No. 790,985. PATENTED MAY 30, 1905.

F. E. SMALL.

METALLIC PACKING FOR PISTON RODS.

APPLICATION FILED SEPT. 24, 1904.

Fig. 3.

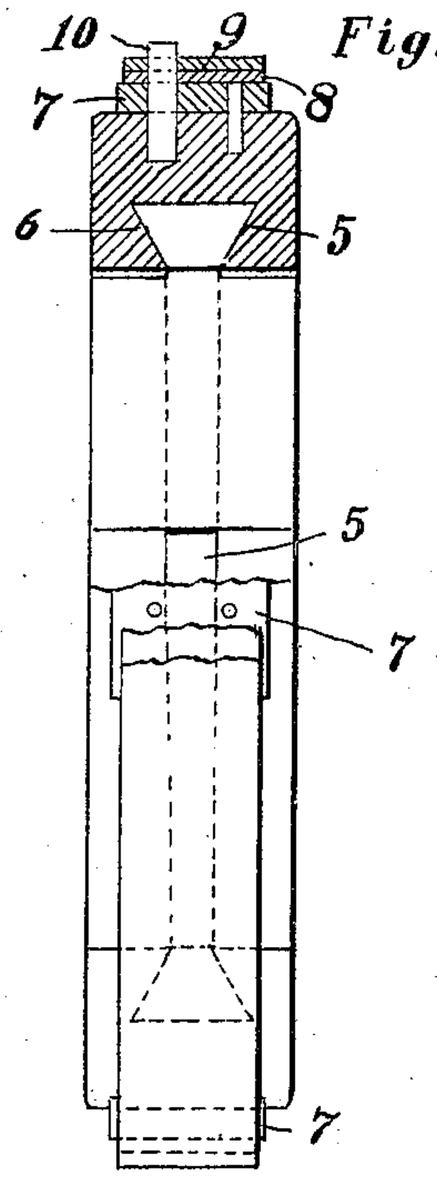



Fig. 2.

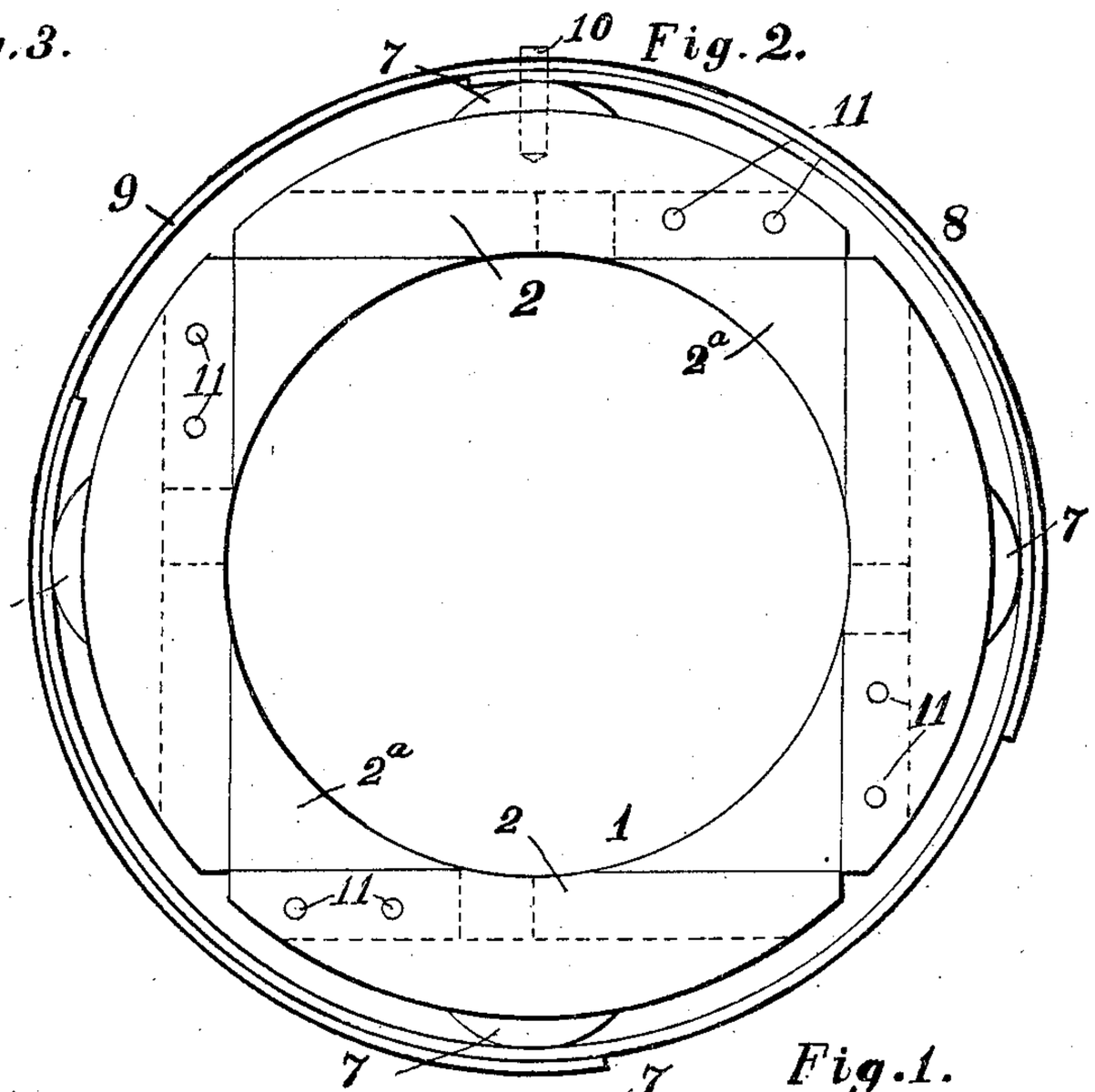



Fig. 1.

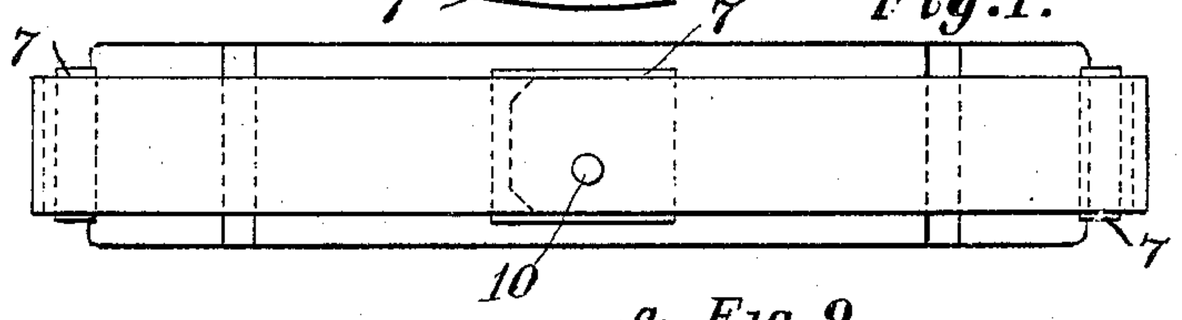



Fig. 6

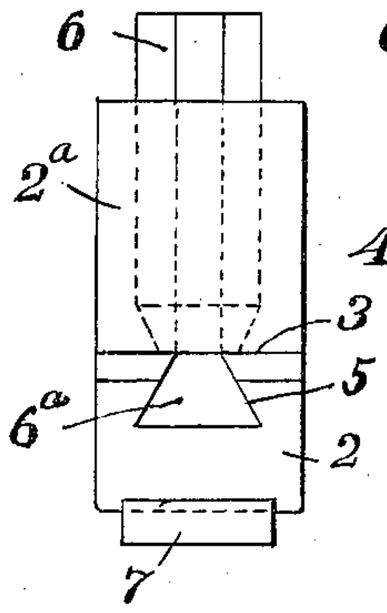



Fig. 4.

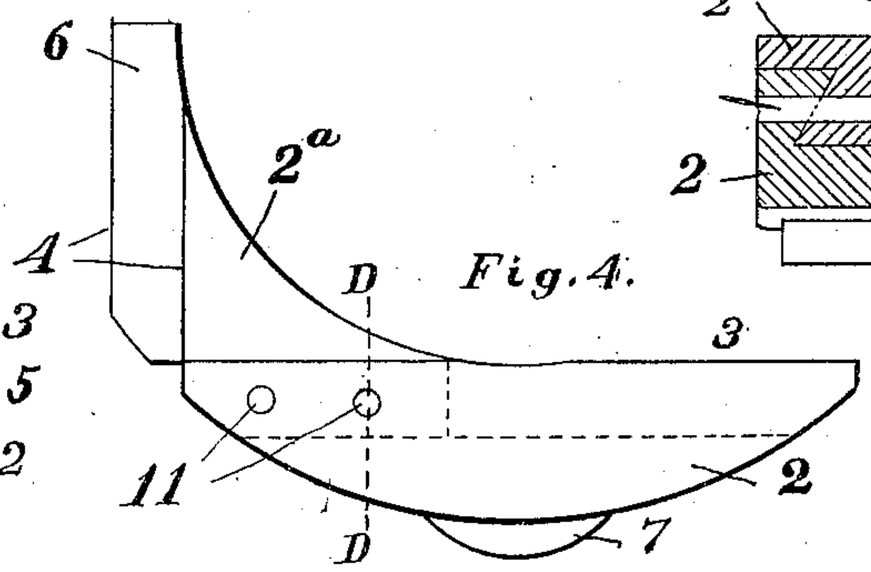



Fig. 9.




Fig. 7.

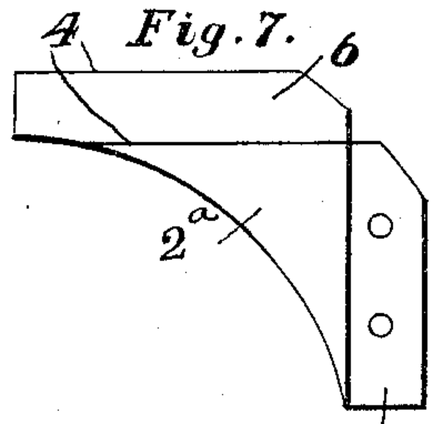



Fig. 8.

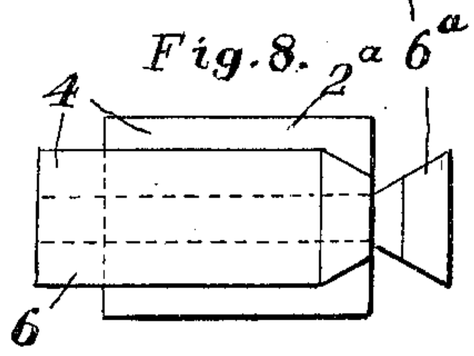
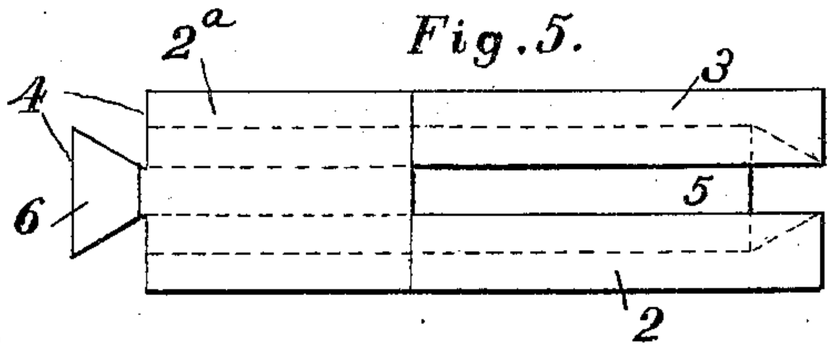



Fig. 5.




Witnesses.

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Inventor.

Frederick E. Small.

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No. 790,985. Patented May 30, 1905.

# UNITED STATES PATENT OFFICE.

FREDERICK E. SMALL, OF BOSTON, MASSACHUSETTS.

## METALLIC PACKING FOR PISTON-RODS.

SPECIFICATION forming part of Letters Patent No. 790,985, dated May 30, 1905.

Application filed September 24, 1904. Serial No. 225,843.

*To all whom it may concern:*

Be it known that I, FREDERICK E. SMALL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Metallic Packings for Piston-Rods and the Like, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to metallic packings for piston-rods and the like, and is an improvement upon the packing shown and described in the Letters Patent No. 757,062, granted to me April 12, 1902; and it consists in certain novel features of construction, arrangement, and combination of parts which will be readily understood by reference to the description of the accompanying drawings, and to the claims hereto appended, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a packing embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an edge view, partly in elevation and partly in section. Fig. 4 is a side elevation of one of the complete segments of which the packing-ring is made up. Fig. 5 is an edge view of said segment looking at its inner surface. Fig. 6 is an end elevation of the same segment looking at the right-hand end of Fig. 4. Figs. 7 and 8 are respectively an elevation and an edge view of the detachable portion of said segment, and Fig. 9 is a section on line D D on Fig. 4 looking toward the right of said figure.

In the drawings, 1 represents the packing-ring proper composed of a plurality of segments 2 $2^a$ of uniform shape and each provided with inner and outer tangential surfaces 3 and 4, respectively, and a portion of its inner surface curved to an arc of a circle to fit the peripheral surface of the rod upon which it is to be used. The inner tangential surface of each segment has formed in the center thereof a dovetailed groove 5, and the outer tangential surface has formed thereon a male dovetailed tongue 6, constructed and arranged to closely fit the dovetailed groove in the inner tangential surface of another section. Each segment may be made entire from a single piece of metal; but to facilitate its construction I prefer to make it in two parts 2 and $2^a$, the part $2^a$ having two outer tangential surfaces arranged at an angle to each other and each provided with a dovetailed tongue 6 or $6^a$, projecting outward from said tangential surfaces, as shown in Figs. 7 and 8. Each segment has secured to or formed upon its outer curved surface at or near the middle of the length thereof a curved projection 7 to serve as a bearing for the peripheral spring 8, the tension of which and of the outer peripheral spring 9 acts to press said segments into close contact with the rod upon which the packing is being used.

One of the segment parts, 2, has set therein an outwardly-projecting pin 10, which engages a hole formed in one end of each of the springs 8 and 9, as shown in Figs. 1, 2, and 3.

In the preferred construction shown the segment part 2 has a dovetailed groove 5, which extends the whole length of its inner face, in one end of which is fitted the dovetailed tongue $6^a$ of the segment part $2^a$ and is firmly secured therein by the pins 11 11, which pass through both parts of said segment, and when so secured together the two parts 2 and $2^a$ form a single segment.

The packing-ring may be made up of four, six, or more segments, as may be preferred, the only difference in the construction in such cases being that the outer and inner tangential surfaces instead of being at right angles to each other, as shown in the drawings, will be at a somewhat greater angle to each other, according to the number of segments employed.

In putting the several segments together around a rod to form a single packing-ring each tongue 6 is inserted in the dovetailed groove 5, formed in the inner tangential surface 4 of another segment, at the end thereof opposite to the segment part $2^a$. (Shown in Fig. 2.)

The two springs 8 and 9 extend circumferentially nearly around the ring 1 one within the other, said spring 8 bearing upon each of the several segments of which said ring is made up, so as to press them into contact

with the rod upon which they are fitted, and the spring 9 bearing for the greater part of its length upon the outer surface of the spring 8, each of said springs being connected to the pin 10, so as to prevent circumferential movement thereof about said ring, the pressure of the spring 9 upon the spring 8 serving to reinforce the spring-pressure, more evenly distribute the pressure upon all of the segments, and also to increase the resistance to the opening of the joints of said segments by virtue of the friction of one spring upon the other.

The operation of my invention will be readily understood from the foregoing without further description here.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A metallic packing for piston-rods and the like articles, comprising a single ring composed of a plurality of segments of uniform shape, each provided with inner and outer tangential surfaces arranged in planes at an angle to each other, and provided respectively with a dovetailed groove, and a dovetailed tongue, as and for the purposes described.

2. In a metallic packing, the combination of a plurality of segments of uniform shape each provided with a curved inner surface and inner and outer tangential surfaces arranged in planes at an angle to each other, said tangential surfaces being provided respectively with a dovetailed groove and a correspondingly-dovetailed tongue, said segment being formed in two parts firmly secured together to form a substantially rigid section.

3. In a metallic packing, the combination of a plurality of segments of uniform shape, each composed of the two parts 2 and $2^a$ firmly secured together by a dovetailed joint and pins passing through both parts, and said segments being connected together by sliding dovetailed connections.

4. In a metallic packing, the combination of a single packing-ring composed of a plurality of segments of uniform shape, and each provided with an inner curved surface and inner and outer tangential surfaces arranged at an angle to each other; an outwardly-projecting pin set in one of said segments; a peripheral spring connected by one end to said pin and extending around said packing-ring in one direction and bearing upon each of said segments; a second peripheral spring also connected to the said pin and extending around said ring in two opposite directions and bearing upon the first-mentioned peripheral spring, as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 21st day of September, A. D. 1904.

FREDERICK E. SMALL.

Witnesses:
N. C. LOMBARD,
CHAS. E. FOLSOM.