

(No Model.)

S. HUGHES.
PACKING FOR PISTON RODS.

No. 559,080.

Patented Apr. 28, 1896.

Fig. 1.

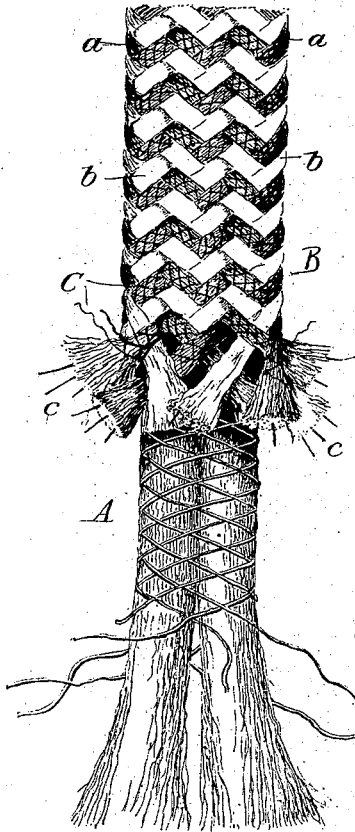


Fig. 6.

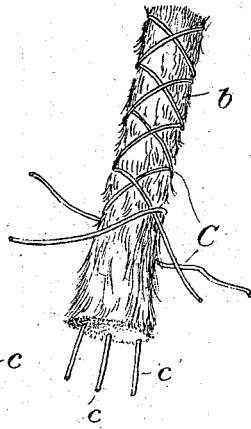


Fig. 3.

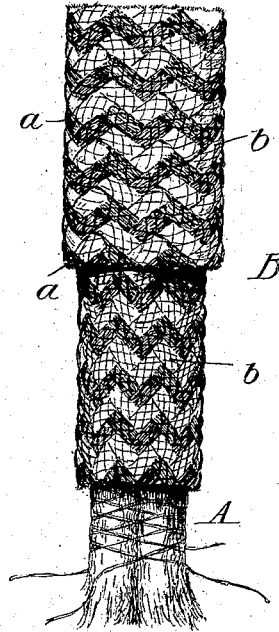


Fig. 4.

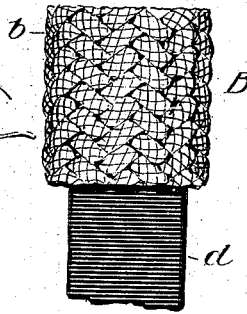


Fig. 2.

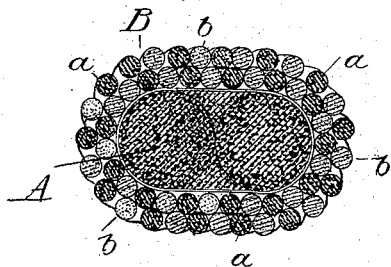
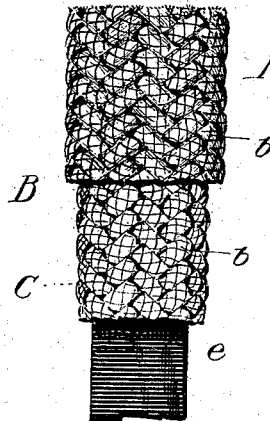


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL HUGHES, OF CHARLESTON, SOUTH CAROLINA, ASSIGNOR TO THE CHARLESTON METALLIC PACKING COMPANY, OF SAME PLACE.

PACKING FOR PISTON-RODS.

SPECIFICATION forming part of Letters Patent No. 559,080, dated April 28, 1896.

Application filed August 28, 1895. Serial No. 580,767. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HUGHES, a resident of Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Packing for Piston-Rods; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in packing for piston-rods, &c., and more particularly to such as employ fibrous material in their construction.

Heretofore in the construction of packings which combine metal with fiber it has been proposed to inclose the fiber by wire closely wound or braided thereon. Such construction not only prevents the proper insulation of the metal, but the fiber is so tightly inclosed by the wire that it is unduly hardened, thus rendering it necessary to force the packing up tightly in the stuffing-box in order to prevent leakage when in use, and when thus forced or cramped into the stuffing-box it will cause undue friction and wear. One of the chief difficulties encountered in the successful operation of combined metallic and fibrous packings as hitherto constructed resides in the fact that sight has been lost of the necessity of lubrication, it having been erroneously assumed that the metallic portions of the packing will constitute a sufficient lubricator, whereas, in point of fact, the introduction of metal into the packing necessitates more than ever a constant and unailing supply of lubricant, and in order to meet this requirement a lubricant should be thoroughly incorporated with the fibrous materials and free to come to the surface of the packing and prevent the latter from becoming dry. If the fiber be tightly wound or closely surrounded by a tight-fitting covering of wire, as has been the practice, the lubricant cannot be thus permitted to reach the surface, but will, in fact, be prevented from doing so. In order to enable the lubricant to work its way to the surface through the fiber, the latter must be fairly loose, and when the lubricant has reached the surface of the packing it must be free to reach the piston-rod and not be choked

off by a closely-woven metallic covering. The lubricant must be free to come through the fiber to the rod just as the oil of a lamp is free to come through the wick to the flame, and to attain these ends is the object of my invention.

A further object is to produce a packing having loosely-woven fibrous material and binding devices so constructed and arranged that the loose fiber will be properly held together without preventing the free passage of a lubricant to the face of the packing.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view illustrating my improvements. Fig. 2 is an enlarged sectional view. Figs. 3, 4, and 5 are views illustrating modifications. Fig. 6 is a detail view.

In Fig. 1 of the drawings my improved packing is shown as comprising, in general, a core A, of asbestos or similar fibrous material, and a covering or coating B, made of fiber and wire, combined in a manner which will now be explained. I prefer to make the core A oval or elliptical in cross-section, and this may be readily accomplished by binding together, side by side, two cords (round in cross-section) by means of any suitable binding devices, such as wire or thread. The covering or envelop B comprises (in the form of the invention shown in Figs. 1 and 2) two series of cords *a b*, plaited or woven together, the series of cords or strands *a* alternating with the series of cords or strands *b*. The strands *a* are preferably made of loosely-disposed hemp or similar fibrous material, and the strands *b* are composed of loosely-disposed asbestos.

Before the cords or strands *a b* are plaited or woven to form the covering or envelop B each strand will have an open netting C placed thereon, and in order to prevent the packing from stretching I prefer to employ longitudinal wires or strips *c*, disposed longitudinally of the strands or interwoven with the netting C. By the use of the nettings C I am enabled to employ the fibrous strands *a b* in a loose and fluffy condition, in which state they are well adapted for the reception

of lubricant and for permitting the latter to find its way to the surface of the packing and have free access to the piston-rod or other device.

5 I prefer to make the network C of metal, since its life will add to the life of the packing by resisting wear, and also because metallic threads hold the fiber in place better than fibrous threads would do and prevent
10 their being blown or forced out when in use. As a soft fluffy loosely-spun fibrous material will absorb a lubricant more readily than if tightly spun, and as by the use of the network it is possible to use when loosely spun materials having a short weak fiber, such as as-
15 bestos, the network is a valuable improvement even if made of fibrous threads.

I do not wish to confine myself to the use of any particular kind of core. For low
20 pressures and temperatures a rubber core *d*, Fig. 4, would be found very effectual, and for high pressures and temperatures asbestos would probably give better results; nor do I wish to confine myself to any particular
25 kind of fiber in the covering or envelop B, as any kind of fibrous material suitable for packings may be employed. I have found, however, that the covering or envelop made as above described gives very good results.
30 A double covering or envelop may be used, if desired, as shown in Fig. 3. Instead of making the envelop or covering B of alternate strands of hemp and asbestos, as above described, it may be made entirely of asbestos
35 strands, each having the netting C thereon, and two or more such envelops or coverings may be employed on a single core *e*, of rubber or asbestos, as shown in Fig. 5.

In Fig. 5 is illustrated a double envelop of

asbestos strands with wire-netting on each strand and a core *e*, of rubber. 40

Other slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to
45 limit myself to the precise details herein shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is— 50

1. A packing for piston-rods comprising a core made of fibers and inclosed in a netting, and a series of interwoven strands inclosing the core and each strand inclosed in a separate netting, substantially as set forth. 55

2. A packing comprising a series of strands of loosely-disposed fibrous material plaited or braided together, an open netting inclosing each strand, and metallic strips or wires disposed longitudinally of the strands to prevent stretching of the packing, substantially as set forth. 60

3. A packing comprising a series of hemp strands and a series of asbestos strands, the materials of both series of strands being
65 loosely disposed, an open netting on each strand, the two series of strands being plaited or braided together so that the strands of one series will alternate with the strands of the other series, substantially as set forth. 70

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SAML. HUGHES.

Witnesses:

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