No. 675,151. Patented May 28, 1901.

J. W. DOWNING.

METALLIC PACKING.

(Application filed Mar. 19, 1900.)

(No Model.)

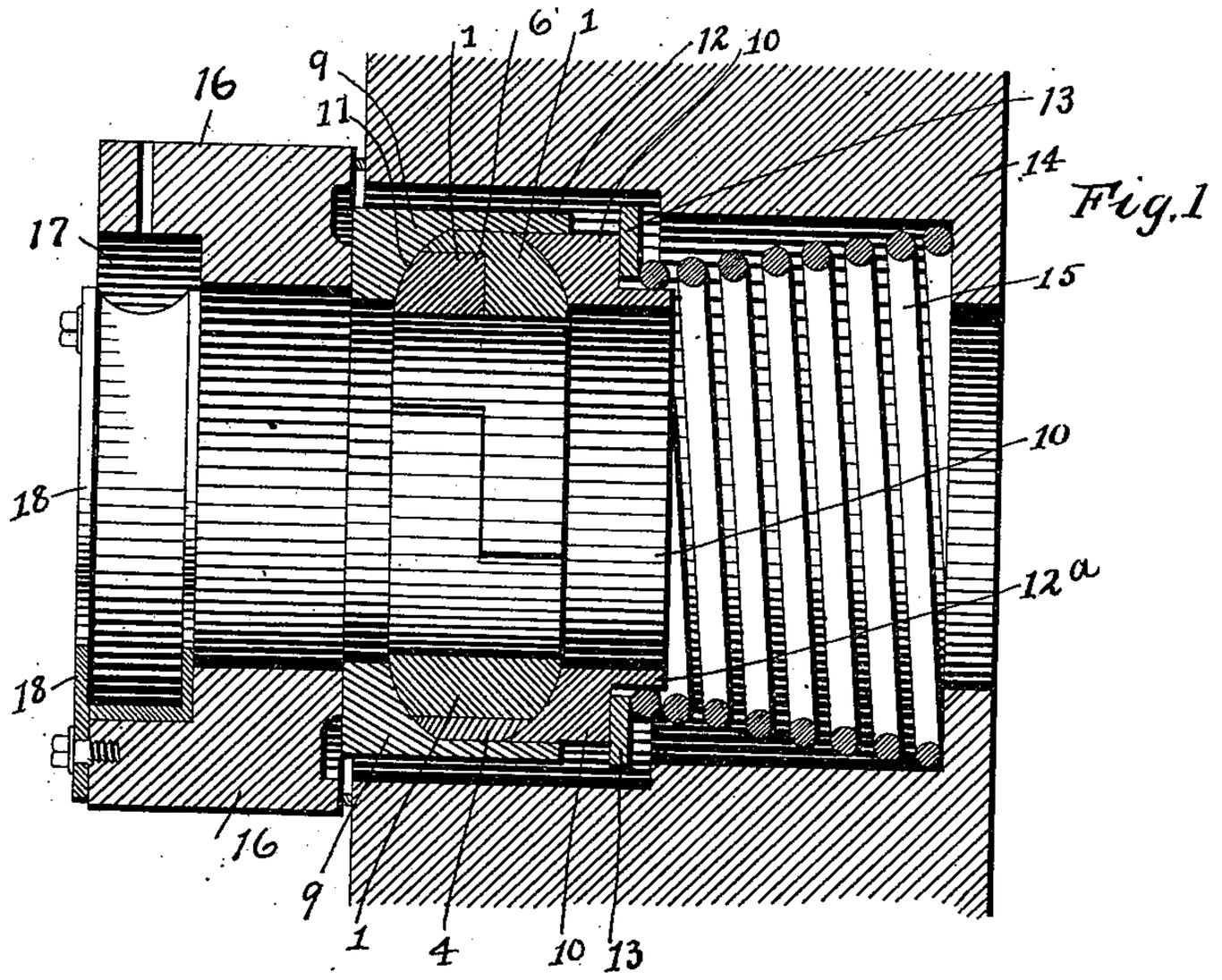


Fig. 1

Fig. 2

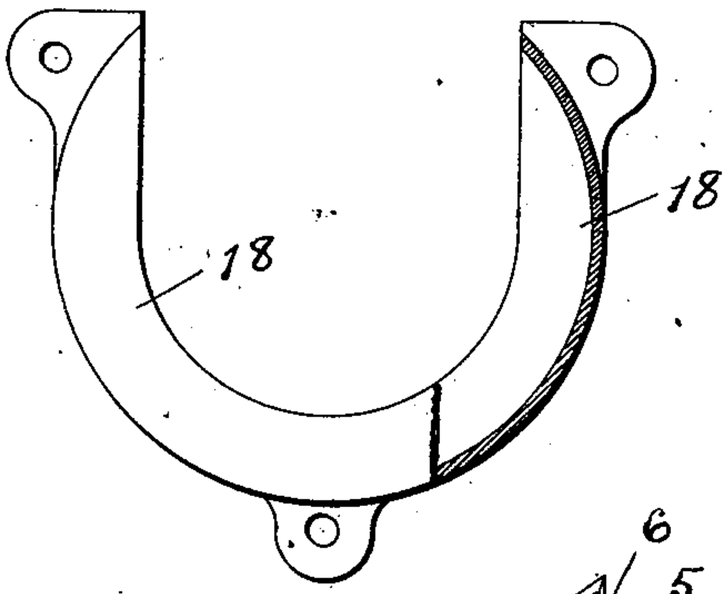


Fig. 3

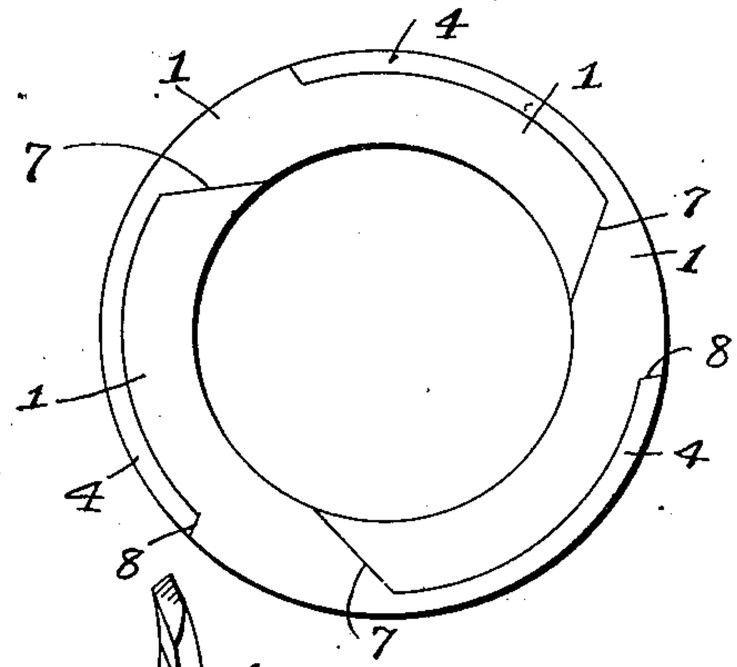
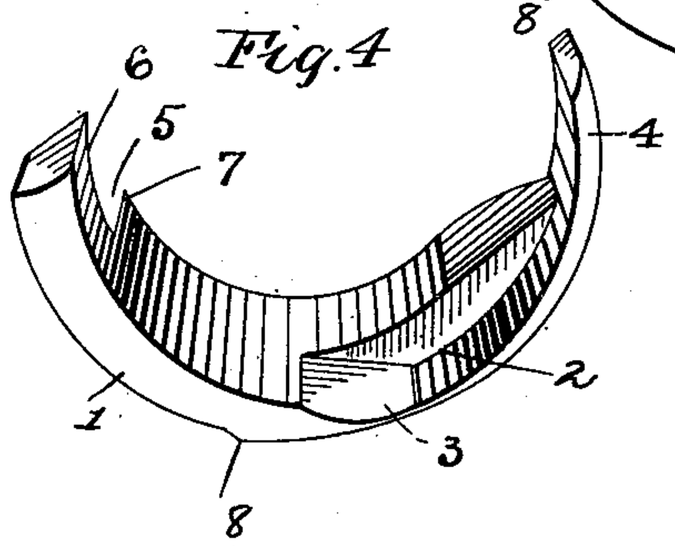


Fig. 4



WITNESSES:
R. G. Hessong.
A. L. Phelps

INVENTOR
John W. Downing
BY
C. C. Shepherd
ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN W. DOWNING, OF COLUMBUS, OHIO.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 675,151, dated May 28, 1901.

Application filed March 19, 1900. Serial No. 9,142. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. DOWNING, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Metallic Packing, of which the following is a specification.

My invention relates to the improvement of metallic packing; and the objects of my invention are to provide a packing of this character of superior construction and arrangement of parts particularly adapted for engine piston-rods and similar rods or shafts, to so construct the same as to insure the automatic feeding of the packing into proper frictional contact with the surface of the piston-rod or shaft as the sections of the packing become worn, to insure the production of a steam-tight packing, and to otherwise produce a simple, durable, and effective metallic packing. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section through a portion of a cylinder-head, showing my improved packing therein, the piston-rod being omitted for the sake of clearness in illustration. Fig. 2 is a view, partially in section and partially in elevation, of the oil or swab cup which I employ. Fig. 3 is a view in elevation of the sectional packing-ring, and Fig. 4 is a view in perspective of one of said packing-ring sections.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a packing-ring which is preferably constructed of sections 1, having the peculiar formation indicated in the drawings, in which three of said sections are shown as employed. Each of the ring-segments 1, which is of suitable metallic packing substance, has formed on its inner side, and what we shall term its "upper portion," an offset or recess 2, which at its inner end terminates in an inclined shoulder 3, which leads from the inner surface of the segment-body to the inner vertical surface of the offset 2. As indicated at 4, one end of the segment is in the form of a comparatively shallow tongue. The opposite end of the segment is cut away on its under side, as indicated at 5, to form a tongue termination 6 and an inclined outer side shoulder 7. That side of the segment on which is formed the under-side cut 5 is also reduced to form a central vertical shoulder 8 on the outer surface of said segment. As indicated in the drawings, both the upper and lower sides of the uncut or unrecessed portion of the segment are provided with a rounded bevel, this curvature of said segment-surfaces being shown more clearly in Fig. 1 of the drawings.

In uniting the segments formed as above described the under side of the tongue portion 6 of one segment is inserted into the recess 2 of the adjoining segment, the tongue portion 4 of said adjoining segment abutting against the shoulder 8 of said first-mentioned segment. It will thus be seen that the inclined end of the tongue 6 of one segment will abut against the correspondingly-inclined shoulder 7 of an adjoining segment. The three segments being united in the manner described results in the production of a metallic packing-ring having rounded upper and lower sides. The packing-ring thus constructed is inclosed in a packing-cup formed of two ring-sections 9 and 10, the section 9 being in the nature of a cup having the inner surface of its end rounded or concaved, as indicated at 11, at the junction of said inner end and its side wall 12, this concavity leading to a central shaft or piston-rod opening in said cup end. The section 10 is in the nature of a ring having a concaved inner end surface and is provided with an outwardly-projecting reduced and comparatively short tubular extension 12^a. The packing-ring herein described is adapted to have one of its sides bearing in the concavity of the casing-ring 10, while its remaining side and periphery are inclosed by the casing-section 9 in the manner illustrated in Fig. 1, the side wall of said casing-section 9 overlapping a portion of the section 10. Loosely surrounding the tubular extension 12 of the casing-section 10 is a metallic ring 13.

The packing and its casing constructed as above described are adapted to be inserted within the mouth or recessed portion of a cylindrical head 14 or other similar cylindrical body, through which may pass and within which is journaled a piston-rod or similar shaft. (Not herein shown.) Within an en-

largement of the head 14 and on the inner side of the packing is provided a coiled spring 15, one end of which abuts against an internal shoulder of said head and the remaining end of which bears against the ring 13.

In case the packing herein described is supported within a cylindrical head, such as is shown at 14, a gland 16 is secured in the usual manner to said cylinder-head, said gland abutting against the outer surface of the packing-case section 9. In forming the gland 16 I preferably enlarge the mouth of the central opening thereof, as indicated at 17, and secure within said mouth a substantially U-shaped swab or oil cup 18, through which the piston may also pass.

Although the herein-described packing is shown within the cylinder-head, it is obvious that the same might be employed within a gland, such as that indicated at 16, or other suitable position to form a steam-tight journal for a piston-rod. Owing to the sectional formation of the packing-ring herein described and the employment of the rounded outer surfaces of the sections thereof in conjunction with the correspondingly-concaved inner surfaces of the casing-sections, the steam which is contained within the cylinder-head exerts a pressure on the outer face of the ring 13, thus operating not only to press the casing-sections into close engagement with the packing-segments, but gradually forcing the latter inward as their inner bearing-surfaces become worn. It will also be seen that the steam which is contained about the peripheries of the casing-sections will serve to retain the latter in close contact with each other and with the outer surface of the packing-segments, thus insuring a steam-tight contact of the packing-ring and its casing-sections.

The employment of the rounded outer surfaces of the packing-ring segments and correspondingly-shaped inner surfaces of the casing-sections also permits of a rocking or oscillating movement of the packing-ring within its casing, such as may be caused by the vibration of the piston-rod or shaft which passes therethrough.

I am aware that segmental packing-rings have been employed heretofore; but my invention differs essentially from these in the formation of the rounded outer surfaces of the packing-segments and the correspondingly-rounded inner surfaces of the packing-casing sections, whereby I am enabled to accomplish the results above mentioned.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a metallic packing, the combination with a packing-ring formed of detachably-connected interlocking segments, each of said ring-segments having its outer side rounded as described, of a casing for said packing-ring comprising sections 9 and 10, each of the latter having its inner surface concaved to receive and correspond with the rounded packing-segment surfaces, substantially as specified.

2. In a metallic packing, the combination with a packing-ring formed of detachably-connected segments, each of said segments having formed in one side the depression or offset 2 and inclined shoulder 3, inclined shoulders 7 and 8 and tongue portions 4 and each of said segments having rounded outer sides as described, of a casing for said packing-ring consisting of sections 9 and 10, the latter having concaved inner surfaces corresponding with the curvature of the segment-surfaces and one of said casing-sections overlapping the other, substantially as specified.

JOHN W. DOWNING.

In presence of—
C. C. SHEPHERD,
A. L. PHELPS.