

No. 666,291.

Patented Jan. 22, 1901.

S. W. WARDWELL, JR.
EXPANSIBLE PULLEY.

(Application filed June 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

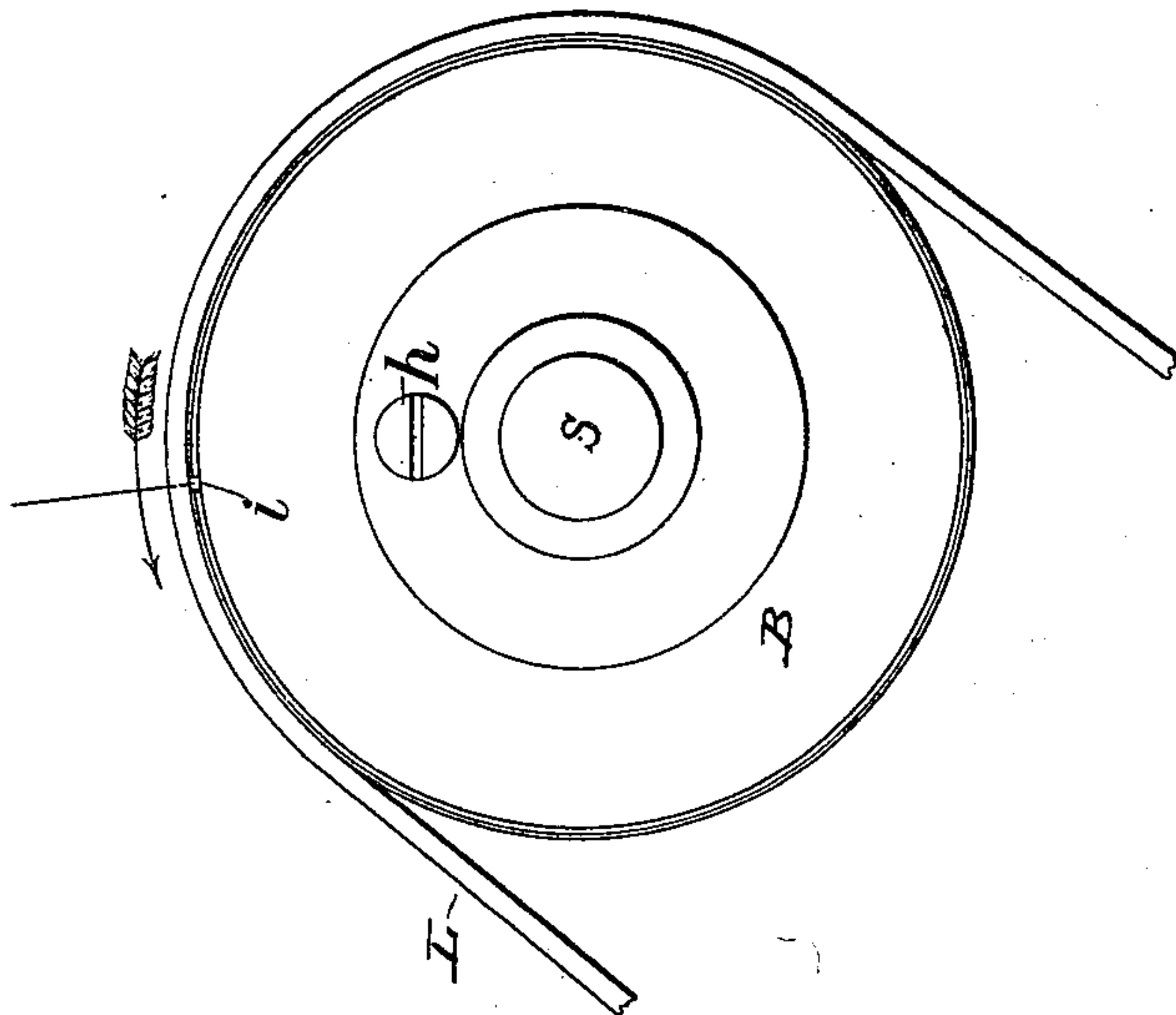
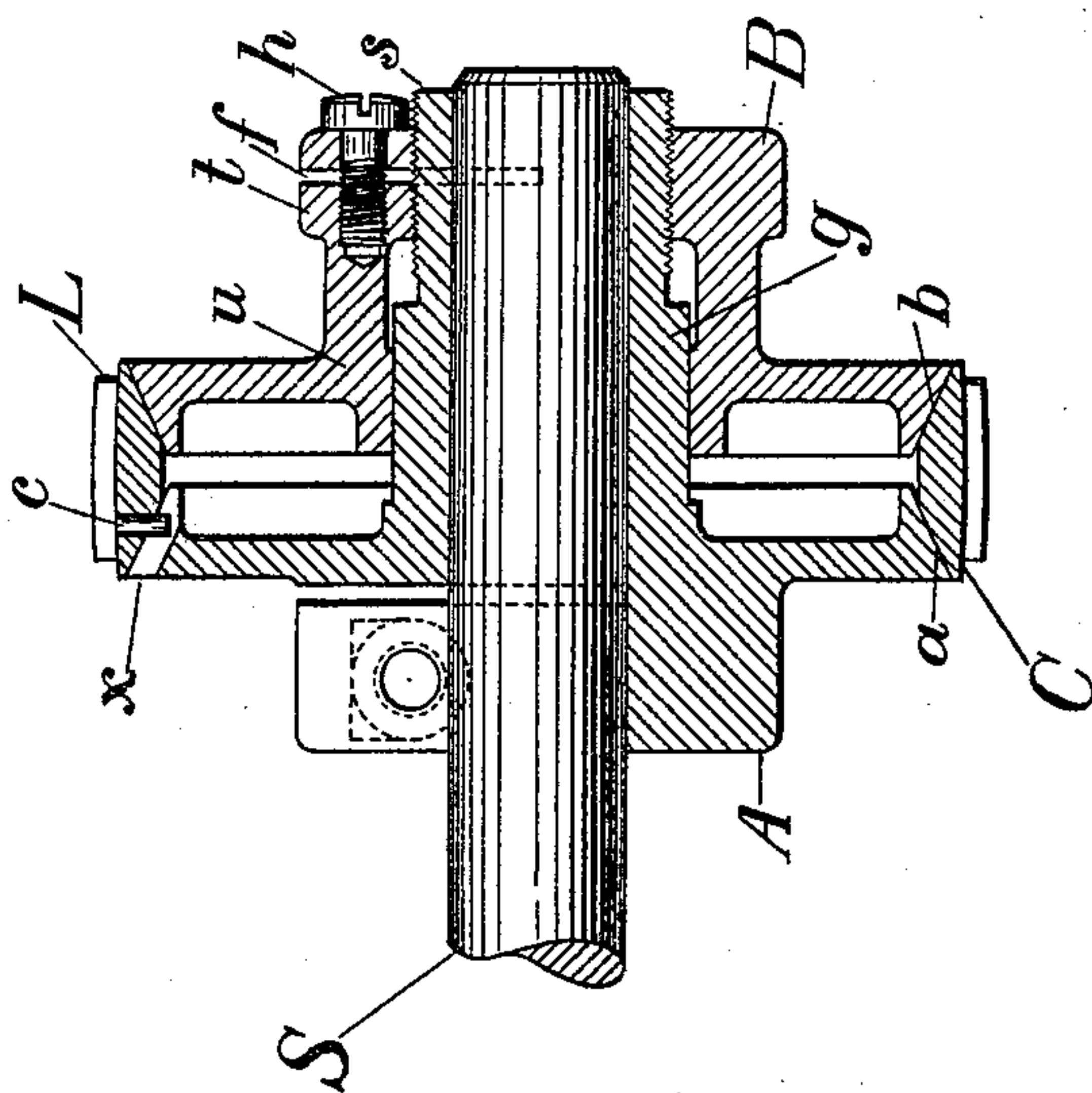


Fig. 1.



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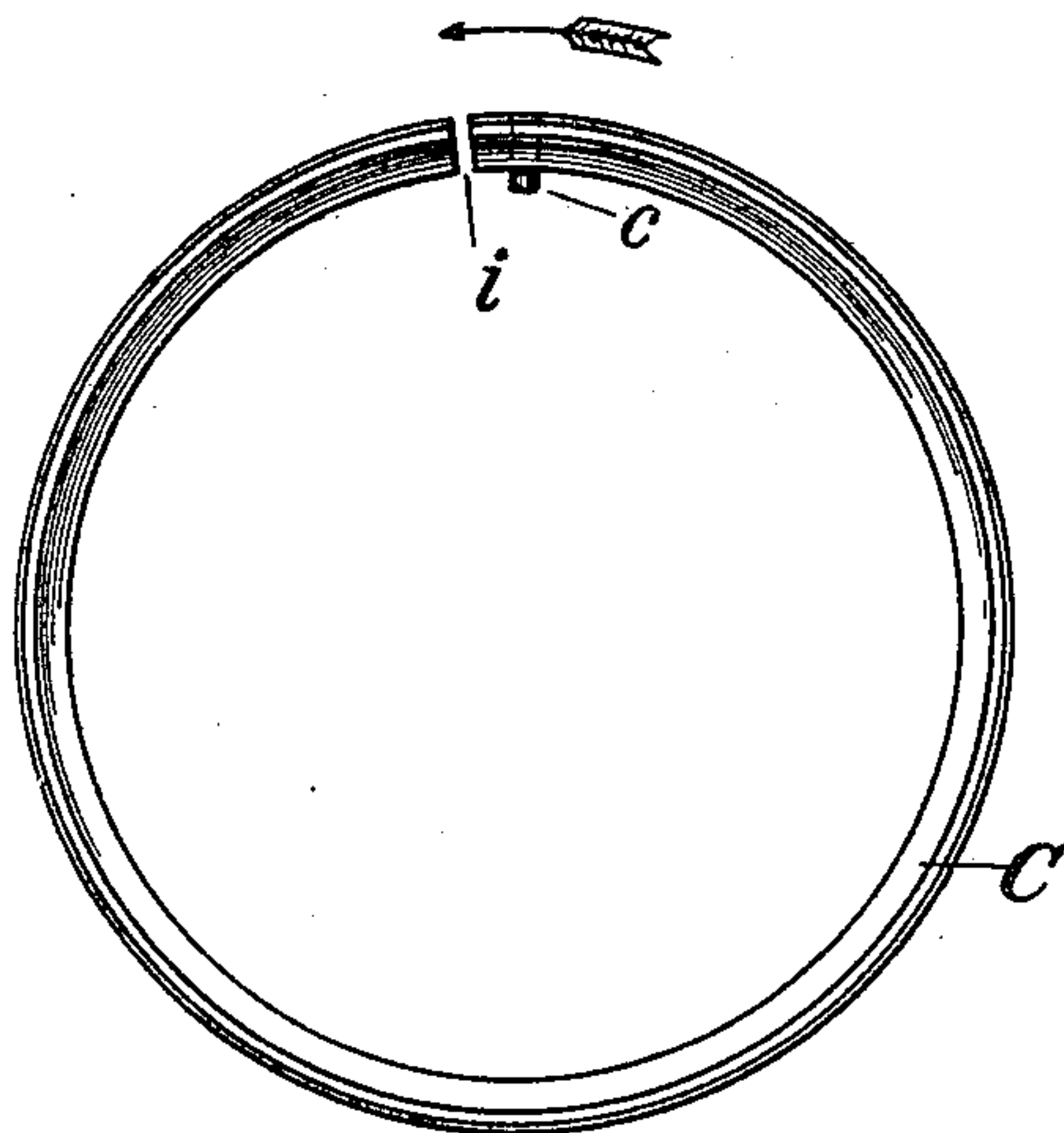


Fig. 5.

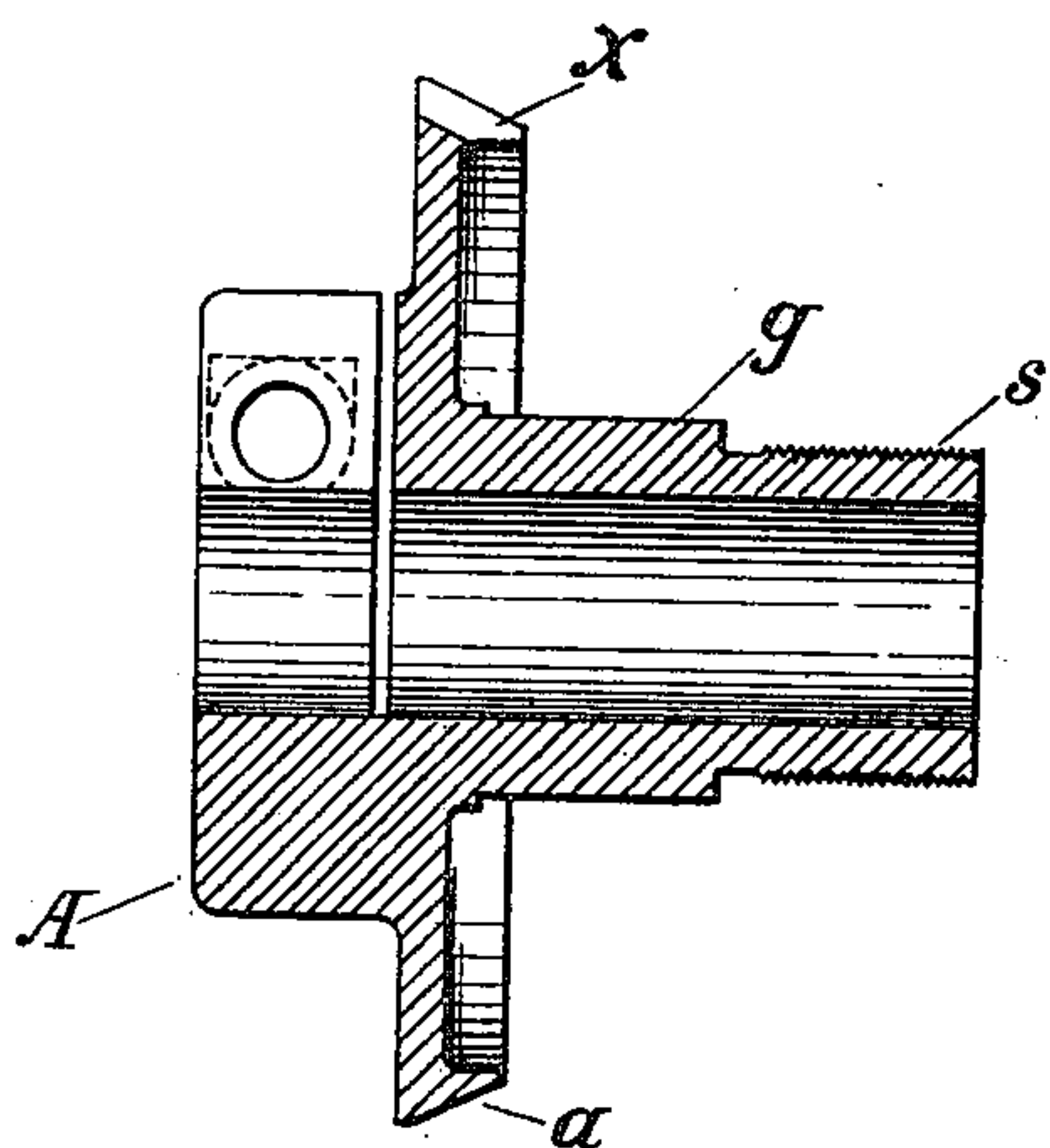


Fig. 3.

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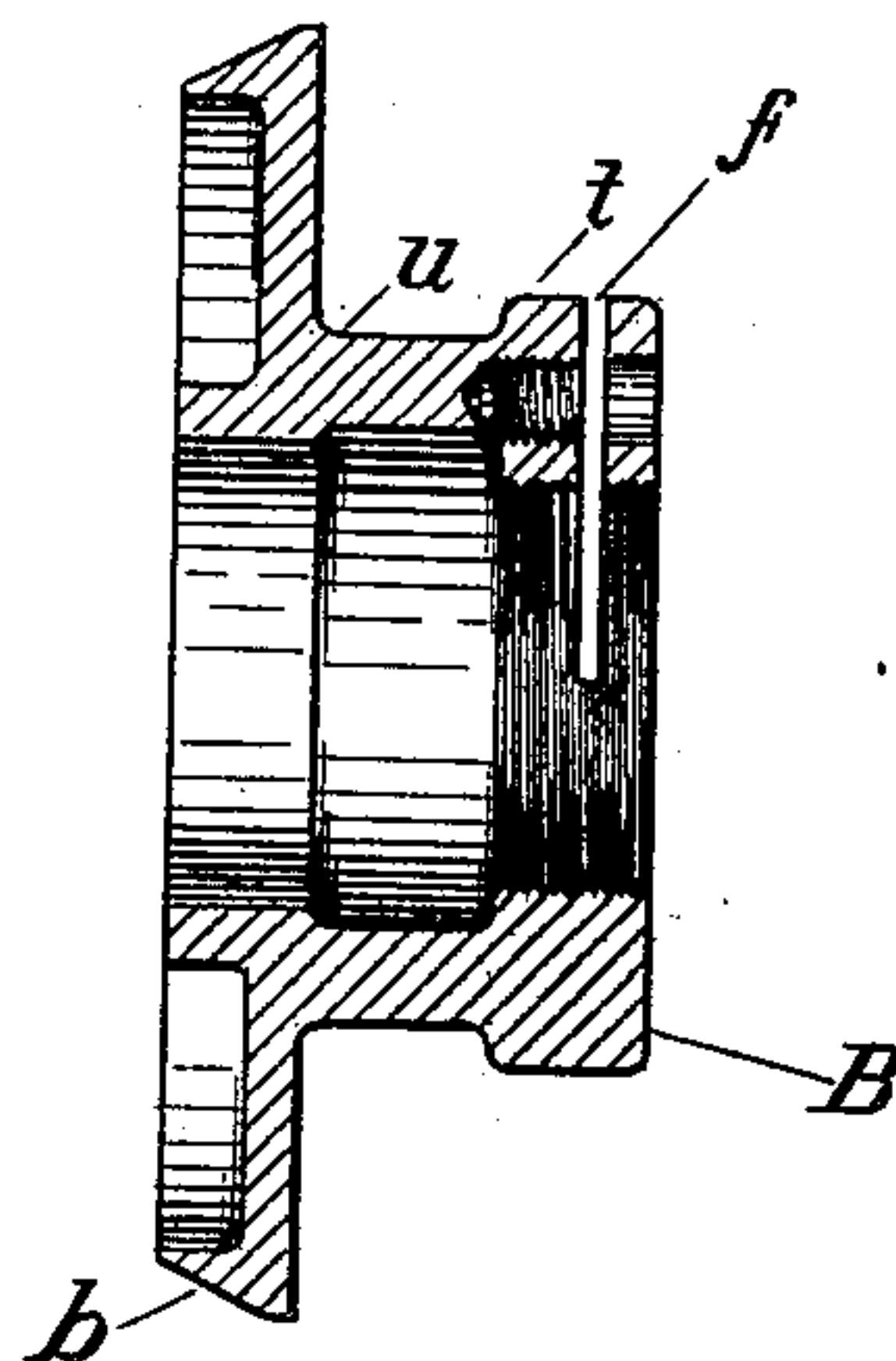


Fig. 4.

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UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF PROVIDENCE, RHODE ISLAND.

EXPANSIBLE PULLEY.

SPECIFICATION forming part of Letters Patent No. 666,291, dated January 22, 1901.

Application filed June 14, 1900. Serial No. 20,239. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Expansible Pulleys, of which the following is a specification.

My invention relates to expansible pulleys, and has for its objects to improve and simplify the construction thereof; and to these ends it consists of the various features of construction and arrangement of parts having the mode of operation substantially as hereinafter more particularly pointed out.

Referring to the accompanying drawings, wherein I have illustrated a preferred embodiment of my invention, Figure 1 is a longitudinal sectional view showing one form in which the pulley can be made. Fig. 2 is a side view of the same. Fig. 3 is a longitudinal section of the fixed section of the pulley. Fig. 4 is a longitudinal section of the movable section. Fig. 5 is a side view of the split band.

While my improved expansible pulley may be adapted for many and various uses, it is designed more especially for use in connection with machines for winding cops—such, for instance, as that set forth in my Letters Patent No. 480,157 and subsequent machines of this general character, wherein it is used more particularly for positively and accurately regulating the relative movements of the rotating winding-spindle and the reciprocating guide. In this class of machines, as well as in others, it is often necessary to adjust the relative movements of the parts very accurately, and heretofore expansible pulleys have been used for such purpose; but they have been provided with V-shaped grooves adapted to be used in connection with correspondingly V-shaped belts, and while this is one of the most efficient devices for accomplishing the desired regulation in speed it is open to some objections, among which may be noted the following: A specially-formed V-shaped belt must be used and is expensive to manufacture, owing to the fact that it must be accurately formed in uniform cross-section throughout and does not obtain so good a bearing on the pulley. The V-shaped

belt is not available for use on machines that wind heavy material, because it is difficult to obtain leather of sufficient thickness for such heavy belts as would be needed. When an expansible pulley is adjusted, it presents a greater or less surface to the belt, depending on whether the two halves are separated or closed. Further, as the leather becomes more pliable from use and from the oil absorbed it sinks more deeply into the pulley, thus changing the pitch-line of the pulley and causing the relative speed of the parts to change. In the present construction I overcome these and other faults by the use of a relatively hard expansible band or ring whose inner face is fitted to a V-shaped groove in the pulley and whose outer face is substantially flat, being adapted to receive a flat belt. By this construction I am enabled to use a thin flexible flat belt of any desired width and of ordinary character which will readily adapt itself to the periphery of the pulley, insuring the maximum surface of contact without change in extent from adjustment of the pulley and of sufficient width to transmit great power.

Referring more particularly to the drawings, Figs. 1 and 2 show the parts, sections, or disks A and B of an expansible pulley having beveled edges *a* and *b*, respectively, adapted to the beveled inner face of a split ring or band C. This split ring or band C may be held in place in any suitable way; but in the present instance it is provided with a pin *c*, projecting inward into a longitudinal slot *x* of the part A. The pin C must be so located relatively to the movement of rotation of the pulley, Fig. 5, that the end of the band secured by the pin will move toward the belt, whereby the latter will tend to press the band away from the pin more firmly into the groove. In other words, the pressure of the belt tends to carry the parts of the band away from the pin *c*, as otherwise the parts of the band would be pushed toward the pin, tending to cause the band to distend and altering the time of the machine or breaking the ring, if made of cast metal, which is the cheapest mode of manufacture. As shown in Figs. 1 and 2, the part A is secured to a shaft S in any suitable manner so as to rotate therewith, while the part B is capable of longi-

itudinal movement to and from the disk of the part A. This movement may be accomplished in any desired way; but I have shown the hub *g* of the part A provided with a screw-thread *s*, with which engages the nut-like termination *t* of the hub *u* of the part B. This part *t* is preferably provided with some sort of a locking device, being shown as provided with a transverse slot *f* and a binding-screw *h*, whereby the parts of the nut may be wedged to the threads of the screw *s* and locked or clamped in position on the shaft. The part A, which is usually secured to the shaft *S*, has the outer end of the hub split longitudinally and provided with a transverse binding-screw by which the parts of the hub may be drawn together and clamped to the shaft. A belt *L* is shown as passing around this pulley, the arrow indicating the preferred direction of rotation in connection with the belt. Of course this belt may extend to any other part of a machine or device to be driven by the pulley.

The operation of the expansible pulley will be readily understood, and it will be seen that the part B is adjusted in proper relation to the part A and expands or allows the band *C* to contract, according to its adjusted position, the band being split, as indicated at *i*. The inner or bearing side of the band being beveled to correspond to the beveled edges *a* *b* of the parts A B will form a practical bearing on the parts, and the outer surface of the band being substantially flat the belt thereon will accommodate itself thereto and avoid the disadvantages arising from the use of a V-shaped belt.

Having thus described and illustrated the preferred embodiment of my invention, what I claim is—

1. The within-described expansible pulley, comprising two parts having beveled edges, one adjustable in respect to the other, a split band fitting the beveled edges of the parts and connected to rotate therewith and to be

expanded and contracted by the adjustment of the parts, substantially as described.

2. The within-described expansible pulley, comprising two parts having beveled edges, one adjustable in respect to the other, a split band fitting the beveled edges of the parts and connected to rotate therewith and having a substantially flat belt-receiving face, substantially as described.

3. In an expansible pulley, the combination of two bevel-edged parts adjustable one in respect to the other, a split band fitting the beveled edges of the parts and having an outer face to receive a flat belt and connected with the parts at one end, substantially as described.

4. The combination in an expansion-pulley, of two sections one with a threaded hub receiving the hub of the other, the sections with annular beveled faces, and a band with an inner face adapted to said beveled faces, substantially as described.

5. The combination with the section of an expansion-pulley having a threaded hub and a second section adjustable on said hub, of an expansion-band supported on said sections and adapted to be rotated therewith and to be expanded and contracted by varying the relative positions of said sections, substantially as set forth.

6. The combination of the section A having a threaded hub and an annular beveled face, the section B adapted to said threaded hub and with an annular face beveled in the opposite direction, with means for securing the sections in relation to each other after adjustment, and a split band adapted to said beveled faces, substantially as described.

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

SIMON W. WARDWELL, JR.

Witnesses:

JOSHUA B. HALE,
EDWIN C. LUINT.