

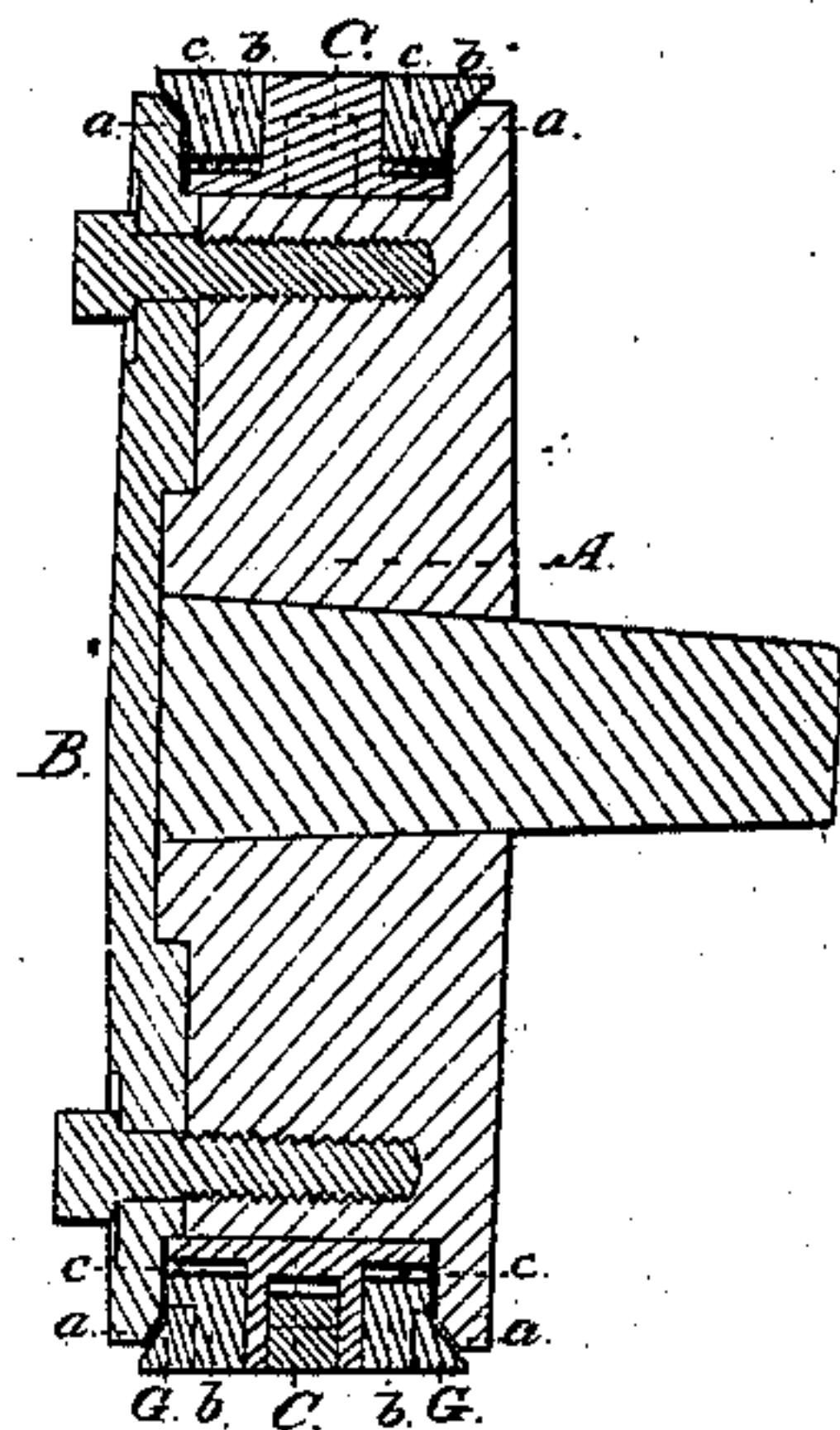
*F. J. Roth,*

*Piston Packing.*

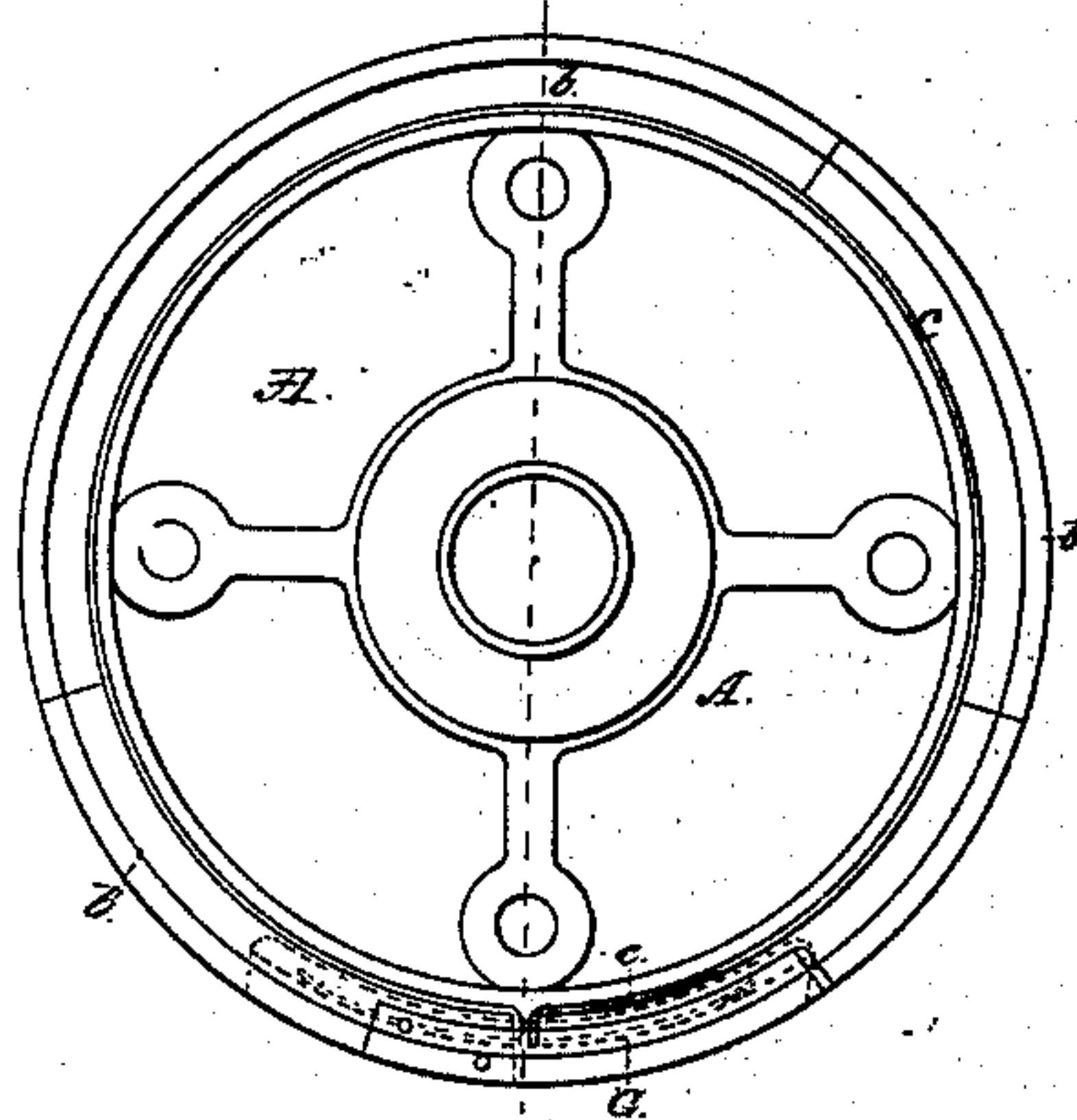
*N<sup>o</sup> 60,062.*

*Patented Nov. 27, 1866.*

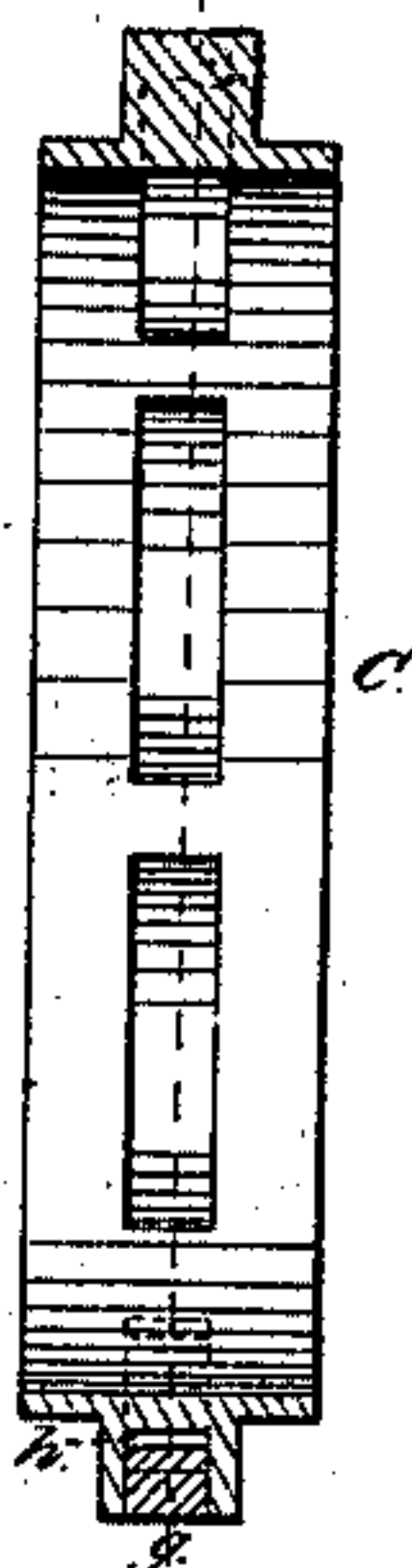
*Fig. 1.*



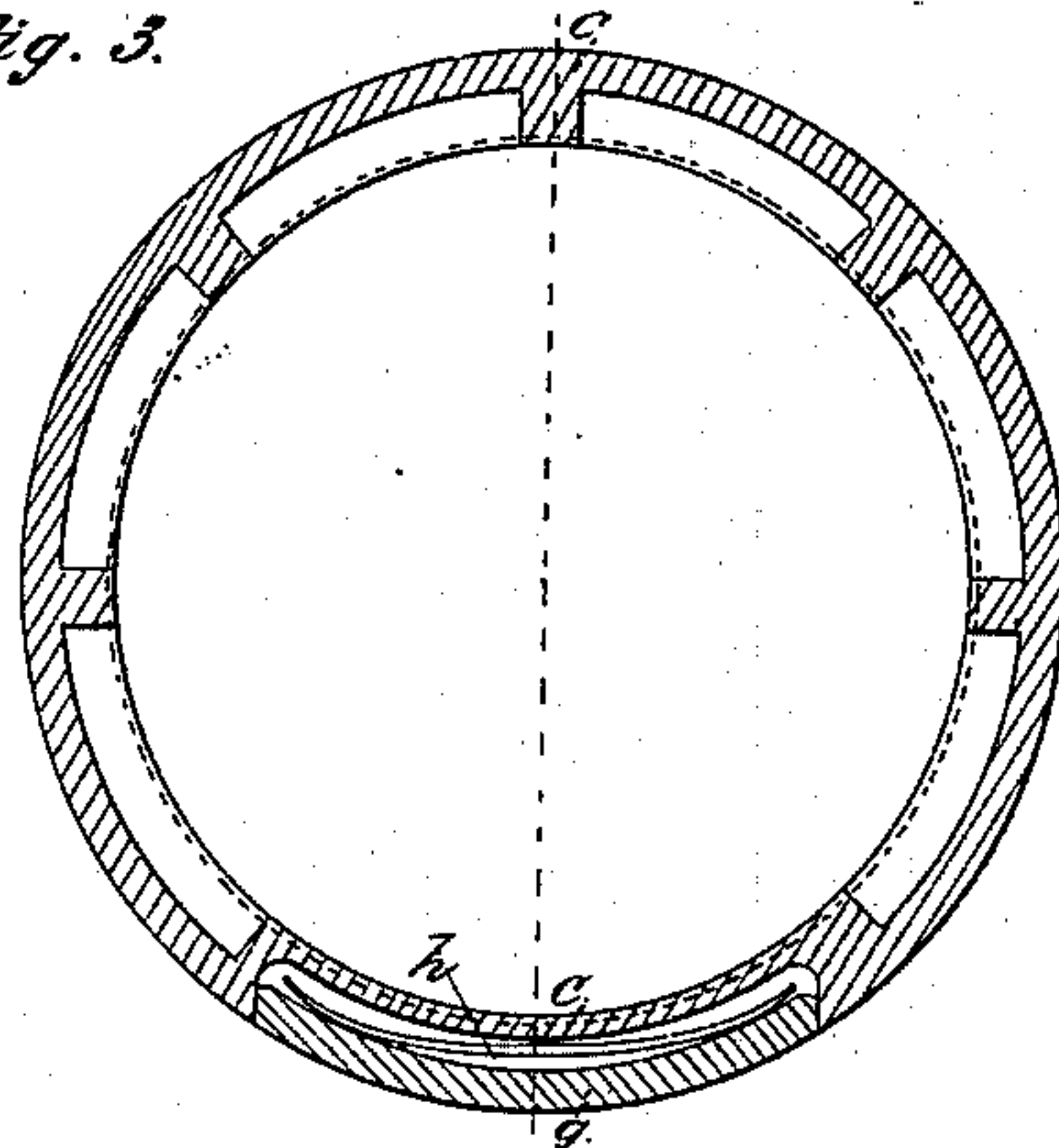
*Fig. 2.*



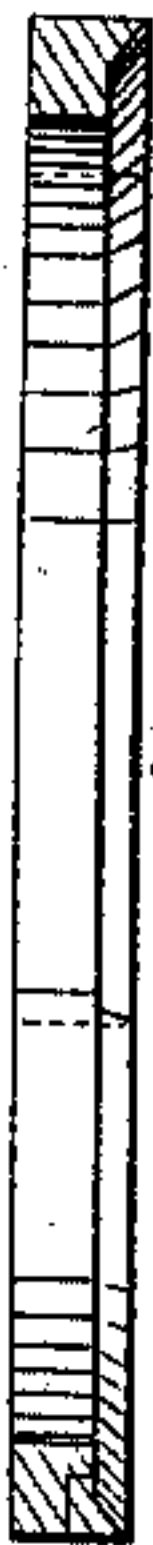
*Fig. 5.*



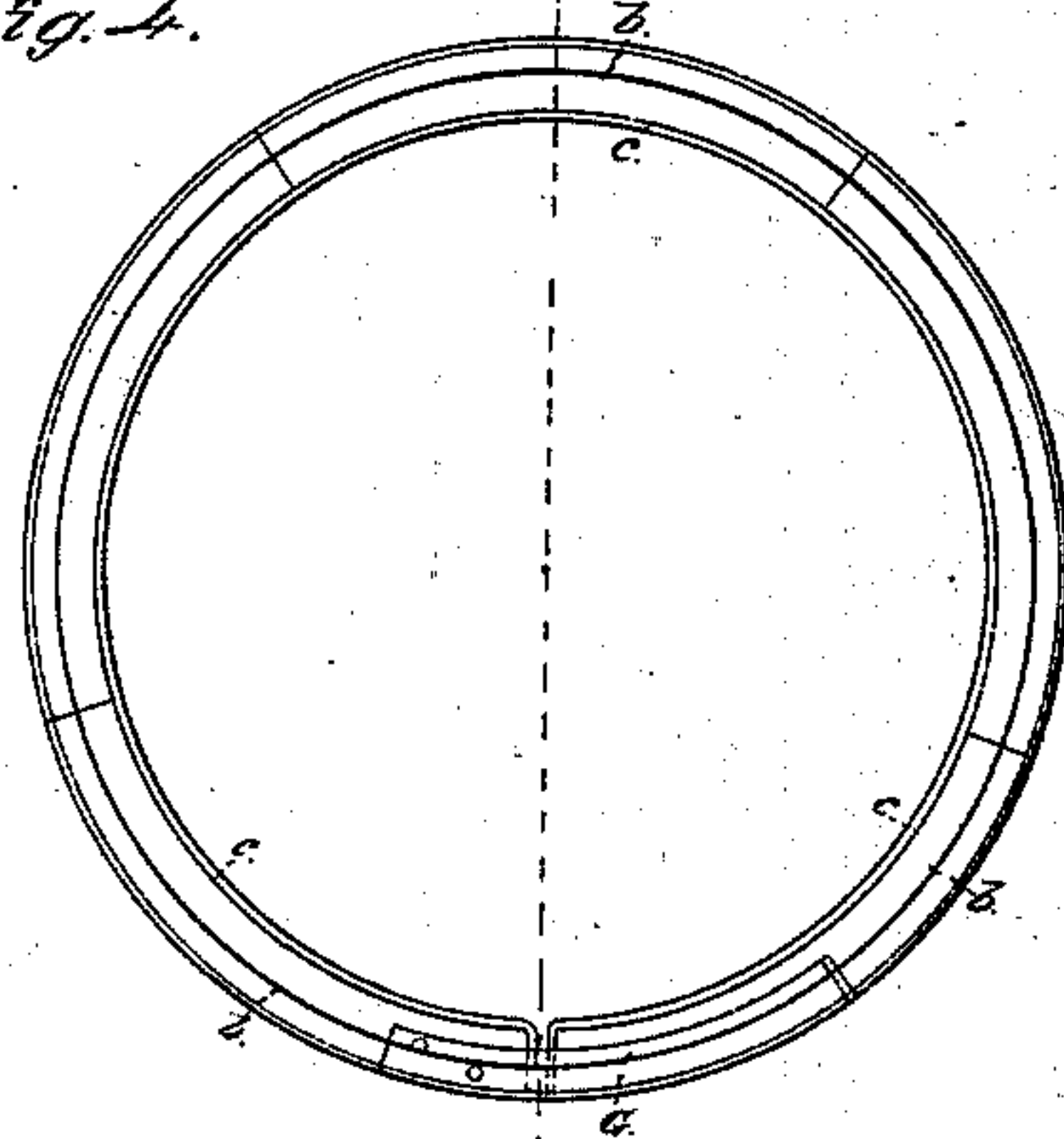
*Fig. 3.*



*Fig. 6.*



*Fig. 4.*



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*By Atty.*  
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# United States Patent Office.

## IMPROVEMENT IN PISTON PACKING.

FRANK J. ROTH, OF NEWARK, OHIO.

*Letters Patent No. 60,062, dated November 27, 1866.*

### SPECIFICATION.

#### TO ALL WHOM IT MAY CONCERN:

Be it known that I, FRANK J. ROTH, of Newark, in the county of Licking, and State of Ohio, have invented a new and improved Piston Packing; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a diametrical section through the improved piston packing.

Figure 2 is an end view of the piston, with the follower removed.

Figure 3 is a central section through the central ring.

Figure 4 is a view of the packing-rings and their spring.

Figure 5 is a diametrical section through the central ring.

Figure 6 is a diametrical section through the packing-rings.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on that class of packing for pistons which is composed of metallic sections, forming, when put together, expansible rings, which are applied within annular recesses that are formed in the circumference of the piston, so that when acted upon by the steam, these ring sections will be forced out against the inner surface of the cylinder, and thereby pack the piston. In this class of pistons, the steam is caused to act upon the packing from the inside outward, provision being made for the passage of the steam into chambers formed in the piston, and thence through an outer ring which receives the packing-rings.

The main object of my invention is to so construct and apply sectional packing-rings to a piston, that superior advantages shall be secured over what have been heretofore experienced in that class of pistons which have their packing expanded by steam acting upon the rings without entering into the piston.

Another object of my invention is to provide, in horizontally working pistons, against an unequal wearing away of the same, by the application of an elastic plate to that part of a piston which slides upon the lowest point of the interior of the cylinder, which plate shall compensate for the wear caused by the gravity of the piston, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A B represent two circular portions which constitute the body of the piston, A being the "spider," and B its follower, which parts are constructed and bolted together in the usual manner, as shown in the drawings. When these two parts are bolted together, they form an annular space between their flanges for the reception of a central ring, C, which is supported by the ends of the radial arms of portion A, so as to lap over the joint of the two parts, A B, as shown in fig. 1, and thus prevent the entrance of steam into the body of the piston. The ring C has a central annular ridge which leaves on each side of it an annular space for receiving the expansible rings. This centre ring, C, forms two sides for each expansible ring, the other side being formed by the circular flanges of the piston, as shown in fig. 1. The inner corners of the circular flanges of the piston are bevelled, as shown at *a a*, for receiving the corresponding bevelled surfaces of the packing-rings *b b*, portions of which rings are fitted loosely but snugly within the annular chambers above described, so that their circumferences project short distances beyond the circumference of the piston and ring C. The packing-rings *b b* are made up of segments or sections, and are held out, so that their outer surfaces press gently against the inner surface of the steam cylinder, by means of springs *c c*, the ends of which are bent outward, as shown in figs. 2 and 4, so as to act upon the ends of the segments *b b*, and thus to keep the ends of all the segments snugly together, except those segments between which the springs are bent outward. These springs *c c* not only act to expand the sectional packing rings, but they also operate to keep the ends of the sections together, so as to form tight joints. To prevent the entrance of steam within the chambers occupied by the springs *c c*, I form recesses in the ends of those segments which receive the ends of the springs *c c*, and insert into said recesses short pieces *G*, which break joints with the joints of said segments. The segments *G* may be riveted to the segments *b*, on one side of the joint. For horizontally working pistons, where the weight of the piston is supported upon the bottom inner surface of the cylinder, I employ a segment *g*, which is inserted into a recess formed in the ridge of ring C, and acted upon by a spring *h*, which supports, or nearly supports, the weight of the piston upon said piece, *g*; this piece *g* may be made of brass, Babbitt metal, or of any other suitable metal; and as its outer surface wears away, the spring will force it outward, so that the axis of the piston and axis of the cylinder within which the piston works, will always coincide. This will prevent



the piston and the stuffing-box of its rod from wearing untrue. Where the weight of the piston is supported by the piston-rod, as in upright cylinders, the plate *g* and spring *h* may be dispensed with. It will be seen, by reference to fig. 1, that the circumference of the packing-rings projects beyond the circumference of the piston-flanges; this allows steam to pass these flanges, and act upon the projecting bevelled surfaces of the packing-rings, and expand them against the surface of the cylinder with a pressure commensurate with the force of steam. The springs *c c*, which I employ, are designed merely to keep the packing-rings expanded, and in contact with the inner surface of the cylinder within which the piston works, so that they are always in a position to be acted upon by the steam and forcibly expanded thereby. I do not confine my invention to steam-engine pistons, as it is applicable to pistons for air and water engines. The segments *b* may be made rectangular or other suitable shape in cross-section, without departing from the principle of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The application of expansible packing-rings to the circumference of pistons, in such manner that said rings shall be expanded by the pressure of steam upon such portions of them as are exposed beyond the periphery of the piston, substantially as described.
2. The arrangement of spring plates *g* to recesses formed in the circumference of pistons, substantially as described.
3. The arrangement of springs *c c*, so as to act upon the ends of packing-rings *b b*, which are made up of segments, substantially as described.

FRANK J. ROTH.

Witnesses:

JOSEPH WM. BURKART,  
CHARLES ROTH.