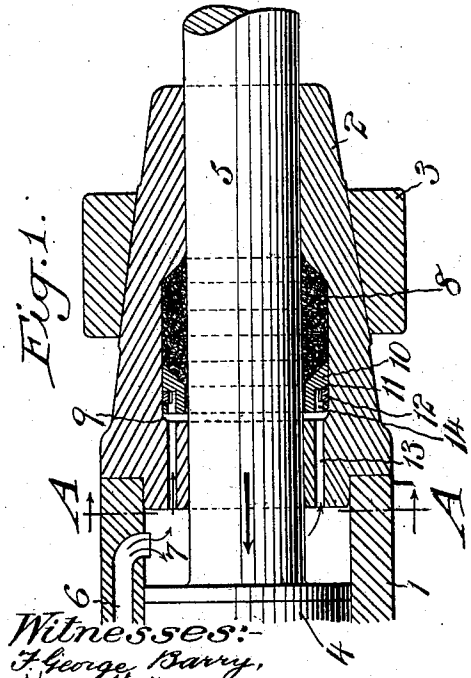


Fig. 1.

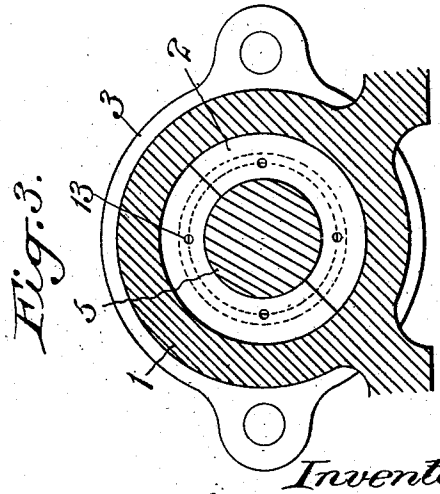


Fig. 3.

Witnesses:-
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Henry Steine.

Inventor.
Robert L. Ambrose
by attorneys
Brown Howard

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UNITED STATES PATENT OFFICE.

ROBERT L. AMBROSE, OF NORTH TARRYTOWN, NEW YORK, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ROD-PACKING.

No. 891,519. Specification of Letters Patent. Patented June 23, 1908.

Application filed December 4, 1906. Serial No. 346,245.

To all whom it may concern:

Be it known that I, ROBERT L. AMBROSE, a citizen of the United States, and resident of North Tarrytown, in the county of Westchester and State of New York, have invented a new and useful Improvement in Piston-Packing, of which the following is a specification.

My invention consists broadly in an efficient packing for the piston rod of a work cylinder which packing is automatically tightened and loosened according to the direction in which the piston rod is moving, and consists more particularly in a packing which is in open communication with the chamber at the front side of the piston so that the packing is automatically tightened around the piston rod when pressure is applied within the chamber to move the piston rearwardly away from its work and is loosened when the space in front of the piston is opened to exhaust and the piston is moved forwardly to strike its blow. This arrangement will prevent leakage around the rod when the motive fluid is used to move the piston rearwardly thus permitting the motive fluid to use its full power and will permit the rod to be freely moved forwardly to strike its blow.

My invention further consists in novel features of construction of the several parts for accomplishing the results above set forth.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Figure 1 is a detail longitudinal central section through the front portion of a work cylinder and its head, the piston and its rod being shown in full lines and the packing being shown in its tightened position around the rod, Fig. 2 is a similar view showing the packing in its loosened position, Fig. 3 is a cross section taken in the plane of the line A—A of Fig. 1, looking in the direction of the arrows, and Figs. 4, 5 and 6 are respectively rear, side and front views of the follower.

The work cylinder is denoted by 1 and its front cylinder head by 2, which head is herein shown as divided longitudinally and held in position by a sleeve 3. The piston is denoted by 4 and its rod which works through the cylinder head 2 is denoted by 5, to which rod the tool, not shown herein, may be attached. The front port 6 of the cylinder, opens into the chamber 7 in front of the piston 4, which port serves alternately as a motive fluid inlet port and an exhaust port. The packing 8 surrounds the piston rod 5 and is located in an annular recess 9 in the front cylinder head 2. A follower 10 of ring form is located within the recess 9 and surrounds the rod 5, which follower is arranged to exert a greater or lesser endwise pressure on the packing 8 according to the direction in which the rod is moving as will hereinafter appear. This follower 10 is provided with a circumferential groove 11 in which a packing ring 12 is located.

One or more passages 13 open communication between the recess 9 at the back of the follower 10 and the chamber 7 in front of the piston 4. In the present instance, four of the passages 13 are shown arranged longitudinally in the front cylinder head 2. The packing ring 12 is expanded to produce the required amount of frictional resistance to the slight forward movement of the follower by providing one or more passages 14 in the follower which open communication between the groove 11 at the back of the ring 12, and the recess 9 at the back of the follower 10.

In the accompanying drawings, I have shown the front wall of the follower flared in one direction, the front wall of the recess 9 flared in the opposite direction and the packing having its ends tapered to fit the same for facilitating the tightening and loosening of the packing owing to the slight movement of the follower.

In operation, as the motive fluid is fed to the cylinder chamber 7 through the front port 6 to move the piston 4 rearwardly, the packing 8 is tightened around the rod 5 by the fluid pressure exerted upon back of the follower 10 from within the chamber through the passages 13, the packing ring 12 being also expanded to exert a frictional resistance, to prevent too great a pressure of the follower on the packing. This tightening of the packing around the rod will prevent all leakage at this point and thus enable the motive fluid to utilize its full power for moving the piston rearwardly. As the piston is started on its forward or striking movement, the chamber 7 is open to exhaust through the front port 6, and the pressure on the back of the follower is withdrawn, as well as the pressure on the back of the follower packing ring. The packing 8 is thereby permitted to

expand longitudinally and release its pressure on the piston rod, thus permitting the rod to slide freely forward to impart a substantially unretarded blow to the work being operated upon.

The follower will act in the proper manner to tighten and loosen the packing until the packing is worn out thus materially adding to the efficiency of the packing.

While I have shown my invention in connection with a drill cylinder, it is to be understood that I do not wish to limit myself to such a device but that I wish to cover the invention wherever applicable.

What I claim is:—

1. A cylinder, its piston, a packing for the piston rod, a follower controlled by pressure from the motive fluid which reciprocates the piston for automatically tightening the packing around the rod when the piston is moved in one direction and permitting the packing to loosen when the piston is moved in the opposite direction and a packing ring surrounding the follower for imparting a frictional resistance to the movement of the follower.

2. A cylinder, its piston, a packing for the piston rod, a follower controlled by pressure from the motive fluid which reciprocates the piston for automatically tightening the packing around the rod when the piston is moved in one direction and permitting the packing to loosen when the piston is moved in the opposite direction and a packing ring surrounding the follower controlled by the said motive fluid pressure for imparting the desired frictional resistance to the advance movement of the follower.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 30th day of November 1906.

ROBERT L. AMBROSE.

Witnesses:
JAMES WALTER TALMADGE,
MILLARD M. DE WITT.