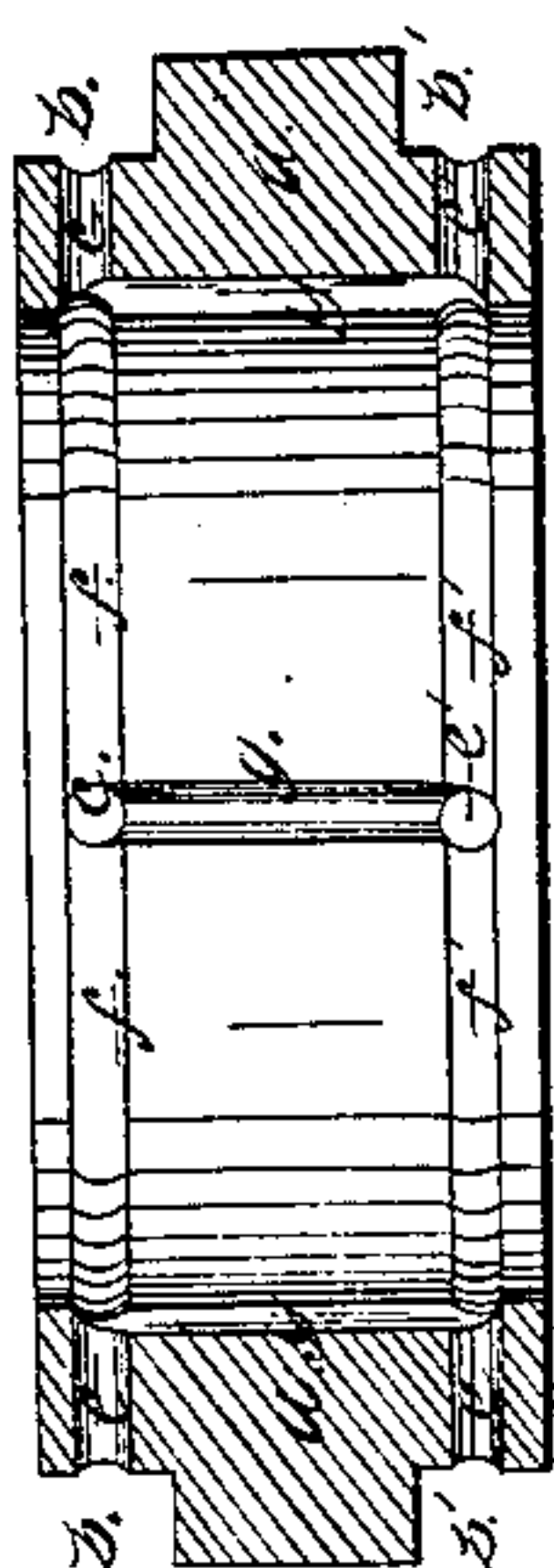


*J. Myers,*  
*Piston Packing.*

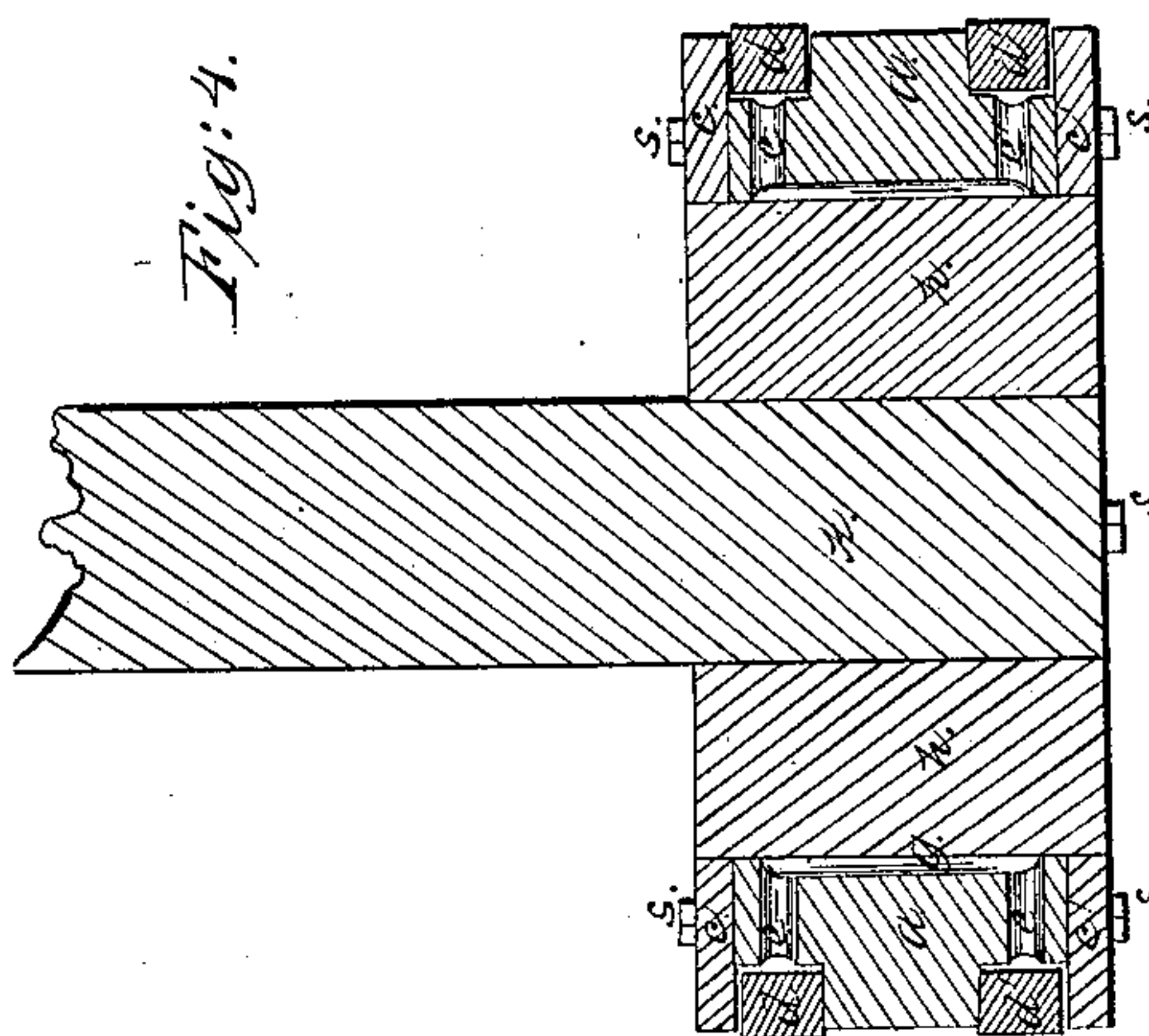
*N<sup>o</sup> 50,661.*

*Patented Oct. 24, 1865.*

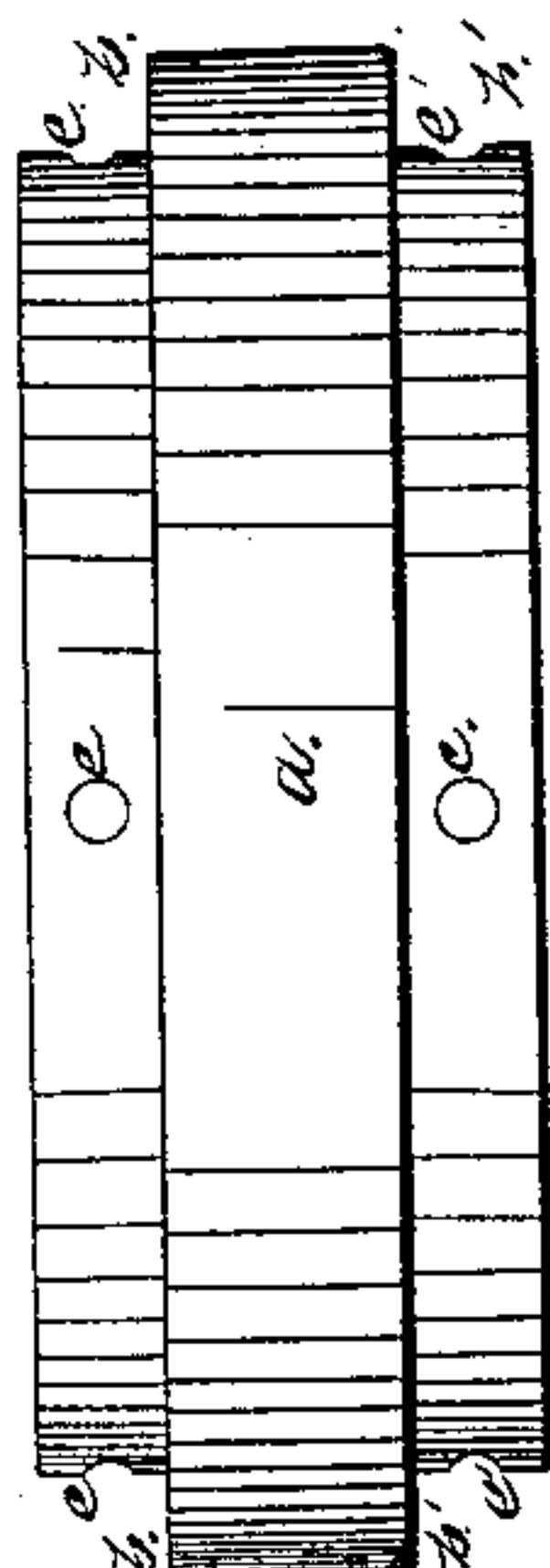
*Fig: 2.*



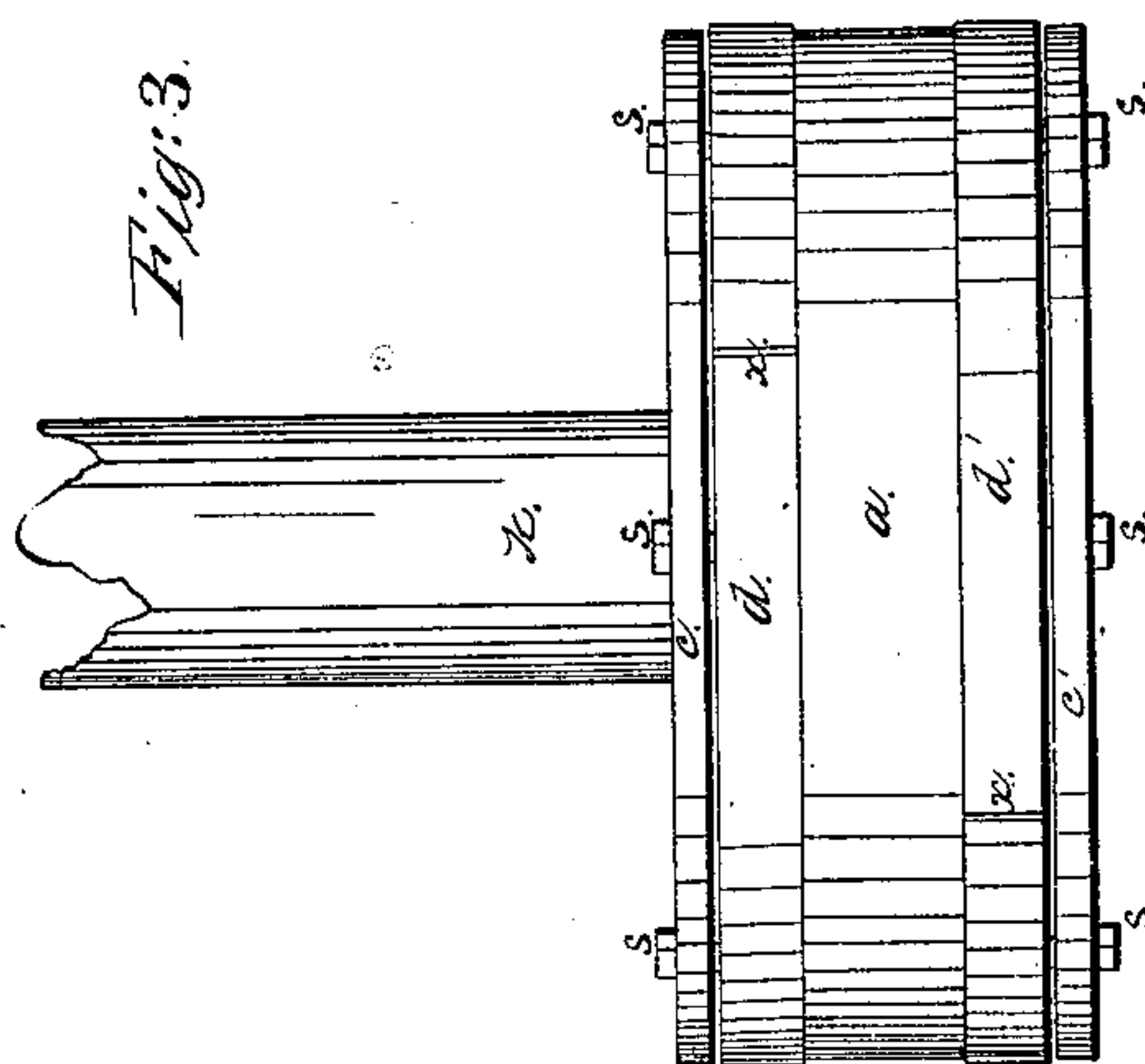
*Fig: 4.*



*Fig: 1.*



*Fig: 3.*



*Witnesses:*

*J. H. Phelps*  
*E. Harmon*

*Inventor:*

*James Myers*  
*by his atty*  
*H. Bakewell*

# UNITED STATES PATENT OFFICE.

JAMES MYERS, OF ALLEGHENY CITY, PENNSYLVANIA, ASSIGNOR TO  
HIMSELF AND SAMUEL N. LIGHTNER, OF SAME PLACE.

## IMPROVEMENT IN PISTON-PACKINGS.

Specification forming part of Letters Patent No. 50,661, dated October 24, 1865.

*To all whom it may concern:*

Be it known that I, JAMES MYERS, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Packing for Steam-Cylinders; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, representing the outer ring of a piston-head of a steam-cylinder.

The object of my invention is to provide a perfectly steam-tight metallic packing for the piston of steam-cylinders by so constructing and combining the piston-head and metallic rings forming the packing as that both of the rings shall be pressed outward against the inner surface of the steam-cylinder by the force of the steam in the cylinder.

Various contrivances have been adopted for securing a steam-tight packing for piston-heads by the use of metallic rings or a single metallic ring set in a groove or recess in the piston-head and pressed outward by the force of the steam which is caused to find access to the recess back of the ring. This has been accomplished where two rings are used by causing the steam to press out the upper ring only in the downstroke of the engine and the lower ring only on the upstroke of the engine, so that even when two rings are employed one only is pressed outward against the surface of the cylinder either at the up or down stroke. The objection to this arrangement is that the piston-head has only a very narrow bearing-surface against the surface of the cylinder and the rings are apt to wear unevenly. By my improvement, however, both of the rings (if two are used, or all of them if more than two) are equally operated upon by the steam on both spokes of the cylinder.

To enable others skilled in the art to construct and use my improvement, I will proceed to describe its construction and operation.

In the drawings, Figure 1 is a side view of the outer ring of a piston-head with the packing-rings and caps removed, and Fig. 2 is a sectional side view of the same. Fig. 3 is a side view of a piston-head with the packing-rings and caps in place. Fig. 4 is a sectional representation of the same.

In all the figures like letters are used to denote similar parts.

In the drawings, *a* is the outer ring of the piston-head, which is reduced in diameter externally at top and bottom, forming, when the caps *c* and *c'* are screwed on, the grooves *b* *b'* for the packing-rings *d* *d'* to lie in.

The piston-ring *a* and caps *c* *c'* are of the same diameter, being slightly—say one-sixteenth of an inch—smaller in diameter than the cylinder in which the piston is to work.

The packing-rings are made of cast-iron or other suitable metal, and may be conveniently made by cutting them off a hollow cylinder or tube of exactly the same external diameter as the cavity or internal diameter of the steam-cylinder—that is, slightly larger than that of the piston-ring. They are then broken across at one point in their circumference, as at *x*, Fig. 3.

The interior diameter of the packing-rings *d* *d'* is slightly greater than the exterior diameter of the base of the grooves *b* *b'* in the piston-ring *a*, so that when the packing-rings are in place, as in Fig. 3, there is a slight distance between the packing-rings and the surface of the piston-ring in the grooves *b* *b'*.

The packing-rings *d* *d'* are slightly thinner in the direction parallel to their axis than the depth of the grooves *b* *b'*, as seen in Fig. 4. In the grooves *b* *b'* of the piston-ring *a* are holes *e* *e'*, (the number of which is immaterial,) which pass through the piston-ring *a*, as seen in Fig. 2, each hole *e* entering a gutter, *f* or *f'*. These gutters are channels made around the inner surface of the piston-ring *a* on the level of and parallel with the packing-ring grooves *b* *b'*. The gutter *f* in the upper part of the piston-ring *a* is connected with the gutter *f'* in the lower part of the piston-ring *a* by gutters *g*, which extend from one gutter, *f*, to the other, *f'*, as seen in Fig. 2.

The piston-ring is filled by a cylindrical plug, *h*, to which the piston-rod *k* is attached. The plug *h* is securely fastened to the piston-ring *a*.

The packing-rings are placed in their appropriate grooves *b* *b'* and then the caps *c* *c'* are placed on each end of the piston-head and fastened by screws *s* *s*, which take into the piston-ring *a*. The caps *c* *c'* serve to keep the packing-rings in place.

The packing-rings may be divided into more



pieces than one, but I prefer to use a ring broken at one point, as hereinbefore described.

A single packing-ring might be used instead of two rings, but the use of two will, I think, be preferable.

The piston-ring, caps, and packing-rings may be conveniently made by casting a hollow cylinder, which, when turned, will be of the diameter of the interior of the steam-cylinder, and cutting off each end the pieces for the packing-rings and then turning down the piston-ring and caps one-sixteenth inch smaller in diameter and cutting out the grooves *b b'* for the packing-rings; or the several parts may be made separately, if preferred.

The operation of the piston-head thus constructed is as follows: When the piston is making its upstroke, as in Fig. 4, the live steam pressing on its under side forces its way around the periphery of the cap *c'* and between it and the under surface of the packing-ring *d'*, and thence passing all around the inner surface of the packing-ring *d'*, between it and the groove *b'*, forces the packing-ring *d'* outward against the inner surface of the steam-cylinder, thus securing a perfectly steam-tight packing. The steam thence enters the holes *e' e'* in the groove *b'*, and passing around the gutter *f'* passes up the gutters *g g*, and entering the holes *c* in the upper gutter, *f*, finds its way around the upper groove, *b*, under the packing-ring *d*, and forces it outward in like manner. On the downstroke of the piston the operation is similar. The

steam enters between the cap *c* and the upper packing-ring, *d*, forcing it outward, and thence passes into the gutter *f* and down the gutter *g* and forces outward the lower packing-ring, *d'*.

I have found by trial that this mode of packing is perfectly steam-tight, and that with cast-iron packing-rings the steam-cylinder is not so liable to cut as with packing of soft metal used in the ordinary way. As the packing and cylinder wear the cast-iron rings adapt themselves to the cylinder. I do not, however, design to confine myself to the use of cast-iron packing-rings, as any other suitable metal may be used for that purpose.

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

The combination of two or more metallic packing-rings, *d d'*, and the caps *c c* with the piston-ring *a*, having passages *e e'*, connecting the groove or space back of one ring with the groove or space back of the other ring or rings, so that the steam entering from either side of the piston-head back of one packing-ring shall have free access to the space or groove back of the other packing ring or rings, substantially as hereinbefore described.

In testimony whereof I, the said JAMES MYERS, have hereunto set my hand.

JAMES MYERS.

Witnesses:

ALLAN C. BAKEWELL,  
W. BAKEWELL.