

No. 612,687.

Patented Oct. 18, 1898.

F. VAN DEN BOSCH.
PACKING FOR PUMP PISTONS.

(Application filed Mar. 22, 1898.)

(No Model.)

Fig. 1.

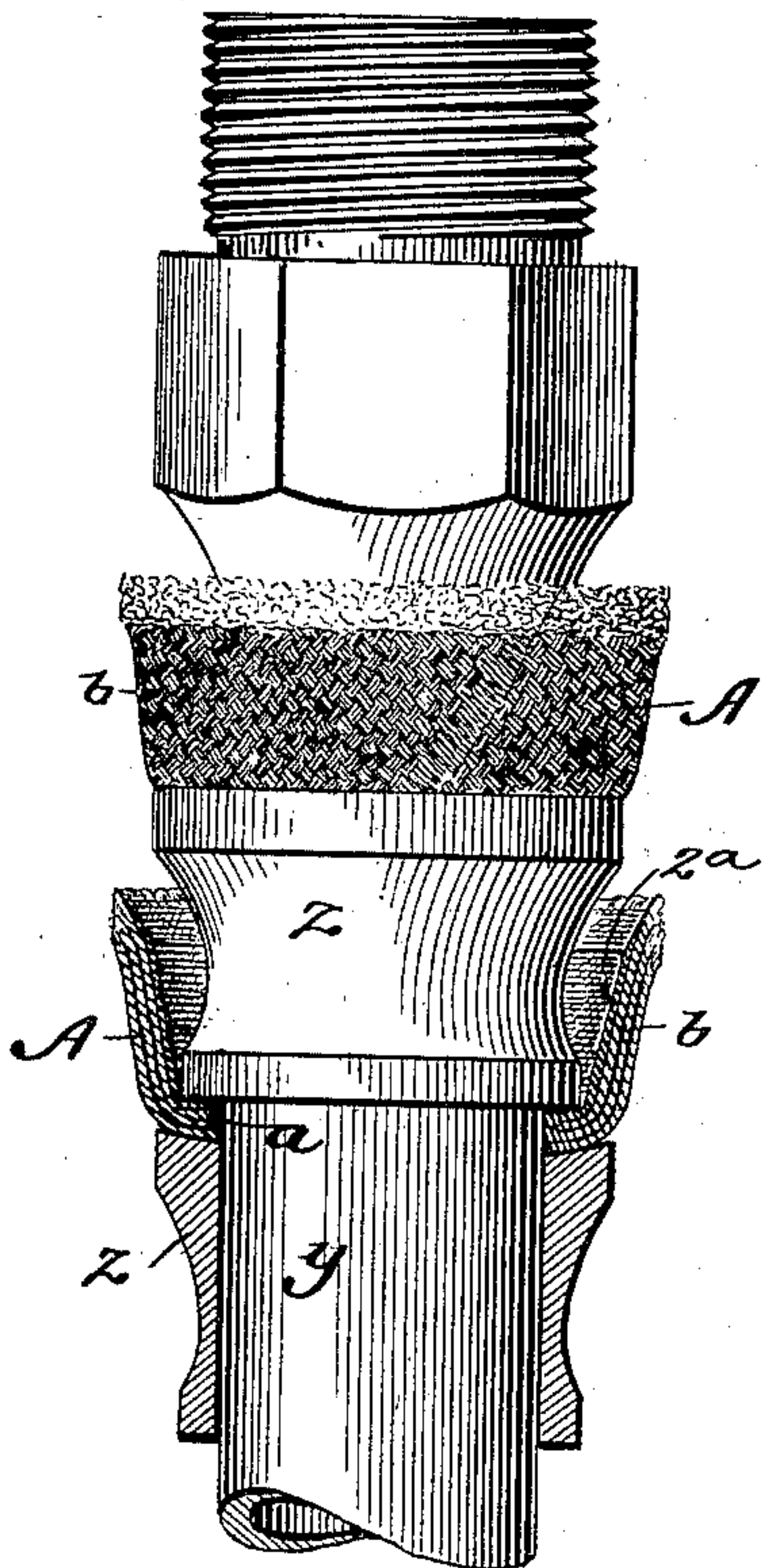


Fig. 2.

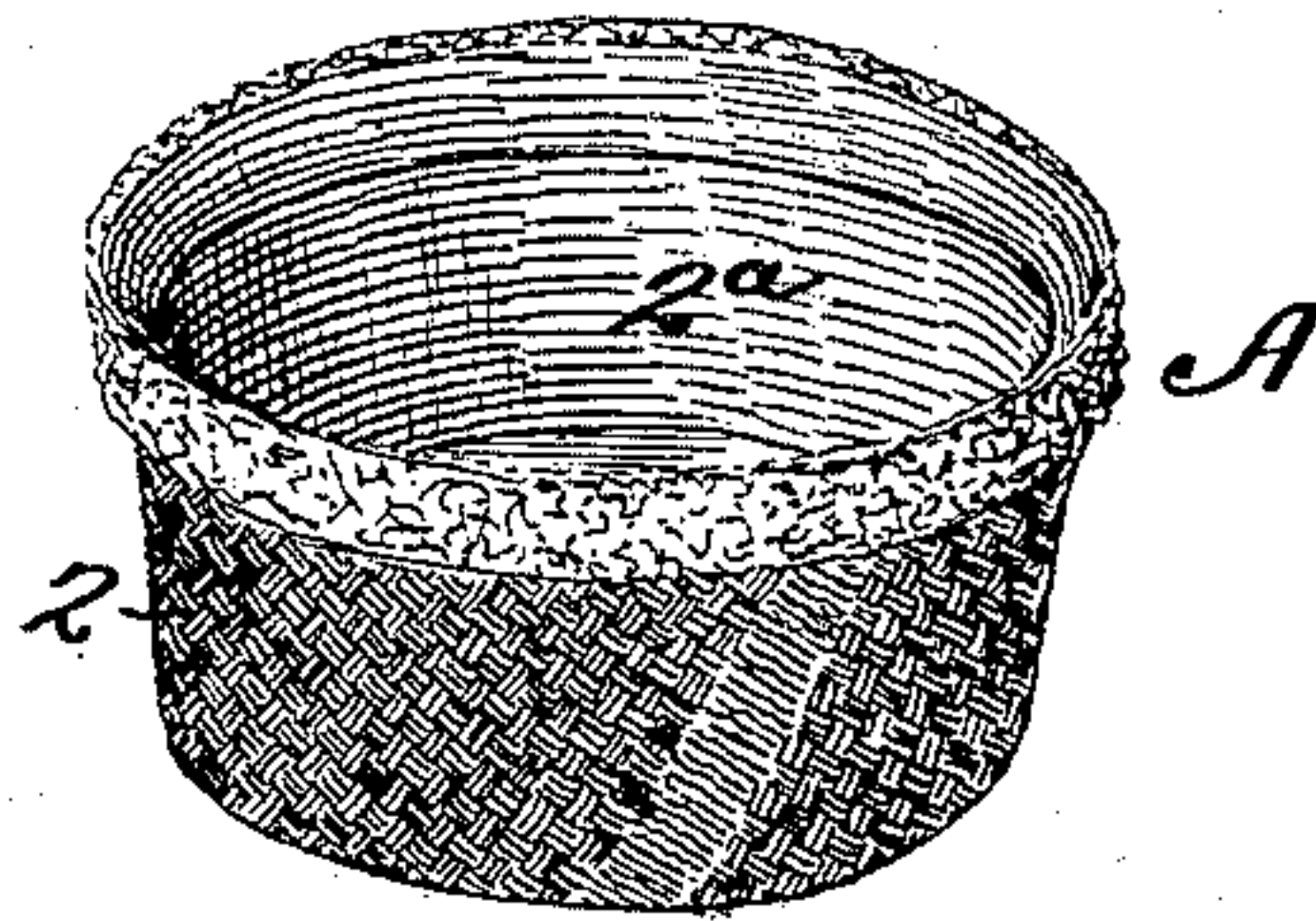


Fig. 3.

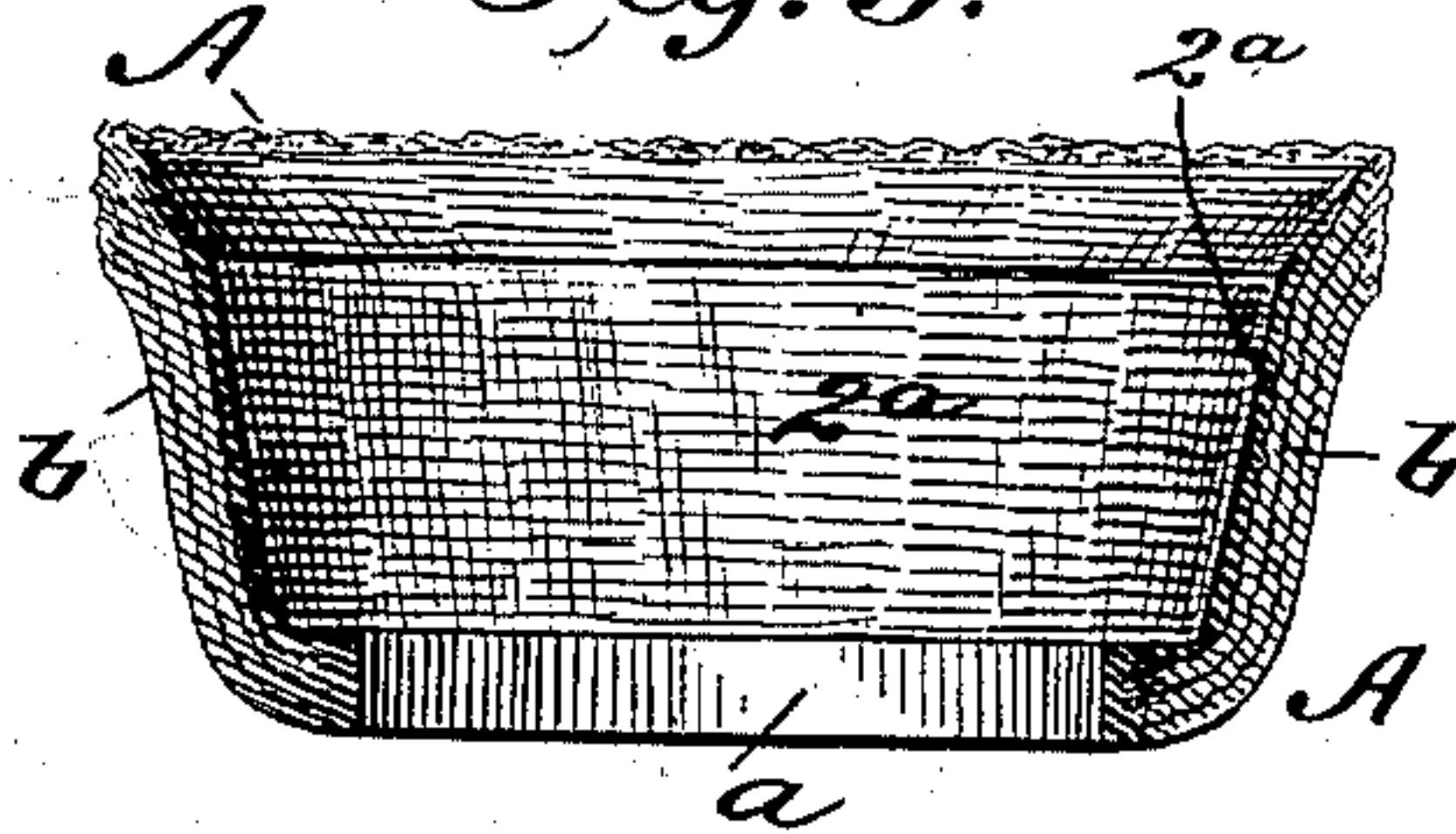


Fig. 4.

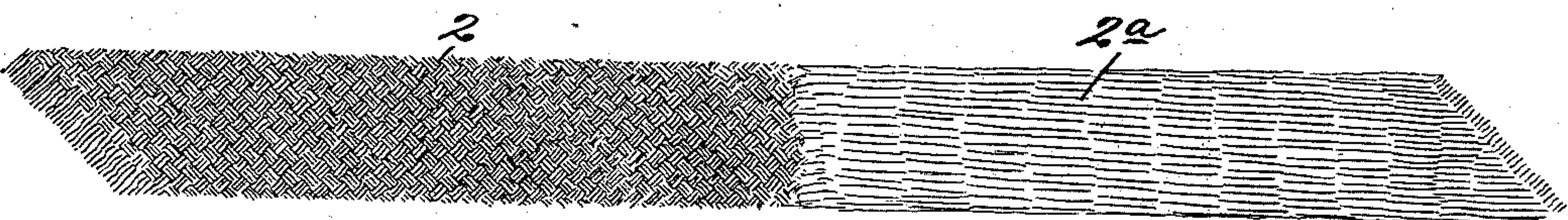


Fig. 5.

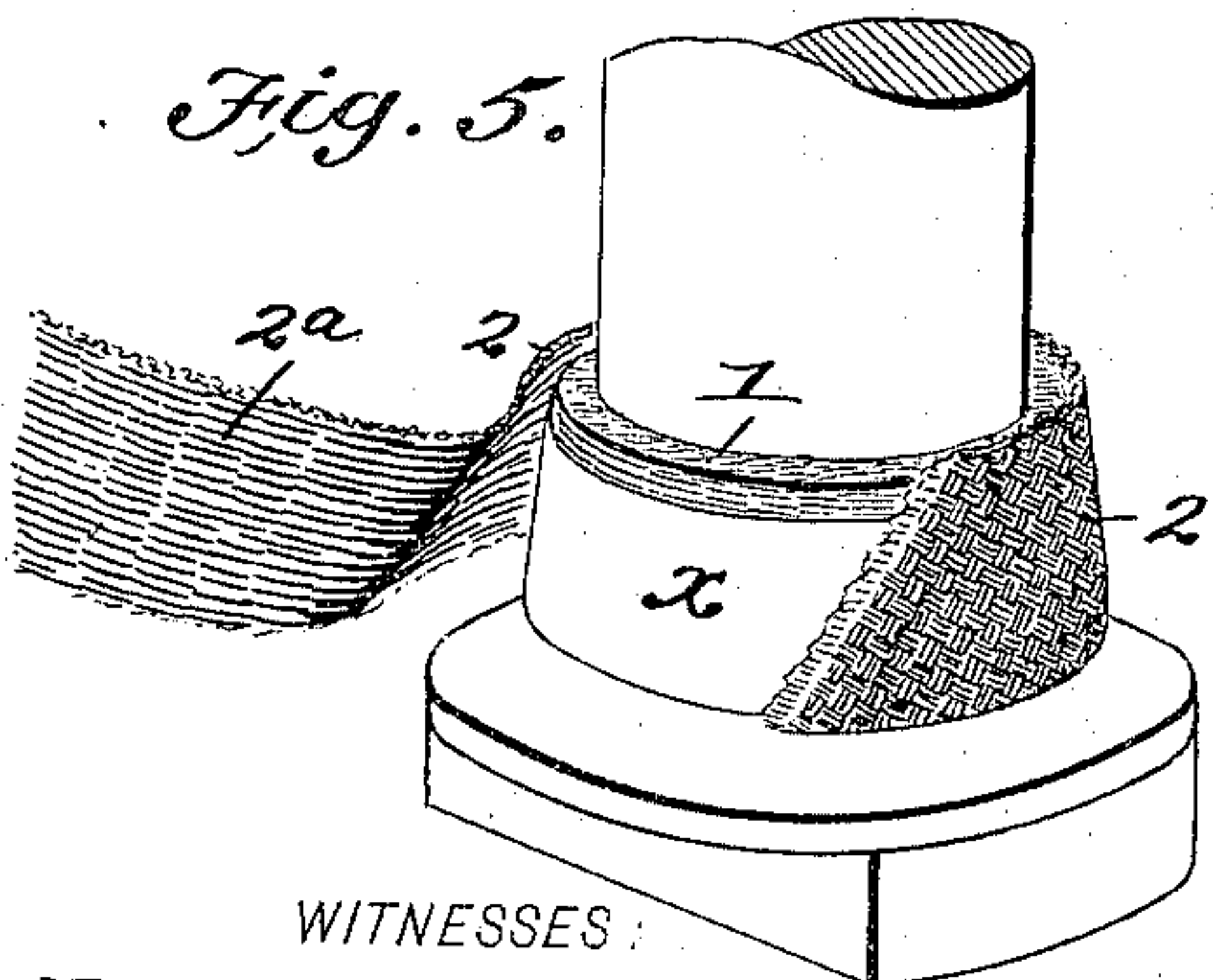
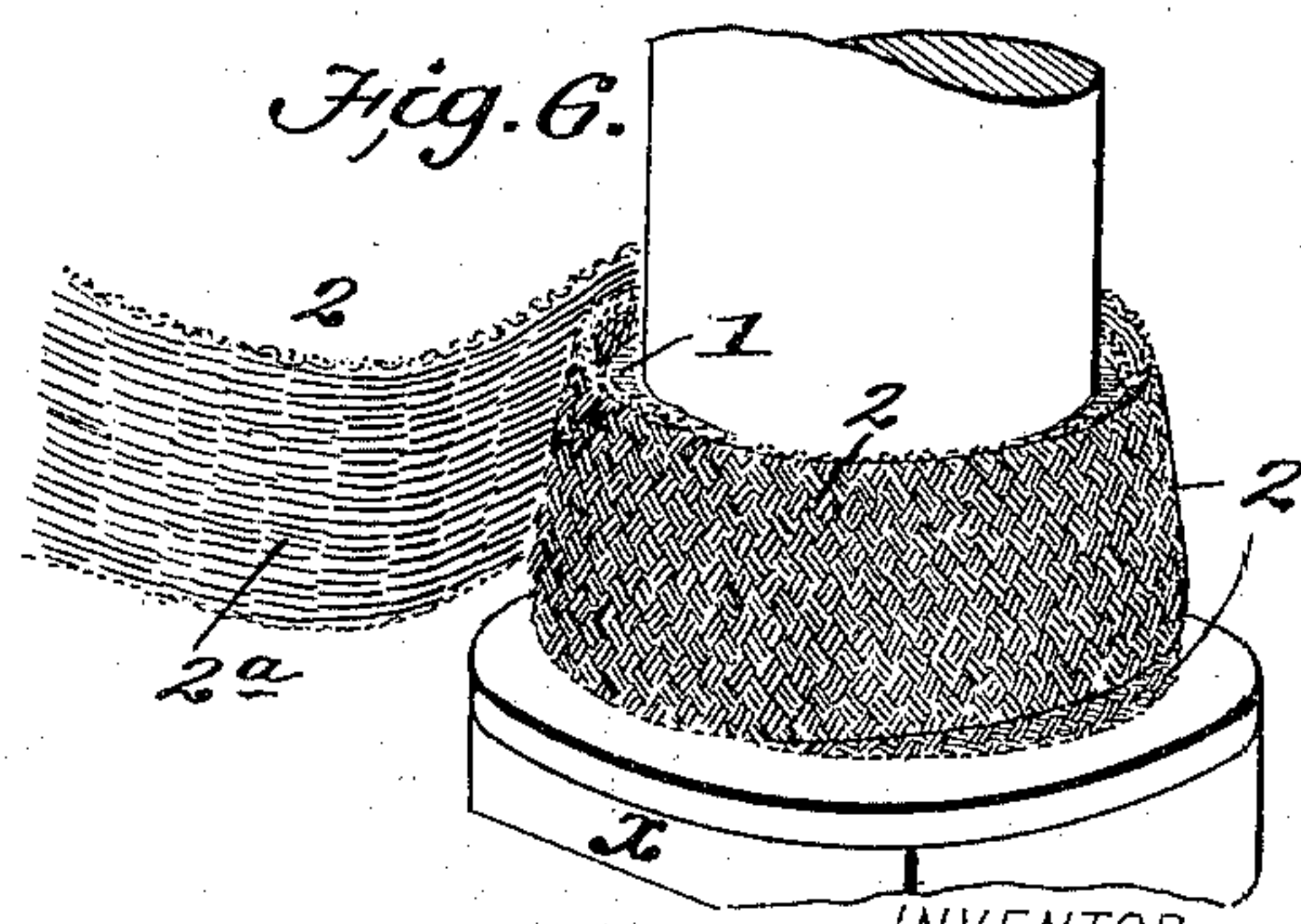


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK VAN DEN BOSCH, OF PARKER'S LANDING, PENNSYLVANIA,
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PACKING FOR PUMP-PISTONS.

SPECIFICATION forming part of Letters Patent No. 612,687, dated October 18, 1898.

Application filed March 22, 1898. Serial No. 674,772. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK VAN DEN BOSCH, residing at Parker's Landing, in the county of Armstrong and State of Pennsylvania, have made certain new and useful Improvements in Packing for Pump-Pistons, of which the following is a full, clear, and exact specification.

It is the object of my invention to provide a cup-like packing-ring for pump-pistons, more particularly pistons used in oil-wells, which shall have greater elasticity, durability, and efficiency than those heretofore employed.

In pumping deep wells cups or rings are subject to rapid wear and great strain, especially at the bottom or lower angle, and from long experience I have also found that cups or rings made of leather, while having the required elasticity, are defective and objectionable in other respects, they being especially apt to be injured by hot liquids and salt water, while cups or rings made of metal or hard rubber are too rigid to form an efficient packing. My improved cup or ring possesses the elasticity and packing quality of a leather cup without, like the latter, becoming soft in oil or hard in salt water or being liable to shrink in hot water or other liquids, and will retain due elasticity and flexibility until worn out.

The construction of my cup or ring is as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a side and sectional view of an oil-pump piston provided with cups or rings constructed according to my invention. Fig. 2 is a perspective view of such cup or ring. Fig. 3 is a vertical section of the cup or ring. Fig. 4 is a plan view of the rubber-coated canvas strip employed in forming the cup or ring. Figs. 5 and 6 are perspective views illustrating the method of construction.

The base or bottom of my cup or ring is constructed of a strip of rubber, while the body portion is formed of a strip of canvas, duck, or some other suitable fabric coated interiorly with some duly adhesive substance which is insoluble in hot or salt water and other liquids in which pistons are commonly used. The adhesive substance I prefer for

thus coating the inner surface of the said strip of fabric is rubber, and it is an important characteristic of my invention that the rubber used for this purpose possesses less adaptability for vulcanization than the rubber of which the inner base-ring is composed, from which it results that when the cup or ring is baked, as in the ordinary process of vulcanization, the base or bottom portion will be relatively stiffer or more rigid than the body portion or flange.

Another most important characteristic of my cup or ring is the arrangement of the fibers, or, more strictly speaking, the warp and weft threads or yarns of the fabric, in such manner that each one is secured at the base of the ring, so that their upper ends only are exposed at the upper edge of the ring, in contradistinction to the usual arrangement of threads or yarns in other forms of rings composed in part of canvas, duck, or analogous fabric.

The details of construction are as follows:

The first step in forming the cup or ring A consists in laying the soft-rubber base-strip 1 (see Fig. 5) around the base of the core x of the vulcanizing-mold. The next step is to wind the canvas or duck strip 2, which is coated interiorly with soft rubber 2^a, over or around the soft-rubber strip 1 and then spirally around the core x and upon itself, as shown in Fig. 6. By this arrangement all the fibers or both warp and weft threads or yarns are diagonal to the vertical axis of the cup or ring, and the upper edges of the several spiral layers or convolutions of said strip 2 are so lapped that when the mold proper (not shown) is placed on the core x and screwed down the said upper edges will be bent or turned inward. By the pressure applied in the mold and by the subsequent baking in a suitable furnace the two strips 1 and 2 adhere to each other and the coated layers or convolutions of the canvas or duck strips 2 also adhere to each other, and thus all form practically one dense structure whose base a has greater rigidity or less elasticity than the flange or body b of the ring A by reason of the greater thickness of such base a and also on account of the higher vulcanizable quality of the rubber composing such strip 1 as compared with the rubber coat-

ing 2^a of the canvas or duck strip 2. This difference of quality is produced by the well-known method of varying the quantity of sulfur mixed with the pure rubber in the process
5 of manufacture.

As constructed the cup or ring A has practically a hard-rubber base-ring *a* and a thinner flange or flaring body portion *b*, containing rubber of less hardness and presenting exte-
10 riorly a fibrous surface composed of interwoven threads or yarns arranged diagonally and all secured at their lower ends and free at their upper ends. Further, such flanged or body portion *b* has an inner surface or shell
15 *a*², of moderately-hard rubber, which contributes the required degree of stiffness or rigidity, so that the fibrous exterior portion is duly supported until worn away and is yet flexible and elastic to a degree required to insure
20 perfect packing while working in the pump-barrel.

To recapitulate, my improved cup or ring is so constructed as to always present a fibrous outer or wearing surface which has two dif-
25 ferent qualities of rubber, the bottom or base portion *a* being rigid and firm, while the body or flange portion *b* is elastic to the degree required to enable it to always adjust itself closely to the pump-barrel. Further, the
30 fibrous body *b* being bent inward and firmly united with the harder rubber of the base-ring *a* spreading of the cup or ring is avoided while it is being clamped tightly on the piston-tube *y*, also from the effect of hydrostatic pressure
35 in the well. As the wear of the piston-cups A progresses they will constantly present a fibrous friction-surface until worn back to the bottom or base, and yet without the possibility of any individual fiber becoming de-
40 tached, since all the fibers are firmly secured within the base *a*, and the latter is in turn

clamped between the tubular metal washers *z* of the piston.

What I claim is—

1. The improved cup or ring for pump-pis- 45 tons of the class described, comprising a body formed of fibrous material, and a base-ring, consisting of vulcanized rubber which is united with the lower edge of such fibrous body and possesses greater rigidity than the
50 same, as shown and described.

2. An improved cup or ring for a pump-piston having a body portion which is composed of a fibrous strip having its fibers, or warp and weft, arranged diagonally, and wound
55 upon itself, and a suitable adhesive substance which binds the layers or convolutions together, all the fibers being secured at their base or lower ends, substantially as shown and described. 60

3. An improved cup or ring for a pump-piston composed of a fibrous body whose warp and weft are arranged diagonally, and have an inner, relatively rigid supporting-shell, and a ring arranged at the base and firmly
65 united with said body, as shown and described.

4. An improved cup or ring for a pump-piston composed of a body portion which is formed of a fibrous strip coated interiorly with
70 some adhesive water-repellent substance, such strip being wound spirally upon itself, and its edges overlapping each other at the bottom of the ring, and a base portion which is also composed of some duly-adhesive wa-
75 ter-repellent substance, and firmly united to the lower edges of the said body portion, substantially as shown and described.

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