

(No Model.)

J. H. McGOWAN.

PISTON ROD PACKING.

No. 347,817.

Patented Aug. 24, 1886.

Fig. 1.

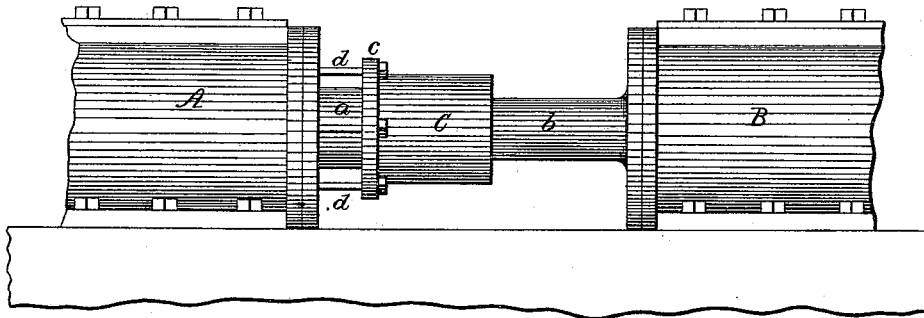


Fig. 2.

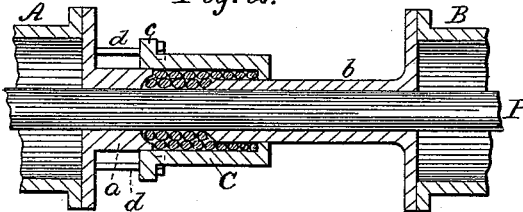


Fig. 3.

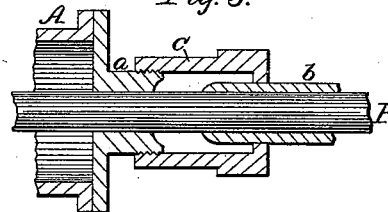


Fig. 4.

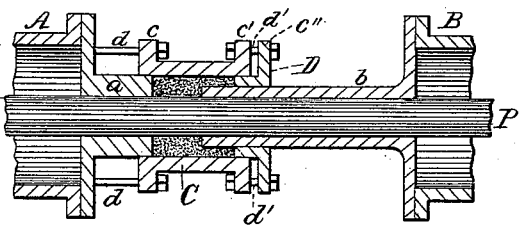
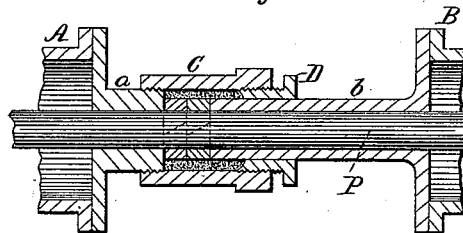


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 347,817, dated August 24, 1886.

Application filed May 12, 1886. Serial No. 301,906. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. MCGOWAN, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Piston-Rod Packing, of which the following is a specification.

My invention relates to the means of packing externally the piston-rods or plungers in structures in which two or more cylinders or chambers (as in steam-pumps, &c.) are arranged separately or "tandem" in relation to a common rod or plunger, its object being to simplify the structure by utilizing one gland or stuffing-box for packing the two contiguous entrances of the rod into adjacent cylinders; also, to prevent the external leakage occurring in such structures where independent packings are used, and to prevent access of dust and dirt to the packing.

To this end my invention consists in the provision upon each cylinder or chamber of a sleeve extending toward the other, and embracing the piston-rod or plunger, with a suitable interval between the contiguous ends of said sleeves, forming a recess for the packing around the rod or plunger, one of said sleeves being of smaller diameter than the other, and in the combination therewith of an outer casing or collar, constituting the stuffing-box proper, fitted snugly over the end of the larger sleeve, and extending thence as a casing of uniform diameter over and beyond the end of the smaller sleeve, thus inclosing an annular packing-space of two diameters, of which the piston-rod or plunger forms the axial core of a portion, and the smaller sleeve the axial core of the remainder. The said casing may be adjustable longitudinally, or its end wall surrounding the smaller sleeve may be formed as an independently-adjustable gland, so that in setting up either or both the packing will be compressed in its inclosing-space surrounding the piston-rod.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which Figure 1 is a side elevation of two cylinders arranged tandem in relation to a common piston-rod or plunger, and of my invention as applied thereto; Fig. 2, a vertical longitudinal section of the packing devices; Fig. 3, a similar section showing the packing-collar engag-

ing by screw-threads in lieu of the retaining-bolts; Figs. 4 and 5, axial sections of constructive modifications.

Referring now to the drawings, A and B designate two cylinders or chambers arranged in the same axial line, in which a common piston-rod or plunger, P, operates—an arrangement common in duplex steam-pumps, steam-engines, and other structures. Heretofore in such structures it has been common to apply separate stuffing-boxes and packing at the plunger-entrances of each cylinder, with an interval in which the rod or plunger was entirely exposed. The disadvantages of this construction are, among others, that the two separate packings produce excessive friction and wear of the parts, and that the leakage is external and objectionable, and that the entire exposure of the plunger between the stuffing-boxes facilitates access of dirt, and consequent destructive wear of the rod and packing.

In my improvement I dispense entirely with the ordinary stuffing-boxes, and apply the following construction: The cylinder A, for example, is provided with a sleeve, *a*, extending beyond the head and surrounding the piston, closely fitting the front opening of a stuffing-box or collar, C, and the cylinder B is provided with a sleeve, *b*, extending in the opposite direction from its head to within a short distance of the end of sleeve *a*, inclosing the same rod or plunger, P, and fitting closely the rear opening of the collar C. The stuffing-box or collar C is cup-shaped, with perforated bottom to slip over the sleeve *b*, and may have a marginal flange, *c*, for the engagement of adjusting-bolts *d*, as shown in Fig. 2, or may engage the sleeve *a* by screw-threads, as in Fig. 3.

To describe more fully the details of the construction shown in Figs. 2 and 3, the annular thickness of the sleeve *a* is equal, say, to the diameters of two (radially-imposed) layers of the packing, the annular thickness of the sleeve *b* equal to that of one such layer, the longitudinal interval between the ends of sleeves *a* *b* equal to that of two or more such layers, and the longitudinal depth of the box C sufficient to lap somewhat over the sleeve *a* and extend sufficiently beyond the end of sleeve *b* to allow several of the packing-coils

to wind around the sleeve *b* within the box *C*. The construction here shown and described is preferable in larger structures where round or or flat "rope" packing is used. It will be
5 seen that upon setting up the box or collar *C* by its adjusting-bolts *d* the entire mass of packing will be compressed, with the effect of forcing it into the space between the ends of the sleeves *a b*, around the plunger *P*, thus
10 packing both the openings in the sleeves at once. It will also be seen that no external leakage can take place from the box or collar *C*, as the packing is not subjected to wear at the outer portions, and therefore remains al-
15 ways in perfect condition. Whatever leakage occurs, therefore, if any, is forced through from one cylinder to the other. It will be obvious that in this case the sleeve *b* must be of sufficient length to allow the box or collar *C* to be
20 slipped back far enough to uncover the space between the two sleeves and permit the insertion of new packing.

In Figs. 4 and 5 I have shown a slight modification of structure, in which the box *C* is constructed as a mere collar fully open at both
25 ends, and an independent adjustable gland, *D*, is used to close the opening around the sleeve *b*. Both the collar *C* and the gland *D* may be secured adjustably by screw-threads, as in Fig. 5, or by retaining-bolts *d d'* and flanges *c c'*, as in Fig. 4. By the employment of the independent nut or gland *D* the renewal of the packing is facilitated, as a small portion may
30 be added from time to time, to replace that lost by wear, by removing the small gland *D*, without disturbing the main packing-box or collar *C*. The proportions and relative arrangement of the parts and packing here shown are illustrative merely, and may be varied without
40 departing from the spirit of my invention. The kind of packing to be used is not material. Thus, the ordinary metallic split or sectional rings may be used adjacent to the rod in the space between the ends of the sleeves,
45 with fibrous packing surrounding it and filling the remainder of the packing-space, and the joints made tight by setting up the collar *C* or gland *D*, either of which latter may be adjusted independently of the other. This I
50 have indicated in Fig. 5.

In Figs. 2 and 3 I have shown the end of the larger sleeve, *a*, countersunk and the corresponding end of the sleeve *b* beveled or conical. This construction I deem preferable where cotton yarn or other soft packing of any
55 kind is used; but where metallic rings are used I deem it preferable to have the ends of the sleeves dressed to plane surfaces, as indicated in Figs. 4 and 5.

I claim as my invention and desire to secure 60 by Letters Patent of the United States—

1. In combination with two independent cylinders or chambers arranged tandem upon the same piston-rod or plunger, an extension
65 from each cylinder or chamber surrounding the piston-rod or plunger as a sleeve, leaving a space between the ends of the sleeves, and a single packing-box or collar surrounding the ends of the sleeves and covering the intervening space around the rod or plunger, sub-
70 stantially as set forth.

2. In combination with two independent cylinders or chambers arranged tandem upon the same piston-rod or plunger, two sleeve-
75 extensions of different diameters embracing the piston-rod or plunger between the cylinders or chambers, and a packing-box or collar inclosing the ends of the sleeves and forming an annular packing-space surrounding the piston between the sleeves and extending in-
80 ward beyond the end of the smaller sleeve, substantially as set forth.

3. The combination of the cylinders *A B*, provided with the separate sleeve-extensions
85 *a b*, with the piston-rod or plunger *P* and the packing-box or collar *C*, substantially as set forth.

4. In combination with the cylinders *A B*, piston *P*, and sleeve-extensions *a b*, of different diameters, the adjustable collar *C*, pro-
90 vided with the gland *D*, substantially as set forth.

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

JOHN H. MCGOWAN.

Witnesses:

L. M. HOSEA,
C. D. KERR.