No. 712,966. Patented Nov. 4, 1902.

J. M. ROCKWELL.

STUFFING BOX FOR STEAM ENGINES.

(Application filed Feb. 26, 1902.)

(No Model.)

FIG. 1.

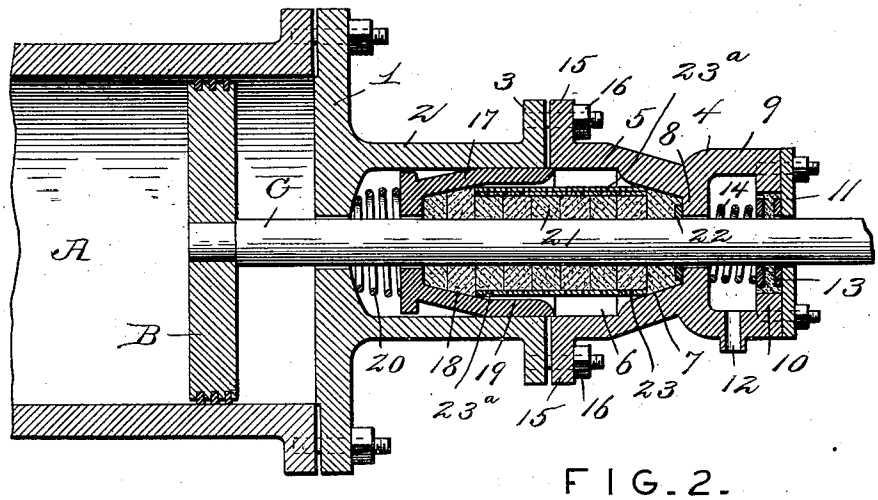


FIG. 2.

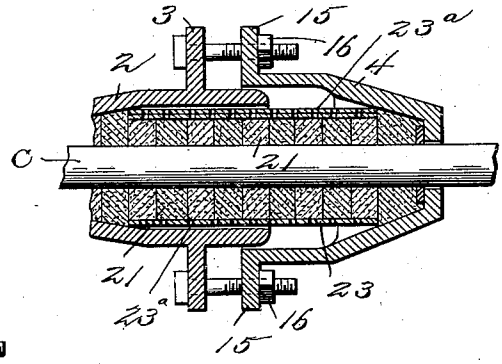


FIG. 4.

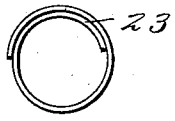
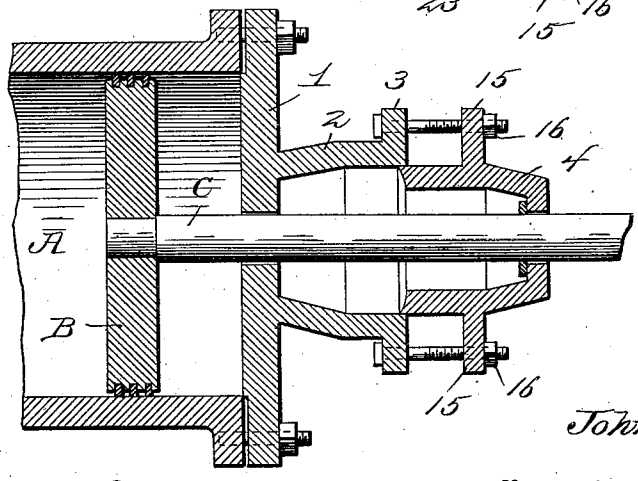


FIG. 3.



Witnesses.

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STUFFING-BOX FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 712,966, dated November 4, 1902.

Application filed February 26, 1902. Serial No. 95,752. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. ROCKWELL, a citizen of the United States, residing at Mount Carmel, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Stuffing-Boxes for Steam-Engines; 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 has relation to improvements in stuffing-boxes for steam-engines; and the object is to provide a stuffing-box wherein the stuffing or packing is of compressible material, and means are employed whereby the packing is automatically fitted to the rod whether the same is a true cylinder or varied by irregular or worn surfaces.

The invention while primarily or mainly intended and designed for application to the piston-rods of steam-engines may be applied to any reciprocating rod where such a device is required, such as pump-rods.

The invention consists in the novel construction of parts and their arrangement and aggroupment in operative combination, as will be hereinafter set forth, and particularly pointed out and distinctly claimed.

I have fully and clearly illustrated the invention in the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section through the cylinder and stuffing-box, showing my improvement as operatively applied thereto. Fig. 2 is a longitudinal central section of another form of stuffing-box having my improvements applied therein. Fig. 3 is a longitudinal vertical section of a portion of a steam-cylinder, showing a form of stuffing-box case to which my invention may be applied in modified form. Fig. 4 is a detail cross-section of the convolute spring.

Referring to the drawings, A designates a steam-cylinder of a steam-engine, B the piston-head, and C the piston-rod, which may all be of the ordinary well-known construction and arrangement. The head 1 of the steam-cylinder is formed with a projecting cylindrical casing 2, having at its free end an annular flange 3, to which the inner end of the outer part or casing of the stuffing-box is connected.

4 designates the outer section or casing of the stuffing-box, made of suitable metal, formed with an interior inner chamber 5, having a cylindrical portion 6 and a conical or tapering portion 7, which latter terminates at a partition 8, having a central opening through which the piston-rod passes. Integral with the casing 5 and partition 8 is a cylindrical box 9, having an interior annular flange 10, with central opening, and to the end of the box 9 is fastened a closing-plate 11 by any proper fastening, substantially as shown. The interior of this box 9 constitutes a drip-chamber, into which the escaped condensations of steam finally reach and are discharged through a drip-pipe 12 and led off by any suitable means, such as a pipe extension connected to the drip-pipe. Within the central opening of the flange 10 on the piston-rod is mounted a packing-ring 13, kept in place by means of an expanding spiral spring 14, mounted on the piston-rod. The inner end of the casing 5 is formed with an annular flange 15, coincident with the annular flange 3, against which it is secured by bolts 16, as shown in the drawings. Within the shell or casing of the stuffing-box thus made up is disposed and yieldingly arranged a follower 17, mounted on the piston-rod and formed with a conical inner section 18 and cylindrical outer portion 19, having an outwardly-curved edge. Behind this follower 17 on the piston-rod is mounted an expansive spiral spring 20, bearing at one end against the bottom of the casing 2 and with its other end against the bottom of the follower, whereby the follower is prevented from jamming down into the steam-space between the end of the follower and the bottom of the casing. On the piston-rod within the main chamber of the stuffing-box is mounted a proper number of rings 21, made of a yielding and elastic material, so that they may automatically adapt themselves to any irregularities in the surface of the piston-rod as it passes through them. The end rings of the series are made to fit the conical portions of the chamber, substantially as seen in the drawings, and at the outer end of the series a metal abutting ring 22 is placed to

prevent the end ring from being pushed through space around the piston-rod. To compress the rings and insure their proper relation and connection to the piston-rod, the straight cylindrical portion is incased or surrounded by a volute cylindrical spring 23, the compressing force of which is exerted on the perimeters of the rings, with the effect of forcing them to conform to any worn parts of the piston-rod. The volute spring 23 has a number of perforations 23^a, through which a lubricating material may find its way to the ring.

It will be seen that the steam in passing from the cylinder into the chamber behind the follower 17 acts by its pressure to force the follower outward over the volute spring, compressing the spring about the packing, and thus setting the packing firmly to the piston-rod, and as the packing wears the follower is moved farther outward over the volute spring even until the end of the follower reaches or extends to the end of the cylindrical part 6 of the casing.

In Fig. 2 of the drawings is illustrated a modified arrangement of the rings, with the volute spring surrounding them. In this application the interior follower is omitted, and the parts of the casings telescope and are held adjustably by bolts projected through the flanges, as shown, and in Fig. 3 a still further modified form of casing is illustrated, to which the rings and volute spring may be applied, as seen in Fig. 2.

It will be perceived from the foregoing description, taken in connection with the drawings, that I provide a stuffing-box wherein the packing-rings automatically adjust themselves to the shape of the piston-rod and that the proper relation and connection thereto are maintained and insured by the action of a volute spring. Means, as the drip-chamber, are provided whereby condensations may be carried off, so as to keep everything clean in front of the stuffing-box.

Having thus described my invention, what I claim is—

1. In a stuffing-box, a casing, a piston-rod projected through the casing, elastic rings on the piston-rod, a volute spring around the rings, and a chambered follower partially embracing the volute spring.

2. In a stuffing-box, comprising a casing formed with a chamber having a cylindrical portion and a conical end portion, and a drip-chamber at the outer end of the casing, a piston-rod projected through the casing, a plurality of rings mounted on the piston-rod within the chamber, a volute spring around the rings on the piston-rod, and a chambered follower to take over the volute spring.

3. In a stuffing-box, a casing formed with a cylindrical portion and a conical end portion, a piston-rod projected through the casing a yielding packing mounted on the piston-rod within the casing, a volute spring on the packing, and a steam-actuated follower extending over the volute spring to compress the volute spring and packing.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN M. ROCKWELL.

Witnesses:
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