

No. 777,655.

PATENTED DEC. 20, 1904.

J. BADEKER.  
PACKING.

APPLICATION FILED MAR. 25, 1904.

NO MODEL.

Fig. 1.

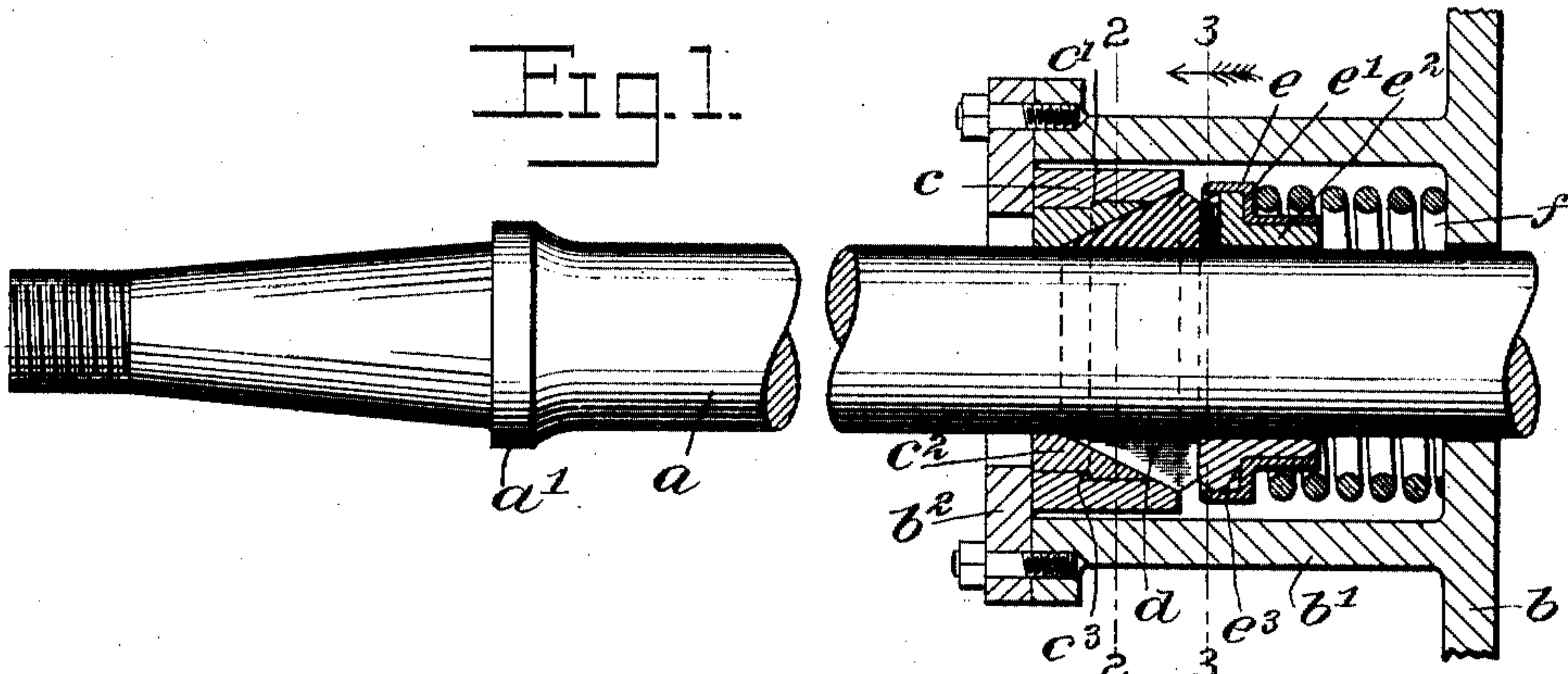


Fig. 2.

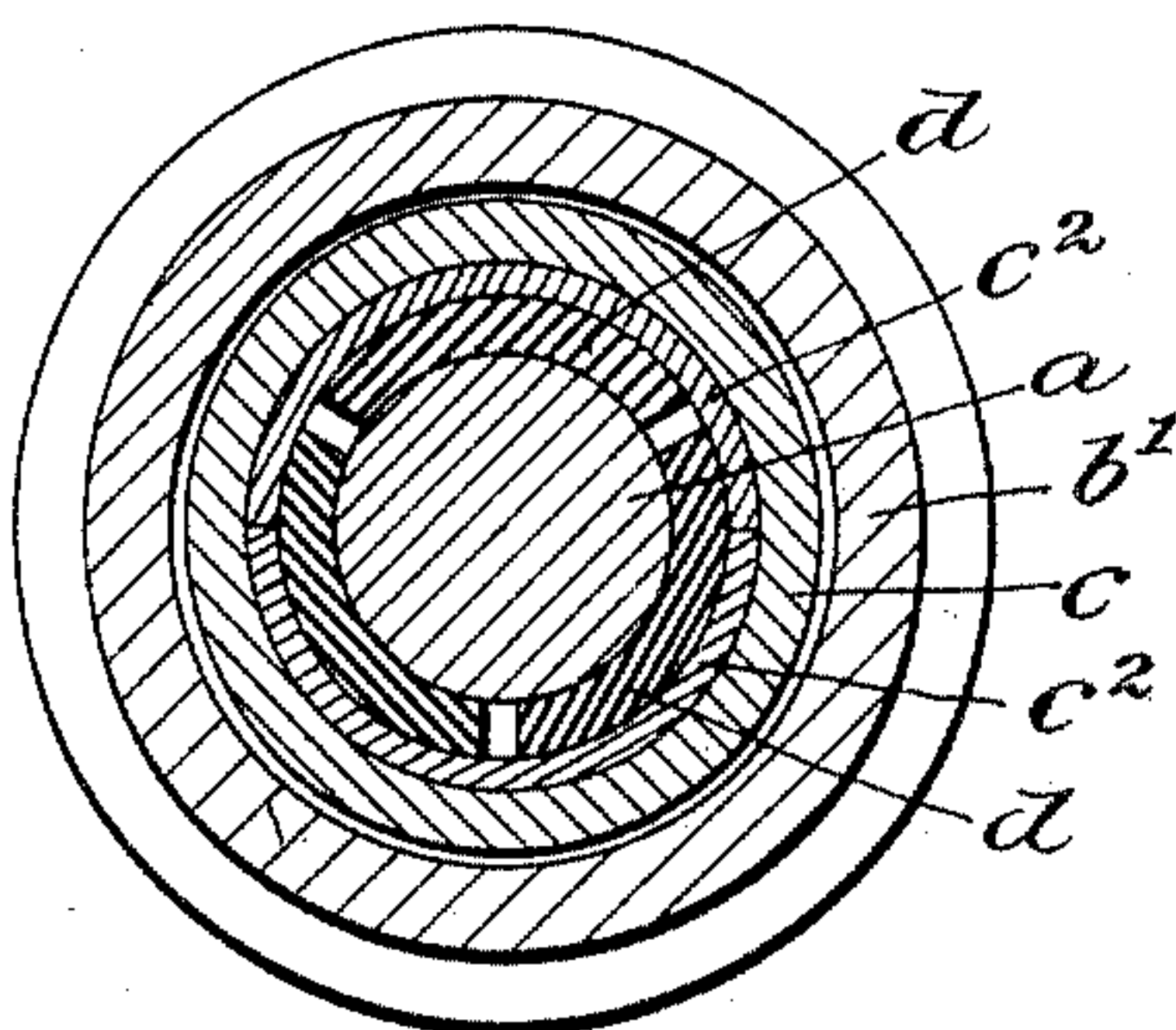


Fig. 3.

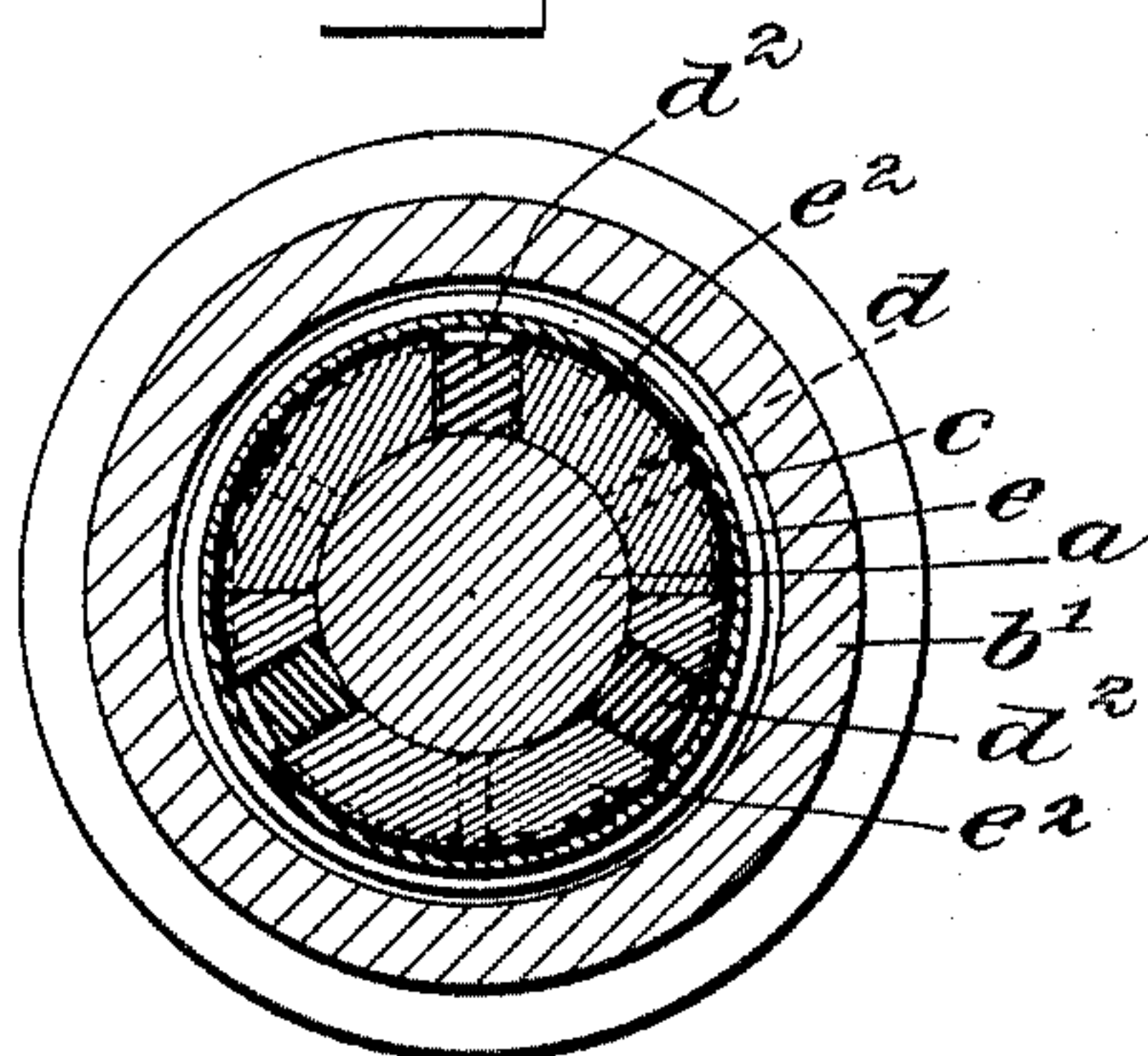


Fig. 4.

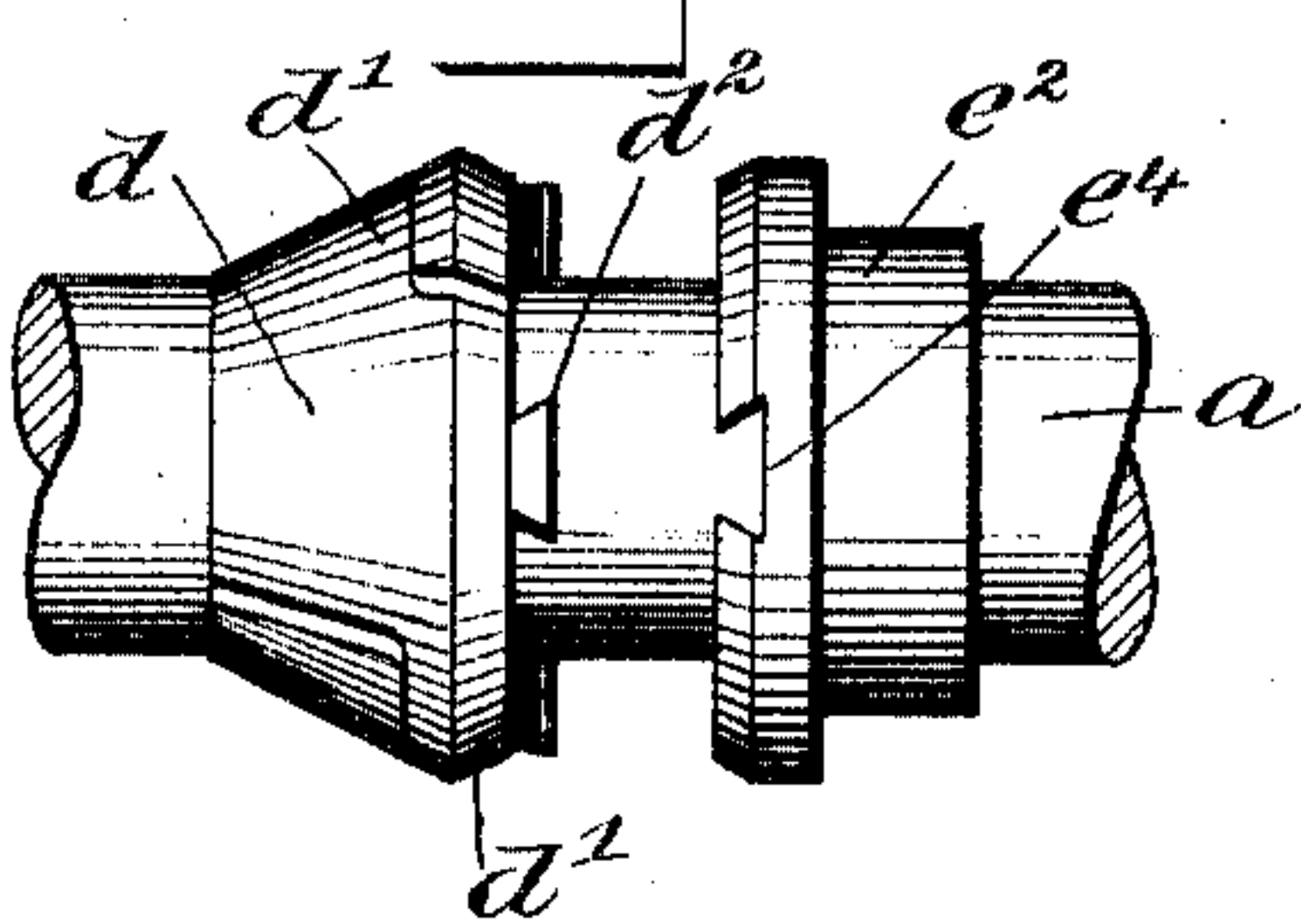


Fig. 5.

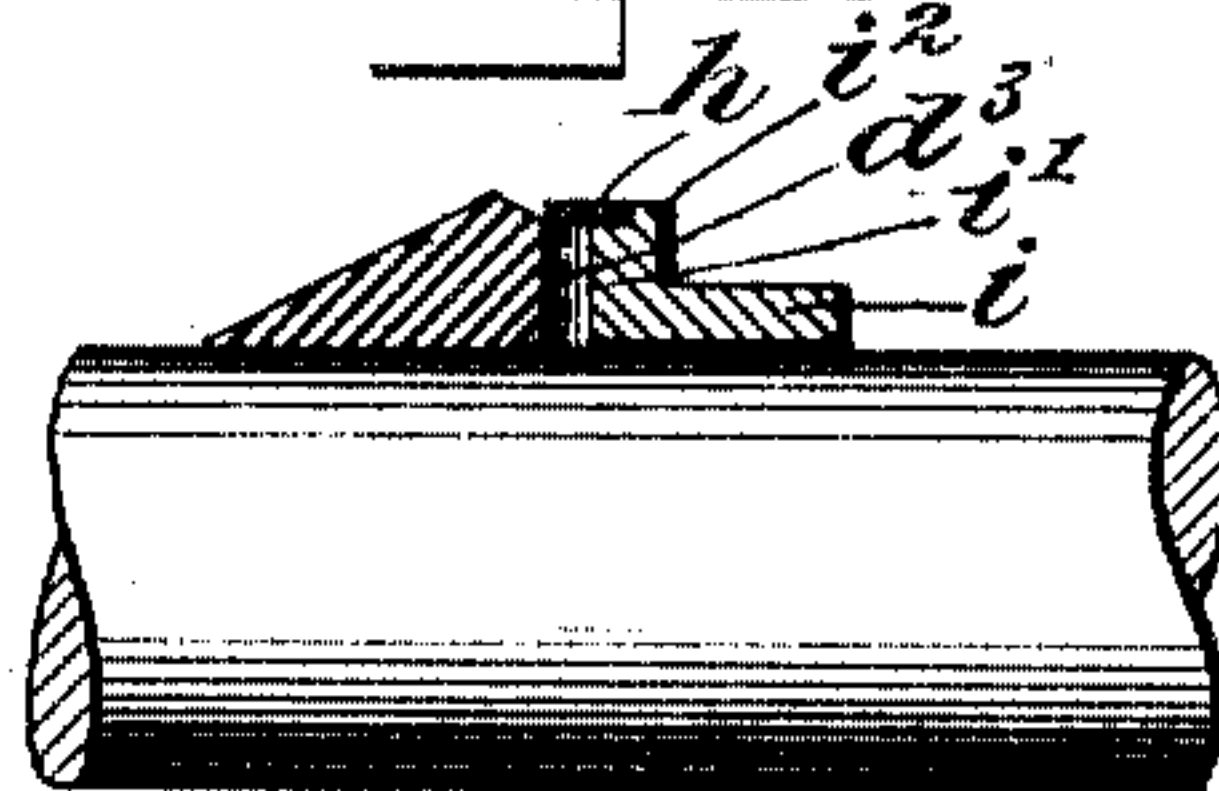
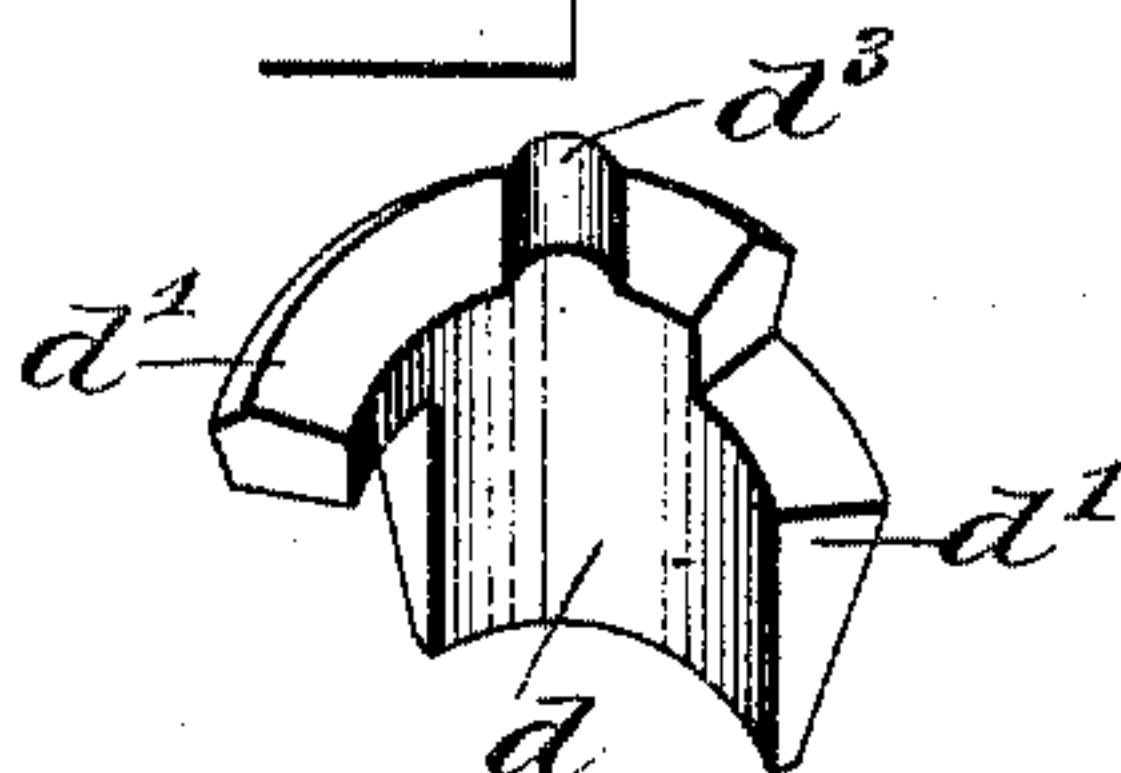


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN BADEKER, OF OMAHA, NEBRASKA, ASSIGNOR TO BADEKER METALLIC PACKING COMPANY, OF OMAHA, NEBRASKA, A CORPORATION.

## PACKING.

SPECIFICATION forming part of Letters Patent No. 777,655, dated December 20, 1904.

Application filed March 25, 1904. Serial No. 199,913.

*To all whom it may concern:*

Be it known that I, JOHN BADEKER, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Packing, of which the following is a full, clear, and exact description.

This invention relates to a metallic rod-packing, particularly for the piston and valve rods of locomotives.

The prime object of the invention is to provide efficient means for preventing independent movement of the segments constituting the packing-cone.

The invention relates to that class of packings in which the cone is formed of a number of segments with overlapping ends adapted to contract around the rod as the segments wear away under the action of the rod. It has been found that if these segments are allowed independent movement around the rod they will wear against each other in such a manner as to permit the passage of the steam between them, and the instant this takes place the action of the steam passing at high pressure between the segments will cut away the metal and soon render the packing useless. This may be prevented by insuring that the segments, if moved at all round the rod, move as a unit. I attain this end by effecting an interlocked or other connection between the individual segments constituting the packing-cone and the collar or follower which bears against the packing-cone and under the action of the usual spring keeps the packing-segments snugly in position, this connection not interfering, however, with the radial movement of the segments, whereby they are allowed to contract around the rod as their inner or rod-engaging surfaces wear away. I will hereinafter particularly describe several different devices for attaining this end.

It is also an object of the invention to enable the packing to be applied with facility to the rods of modern compound locomotives. The rods of these engines are provided with a peculiar shoulder intended to engage the cross-head, and unless the piston be disconnected from the rod and the rod withdrawn

from the cylinder it is impossible to apply an ordinary metallic packing. By a peculiar division of certain of the parts into matching sections I am enabled to place the packing in position with perfect ease and without in any way impairing the efficiency of the packing.

Various other features of major or minor importance are involved, and all will be fully set forth hereinafter.

This specification is an exact description of several forms of my invention, while the claims define the precise scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section of my improved packing, showing it applied to the rod and stuffing-box of a modern compound locomotive. Fig. 2 is a cross-section on the line 2 2 of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 1 looking in the direction of the arrow applied to said line and showing by full lines the parts of the follower and by dotted lines the several segments of the packing-cone and by full lines the gibs or keys with which said segments are provided to connect them with the follower. Fig. 4 is a side elevation of the packing-segments and the inner section of the follower, showing them on the rod, but out of engagement with each other. Fig. 5 is a sectional view illustrating the segments and follower, showing a modification of the connection between these parts and a modified construction adapted to ordinary rods; and Fig. 6 is a perspective view of the segment shown in Fig. 5.

Referring particularly to Figs. 1, 2, 3, and 4, *a* indicates a rod; *a'*, the before-mentioned shoulder thereon. *b* indicates a part of the cylinder-head, *b'* the stuffing-box, and *b<sup>2</sup>* the gland.

The cup containing the packing cone or segments encircles the rod and bears against the inner wall of the gland *b<sup>2</sup>* in the usual manner. This cup is formed of an integral outer ring-like section *c*, having a bore or inner periphery of two diameters connected by a shoulder *c'*. Within this outer ring-like



part  $c$  of the cup is an inner part composed of two semicircular sections  $c^2$ , having an external surface or periphery of two diameters matching, respectively, with the inner diameters of the outer part  $c$  and connected by a shoulder  $c^3$ , as shown. These parts  $c$  and  $c^2$  of the cup are set together accurately to give the cup an inner surface tapering uniformly toward the rod. In connection with this construction it will be seen that the outer part  $c$  of the cup may be readily slipped over the shoulder  $a'$  of the rod and then the inner sections  $c^2$  may be placed around the rod and the cup moved over them, so as in this manner to form a complete cup, snugly and properly inclosing the rod.

The packing-cone is here shown as formed of three segments  $d$ , having overlapping reduced end portions  $d'$ , each made of the usual or any desired construction. Said cone fits snugly within the cup and encircles the rod, as illustrated, so as to form a steam-tight joint, and as the segments wear away they contract around the rod, owing to the clearance which is left between their overlapped ends. Each segment is provided with a dovetailed gib  $d^2$  on its larger end, according to the arrangement here shown, inner side. Said gibs are adapted to lock with the follower to prevent independent movement of the segments around the rod. The follower is formed of an outer ring or sleeve-like part  $e$ , having two diameters connected by a shoulder  $e'$ , and of an inner part composed of two semicircular members  $e^2$ , matching with each other and encircling the rod within the outer part  $e$ . The inner parts  $e^2$  of the follower are of two exterior diameters, connected by a shoulder  $e^3$ , these exterior diameters of the inner part of the follower matching with the interior diameters of the outer part. The inner part of the follower is formed with a number of radial undercut grooves  $e^4$ , which are one for each of the packing-segments and within which the dovetailed gibs  $d^2$  are engaged in such a manner as to prevent longitudinal or sidewise movement of the segments independent of the follower, but to allow a free radial movement of the segments independent of the follower. To attain this end, the slots  $e^4$  and gibs  $d^2$  are disposed radially of the rod. The larger or outer end of the section  $e$  of the follower extends over the outer ends of the gibs  $d^2$ , and consequently prevents the segments from moving outward beyond their proper position.

In connection with the packing-segments and follower thus constructed it will be observed, first, that in assembling the follower the outer part  $e$  may be freely moved over the shoulder  $a'$  of the rod, and then the members of the inner part  $e^2$  set around the rod and the outer part moved over the inner part to hold the entire device in its proper position. After this has been done the outer part  $e$  of the fol-

lower may be moved back slightly, sufficiently to allow the packing-segments to be placed around the rod and their gibs  $d^2$  engage in the slots  $e^4$ , and finally the outer part  $e$  of the follower may be moved up to cover the outer ends of the gibs, and thus it will be seen that the follower and segments are locked together in their proper relative positions, and it is then very easy to assemble the packing by moving the packing-cone into the cup and pushing the latter into the stuffing-box against the usual spring  $f$ , and finally securing the gland over the outer end of the box. Now it will be observed that owing to the connection between the cone-segments and the follower it is impossible for the segments to move independently of each other around the rod, and thus the detrimental wearing of the segments against each other is avoided without, however, interfering with the free contracting of the packing-segments around the rod. It may also be seen that the follower and the packing-cone as a unit may turn freely within the cup, the engaging faces of the cup and cone being uniform and furnishing no obstacle to this movement. A certain degree of this movement is advantageous, since by this means the segments are made to grind slightly into the cup, and thus insure an absolutely uniform and steam-tight engagement. Excessive movement of this character is prevented, however, by the large frictional contact between the cone and cup and the pressure of the spring  $f$ .

The manner in which connection between the cone-segments and the follower is effected is not material to my invention. Various means may be resorted to for this purpose. In addition to the device shown in Figs. 1 to 4 I have also illustrated (see Figs. 5 and 6) a mere projection  $d^3$  on the segment, adapted to fit into a corresponding cavity  $i'$  in the follower  $i$ . These projections may be of any size and shape, so long as the principle of my invention is adhered to, and they may be formed, if desired, on the follower and the segments notched to receive them. In regard to this connection between the segments and follower I would point out, however, a distinct advantage in using a dovetailed gib or an equivalent locking means. In assembling the packing it is essential to place the parts in a certain juxtaposition, and by effecting an interlock, such as described, I insure that the segments are held properly, and that the elements of the packing may be quickly assembled without the exercise of any great care on the part of the person fitting the packing.

In Fig. 5 a construction is illustrated which is adapted for ordinary rods—i. e., rods without the shoulder  $a'$ —and in this case the follower  $i$  is solid. In order to hold the packing-segments and follower in proper relation during the emplacement of the segments, I provide a spring  $h$ , which is preferably in the



form of a flat split ring and which encircles the follower and engages the outer ends of the gibs or projections, this ring bearing between the outer peripheral portions of the packing-segments and a slight shoulder  $\lambda^2$ , formed on the follower. It will be observed, therefore, that I have provided a means for holding the segments and follower in their proper relative position, whether the packing is to be applied to compound locomotives of recent construction or to locomotives of the construction commonly practiced heretofore.

Various changes in the form, proportions, and minor details of the invention may be resorted to at will without departing from the spirit thereof. Hence I consider myself entitled to all such variations as may lie within the scope of the claims.

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

1. A rod-packing comprising a cup, packing-segments, a follower, and means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections.

2. A rod-packing comprising a cup, packing-segments, a follower, means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, and means for limiting the outward movement of the packing-segments.

3. A rod-packing comprising a cup, packing-segments, a follower, and means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, the said means for connecting the segments to the follower comprising interengaging surfaces on said parts.

4. A rod-packing comprising a cup, packing-segments, a follower, and means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, the said means for connecting the segments to the follower comprising dovetailed gibs and undercut slots receiving the gibs, the slots and gibs running radially of the rod.

5. A rod-packing comprising a cup, packing-segments, a follower, means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, the said means for connecting the segments to the follower comprising dovetailed gibs and undercut slots receiving the gibs, the slots and gibs running radially of the rod, and a means for limiting the outward radial movement of the segments.

6. A rod-packing comprising a cup, packing-segments, a follower, means for connect-

ing each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, the said means for connecting the segments to the follower comprising dovetailed gibs and undercut slots receiving the gibs, the slots and gibs running radially of the rod, and an annular member encircling parts of the segments, to limit the outer radial movement thereof.

7. A rod-packing comprising a cup, packing-segments, a follower, means for connecting each segment to the follower, to prevent independent circular movement of the packing-segments and to allow free radial movement of said sections, the said means for connecting the segments to the follower comprising dovetailed gibs and undercut slots receiving the gibs, the slots and gibs running radially of the rod, and a spring in the form of a split ring encircling parts of the segments, to limit the outer radial movement thereof.

8. A rod-packing comprising a cup, a packing-cone formed of segments, the cone fitting within the cup and the cup and cone having uniform engaging surfaces, to allow a relative turning movement of the cup and cone, a follower, and means for connecting the segments of the cone with the follower, to prevent independent turning movement of the segments and to allow free radial movement thereof.

9. A rod-packing comprising a cup, a packing-cone formed of segments, the cone fitting within the cup and the cup and cone having uniform engaging surfaces, to allow a relative turning movement of the cup and cone, a follower, means for connecting the segments of the cone with the follower, to prevent independent turning movement of the segments and to allow free radial movement thereof, and means for limiting the outer radial movement of the segments.

10. A rod-packing comprising a cup, a cone engaged therein and formed of matching segments, and a follower formed of an annular outer part and sectional inner part, the inner part of the follower and the segments of the cone having interengaged parts for the purpose specified, and the annular outer part of the follower lying opposite parts of the packing-cone segment to limit the outward movement thereof.

11. A rod-packing comprising a cup, packing-segments and a follower, the packing-segments having each a projection and the follower having cavities respectively receiving the projections whereby to connect the segments to the follower to prevent independent circular movement of the segments and to allow free radial movement of the same.

12. A rod-packing comprising a cup, a packing-cone fitting within the cup, the cone and cup being centrally orificed to permit the passage of the rod, a follower, means for yieldingly pressing the follower against the pack-



ing-cone to hold it snugly in the cup, the said  
packing-cone being made up of a plurality of  
matching segments, and means coacting be-  
tween said segments and the follower to allow  
5 free radial movement of the segments, but to  
prevent independent turning or circular move-  
ment thereof.

In testimony whereof I have signed my name  
to this specification in the presence of two sub-  
scribing witnesses.

JOHN BADEKER.

Witnesses:

ISAAC B. OWENS,  
EVERARD BOLTON MARSHALL.