

(No Model.)

J. BRANDON.
PACKING FOR PISTONS.

No. 315,115.

Patented Apr. 7, 1885.

Fig. 1.

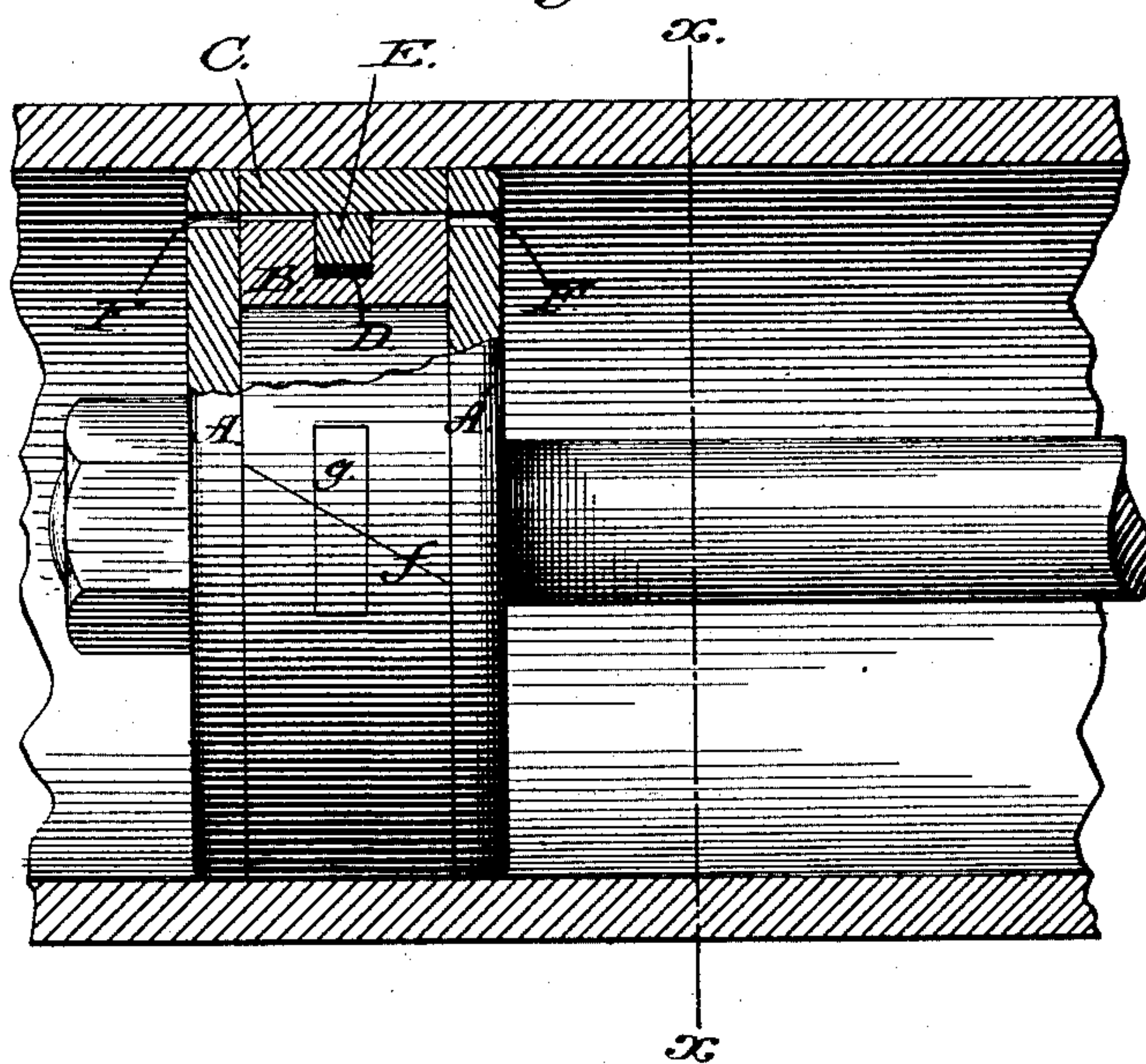
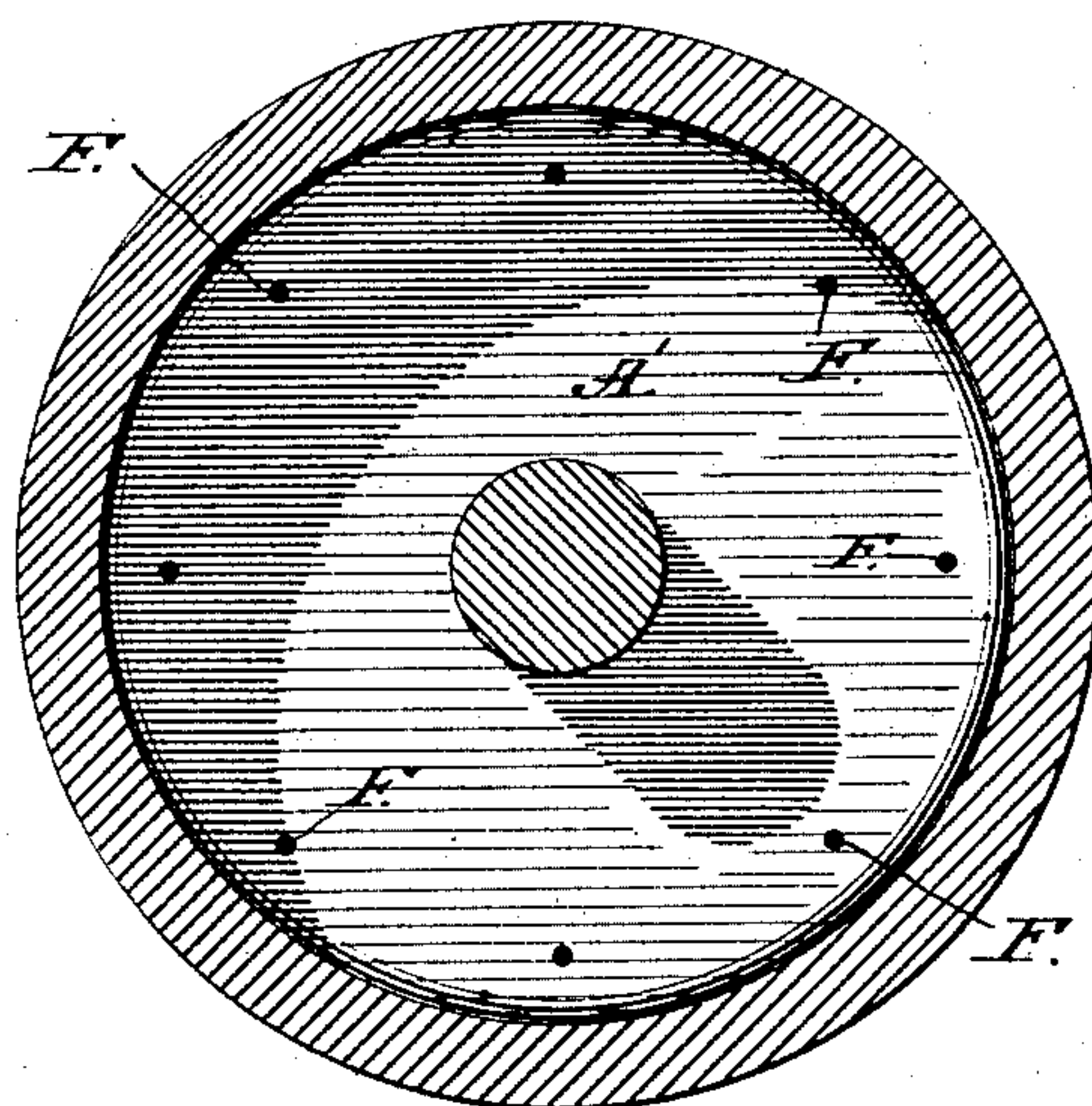


Fig. 2.



Attest:

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UNITED STATES PATENT OFFICE.

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PACKING FOR PISTONS.

SPECIFICATION forming part of Letters Patent No. 315,115, dated April 7, 1885.

Application filed December 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRANDON, of the city, county, and State of New York, have invented a new and useful Improvement in the Packing of Pistons for all Manner of Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improvement in the packing for pistons for which I obtained Letters Patent No. 283,068, August 14, 1883.

By the invention therein described I obtained a packing free from the influence of the pressure in the cylinder, and whose radial pressure against the inner face of the cylinder is due wholly to forces extraneous to that in the cylinder—as, for example, to the force of internal springs.

The object of my present invention is to substitute for such extraneous pressure in producing a proper contact of the packing-ring with the cylinder so much of the cylinder-pressure as may be found needful. To this end it consists in combining with the packing-ring encircling the piston a narrow concentric auxiliary ring placed centrally inside of the packing-ring, to bear against it, and within an annular rectangular groove or recess cut in the periphery of the body of the piston. This central ring operates as a packing against the one face or the other of the groove, as well as against the main packing-ring, to prevent leakage through the piston under the packing-ring, a free vent being supplied between each face of said central ring and the outer face of the piston. By this means the pressure within the cylinder is exerted radially against only one-half or less of the inner surface of the packing-ring, so that, after allowing for the area of equilibrium between the face of the packing-ring and the inner face of the cylinder, the effective pressure is easily reduced to the minimum, which may be necessary to maintain an effective joint between the two, and which will adjust itself to the working pressure exerted at the time within the cylinder.

In the accompanying drawings, Figure 1 is a sectional view illustrating my invention, and Fig. 2 a transverse section in line *xx* of Fig. 1.

A A' represent the head-plates or head and

follower of a piston, and B its cylindrical body, to and against which the head-plates are secured. The body B may be solid or annular, and its diameter so far less than that of the heads A A' as to leave an annular or circumferential recess between their outer edges. A divided packing-ring of ordinary form, C, is fitted within this annular recess, its joint at *f* being broken by an inserted strip, *g*, in the customary manner. This ring is adapted to fill the recess, its outer periphery being flush with the rims of the heads A A'. A rectangular groove or recess, D, is cut circumferentially in the middle of the periphery of the body B of the piston, and an auxiliary divided ring, E, is fitted snugly within said recess, so that its outer periphery shall bear closely against the inner periphery of the packing-ring C, and its lateral faces bear each against the opposite face of the recess D.

A series of apertures, F F, are pierced through each face or head of the piston in line to register with the joint between the packing-ring C and the head B, so that the pressure of the fluid against either head shall be felt in said joint and be exerted between the body of the piston and the packing-ring, to force the latter out radially toward the inner face of the cylinder. This movement of the fluid under the packing-ring C, and consequently its radial pressure thereon, is arrested by the auxiliary ring E, which packs the joint between the ring and the body B of the piston, and, being forced against the face of the recess in said body, prevents any leakage through the piston. While an access of the fluid within the cylinder is thus permitted to the portion of the packing-ring inside of the central auxiliary ring, E, and its pressure is thus allowed to operate thereon, all pressure upon the packing-ring beyond the auxiliary ring E is removed and prevented by reason of the free vent afforded by the openings F F in the opposite head. The area of radial pressure upon the packing-ring C is thus reduced by my invention to the area of so much of the inner surface of said ring as lies between that head of the piston which is under pressure and the corresponding face of the central auxiliary ring, E, and the actual pressure inside of and against the ring over this reduced area is again reduced by the creeping press-

ure of the fluid, which, working in between the contact-surfaces of the outer face of the packing-ring and the inner face of the cylinder, establishes an area of equilibrium between
5 the pressure on the inner and outer faces of the ring inside of the auxiliary ring E. The outward or radial pressure upon the packing-ring C is thus reduced to the minimum required for producing a close joint, while at
10 the same time it is governed by and is made to bear a proper relation to the working pressure within the cylinder.

It is manifest that my invention is applicable to both water and steam engines, and to
15 all pistons actuated by a fluid-pressure or employed in forcing fluids.

I claim as my invention—

The combination, with the outer packing-ring and the central body of a piston, and with a series of apertures affording free communication from the joint between the two
20 outward through both heads of the piston, of an auxiliary ring fitted within a central annular recess in the periphery of the body to bear out centrally against the inner face of the
25 packing-ring, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES BRANDON.

Witnesses:

JOHN A. ELLIS,
A. B. MOORE.