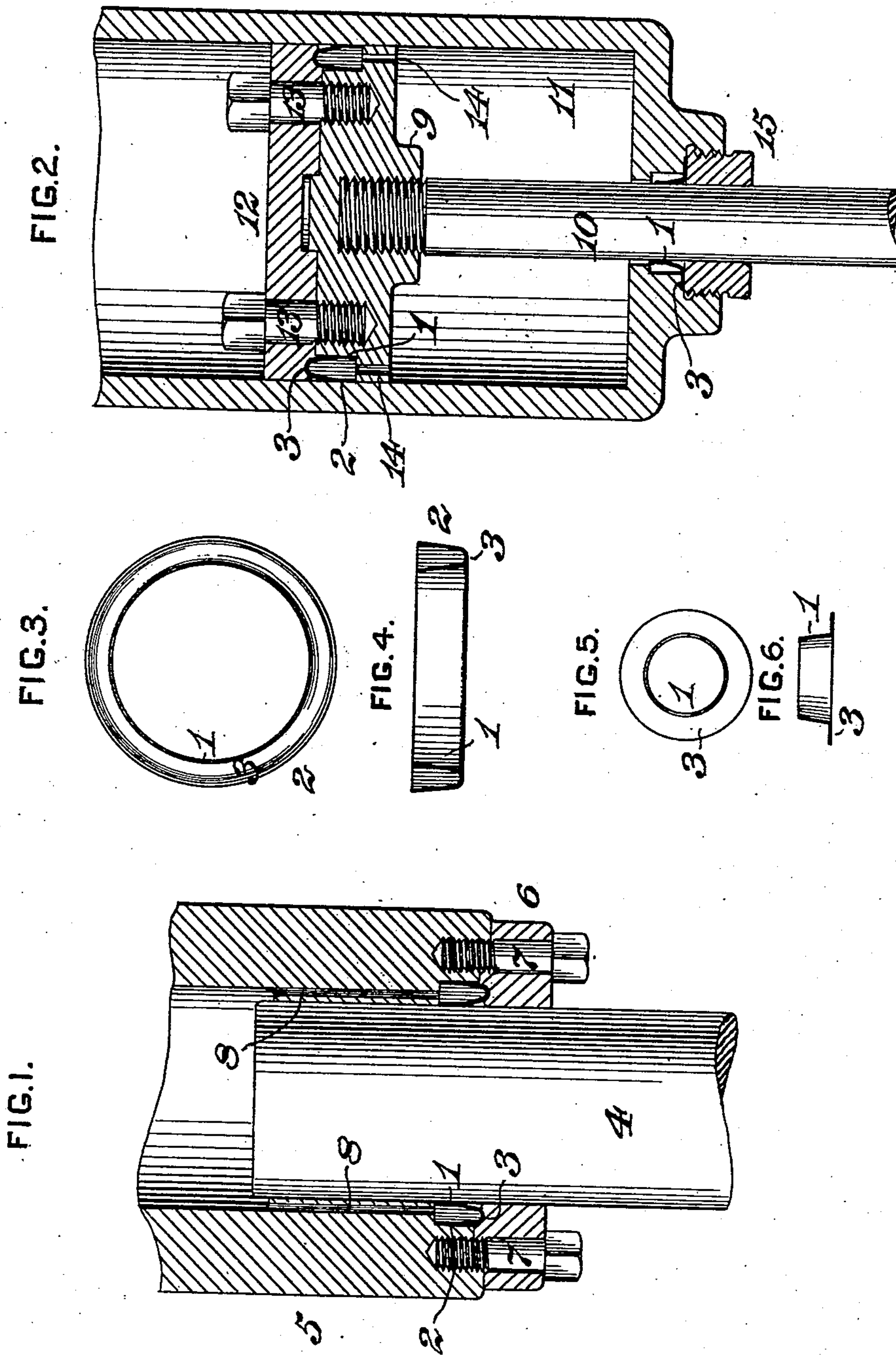


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W. S. HALSEY.
METALLIC PACKING FOR PISTONS, RODS, &c.
APPLICATION FILED FEB. 14, 1902.

NO MODEL.



WITNESSES:

James C. Heron.
S. R. Bell.

INVENTOR

William S. Halsey.
by S. R. Bell.

Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM S. HALSEY, OF PITTSBURG, PENNSYLVANIA.

METALLIC PACKING FOR PISTONS, RODS, &c.

SPECIFICATION forming part of Letters Patent No. 739,859, dated September 29, 1903.

Application filed February 14, 1902. Serial No. 94,084. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. HALSEY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Metallic Packing for Pistons, Rods, &c., of which improvement the following is a specification.

My present invention is an improvement upon that for which Letters Patent of the United States, No. 671,551, were granted and issued to me under date of April 9, 1901; and its object is to provide a packing-ring by means of which, as in the device of Patent No. 671,551 aforesaid, a fluid-tight joint may be made and maintained without undue friction between a cylinder and a piston, piston-rod, or plunger working therein, and which shall, further, be of such construction as to enable the expanding forces acting upon it to be more effectively exerted and to be conveniently adapted for location and retention in operative position.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a longitudinal central section through a portion of a cylinder fitted with a plunger or ram, illustrating an application of my invention; Fig. 2, a similar section through a cylinder and piston with my invention applied to the latter; Fig. 3, a view in elevation of a packing-ring detached; Fig. 4, a diametral section through the same; Fig. 5, a view in elevation, showing a modified form adapted for application in a piston-rod stuffing-box; and Fig. 6, a diametral section through the same.

In the practice of my invention I provide a packing-ring which is formed of light sheet metal possessing a greater or less degree of elasticity—as soft steel, copper, or brass—said packing-ring being made by drawing a flat annular plate of such metal into the form of an annulus of U or channel section. The inner shell 1 and outer shell 2 of the packing-ring are tapered or inclined from the intermediate annular connecting-body of metal 3 oppositely—that is to say, in the directions of the fixed and the moving members, against which, respectively, the shells are designed to abut, and the diameter of each shell at its end farther from the connecting-body 3 is

made slightly greater than the diameter of the bore or the cylindrical body, as the case may be, against which it is designed to abut.

As shown in Fig. 1, my improvement is illustrated as applied for packing the joint between a plunger or ram 4, working in a cylinder 5, and a head or cap 6, which is secured to the cylinder by bolts 7. The packing-ring is fitted in a recess or counterbore at the end of the cylinder, with the open end of the annulus facing the latter and the closed end resting on the cap 6. The fluid under pressure in the cylinder is admitted to the space between the inner and outer shells of the packing-ring through ports 8, formed in the wall of the cylinder, and the pressure of said fluid acting in unison with the expansive tendency of the oppositely-tapered or inclined inner and outer shells forces said shells against the periphery of the plunger and the bore of the recess in which the packing-ring is held and effects and maintains a fluid-tight joint between the plunger and cylinder without inducing excessive friction or undue resistance to the movement of the plunger.

Fig. 2 shows the application of my improved packing-ring to a piston 9, which is fixed upon a piston-rod 10 and is adapted to reciprocate in a fluid-pressure cylinder 11. The piston-rod works through a stuffing-box provided with a gland 15. The packing-ring is fitted in a circumferential recess on the piston 9 and is held in position by a follower 12, secured to the piston by follower-bolts 13. Fluid under pressure is admitted to the space between the inner and outer shells of the packing-ring through ports 14, formed in the piston. The shells are forced and held against the bore of the cylinder and the circumferential bearing on the piston and tight joints with these surfaces made and maintained by fluid-pressure and the elasticity of the shells, as in the instance first described.

Figs. 2, 5, and 6 illustrate a modified form of packing-ring adapted for application in piston-rod stuffing-boxes. In this instance the outer shell 2 is omitted and the inner shell 1 is inclined inwardly from the surrounding annular body 3 and is of slightly less diameter than the piston-rod 10, against which it is pressed by its own elasticity and the pressure of the fluid in the cylinder,

which acts upon it through a loose fit between the piston-rod and the head of the cylinder. The packing-ring is held in position by clamping its body between the cylinder-head and the gland 15.

It will be seen that my improved packing-ring is simple, light, and inexpensive in construction and that it may be readily inserted in and removed from operative position relative to a piston, plunger, or piston-rod. A substantial advantage is attained in the capability of presenting a double obstruction to leakage of fluid without involving increased friction or additional members, this being due to the expansion of the shells against both an inner and an outer surface and their connection by an integral and unbroken body, which forms with the shells a chamber in which the expansive action of fluid under pressure may be effectively exerted.

I claim as my invention and desire to secure by Letters Patent—

1. A packing-ring formed of light sheet metal, possessing elasticity, drawn into an integral and unbroken annular body and a shell and projecting from the inner side thereof, said shell being tapered or inclined away from the body to a diameter slightly less than that of the surface against which it is to abut when placed in operative position.

2. A packing-ring formed of light sheet metal possessing elasticity, drawn into an integral and unbroken annular body and inner and outer shells, said inner and outer shells being slightly tapered or inclined in opposite directions from the intermediate an-

nular connecting-body and forming therewith a chamber of U or channel section.

3. The combination of a cylinder, a movable member, as a piston or plunger, fitted to traverse therein, and an integral and unbroken packing-ring of elastic sheet metal, interposed between and bearing on the cylinder and the movable member, said packing-ring being of U or channel section and having its inner and outer shells slightly tapered or inclined in opposite directions from the intermediate annular connecting-body, and abutting against the cylinder and movable member, with the annular chamber between said shells open to the pressure in the cylinder.

4. The combination of a cylinder, a piston fitted to reciprocate therein, an integral and unbroken annular packing-ring of elastic sheet metal of U or channel section fitted in a circumferential recess on the piston and having its inner and outer shells slightly tapered or inclined in opposite directions from an intermediate connecting-body, and bearing, respectively, on the piston and the cylinder, a follower connected to the piston on the side of the recess thereof adjoining the body of the packing-ring, and a port in the piston for the admission of pressure to the chamber between the inner and outer shells of the packing-ring.

WILLIAM S. HALSEY.

Witnesses:

J. SNOWDEN BELL,
CLARENCE A. WILLIAMS.