

J. G. WILLARD.  
Packing for Pistons, Plungers, &c.

No. 221,202.

Patented Nov. 4, 1879.

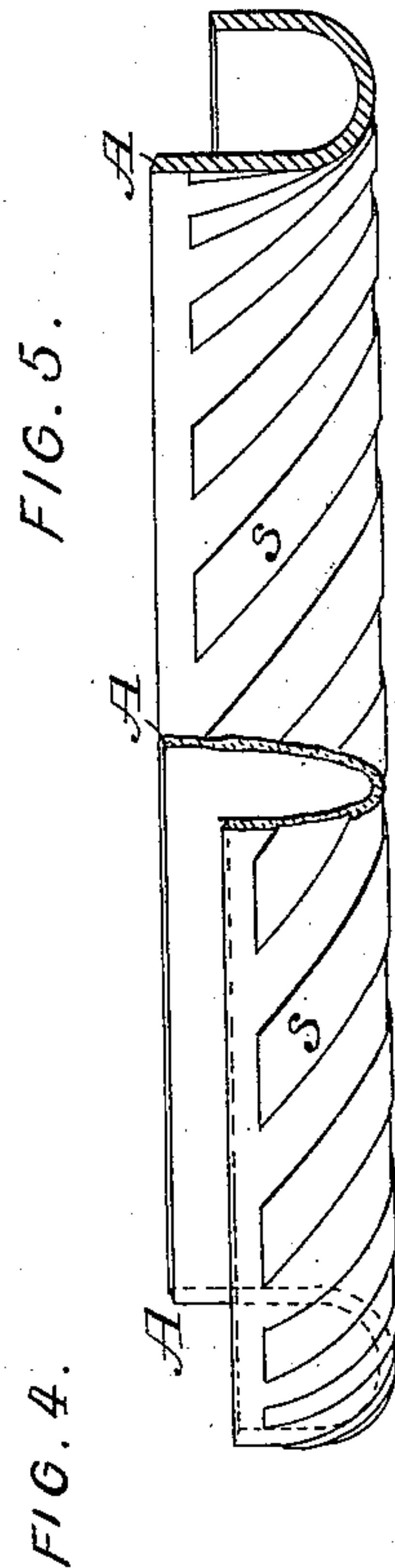
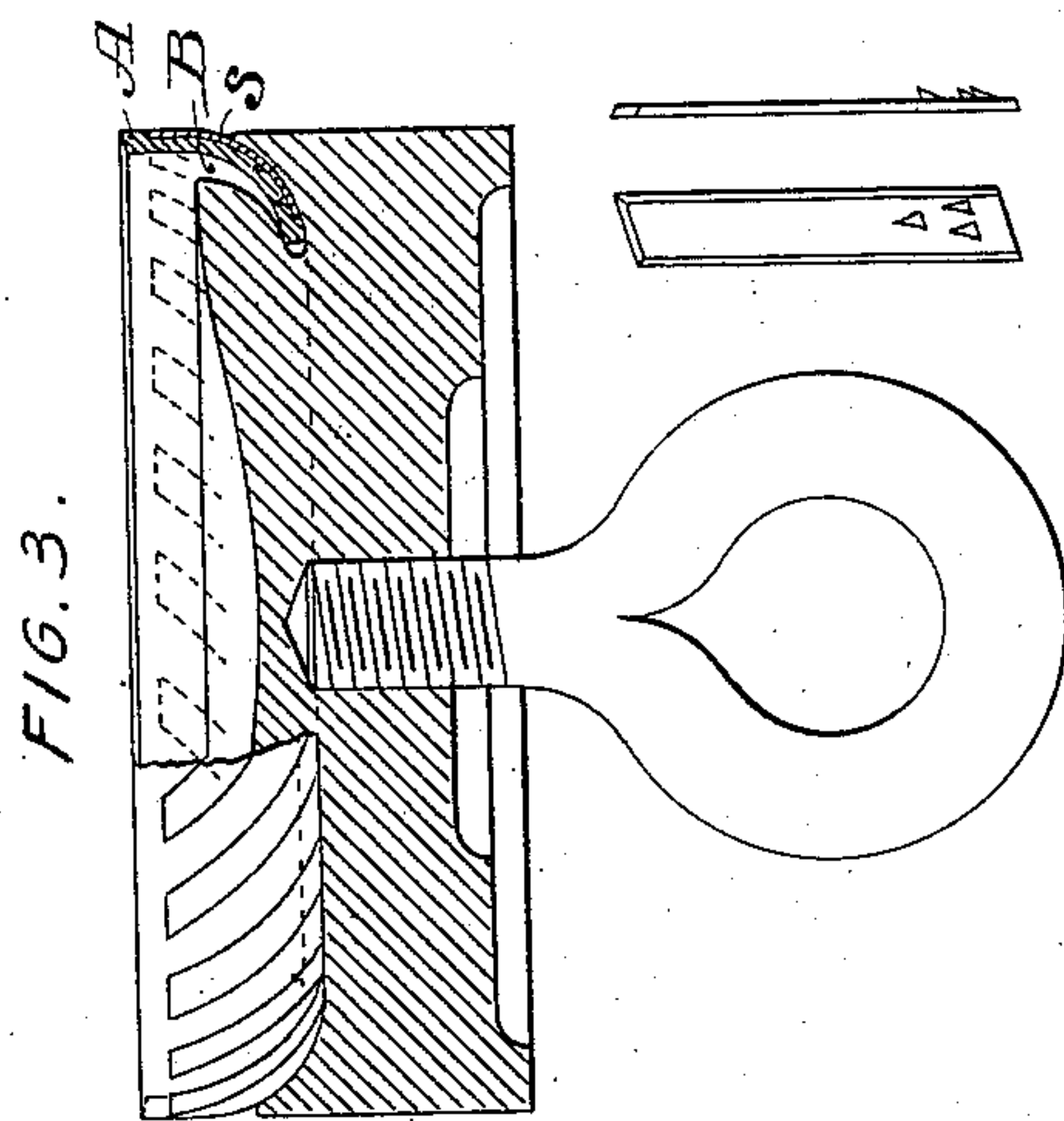
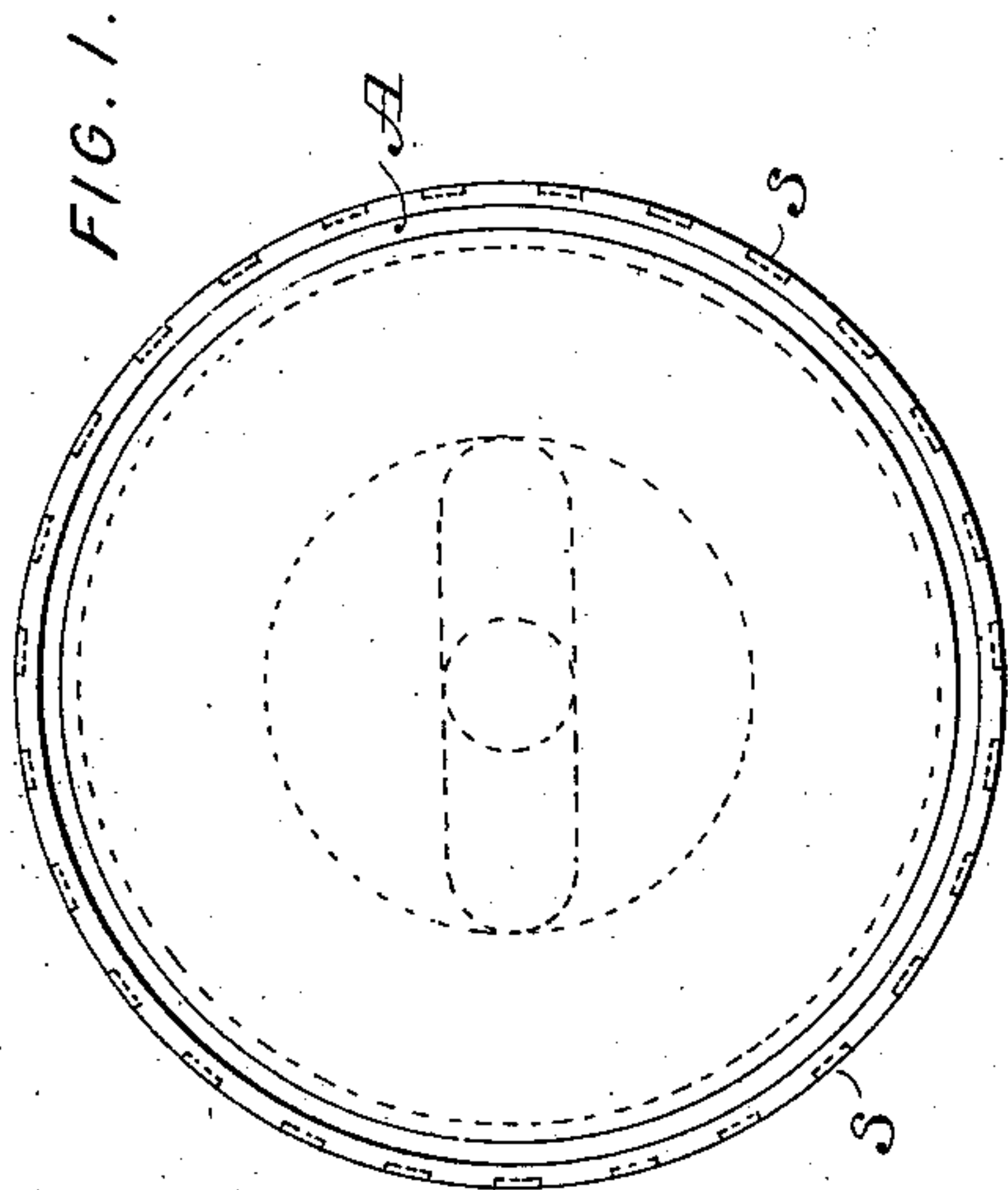
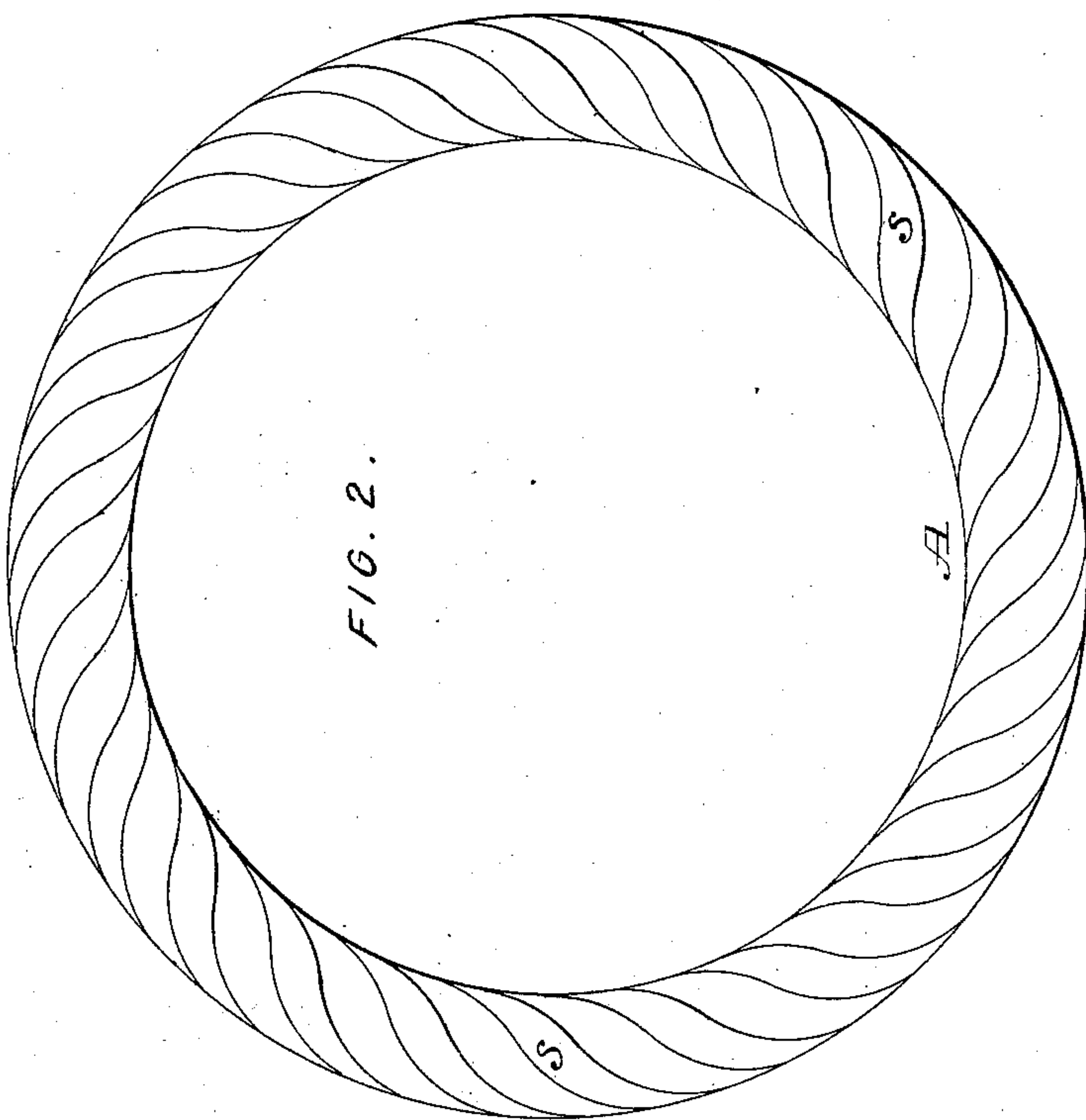


FIG. 5.

WITNESSES.

C. Fiebert. Nagle  
H. R. Gantt

Joel G. Willard  
By Boyd Elist for the  
att'y  
INVENTOR.

# UNITED STATES PATENT OFFICE

JOEL G. WILLARD, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN PACKINGS FOR PISTONS, PLUNGERS, &c.

Specification forming part of Letters Patent No. **221,202**, dated November 4, 1879; application filed September 9, 1878.

*To all whom it may concern:*

Be it known that I, JOEL G. WILLARD, of Brooklyn, county of Kings, State of New York, have invented a new and useful Improvement in Packings for Pistons, Plungers, &c., which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a plan of a piston, showing the edge of the cup-shaped leather packing. Fig. 2 is a plan of another form of the packing. Fig. 3 is a section of Fig. 1. Fig. 4 are views of the metal strips to be used with the packings, and Fig. 5 is a partial section and elevation of Fig. 2.

This invention pertains to certain improvements upon the well-known cup-shaped leather or rubber packings, which have one edge connected with the piston, and the other is turned out and toward the direction of the pressure, so that in meeting it the packing is expanded, and thereby makes a tight joint between it and the cylinder.

The invention consists in the application of soft-metal strips, or their equivalents, upon the exterior surface of the said packing in such a manner as to permit the elastic material to come in contact with the exterior working-surface of the cylinder, and at the same time bring some portion or portions of the said strips over the said entire working-surface, whereby it (the soft metal) may fill the pores of the metal of the cylinder and keep its working-surface always smooth.

The elastic portion of the said packing is shown at A, and may be attached in any manner to the piston or plunger, as at B, where it is represented as forced into a groove in the piston; or it may be fastened to a block by nails, or with a band around it, or in any other suitable manner. Upon the exterior of the said elastic packing strips of soft metal, as of copper, (shown at Fig. 4,) are fastened in such a position as to permit some portions of the

packing to press at all times against the surface to be packed or cushioned, and at the same time furnish a metal wearing-surface over the entire working-surface upon which the packing travels. This is best accomplished by inclining the said strips, as shown in the drawings, and the strips may be inserted between the packing and its outer band or support, as at S, Fig. 3, where one of the strips of soft metal is shown in section, and carried in between the packing and its exterior support, and in which case rasp-like projections may be formed upon the strips to engage with the soft packing to hold them in position during the movement of the piston or plunger or until they become embedded therein.

Instead of the metal strips, rivets of soft metal with broad heads may be used, and placed alternately with each other, or placed in inclined rows; but the strips are preferred, and are found to work the best in practice.

Packings so formed are well adapted to the cylinders of what are known as "water-elevators," and may be used either in the single or double cylinders, or with the telescopic pistons, where the form shown in Figs. 2 and 5 is quite applicable. It is also evident that such packings may be used in various kinds of pumps where metal cylinders are employed.

When the strips of metal are used their edges next to the packing may be beveled or chamfered to prevent their sharp corners from cutting into the packing; and it is evident that they may be held in position by tapering them at one end and turning the point in toward the packing to catch upon it.

I therefore claim—

The combination of the cup-shaped packing and the metal strips, substantially as and for the purposes set forth.

JOEL G. WILLARD.

Attest:

BOYD ELIOT,  
I. D. STELWELL.