G. DRYDEN.

Improvement in Piston-Packing.

No. 129,799. Patented July 23, 1872.

Fig. 1.

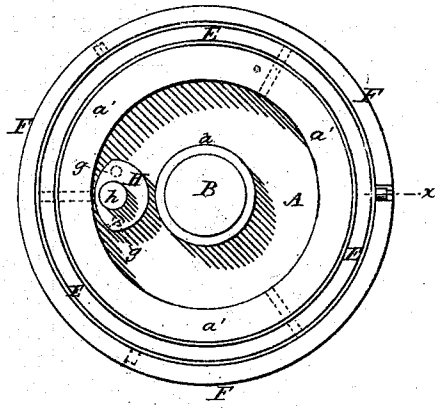


Fig. 2.

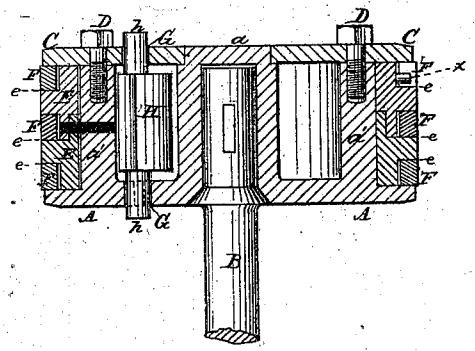
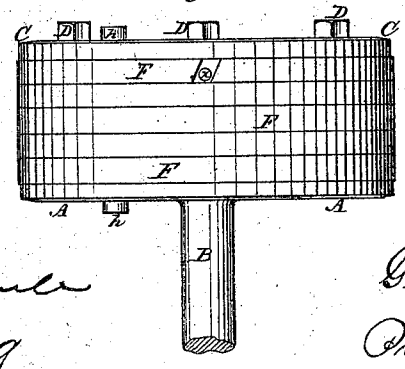


Fig. 3.



Witnesses:

Thomas Simmons

John R. Young

Inventor:

George Dryden, by

Prindle and Co, his Attys

UNITED STATES PATENT OFFICE.

GEORGE DRYDEN, OF SOUTH BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PISTON-PACKINGS.

Specification forming part of Letters Patent No. **129,799**, dated July 23, 1872.

To all whom it may concern:

Be it known that I, GEORGE DRYDEN, of South Boston, in the county of Suffolk and in the State of Massachusetts, have invented new and useful Improvements in Piston-Packing; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is an end view of a piston containing my improved packing-rings. Fig. 2 is a central cross-section of the same, and Fig. 3 is an edge view of said piston and rings complete.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to utilize the elastic pressure of steam within a cylinder for the purpose of expanding the piston-packing; and it consists, principally, in the combination of the inner and outer packing-ring with the piston head and follower and the double valve, substantially as and for the purpose hereinafter specified. It consists, further, in the construction and combination of the sections of the circumferentially-divided inner packing-ring, substantially as and for the purpose hereinafter shown. It consists, finally, in the construction of the valve and its combination with the piston head and follower, substantially as and for the purpose hereinafter set forth.

In the annexed drawing, A represents the piston-head, provided with a central hub, *a*, for the reception of the piston-rod B, and with an annular body, *a'*, which, in connection with said hub, furnishes a bearing for the follower C, said follower being secured in place by means of three or more screws, D, in the usual manner. Fitted between the head and follower, outside of the body *a'*, is a packing-ring, E, which has a diameter slightly greater than said parts, and slightly less than the diameter of the cylinder, and is provided, at or within its upper corners and within its center, with three right-angled grooves, *e*, which have equal width and depth, and are separated by corresponding portions of said ring. Within the grooves *e* of the ring E are fitted three rings, F, which, while closely filling the space laterally, have a slightly less depth than said grooves. Being divided diagonally at one point, each ring is sprung open slightly, so as to cause it to closely fill the cylinder, and is secured in position, circumferentially, with relation to the inner ring by means of a stud or pin, *x*, which projects radially outward from the latter into the space or division between the ends of said ring F. The divisions of the outer rings are placed so as to equally divide the space around the circumference of the inner ring; and directly beneath the center, transversely and longitudinally of each of said outer rings, is provided an opening, *z*, that passes radially inward through said ring E and through the body *a'* of the piston-head. Passing through each—the piston-head A and follower C—in a line with the piston and just within the body *a'*, is an opening, G, that receives and contains the stem *h* of a double valve, H, said valve being constructed with square parallel ends or faces, and having a length somewhat less than the space between said follower and head, so that when said valve bears against one of the latter a space is left between its opposite end and seat. Within the seat or bearing for each end of the valve H is provided one or more openings, *g*, which extend outward and afford communication between the interior of the piston and the steam-space within the cylinder, and, when not covered by said valve, permit the free passage of steam to the former.

The device is now complete, and operates as follows: Upon the admission of steam to the cylinder upon either side of the piston the valve is thrown to the opposite side of the latter, so as to close upon such side the opening *g* and open the corresponding opposite openings, through the latter of which steam enters and fills the piston, and, passing outward through the opening *z*, presses against the inner side of the divided rings and holds them firmly against the wall of said cylider. When, by a change of the valve of the engine, steam is admitted to the opposite side of the piston, the position of valve H is reversed, and the action of the steam upon the packing-rings continued.

One advantage of this method of distending the packing over the metal springs usually employed consists in the invariable correspondence between the pressure of the steam within the cylinder and the power requisite to hold the packing in contact with the interior of said

cylinder, so as to prevent the passage of steam between the same. Another advantage is found in the absence of friction between the rings and cylinder after steam is shut off and while motion continues, it being well known that steam acts as a lubricant, and upon shutting off the same great liability exists to the cutting of the bearing-surfaces.

Experience having shown that better results are obtained by having three or more bearings for the rings upon the cylinder than by the employment of but two bearings, I have, as seen, constructed my packing with three expansible rings, the center one of which is contained within a groove having a wall upon either side. In order to permit of the insertion of the center ring I construct the inner ring E in two sections, and unite them by means of a tongue, e', attached to and forming a part of one section, and a corresponding groove, e'', formed within the contiguous portion of the opposite section. By this construction the sections of the ring can be easily separated, whenever it may become necessary to remove the expansion-ring or to dress the faces of the groove, and when united said sections jointly operate in the same manner as though formed of or from one piece of metal.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. The packing-rings E and F, constructed as shown, and combined with the piston-head A, follower C, and the valve H, substantially as and for the purpose specified.

2. The packing-ring E, composed of two grooved sections, constructed and combined substantially as and for the purpose shown.

3. The valve H, constructed as shown, and combined with the piston-head A and follower C, substantially as and for the purpose set forth.

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

GEORGE DRYDEN.

Witnesses:

JOHN B. HUGHES,
JAMES RUSSELL.