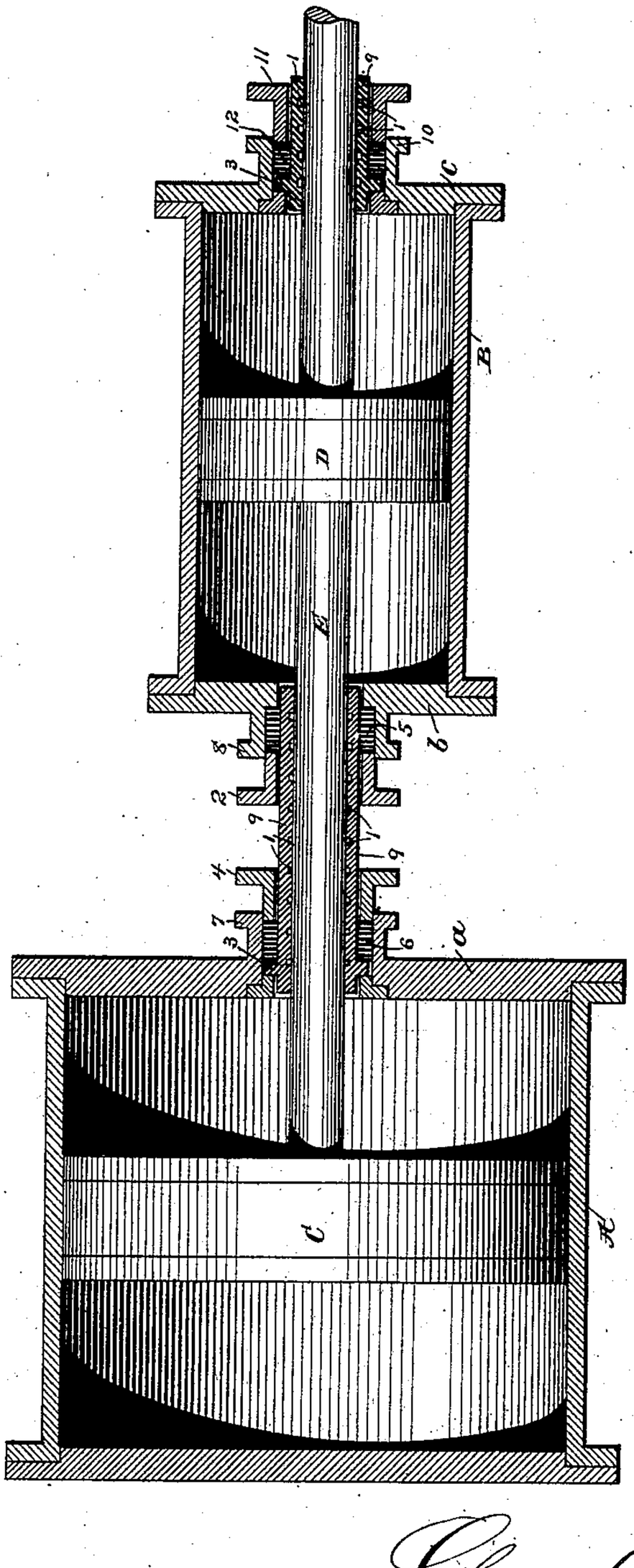
(No Model.)

C. C. WORTHINGTON.

PISTON ROD PACKING.

No. 332,856. Patented Dec. 22, 1885.



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PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 332,856, dated December 22, 1885.

Application filed August 3, 1885. Serial No. 173,378. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. WORTHINGTON, a citizen of the United States, residing at Irvington, county of Westchester, and State of New York, have invented certain new and useful Improvements in Piston-Rod Packing, fully described and represented in the following specification and the accompanying drawing, forming a part of the same.

This invention relates to a means for packing piston or plunger rods, and for other similar purposes, by which the friction due to the passage of the rod through the packing is to a great extent avoided and the movement of the rod made more easy.

The present invention may be applied with good effect in any case where it is necessary to form a tight joint around a piston or plunger rod, but is more particularly useful in those cases—as, for example, in compound engines—in which it is necessary or desirable that the same rod should be connected to the pistons or plungers of two or more cylinders which are arranged end to end and in comparatively close proximity to each other. In such cases it is of course necessary that the rod should pass through the adjacent ends or heads of the cylinders, and that the cylinder-heads should be provided with suitable means for forming tight joints around the rod. If stuffing-boxes of the ordinary construction, in which the packing material is pressed directly around the rod, are employed for this purpose, the friction between the packings and the rod is sufficient to cause a considerable loss of power, and this it is highly desirable to avoid.

It is the object of the present invention to as nearly as possible overcome this difficulty, and to provide a means by which a practically tight joint can be formed around a piston or plunger rod without causing the packings to press against the rod.

As a full understanding of the invention can be best imparted by a detailed description of the manner in which it is applied, such description will now be given, reference being had to the accompanying drawing, which shows a horizontal section of the two cylinders of a compound engine, the outer end or head of the smaller cylinder and the adjacent ends or heads of the two cylinders being provided with packing devices constructed according to the present invention.

Referring to said figure, it is to be understood that A B are the two cylinders of an ordinary compound engine, their two pistons C D being attached to the same rod, E, which passes through the outer end or head, *c*, of the smaller cylinder and the adjacent ends or heads *a b* of the two cylinders, which are, as is frequently the case, placed a short distance from each other. This shows both applications of the invention in a single structure.

In order to avoid the friction occasioned by the passage of the rod E through two packings between the cylinders, I provide the rod with a rigid sleeve, 9, which surrounds the rod between the two cylinders, with its opposite ends extending into and through two ordinary stuffing-boxes, 7 8, with which the heads *a b* are provided. The sleeve 9 is provided with two followers, 2 4, which enter the boxes 7 8 and press the packings 5 6, with which the boxes are provided, around the sleeve, so as to form perfectly-tight joints. The followers 2 4 may be arranged to screw into the boxes to compress the packings; or this may be done by means of bolts passing through the flanges of the followers and the flanges of the boxes; or the followers may be forced into the boxes to compress the packings in any convenient or suitable manner. By this means it will be seen that the pressure of the packings 5 6, instead of being exerted directly against the rod E, is exerted against the sleeve which surrounds the rod, thereby relieving the rod from the friction of the packings.

The sleeve 9 will be made to fit the rod quite perfectly, but will be sufficiently loose, so that it will occasion but very little friction against the rod E, and the followers 2 4 will be made to fit loosely, as indicated, so that the sleeve may be capable of a slight lateral movement against the yielding packings, so as to accommodate itself to any spring in the rod E, and thus prevent the rod from cutting or wearing, as would be the case if the sleeve were rigidly supported.

In order to prevent the sleeve 9 from having any endwise movement, it is provided with

a flange, as 3, which rests between one of the cylinder-heads and the packing at that end of the sleeve, as shown in the drawing.

If preferred, the sleeve 9 may be provided with two of the flanges 3—one for each stuffing-box. Should any slight leak take place through the sleeve, it being simply from one cylinder to the other, and not to the open air, it will in most cases be found unobjectionable, and the possibility of any such leak can be still further reduced by providing the interior of the sleeve with a series of grooves or channels, as 1, in which water will accumulate, so as to not only lubricate the rod E, but also provide a water-packing.

The invention is also applicable, as before stated, to those cases in which the rod which is to be packed passes through only one cylinder-head. This application of the invention is illustrated at the outer end of the cylinder B, in which the sleeve 9 simply surrounds the rod E in the stuffing-box 10, and is provided with a single follower, 11, which compresses the packing 12 around it. In this case the sleeve 9 is provided with the grooves 1 and flange 3, and the follower 11 is made to fit loosely around the sleeve, the same as in the arrangement first described and for the same purpose.

Although, for the purpose of illustration, the invention is shown as applied to the cylinders and piston-rod of a compound engine, it is to be understood that it is not limited in its application to the cylinders and rod of such an engine, but can be applied with equally good results in any case where it is necessary to form a tight joint or joints around a rod which passes through a single wall or through two walls which are located in close or comparatively close proximity to each other.

I am aware of Letters Patent No. 188,433, in which there is described a packing consisting of leather, hemp, rubber, or similar material having a metallic bearing which surrounds the rod. In that case, however, the metallic bearing is so formed that it closes around the rod by the pressure of the packing, and does not relieve the rod of the pressure of the packing.

I am also aware of Letters Patent No. 254,736, in which there is described a metallic packing composed of rings or sections of rings which are so constructed as to be contracted around the rod by the forcing inward of the follower. I do not therefore wish to be understood as claiming anything shown in these patents; but

What I do claim is—

1. The combination, with the wall or head *c*, having the stuffing-box 10, and the rod E, passing through said box, of the rigid sleeve 9, surrounding said rod, and the packing 12, surrounding said sleeve, substantially as described.

2. The combination, with the wall or head *c*, having the stuffing-box 10, and the rod E, passing through said box, of the rigid sleeve 9, surrounding said rod and having the flange 3, and the packing 12, surrounding said sleeve, substantially as described.

3. The combination, with the wall or head *c*, having the stuffing-box 10, and the rod E, passing through said box, of the rigid sleeve 9, surrounding said rod, and the yielding packing 12, surrounding said sleeve and permitting it to have a slight lateral movement to accommodate itself to distortions of the rod, substantially as described.

4. The combination, with the walls or heads *a b*, having the stuffing-boxes 7 8, and the rod E, passing through said boxes, of the sleeve 9, surrounding said rod, and the packings 5 6, surrounding said sleeve, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES C. WORTHINGTON.

Witnesses:
STILLMAN H. STORY,
T. H. PALMER.