

(No Model.)

F. P. & J. T. MARTIN.
ROD PACKING.

2 Sheets—Sheet 2.

No. 470,302.

Patented Mar. 8, 1892.

Fig. 4.

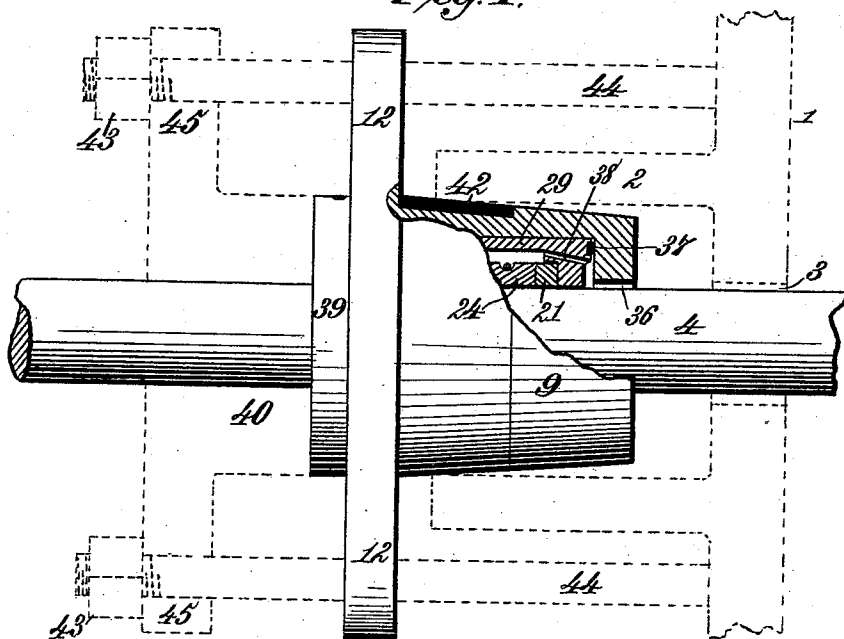
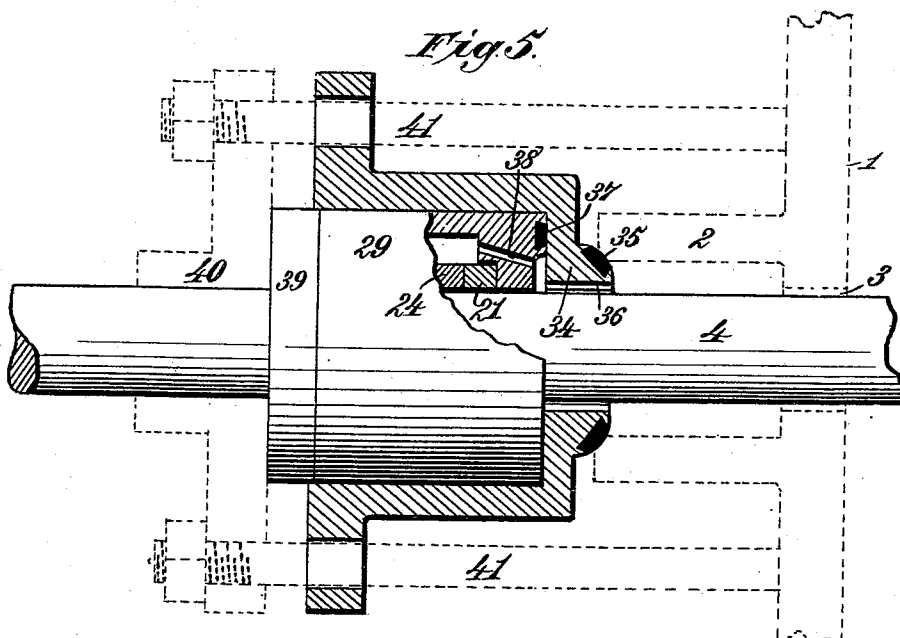


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS P. MARTIN, OF EASTON, AND JOHN T. MARTIN, OF SCRANTON,
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ROD-PACKING.

SPECIFICATION forming part of Letters Patent No. 470,302, dated March 8, 1892.

Application filed June 12, 1891. Serial No. 396,036. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS P. MARTIN, residing at Easton, in the county of Northampton, and JOHN T. MARTIN, residing at Scranton, in the county of Lackawanna, State of Pennsylvania, both citizens of the United States, have invented new and useful Improvements in Rod-Packings, of which the following is a specification.

Our invention relates to rod-packings, and more particularly to the improvements thereon shown, described, and claimed by us in an application for Letters Patent filed of even date herewith.

It is the purpose of our invention to combine with a rod-packing and with the steam-housing inclosing the same means whereby the housing may be arranged either upon the exterior of the stuffing-box of the steam-cylinder or partly within and partly without said stuffing-box, and whereby a tight steam-joint may be made at the mouth of the stuffing-box without the necessity of grinding a steam-face upon each of the engaging parts.

It is our purpose, also, to combine with the steam-housing containing the packing an outer inclosing box, and to provide means whereby the steam may have free passage to the interior of the steam-housing, in order that it may exert its force upon the outer faces or backs of the packing-rings and clamp them upon the rod.

The invention consists in the several novel features of construction and new combinations of parts hereinafter fully set forth, and then more particularly pointed out and defined in the claims which conclude this specification.

To enable others skilled in the art to make, construct, and use our said invention, we will proceed to describe the same fully and in detail, reference being had for such purpose to the accompanying drawings, in which—

Figure 1 is a central longitudinal section showing a portion of a cylinder-head, the stuffing-box and an outer box, steam-housing, and packing embodying our invention. Fig. 2 is a similar view showing a slight change in construction. Fig. 3 is an elevation of the outer end of the intermediate port-sleeve

shown in Fig. 2. Fig. 4 is a sectional elevation showing one manner of forming the steam-joint at the mouth of the stuffing-box and illustrating one method of using the gland to compress the sealing-ring upon the end of the housing. Fig. 5 is a sectional elevation showing a modified construction of the parts illustrated in Fig. 4.

The reference-numeral 1 in said drawings designates the cylinder-head, and 2 denotes the stuffing-box, of an ordinary steam-cylinder, the head 1 having a rod-opening 3, through which the piston-rod 4 reciprocates.

5 indicates a port-sleeve, consisting of a circular block of metal fitting easily within the mouth of the stuffing-box, which it enters for some little distance, and provided with a collar or flange 6 to rest upon the end of the stuffing-box, a circular cushion 7, of soft metal, being set within a dovetailed channel in the face of the collar to rest on the end of the stuffing-box. In front of the collar or flange 6, or from its outer face, the solid metal is projected to form a circular offset 8, which may be of the same or of a different diameter from the portion entering the stuffing-box to form a seat for the open end of an exterior box 9, which will be described hereinafter.

In the port-sleeve 5 are formed a series of steamways or small ports 10, usually drilled at an angle with the axis, so as to open as near the periphery of the offset 8 as possible, and at the same time pass within the angle between the circular body lying in the box and the seating-face of the flange or collar 6.

The exterior box 9 consists of a cylindrical body having an open end resting upon the collar 6 and around the offset 8, its interior diameter being usually as great or a little greater than that of the stuffing-box. Upon opposite sides project lugs 12, having bolt-openings 13, which receive the threaded ends of bolts rigid upon the cylinder-head, nuts 14 being turned upon the ends of the bolts and forced against the lugs 12. The outer end of the exterior box is closed, save as to a rod-opening in which the rod fits closely, as it does also in the port-sleeve 5. Within the exterior box is a steam-housing of any suitable form—such, for example, as a

sectional housing consisting of an inner section 15, surrounding the rod closely and having a flange 16 parallel with the rod, its edge abutting against the outer face of the offset 8. Within this flange, which is perforated with steam-openings 17, is arranged a packing-ring 18, cleft and compressible upon the rod by the pressure of the steam and filling the space between the offset 8 and that part of the housing which surrounds the rod. The remainder of the housing consists of a section 19, having a thickened outer end abutting against the closed end of the exterior box and closely surrounding the rod, said part having an offset 20 adjacent to said end, within which is placed a wear-plate 21. From the offset 20 a circular shell projects toward and abuts against the section 15, its open end being provided with a narrow internal collar 23, within which lies a second wear-plate 21. Between these two wear-plates a packing-ring 24 is arranged, formed of soft metal and having the essential characteristics of the packings shown and described in the application for Letters Patent filed by us of even date herewith. These parts require no specific description in this application. The shell or flange 19 is provided with steam-openings 25, and steam-space is provided around the sectional steam-housing by forming longitudinal ribs 26 upon the interior face of the outer box, said ribs terminating at a little distance from the open mouth of the box, in order that a space may be left between their ends and the offset 5.

Instead of drilling steamways in the port-sleeve we may channel the circular face which surrounds the rod, forming longitudinal grooves 27 therein. (Shown in Figs. 2 and 3.) An intersecting channel 28 is cut in the face of the offset 5 at its inner edge, preferably extending a little distance outside the ends of the channels 27, as shown in Fig. 3. With this construction the steam-housing 29 may fit the exterior box closely. At its inner end, which abuts against the offset 8 of the port-sleeve and which is provided with a narrow internal collar, is placed a port-ring 30, similar in its general form and the material of which it is made, to the wear-plates 21 in Fig. 1. In this port-ring are formed radial notches 31, cut in its inner face, their outer ends entering notches 32, cut in the back or outer face of the ring and having greater depth at the points where they intersect the radial notches. A circular channel 33 is also cut in the inner flat face of the port-ring, intersecting the inner ends of the radial notches; but this channel may be omitted when the circular channel 28 is present in the port-ring. This construction does not differ substantially, so far as the port-ring is concerned, from that shown and described in our application accompanying this, heretofore mentioned.

In some cases it may be desirable to dispense with the port-sleeve entirely, and when

this is done we can turn the exterior box and bring its closed end next to the stuffing-box 2, as shown in Fig. 5. To form a steam-joint at the mouth of the stuffing-box, the end of the outer box is slightly turned off to leave a collar or thickened portion 34, surrounding the rod-opening in said end, the collar having an outer face which is rounded, curved, or convex, its greatest outside diameter exceeding the interior diameter of the stuffing-box, while the smaller end is of such size as to enter the stuffing-box slightly. In this convex or rounded surface we set a circular cushion 35, of soft metal, concentric with the axis of the rod-opening and so arranged that it will seat upon the inner edge of the mouth of the stuffing-box, which is usually, though not necessarily, dressed off to remove the sharp angle and slightly enter the mouth. Steam enters the outer box through longitudinal channels 36 in the face of the rod-opening. When this construction is used, the steam-housing will be provided with a soft-metal cushion 37, seating upon the closed end of the outer box and surrounding a series of steamways 38, drilled through the end of the housing. The housing will be closed at the outer open end of the exterior box by a sealing-ring 39, having a soft-metal cushion, and this sealing-ring is pressed into the mouth of the box by a gland 40, the bolts 41 passing through the lugs of the outer box and through lugs on the gland. These parts are so similar to those shown and described in our concurrent application for Letters Patent that their description here is not essential.

Where the size of the stuffing-box permits, we may dress off the outer face of the exterior box to give it a tapering form, the box with this construction resembling a frustum of a cone, the scalene angle being very small. In this tapered face a circular cushion 42, of soft metal, is inserted, part thereof having a diameter in excess and part being of less diameter than the interior of the stuffing-box. When the closed end of the box 9 is inserted in the stuffing-box, the soft-metal cushion will engage the edge of the open mouth of said box, and as it is forced therein the gradually-expanding face of the cushion will be driven more and more closely and forcibly against the edge and inner face of the box 9 until a perfectly-tight joint is formed. The steam-housing and packing used inside the box may be of any suitable form—as, for example, that shown in Fig. 5.

The box 9 is driven into the stuffing-box, and the sealing-ring 39 is also pressed into its open end by means of nuts 43, turned upon the threaded ends of bolts 44, rigidly connected to the cylinder-head. These bolts pass through the lugs 12 of the outer box and through the lugs 45 of a gland similar to the gland 40 in Fig. 5. This gland may be turned end for end, as shown in Figs. 4 and 5, respectively, and the nuts 43 are turned up

against the lugs of the gland to the required point.

What we claim is—

1. The combination, with a cylinder-head
5 having a rigid projecting stuffing-box 2, of the exterior box 9, arranged bodily outside of the stuffing-box, containing a steam-housing and packing and formed with laterally-projecting lugs 12, a yielding collar or flange bearing
10 against the inner end of the exterior box and against the outer end of the stuffing-box, the threaded bolts rigid on the cylinder and extending through the lugs formed on the exterior box, and nuts turned on the bolts and
15 resting against the lugs of the exterior box, substantially as described.

2. In a rod-packing, the combination, with the stuffing-box and piston of a steam-cylinder, of an exterior box containing the steam-housing and its contained packing, said exterior box having a soft-metal cushion which
20 slightly enters the mouth of the stuffing-box and forms a tight joint, substantially as described.

25 3. In a rod-packing, the combination, with the stuffing-box and piston-rod of a steam-cylinder, of an exterior box having a tapered

cylindrical face and provided with a soft-metal cushion set in said face and adapted to partly enter the mouth of the stuffing-box, 30 substantially as described.

4. In a rod-packing, the combination, with the stuffing-box and piston-rod of a steam-cylinder, of an exterior box partly entering said stuffing-box and provided with a tapered cylindrical surface having a soft-metal cushion 35 seating around the mouth of said stuffing-box, a steam-housing and packing arranged in the outer box and receiving steam through channels cut in the face of the rod-opening, 40 a sealing-ring closing the housing, and a gland bearing upon the sealing-ring and pressed thereon by nuts turned upon bolts passing through the lugs of the exterior box and through the lugs of the gland, substan- 45 tially as described.

In testimony whereof we have hereunto set our hands and affixed our seals in presence of two subscribing witnesses.

FRANCIS P. MARTIN. [L. S.]

JOHN T. MARTIN. [L. S.]

Witnesses:

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