

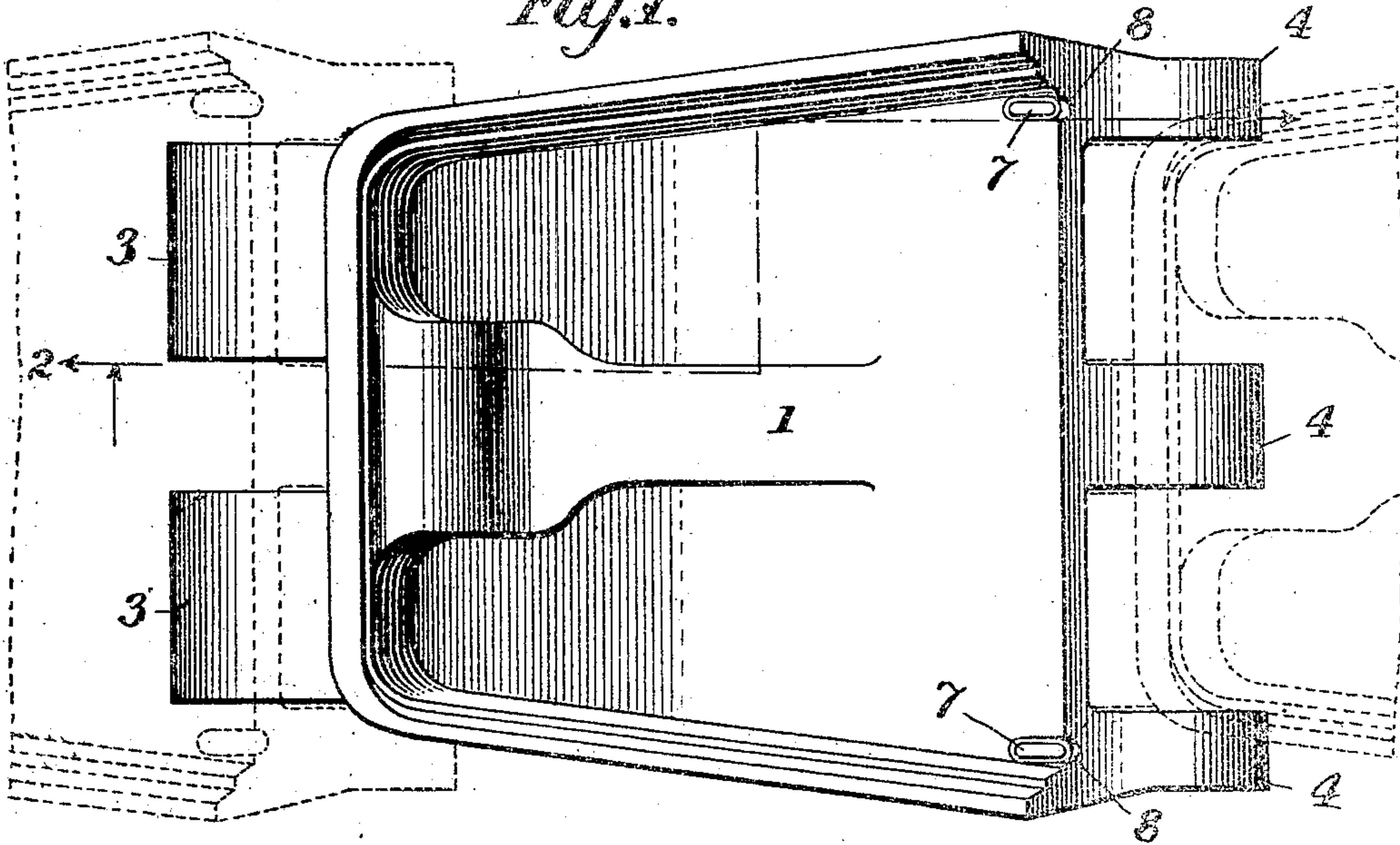
No. 854,731.

PATENTED MAY 28, 1907.

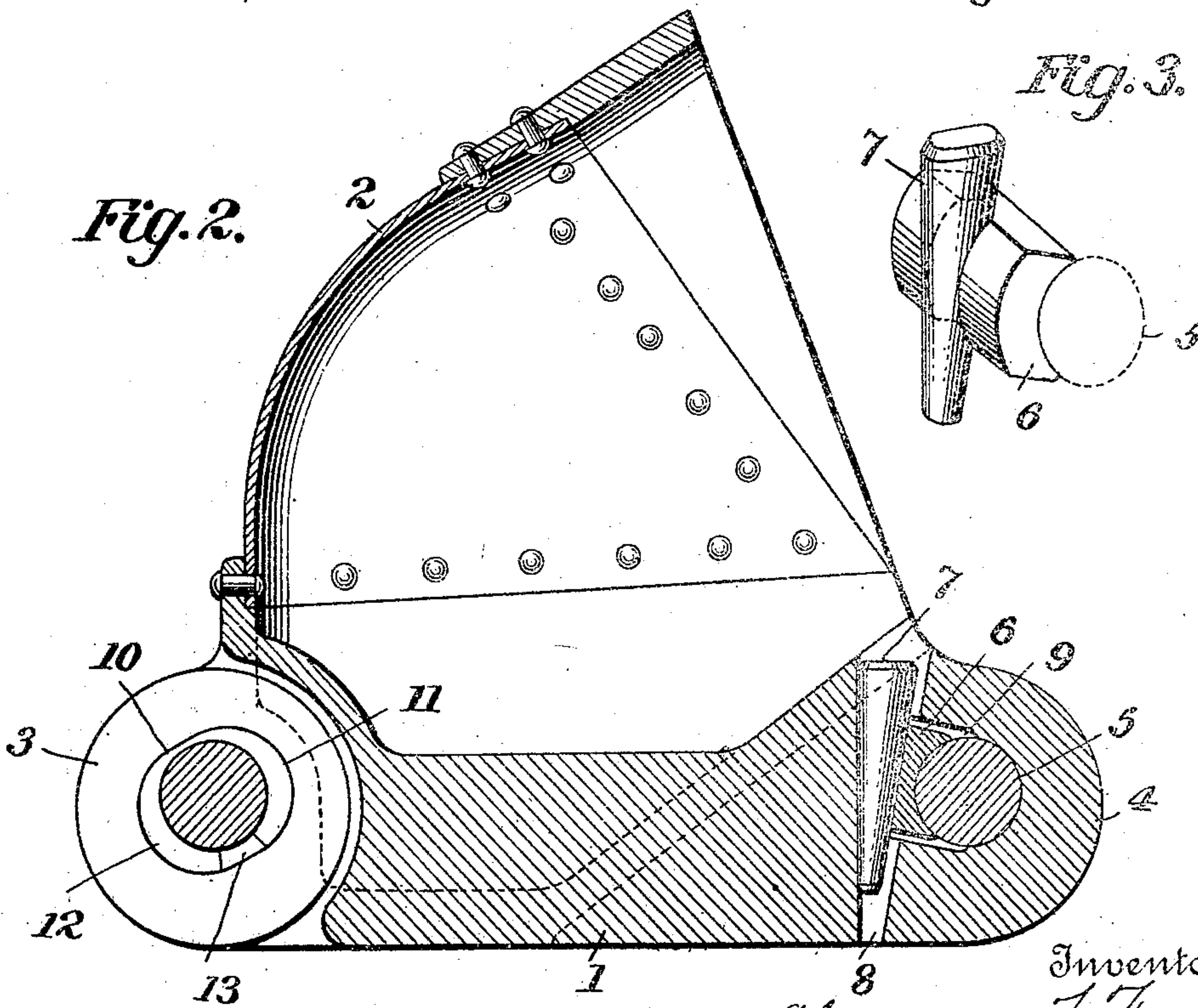
A. T. FRASER.  
DREDGE BUCKET JOINT.  
APPLICATION FILED MAY 18, 1906.

2 SHEETS—SHEET 1.

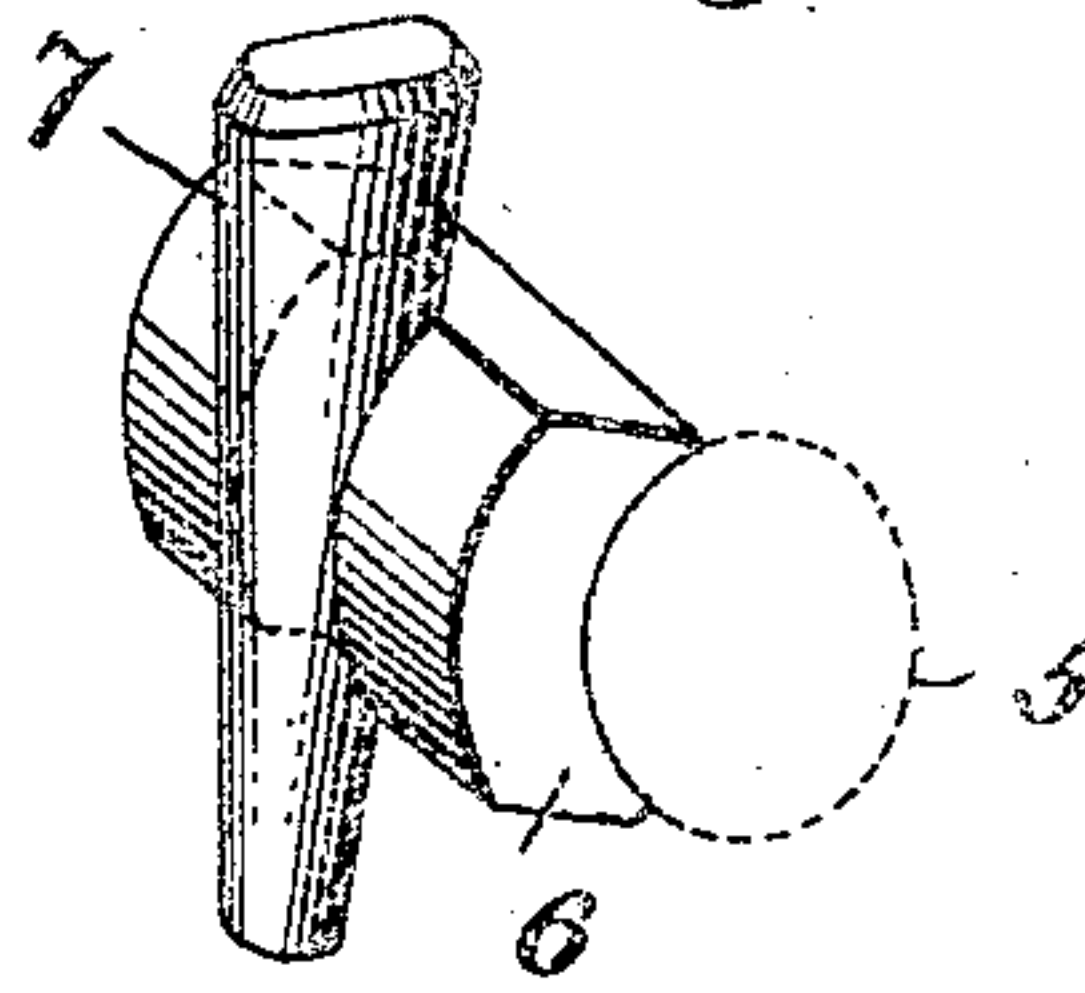
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



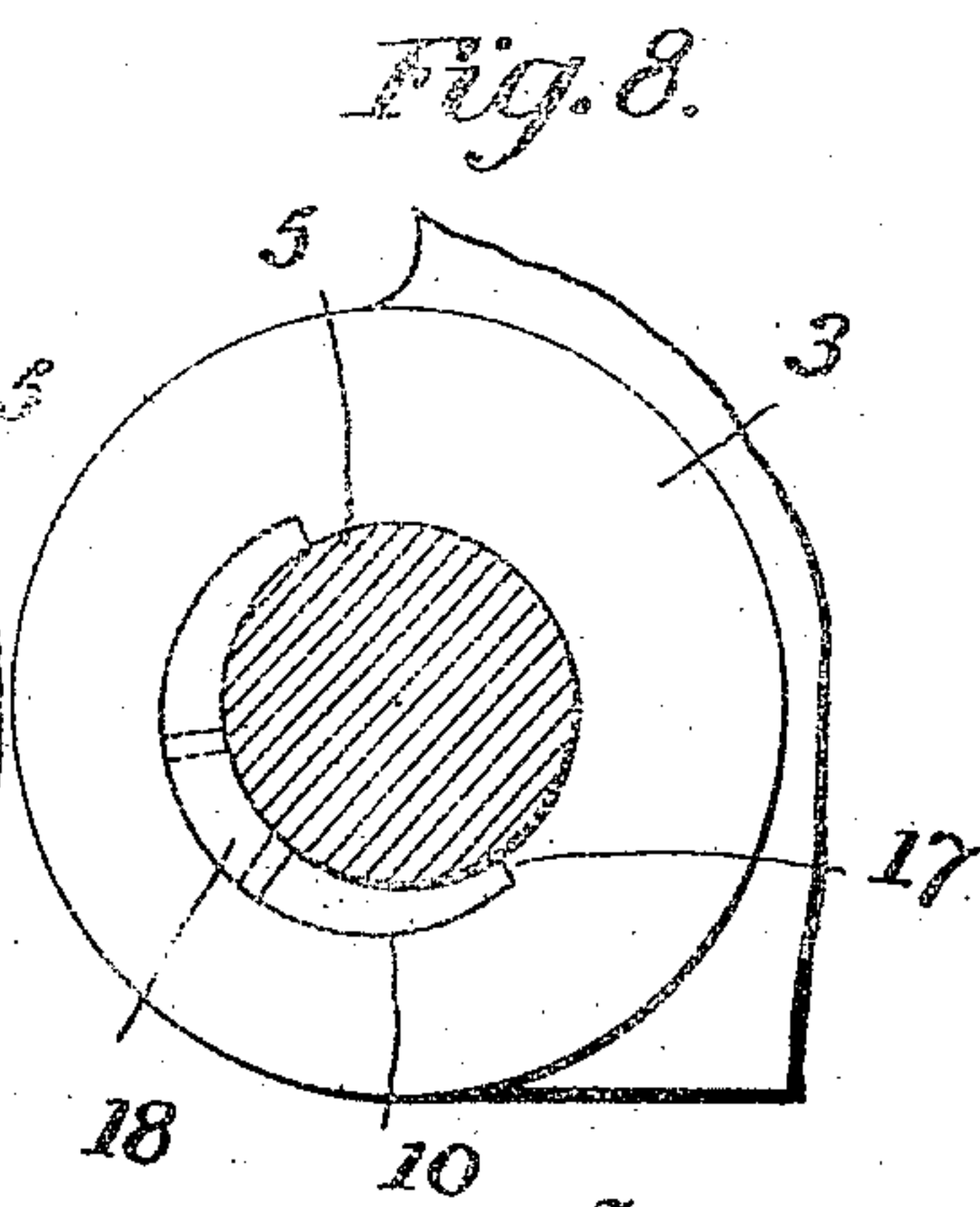
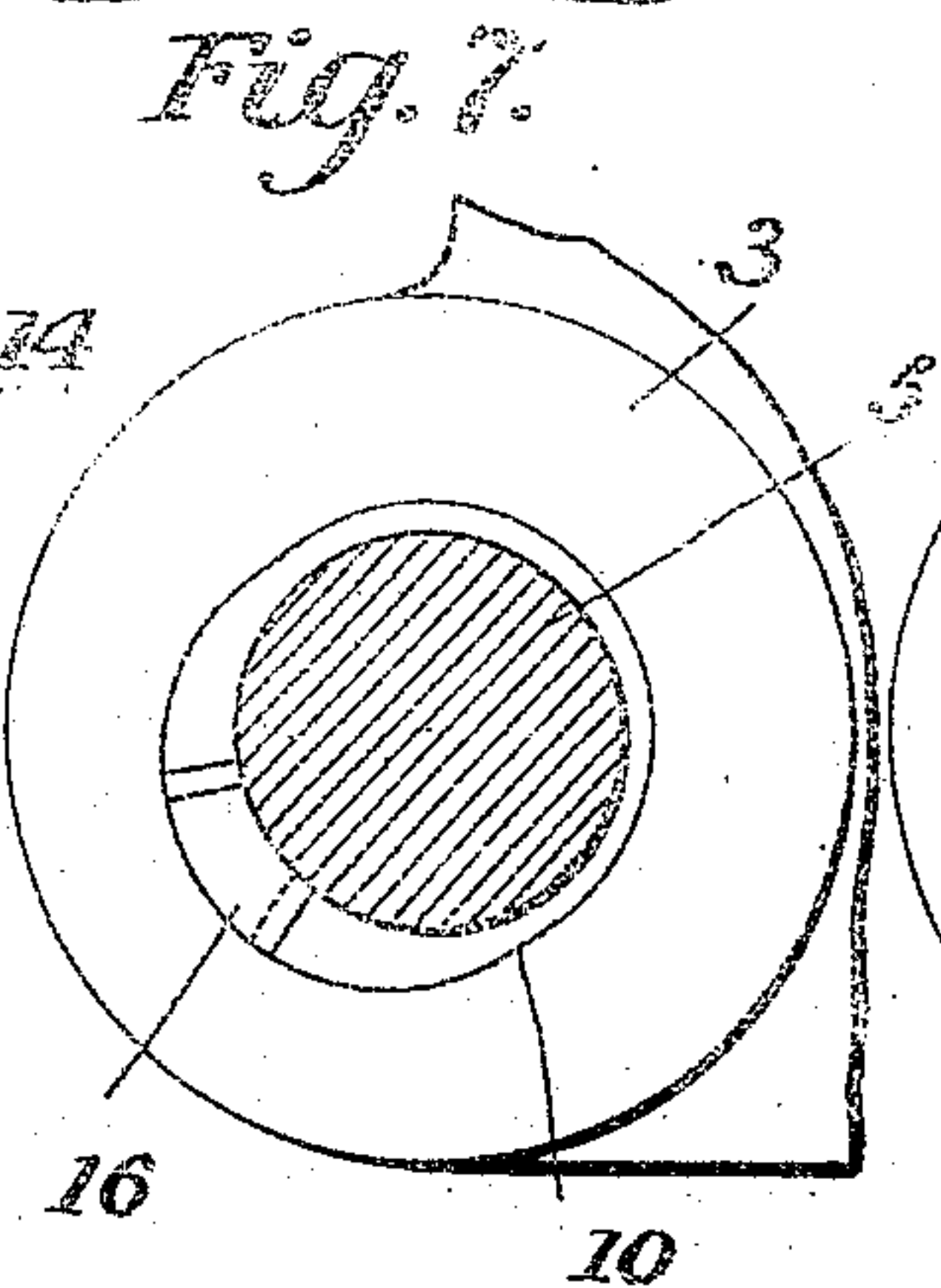
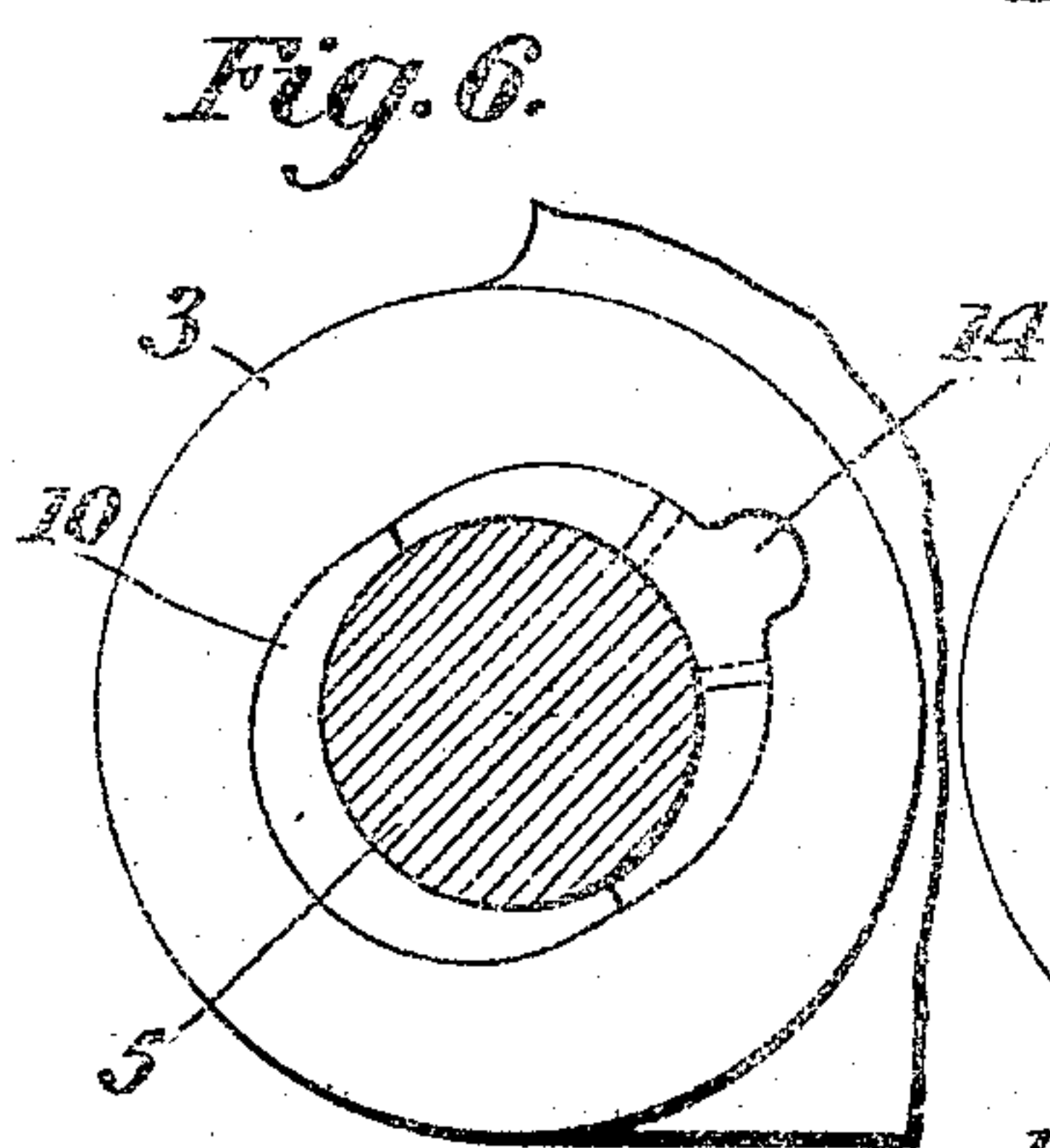
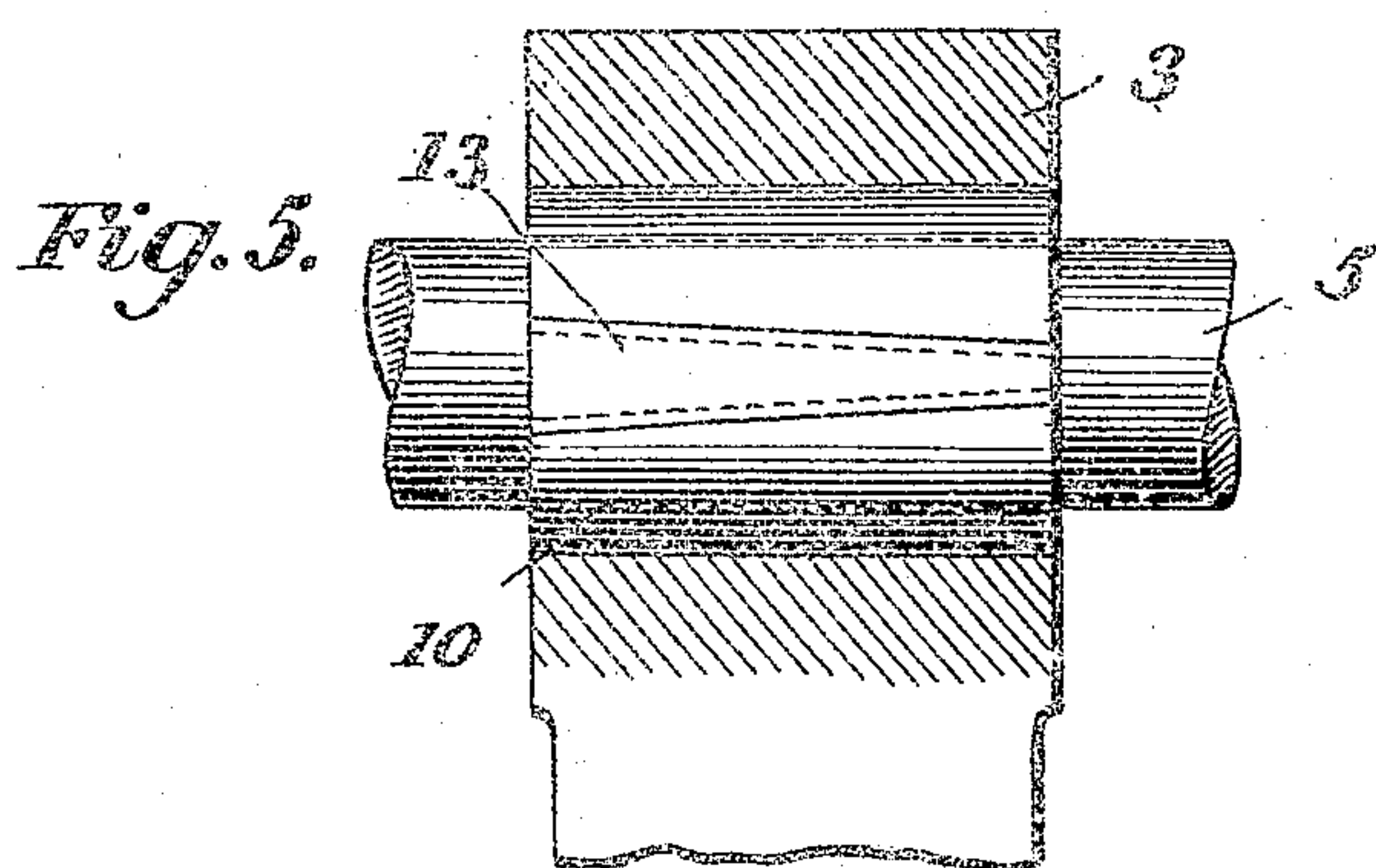
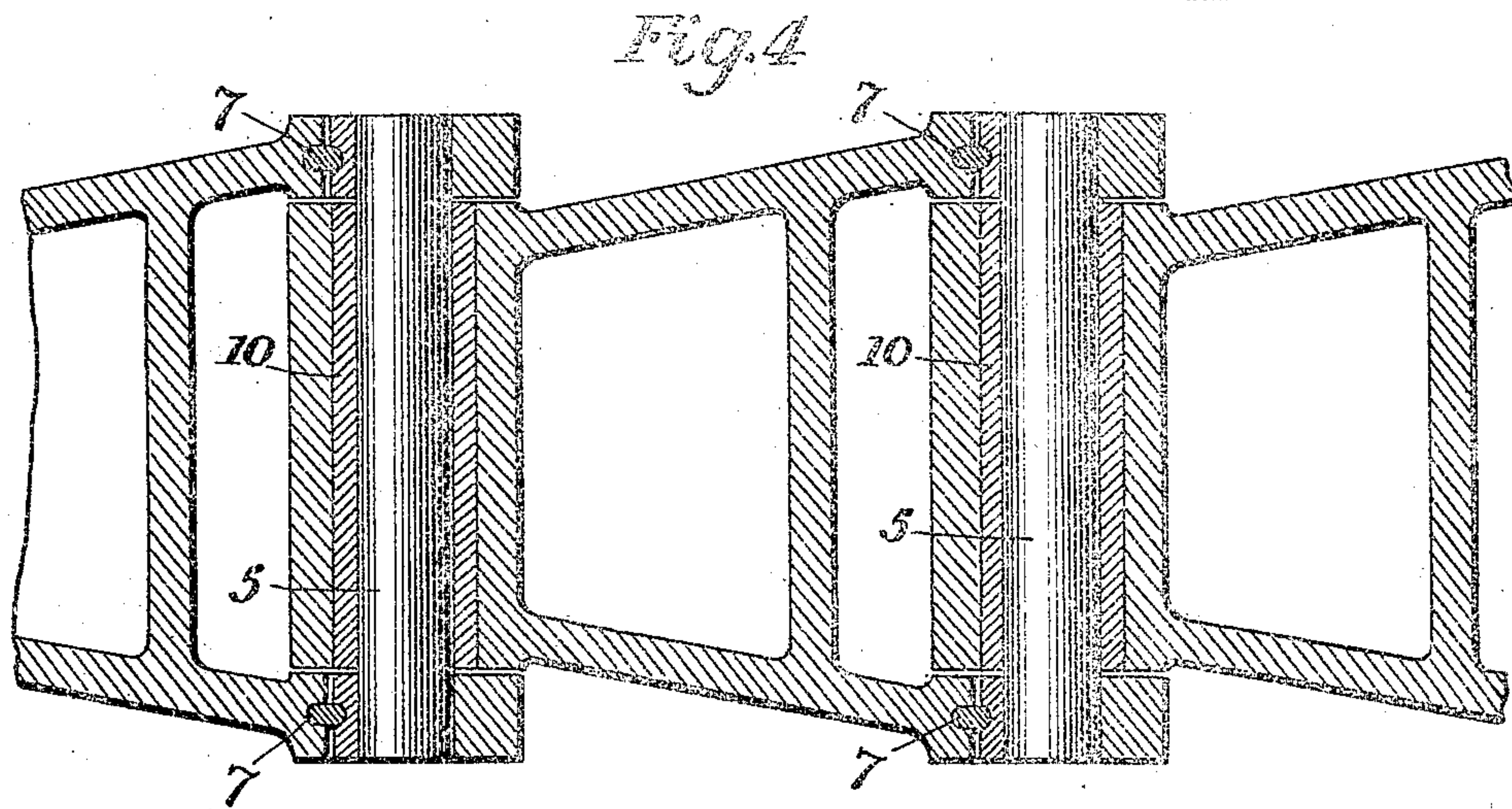
Witnesses  
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ALEXANDER T. FRASER, OF BUTTE, MONTANA.

## DREDGE-BUCKET JOINT.

No. 854,731.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed May 18, 1906. Serial No. 317,545.

*To all whom it may concern:*

Be it known that I, ALEXANDER THOMAS FRASER, a citizen of the United States, and a resident of Butte, county of Silverbow, State of Montana, have invented certain new and useful Improvements in Dredge-Bucket Joints, of which the following is a specification.

This invention relates to improvements in joints for dredge buckets and other like structures in which a series of buckets or links are connected by hinge joints for digging, elevating or conveying purposes. In dredging machines using a continuous chain of buckets, the strain on the joints between the buckets is very great and it is impossible to keep sand and other gritty substances out of the joints, hence joints of ordinary construction wear very rapidly.

My invention is particularly adapted for use in such dredging machines and it results in great economy as all of the wearing parts of the joints are interchangeable and renewable and the buckets proper are not subjected to wear at the points where they are hinged together.

The invention will be described in connection with the accompanying drawing, in which,

Figure 1 is a plan view of one link of a dredge bucket chain, the bucket being removed and parts of two adjacent links being shown in dotted lines; Fig. 2 is a section on the line 2—2 of Fig. 1, the bucket being included; Fig. 3 is a perspective view of one of the devices for locking the coupling pins; Fig. 4 is a sectional plan view of a different form of dredge chain to which my invention may be applied; Fig. 5 is a side view of the bushing shown in Fig. 2, showing the wedge for securing the bushing in place; Figs. 6, 7 and 8 are end views of different forms of bushings;

Referring to Figs. 1 and 2 of the drawing, 1 indicates a link of a bucket chain and 2 the bucket proper which is suitably secured to the link. The link shown in Fig. 1 has a pair of lugs 3, at one end, and three lugs 4 at the other end. It will be understood that all of the links of the chain are of similar construction and that the lugs 3 of each link have a working fit in recesses between the lugs 4 of the adjacent link. Through the lugs 3, 4, is passed a pivot pin 5. If the pin were permitted to turn relatively to the lugs, the lat-

ter would be rapidly worn away by the grit which necessarily gets into the joints of a dredge. I therefore prevent any wear or relative movement between the pivot pin and the lugs of the chain or bucket by the following means: The pin is clamped in one set of lugs, as for instance the lugs 4, by means of a block 6 which is concave on one side to fit the surface of the pivot pin, and preferably convex on the other. In the rear of this block is a groove adapted to receive a wedge 7, the groove and wedge being preferably arranged transversely of the pivot pin as shown in Figs. 1 to 3. One or more of the blocks 6 and wedges 7 may be used at each joint. I preferably use one at each end of the pin, as shown in Fig. 1. A hole 8 is formed at the rear of each of the outside lugs to receive the wedge, and a recess 9 is formed in each of the outside lugs to receive the block 6. When the parts are assembled, as shown in Fig. 2, and the wedges 7 are driven firmly into place, the pivot pin will be clamped securely in the lugs and prevented from any movement relative to the lugs. There will therefore be no wear of the lugs 4 or of the pivot pins in said lugs.

It will be evident that the pin locking devices 6, 7, may be applied to the middle lug 4 instead of the outside lugs, or if desired, to all of the lugs 4 of each link. The elongated cross-section of the wedge gives it strength in the direction in which the strain comes upon it and also avoids undue weakening of the link, the seat or opening 8 for each wedge being correspondingly narrow. It will be noted that the blocks 6 and the wedges 7 interlock, the wedges preventing any longitudinal movement of the blocks upon the pivot pins.

I provide bushings for the lugs 3 having openings to receive the pivot pin and I provide means for locking these bushings securely in the lugs so that there will be no relative movement or wear between the outer surfaces of the bushings and the lugs. As shown in Figs. 2 and 5, my preferred form of bushing 10 has a circular or cylindrical opening to receive the pin and it is elliptical in section, thus providing two crescent-shaped parts 11, 12, which form its wearing surfaces. Between the parts 11, 12, at one side of the bushing is a wedge piece 13, forming a section of the bushing. The bushing is secured in the eye of the lug 3 by driving the wedge into



place, thus expanding the bushing and causing its outer wall to cling frictionally to the inner wall of the eye of the lug. The longer axis of the bushing, which is somewhat elliptical in section, is inclined so that the wear of the pin will be on the thickest portions of the crescents, as shown in Fig. 2. The wear of course will be upon one side of the bushing and the bushing is made symmetrical so that it may be reversed, substituting the portion 11 for the portion 12, for instance, when the latter is worn out. This reversal is accomplished by simply driving out the wedge, removing and reversing the bushing, and then replacing the wedge. It will be understood that each of the lugs 3 is provided with a bushing of the character described. It will be evident that the only relatively movable wearing parts of the chain are the pins 5 and the bushings 10. By renewing these parts a dredge or other chain may be quickly restored to working condition when the joints are worn out.

Fig. 4 illustrated my invention applied to a dredge chain in which the links have two lugs at one end and one at the other. In this form of chain I preferably use two locking devices for the pin and a single bushing at each joint.

In Figs. 6, 7 and 8 I have shown end views of three forms of bushings which are among the various modifications of which my invention is susceptible. In Fig. 6 the wedge 14 for securing the bushing in place is provided with a rib 15 which gives additional security against any relative movement of the bushing and the lug when the wedge is driven tightly into place. In Fig. 7 I have shown a bushing having a locking wedge 16 on its wearing side. That is, the wear of the pin is partly on the bushing proper and partly on the wedge. This form has some advantages as the pressure of the pin on the wedge will lock the outer surface of the wedge to the lug and prevent any possible slipping of the wedge. In Fig. 8 I have shown a bushing similar to that shown in Fig. 7 except that it extends but half-way around the pin, its ends abutting against shoulders 17. The wedge 18 forces the ends of the bushing tightly against these shoulders and locks the bushing in place substantially in the manner heretofore described. The advantage of this particular form is a saving of metal in the bushing, which metal is quite expensive.

It will be evident that various changes in the form and mechanical details of my improved joint for dredge buckets and similar devices may be made without departing from the spirit and scope of the invention.

Without limiting myself to the precise con-

struction and arrangement of parts illustrated and described, I claim,

1. In a dredge or conveyer chain, the combination with the links having lugs and with the pivot pins, of bushings for certain of said lugs, each bushing comprising two relatively movable reversely tapered parts adapted, when assembled, to securely hold the bushing in the eye of the lug.

2. In a dredge or conveyer chain, the combination with links having lugs and with pivot pins extending through said lugs, of bushings for certain of the lugs, each bushing comprising a wedge and a reversely tapered portion, for the purpose set forth.

3. In a dredge or conveyer chain, the combination with links having lugs and with pivot pins extending through said lugs, of bushings for certain of the lugs, each bushing comprising a part, of crescent-shaped section, and a longitudinally arranged wedge for expanding the bushing in the eye of the lug.

4. In a dredge or conveyer chain, the combination with links having lugs and with pivot pins extending through said lugs, of bushings for certain of the lugs, the lugs which receive the bushings having eyes which are eccentric to the pivot pins, said bushings comprising crescent-shaped portions adapted to fit the said eyes, and wedge portions adapted to expand the bushings in the eyes.

5. A bushing for a dredge or conveyer chain comprising two reversely tapered sections adapted when brought into register to expand, for the purpose set forth.

6. The combination with a link of a dredge or conveyer chain having a lug and a substantially elliptical eye therein, of a bushing having two crescent-shaped portions, and an intermediate wedge portion, said bushing being reversible, for the purpose set forth.

7. In a dredge or conveyer chain, the combination with links having lugs, and pivot pins, of means for locking the pins in certain of said lugs comprising blocks adapted to bear on the pins, wedges bearing on said blocks, and seats in said links for the wedges.

8. In a dredge or conveyer chain having links provided with lugs and having pivot pins, means for locking the pins in the links comprising blocks each having a concave face bearing on a pin, a transverse groove in its back, a wedge of elongated cross section operating in said groove, and a seat in the link for said wedge.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER T. FRASER.

Witnesses:

JAMES A. WATSON,

EDWIN S. CLARKSON.