W. Brown.

Steam Packing.

No. 105,036. Patented Jul. 5, 1870.

Fig. 3.

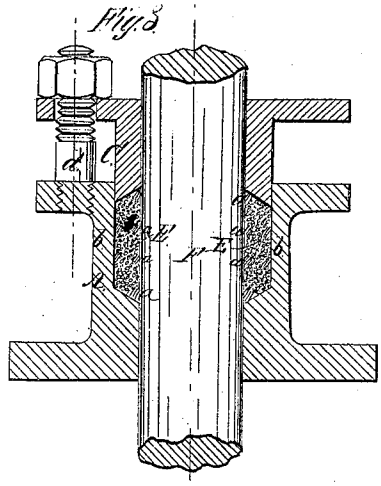


Fig. 2.

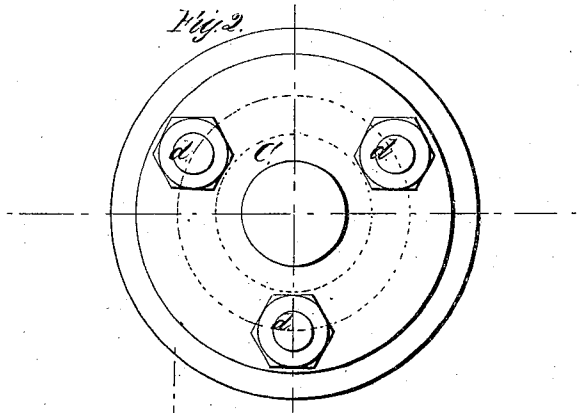
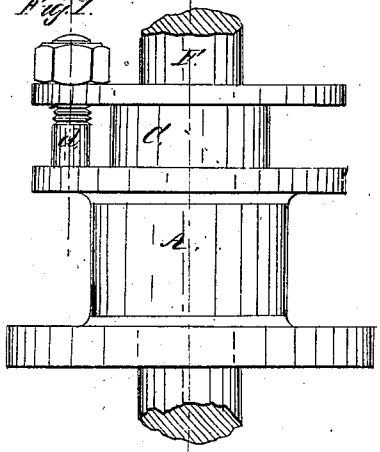


Fig. 1.



Witnesses;
Robert Moffin
Benjamin Wiley.

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UNITED STATES PATENT OFFICE.

WILLIAM BROWN, OF HOBOKEN, NEW JERSEY.

IMPROVED STEAM-PACKING.

Specification forming part of Letters Patent No. **105,036**, dated July 5, 1870.

To all whom it may concern:

Be it known that I, WILLIAM BROWN, of Hoboken, in the county of Hudson and State of New Jersey, have made an invention or discovery of a new and useful Improvement in the Packing of Stuffing-Boxes, and other instrumentalities in which packing is used; and I do hereby declare that the following is a full, clear, and exact description and specification of the same.

Previous to my invention stuffing-boxes and pistons have been packed by inserting rings or coils of twisted or of plaited yarns of fibrous materials into the packing-cavity. They have also been packed by inserting in the packing-cavity rolls of fibrous materials, or of fibrous materials combined with india-rubber. They have also been packed by inserting into the packing-cavity coils or rings of hemp rope surrounded by a netting of brass wire, and also by inserting into said cavity coils or rings of rope having a hemp core and an exterior composed in part of metallic wire. They have also been packed by inserting in the packing-cavity metal rings fitted in, so as to cover completely the sliding surface, which it is the object of the instrument to pack. Each of the said systems of packing possesses advantages peculiar to itself, and each is defective in some respect. The system of packing by the employment of plaited or twisted yarns of fibrous material before referred to is defective on account of the rapidity with which it is worn away, while the system of packing by the use of composite ropes of fibrous material and metal wires is defective because of the inequality of the wear, and because when the wire covering is partially worn off the sliding surface is exposed to the rubbing action of materials of different qualities, whereby unequal wear is produced. The systems of packing by means of the hemp rope, the rolls of fibrous material, and the composite rope of wire and hemp are also objectionable, because the hemp or other fibrous material, being soft and pliable, yields readily to the strain due to the screwing up of the gland or follower; hence the packing rope or roll squashes when squeezed by the gland, and loses its circular section, and its materials completely fill up the packing-cavity of the stuffing-box to the exclusion of the lubricating material.

The object of my invention is to retain the advantages resulting from the employment of a packing that is readily flexible, and can be inserted in the packing-cavity in the form of coils, and at the same time to obviate the defects resulting from the employment of a packing composed in whole or in part of hemp or similar fibrous material, whether twisted or plaited, and whether coated, wholly or partially, with metallic wires; and my invention is based upon the discovery that rope composed wholly of metal wires can be effectively employed as the packing material, provided it be inserted in the packing-cavity in such manner as to leave spaces for the entrance and lodgment of the grease or other lubricating material required to reduce the friction produced by the rubbing of the packing upon the movable surface which is packed.

In order that my invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, a stuffing-box embodying my invention.

In said drawings, Figure 1 represents a side view of said stuffing-box and the piston-rod. Fig. 2 represents a top view of the stuffing-box, and Fig. 3 represents a vertical section of the stuffing-box with the packing in place.

The stuffing-box A is of the ordinary form, having a packing-cavity inclosed by the wall *b b*, and being fitted with a gland or follower, C, which can be forced into the packing-cavity to compress the packing by means of screws *d*. The packing material E is ordinary wire rope, the diameter used being, by preference, the same as the breadth of the space between the wall *b* of the packing-cavity and the face of the moving surface, which, in this example, is the moving surface of the piston-rod F. The wire rope is coiled into the packing-cavity, and it is deemed best to use a piece sufficiently long to fill the entire cavity from the bottom to the gland. This rope must be so rigid as to maintain a curved section under a pressure of the gland C sufficiently forcible to cause the packing to be steam-tight, so that spaces are formed, as at *a a a a*, within the wall of the packing-cavity, adjacent to the curved peripheries of the coils of the wire rope, in which spaces the lubricating material can lodge, so as to apply itself to the moving surface of the piston-rod. This character of wire rope is essential to the practical success of the packing, for if the wire rope used be of so loose or

compressible a texture that it readily squashes under the pressure of the gland, so as to complety fill the packing-cavity, no spaces are left for the lodgment of the lubricating material, one of the essential characteristics of my invention is omitted, and the packing is practically valueless.

My invention is applicable to the packing of pistons, as well as to the packing of piston-rods, the packing material being in each case combined with the wall of the packing-cavity, so that spaces are formed between the coils of packing within the wall, as before described.

Upon comparing my new system of packing with the previous systems of packing by means of plaited or twisted rope, or coils composed in whole or in part of fibrous material, it will be perceived that my invention does not consist of a mere change of material; but that it embodies a substantially different mode of operation. Thus, in all the preceding modes of packing by means of a rope or a roll, the packing has consisted in whole or in part of a soft fibrous material that is readily squashed by pressure, especially when its softness is enhanced by the action of the hot steam or hot water to which the packing is subjected when used; hence the effect of the pressure of the gland is to force the soft material to change its form, and to fill the packing-cavity, and when a composite packing rope or roll of wire and hemp or canvas is used to squash the soft material into the crevices between the wires, so that in all such preceding systems no spaces are left for the lubricating material. In my system, on the other hand, the character of packing material employed necessitates the formation and maintenance of spaces for the lubricating material, so that the moving surface, which is packed is continually lubricated by contact, at short intervals, with the lubricating material in the spaces between the coils of the packing.

Having thus described my invention, I declare that I do not claim to have invented wire rope, nor to be the first who combined the wall of a packing-cavity with rope of some kind; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the wall of the packing-cavity with a wire rope, so as to operate in the manner hereinbefore set forth.

In testimony whereof I have hereto set my hand this 29th day of April, A. D. 1869.

WILLIAM BROWN.

Witnesses:
ROBERT COFFIN,
BENJAMIN WILCOX.