

No. 628,515.

Patented July 11, 1899.

J. T. N. ANGELL.
METALLIC PACKING.

(Application filed Nov. 15, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

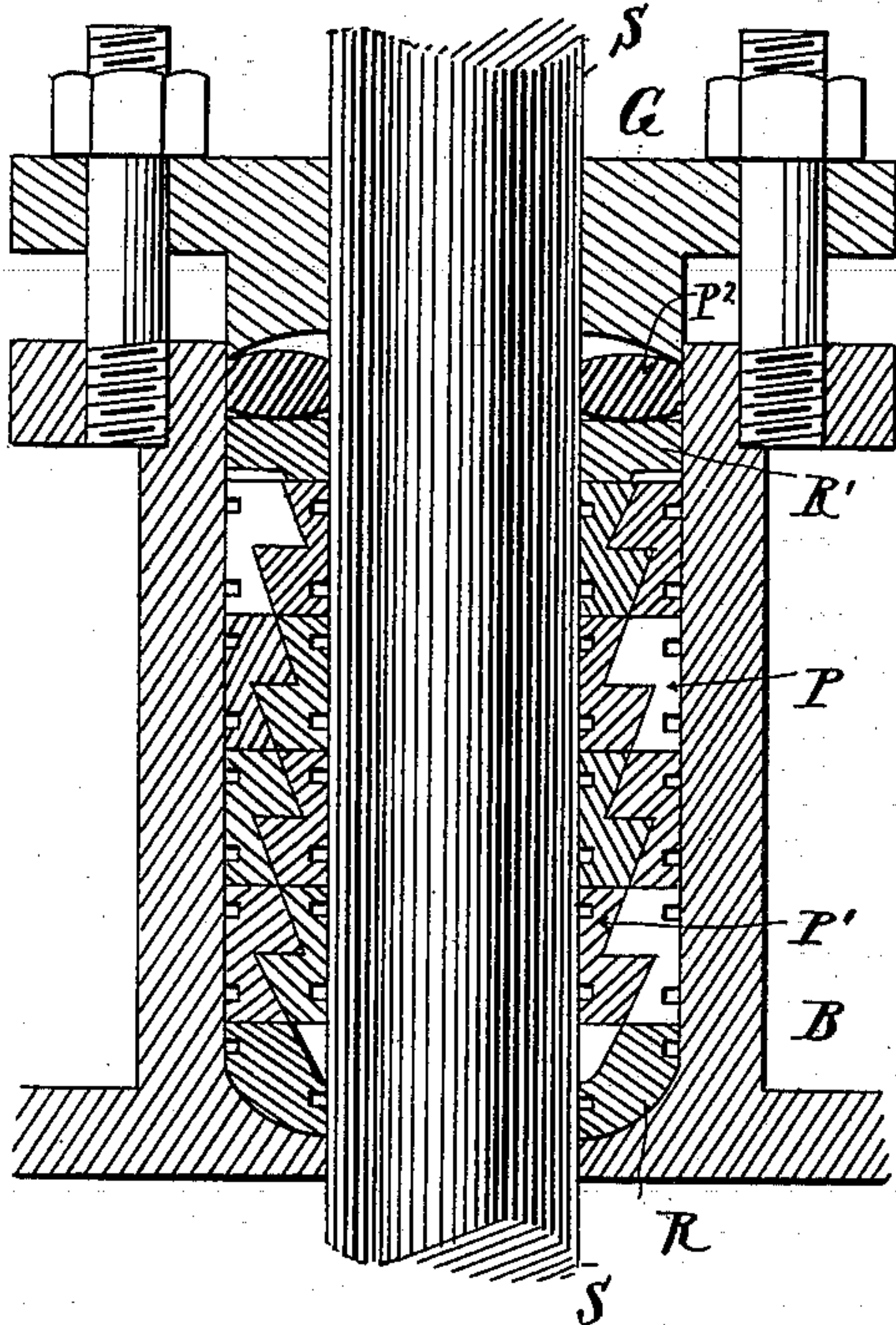
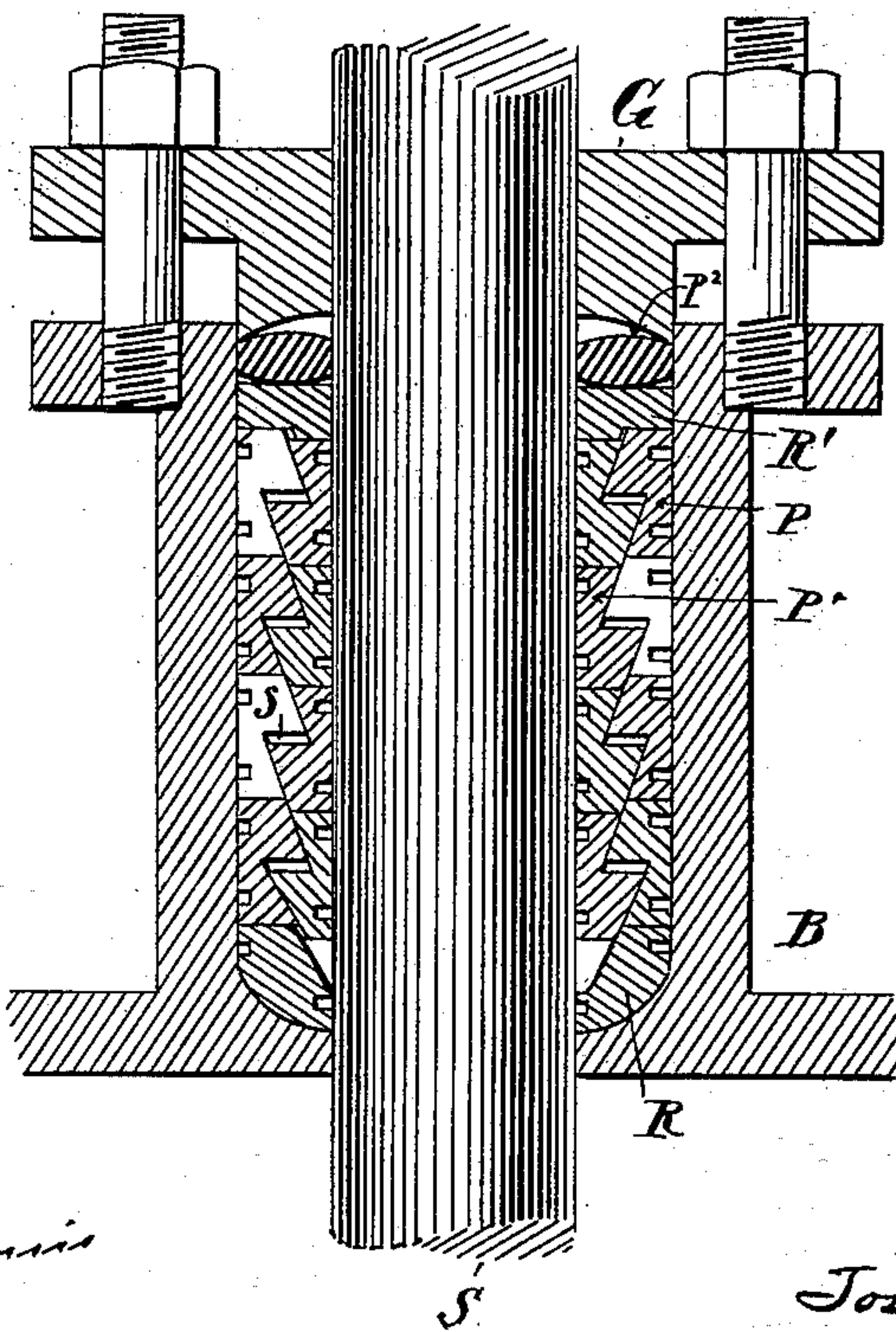


Fig. 2.



Witnesses,
C. W. Benjamin
Edw. Spryer

Inventor:
Joseph T. N. Angell
by A. G. Wernicke,
his attorney.

No. 628,515.

Patented July 11, 1899.

J. T. N. ANGELL.
METALLIC PACKING.

(Application filed Nov. 15, 1898.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 3.

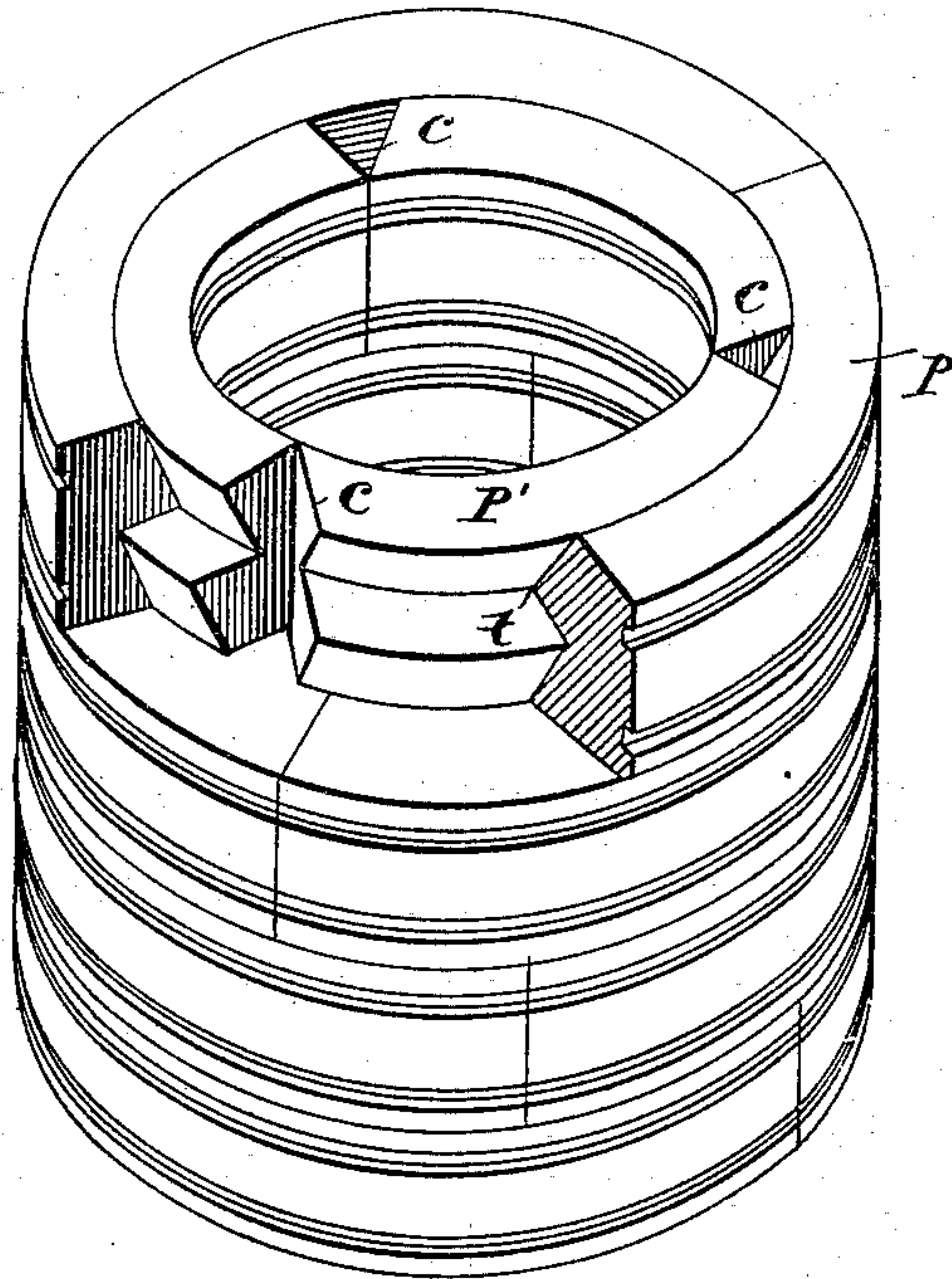
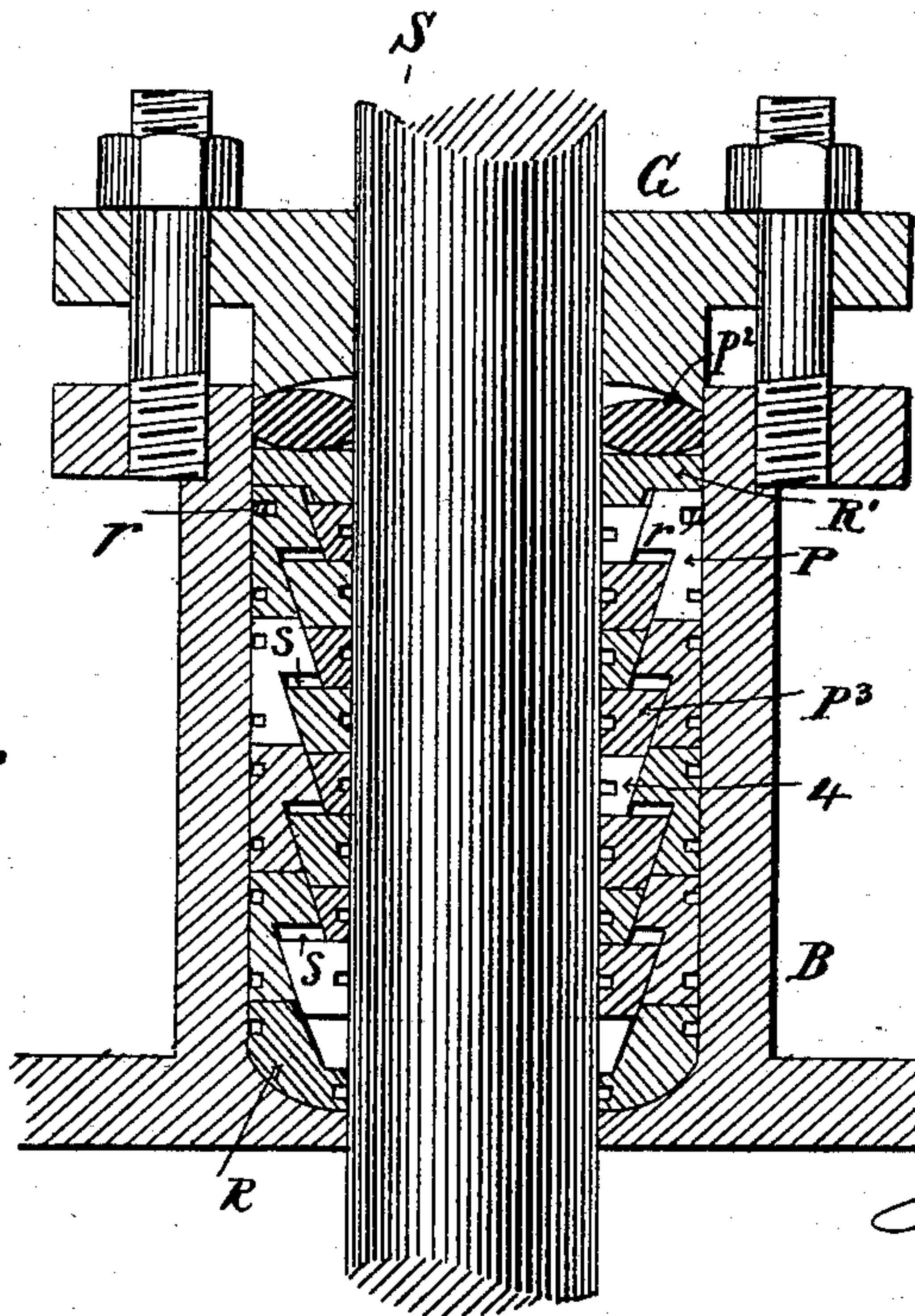


Fig. 4.



Witnesses,
C. W. Benjamin
Edw. S. Sayer

Inventor,
Joseph T. Angell
by H. W. Sweeney
His Attorney

No. 628,515.

Patented July 11, 1899.

J. T. N. ANGELL.
METALLIC PACKING.

(Application filed Nov. 15, 1898.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 5.

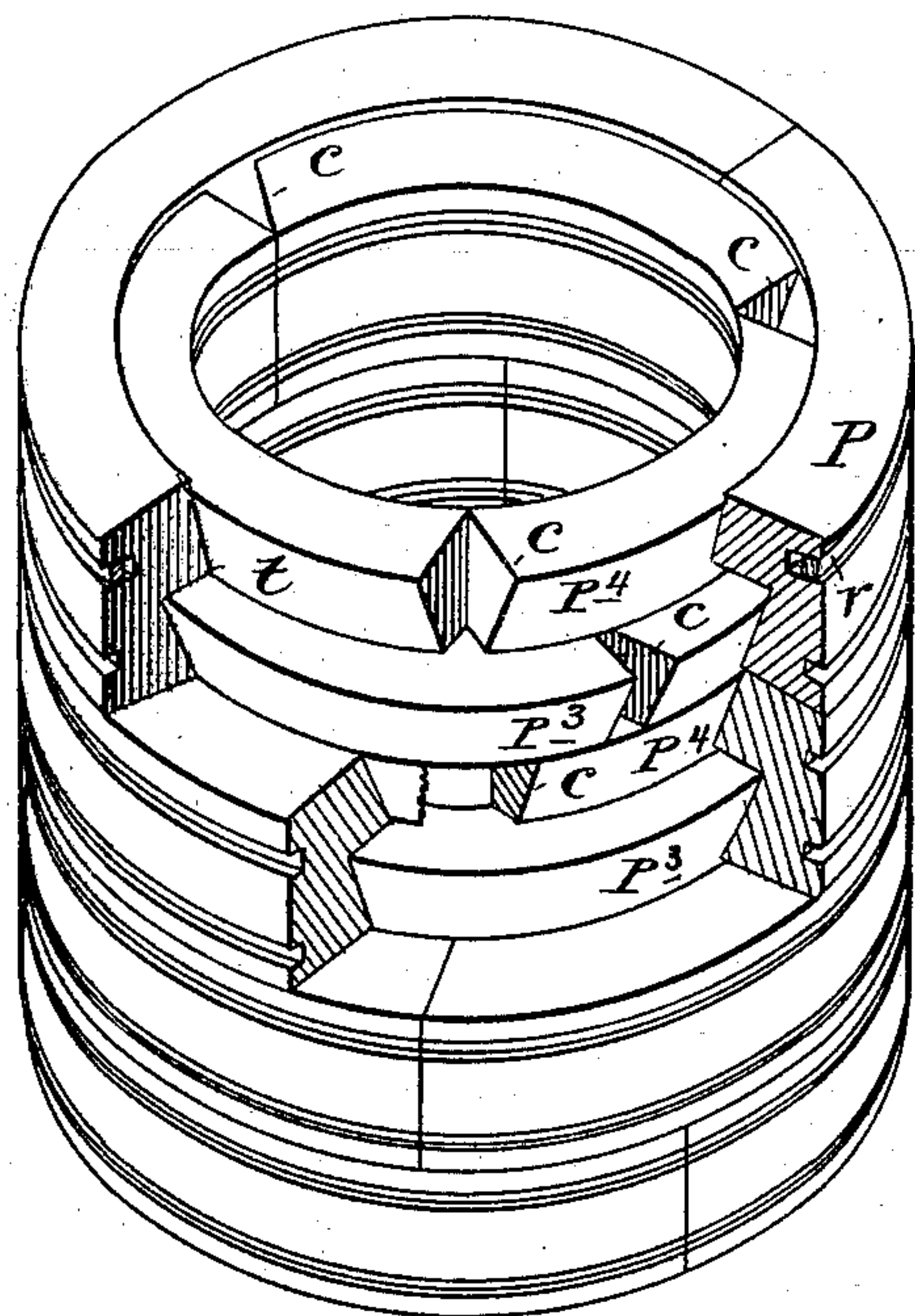
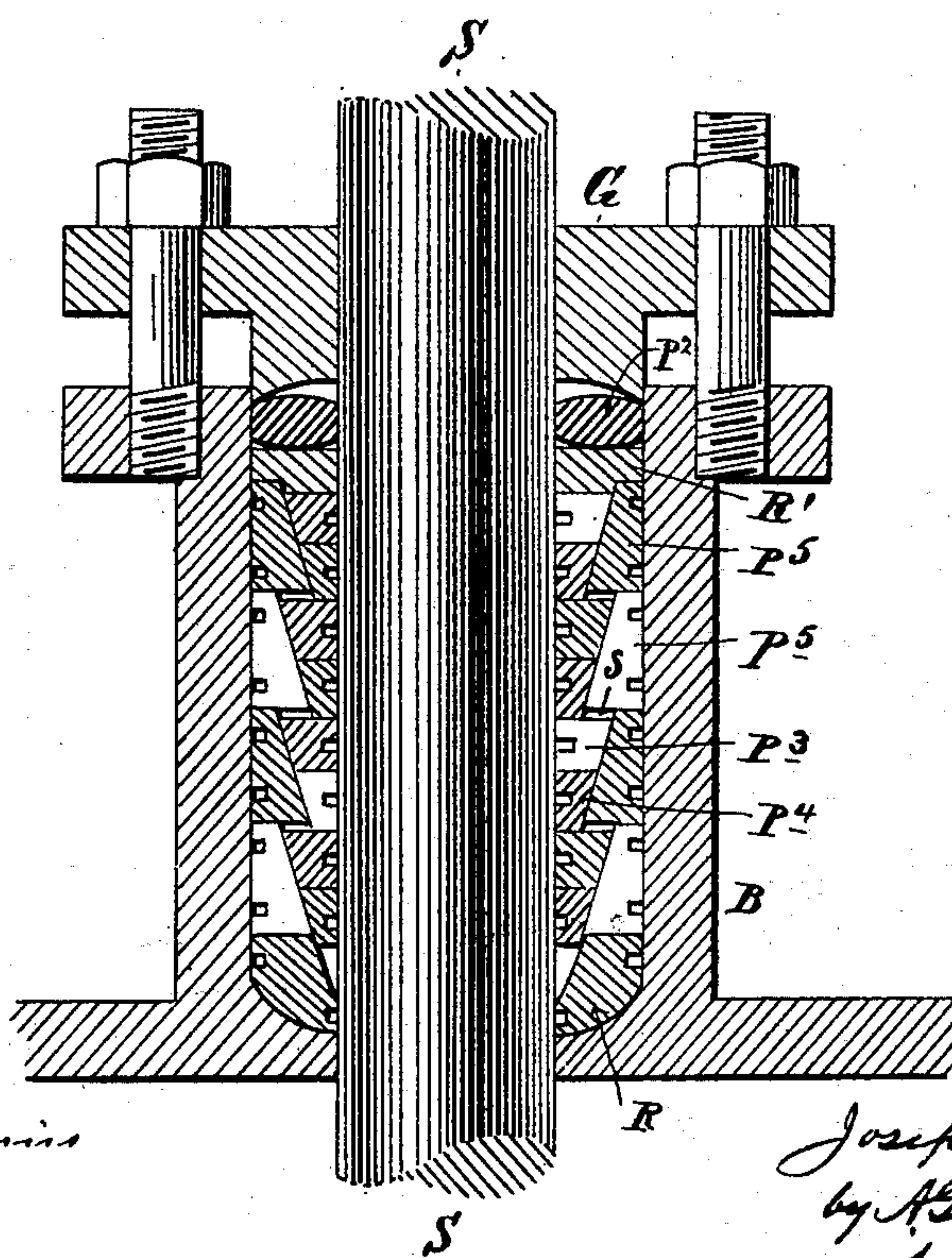


Fig. 6.



Witnesses,
C. W. Benjamin
E. A. Spry

Inventor.

Joseph T. Angell
by A. H. Wernicke
his attorney,

UNITED STATES PATENT OFFICE.

JOSEPH THOMAS NAYLOR ANGELL, OF NEW YORK, N. Y.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 628,515, dated July 11, 1899.

Application filed November 15, 1898. Serial No. 696,517. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH THOMAS NAYLOR ANGELL, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Metallic Packings, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a sectional view of a packing embodying my invention located within a stuffing-box, also in section and partially surrounding a rod, shown in full lines. Fig. 2 is a similar view of such parts in the positions they will occupy when because of wear the parts have been moved one on the other to preserve the joint tight. Fig. 3 is a perspective view of the compound rings of such a packing, a portion of the outer part being broken away to more clearly exhibit the pictures of the said rings. Fig. 4 is a view similar to that of Fig. 2, but of a different style of ring, so arranged and combined as to accomplish to some degree the end sought. Fig. 5 is a view similar to Fig. 3 of the devices of Fig. 4; and Fig. 6 is a view similar to Fig. 2, but of a still further modification of ring.

The invention relates to metallic packings for use about piston-rods and in analogous places; and it consists in those special features by means of which the leaking which may occur in other forms or combinations may be prevented.

The main thought in the device is the combination of two rings, one having its interior face bearing upon the rod and the other having its exterior face bearing upon the interior of the stuffing-box, the remaining faces of the two rings being opposed, respectively, one to the other and having one or more conical surfaces, the inclines of which are reversed, relatively, one of one ring to that of the other where they make contact one with the other. It is manifest that when the inner face of the inner of such a pair of rings has been worn off by friction with the rod it being in sections may still be caused to make a close joint with the rod by pushing it farther along upon the conical surface of the outer ring, and just such a device is shown in my Patent No. 609,752, of August 23, 1898; but it is also

manifest that such movement will leave an open space between some of the faces of the different rings. If such openings occur immediately at each joint between one inner member of a compound ring and the next of such inner members, any steam entering into said space may traverse it till it reaches the point *c*, where the section of the inner ring ends, and there readily pass up to the next level, again traverse the space there till another uptake is reached, and so follow on till it escapes at the other side of the packing. To prevent such happenings, I have so constructed my rings that the said spaces will not occur at the joints between each inner ring and the next inner ring, the result being that if steam enters one of the spaces *s* it may traverse that and pass up at the section-cut *c* to the top of that ring; but there the section-cut is covered by the succeeding inner ring, and no space or passage *s* being there the steam cannot reach the section-cut in this next or covering inner ring, and it is prevented from blowing through the packing, and will therefore condense. The preferred style is that of Fig. 3, the peculiarity of which is that the width of the ring *P'* at its top and bottom is the same, but the intermediate tooth *t* extends beyond the line of the top and bottom. The result is that as the inner rings are forced downward to preserve the joint at the rod, the bottom of one inner ring resting upon the top of the next one and being of the same width, the conical surface of that bottom part of the one ring and the conical surface of the underlying top part of the next ring form, substantially, one constantly-increasing conical surface and keep the space at the joint between the succeeding rings entirely closed, the separation between the flat surfaces of the inner and outer rings, which must take place somewhere, occurring at the interior of the tooth alone, as at *s*, Fig. 2—in other words, at a place where the passage thus provided reaches only the section-cuts of its own inner ring, which cuts are closed top and bottom by the preceding and succeeding rings of the series. I say “flat” parts, but it is evident that the opposing surfaces of the inner and outer rings where they are not conical may be almost any form that will join the two conical surfaces,

provided that of the inner will fit that of the outer.

The conical surface of the inner ring is practically that of two frustums of one cone cut sequentially, but reversely placed, as will be plain from observing the lower part of one ring—say the right-hand part of the left-hand ring and the left-hand part or top of the next ring, the conical surfaces of which, if considered together, appear to be merely the surface of a frustum of one and the same cone; but as the left-hand part or top of the second ring is a mere reproduction of the top part of the first ring the assertion is proved true that the form of the conical surface of one ring of Fig. 1 is merely that of the conical surfaces of two frustums of one cone cut sequentially and reversely placed, this being necessary so that the conical surface of the upper ring following down into the space left by the forcing down of the next ring, &c., may substantially fill that space and there shall be at that point no offset, which by moving away from the overlying part of the outer ring, as it does at the middle of the ring, shall leave the objectionable space registering with the division-line between the two inner rings. The same result is attained by the arrangement of Figs. 4 and 5, in which the outer rings are substantially the same as those of Figs. 1, 2, and 3, but the inner rings have but a single tooth—are, in effect, cut in two horizontally. It will be noticed, however, that the two-frustum idea is still retained. For instance, the second ring and the third of the inner series when considered together have a conical surface similar to the outer surface of one frustum of a cone, and as the third inner ring moves downward, so that its upper surface is below the level of the upper face of the second outer ring, the second inner ring follows on, leaving no space at this point, and the second and third inner rings being set one on the other, so as to break joints, the blowing through of the steam is prevented by substantially the same means as in the other style.

The outer rings may or may not be single-toothed, as may be preferred. In fact the inner faces of the outer rings might be continuously conical, as shown in Fig. 6.

A spring-ring *r*, surrounding the sections of the outer rings and set in a groove therein, as shown in Figs. 4 and 5, may sometimes be employed as an additional packing between the box and the ring and also as a binder to hold the sections in place while passing them to their seats in the box.

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

1. A metallic packing composed of a compound ring substantially as set forth, the inner division of which on its outer face has substantially the form of the outer surface of two frustums of a cone, cut sequentially and reversely placed, all substantially as set forth.

2. A compound metallic packing-ring, composed of an inner and an outer ring, substantially as set forth, the inner ring composed of sections and having an interior face adapted to fit the rod to be packed, a top and bottom of even width, an exterior face composed of two conical surfaces parallel, but not continuous, one with the other, and a third surface joining the two conical surfaces, all substantially as set forth.

3. A metallic packing composed of a series of sectional compound rings, placed one against another, with joints broken, each said ring composed of at least one outer ring and at least one inner ring, the outer ring being adapted on the outer face to fit a stuffing-box and on the inner face to fit some portion of an inner ring, the inner rings being adapted, on the inner face, to fit the body to be packed, and on the outer face to fit some portion of an outer ring, the opposing working faces of the outer and inner rings being conical surfaces as set forth, and said conical surface of at least one portion of one inner ring forming a continuation of the conical surface of at least one portion of an adjacent inner ring of the series, all substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 1st day of November, A. D. 1898.

JOSEPH THOMAS NAYLOR ANGELL.

Witnesses:

A. G. N. VERMILYA,
EDWD. SPEYER.