(No Model.)

J. BRANDON.

PISTON PACKING.

No. 345,569. Patented July 13, 1886.

Fig. 1.

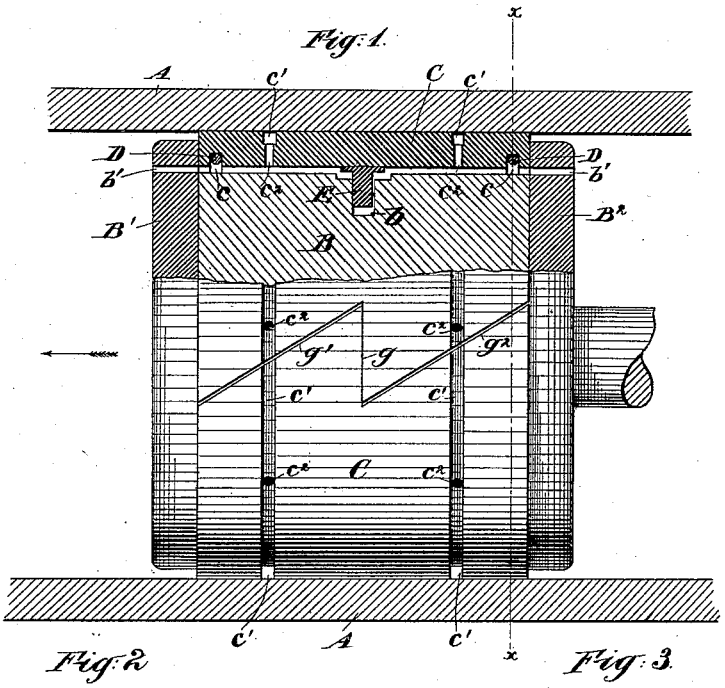


Fig. 2

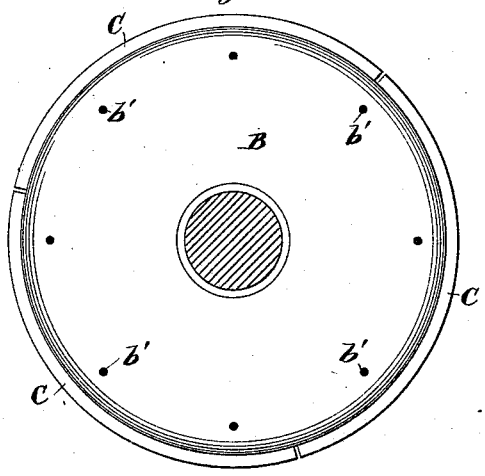
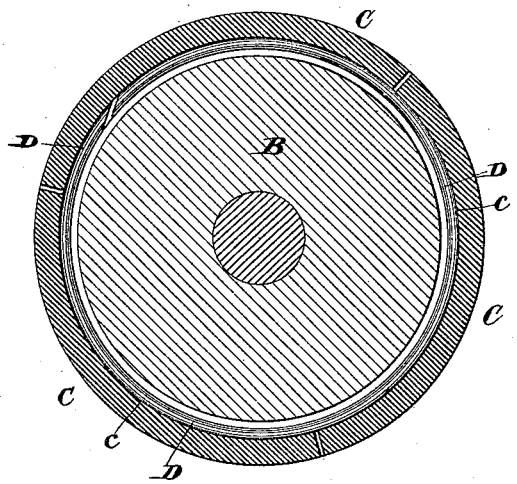


Fig. 3



Witnesses:
Charles R. Searle,
L. C. Smith.

Inventor:
James Brandon
by his attorney
Thomas Spencer Stetson.

UNITED STATES PATENT OFFICE.

JAMES BRANDON, OF NEW YORK, N. Y.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 345,569, dated July 13, 1886.

Application filed December 14, 1885. Serial No. 185,555. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRANDON, of New York city, in the county and State of New York, have invented certain new and useful Improvements in Piston-Packing, of which the following is a specification.

I have in patents to me, dated August 14, 1883, and April 7, 1885, set forth a construction in which the pressure of the steam or other fluid which urges the piston, or which is urged thereby, serves to force out the packing to an extent intended to be sufficient to maintain the tightness without engendering serious friction or wear. The present invention serves to attain the end still more perfectly. It also aids to hold the several parts of the packing more reliably in place under certain conditions. I have devised an improved construction of the joints, by which the parts in which the main packing-ring is formed are matched together.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is an elevation, partly in section. Fig. 2 is an end view, and Fig. 3 is a cross-section.

Similar letters of reference indicate like parts in all the figures where they occur.

A is the cylinder, only a portion of which is shown. (See Fig. 1.)

B is the body of the piston, and B′ and B^2 are flanges, one of which is usually removable, but which for all the purposes of this invention may be considered as part of the body B, or fixed immovably thereto.

C C C are broad sections of a nicely-fitted packing-ring, certain portions of the breadth of each of which are designated, when necessary, by additional marks, as C′. A much narrower ring, E, fitted loosely in a narrow groove, *b*, in the mid-length of the piston, presses out gently against the smoothly-fitted interior of the sections C. Wires D, having their ends scarfed and matched together, as shown in Fig. 3, also press outward gently against the sections C near each end of the piston, being matched in deep internal grooves, *c c*, as clearly shown in Fig. 1. Two grooves, c' c', are turned or otherwise produced in the outer face of the sections C in the positions shown. (See Fig. 1.) Holes c^2 are drilled or otherwise produced from each of these grooves to the interior of the sections. The result is to keep the grooves c' c' each in free communication with the space within the packing; and as this space is, through the holes b' in the piston-flanges B′ B^2, kept in free communication with the spaces in the respective ends of the cylinder, one groove c' is always filled with steam or other fluid under the pressure which obtains on the pressure side of the piston.

The joints or lines of junction of the several sections of the ring C are peculiarly formed. Instead of being, as usual, cut obliquely across in a direct line, there are two oblique lines, g' g^2, one on each side of an offset, *g*. The surfaces at *g* are scraped together and make a steam-tight contact. The other surfaces at g' and g^2 may open to various extents as the wear of the packing and of the cylinder proceeds.

The device without the grooves c' and holes c^2 would cause the steam or other fluid to press out the packing C too forcibly. At each movement the fluid being worked enters through the holes b' on one face of the piston, and fills the whole space within the packing C from that face inward to the central ring, E. The fluid also flows inward and gets within the narrow ring E and presses it out against C; but beyond that it cannot go. That is the action of the construction shown in my patent of April, 1885, above referred to; but it is liable to make too much pressure outward, inducing resistance by friction and a rapid wearing out of the packing C and of the finely-finished surface in the interior of the cylinder. My present invention avoids this excessive outward pressure, while retaining a liberal width of the packing. The presence of the grooves c' c' on the exterior of the packing C, filled with fluid at the full pressure of that on the interior of the packing, contributes to induce an equilibrium of pressure on the outer and inner faces. It attains this end more nearly than would appear from the mere comparison of the areas. As the piston moves, the small areas successively covered by the filled groove c' are bathed in the fluid at full pressure, and

its minute invisible recesses are filled with the same. This induces a condition in the surfaces which relieves them from severe frictional contact and wear. There is substantial equilibrium in the whole of the packing outside of the groove c'. By this construction and arrangement I am able to have as wide packing as can possibly be desired, with a gentle and reliable outward pressure thereon, without danger of excessive friction and wear from too great force in that direction.

I make the joints $g\ g'\ g^2$ by casting the sections C C a little too wide, planing and finishing the offsets g, bolting them firmly together, and turning remaining surfaces, or so many as are required, to bring the series of sections to the proper width and form.

Modifications may be made in the forms and proportions without departing from the principle or sacrificing the advantages of the invention. I can make the packing C in a greater or less number of parts. There may be more of the grooves c' and holes c^2. The flanges or lips on the sides of the ring E may be omitted. I prefer the whole as shown.

I claim as my invention—

1. The broad packing C, provided with the grooves c' and holes c^2, in combination with each other, and with the narrower internal ring, E, and with the piston body B B′ B², having the groove b and holes b', and cylinder A, as herein specified.

2. The narrow springs D, in combination with the piston B B′ B², having holes b', narrow packing-ring E, fitted loosely in the groove b, and wide packing-ring C, made in sections, and grooved on the interior, all arranged for joint operation relatively to each other and to the cylinder A, as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, this 10th day of December, 1885, in the presence of two subscribing witnesses.

JAMES BRANDON.

Witnesses:
WM. A. LEFFINGWELL,
ORMYLON BENEDICT.