T. H. HOPKINS.

Stuffing-Boxes for Steam-Engines.

No. 196,978. Patented Nov. 13, 1877.

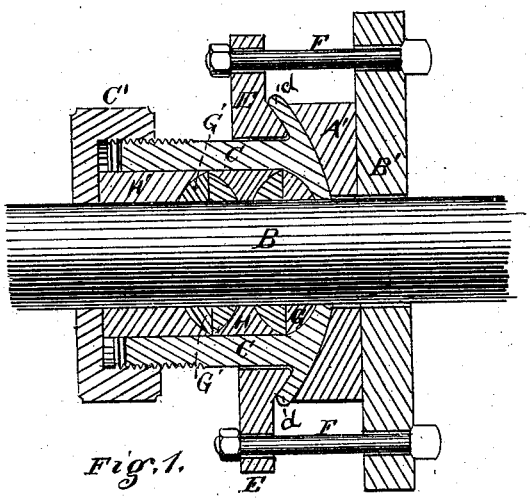

Fig. 1.

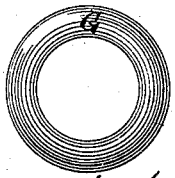

Fig. 4.

Fig. 5.

Fig. 6.

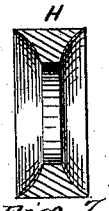

Fig. 7.

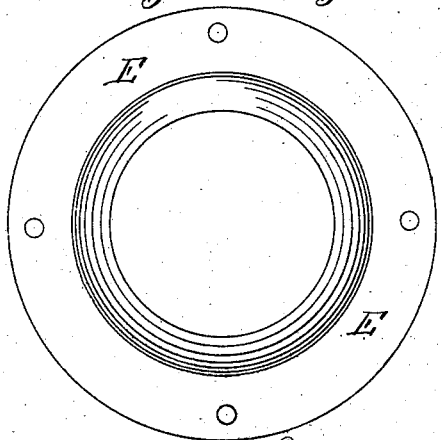

Fig. 2.

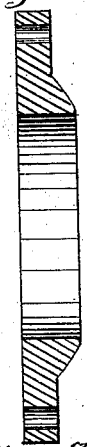

Fig. 3.

Witnesses
James McEvoy
J. D. Chambers

Inventor Taylor H. Hopkins.
By Attorney Wm. Gr. Cuthbert

UNITED STATES PATENT OFFICE.

TAYLOR H. HOPKINS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN STUFFING-BOXES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **196,978**, dated November 13, 1877; application filed February 14, 1877.

To all whom it may concern:

Be it known that I, TAYLOR H. HOPKINS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Stuffing-Boxes for Piston-Rods, which improvement is fully set forth in the following specification and accompanying drawing.

The object of my invention is a stuffing-box which is self-adjusting to any irregular movement of the piston or piston-rod, and to preserve the packing from irregular wear.

In the drawing, Figure 1 is a horizontal longitudinal section of the invention, all the parts being in proper position. Fig. 2 is a plan of the large ring or flange. Fig. 3 is a transverse section of the same. Fig. 4 is a plan view of a ring of metallic packing. Fig. 5 is a transverse section of the same. Fig. 6 is a face view of the intermediate gland. Fig. 7 is a transverse section of the same.

A is a cylinder-head, on which is seated a thick circular plate or block, A′, the joint between them being a "ground joint." Said block is about twice the diameter of the piston-rod B, which passes freely through a hole in the center. The front or outer face of block A′ is "dished" or concave, in which is seated (the joint being ground) the convex bottom D of the cylindrical-shaped box C, said box being externally about one-fourth less in diameter than the block A′. It is provided with a screw-thread cut around its outer end, on which screws the cap C′, said cap being made as is usual. The internal diameter of box C is about one-third more than the piston-rod B. Its bottom D is concave and so perforated that the piston-rod will just pass through. Externally the bottom D projects beyond the sides of the box, on the same line of circle as the concavity of block A′, sufficient to form a strong flange, as shown by *d*, Fig. 1, its outer face being correspondingly concave. E is a strong ring, a little less in diameter than the cylinder-head A. It passes loosely over and around box C, and is provided with an annular projection around the hole in its center, on the side toward the cylinder-head, which fits into the hollow in the front of flange *d*, their contact or bearing faces being smooth-finished so that they may easily slide on each other.

Flange or ring E is attached to the cylinder-head by three or more bolts, F, having ball heads and nuts, which pass through the flange portion of the cylinder-head and holes in said ring E, the said holes being large enough to permit said bolts to roll on their heads and nuts to any lateral movement of the box C or ring E. G and G′ are pairs of metallic packing-rings, each pair fitting on the piston-rod, and of a convex shape front and back, the first, G, fitting into the concave bottom D by its rear convexity, and covered in front by an intermediate gland, H, which is correspondingly concave on both surfaces, the front of which receives the rear convexity of packing G′. H′ is a gland, which is immediately in front of packing G′, on which it bears by its rear surface, which is concave, the front being plain, so that the cap C′ may have a proper bearing on it when screwed on box C.

It will be understood that the size of the glands and packing-rings are made with reference to the internal diameter and depth of box C and the diameter of the piston-rod, both of which they should fit; also, that the glands H and H′ are some slight distance apart at their points.

Operation: The various parts being all properly adjusted to each other, as shown in Fig. 1, the cap C′ is screwed down on box C, forcing the glands and packing-rings together. The concave faces of the glands, bearing on the convex surfaces of the packing, force it on the piston-rod. Should the piston-rod from any cause work out of line, the box will adjust itself to such irregular movement by moving in the block A′ and ring E on the bolts F F, the block A′ also moving on the cylinder-head, the movements of these parts being such that the box C and the packing contained in it will continue in line with the piston-rod, thus preventing any irregular wear of the packing.

I do not wish to be understood as confining myself to the ball-head bolts, as other kinds may be substituted therefor—as, for instance, knuckle-jointed bolts; also, I desire to say that those parts which I have described as concave and convex in their relation to each other, except the glands, packing-rings, and interior concave shape of the bottom D, might be re-

versed; also, that the annular projection described as formed around the hole in ring E may be made as a separate ring, all of which I claim as mechanical equivalents; also, I desire to say that my invention is applied to engines or other machines in present use by bolting a plate similar to that described as the cylinder-head A to the cylinder-head.

Having thus described my invention and its operation, what I claim, and desire Letters Patent for, is—

1. In combination with a piston-rod, the box C, provided with the flange *d* and bottom D, seated on the block A′, all constructed and operating in manner as described, for the object set forth.

2. The combination of the cylinder head or plate A, block A′, box-bottom D, flanges *d* and E, and bolts F, all operating in manner as described, for the purpose of the box C adjusting itself to any irregular action of the piston-rod.

3. The cylinder head or plate A, block A′, box C, bottom D, flange *d*, ring or flange E, bolts F, packing G G′, and glands H H′, all constructed and operating in manner as described, and for the object set forth.

TAYLOR H. HOPKINS.

Witnesses:
WM. M. CUTHBERT,
H. R. FOSTER.