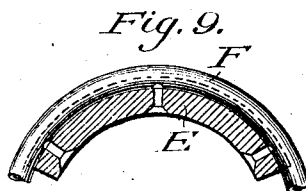
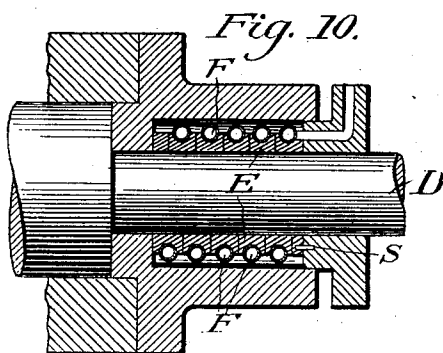
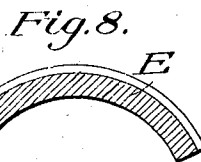
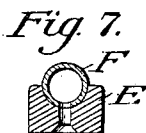
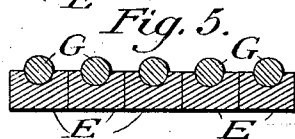
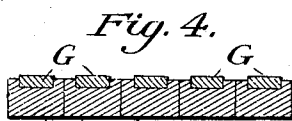
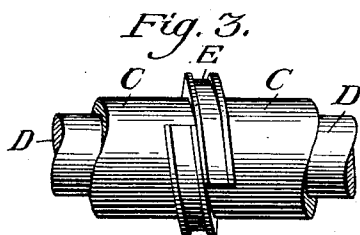
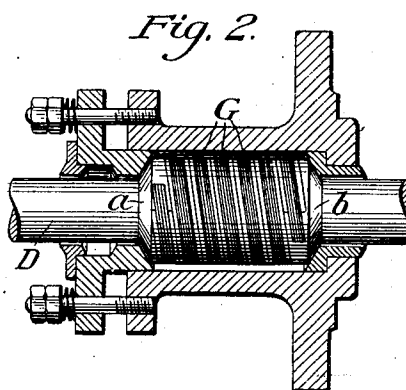
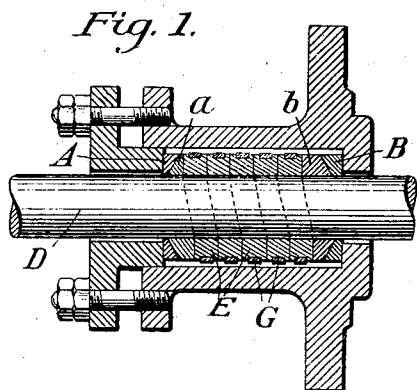


O. ISHERWOOD.  
METALLIC PACKING MECHANISM.  
APPLICATION FILED OCT. 10, 1901.

NO MODEL.



Witnesses:  
Joseph M. Antypa,  
William Hadcock.

Inventor  
Oswald Isherwood

# UNITED STATES PATENT OFFICE.

OSWALD ISHERWOOD, OF NEAR MANCHESTER, ENGLAND.

## METALLIC PACKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 734,559, dated July 28, 1903.

Application filed October 10, 1901. Serial No. 78,268. (No model.)

*To all whom it may concern:*

Be it known that I, OSWALD ISHERWOOD, a subject of the King of Great Britain, and a resident of 6 Hardy street, Peel Green, Patricroft, near Manchester, in the county of Lancaster, England, have invented certain Improvements in Metallic Packing Mechanism, of which the following is a specification.

My invention relates to improvements in the construction and arrangements of metallic packing mechanism for piston-rods, pump-rods, tappet-valves, or other reciprocating rods, and for like purposes, one object of the invention being to provide a cheap and effective metallic packing capable of fitting ordinary stuffing-boxes employed on marine, stationary, or locomotive steam-engines, and one also applicable to tappet-valve stuffing-boxes of the Corliss pattern, centrifugal pump-rods, or other similar purposes, having an angular or rotary movement. The foregoing description has reference to packings in which lateral movement is possible and in cases also where it is desirable to allow a spherical movement.

My invention consists, essentially, in the use of externally-grooved segments or complete externally-grooved rings, preferably of antifriction white metal, designed to come into contact with the rod to be packed and passing therethrough or with a sleeve mounted on said rod, in combination with a spring-coil surrounding said segments or rings and capable of keeping them in contact with the rod or sleeve, as required.

My invention also comprises the use with such a combination of parts when required, of spherical end bearings, and also means for conveying lubricant to the packed rod or stem.

My invention will be fully described with reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a metallic packing constructed in accordance with my invention, arranged in a common form of stuffing-box; Fig. 2, an elevation, partly in section, of packing applied to a stuffing-box fitted with a small wiper-gland for soft packing. Fig. 3 shows to an enlarged scale the application of one of the grooved metallic

rings arranged on the sleeve or shell of a pump or piston rod; Fig. 4, an enlarged transverse section of a series of packing-rings with a spring-coil surrounding them of rectangular cross-section; Fig. 5, a similar view to Fig. 4, showing spring of circular cross-section; Figs. 6 and 7, transverse sections of single rings or segments and springs indicating arrangements for passing lubricants through the packing-rings; Fig. 8, a sectional side elevation of one of the segments; Fig. 9, a similar view to Fig. 8, showing means for conveying lubricant to the packed rod or stem, and Fig. 10, a sectional elevation showing the application of the metallic packing to a rotary shaft stuffing-box and means for conveying lubricant to the shaft.

In all the drawings similar letters refer to corresponding parts.

In carrying out my invention the stuffing-boxes may be constructed in any ordinary way.

D indicates the rod or stem to be packed, while E indicates packing rings or segments, preferably made of antifriction white metal, though they may be made of any other material suitable for the purpose. These rings or segments are provided with internal plane faces to lie close to the rod or stem *d*, while their sides are adapted to be parallel to each other. The ends of the rings or segments are arranged to break joint in an axial direction, as shown more clearly in Fig. 3, where they are mounted on a sleeve or bush C. At the external side each ring or segment E is grooved, and when the whole of the rings or segments for one complete packing are assembled together side by side they form a complete spiral, only broken at intervals axially. In order to press the packing-rings directly against the rod, stem, or axle D with equal pressure, I combine with the segments or rings E a spiral spring G, of suitable cross-section, preferably corresponding to the cross-section of the grooves in the rings and adapted to embrace the whole of the rings or segments, which it completely holds together. The cross-section is shown rectangular in Figs. 1, 2, 3, 4, and 6, while it is circular in Figs. 5, 7, 9, and 10. The spring may be made of steel, brass, or nickel alloy or any other suit-

able metal or alloy preferably having non-corrosive properties; but in all cases the internal diameter of its convolutions is somewhat less than the external diameter at the bottom of the grooves of the segments or rings E when the spring is at rest, so that when the latter is placed on the former there is always an automatic tendency to close them on the rod, stem, or axle D to be packed.

The rings or segments E may be assembled on the rod D with a space between their sides or be close together, and pressure in an axial direction may be brought to bear by the ordinary stuffing-box mechanism. Instead of allowing the packing-rings E to bear directly against the end walls of the stuffing-box I prefer to insert floating socket ends A and B, having internal spherical faces adapted to fit against rings *a* and *b*, having corresponding spherical faces, the inner faces of the latter rings being adapted to bear against the packing-rings E. In this way the rod D may work with perfect freedom, both laterally and axially, while a steam-tight joint from the cylinder is insured.

It will be seen that all the packing is done by the metallic packing-rings E, which can be easily removed and replaced by new segment packing-rings without disconnecting the piston-rod. To do this, the packing is first taken from the stuffing-box, the ball ends *a b* removed, and the old segment packing-rings slid out of spring-coil. This done, new ones are slid in their respective places and the top and bottom rings *a b* replaced. The latter can be constructed in halves, if desired, to save time in the removal of cross-head or piston-rod. When the packing is again completed, it is then replaced back in stuffing-box in the usual way.

In Fig. 6 the segments or rings E are perforated at intervals and corresponding holes formed in the spring G, the holes in the former being preferably countersunk at both ends. The whole of the holes serve to admit lubricant from the interior of the stuffing-box to the rod or stem D.

In Figs. 7, 9, and 10 the encircling springs for the segments or rings E take the form of a spring-tube F, provided with perforations corresponding to those in the rings E, and through this tube lubricant may be passed to the rod, stem, or axle D from a passage in the gland, as in Fig. 10. I prefer to carry out this part of my invention when applying the same to a rotary or Corliss type of valve-rod, and in such cases the segments or rings E may be prevented rotating by a pin S.

In conclusion, I would have it understood I am aware that metallic packing-rings have been used prior to the date of my invention, also that continuous perforated tubes of soft metal to contain lubricant have been heretofore employed as a packing medium by themselves, and that rings of crescent form in cross-section, combined with separate rubber com-

position rings, have also been employed; but I do not claim any such arrangements, though, on the other hand,

What I claim as my invention, and desire to protect by Letters Patent, is—

1. A metallic packing comprising a series of separate packing rings or segments adapted to break joint with each other arranged spirally and provided with straight faces adapted to bear against the rod, stem or shaft to be packed and with grooved exterior faces and a spiral spring adapted to lie in said exterior grooved faces of the rings or segments substantially as and for the purpose described.

2. A metallic packing comprising a series of separate packing rings or segments adapted to break joint with each other arranged spirally and provided with straight faces adapted to bear against the rod, stem or shaft to be packed and with grooved exterior faces, and a spiral spring adapted to lie in said exterior grooved faces of the rings or segments in combination with a stuffing-box provided with an axially-movable gland substantially as described.

3. A metallic packing comprising a series of separate packing rings or segments adapted to break joint with each other arranged spirally and provided with straight faces adapted to bear against the rod, stem or shaft to be packed and with grooved exterior faces, a spiral spring adapted to lie in said exterior grooved faces of the rings or segments, a ring bearing against each end of the series of packing-rings each provided with a spherical face, a second ring at each end provided with a spherical face adapted to fit in the corresponding face of the first ring, each of said rings having a plain face to contact with the end walls of the stuffing-box and a stuffing-box provided with an axially-movable gland substantially as described.

4. A metallic packing comprising a series of separate packing rings or segments adapted to break joint with each other, arranged spirally, and provided with straight faces adapted to bear against the rod, stem, or shaft to be packed and with grooved exterior faces, a series of holes passing radially through the rings or segments and a spiral spring provided with perforations adapted to lie in said exterior grooved faces of the rings or segments substantially as described.

5. A metallic packing comprising a series of separate packing rings or segments adapted to break joint with each other, arranged spirally, and provided with straight faces adapted to bear against the rod, stem, or shaft to be packed and with grooved exterior faces, a series of holes passing radially through the rings or segments and a spiral tubular spring provided with perforations adapted to lie in said exterior grooved faces of the rings or segments substantially as described.

6. A metallic packing comprising a series of separate packing rings or segments adapted

to break joint with each other, arranged spirally, and provided with straight faces adapted to bear against the rod, stem, or shaft to be packed and with grooved exterior faces, a series of holes passing radially through the rings or segments and a spiral tubular spring provided with perforations adapted to lie in said exterior grooved faces of the rings or segments in combination with a stuffing-box provided with an axially-movable gland having a passage communicating with the tubular spiral spring substantially as described.

September 27, 1901.

OSWALD ISHERWOOD.

Witnesses:

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