

J. CRANE.
 PACKING AND METHOD OF MAKING THE SAME.
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1,151,344.

Patented Aug. 24, 1915.

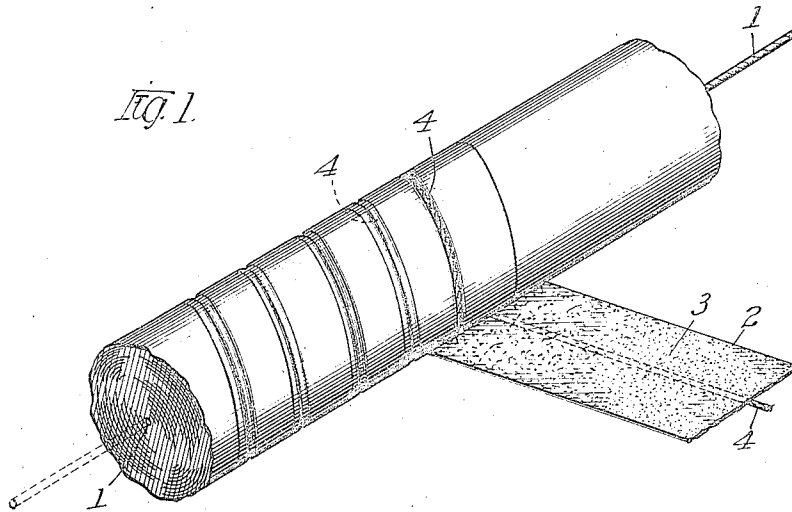
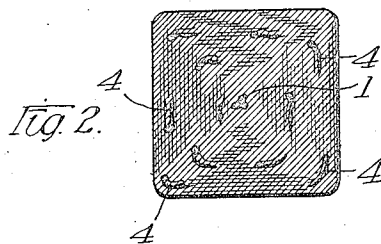


Fig. 3.

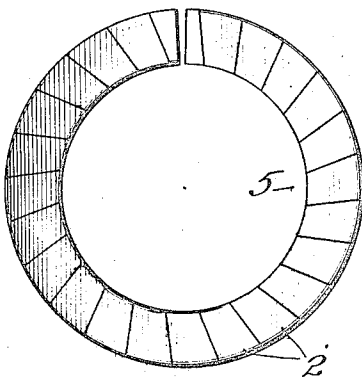
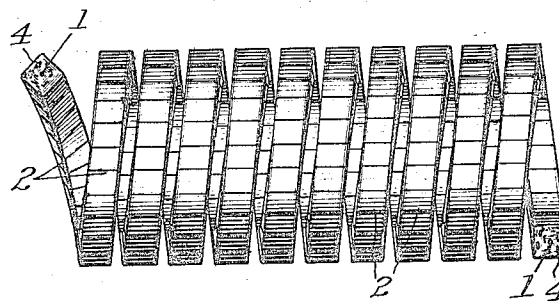


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PACKING AND METHOD OF MAKING THE SAME.

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To all whom it may concern:

Be it known that I, JOHN CRANE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Packing and the Method of Making the Same, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in packings such as employed for making fluid-tight joints.

In my prior Patent, 956,042 issued April 26th, 1910, over which the present invention is an improvement, I have shown a packing which, in the embodiment of the invention illustrated, consists of thin, superposed, flexible, metallic sheets rolled together in cylindrical form with a lubricating compound applied to the surface of said sheets, layers of fibrous material wrapped around the cylinder, and a protective coat of paint applied to the outer surface. Although long experience has demonstrated that said packing was a great improvement over other packings previously used, nevertheless, I have so improved both the method of manufacture and the product, that, by suitably reinforcing the latter throughout its mass, I can dispense with the outer layers of fibrous material and paint, thereby rendering the product not only more efficient for its purpose, but enabling it to withstand rough handling while being shipped and installed, despite such lack of outer covering. The production of a product having these important characteristics, constitutes therefore, the main object of my invention. As contributory to this object, I have, as further objects: to provide a packing, the metal foil of which may be tightly rolled; to provide a packing which may be made in long lengths; to provide a packing in which the outer surface is exposed and available for immediate use without a protecting covering, but which may nevertheless be bent or distorted to any degree necessary without breaking it into small parts; and to provide an improved method of manufacture better adapted to production on a commercial scale.

In the drawings: Figure 1 is a perspective view showing the manner in which the packing is wound. Fig. 2 is a cross-section of the completed packing. Fig. 3 is a top plan view of a finished length cut and bent into

circular form to surround a piston rod. Fig. 4 is a finished length of packing wound into helical form for convenient shipping.

In manufacturing my improved packing, I employ preferably a core 1 which may be made of almost any suitable non-abrasive material. One or more strands of flax twine is suitable for the purpose, although cotton, hemp or equivalent flexible cords, or brass, copper or other wire of relatively soft metal may be used. Thin metal strips or sheets are then wound about the core. I employ preferably a strip of metal foil 2 wound on helically whereby the adjacent turns overlap each other, although I do not necessarily limit myself to this construction. Various metals are suitable for this purpose. Lead, and alloys containing lead, are particularly advantageous. The strip or sheet of thin flexible metal has a coat of graphite or other lubricating compound 3 applied thereto, as it is being wound on to the core.

I find that it is very desirable to wind the metal foil tightly about the core. Since the metal is soft and easily torn, it is not feasible to maintain it under any considerable tension while it is being wound. However, I preferably employ a tension member to aid in the winding, which member may be string, cord, non-abrasive wire, or suitable equivalent material. I employ preferably twine 4 which I wind on with the metal foil, and which twine may be maintained under considerable tension, and which not only aids in wrapping the foil under such tension as it will stand, but which binds the helical turns as they are being wound, drawing the entire coil into a closely wound compact roll. Since the string as well as the metal foil is preferably wound helically on the core, the successive layers of both string and foil interlock, whereby the entire length of packing is firmly bound together and is reinforced. The string does not appreciably increase the thickness of the finished core, as the adjacent turns thereof are not close together, but are spaced apart a variable distance dependent on the pitch or spacing of the successive turns. More than one binding twine may be employed if desired under special conditions.

The final product is plastic and is preferably pressed or molded to give it a square or rectangular cross-section instead of the round cross-section which it assumes while being formed, although it may be molded

into other shapes if desired. The completed length of packing may then be either coiled up for shipment (see Fig. 4) or cut up and formed into rings or gaskets 5 (see Fig. 3);
 5 or it may be otherwise prepared so as to facilitate its ready installation by the user. By virtue of the string reinforcement, both core and helix, the final product may be readily bent into rings of small radius, if
 10 desired, without breaking apart. There is not enough string in the mass, however, to constitute an appreciable proportion thereof. On the contrary, practically the entire mass is made up of thin compact layers of
 15 foil with a lubricating compound between adjacent layers. Because of the compactness of the mass, there is more lubricating compound to a given volume of the packing, than if the structure were loosely rolled.
 20 The effectiveness of the packing as a lubricator, is therefore greatly increased, while at the same time, the packing is very plastic and may be readily deformed or pressed into any desired inclosure such as a stuffing
 25 box, so as to completely fill it. There is, furthermore, practically no waste as the packing is substantially uniform throughout, consisting of superimposed sheets of metal foil with interposed lubricating compound, not only near the outer surface thereof, but near the center as well.

By my improved method of manufacture, the packing may be made in larger lots and much more quickly than heretofore, due
 35 largely to the winding operation employing a long strip or band of foil as compared with the operation of rolling up a plurality of previously superimposed sheets. Of course, my improved process may be adapted
 40 to the rolling up of superimposed sheets also where desired, the string being employed to insure a tight winding, and to reinforce the finished product, enabling it to be bent without an outer fiber covering.
 45 Under certain favorable conditions of handling and installation, the binding string may also be dispensed with.

It is obvious that various changes may be made in the process and product described,
 50 without departing from the spirit of the invention as expressed in the appended claims.

I claim as my invention:—

1. A packing consisting of a core, metal

foil wound thereon and a fiber tension member interposed between successive turns of 55 the foil for insuring a compact product and for reinforcing it mechanically.

2. A packing consisting of a roll of metal foil with a string wound in it from end to end, the adjacent turns of the latter being 60 spaced apart so as not to appreciably increase the diameter of the final product.

3. A packing comprising a core, a helical roll of metal foil about said core and lubricating means between adjacent turns thereof. 65

4. A packing comprising a band of rolled metal foil, lubrication between the individual layers thereof, and a flexible non-abrasive tension member wound in with said foil. 70

5. A new article of manufacture consisting of rings of rectangular cross-section formed of metal foil rolled about a flexible core and having a flexible tension member wound in with said foil to reinforce it. 75

6. A new article of manufacture consisting of closely rolled metal foil sheets with lubrication between the adjacent turns thereof whereby the proportion of lubricating material to the metal is relatively high. 80

7. As a new article of manufacture, a string core, a lead foil strip wound helically thereon, a string superimposed on said strip and also wound helically with said strip and graphite between the adjacent turns of said 85 strip.

8. The method of manufacturing packing which consists in first forming a long metal foil strip into a compact roll with a helical string reinforcement in it, and then pressing said roll to a rectangular cross-section. 90

9. The method of manufacturing packing which consists in first forming a metal foil strip into a compact roll with string reinforcement in it from end to end, second, 95 molding said roll to a rectangular cross-section, and third, bending the product thus formed to substantially a circular outline.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses. 100

JOHN CRANE.

Witnesses:

DAHLIA ANDERSON,
 McCLELLAN YOUNG.