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A. W. & A. D. MORRIS.
METALLIC ROD PACKING.

(Application filed Apr. 18, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

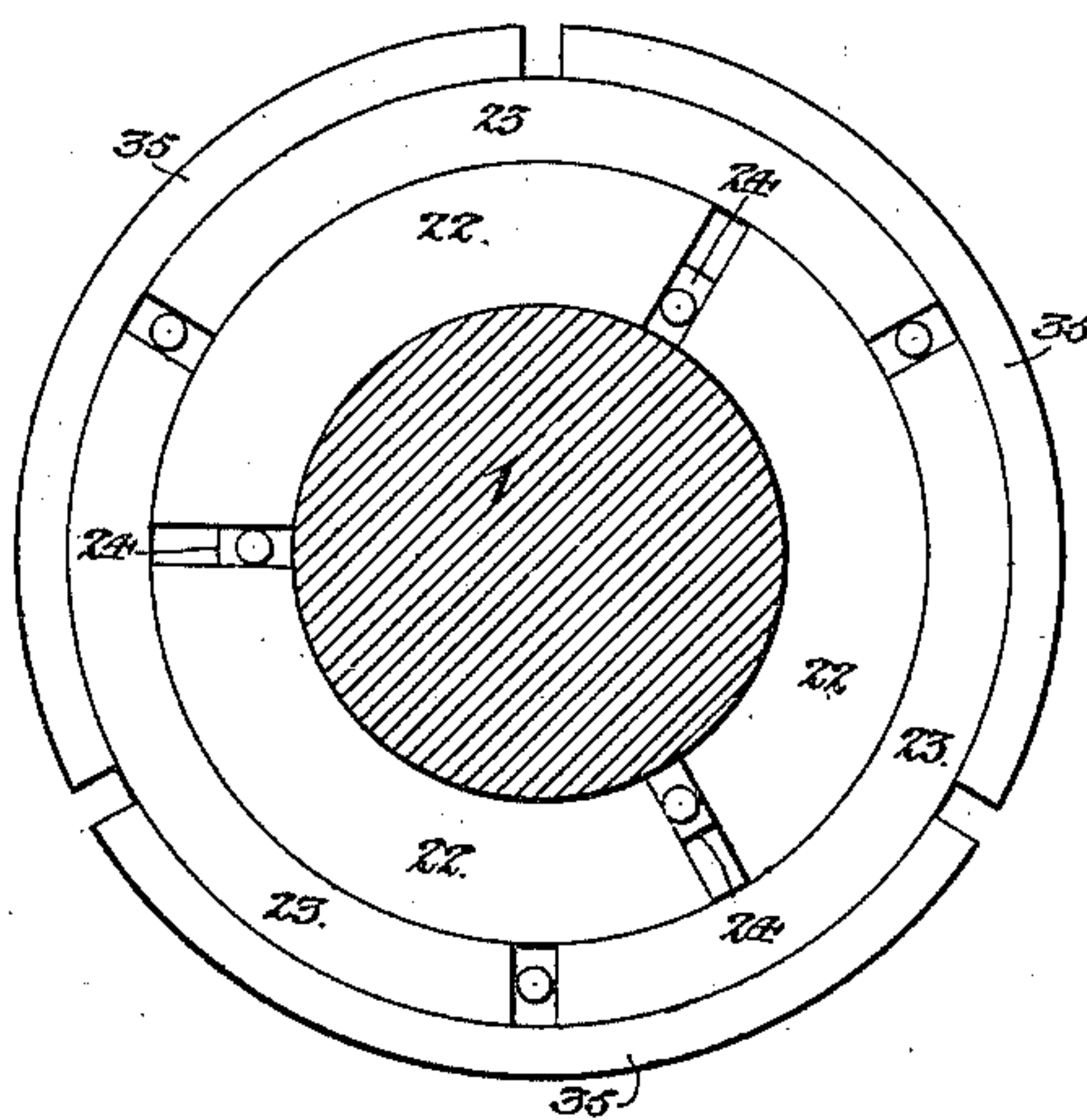
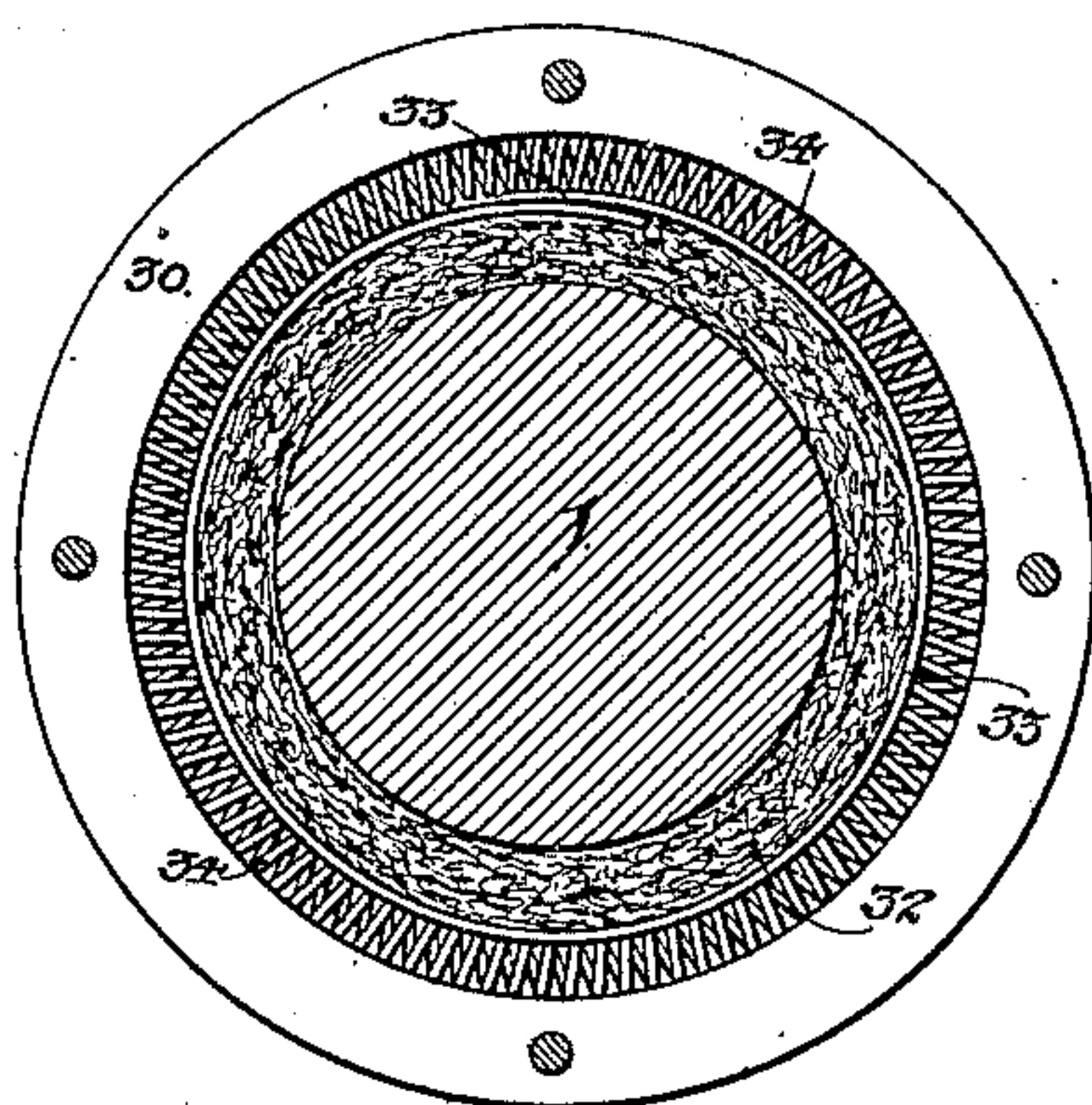


Fig. 5.



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METALLIC ROD-PACKING.

SPECIFICATION forming part of Letters Patent No. 688,790, dated December 10, 1901.

Application filed April 18, 1901. Serial No. 56,451. (No model.)

To all whom it may concern:

Be it known that we, ALFRED W. MORRIS, a subject of the King of Great Britain, and ALFRED D. MORRIS, a citizen of the United States, both residents of Camden, New Jersey, have invented certain Improvements in Metallic Rod-Packing, of which the following is a specification.

One object of our invention is to provide a metallic ring packing for the piston and valve rods of motive-power engines, pumps, &c., whereby a multiplicity of joints will be presented through which the motive or other fluid will be compelled to find its way before it can escape from the box or chamber containing the rings, a further object being to prevent uneven pressure of the rings upon the rod.

In the accompanying drawings, Figure 1 is a longitudinal section of a stuffing-box casing containing three forms of metallic ring packing embodying our invention. Figs. 2, 3, and 4 are sections taken, respectively, on the lines *a a*, *b b*, and *c c*, Fig. 1, and showing said different forms of packing; and Fig. 5 is a transverse section on the line *d d*, Fig. 1.

In Fig. 1 part of the piston or valve rod is represented at 1, this rod being surrounded by a stuffing-box casing containing the metallic rings whereby the packing of the rod is effected, this casing in the present instance being composed of independent sections 2, 3, and 4, each containing a set of packing-rings, and the outermost section of the casing being closed by a cap-plate 6. Each set of rings comprises an outer series of ring-segments, each having a web extending inwardly and bearing upon the rod, and an outer lateral flange or flanges between which and the rod and flanking the web are other ring-segments, so that pressure applied to the flanges of the outer ring-segments and having the effect of forcing the same inwardly or toward the rod will not only cause the webs of said outer ring-segments to bear upon the rod, but will also be transmitted to the inner ring-segments contained between said flanges and the rod and will therefore cause these segments to bear upon the rod.

In that form of packing shown in section 2

of the stuffing-box casing the webs 9 of the outer ring-segments are at the ends of the flanges 10, the cross-sectional form of these segments being L-shaped, and between the rod and the flanges 10 of said outer ring-segments are disposed four sets of ring-segments 11, 12, 13, and 14, the segments 12, 13, and 14 being of simple quadrangular cross-section, while the segments 11 are of T-shaped cross-section, comprising outer flanges and a central web, the segments 12 flanking this web on one side and the segments 13 and 14 flanking it on the other side, the segments 13 being next to the rod and the segments 14 surrounding the segments 13 and lying next to the flange of the ring 11, this arrangement providing for contact of the rod with the four rings 9, 11, 12, and 13 of the packing.

The packing contained in section 3 of the stuffing-box casing has outer ring-segments T-shaped in cross-section and each having a central web 15 and lateral flanges 16, inner ring-segments 17 flanking said central web 15 on one side and inner and intermediate ring-segments 19 and 20 flanking it on the other side.

The packing contained in section 4 of the box has outer ring-segments 35 of T shape, the central webs of these segments being flanked on one side by ring-segments 21 and on the other side by inner and intermediate ring-segments 22 and 23 and being expanded in width in those portions adjacent to the rod so as to form shoulders 24, which are overlapped by flanges 25 on the flanking ring-segments 21 and 22, whereby said flanking ring-segments are confined to the outer segments radially in both directions and partake not only of the inward movement imparted to said outer segments, but also of any outward movement which the latter may have, the entire series of segments in this form of ring moving practically as a unit in both directions.

It will be noted that the single ring-segments 12, 17, and 21 are on that side of the respective packings which is next to the cylinder or valve-box, the double ring-segments 13, 14, 19, 20, and 22 23 being on the outer

sides of their respective packings. The reason for this is that each packing is pressed forwardly in the casing by the fluid-pressure, and consequently bears firmly upon the partition of the casing in advance of it, so as to prevent any leakage at that point, the fluid being therefore compelled to find its way between the peripheral contact-faces of the segments; hence the advisability of multiplying these contact-faces to the greatest possible extent.

Various means may be adopted for compressing the outer ring-segments of the packing. Thus in the form of packing shown in section 2 of the casing inward pressure is imparted to each of the outer ring-segments by means of an elliptic spring 26, secured centrally to each of said segments and bearing at its outer free ends against a ring 27 free to play laterally to a limited extent within the casing 2, while in the form of packing shown in section 3 of the box the outer ring-segments are grooved for the reception of coiled springs 29, which constitute endless elastic bands surrounding the series of ring-segments.

The purpose of using the laterally-unconfined ring 27 in connection with the elliptic springs 26 is to prevent uneven pressure upon the ring-segments, such as sometimes results when the elliptic springs bear directly against the casing and are of uneven strength. The unconfined packing-ring 27 acts as an equalizer for the three springs and insures uniform pressure upon each of the segments. In that form of packing shown in section 4 of the box compressing-springs are dispensed with, the pressure of the steam in the box being relied upon to force the ring-segments against the rod, no means of compressing the segments against the rod when the steam is cut off being required, because said segments are in engagement with each other in both directions and cannot therefore separate from each other radially in the absence of external pressure tending to force them inwardly.

This form of packing is especially available for use in connection with rocking or vibrating valve-stems, since the torsional strain upon the segments cannot force the same apart, independent outward movement of any of the segments being impossible.

The cap-plate 6 of the stuffing-box casing has a projecting flange 30, to the outer face of which is secured an annular plate 31, said cap-plate, outer plate, and flange thus forming a box for the reception of a swab 32, composed of fibrous material saturated with a suitable lubricant in order to properly lubricate the reciprocating rod 1. Surrounding the swab 32 is an expansible and contractible ring washer 33, preferably formed with overlapping ends, as shown in Fig. 6, and surrounding this ring washer is a coiled spring-band 34, which tends to compress said washer, and thereby force the lubricated swab constantly into contact with the rod, thus insur-

ing said contact until the swab is practically worn out.

Each of the forms of packing which we have illustrated provides at least three independent series of segments for contact with the rod and a plurality of joints through which the fluid must find its way in order to pass the packing. Hence the intended duty is performed without unduly increasing the size of the packing-rings or the pressure of the same upon the rod.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. In metallic rod-packing, the combination with an outer casing, of a plurality of packing-rings composed of sets of segmental rings arranged to provide a multiplicity of contact-faces, the inner ring comprising a series of L-shaped ring-segments each having a web bearing upon the piston-rod and flanged at the outer end, a series of T-shaped ring-segments flanking said webs interposed between said flanges and the rod, and each of said T-shaped ring-segments comprising a central web bearing upon the rod and flanged at the outer end, and ring-segments flanking said central T-shaped segments; and the outer ring or rings comprising a series of T-shaped ring-segments, each having a central web bearing against the rod and flanged at the outer end, said web having shoulders between the rod and flanges at its outer end, and ring-segments flanking the central web of each T-shaped ring-segment and having shoulders engaging the shoulders on the T-shaped ring-segments, substantially as specified.

2. The combination in metallic rod-packing, of a series of L-shaped ring-segments each comprising a web bearing upon the rod and flanged at the outer end, a series of T-shaped ring-segments flanking said webs, interposed between said flanges and the rod, and each comprising a central web bearing upon the rod, and flanged at the outer end, and other ring-segments flanking said webs, interposed between the rod and the outer flanges of the webs, and comprising an inner series and an intermediate series of segments, substantially as specified.

3. The combination in metallic rod-packing, of an outer casing, a packing-ring comprising segments compressible upon the rod, a continuous outer ring surrounding said packing-ring and laterally movable within the casing, and springs interposed between said outer ring and each of the outer ring-segments, substantially as specified.

4. The combination in metallic rod-packing, of an outer set of ring-segments, each comprising a web flanged at the outer end and having an inner shoulder, and inner ring-segments flanking said webs and shouldered for engagement with the shoulders of the webs, substantially as specified.

5. The combination in metallic rod-packing, of an outer set of ring-segments, each

comprising a web bearing upon the rod,
flanged at the outer end and having an inner
shoulder, and inner ring-segments flanking
said webs, interposed between the rod and
5 said flanged portions of the webs, and should-
ered for engagement with the shoulders of
the webs, substantially as specified.

In testimony whereof we have signed our

names to this specification in the presence of
two subscribing witnesses.

ALFRED W. MORRIS.
ALFRED D. MORRIS.

Witnesses:

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