(Model.)

# W. P. WOODRUFF.

## STEAM AND OTHER PACKING.

No. 271,390. Patented Jan. 30, 1883.

*Fig. 1.*

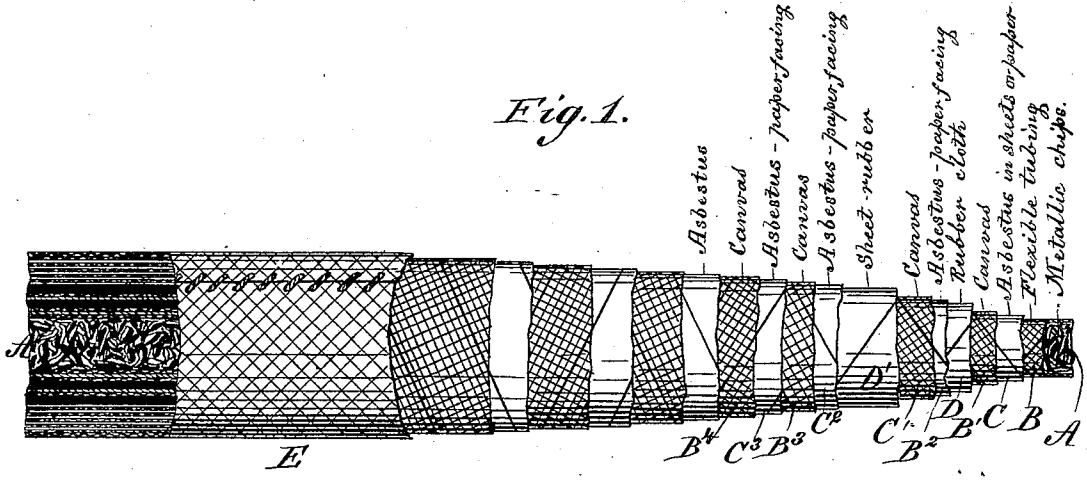
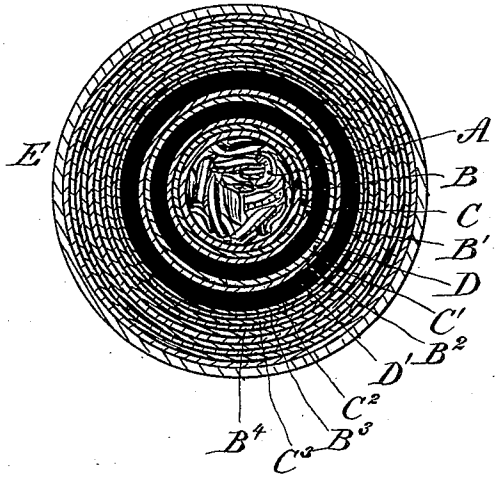



*Fig. 2.*




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# UNITED STATES PATENT OFFICE.

WILLIAM P. WOODRUFF, OF NEW YORK, N. Y.

## STEAM AND OTHER PACKING.

SPECIFICATION forming part of Letters Patent No. 271,390, dated January 30, 1883.

Application filed October 7, 1882. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. WOODRUFF, of the city, county, and State of New York, have invented new and useful Improvements in Steam and other Packing, of which the following is a full, clear, and exact description.

The object of this invention is to provide a roll-packing that may be cut into lengths, as required, and which shall possess in an eminent degree flexibility, anti-friction properties, freedom from heating or burning, and superior durability, and shall be self-lubricating. Said packing is applicable for use on pistons, around valve-stems, and in stuffing-boxes, or elsewhere, under exposure either to steam or water and other fluids or gases, and, as in certain former packings, is made up in part of a central core or filling of comminuted metal—such as metal chips or turnings—and in part of an outside envelope of canvas or other suitable flexible material; but it essentially differs in other important respects from such packings, and altogether dispenses with the use of an exterior covering formed of spirally-wound thin metallic strips or other like binder restricting the flexibility of such packings.

The invention consists in certain novel combinations of parts and materials, including canvas or cloth wrappers faced with asbestus paper, also wrappers of sheet-rubber or rubber cloth, all outside of a filling of metal in a fragmentary condition, and within an envelope of flexible material, substantially as hereinafter described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a longitudinal view of a piece of my improved roll-packing, with portions of the different wrappers of which it is composed removed at different points in its length for the purpose of more clearly explaining the construction of the packing. Fig. 2 is a transverse section of said packing upon a larger scale.

A is the core or central filling, consisting of metal in a fragmentary state, such as chips or turnings of some anti-friction metal or alloy. Said core or filling is contained within a flexible tube or clothing, B, of canvas or other like material. Around this flexible clothing B is a spirally-wound strip of asbestus in the sheet, or asbestus paper C, backed by a spirally-wound strip, B′, of canvas or cloth, and outside of these wrappers is spirally wound a strip, D, of sheet india-rubber or rubber cloth. Mounted or spirally wound around or outside of these again is another spirally-wound strip of canvas, $B^2$, faced with asbestus paper C′, and outside of this a spirally-wound strip of sheet-rubber, D′, and externally of all these are any number of successive layers or reversely spirally wound strips of canvas, $B^3$ $B^4$, with asbestus paper $C^2$ $C^3$ on the inside of them, the number of such layers of cloth or canvas having asbestus-paper facings varying with the thickness of the packing to be produced. The rubber strips D D′ are wound in a reverse spiral direction to the asbestus or canvas strips they next come in contact with, and between the several wrappers, when or before putting them to their places, I introduce or smear plumbago mixed with tallow in sufficient quantity to give a lubricating character to the packing. In facing the canvas strips with asbestus paper said paper is secured to the canvas by paste or cement. Of course not only may the number of layers of asbestus paper and canvas be varied, but also the number of interposed india-rubber wrappers D D′ also be changed. Thus for small-sized packings there may be only a single wrapper of rubber, and for large packings two or more of such wrappers. After the packing has been built up, as described, it is inclosed within a canvas or other like flexible wrapper or envelope, E, which may be secured by sewing, braiding, or otherwise. This constitutes the complete packing, which will be found both elastic and durable, and which will possess all the properties that it was the object of the invention as hereinbefore specified to obtain, the fragmentary metal core preventing heating or burning and giving flexibility, the asbestus and cloth or canvas also having a like effect, the plumbago likewise preventing burning, and aiding, with the tallow, to make the packing self-lubricating, and the india-rubber securing elasticity and giving a water-proof character to the packing.

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

1. In a packing in which a tubular envelope of canvas or like material serves to contain within it metal reduced to a fragmentary condition, the combination, with the outer envelope, E, the fragmentary metal filling A, and its inclosing flexible covering B, of a series of spirally-wound wrappers of canvas or cloth, B′ $B^2$ $B^3$ $B^4$, having asbestus-paper facings C C′ $C^2$ $C^3$, arranged between said covering B and outer envelope, E, substantially as specified.

2. The steam and water packing composed of an outer envelope of canvas or like material, a core of metal in a fragmentary condition inclosed by a cloth or similar flexible tubing, one or more rubber wrappers between said tubing and outer envelope, a series of spirally-wound canvas or cloth wrappers faced with asbestus paper, having the rubber wrapper or wrappers interposed between them, and a lubricant applied between the several layers or wrappers, all substantially as herein described.

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Witnesses:
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