To all whom it may concern:

Be it known that we, JOHN CRANE and FRANK E. PAYNE, citizens of the United States, residing at Maywood and Glenco, in the counties of Cook and Lake, respectively, and State of Illinois, have invented a certain new and useful Improvement in Metallic Packings and Methods of Making Same, of which the following is a full, clear, concise, and exact description.

This invention relates to improvements in metallic packing and more particularly to the general type of packing and the process of making the same disclosed in the prior patents of John Crane, 115344, August 24, 1915, and 1206306, November 28, 1916.

The packing illustrated in said patents is formed by helically winding a strip of metal foil back and forth on to a suitable core, said core being shown and described in the first of said patents as twine, soft metal wire, or any other suitable non-abrasive material, while the other of said patents discloses a relatively large core of resilient or expandable material, such as rubber, flax, canvas, or some suitable equivalent thereof. The strip of metal foil is wound on the core with a string or other tension member in order to insure a compact roll and to mechanically reinforce the finished product, whereby it may be coiled, rolled or bent without breaking. In other words, a flexible, metallic packing is produced. A suitable lubricating medium, such as graphite, is applied to the strip of foil as it is wound on the core. Either of these forms of flexible packing may be used in connection with the present invention, the former however, being preferred.

The primary object of the present invention is to provide a flexible metallic packing having a flexible resilient backing. Such a packing is well adapted for use on a rod, which is scored or shouldered or which is slightly out of line. It may also be used advantageously as a gasket, or in other classes of service where a pronounced cushioning effect is desired. Other objects and advantages will be apparent from the following description, taken in connection with the accompanying drawings, wherein several forms of the invention are illustrated.

In the drawings:

Figure 1 is a perspective view showing the manner in which the packing is wound.

Figure 2 is a plan view of a completed length of packing bent to circular form.

Figure 3 is a side elevation showing the packing wound as a helical coil.

Figure 4 is a cross sectional view of the packing illustrated in Figs. 2 and 3.

Figures 5, 6, 7 and 8, are cross sectional views illustrating other forms of the invention;

and

Figure 9 is a section through a stuffing box.

In Fig. 1 of the drawings, we have illustrated the manner in which the metallic packing is formed. The core is shown at 1 and may be of any suitable non-abrasive material, said core being rotated in any preferred manner, to permit of the metal foil 2 being conveniently wound thereon. Foil made of babbitt and other alloys containing lead, has been found well adapted for this purpose, although any soft non-frictional metal may be employed. A coating of graphite 3 or some other suitable lubricating medium is applied to the metal foil, as it is wound on to the core, whereby said lubricating medium is confined between the adjacent layers of the metal. If desired, the lubricating medium may be applied to the metal foil prior to the winding operation. A string 4 or other tension member is preferably made use of in winding the metal foil onto the core to permit of said foil being wound tightly into a compact roll. This string not only serves as a tension member, but also reinforces the finished product, rendering it possible to coil, roll or bend the same without injury, and thus insuring a flexible article.

After the metal foil has been rolled as above described, a suitable backing 5 of resilient or expandable material, such as rubber or some equivalent thereof, is applied thereto in any preferred manner. In the packing shown in Figs. 2, 3 and 4, it is
preferred to secure to the opposite sides of the backing 5 in any suitable manner, laminated strips of canvas and rubber or other non-abrasive material 6, or said strips may be bent to form a channel to receive said backing. These laminated strips 6 may be stitched to the backing 5 or vulcanized thereto, and extend above the face of the backing 5 to provide a channel for the reception of the metal foil packing. After this packing has been positioned on the backing 5 within the channel, the two are passed through rollers or dies which press them together into one composite structure, as shown particularly in Fig. 4. The strips 6 and the packing may be more securely united by stitching the same together, or by the employment of any other suitable fastening means.

In Figs. 5 and 6, the metal foil packing is applied directly to the backing 5, the laminated strips being dispensed with. The desired cross-sectional outline may be obtained by means of rollers. The cylindrical packing may be placed on the face of the backing and the two passed through rollers or dies which press them together. Stitching 7 or vulcanizing may then be used to hold the two together or they may be molded separately and assembled afterward.

Figs. 7 and 8 illustrate further forms of the invention, wherein the metal foil packing is pressed into suitable dove-tailed channels 8 or 9, in the backing 5, to thereby retain the same in position on said backing without the aid of additional fastening means, although the stitching and vulcanizing described in connection with the other forms of the invention may be employed as an additional security.

As a further modification of the various forms of packing previously described, the metal packing and the resilient backing may be held together by wrapping them with metal foil 10, as shown in Fig. 5 for example, instead of stitching them, or vulcanizing them. Such wrapping would be sufficiently strong to hold the parts against displacement until after they had been installed in a stuffing box, or other enclosure, after which it would be immaterial whether the holding means remained effective.

In Fig. 9 a stuffing box 11 is illustrated having a gland 12 held by means of studs 13, by means of which the packing 14 is compressed about the rod 15. The packing may be assumed to be any one of the various forms described herein.

It is well known that piston rods and similar reciprocating rods which require packing, do not always run exactly true, and in the use of packing therefore, the same is pressed either to one side or the other by the lateral motion of the rod. If the said packing is not-expandable, it does not return to its original position, to thereby maintain a tight joint. With the present packing, a tight joint is maintained, despite irregularities in the movement of the piston rod or other rod, by virtue of the resilient backing, which tends to hold the metal foil packing closely about the rod at all times. The packing herein described is also well adapted for use on a scored rod or shouldered rod.

It is obvious that various changes and modifications may be made without departing from the spirit of the invention, and the rights therefore reserved to make such changes as fall within the scope of the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A packing comprising a flexible metallic body and a flexible backing therefor.

2. A packing comprising a flexible metallic body and a flexible backing stitched thereto.

3. A packing comprising a core, a helical coil of metal about said core, lubricating means interposed between the adjacent layers of said coil, and a resilient backing for said coil.

4. The method of manufacturing packing which consists in first winding metal foil into a compact roll, pressing said roll to a rectangular cross section and then mounting it on the face of a resilient backing.

5. A packing comprising a resilient backing, laminated strips positioned on each side thereof, and projecting above the face of said backing, and a helical roll of metal foil mounted on said backing between said laminated strips.

6. As a new article of manufacture, a flexible roll of metallic foil formed as a ring and having a resilient backing on the side of the ring opposite the wearing surface.

7. A packing comprising a flexible metallic body and a flexible resilient backing therefor.

8. A packing comprising a backing in the form of a channel, and a flexible metallic body fitting within said channel.

9. A packing comprising a body portion, a backing therefor and strips adapted to be secured to the sides of said backing to hold the body portion in position thereon.

10. A new article of manufacturing comprising a flexible roll of metallic foil secured to a resilient backing.

11. A new article of manufacturing comprising a flexible roll of metallic foil secured to a resilient backing by means extending through said roll and said backing.

12. A new article of manufacturing comprising a flexible roll of metallic foil secured to a resilient backing by means join-
ing the adjacent faces of said roll and said backing.

13. The improved method of manufacturing packing which consists in pressing a roll of metallic foil into rectangular cross section and then fastening said metallic foil to a resilient backing.

14. A packing comprising a metallic body and a resilient backing vulcanized thereon.

In witness whereof we hereunto subscribe our names this 16th day of March, A. D. 1917.

JOHN CRANE.
FRANK E. PAYNE.