

No. 631,956.

Patented Aug. 29, 1899.

S. E. DIESCHER.
SHAFT COUPLING.

(Application filed Mar. 9, 1899.)

9 Sheets—Sheet 1.

(No Model.)

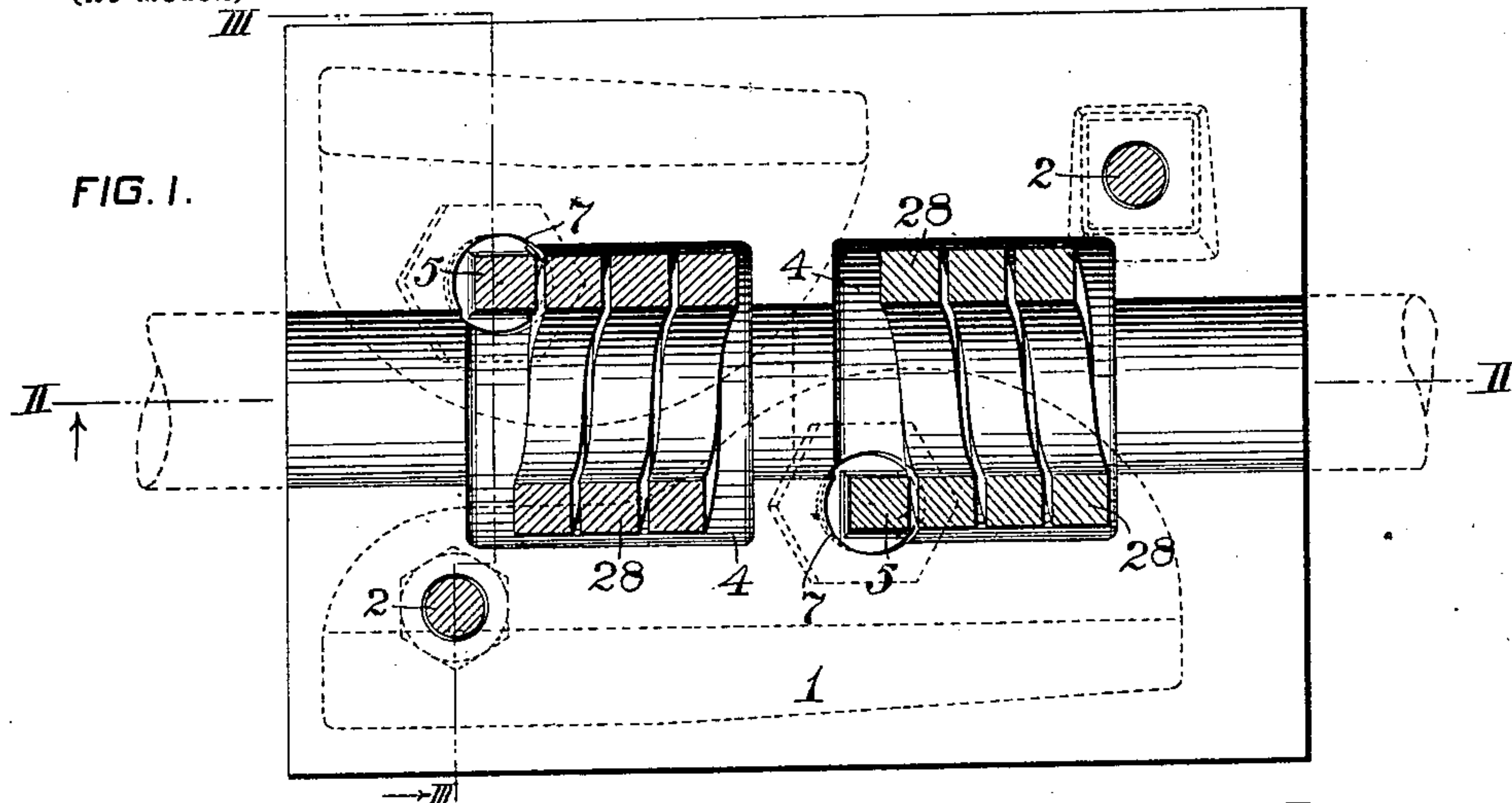


FIG. 2.

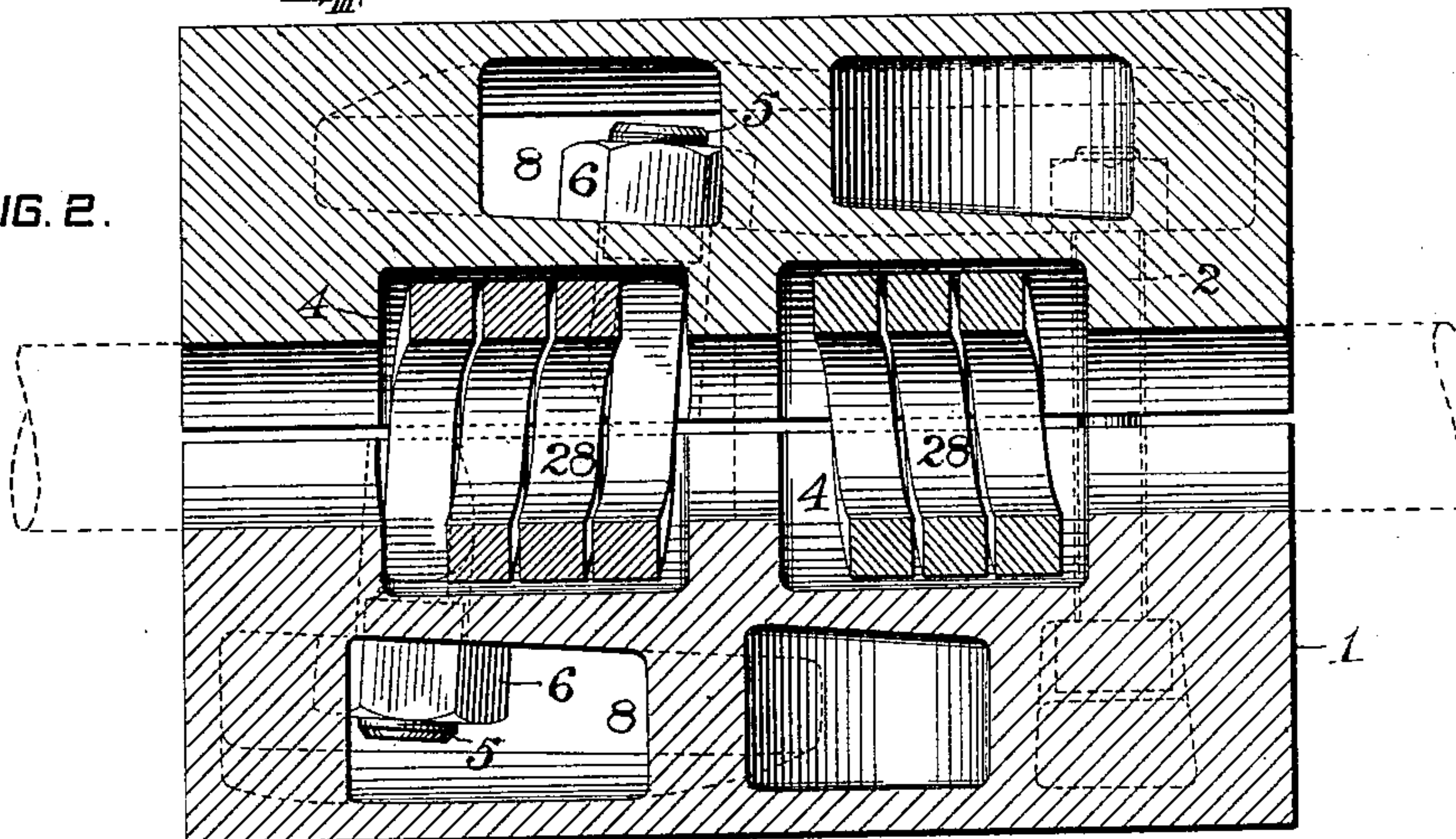
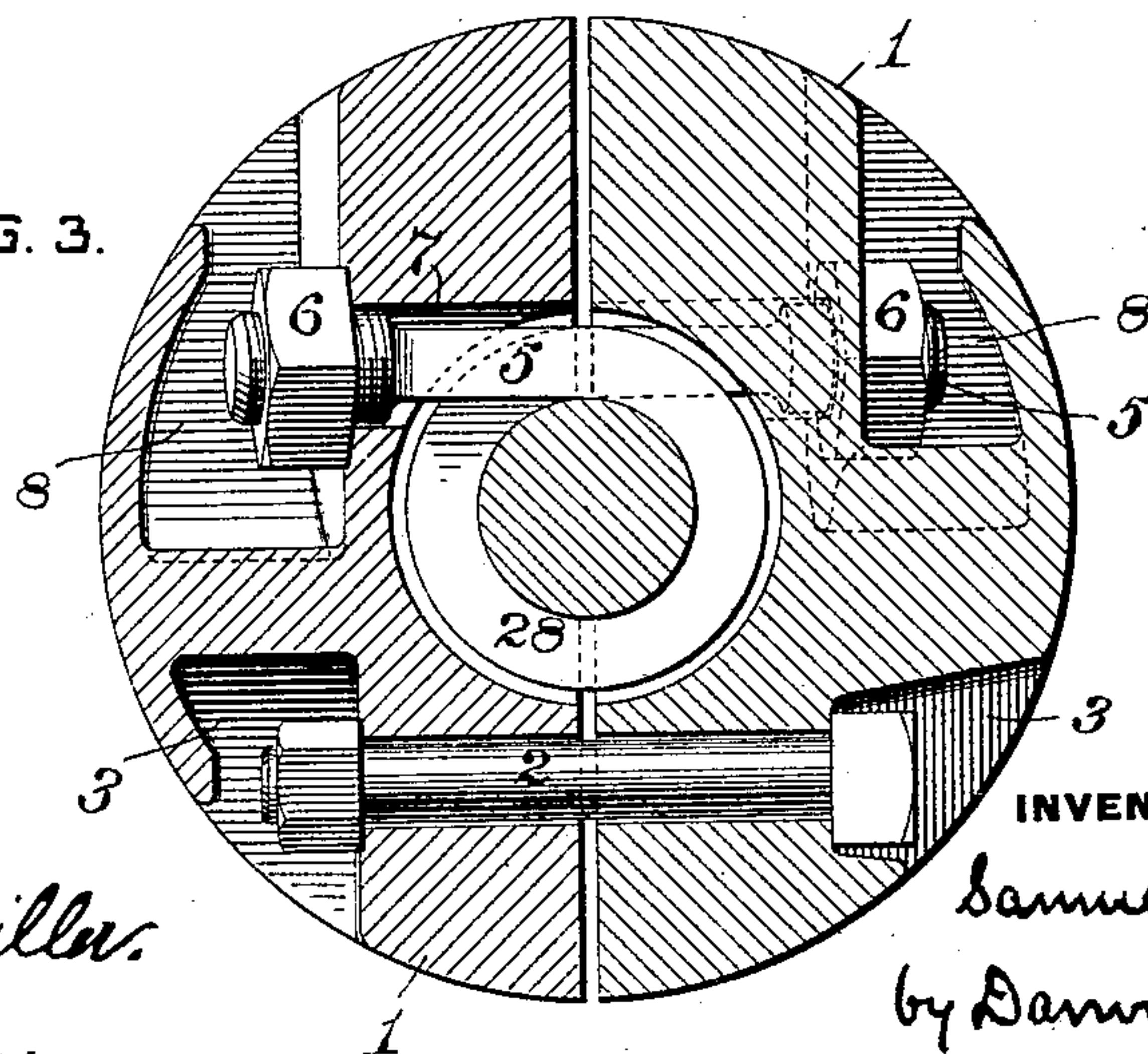


FIG. 3.



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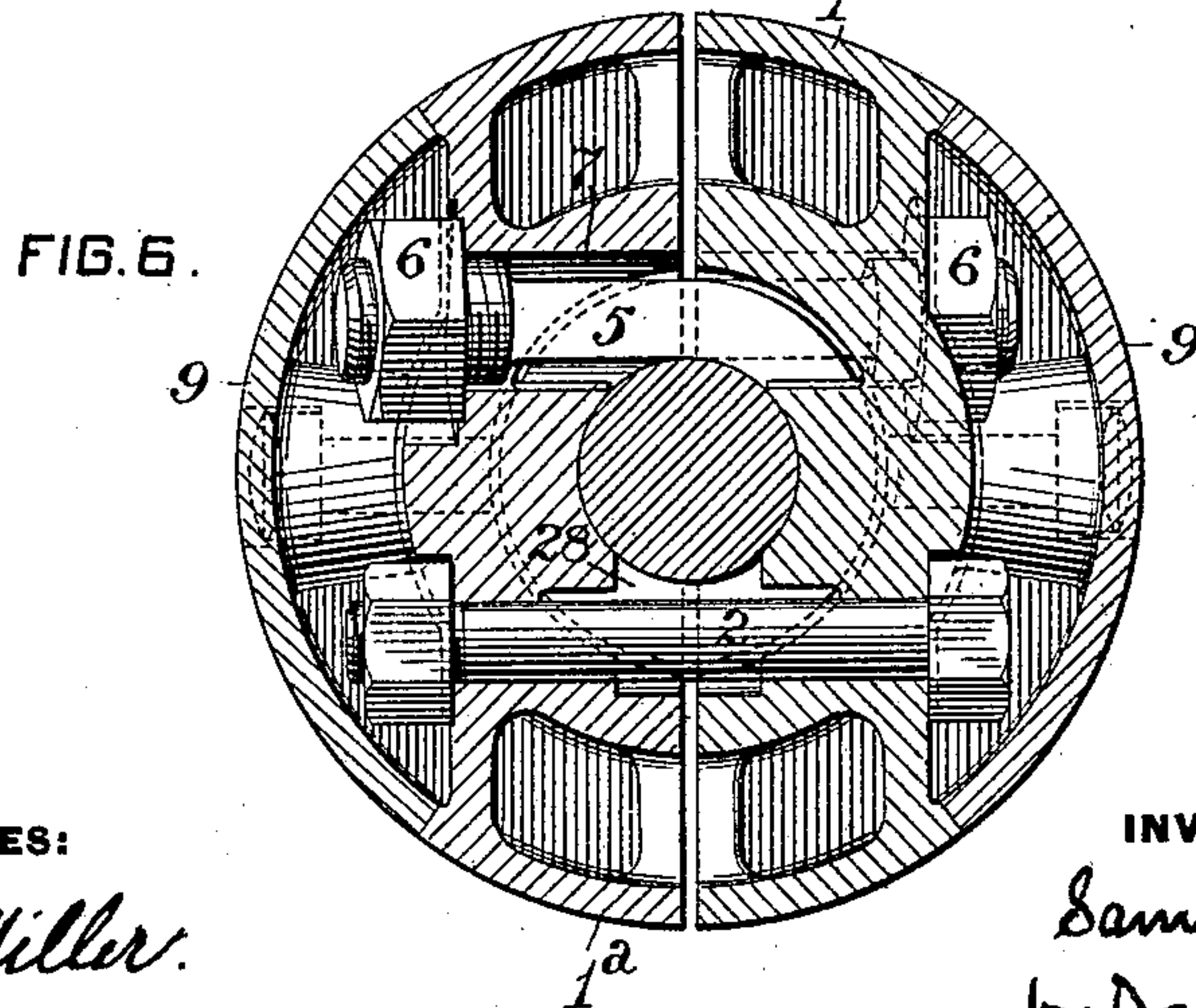
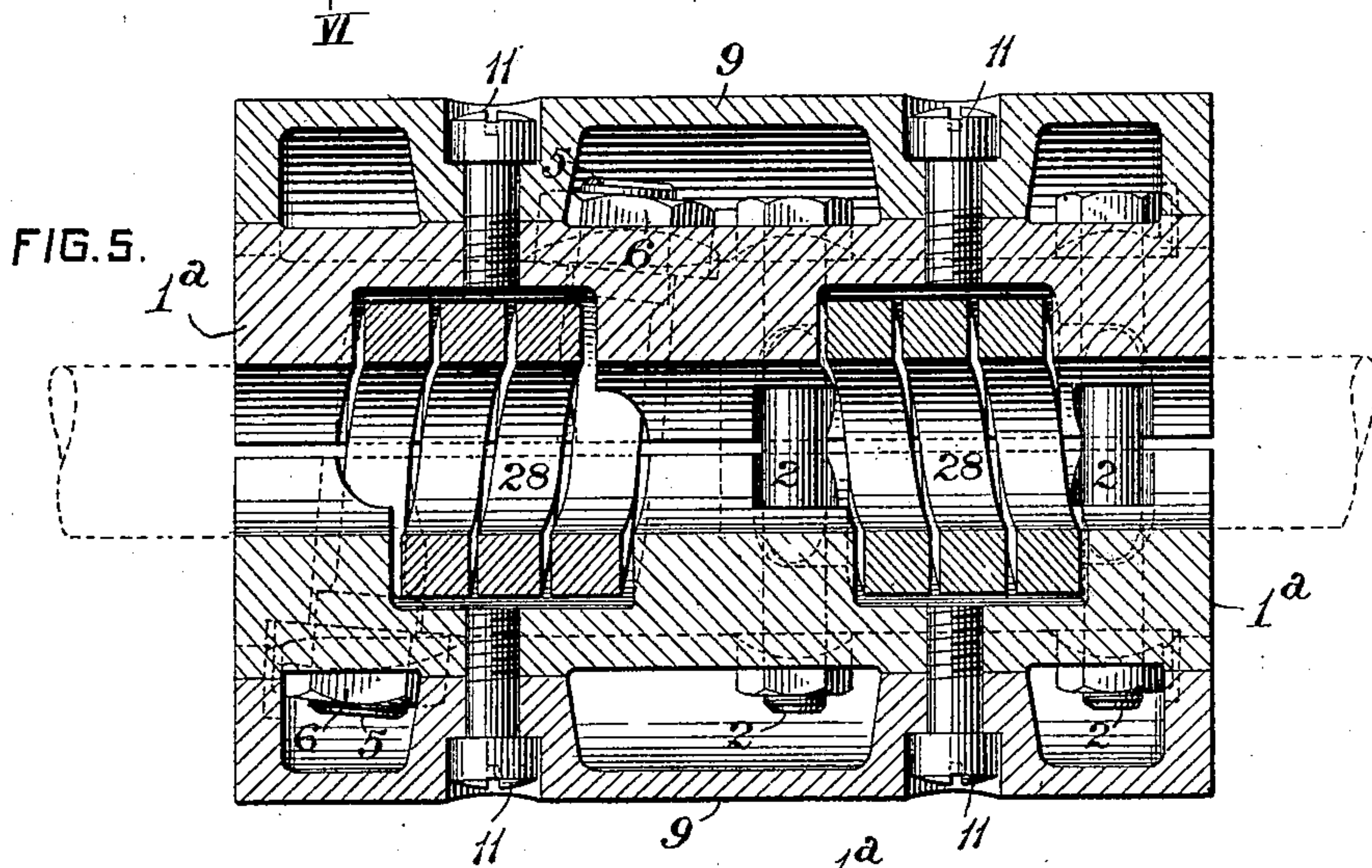
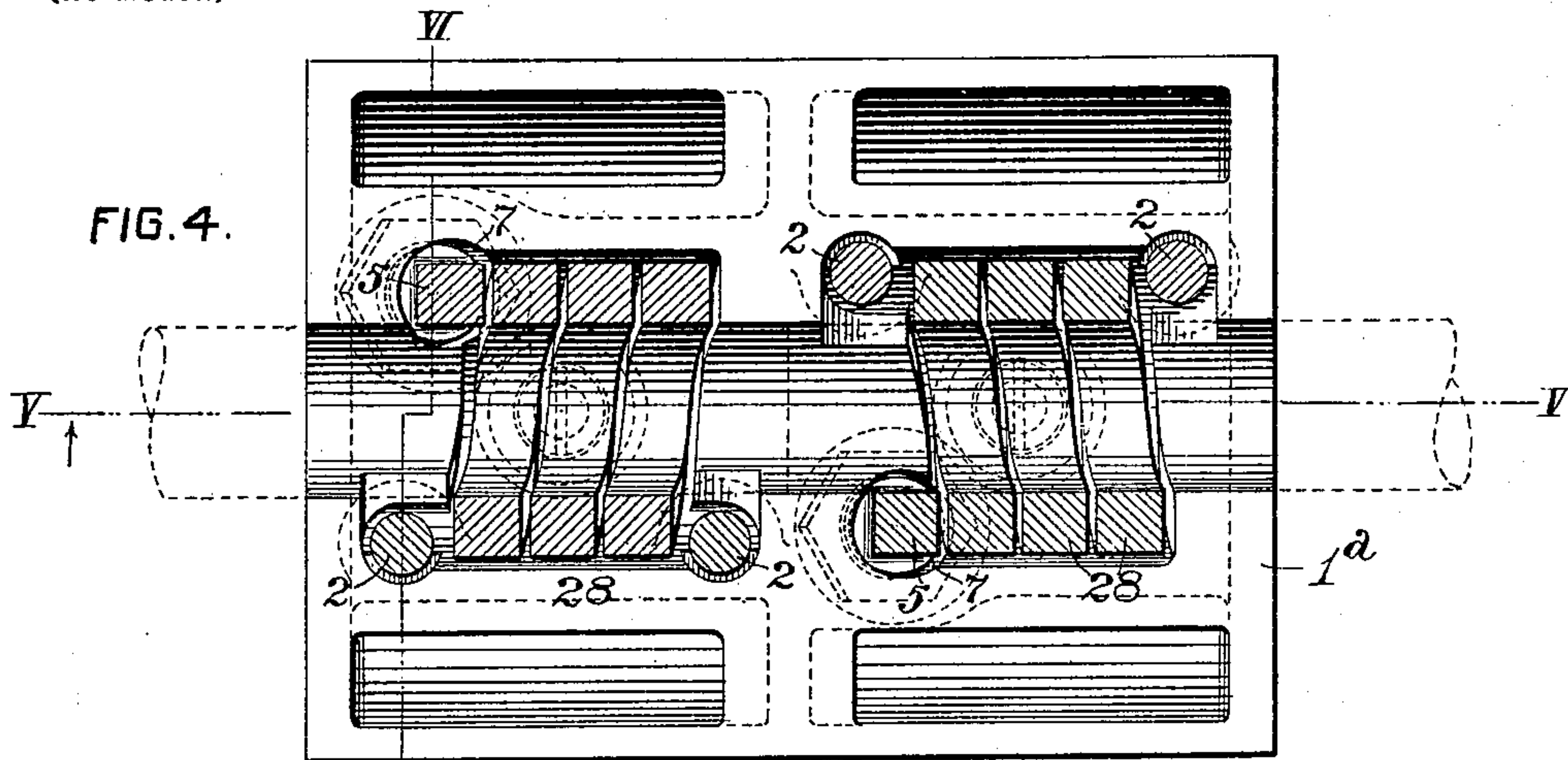
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FIG. 7.

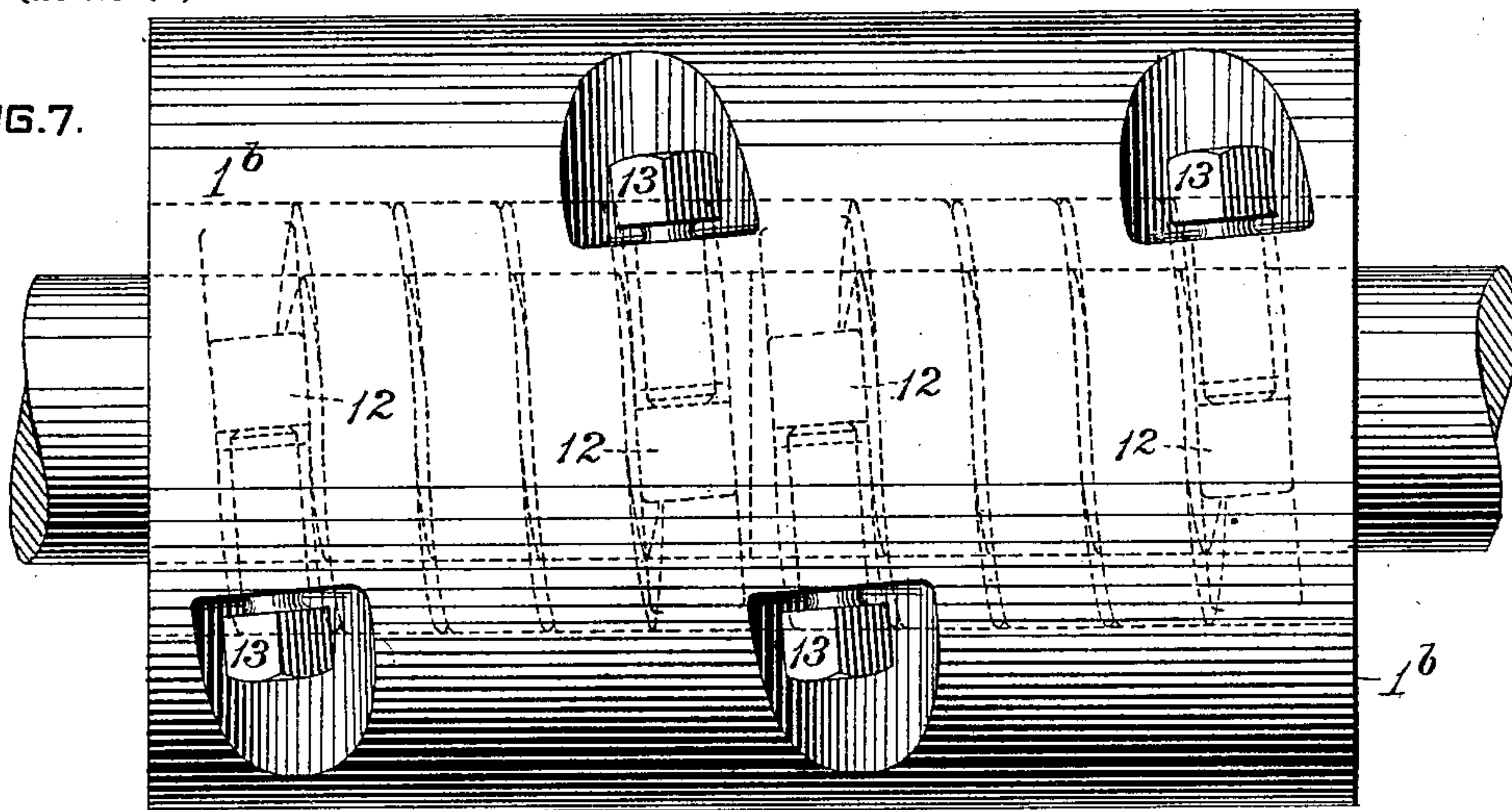


FIG. 8.

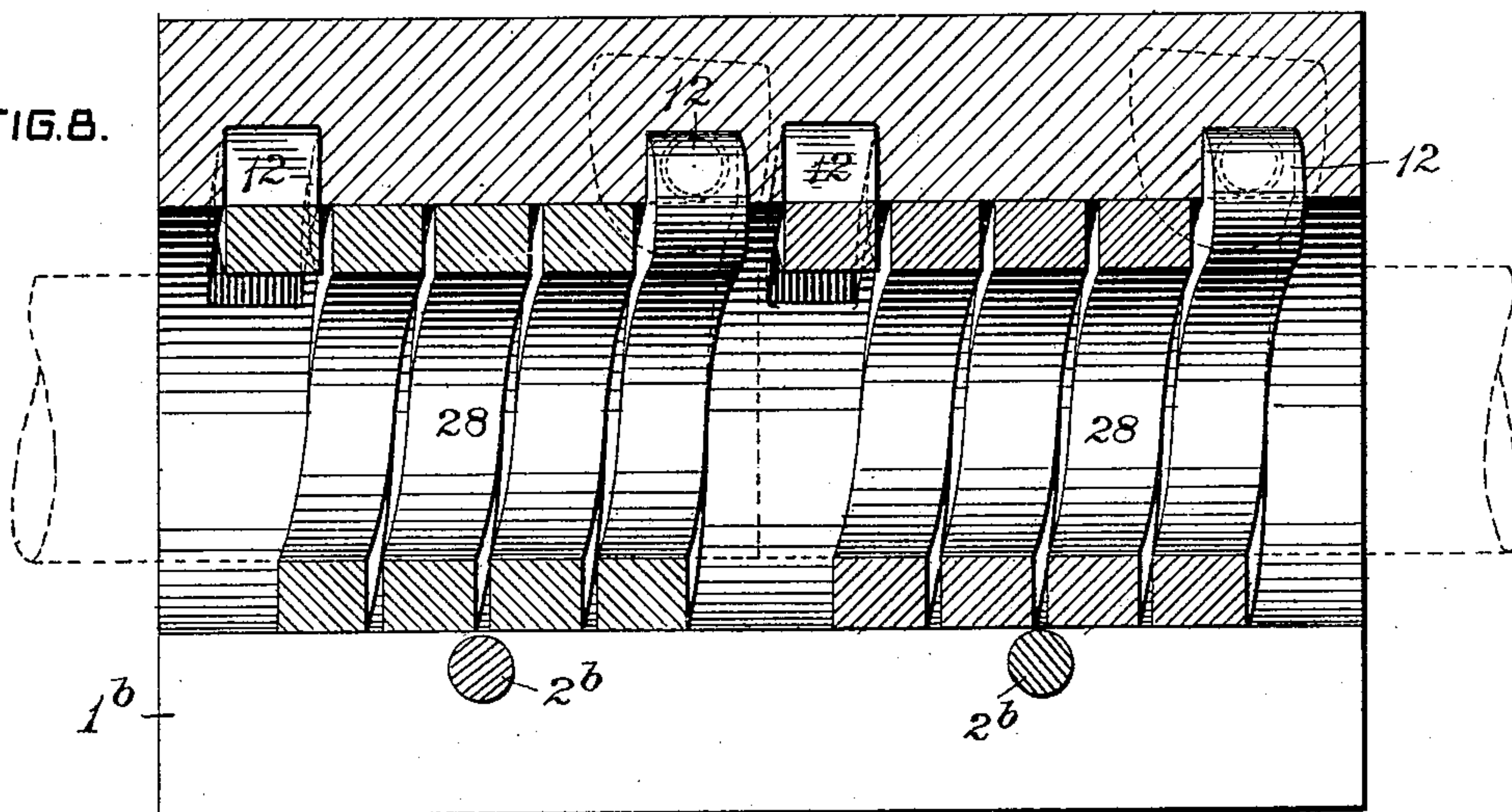
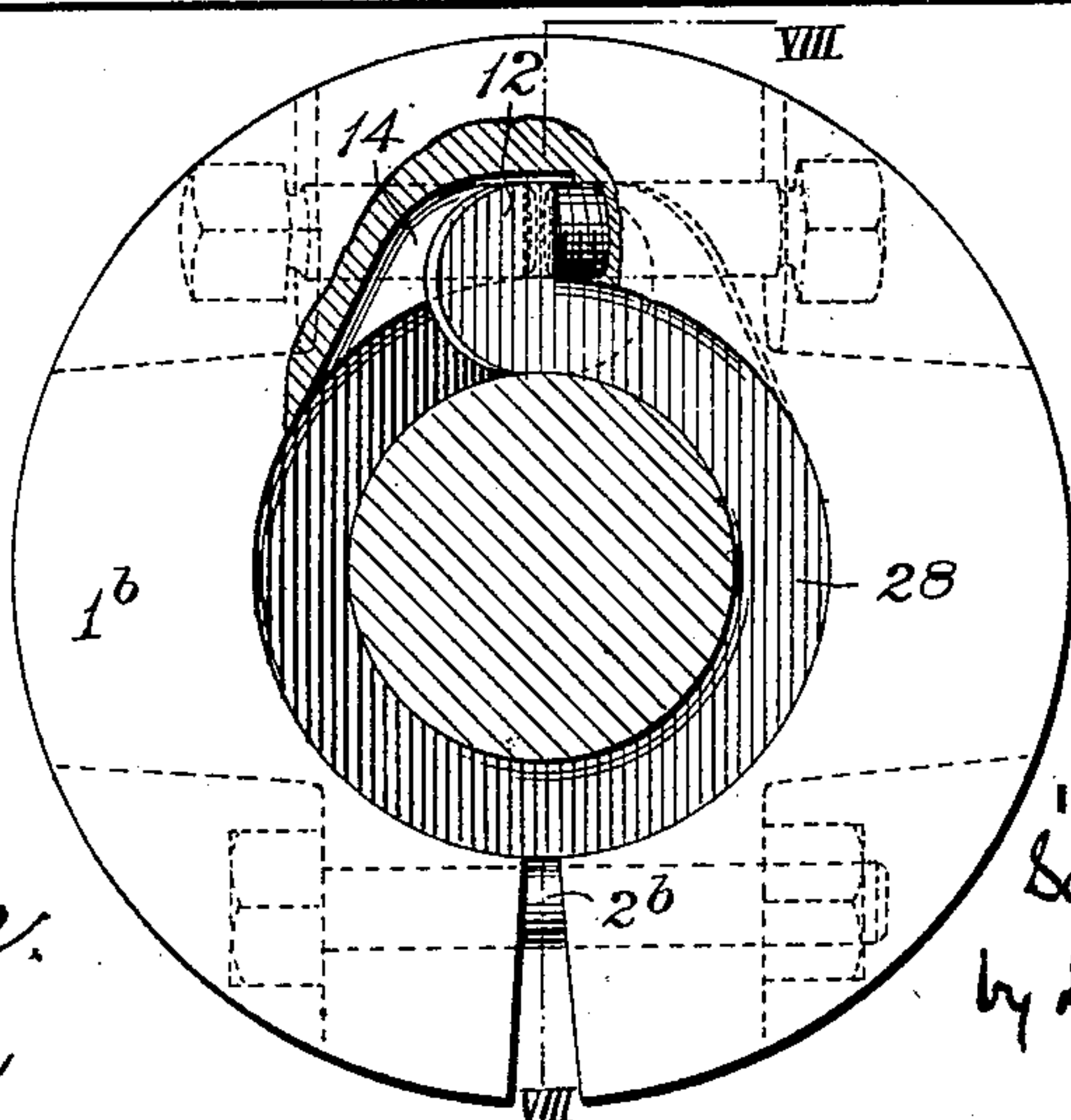


FIG. 9.



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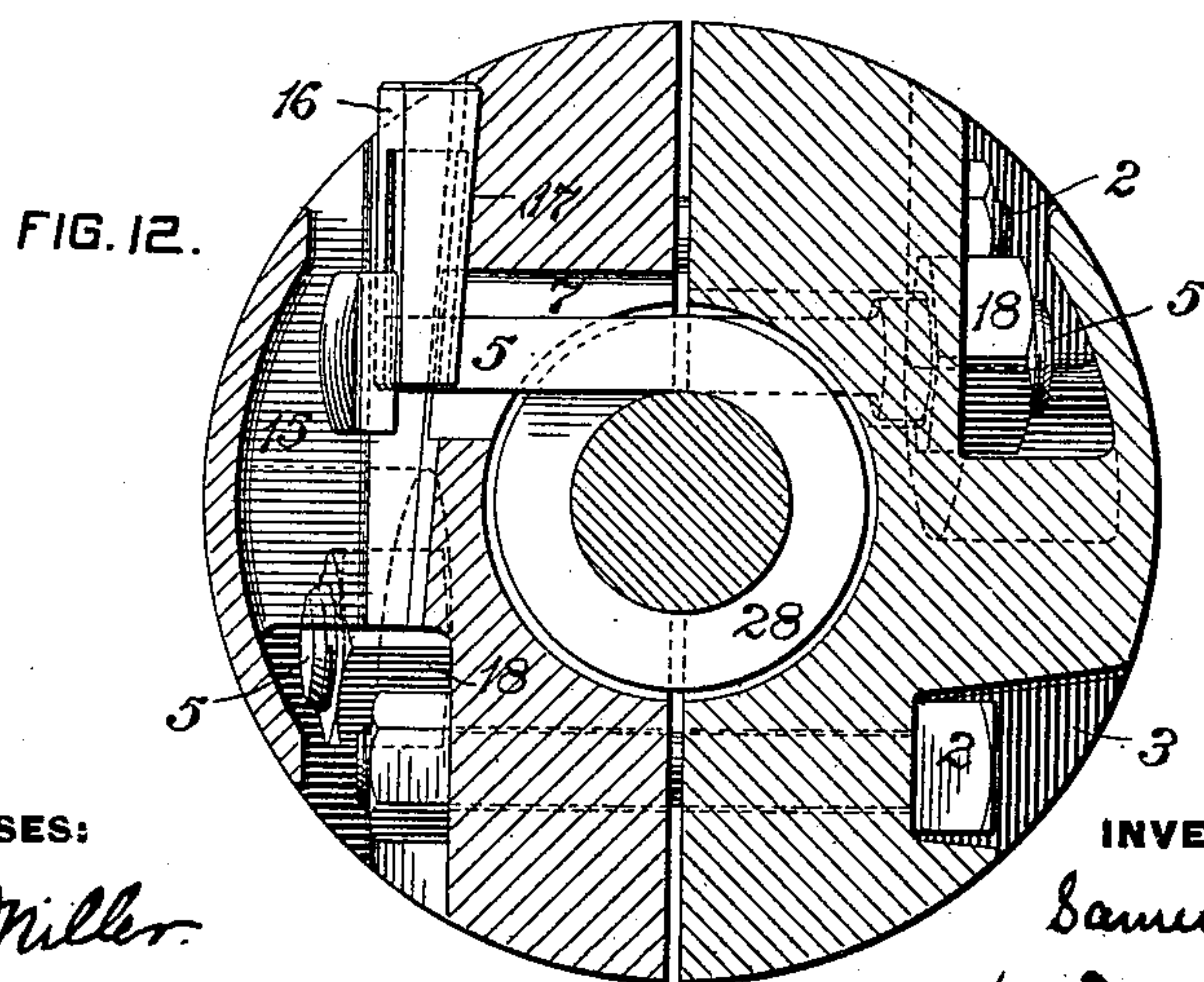
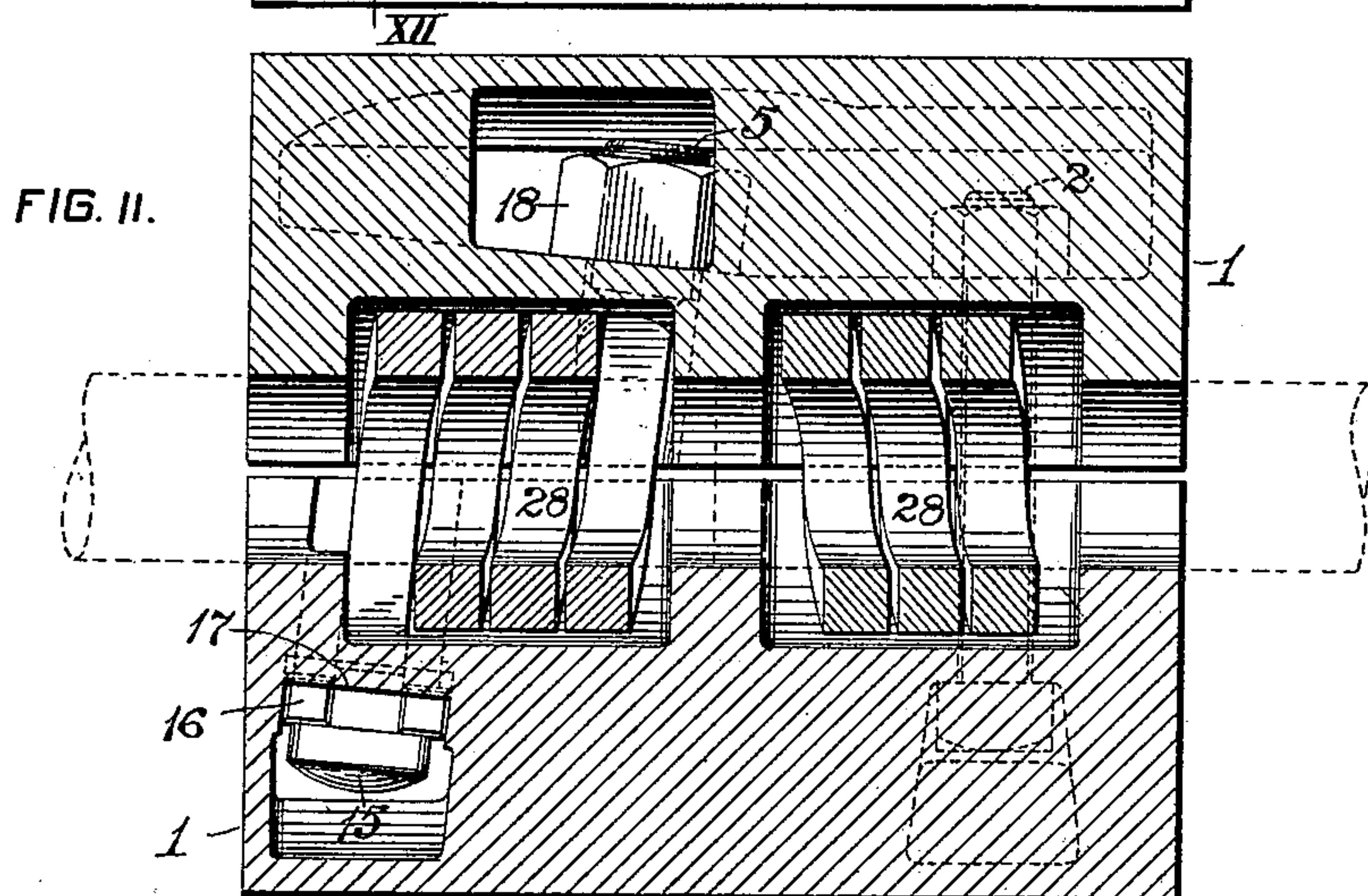
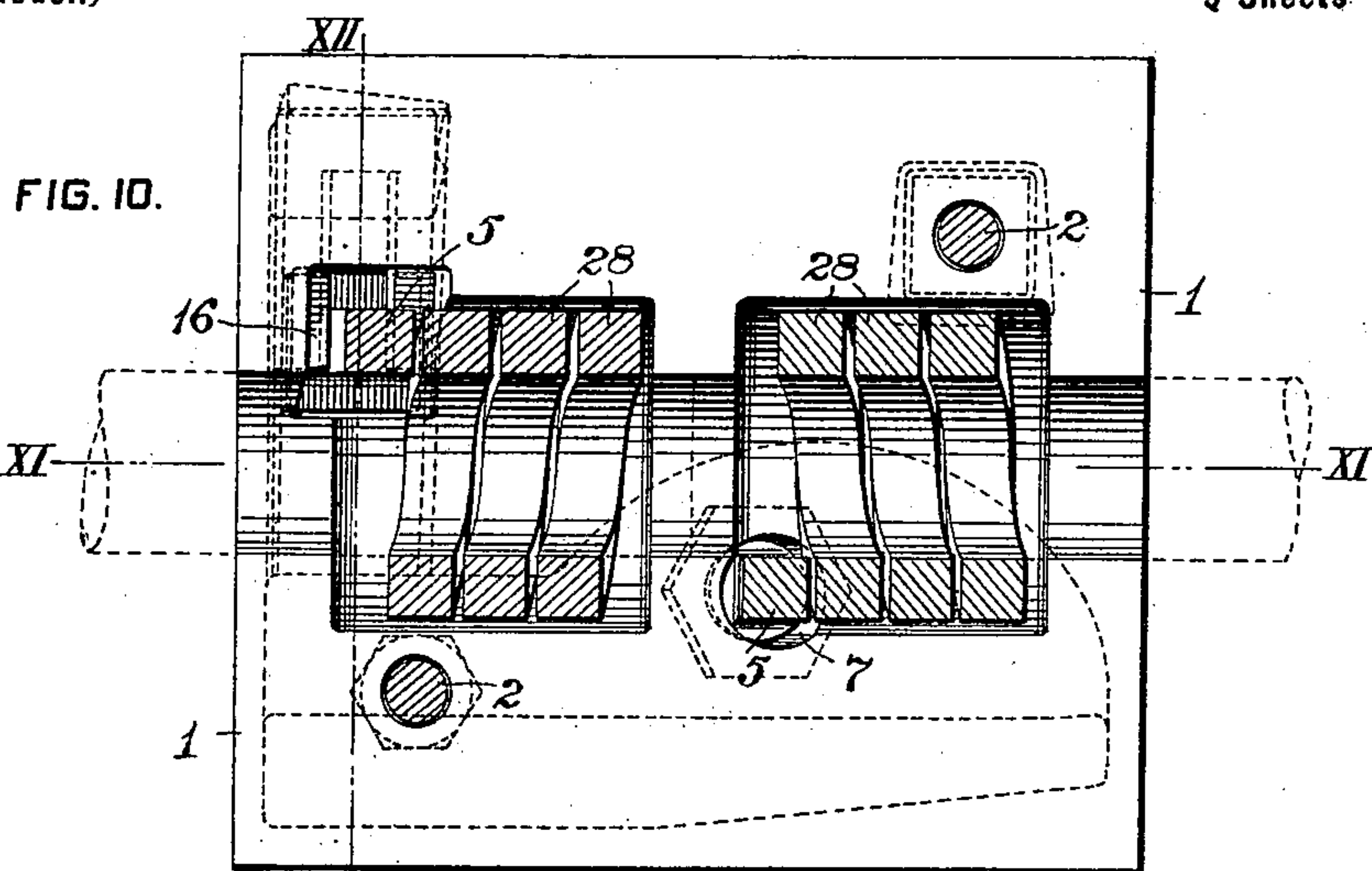
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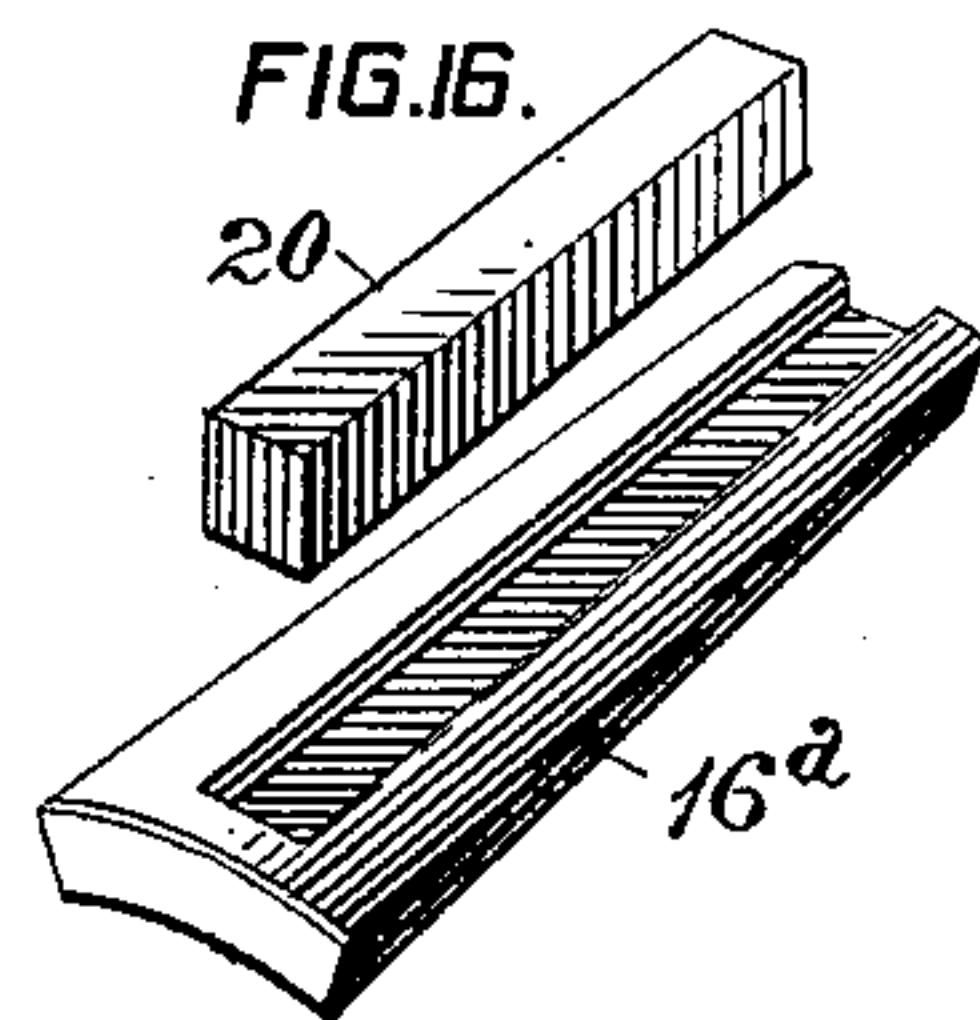
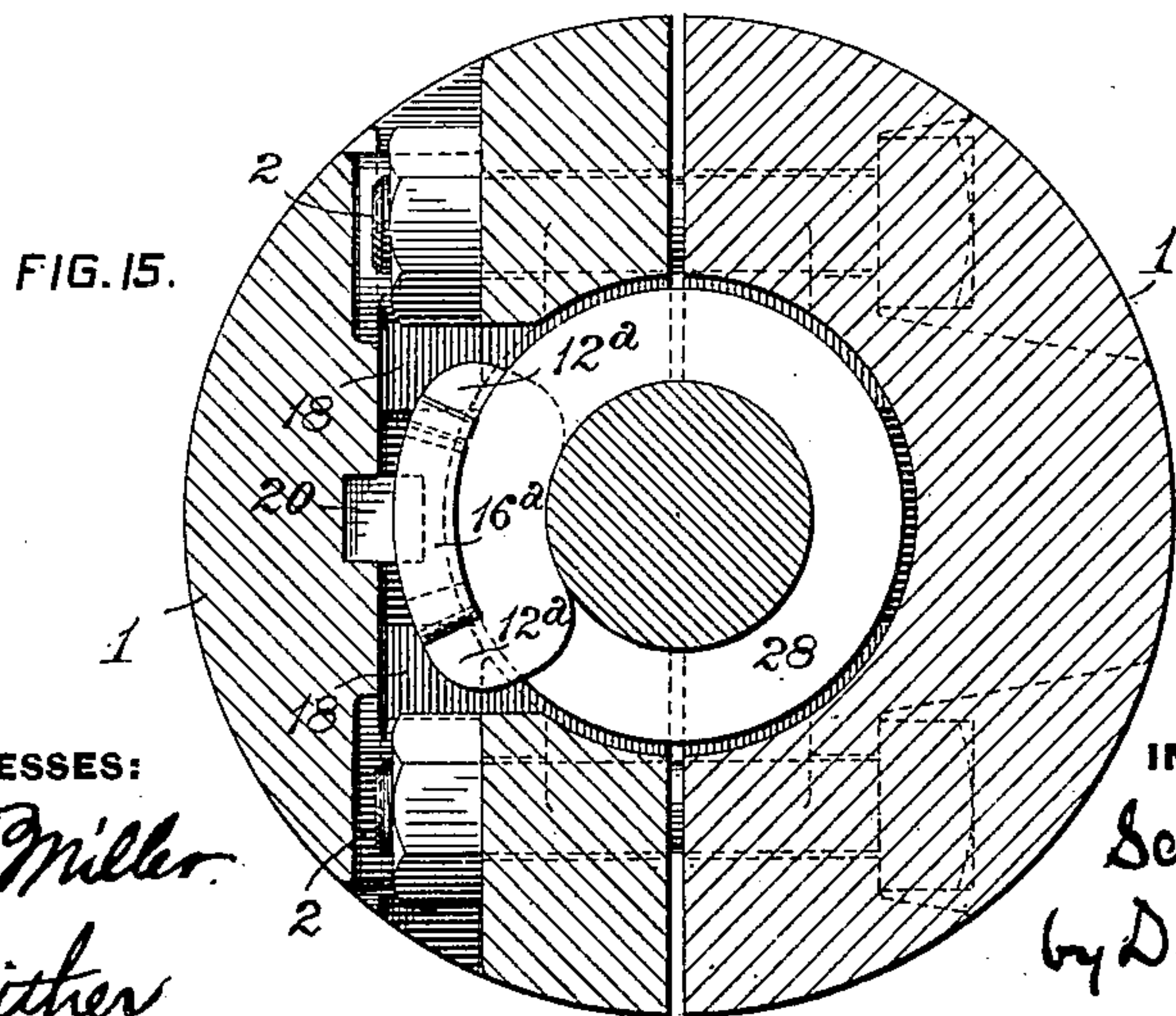
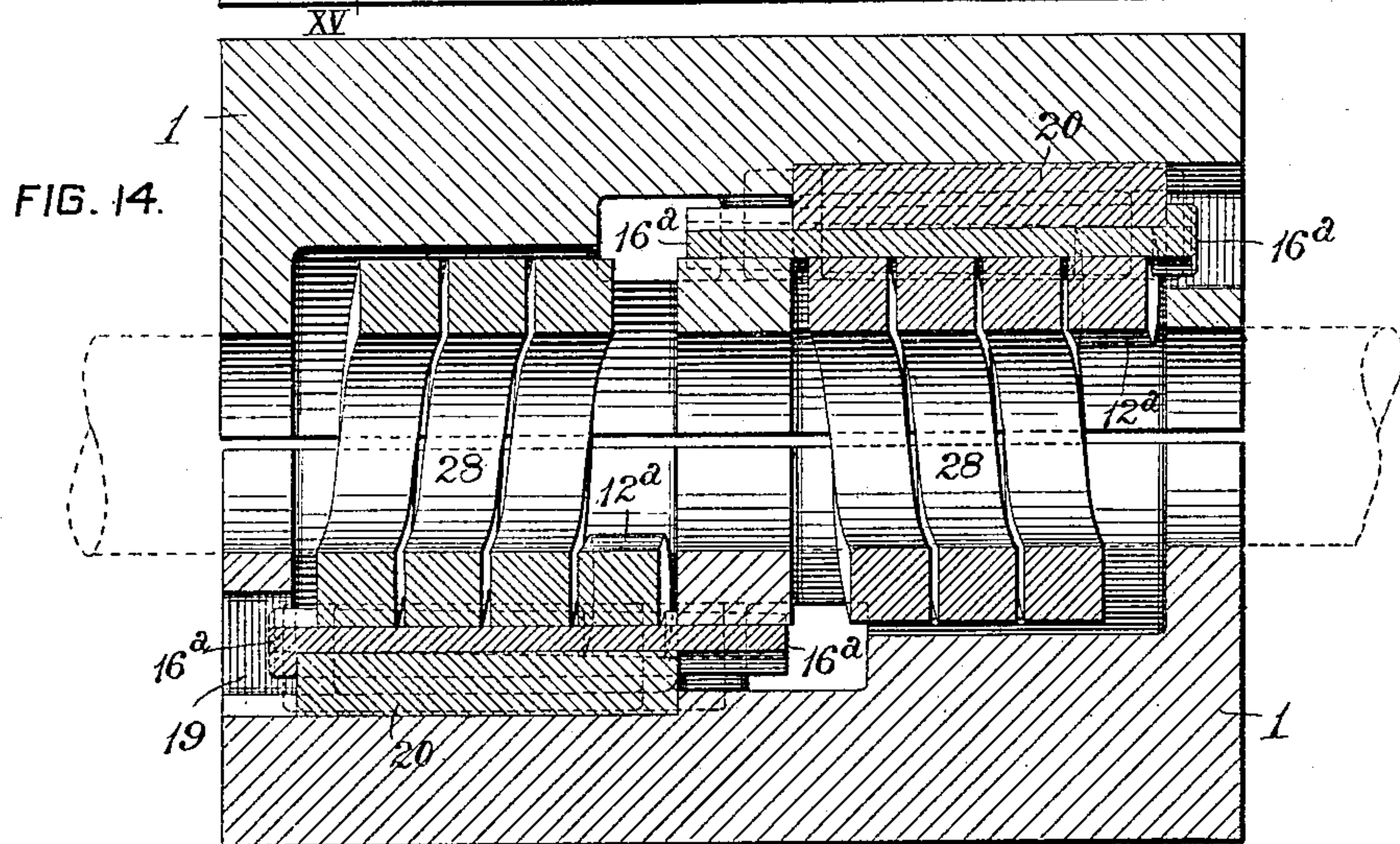
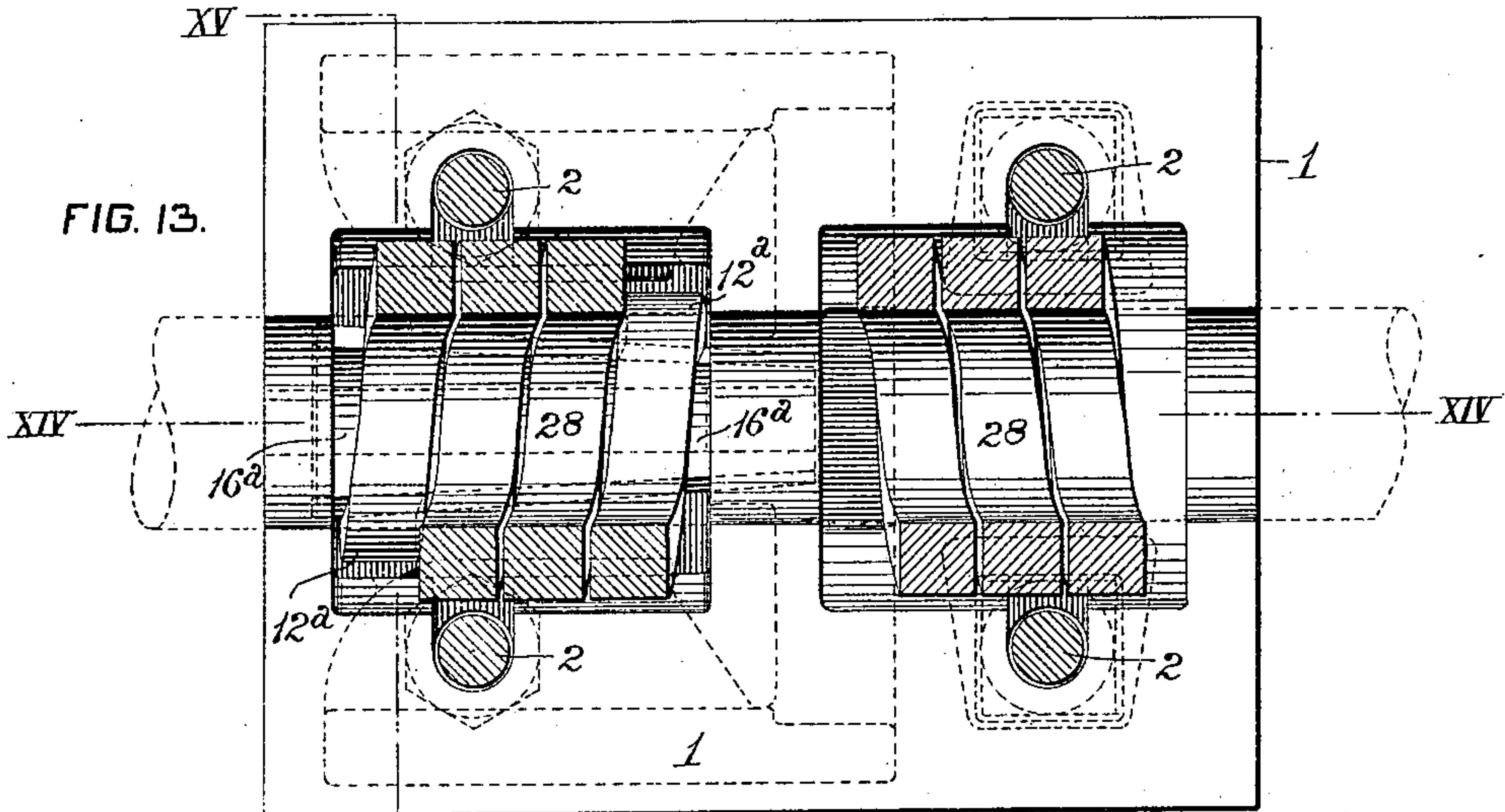
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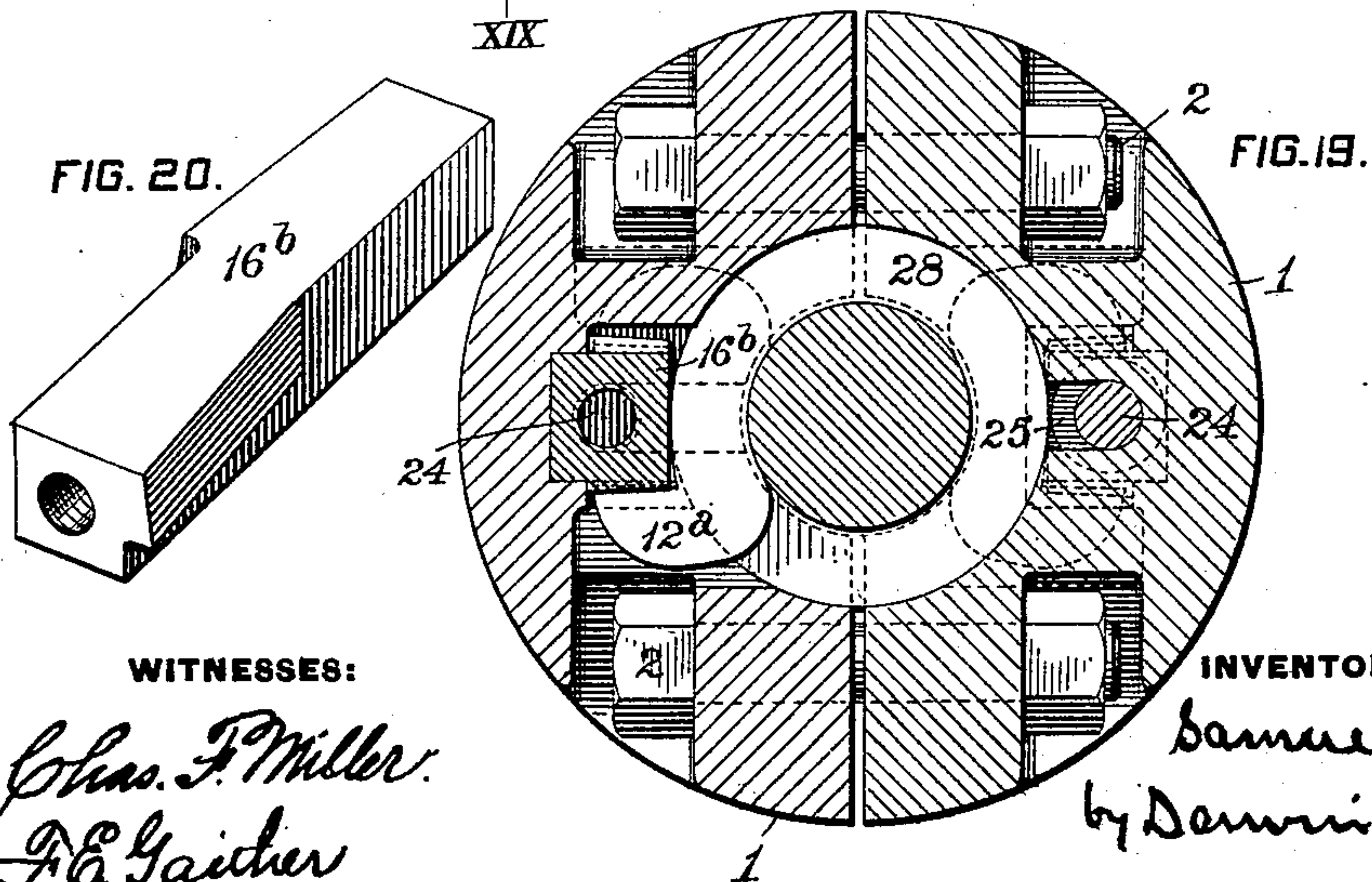
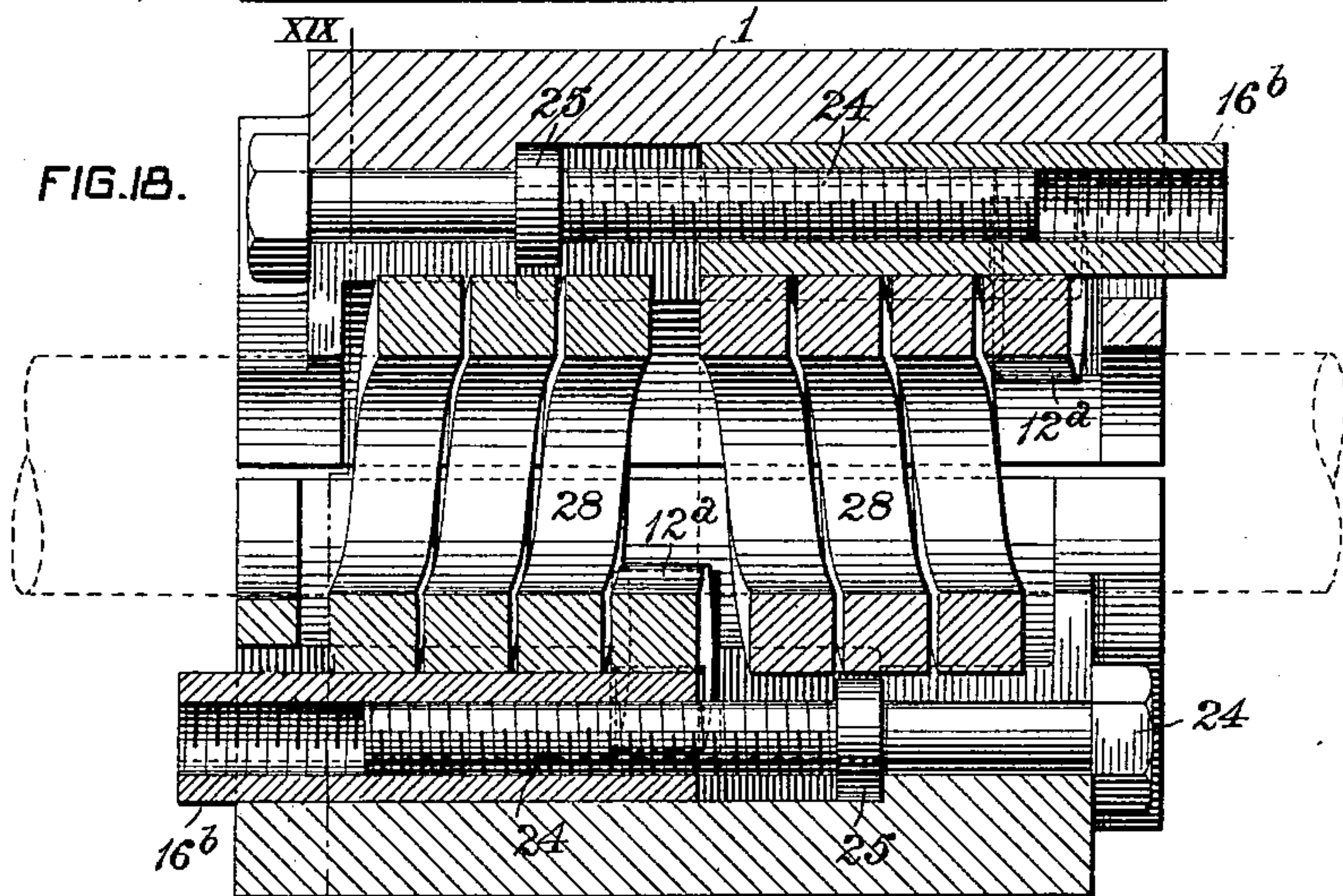
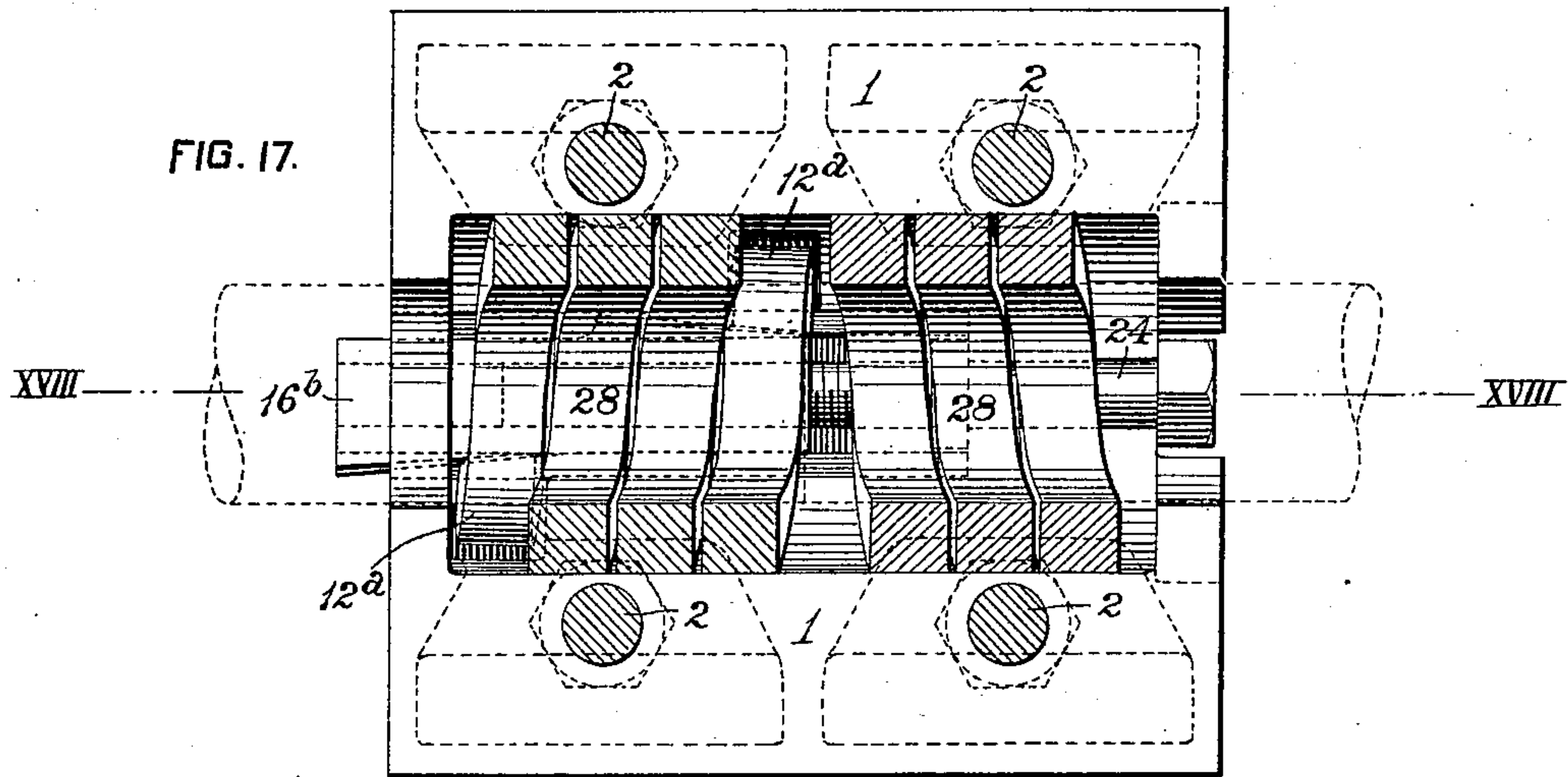
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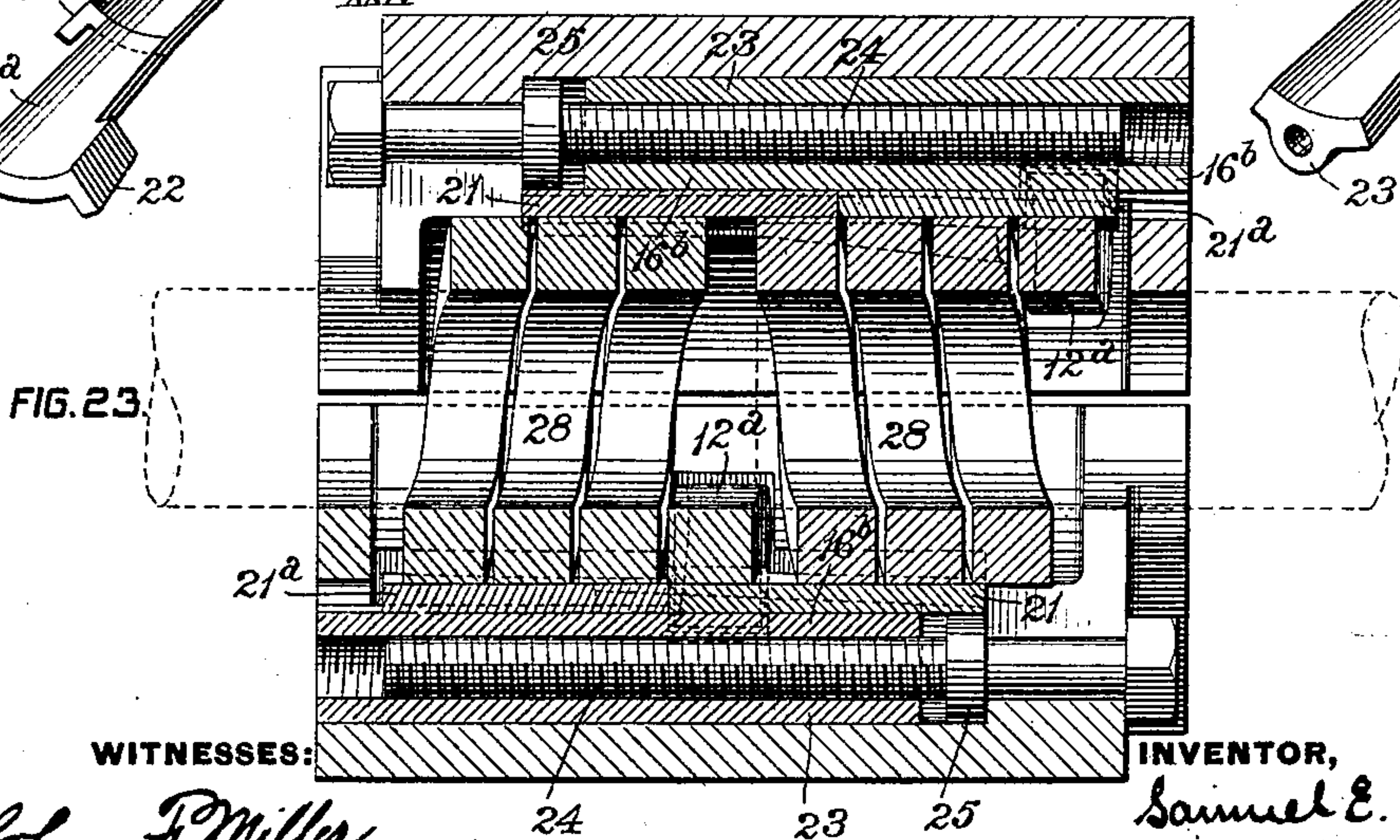
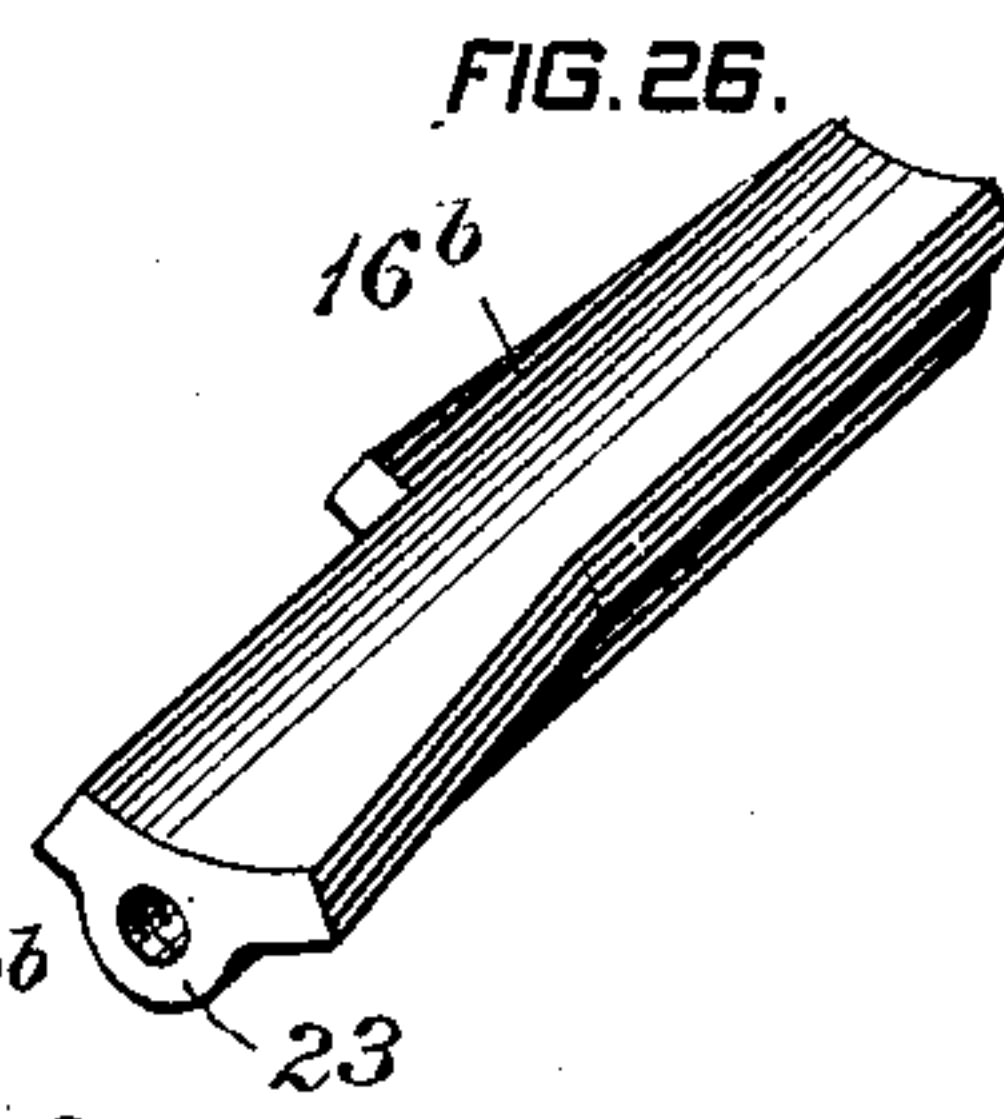
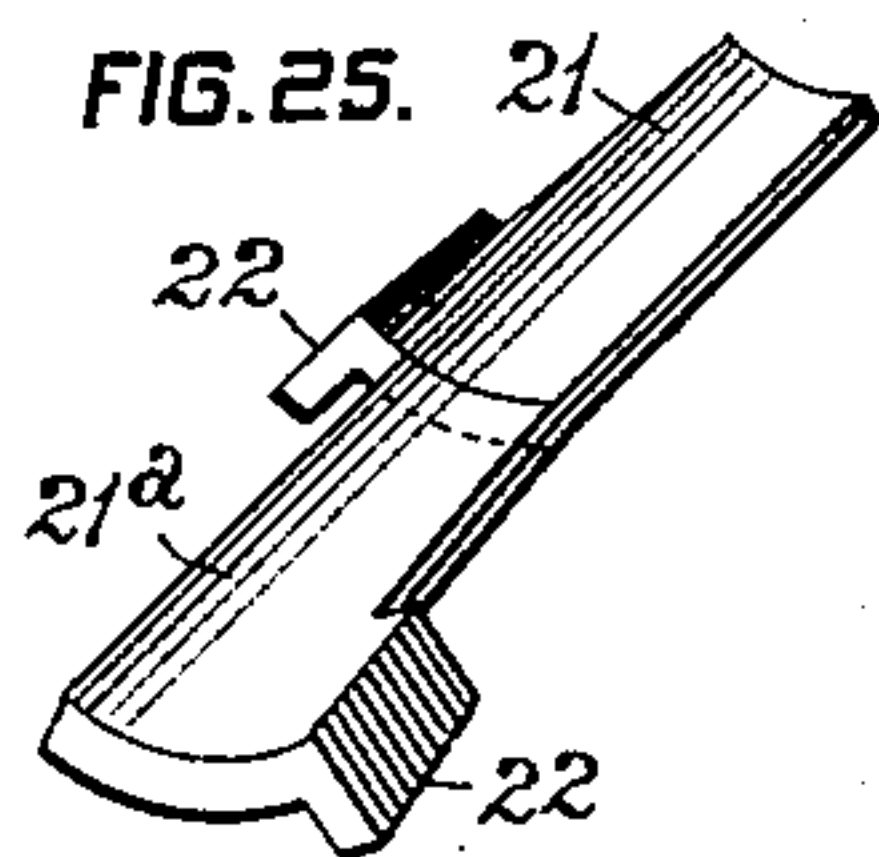
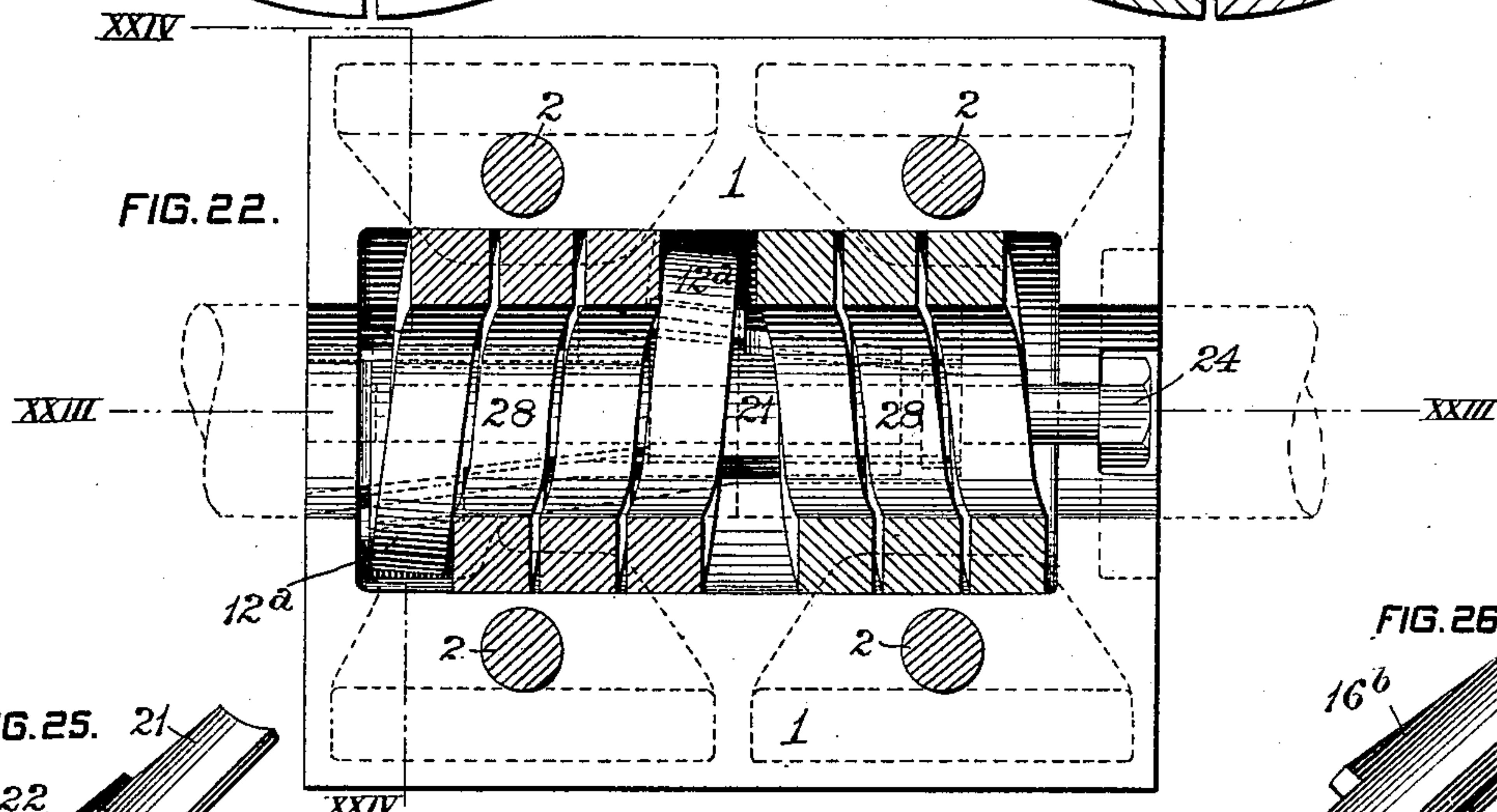
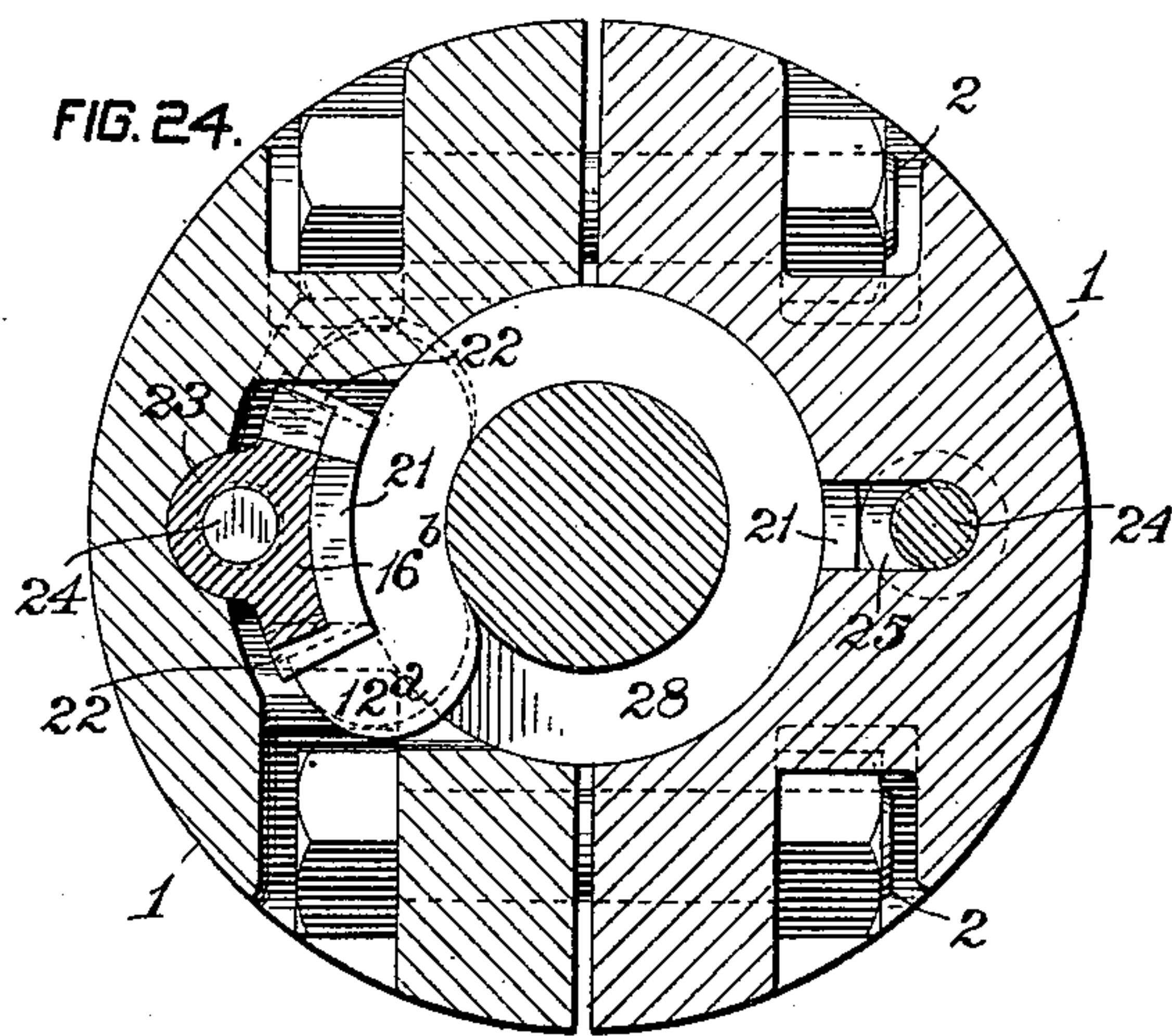
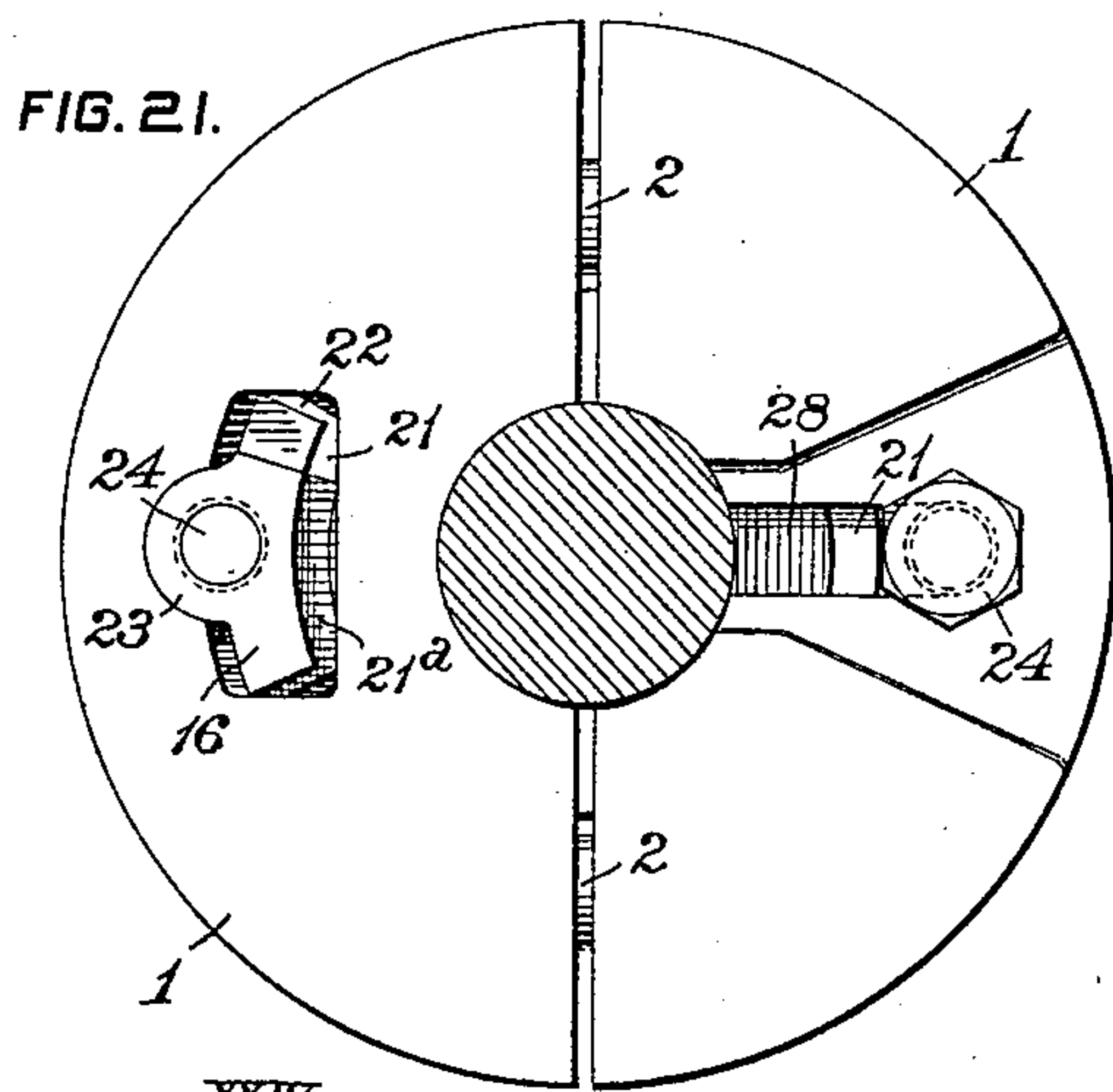
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FIG. 32.

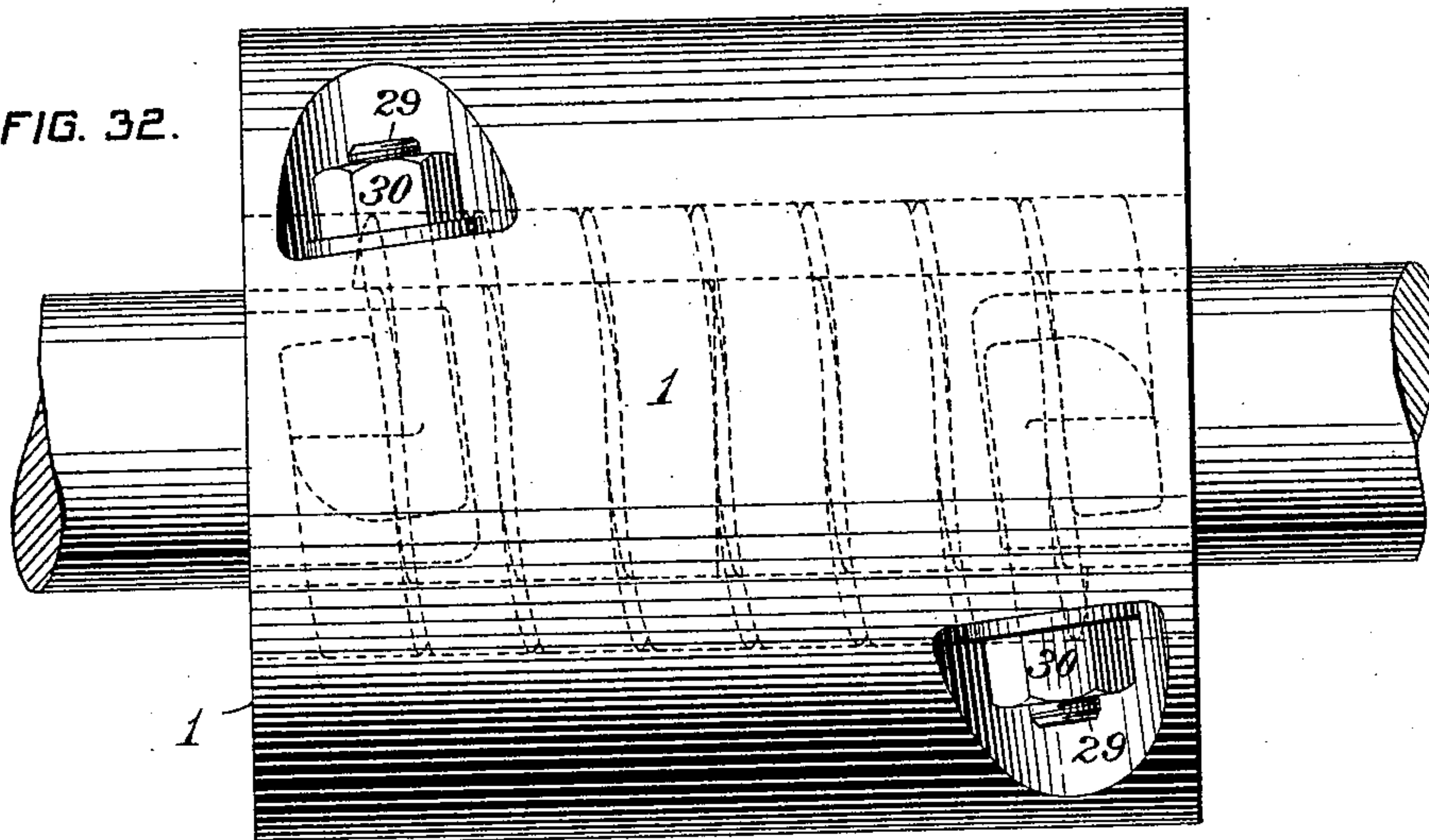


FIG. 33.

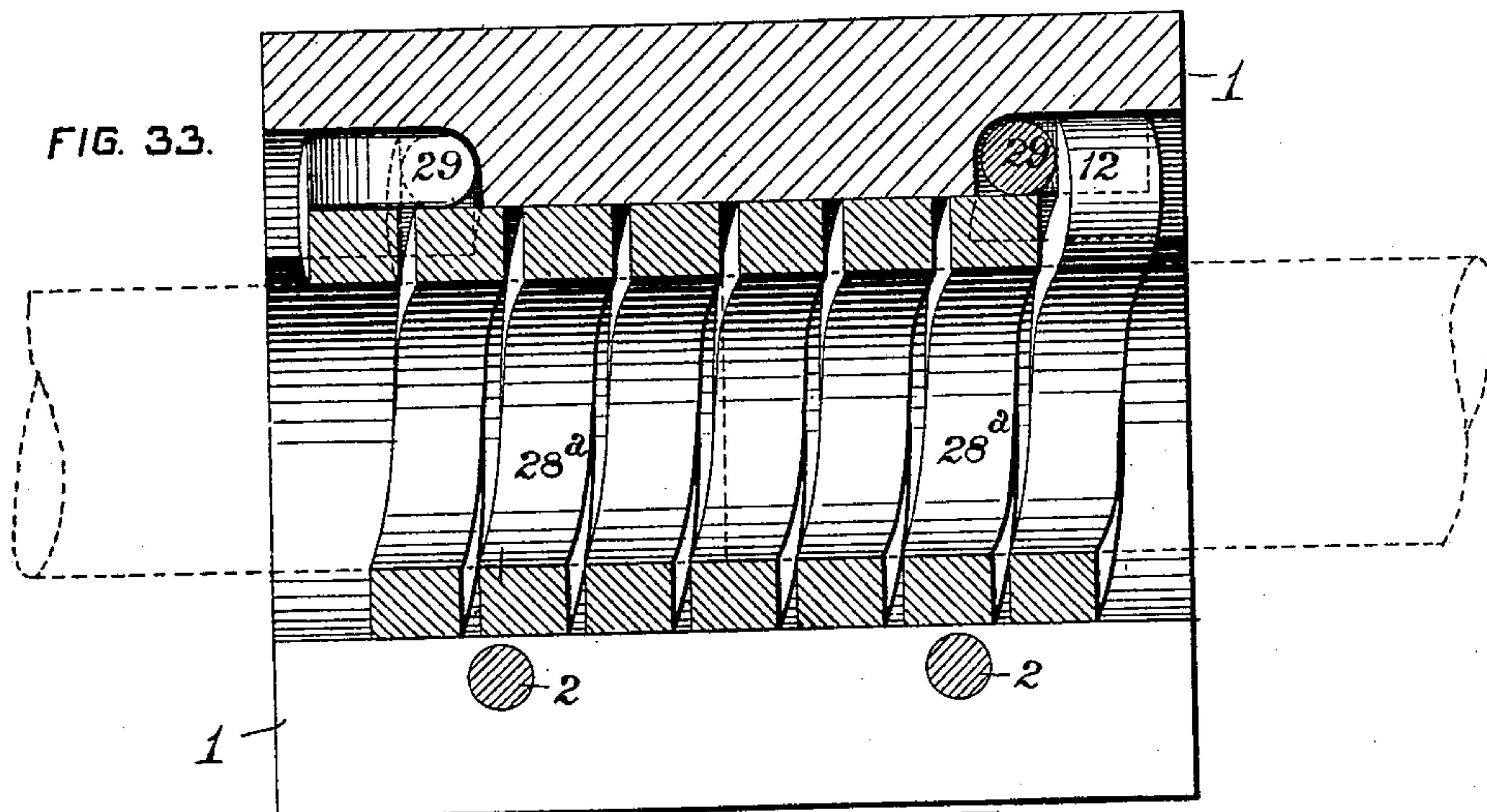
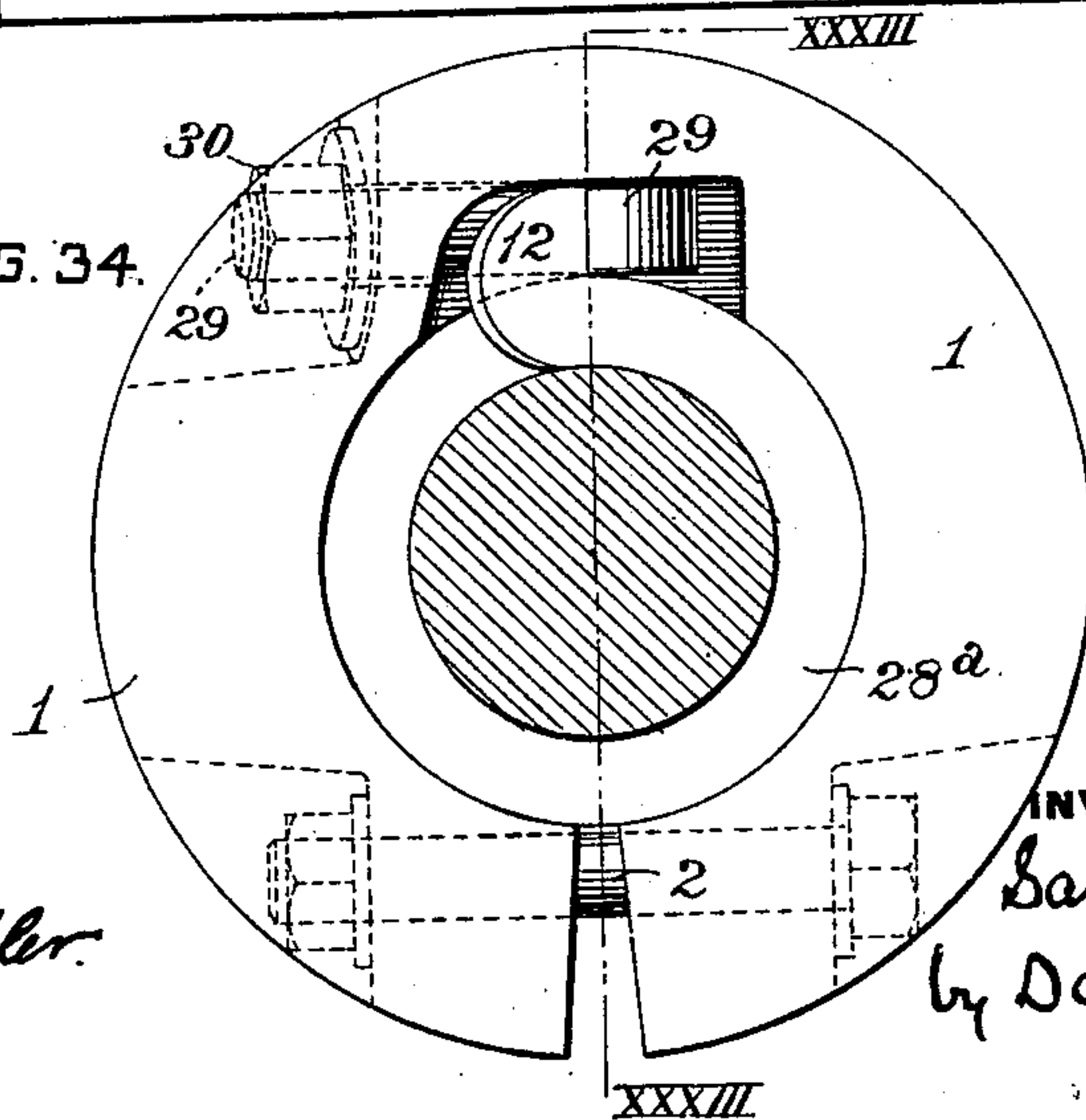


FIG. 34.



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UNITED STATES PATENT OFFICE.

SAMUEL E. DIESCHER, OF PITTSBURG, PENNSYLVANIA.

SHAFT-COUPLING.

SPECIFICATION forming part of Letters Patent No. 631,956, dated August 29, 1899.

Application filed March 9, 1899. Serial No. 708,341. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. DIESCHER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Shaft-Couplings, of which improvements the following is a specification.

The invention described herein relates to certain improvements in shaft-couplings, and has for its object a construction wherein the forward rotary movement of one of the connected shafts and the retarding action of the other shaft will effect a tightening of the coupling on both shafts, such tightening being approximately proportional to the resistance presented by the driven shaft.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view of one-half of my improved coupling, the casing being shown in elevation and the gripping members in section. Figs. 2 and 3 are sectional views, the planes of section being indicated by the lines II II and III III, respectively, in Fig. 1. Figs. 4, 5, and 6 are views similar to Figs. 1, 2, and 3, illustrating a modification of the coupling, the planes of section of 5 and 6 being indicated, respectively, by the lines V V and VI VI, Fig. 4. Fig. 7 is a view in side elevation of a further modification of the structure shown in Figs. 1 to 6. Fig. 8 is a longitudinal section, and Fig. 9 an end elevation, of the structure shown in Fig. 7. Fig. 10 is a view, partly in elevation and partly in section, illustrating a modification in the means for tightening and holding the gripping members. Figs. 11 and 12 are sectional views on planes indicated, respectively, by lines XI XI and XII XII, Fig. 10. Figs. 13, 14, 15, 17, 18, and 19 are views similar to Figs. 10, 11, and 12, respectively, and illustrate modifications of the construction in the tightening mechanism. Figs. 16 and 20 are detail views of the wedges employed in the structure shown, respectively, in Figs. 13, 14, 15, 17, 18, and 19. Fig. 21 is an end elevation of a further modification in the tightening mechanism. Fig. 22 is a view of the same, partly in section and partly in elevation. Fig. 23 is a sectional elevation on a

plane indicated by the line XXIII XXIII, Fig. 22. Fig. 24 is a transverse section on the line XXIV XXIV, Fig. 22. Figs. 25 and 26 are detail views. Fig. 27 is a view, partly in elevation and partly in section, of a modified construction of the grippers. Figs. 28 and 29 are sectional views on planes indicated by lines XXVIII XXVIII and XXIX XXIX, Fig. 27. Fig. 30 is an elevation of the interior of one-half of the case or shell. Fig. 31 is a side elevation of one form of gripper extended. Fig. 32 is an elevation of a further modification of my clutch; and Fig. 33 is a sectional elevation, and Fig. 34 an end elevation, of the same.

In the practice of my invention the shell or casing 1, which is employed for holding the shaft-sections in alinement and also for connecting the grippers together, is preferably formed in two sections for convenience in applying the coupling to the shaft-sections. The coupling-sections are secured together around the adjoining ends of the shaft-sections by bolts 2. The outer walls of the coupler-sections are recessed, as at 3, for the reception of the heads and nuts of the bolts 2. The inner walls of the coupler-sections are provided with pockets 4, which will form, when the coupler-sections are secured in position, annular recesses around the shaft-sections adjacent to the ends thereof for the reception of the gripping members of the coupler. Each of these gripping members consists of a spirally-wound metal bar 28, preferably having a transversely flat or plane inner surface, so as to have a comparatively broad bearing on the shaft. The ends of the spiral coil are arranged tangential to the coil in order that suitable mechanical devices may be applied to such ends for the purpose of tightening the turns of the coil around the shaft. The tightening of the coils can be effected in many ways, and while the several forms shown and described are at present considered preferable the invention herein is not limited as regards the broad terms of the claims to such specific constructions.

In the constructions shown in Figs. 1 to 6, inclusive, the tangential ends 5 of the spiral coils are threaded for the reception of the tightening-nuts 6. In applying the coupler to shaft-sections the coils are placed around

the shaft-sections and the casing or shell sections are placed in position, the tangential ends of the coils being passed through holes 7 in the casing. After the casing-sections have been bolted together around the shaft-sections the nuts 6 are screwed up, thereby drawing each spiral coil tightly around its shaft-section. The outer walls of the casing are recessed, as at 8, around the holes 7 for the reception of the tightening-nuts.

It will be observed that the recesses 3 and 8 are approximately tangential and partially undercut, so that the openings in the surfaces of the shell are comparatively small and lie in such direction as to reduce to a minimum all liability of the clothing of a workman being caught by the coupler. In lieu of recessing the shell or casing, as shown in Figs. 2 and 3, opposite sides of the casing or shell 1^a may be made flat or plane, as shown in Figs. 5 and 6, and the projecting bolt heads and nuts covered by cap-plates 9, secured to the shell or casing by screws 11. As the outer surfaces of these caps are on arcs of circles of a radius equal to that of the curved portions of the casing, the latter, when the caps are in position, will present a smooth cylindrical surface.

In lieu of two half-shells, as shown in Figs. 1 to 6, inclusive, a split shell or casing 1^b, as shown in Figs. 7, 8, and 9, may be employed; but in such case the shell or case is slipped onto one of the shaft-sections prior to their being brought into alinement, and then slid back over the adjoining ends, and, further, in lieu of threaded tangential ends whereby the coils may be drawn tightly around the shaft-sections the ends of the coils may be turned out radially, forming shoulders or abutments 12. The coils are tightened around the shaft by means of set-screws 13 passing through the casing in lines tangential to the coils and bearing at their inner ends against the shoulders or abutments 12.

In lieu of constructing the casing or shell so that portions thereof will bear directly on the shaft-sections the casing or shell may bear solely on the gripping-coils, and thereby hold the shaft-sections in desired alinement, as shown in Figs. 8 and 9. When using a non-sectional shell or casing, the coils are compressed sufficiently by any suitable means to permit of their being driven into the casing until the projecting shoulders or abutments 12 enter sockets or recesses 14 in the inner wall of the casing. It is preferred that the recesses 14 should be formed in the side opposite the longitudinal slot in the casing, so that the pressure exerted by the set-screws 13 in tightening the coils on the shaft will operate against a solid portion of the casing and will not tend to open or expand the casing. After the coils have been tightened around the shaft-sections the casing is drawn tightly against the coils by means of bolts 2^b.

If desired, the coils may be tightened by means of wedges arranged between heads 15,

formed on the ends of the coils and the casing or between radially-projecting shoulders on the end of the coils. As shown in Figs. 10 to 12, inclusive, the wedge 16 is forked for the reception of the end of the coil having the head 15 formed thereon, the prongs of the wedge passing under the head and bearing on its opposite side against a suitably-formed seat 17 on the casing. As the coils can generally be tightened sufficiently by force applied only to one end, the opposite end can be held in the casing by a nut 18, screwing on the threaded tangential end, as shown; but power can be applied to both ends of the coils by means of wedges.

As shown in Figs. 13 to 15, the coils are so formed that their ends overlap and are provided with radially-projecting shoulders or abutments 12^a, which project into a suitably-shaped recess 19, formed in one of the sections of the casing. The wedge 16^a is forced in between the shoulders 12^a on the overlapping ends of the coils, thereby forcing such ends in opposite directions and tightening the coils on the shaft-sections. In order to hold the wedge in position between the shoulders or abutments and also to move in an approximately straight line so as to insure equal movements of both ends of the coils, a key 20 is driven in between the wedge and the outer wall of the recess 19.

As the wedges where they bear on the coils might in some cases displace the coils laterally when being driven in, it is preferred to employ shoes or bearing-pieces 21 21^a—two for each wedge. (See Figs. 21 to 26, inclusive.) As shown in Fig. 25, each of these shoes consists of a concavo-convex portion adapted to rest upon the coils and with an ear or lug 22, forming a bearing between the shoulder or abutment 12^a and the wedge 16^b. An outwardly-projecting rib 23 is formed on the wedge and adapted to project into a guiding-groove in the casing. A threaded opening is formed through this rib for the reception of the shifting screw 24, which is held from longitudinal movement by collars 25, bearing against shoulders on the casing, as shown in Figs. 17 to 24, inclusive.

While it is generally preferred to form the grippers by coiling a bar rectangular in cross-section and formed of a material, as steel, having some resilience, so that the coils will expand when released from tension, the grippers may be formed of a series of curved links 26, pivotally connected together, as shown in Figs. 27 to 31, inclusive. As clearly shown, these links are formed with recesses 27 in their outer walls to permit of the operation of the wedges 16^b on the shoulders or abutments 12^b, said recesses being made of a width greater than that of the wedges.

It will be understood that when any of the means herein described other than the wedges are employed for tightening the link-coils, the outer walls of the links need not be recessed.

It is characteristic of my improvement that no special preparation—such as cutting keyways, &c., in the shaft-sections to be connected—is necessary and also that the coupler
5 can be applied after the shaft-sections are in position in their bearings. While it is preferred to employ two gripping members, one for each shaft-section, a single gripping member 28^a may be employed, as shown in Figs.
10 32, 33, and 34. This gripping member 28^a is made of sufficient length to extend a considerable distance along the adjoining ends of the shaft-sections, so as to take a firm grip on each. This coil may be tightened around
15 the shaft-sections by any of the mechanical devices hereinbefore described, or by means of hooks 29 engaging the turned-out ends of the coil and having threaded stems projecting tangentially through the casing and adapted
20 to receive tightening-nuts 30. After the coil has been drawn tight around the shaft-sections the casing is tightened against the coil, so as to hold the shaft-sections in alinement.

25 I claim herein as my invention—

1. A shaft-coupling comprising a shell, a spiral gripping member and means carried

by the shell for contracting and holding the gripping member in frictional engagement with the shaft, substantially as set forth. 30

2. A shaft-coupling having in combination two spiral gripping members, means for contracting and holding the gripping members in frictional contact with the shaft-sections and means for connecting said members, 35 whereby one member is caused to rotate in unison with the other member, substantially as set forth.

3. In a shaft-coupling the combination of a shell or casing, spiral coils arranged within 40 the shell or casing and means for contracting such coils, substantially as set forth.

4. A shaft-coupling, having in combination a shell or case adapted to inclose and hold in alinement the shaft-sections, two spiral grip- 45 ping members and means for contracting said coils, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SAMUEL E. DIESCHER.

Witnesses:

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