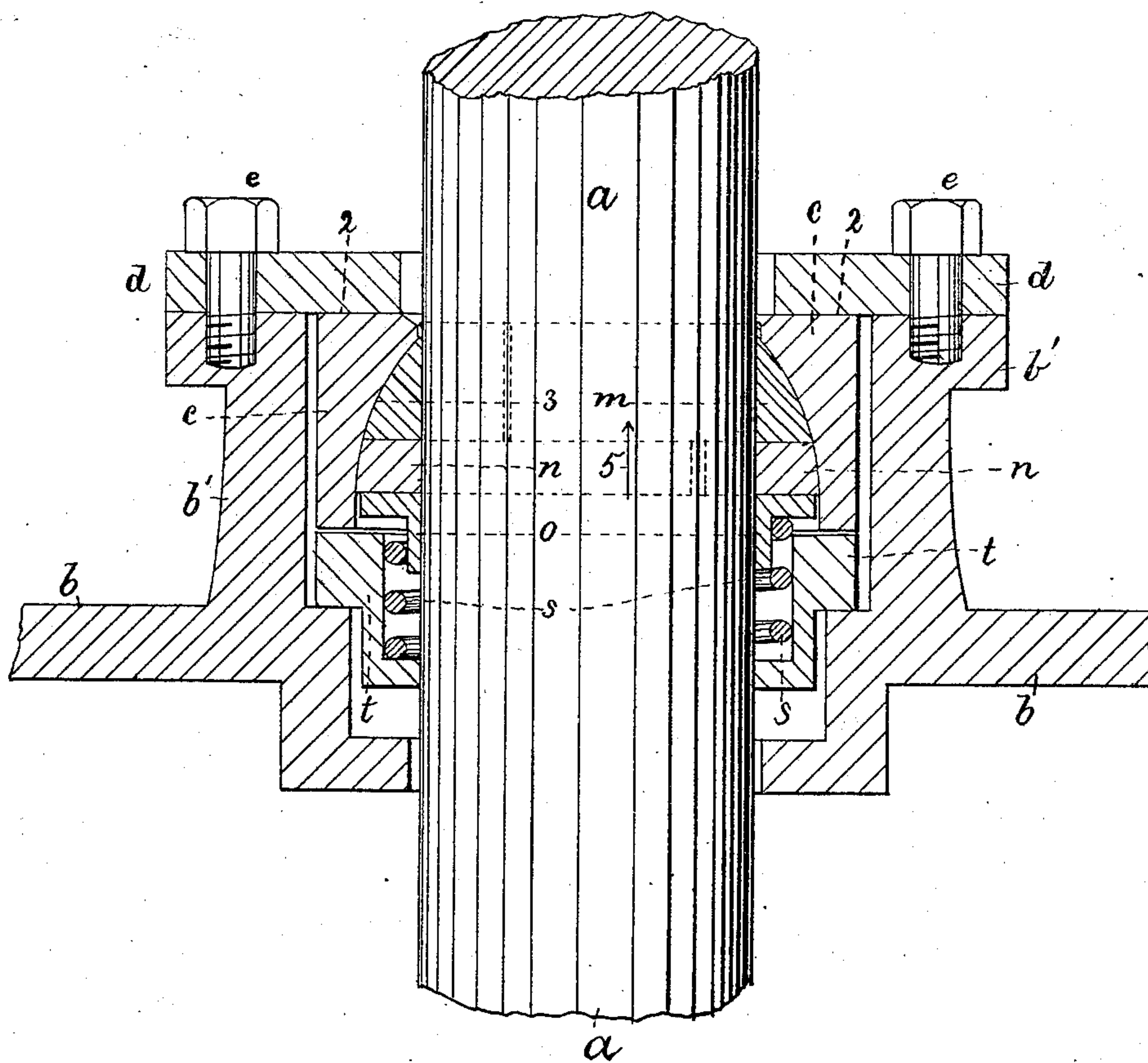


(No Model.)

E. P. MONROE.
PISTON ROD PACKING.

No. 245,967.

Patented Aug. 23, 1881.



Witnesses—
Arthur Reynolds.
Bernice J. Hayes.

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UNITED STATES PATENT OFFICE.

EDWIN P. MONROE, OF NEW YORK, N. Y., ASSIGNOR TO THE UNITED STATES METALLIC PACKING COMPANY, OF BOSTON, MASS.

PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 245,967, dated August 23, 1881.

Application filed February 11, 1881. (No model.)

To all whom it may concern :

Be it known that I, EDWIN P. MONROE, of the city, county, and State of New York, have invented a new and useful Improvement in
5 Piston-Rod Packing, of which the following description, in connection with the accompanying drawing, is a specification.

My invention relates to a metallic packing for piston-rods, and has for its object to produce a more simple and readily-constructed packing than those heretofore in use, the same being self-adjusting to compensate for wear and for irregularities in the movement of the piston-rod.

15 In one kind of metallic packing heretofore in use a rocking cup is employed having a spherical bearing-piece upon the cylinder or a packing-case fixed thereto, and having a conical or tapering passage, through which the piston-rod
20 passes. The packing-rings are made conical on their outside to fit the passage in the said socket and cylindrical on their inside to fit the piston-rod. The object in making the packing-rings and their socket in the rocking cup tapering is to enable the said rings to be constantly
25 wedged up to a tight bearing upon the piston-rod. The spherical bearing-piece, in connection with the cup, permits it to rock to enable the packing-rings to conform to the piston-rod, if
30 the latter in its reciprocation deviates from the direct line, owing to wear in its guides, or from other causes.

This, my present invention, has for its object to enable the spherical bearing-piece to be dis-
35 pensed with without losing anything in the adjustability of the packing to irregularities in the movement of the piston-rod, and thus simplifying and cheapening the construction of the parts and making the packing more compact and convenient.

40 My invention consists in a piston-rod-packing ring having a spherical or zone-shaped exterior, and contained within a packing-receptacle which supports the packing-ring and
45 permits the latter to both rock and be moved longitudinally in the receptacle, according to the requirements of the piston-rod, and to compensate for wear; also, in a packing-ring having its outer portion made spherical or zone-

shaped, combined with a receptacle or socket-
50 piece therefor, having an internal bearing-surface, also made zone-shaped, to receive and support the said packing-ring, which thus has a spherical bearing in its receptacle and is free
55 to rock to accommodate irregularities in the movement of the piston-rod. The surfaces of the ring and receiver in contact are of such shape that the wear occurring between the ring and piston-rod is compensated for automati-
60 cally by pressing the packing-ring by a suitable follower and spring or by the fluid-pressure more deeply into the socket, the ring, which may be split, being thereby closed or contracted to fit the piston-rod. The packing-receptacle
65 is connected with the cylinder-head by a suitable union or coupling in such a manner that it has a free lateral movement to compensate for deviations from right-line movement of the rod.

The drawing shows a piston-rod packing
70 embodying my invention.

The rod *a* and partition, wall, or cylinder-head *b* may be that of any apparatus in which a rod is required to move and maintain a steam,
75 fluid, or air tight fit.

The packing-receptacle *c* is connected with the cylinder-head *b* by the union or coupling *d*, (shown as fastened to the cylinder-head *b*,) or the usual stuffing-box projection *b'* thereon, by bolts *e*, the said receptacle being free to move
80 laterally on its bearing 2 on the said coupling *d* to compensate for lateral vibration or change in position of the rod 2. The said packing-receptacle *c* is provided internally with a curved socket, furnishing a bearing-surface, 3, shaped
85 as a zone of a sphere, to receive and support the packing-rings *m n*, zone-shaped externally to properly fit within the said socket, and shaped internally to bear evenly on the outside of the piston-rod *a*. The packing-rings *m n* will preferably be acted upon, as usual, by the follower
90 *o* and spring *s*, to press the packing-rings into their socket in the direction of the arrow 5, the pressure of the steam or other fluid in the cylinder also having the same tendency.

95 Owing to the spherical shape of the bearing-surface 3 between the packing-receptacle *c* and the packing-rings *m n*, the latter are per-

fectly free to rock in any direction, and permit the inner bearing-surfaces of the packing-rings to remain always in contact with the piston-rod *a*; and since the internal bearing-surface of the receptacle is of larger diameter at one than at the other end the packing-rings, when pressed into the receptacle in the direction of the arrow 5, will quickly and easily be wedged or contracted by the said surface 3 into closer contact with the piston-rod *a*, the spherical surface between the ring and the receptacle, as herein shown and described, performing the function of the conical surface in the packings heretofore in use, and also of the rocking bearing-piece, such as shown in reissued patent of the United States, No. 9,365, August 31, 1880, upon which this my invention is intended to be an improvement.

In this my invention the packing itself always has a free rocking movement, and as it wears will also sink more deeply into the packing-receptacle in the direction of the arrow 5, and will thus always maintain a tight fit on the piston-rod.

The chock *t*, upon which the spring *s* in this instance has its bearing, prevents the packing-receptacle *c* from being carried back in a direction opposite to the arrow 5 in case the packing adheres to the rod *a* when moved in that direction; and the said chock is arranged, as shown, to permit the follower *o* and packing *m n* to move a small amount in this direction after the receptacle *c* has been stopped, to thus remove the packing slightly from its bearing in the curved surface 3, so that it will no longer be pressed or wedged thereby against the rod *a*. After a sufficient movement to thus relieve the pressure on the packing the follower is itself positively stopped by the chock *t* and the adhesion between the rod and packing overcome without bringing too great a strain upon the spring *s*, which, without this arrangement of the chock *t*, would have to overcome the said adhesion by the gradual increase in pressure, or usually by the shock received when the coils of the spring are brought wholly together, thus straining the said spring.

It is not necessary that the coupling *d* should have its bearing on the extreme end of the packing-receptacle *c*, as shown, and it may sometimes be desirable to provide the said receptacle with a shoulder or flange to be engaged by the said coupling, in which case the said receptacle may extend out from the cylinder *b* beyond the said union *d*, if desired.

One or more packing-rings, like *m n*, may be employed, and they may be either split or not, as desired, it being found that the metal

of which they are formed will compress and conform itself to its socket and the piston-rod as the latter acts upon it to wear it away.

I am aware that a packing-ring has been made oval externally, but it will be obvious that an oval-surfaced ring cannot rock freely, as can my zone-shaped ring, the bearing-surface of which is a portion of a perfect sphere.

I claim—

1. The herein-described packing-ring, having a cylindrical inner surface to fit the rod to be packed, and a spherical or zone-shaped outer bearing-surface contained within a suitable receptacle to support the said packing-ring in operative position, as described, the said spherical bearing-surface permitting the packing-ring to rock and move freely and adjust itself to the movement and wear of the piston-rod, substantially as described.

2. In a piston-rod packing, the packing and the packing-receptacle having a bearing-surface, 3, between them, curved as described, whereby the said ring is permitted to rock freely and universally in the receiver, according to the requirements of the piston-rod, and also to be compressed by movement in a longitudinal direction over the piston-rod to compensate for wear, substantially as described.

3. The packing-ring having a zone-shaped external bearing-surface and the receptacle therefor, combined with a spring and follower to press the said ring into the receptacle, to thereby wedge it into close contact with the piston-rod, substantially as described.

4. The rod *a* and cylinder-head *b*, combined with the zone-shaped packing-ring and receptacle therefor, and the coupling *d*, to connect the said receptacle to the cylinder-head, having a bearing, 2, for the said receptacle, whereby the said receptacle is permitted to have free lateral movement thereon, substantially as and for the purpose described.

5. The packing-receptacle, packing-ring therein, and follower and spring, combined with the chock *t*, arranged, as described, to prevent the movement of the receptacle with the piston-rod, and thereafter to positively stop the said follower after the packing has been moved from its bearing in the receptacle, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN P. MONROE.

Witnesses:

HULBERT PECK,
FRANK J. HART.