

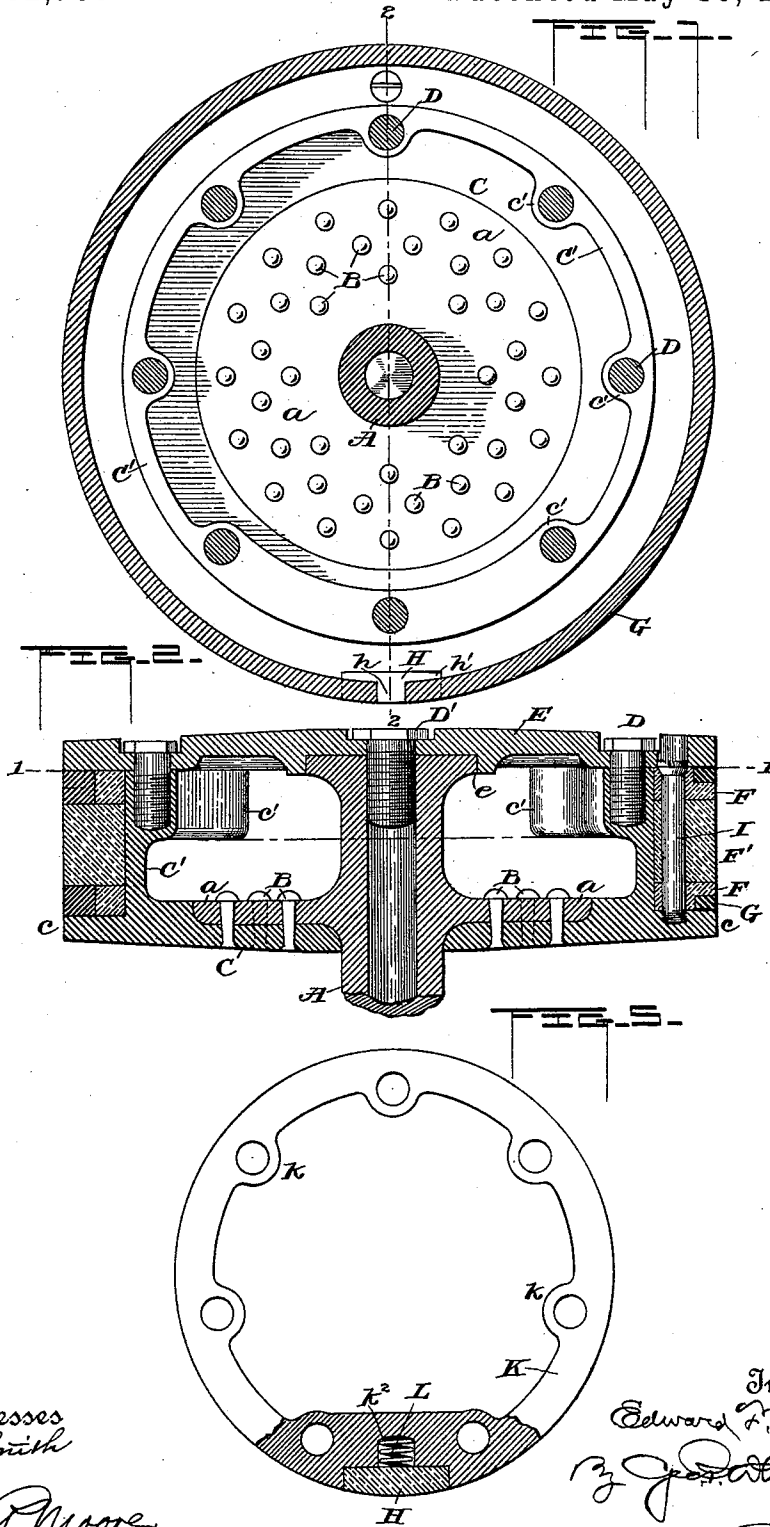
(No Model.)

2 Sheets—Sheet 1.

E. F. PEACOCK.
PISTON.

No. 582,763.

Patented May 18, 1897.



Witnesses
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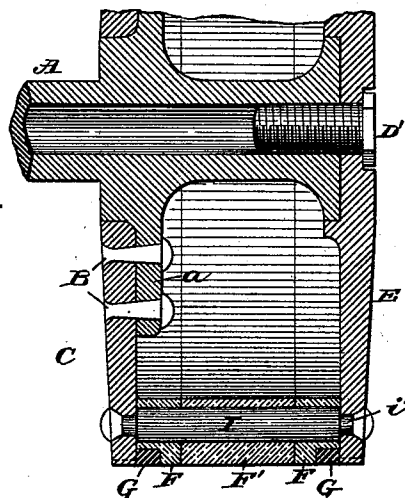
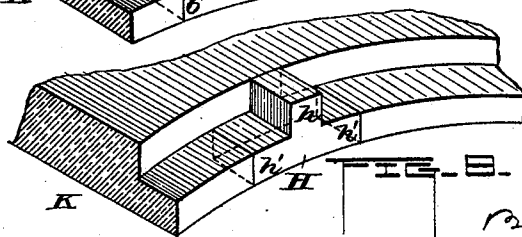
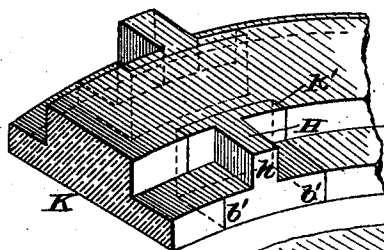
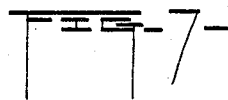
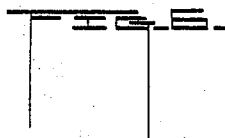
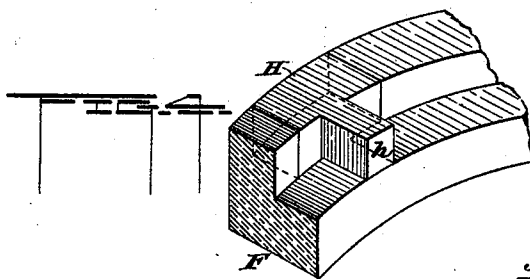
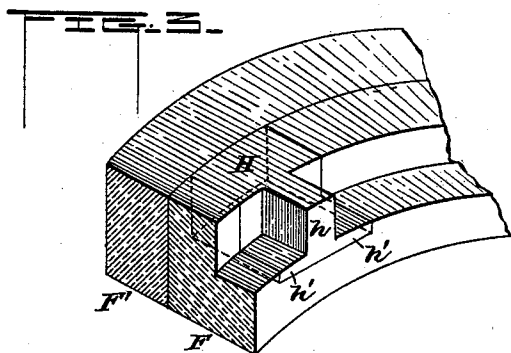
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2 Sheets—Sheet 2.

E. F. PEACOCK.
PISTON.

No. 582,763.

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UNITED STATES PATENT OFFICE.

EDWARD F. PEACOCK, OF PHILADELPHIA, PENNSYLVANIA.

PISTON.

SPECIFICATION forming part of Letters Patent No. 582,763, dated May 18, 1897.

Application filed July 17, 1895. Serial No. 556,258. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. PEACOCK, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pistons; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to steam-engines; and it consists in certain improvements in pistons.

The usual mode of connecting a piston to the rod is to provide the piston with a heavy central boss in which is bored a slightly-tapering hole to fit a similar taper on the end of the piston-rod. The piston is either shrunk on the rod or is held by nuts screwed upon a threaded neck on the end of the rod. This construction has some objections, since the piston is apt to work loose or the rod to break off at the shoulder when it enters the piston. In any event the piston must be heavy in order to be strong.

My invention aims to obviate these difficulties and provide a strong, rigid, but light connection for the piston and piston-rod. I also aim to improve the construction of the bull-rings and packing-rings, especially when used in connection with my break-joint blocks shown and described in my Patent No. 407,370, dated July 23, 1889.

In the accompanying drawings, Figure 1 is a sectional plan view on line 1 1, Fig. 2, of a piston embodying my improvements. Fig. 2 is an axial section of the same on line 2 2, Fig. 1. Figs. 3 and 4 show two forms of break-joint block used with this piston. Fig. 5 is a modification. Fig. 6 is a further modification. Fig. 7 is a third form of break-joint block, and Fig. 8 is a modification thereof.

The piston-rod A is preferably hollow for the sake of lightness, and thus made may be made of somewhat greater diameter than usual to give greater strength without increase in weight. Near its end it is provided with an integral flange *a* of considerable diameter, to which is attached, preferably by rivets B, the back plate C of the piston. This plate may be plain, as shown in Fig. 6, but I

prefer to form it with a rim C' near its outer edge, having a cylindrical outer face and provided at intervals with internal bosses *c*, in which are drilled holes which are tapped to receive the screws D, by means of which the follower-plate E is secured in place. A central screw D' may enter the end of the rod A through the plate E, and the plate may be recessed at *e* to receive the end of the rod. It will be noticed that by this construction I dispense entirely with the heavy central hub or boss of the piston and form a light, hollow, but strong structure firmly secured together. The edge of the follower-plate E projects beyond the flange C', and in connection therewith and with the projecting edge *c* of the plate C forms a wide peripheral groove in which are received the bull-rings F F', preferably three in number, as shown. The two outer rings F are rabbeted to form a packing-ring groove, which is filled by a thin packing-ring G, sprung into place as usual.

The ends of the rings G do not meet, but the space between them is filled by a break-joint block H, seated in a slot in the bull-ring. In my prior patent I have shown the block seated in a recess or pocket formed at one side of the ring-groove, with a rib on the block projecting into the space between the ends of the packing-ring. The pocket is difficult and expensive to make, so I have improved upon that construction by slotting the bull-ring clear across. This construction is one which can be easily and quickly effected on a slotting or milling machine and materially reduces the cost. The slot may extend below the bottom of the ring-groove, as shown in Figs. 1 and 3, or it may be flush therewith, as in Fig. 4. In the former case the break-joint block not only fills the slot in the bull-ring and has a rib *h* to fit between the ends of the packing-ring and keep it from revolving in its groove, but there are also flanges *h'* on the block to underlie the ends of the packing-ring and form a better break-joint. The bull-rings may be loose on the rim C', but they are preferably kept from revolving on the piston by means of a dowel-pin I, passing through the follower-plate E, all three of the rings, and into the plate C. This pin may be screw-threaded, as shown in Fig. 2, or it may be in the form of a rivet having shoulders *i* to re-

ceive the plate C and follower E, through which pass necks i' , which are headed down, as shown in Fig. 6. The advantage of this construction is that if a rivet breaks it cannot fall and make mischief in the cylinder. It will be noticed that these rivets also take the place of the screws D in Fig. 2.

- Instead of using three bull-rings side by side, I may have but one, as shown at K, Figs. 4, 7, and 8. This is provided with perforated bosses k on the inside for the rivets I, and its edges are rabbeted, as shown in Fig. 7, to form packing-ring grooves. The ring is also slotted through on each edge to receive a break-joint block H, which is of the same depth as the ring and preferably engages a shallow recess at k' to keep it in place, or the block may be of the same width as the groove, as shown in Fig. 8. The two blocks on the opposite edges of the ring are preferably placed out of line with each other. If desired, a spring L may be placed in a pocket k^2 in the ring to force the block outwardly against the inner surface of the cylinder. This is more especially necessary in vertical cylinders, since in horizontal cylinders the weight of the block keeps it out, the joint being arranged at the bottom or lower side of the piston.
- It will be observed that all the break-joint blocks shown are of the same thickness as the bull-ring, so as to fill the slot therein when in place.

Considerable attention is now being given to the problem of reducing the weight of the reciprocating parts in locomotives and other steam-engines, and an important advantage of my construction of piston is that I can use light materials, such as steel and phosphor-bronze, in place of cast-iron. The bull-rings especially should be made of antifriction metal to insure the smooth wearing of the cylinder, while the packing-rings may be of cast-iron, as heretofore; but being narrow and thin they will be likely to avoid any injurious cutting.

Should it be desirable to use metal for the back plate and follower-plate which is not suitable to come in contact with the cylinder, the plates can be slightly reduced in diameter, as indicated by dotted lines in Fig. 6.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a plate-piston, of a forged piston-rod having near one end an integral and comparatively thin flange considerably less in diameter than the plate-piston, to which it is designed to be attached, substantially as described.
2. The combination with a forged hollow piston-rod having near one end an integral and comparatively thin flange of a plate-piston of greater diameter than and attached to said flange, substantially as described.
3. The combination with a piston-rod having near one end an integral flange, of a piston-plate riveted to said flange, substantially as described.

4. The combination with a hollow piston-rod having near one end an integral flange, of a piston-plate overlapping said flange and secured thereto by rivets lying parallel with said rod, substantially as described.

5. The combination with a piston-rod having near one end an integral flange, of a piston having a back plate overlapping and secured to said flange, and a follower-plate secured to the end of the rod, and one or more bull-rings fitting between said plates, substantially as described.

6. The combination with a piston-rod having an integral flange, of a back plate riveted to said flange, a follower-plate secured to the end of said rod, one or more bull-rings fitting between said plates, and a pin passing through said plates and rings to keep the latter in place, substantially as described.

7. In a piston, a back plate having a cylindrical rim provided with internal bosses, a follower-plate, screws passing through said plate into tapped holes in said bosses, bull-rings fitting around said rim, and a dowel-pin passing through said plates and rings, substantially as described.

8. In a piston, the combination with a bull-ring having a packing-ring groove, and a slot extending clear across said bull-ring, and intersecting said groove, of a packing-ring in said groove, and a break-joint block received in said slot, substantially as described.

9. In a piston, the combination with a bull-ring rabbeted on one edge to form a packing-ring groove and having a slot extending clear through said bull-ring and intersecting said rabbet, of a packing-ring in said groove, and a break-joint block received in said slot, substantially as described.

10. The combination with a bull-ring having a packing-ring groove and a slot extending clear through said bull-ring, of a packing-ring in said groove and a break-joint block as thick as the bull-ring and fitting said slot, substantially as described.

11. The combination with a bull-ring having a packing-ring groove and a slot extending clear through said bull-ring, of a break-joint block of the same thickness as the bull-ring and fitting said slot, the block being provided with a rib to enter between the ends of the packing-ring, substantially as described.

12. The combination with a bull-ring having a packing-ring groove and a slot extending clear through the ring, of a break-joint block H fitting said groove, and having a rib to enter between the ends of the packing-ring, and flanges h' to underlie the ends of said ring, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD F. PEACOCK.

Witnesses:

GEORGE H. JACKSON,
LUTHER WALKER.