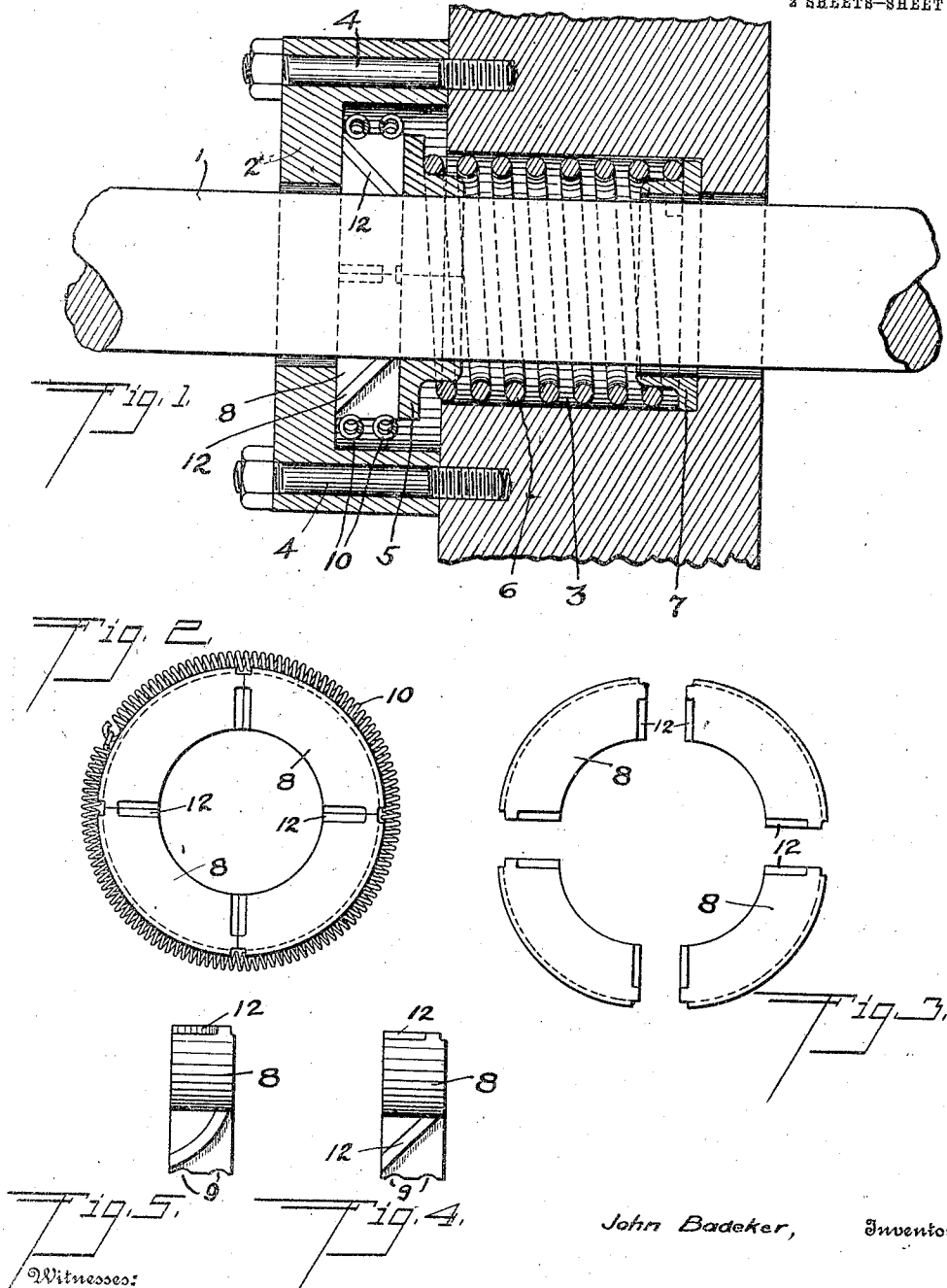


J. BADEKER.
METALLIC ROD PACKING.
APPLICATION FILED MAY 11, 1909.

975,313.

Patented Nov. 8, 1910.

2 SHEETS-SHEET 1.



Witnesses:

Roy G. Katz
D. A. Barnell

John Badeker, Inventor.

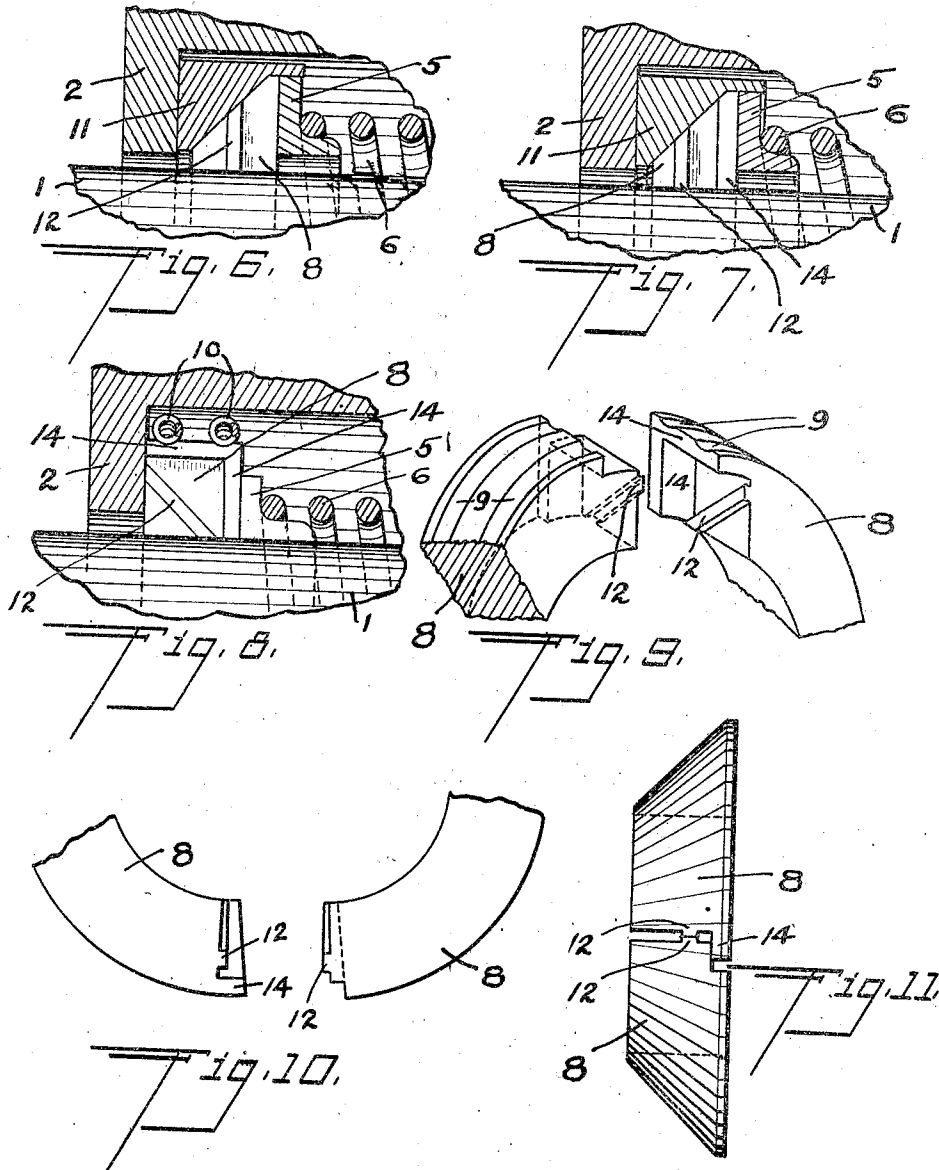
By David A. Barnell,
Attorney.

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John Badeker, Inventor.

Witnesses:

H. J. Cathoe
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UNITED STATES PATENT OFFICE.

JOHN BADEKER, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO N. W. ANDERSON,
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METALLIC ROD-PACKING.

975,313.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed May 11, 1909. Serial No. 495,363.

To all whom it may concern:

Be it known that I, JOHN BADEKER, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Metallic Rod-Packing, of which the following is a specification.

My invention relates to metallic rod packing, and it is the object thereof to provide a simple, inexpensive and efficient metallic packing for use especially on the piston-rods and valve-stems of steam engines.

My invention consists in the particular constructions, combinations and arrangements of parts hereinafter described and claimed.

Constructions embodying my invention are illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through a packing gland having my packing arranged therein, Fig. 2 is a front elevation of the packing ring, Fig. 3 is a similar view with the segments separated, Fig. 4 is a detail side elevation of one of the segments, Fig. 5 is a similar view showing a slightly different form for the reduced portions of the ring, Fig. 6 is a detail showing the arrangement of the packing when a cone-cup is used for pressing the segments toward the rod, Fig. 7 is a similar view showing the cone type of the packing as arranged on rods of varying diameter, Fig. 8 is a similar detail of the spring-retained type of the packing, Fig. 9 is a perspective view showing the adjoining ends of two segments of the latter type of packing, Fig. 10 is a front elevation of the same, and Fig. 11 is a side elevation of the cone type of packing ring shown in Fig. 7.

In carrying out my invention the packing is disposed in the usual way around the rod 1, within a gland 2 which is secured over the stuffing-box 3 by studs 4, the packing being engaged at the inner side by a follower-ring 5, and said follower-ring being pressed toward the gland by a spring 6 which encircles the rod and extends back into the stuffing-box and bears against the neck-ring 7.

I prefer to employ a single packing ring, which may be divided into a plural number of segments 8. Any suitable means may be

employed for holding the segments in engagement with each other and for pressing them in toward the rod to compensate wear between the same. I have illustrated in the drawings two different ways for so holding the segments in engagement with the rod. In the first method, which is illustrated in Figs. 1 to 5 and Figs. 8 to 10, the segments are made substantially rectangular in section and are provided on their outer surfaces with circumferential grooves 9 in which are placed the annular coil springs 10. In this form of the packing the packing ring is pressed against the inner face of the gland 2 by the pressure of the spring 6 upon the follower-ring 5, and the segments are pressed toward the rod by the annular coil springs 9. The packing ring is also pressed against both the gland and rod by the pressure of the steam which enters the stuffing-box and gland, and the packing serves to close, and prevent the escape of steam through, the opening between the rod and the gland. In the second method, which is illustrated in Figs. 6, 7 and 11, the segments are made substantially triangular in section, and are inclosed by an integral ring 11 having a conical bore into which the segments are pressed by the spring-impressed follower-ring 5. In this form of the packing the front face of the cone-ring 11 fits against the inner face of the gland 2, making a steam-tight joint therewith, and the packing ring serves to close the opening and prevent the escape of steam between the rod and cone-ring. The pressure of the follower-spring 6 and of the steam in the gland are both exerted on the rearward face of the packing ring which, owing to the triangular section thereof, is thus held in engagement with both the rod and cone-ring.

To enable the packing ring to close upon the rod, the transverse sectional area of the ring is reduced at several points therein to an amount such that the closing-pressure upon the ring will be sufficient to upset the reduced portions thereof, thus reducing the outer diameter of the ring and compensating wear in the bore thereof adjoining the rod. The reduced portions of the ring are made at the ends of the segments in the form of abutting ridges 12 which extend across the ends of the segments from the bore of the ring to the outer or forward face there-

of. The said abutting ridges may extend diagonally across the ends of the segments in either straight or arcuate lines, as shown in Figs. 4 and 5, or, in the ring of triangular section, the ridges may extend radially to the rod, as shown in Figs. 6, 7 and 11. In every case one end of the ridge engages the rod and the other end engages the other member with which the packing must form a joint in order to prevent the escape of steam from the gland, the latter member being either the cone-ring 11 or the inner face of the gland 2. It is essential that the reduced portions of the ring be made of a relatively soft material, the exact nature of which may vary according to the temperatures and pressures to which the packing is exposed. The remainder of the packing ring may be of a material different from and harder than that which forms the reduced portions or ridges 12, but the latter must be of a material capable of being distorted by compression, or upset, in order to permit the ring to close upon the rod.

For rods having a uniform travel and which, therefore, maintain a uniform diameter, the abutting ridges between the ends of the segments are sufficient to maintain the joint and prevent the escape of steam; but on rods such as the valve-stems of locomotives, having a variable travel and which, therefore, wear hollow at the center, or spindle-shaped, the packing ring may close down to the smallest part of the rod so that when the larger portions thereof pass through the ring the segments separate slightly and permit a leakage of steam between the ends thereof. In packing for use in such cases as the latter, the segments are provided at one end with overlapping tongues or flanges 14 and at the opposite end with recesses or rabbets into which the flanges of the adjoining segments fit. In the cone type of the packing the flanges 14 need be provided only at the rearward side of the segments, as shown in Figs. 7 and 11. In the packing ring of rectangular section the flanges 14 are provided at both the rearward and outer sides of the ring, as shown in Figs. 8 and 9. It will be obvious that when the overlapping flanges are employed, any slight opening between the upset abutting ridges 12 will not permit a leakage, since the joints between the segments will still be closed by the said flanges.

It will be observed that by the use of metallic packing constructed in accordance with my invention, the friction and wear between the packing and rod will be reduced to a minimum, since the greater part of the compressive or closing-pressure exerted by the retaining-springs and steam upon the packing-ring will be received by and utilized in compressing and upsetting the reduced portions of the ring instead of causing an ex-

cessive and unnecessary pressure between the segments and rod.

Now, having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a metallic rod-packing, a gland, a packing ring having the transverse sectional area thereof reduced at a plural number of points therein, and means embracing the ring to press the same toward the rod, the reduced portions of the ring being of material capable of being upset by the pressure thereon and being adapted to complete a steam-tight connection between the rod and gland.

2. In a metallic rod-packing, a gland, a packing ring comprising a plural number of segments, means embracing the ring for pressing the segments toward the rod, and abutting ridges formed on the ends of the segments, the said ridges being of material capable of being upset by the compressive pressure thereon and being adapted to complete a steam-tight connection between the rod and gland.

3. In a metallic rod-packing, a packing ring comprising a plural number of segments, means arranged to press the segments toward the rod, ridges formed across the ends of the segments, the said ridges being normally in abutment with each other, and flanges at one end of each of the segments, the said flanges overlapping the ends of the adjoining segments.

4. In a metallic rod-packing, the combination with a gland, and a spring-impressed follower arranged therein, of a packing ring arranged between the gland and follower, and means embracing the ring to hold the same in engagement with the rod, the ring having portions therein of reduced transverse sectional area capable of being upset by the pressure of the embracing means together with the steam pressure within the gland.

5. In a metallic rod-packing, the combination with an inclosing gland, of a packing ring arranged therein and encircling the rod, the said packing ring consisting of a plural number of segments divided on lines radial to the rod, the ends of the segments having ridges formed thereon of relatively soft material capable of distortion by pressure, and means arranged to press the segments toward the rod and hold said ridges normally in engagement with each other.

6. In a metallic rod-packing, the combination with an inclosing gland, of a packing ring arranged within the gland and encircling the rod, the said ring consisting of a plural number of segments, the ends of each of the segments having ridges across the same of material capable of distortion by pressure, each of the segments having at one end a flange extending beyond the ridge

thereon and at the opposite end a rabbet adapted to receive the flange of the adjoining segment, and resilient means arranged to press the segments toward the rod and
5 hold the said ridges normally in engagement with each other.

In testimony whereof I have hereunto

subscribed my name in the presence of two witnesses.

JOHN BADEKER.

Witnesses:

D. O. BARNELL,
ROY G. KRATZ.