

S. REDFERN.  
METALLIC PACKING.  
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903,229.

Patented Nov. 10, 1908.

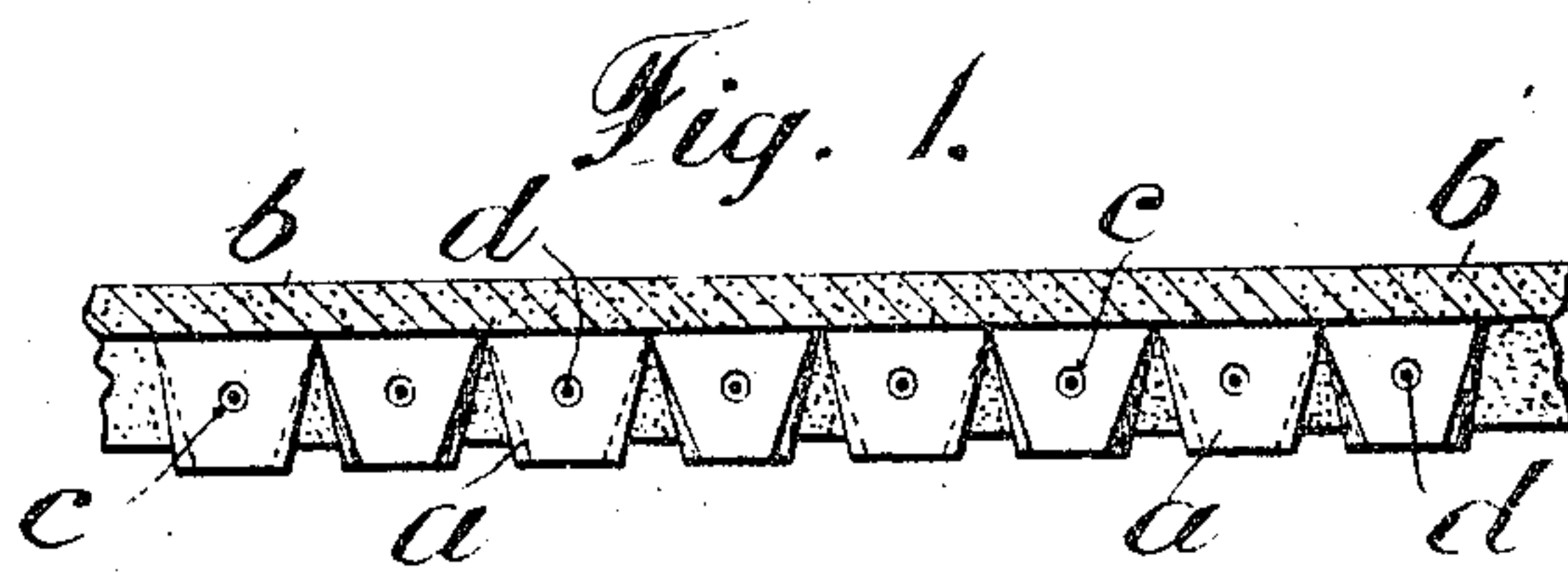
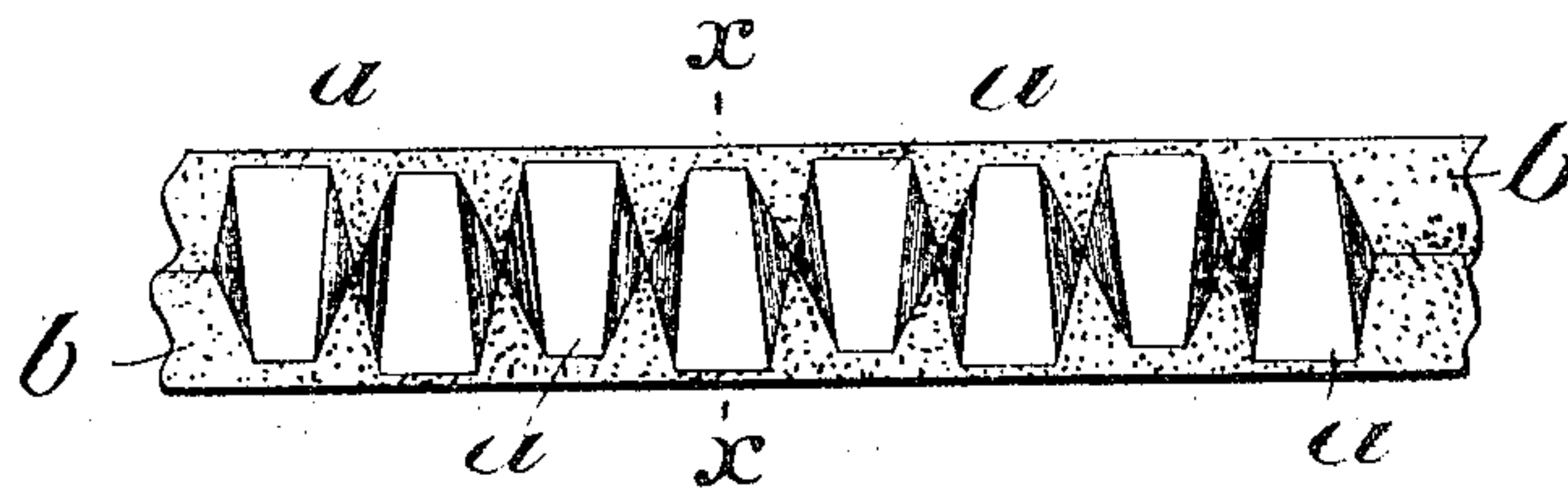


Fig. 2.

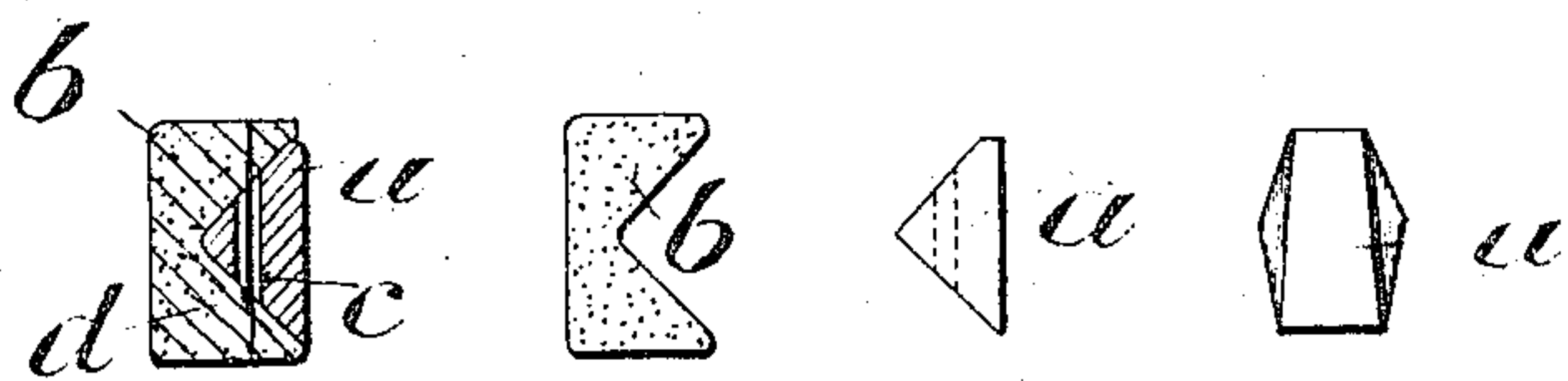


Fig. 3. Fig. 4. Fig. 5. Fig. 6.

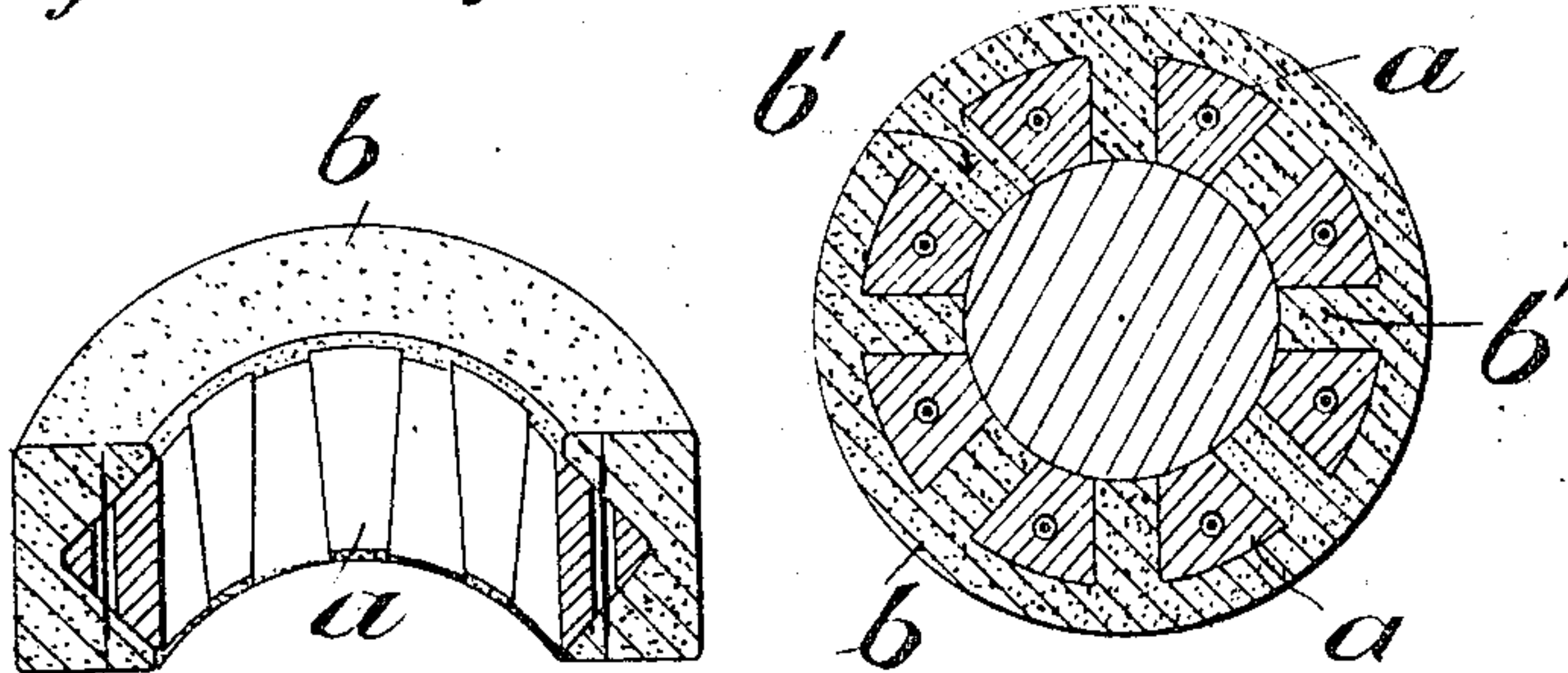


Fig. 7.

Fig. 8.

Witnesses:-  
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# UNITED STATES PATENT OFFICE.

SAMUEL REDFERN, OF MANCHESTER, ENGLAND.

## METALLIC PACKING.

No. 903,229.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed July 29, 1907. Serial No. 386,056.

*To all whom it may concern:*

Be it known that I, SAMUEL REDFERN, a subject of the King of Great Britain and Ireland, and resident of Manchester, Eng-

land, have invented certain new and useful Improvements in Metallic Packing for the Piston-Rods of Steam-Engine Cylinders and the Like, of which the following is a specification.

This invention refers to improvements in metallic packing for the piston rods of steam engine cylinders and the like, and its object is to provide a form of packing which adapts itself more readily to the piston rod or other object to be packed, and is therefore more effective in use than known makes of metallic packing.

According to the invention, the improved packing consists of a number of small segmental blocks, each of, by preference, triangular formation or beveled on its rear face and each of taper shape in plan. Each segment is also slightly tapered in a vertical direction. The several segments when assembled form a complete ring, the lateral taper being such as to allow them to lie side by side and closely fit the piston rod.

To facilitate the assembling of the segments and their adjustment when around the piston rod, they are secured to a length of fibrous packing, the packing being of V channel section, and the segments being held in the channel by pins which pass loosely through holes in the segments. With the segments thus held by a length of fibrous packing, and two or more sets of segments similarly held and arranged in ring formation one upon another in a stuffing box, a most effective combination of metallic and fibrous packing is obtained, the fibrous material allowing of the required compression to insure the necessary contact between the several rings and the walls of the stuffing box, and also to hold the blocks to the piston rod.

Upon the accompanying drawing, Figure 1 illustrates a face view and Fig. 2 a longitudinal section of a length of packing made according to this invention. Fig. 3 illustrates a transverse section on line  $x-x$ . Fig. 4 illustrates a cross section of the fibrous portion of the packing only. Fig. 5 illustrates a side view, and Fig. 6 a face view of one of the metallic segments. Fig. 7 illustrates in perspective one half of the improved packing as it appears when applied

to a piston rod. Fig. 8 illustrates a sectional plan of a modification.

$a, a$  are the metallic segments, and  $b$  is the fibrous packing, which is made to the section shown in Fig. 4, and therefore with a longitudinal V-shaped groove. Into such groove fit the segments  $a, a$ , these latter being of corresponding shape, see Figs. 3 and 5. Each segment is formed with a hole  $c$  and when in the groove of the packing the segment is held to the packing by say a phosphor bronze pin  $d$  driven vertically through the packing and the hole in the segment, see Fig. 3, the pin being preferably slightly shorter than the depth or thickness of the packing. Each segment is also tapered in plan, see Fig. 2, the degree of taper depending on the size of rod around which the segments are intended to lie, or the taper being such that when the packing is brought to the round, see Fig. 7 the inner circumference of the segments corresponds to the circumference of the piston rod and the sides of the segments when around the rod lying radial to the center of the rod.

By arranging a series of rings of the improved packing one upon another within the stuffing-box of a steam engine, and around the piston rod, and tightly clamping the several rings by the usual gland, the metal segments  $a, a$  are firmly held against the rod, while the fibrous portion tightly fits against the inner face of the stuffing boxes and partly against the piston rod.

The ends of the packing will preferably lie slightly apart, and the ends of one ring will lap with, or cover, those of the other rings, so that there shall be no possibility of steam leaking between the ends of the rings. A slight space is also left between the ends of the rings, so that the rings will adapt themselves more readily to the piston rod, especially when tightened up under the pressure of the gland.

The metal segments may be parallel-sided vertically, or they are, by preference, slightly tapered vertically, see Figs. 1, 6 and 7. They are also arranged alternately with the narrower and uppermost, see Figs. 1 and 7, so that when the rings are compressed the segments tend to move up and down and thereby allow the face nearest the piston rod to move against the rod as the segments wear away, the slight space between the ends of the ring allowing of the endwise expansion of the ring, and thus also allowing of the



running in of the segments against the rod, the segments having a kind of floating movement. The beveled faces of the back of the segments and the V-shape of recess in the fibrous material cause the segments to be moved and held tightly against the rod. The segments will preferably be made by being first formed as a ring to a size or diameter slightly greater than that of the packing required or rod to be fitted, and after smoothing up will be cut into the sizes and shapes which will enable them to fit the rod. They may, however, be made singly and be finished and made ready for use when assembled.

In Fig. 8 I show how the metal segments *a*, *a* may be arranged at a slight distance apart and have portions of the fibrous material *b* lying between them, so that, on the packing being compressed when around the piston-rod, the intermediate portions of the fibrous material will allow of the more ready closing in of the segments, the said portions yielding on being squeezed into smaller compass under the tightening of the gland. In this arrangement the blocks may be parallel sided. While preferring the segments to be held to the fibrous packing by pins they may be loose or be held in other ways.

What I claim is:—

1. A packing for the piston rods of steam engine cylinders and the like, consisting of a length of fibrous material, in one longitudinal face of which is a continuous V-

shaped groove, in combination with a series of small metal blocks within the said groove, each of the blocks being tapered transversely and vertically, and each on its wider vertical face fitting in the groove in the fibrous material, the several blocks being arranged with their wider and narrower ends alternately uppermost and lowermost, and, when the packing is applied to the piston rod, collectively forming a complete ring, substantially as herein set forth.

2. In a packing for the piston rods of steam engine cylinders and the like, a length of fibrous material, in one longitudinal face of which is a continuous V-shaped groove, in combination with a series of small metal blocks within the said groove, each of the blocks being tapered transversely and vertically, each on its wider vertical face fitting in the groove in the fibrous material, and each having a vertical hole, a pin passing through the hole in each block and also through the fibrous material, and the several blocks arranged with the wider and narrower ends alternately uppermost and lowermost, and when the packing is applied to a piston rod collectively forming a complete ring, substantially as herein set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

SAMUEL REDFERN.

Witnesses:

P. D. BAILEY,

F. C. PENNINGTON.