

UNITED STATES PATENT OFFICE.

JOHN BADEKER, OF OMAHA, NEBRASKA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THOMAS WESLEY MITCHELL, OF MISSOURI VALLEY, IOWA, AND WALTER EVERETT, OF LYONS, NEBRASKA.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 606,638, dated July 5, 1898.

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To all whom it may concern:

Be it known that I, JOHN BADEKER, of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Metallic Packings; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in packings such as are primarily designed for use in making steam, fluid, or gas tight the joints formed between a sliding piston-rod or like structure and the head of a casing or similar structure—such, for instance, as the cylinder-head in a steam-engine—and while it will be understood that I do not wish to be limited to the application of the improved packing to any particular form of rod or casing or even to a sliding rod I have deemed it expedient to illustrate the invention in connection with an ordinary cylinder-head and piston-rod.

Referring to the accompanying drawings, Figure 1 is a vertical section taken through a cylinder head and gland, showing the application of my improved packing. Fig. 2 is a view taken at right angles to Fig. 1 with the cover of the gland removed. Fig. 3 is a perspective view of a supporting-ring for the confining-bearings of the packing-segments. Fig. 4 is a view of one of the packing-ring segments shown in bottom and side elevation.

Like letters of reference in the several figures indicate the same parts.

In carrying my invention into practice I make use of segmental packing-rings of a form to be presently described, which rings or segments are adapted to inclose the shaft or other member to be packed and to be themselves located in a gland or other receptacle, such as that lettered A in the accompanying drawings, to which the fluid or gas pressure may have access, and are adapted to be confined therein by a cover, such as B, and are preferably held in place at one end or the other of the gland by a coil-spring, such as C, although any other well-known means for hold-

ing the segments or packing-rings together and against the end of the gland may be employed. The packing-rings themselves are formed of a series of segments D, each being a duplicate of the other and adapted to fit together, so as to interlock and form unbroken contacting surfaces for the rod or other member, such as E, which they surround. The preferred form of segment is shown clearly in Fig. 4, wherein it will be seen that at the center each segment is provided with a transverse offset or projection d , having inclined faces d' , the inclination of the faces corresponding to the angle of inclination of the angular faces d^2 at the ends of the segments on the inner sides. Thus when the parts are assembled the underlying segments bridge the ends of the overlying segments, and the projections d , fitting up between the ends of the overlying segments, and, on the other hand, down between the ends of the underlying segments, will form tight joints through which the steam or other fluid or gas under pressure will not pass, at the same time affording unbroken contacting surfaces for the piston-rod. By "unbroken" it will be understood that I mean contacting surfaces which are only broken by tight joints at any point from which steam or other fluid or gas under pressure could find its way from the outside of the packing-rings into the piston-rod.

With such a construction the steam or other pressure on the outer sides of the segments is utilized to force the segments against the rod and so maintain the wearing surfaces in contact with the rod; but practice has demonstrated the fact that the pressure on the segments, when sufficient to do the work, causes them to spring and so enlarge the diameter of the circle on which they are formed. In other words, the ends of the segments are caused to move away from each other, reducing the curvature of the segments proportionately, whereby not only is the wearing surface distorted, but the angle of the bearing-surfaces d' and d^2 on the cooperating segments is changed to such a degree as to permit of the ready passage of steam or other fluid or gas under pressure therethrough,

so destroying the efficiency of the packing. With a view to overcoming this defect I now mount the segments constituting the packing-ring in guides having parallel surfaces which
 5 will permit the segments to move bodily forward or back, but will prevent effectually any spreading of the ends in the manner indicated.

In the preferred embodiment each of the segments is provided at each of its ends with
 10 projections or projecting bearing-surfaces F, arranged in parallel planes, which coincide with the movements of the segments in taking up wear or in advancing to maintain steam-tight joints. These surfaces F are adapted
 15 to work upon and cooperate with corresponding parallel surfaces G, preferably formed in a ring or support II, adapted to surround the packing-rings and to be capable of a limited
 20 movement bodily within the gland to accommodate any lateral movement of the piston-rod due to unequal wear or lateral deflection thereof. The ring II is provided with parallel bearing-surfaces G on opposite sides near
 25 one edge and with parallel bearing-surfaces G', arranged at right angles thereto and near the opposite edge. Thus the one ring constitutes the guides or support for two sets of packing-rings, although it will be understood
 30 that any desired number of packing-rings may be employed in the well-understood manner.

A washer K is preferably arranged over the packing-rings to form a bearing for the spring C, and inasmuch as this would tend to ob-
 35 struct the entry of the steam or other fluid or gas under pressure into the ring II, I preferably form apertures *h* in said ring, through which the steam may pass freely.

As a convenient means for holding the
 40 packing-rings in proper position when there is no steam-pressure I mount flat springs M, Fig. 2, within the ring II and adapted to bear against the segments at substantially the center, although any other form of spring or re-
 45 taining device may be employed when so desired.

The segments being duplicates are quickly and easily manufactured at slight cost and may be formed of hard or soft metal, as de-
 50 sired, and while they will maintain a perfect steam-tight joint around the piston-rod they are still free to expand or contract to permit the free passage of the rod when of irregular diameter, and, furthermore, being free to
 55 move laterally they will accommodate themselves to lateral irregularities in the rod and maintain the steam-tight condition under all circumstances.

Obviously the packing may be employed
 60 for steam-engines, valve-rods, pumps, air-

pumps, and like machinery without material alteration.

Having thus described my invention, what I claim as new is—

1. In a metallic packing, the combination 65 with the segments arranged in parallel transverse planes and having interlocking projections with cooperating bearings d' , d^2 , of a support having oppositely-arranged parallel bearing-surfaces located in the plane of bodily 70 movement of the segments and with which bearing-surfaces the ends of the segments are adapted to cooperate, whereby the lateral spreading or straightening out of the segments is prevented; substantially as de- 75 scribed.

2. In a metallic packing, the combination with the segments constituting the packing-rings arranged to break joints and with cen- 80 tral projections extending between the ends of the adjacent segments, of an inclosing-ring support having oppositely-arranged parallel bearing-surfaces lying in the plane of bodily movement of the segment and with which 85 bearing-surfaces the ends of the segments cooperate to prevent lateral spreading or straightening out of the segments; substantially as described.

3. In a metallic packing, the combination with the segments having straight parallel 90 bearings at their ends, arranged to break joints and having central projections extending between the ends of adjacent segments with cooperating bearing-surfaces d' , d^2 , re- 95 spectively, of an inclosing supporting-ring having parallel oppositely-arranged bearing-surfaces lying in the plane of bodily movement of the segments and with which bear- 100 ing-surfaces the ends of the segments cooperate to prevent lateral spreading or straightening of the segments; substantially as described.

4. In a metallic packing the combination with the gland, the rod, the spring and the cover for the gland, of the segments formed 105 with parallel end bearings and central projections fitting between the ends of adjacent segments, the loose inclosing supporting-ring having parallel bearings with which the bear- 110 ings on the ends of the segments cooperate to prevent lateral spreading of the segments, the washer overlying the segments and against which the spring takes its bearing and supplemental springs for holding the segments in contact with the rod; substantially as de- 115 scribed.

JOHN BADEKER.

Witnesses:

CARL C. WRIGHT,
 G. W. COVELL.