

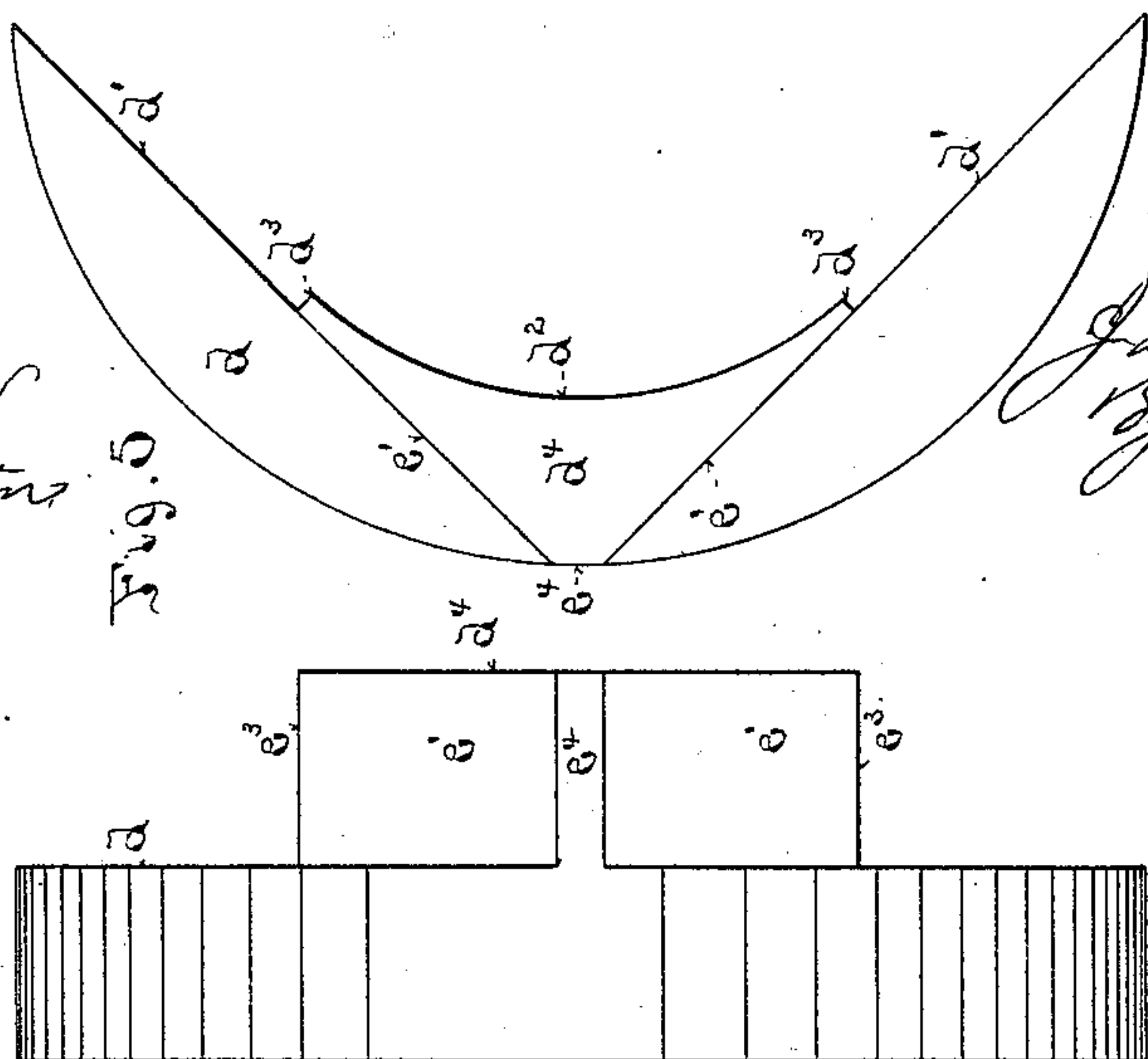
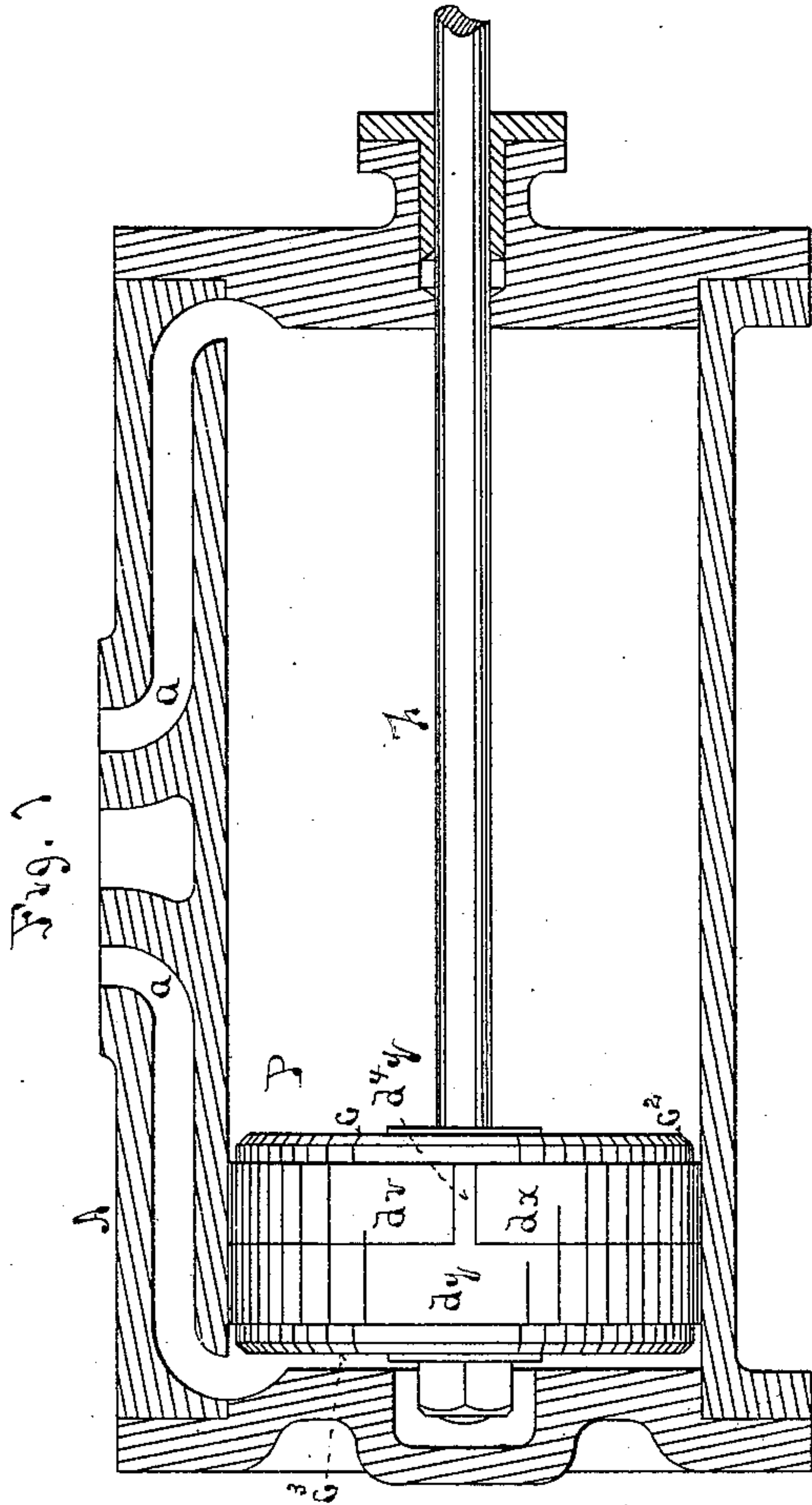
(No Model.)

2 Sheets—Sheet 1.

J. FERGUSON.
PACKING FOR PISTONS.

No. 336,223.

Patented Feb. 16, 1886.



Witnesses
W. D. Brown
H. P. Ockington

Inventor
James Ferguson
By David H. Rice
Att'y

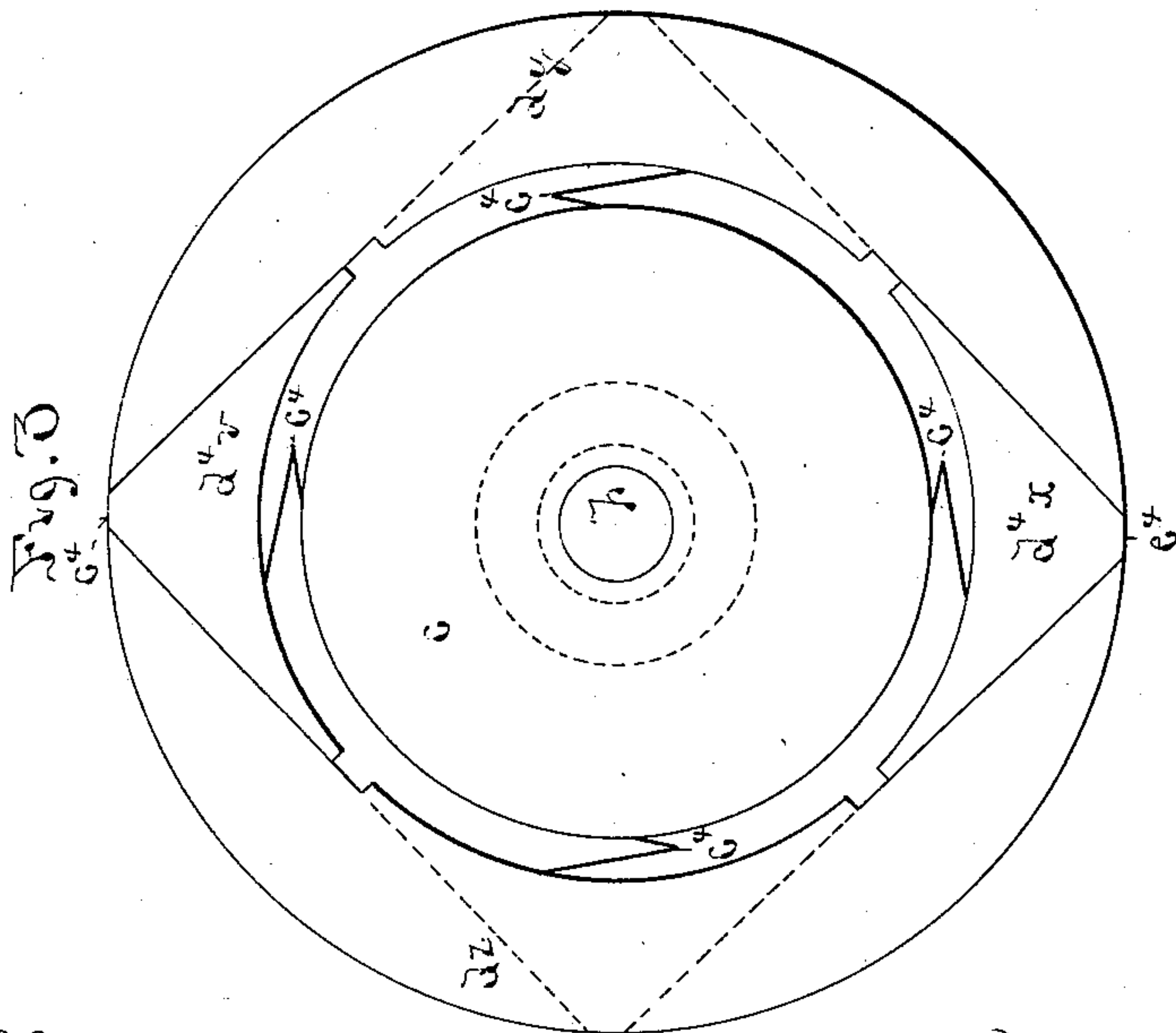
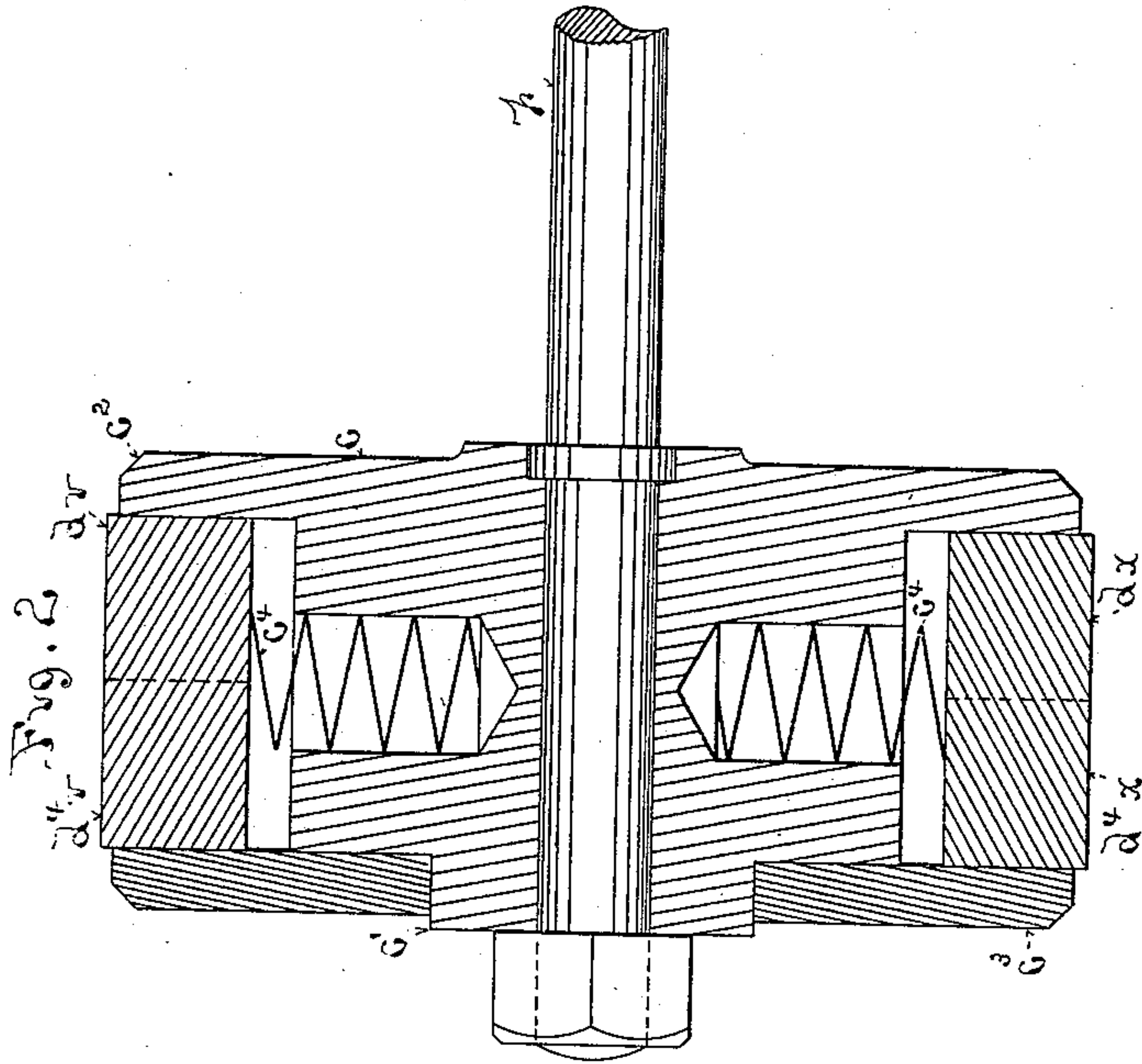
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N. P. Ockington.

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UNITED STATES PATENT OFFICE.

JAMES FERGUSON, OF BRIDGEWATER, MASSACHUSETTS.

PACKING FOR PISTONS.

SPECIFICATION forming part of Letters Patent No. 336,223, dated February 16, 1886.

Application filed December 26, 1885. Serial No. 186,706. (No model.)

To all whom it may concern:

Be it known that I, JAMES FERGUSON, of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Packing for Pistons, of which the following is a specification.

My invention relates to metallic packing for the pistons of engines and other similar cylinders; and it consists in a certain new and useful construction and arrangement of the parts of the same, substantially as hereinafter described and claimed.

In the drawings, Figure 1 is a longitudinal central section of an engine-cylinder, showing the piston provided with my improved packing. Fig. 2 is an enlarged transverse section of the piston-head, showing the construction of the packing. Fig. 3 is an end view of the same with the cap or follower removed to show the arrangement of the parts. Figs. 4 and 5 are edge and side views, respectively, of one of the pieces forming the packing-rings.

A is the steam-cylinder, provided with the steam-ports $a\ a$. P is the piston, composed of a head and stem or rod, p , in the usual form. The piston-head is formed of a part, c , which composes its hub part and the flange c^2 on one end, formed as shown in Fig. 2. This part is provided with an axial hole, through which rod p passes, and in which it is secured. A collar, c' , is formed on the end opposite to flange c^2 , and a ring or follower, c^3 , corresponding in diameter with flange c^2 , is secured on this collar by a screw-thread or pins, or both together, leaving a broad groove around the hub part of the member c between the ring and flange. This groove receives the packing, which is composed of four pieces, like d , Figs. 4 and 5, fitted together around the hub. Each piece d is formed semicircular on its exterior and with two plane faces, $d'\ d'$, at each end on the inside, terminating at a curved inner face, d^2 , in the middle part of piece d , formed so as to be on a curve of less radius from the center of the piston-head than any part of planes $d'\ d'$. Shoulders $d^3\ d^3$ connect curved face d^2 with the plane faces $d'\ d'$ at each end of it. On one side of the piece d is attached a projecting part, d^4 . This projecting part is so formed that it has two outer plane faces, $e'\ e'$, coinciding with the faces $d'\ d'$, a short curved

outer face, e^4 , coinciding with and forming an extension of the outer curved face of part d , and lying between faces $e'\ e'$, a curved inner face coinciding with and forming an extension of the curved inner face, d^2 , of part d , and two ends coinciding with and forming extensions respectively of the shoulders $d^3\ d^3$, as shown in Figs. 4 and 5. Four of these pieces like d (lettered $dv\ dx\ dy\ dz$) are put together, as shown in Figs. 1, 2, to form a single complete packing around the hub of part c of the piston-head by inserting four springs, c^4 , in radial holes in the hub, and slipping the four parts together sidewise and over the springs, and putting the follower c^3 in place. This is accomplished by placing dv and dx so as to form a nearly-complete ring, and placing dy and dz in the like position, (shown in Fig. 3,) and slipping the projections d^4v and d^4x inside of the faces $d'y$ and $d'z$, and slipping the like projections (one of which, d^4y , is shown in Fig. 1) of parts dy and dz inside of the corresponding faces of parts dv and dx . In this position it will be found that the outer curved faces, e^4 , of the projections d^4 complete the rings formed by $dv\ dx$ and $dy\ dz$, respectively, and that neither part dv or dx can move outward until dy and dz does, because its projection d^4v or d^4x lies inside the latter, and that neither part dy or dz can move outward until dv and dx does for the same reason; or, in other words, all the segments $dv\ dx\ dy\ dz$ must move outward simultaneously or not at all. It will also be found that all the transverse joints between segments $dv\ dx$ are broken or covered by solid parts of $dy\ dz$, and vice versa, thus preventing the escape of steam through the joints of the packing. This packing has, therefore, a breadth of bearing for each segment d equal to twice its own all around it, since it not only takes a bearing upon its own surface, but upon that of the segment beside it, and thus renders it impossible for the springs $c^4\ c^4$ to act unequally upon the segments or one segment to cut or wear away the cylinder more than another.

Other forms of spring-pressure may be employed instead of springs $c^4\ c^4$, if preferred.

What I claim as new and of my invention is—

1. In combination with the piston P, four segments, d , arranged around its head and form-

ing an expansible packing, each provided with a laterally projecting part, d^1 , extending under the ends of two adjacent segments, substantially as described.

- 5 2. The combination of the piston-head formed of flange c^2 and flange-follower c^3 , four segments, d , arranged between the flanges and forming an expansible packing, each provided with a laterally-projecting part, d^1 , extending

under the ends of two adjacent segments, and the springs c^4 c^4 between the segments and the hub of the piston-head, substantially as described.

JAMES FERGUSON.

Witnesses:

FRANK J. PLUMMER,
DAVID HALL RICE.