C. C. JEROME.

Stuffing-Box for Steam-Engines.

No. 211,299. Patented Jan. 14, 1879.

Fig. 1.

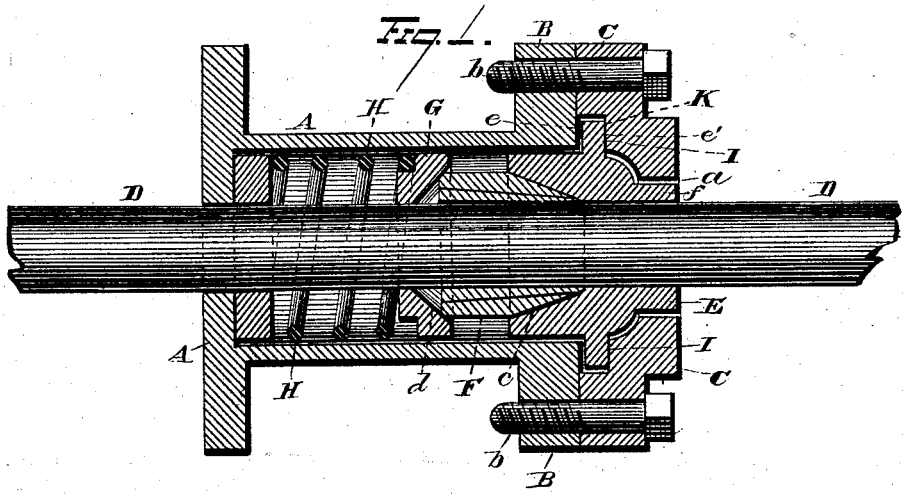


Fig. 2.

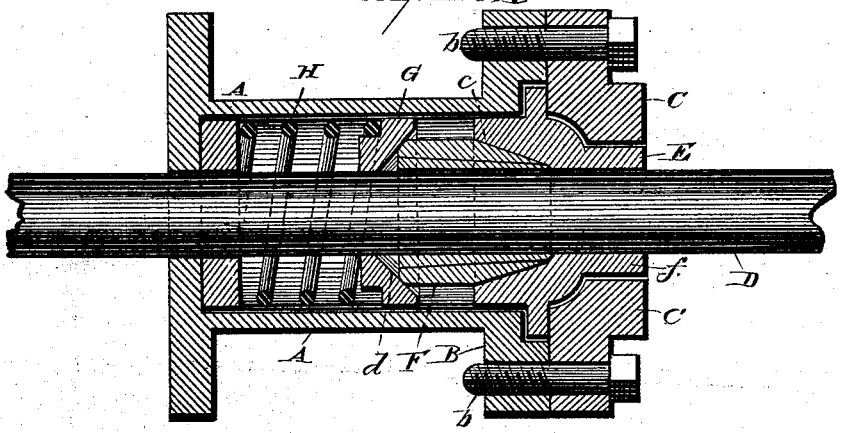


Fig. 3.

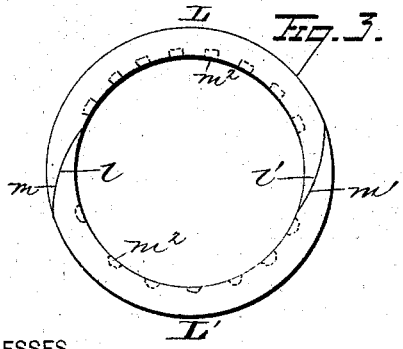
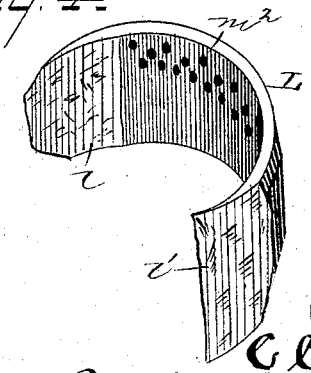


Fig. 4.



WITNESSES

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CHARLES C. JEROME, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN STUFFING-BOXES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **211,299**, dated January 14, 1879; application filed December 16, 1878.

To all whom it may concern:

Be it known that I, CHARLES C. JEROME, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stuffing-Boxes and Packing for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in stuffing-boxes and metallic packing for steam-engines; the object being, first, to provide a stuffing-box of simple and durable construction for packing the piston-rod of a steam-engine and allow of the lateral movement of the packing to compensate for the uneven wear of the piston and piston-rod, and, second, to furnish a metallic packing of such construction that it will automatically take up for all wear of the piston-rod or packing, and adapted to be readily applied to the piston-rod without disconnecting the same from the cross-head.

To these ends my invention consists, first, in the combination, with the stuffing-box and a face-plate secured to the outer end thereof, said parts being provided with an inclosed recess between their opposing faces, of a packing-receptacle having a converging inner space for the reception of metallic packing, and an annular flange on its outer surface, which overlaps the bore of the stuffing-box, and is furnished with an extended bearing to allow of the lateral adjustment or movement of the packing-receptacle.

My invention further consists in the combination, with the stuffing-box and a face-plate having a recess formed therein on the side toward the stuffing-box, of a packing-receptacle provided with an annular flange, which rests upon the outer end of the stuffing-box when forced in one direction, and against the bearing in the recessed face-plate when forced in the opposite direction.

My invention further consists in the combination, with a stuffing-box and recessed face-plate, of a packing-receptacle provided with an angular flange having parallel bearing-surfaces, which is interposed between the end of the stuffing-box and face-plate.

My invention further consists in the combination, with a stuffing-box and recessed face-plate, of a packing-receptacle provided with an annular flange intermediate its ends, said flange being interposed between the end of the stuffing-box and face-plate, the outer end of said packing-receptacle constructed to project within the face-plate.

My invention further consists in the combination, with a stuffing-box and a face-plate adapted to fit steam-tight against the outer end of the stuffing-box, of a packing-receptacle provided with an annular flange interposed between the stuffing-box and face-plate, the outer end of said packing-receptacle constructed to extend through the opening in the face-plate.

My invention further consists in the combination, with a packing-receptacle having a tapering or converging packing-space therein, of a packing-follower provided with a concave bearing-face to force the outer end of the metallic packing inwardly around the piston-rod.

My invention further consists in a metallic packing composed of two or more sections, the meeting edges of which overlap each other on both the inside and outside of the packing-ring, said overlapping joints being formed on a curve that coincides with the periphery of the packing-rings.

My invention further consists in the several details of construction and combinations of parts, as will hereinafter be explained, and pointed out in claims.

In the accompanying drawings, Figure 1 is a longitudinal central section of my improved stuffing-box. Fig. 2 is a modification. Fig. 3 is a plan view of one of my improved packing-rings. Fig. 4 is a view, in perspective, of one of the sections of the ring.

A represents a stuffing-box, and B the outer flange thereof. C is a face-plate, constructed with a central opening, *a*, for the outer end of the packing-receptacle of the piston-rod D. The face-plate C is secured to the flange B of the stuffing-box by bolts *b*, or in any other desired manner.

E represents a packing-receptacle, made of any desired length and material. The inner space, *c*, of the packing-receptacle converges outwardly toward the cylinder or steam side, and within said space is placed the metallic

packing ring or rings F, which latter, being forced by the steam against the converging walls of the packing-receptacle, are automatically contracted, and caused to form a steam-tight joint around the piston-rod.

G is a follower which surrounds the piston-rod, and abuts against the inner end of the packing-ring that projects without the packing-receptacle. Follower G is held against the packing-ring by means of a spring, H, the latter serving to preserve a tight joint and retain the packing ring or rings within the receptacle E. When a converging packing-space is employed to contract the packing-rings when worn, and thus automatically compensate for wear, that portion of the packing-ring which projects without the receptacle has a tendency to spread apart, and thus allow the steam to enter between the piston-rod and packing-ring.

My improved form of follower is provided with a concave face, *d*, against which is seated the inner end of the packing-ring, and, when used in connection with the packing-receptacle, with its converging packing-space, serves to contract the outer end of the packing-ring that projects outside of the packing-receptacle when the ring becomes worn, and thus both ends of the metallic packing are drawn against the piston-rod, to compensate for wear, and a true and even bearing-surface preserved within the entire length of the metallic packing.

Packing-receptacle E is furnished with an annular flange, I, having parallel bearing-surfaces *e e'*, said flange being of sufficient sectional area to overlap the bore of the stuffing-box and rest upon the outer surface of the stuffing-box flange B.

Face-plate C is constructed with a recess, K, in its face adjacent to the stuffing-box, for the reception of the annular flange I of the packing-receptacle. Recess K is of greater diameter than the annular flange I, for the purpose of providing for the lateral movement of the latter, with its inclosed packing, to compensate for any uneven wear and travel of the piston or piston-rod. The outer end, *f*, of the packing-receptacle surrounds the piston-rod, and is inclosed within the central opening of the face-plate.

From the foregoing it will be observed that a steam-tight joint is formed between the face-plate and the outer end of the stuffing-box, the opposing surfaces of said parts being formed with ground joints to prevent any escape of steam between the same. When the steam is on the packing the annular flange on the outer surface of the packing-receptacle rests upon the annular ground joint *h* within the recessed face-plate, and thus the steam is prevented from any escape past the same. When steam is shut off from the cylinder the packing is prevented from receding or being drawn backward on the piston-rod by means of the annular flange of the packing-receptacle resting upon the outer surface of the flange B of the stuffing-box.

Instead of forming a recess in the face-plate for the reception of the annular flange on the packing-receptacle, the flange B of the stuffing-box may be recessed and the face-plate have a plain surface, as shown in Fig. 2. This form of construction will accomplish the same result, and is within the scope of my invention; but the preferred construction is that illustrated in Fig. 1, as a greater length of packing-space is provided in a stuffing-box of given length.

L L' represent the sections of my improved metallic packing-rings. Each section is provided with inner and outer curved surfaces, *l l'*, which constitute curved steam-tight lap-joints *m* m^1 when the rings are forced within the converging packing-receptacles. The rings are conical or wedge-shaped, and the opposite ends of each section are formed tapering and on a curve coinciding with the periphery of the ring or sections thereof, so that one of the tapering ends of each section will have a full bearing on the piston-rod, and the opposite end a bearing against the converging wall of the packing-receptacle. Thus, when the ring becomes worn the sections thereof will automatically contract and move against the piston-rod, the curved lap-joints gradually encircling and bearing upon the peripheries of the sections, and forming a steam-tight joint therewith, being formed on a curve exactly coincident therewith. This form of packing not only insures a perfect steam-tight joint and readily compensates for wear, but also is a great improvement on packing having but a single joint, for the reason that the independent sections may be readily applied to a piston-rod without the necessity of disconnecting the latter from the cross-head, thereby resulting in a saving of time and expense in the packing of an engine, and insuring a perfect steam-tight joint when the packing is secured in place. In order to insure perfect steam-tight joints between the sections of the packing-ring, the latter are constructed as follows: Within a mold or flask I place a core or rod of the desired size of the diameter of the ring, thus forming an annular space between the mold and the rod, within which is placed a brass or other metal pattern of one of the sections of the ring. Babbitt metal, or any composite metal of which the ring is to be composed, is then poured into the annular space, and one section of the packing-ring is thus formed. This section is then taken out of the mold and the joints smoked, to prevent the succeeding charge of metal from uniting therewith at the joints. The section of the ring thus formed is then placed in the mold in lieu of the brass pattern, and the ring metal poured again into the annular space, which, coming in direct contact with the section already formed, unites therewith, and the complete ring is removed from the mold. This ring is then put into a lathe and turned down, and cut off in any desired lengths. When severed the sections of the ring fall apart at their smoked joints.

It will thus be understood that the adjacent

surfaces of the sections at their jointed ends are exact counterparts of each other, as one section serves as a pattern for its mate, and thus when the sections of the packing-ring are arranged within the packing-receptacle a perfect steam-tight joint is formed.

The inner surfaces of the packing-rings are provided with lubricating-receptacles m^2, which are preferably arranged to intersect each other, as shown, in order to provide a continuous lubricating-surface within the packing-ring, and to preserve a steam-tight joint between the packing and piston-rod. By locating the lubricating-receptacles so that the rows will intersect each other the packing is worn away evenly when forced into its converging ring.

It is evident that many slight changes in the construction and arrangement of the several parts of my device may be resorted to without departing from the spirit of my invention—as, for instance, the annular flange on the packing-receptacle may be formed on the end of the packing-receptacle instead of intermediate of its ends, and the flange serve the same functions, as heretofore explained. Again, a plain-faced follower or a gland may be employed for forcing the packing-rings into the packing-receptacle. Again, the packing-rings may be composed of any desired number of sections. Again, but a single packing-ring may be employed, and the tapered end thereof be inserted in the converging space of the packing-receptacle, and the inner end project from without the same and bear upon the concave face of the follower, the latter serving to force the outer end of the packing-ring snugly against the converging wall of the packing-receptacle, and also to contract the inner and projecting end of the ring tightly around the piston-rod.

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

1. The combination, with a stuffing-box and face-plate secured in a steam-tight manner to the outer end of the stuffing-box, of a packing-receptacle having an inner converging packing-space, and provided with an annular flange on its outer surface of greater diameter than the bore of the stuffing-box, said flange located within a recess between the opposing faces or surfaces of the face-plate and stuffing-box, substantially as set forth.

2. The combination, with a stuffing-box and a face-plate provided with a recess on its side toward the stuffing-box, of a packing-receptacle provided with an annular flange on its outer surface, which rests upon the outer end of the stuffing-box when the packing-receptacle is forced in one direction, and against the bearing in the recessed face-plate when forced in the opposite direction, substantially as set forth.

3. The combination, with a stuffing-box and a recessed face-plate, of a packing-receptacle provided with an annular flange having parallel bearing-surfaces, which is encircled by a steam-tight joint formed between the end of the stuffing-box and recessed face-plate, substantially as set forth.

4. The combination, with a stuffing-box and recessed face-plate, of a packing-receptacle provided with an annular flange intermediate of its ends, said flange interposed between the end of the stuffing-box and face-plate, and surrounded by a steam-tight joint, substantially as set forth.

5. The combination, with a stuffing-box and a face-plate adapted to fit steam-tight against the outer end thereof, of a packing-receptacle provided with an annular flange, which is interposed between the face-plate and outer end of the stuffing-box, the outer end of the packing-receptacle projecting into the central opening in the face-plate, substantially as set forth.

6. The combination, with a packing-receptacle having an inner converging packing-space, of a follower constructed with a concave bearing-face to contract the inner ends of the packing-rings, substantially as set forth.

7. A metallic packing composed of two or more sections, the adjacent ends of which are formed on a curve that coincides with the periphery of the ring, substantially as set forth.

8. A metallic packing-ring composed of two or more sections, the adjacent ends of which are tapered and curved, and adapted to be joined in such a manner that one end of each section will bear against the piston-rod, while the opposite end of each section will bear upon the adjacent section of the ring, substantially as set forth.

9. A tapering packing-ring provided with a series of lubricating-receptacles, arranged to intersect each other, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

CHARLES C. JEROME.

Witnesses:

F. O. McCLEARY,

FRANK GALT.