

M. SPORLEDER.
CANNON PINION FOR WATCHES.

(No Model.)

(Application filed Sept. 29, 1900.)

2 Sheets—Sheet 1.

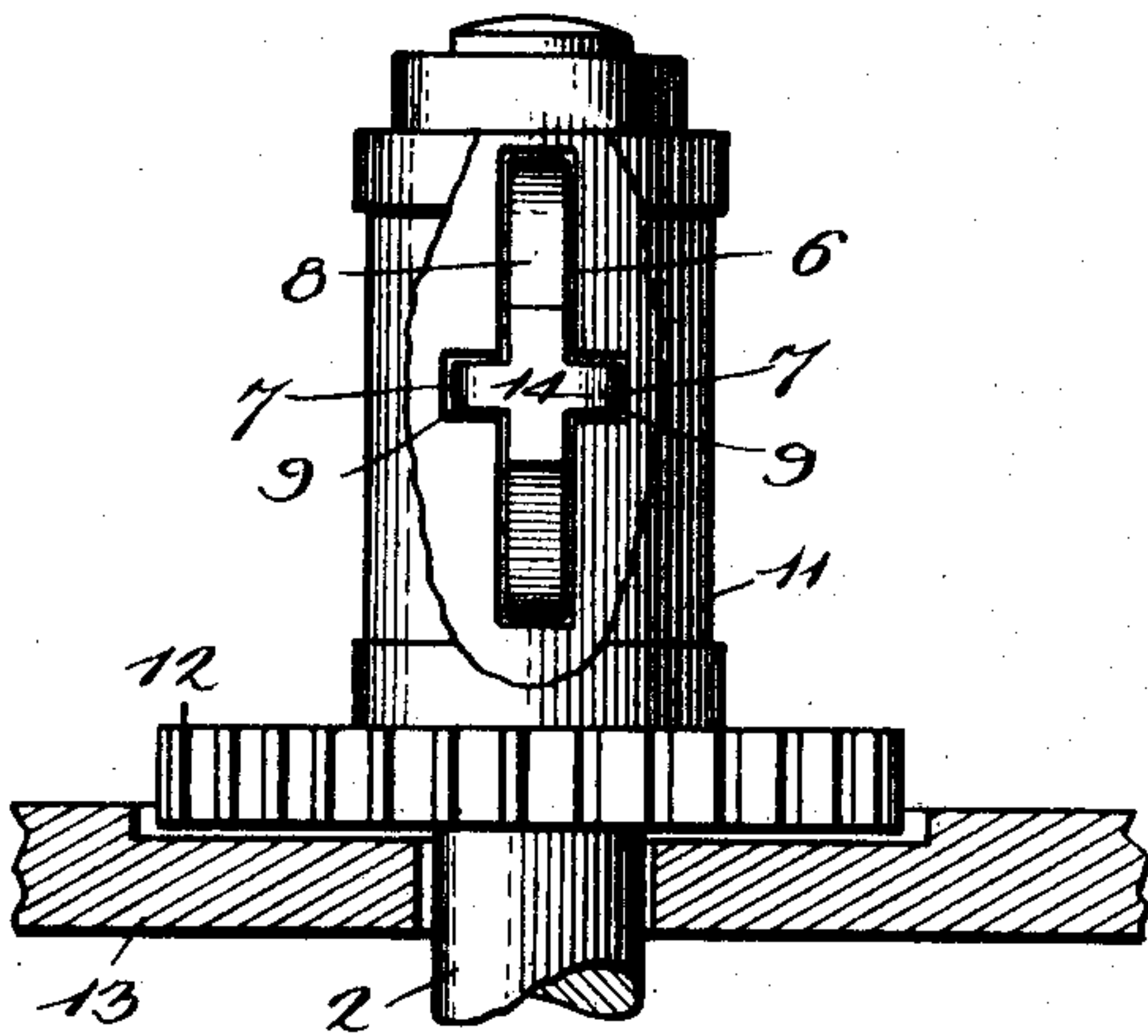


Fig. 1.

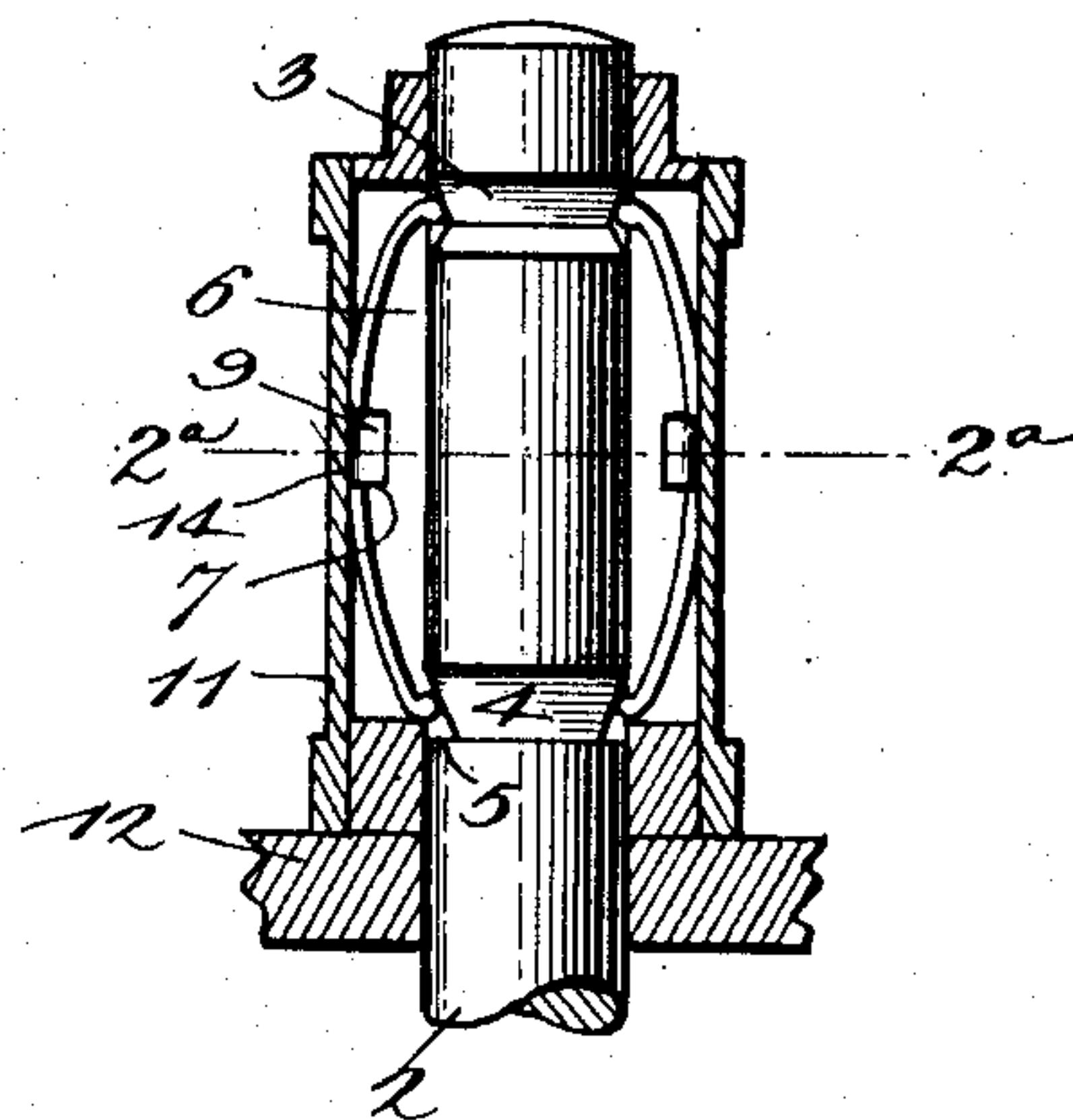


Fig. 2.

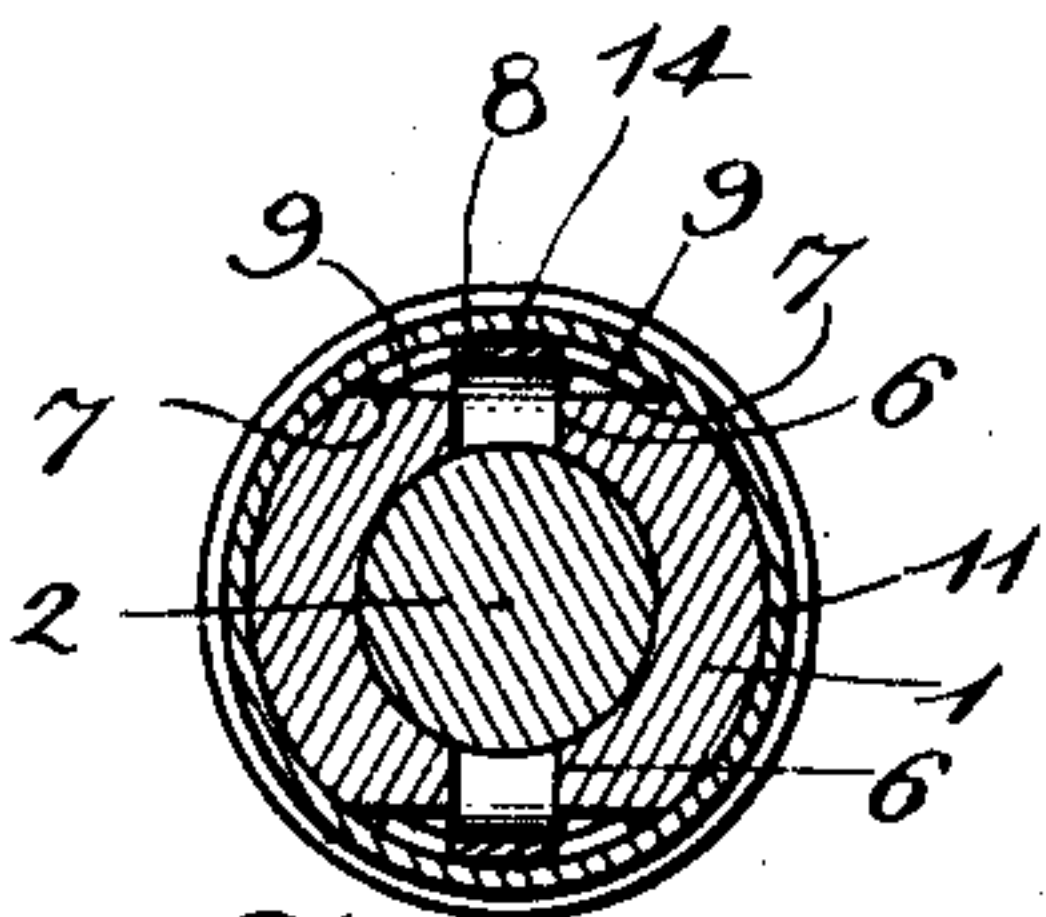


Fig. 2a.

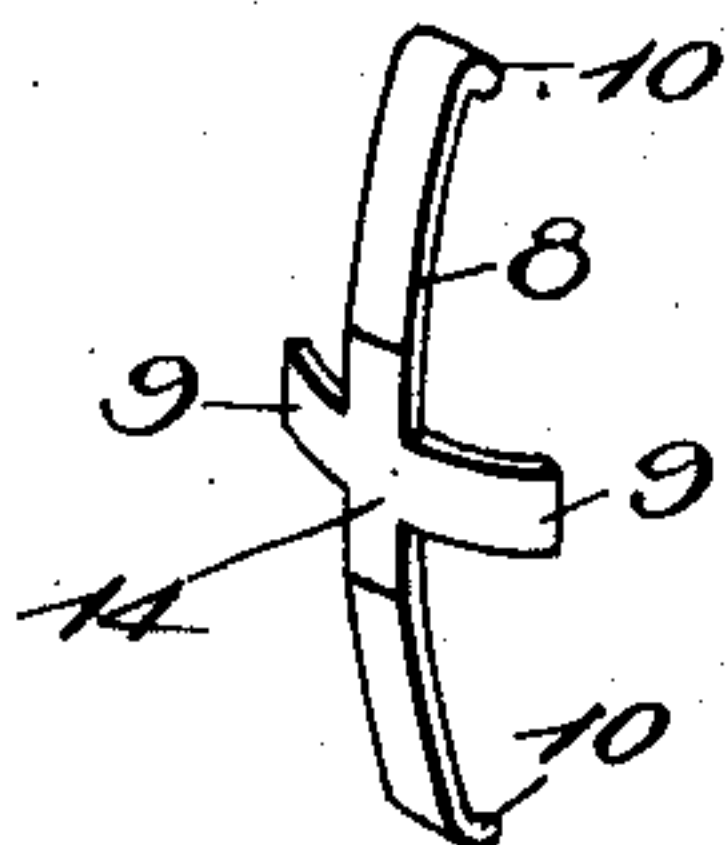


Fig. 6.

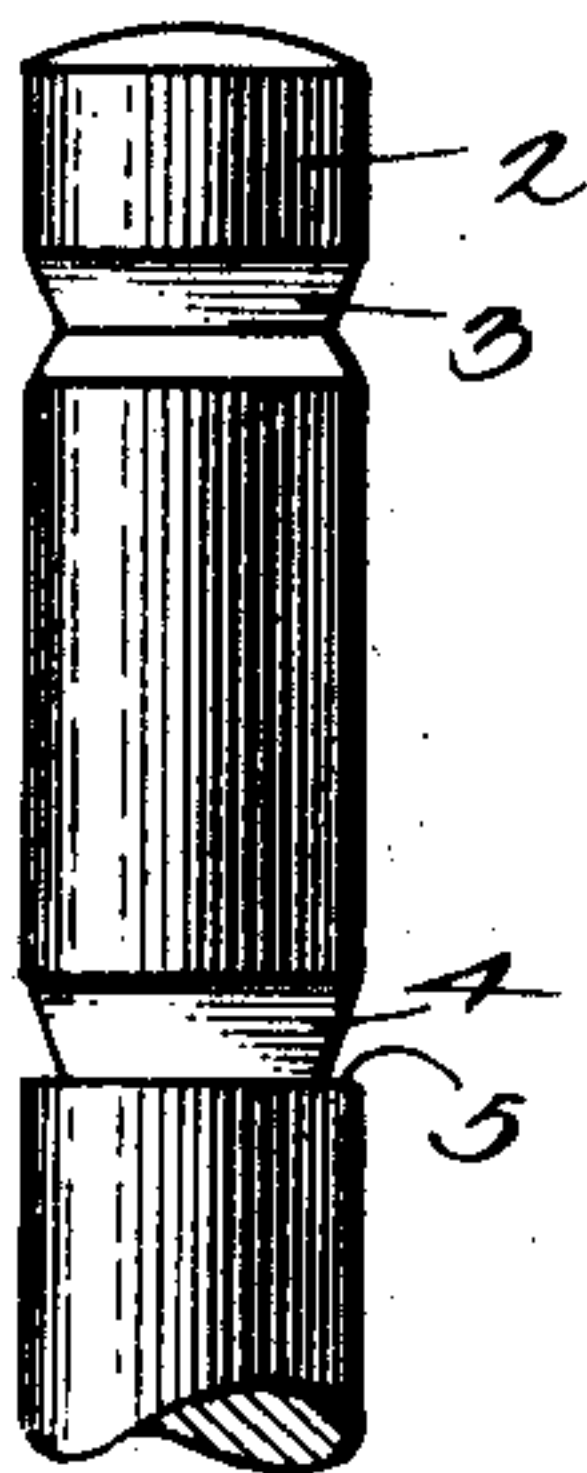


Fig. 3.

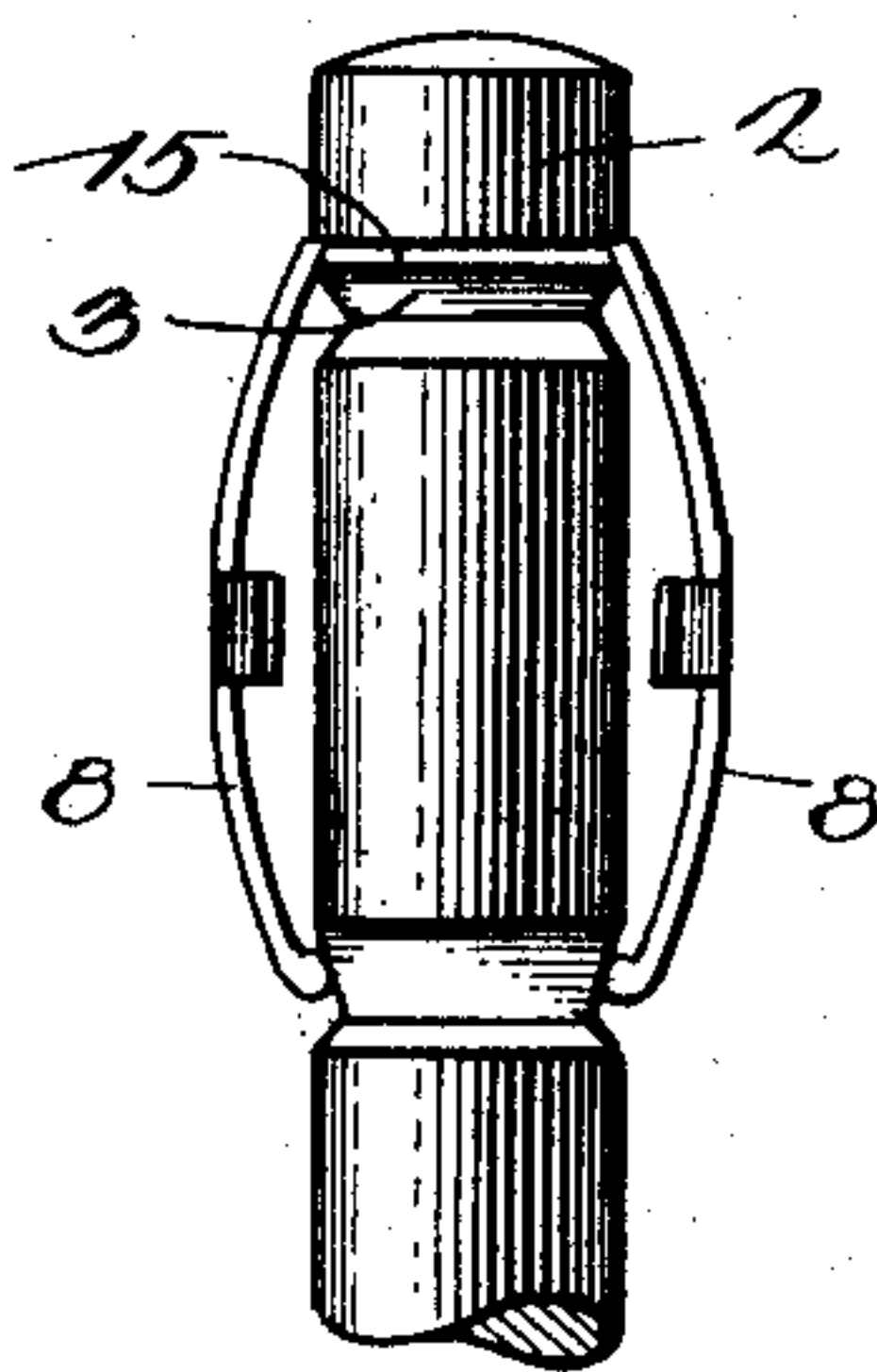


Fig. 4.

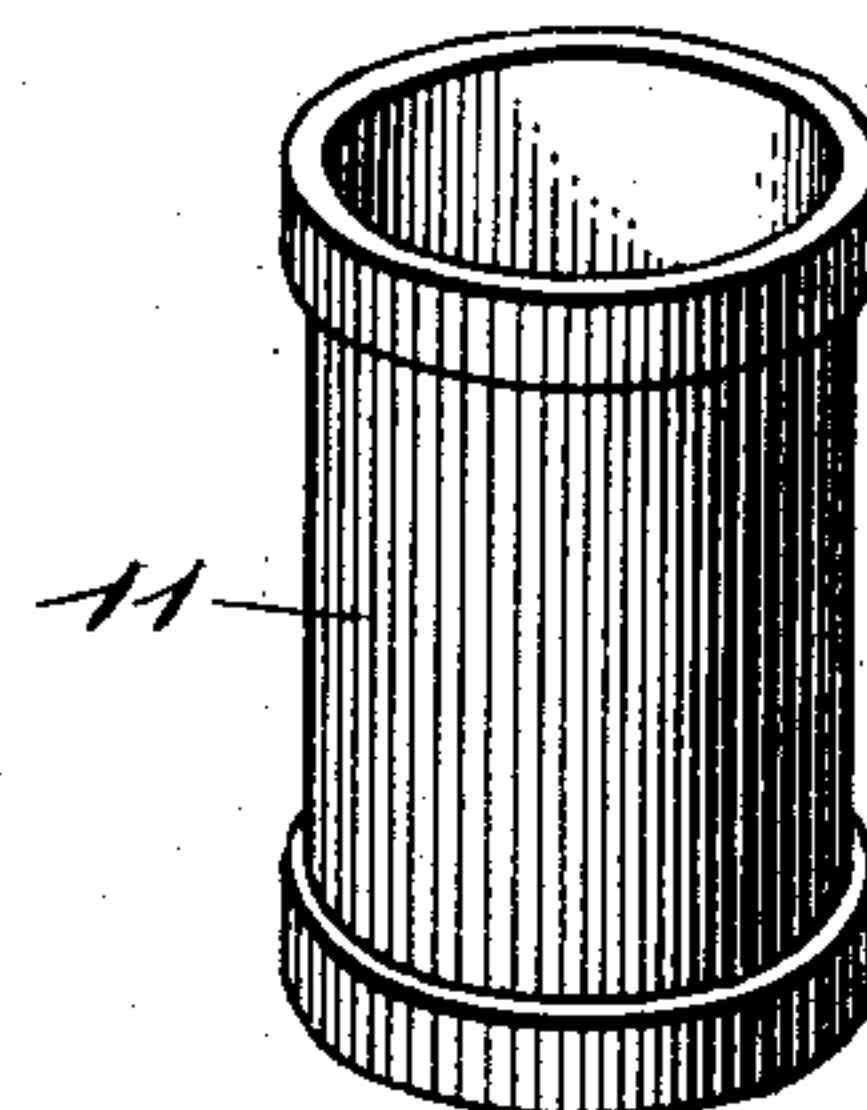


Fig. 5.

Witnesses

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2 Sheets—Sheet 2.

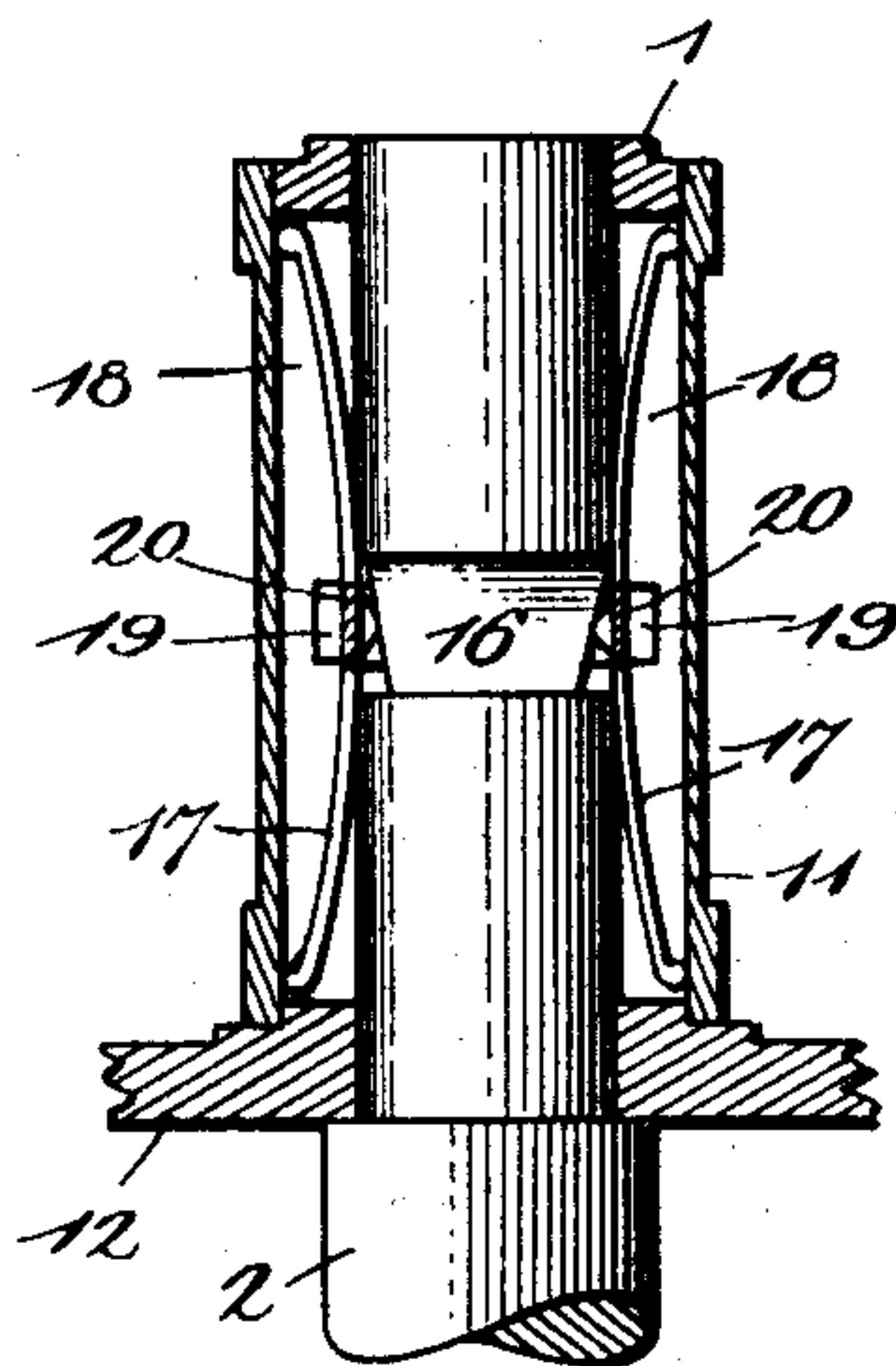


Fig. 7.

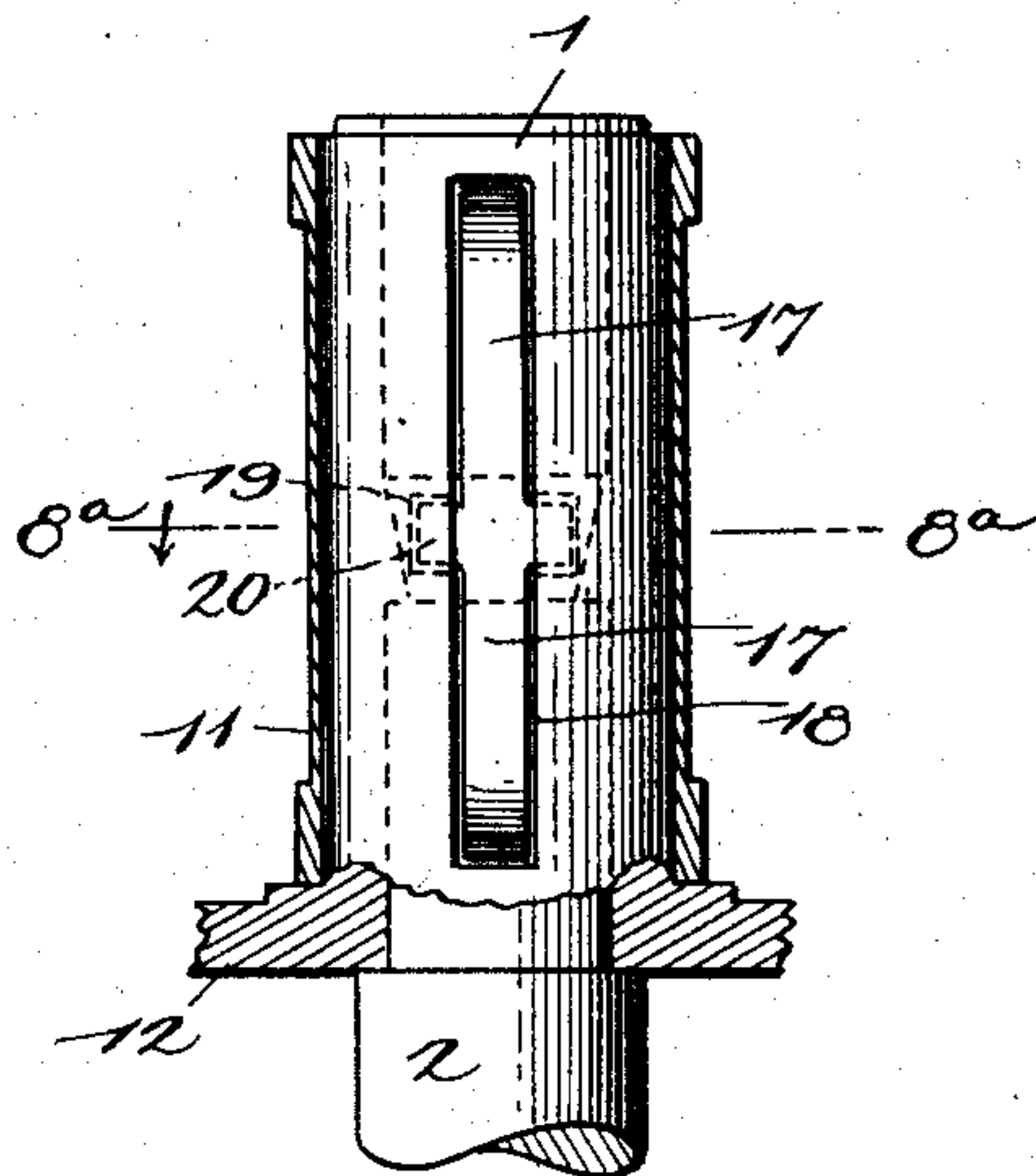


Fig. 8.

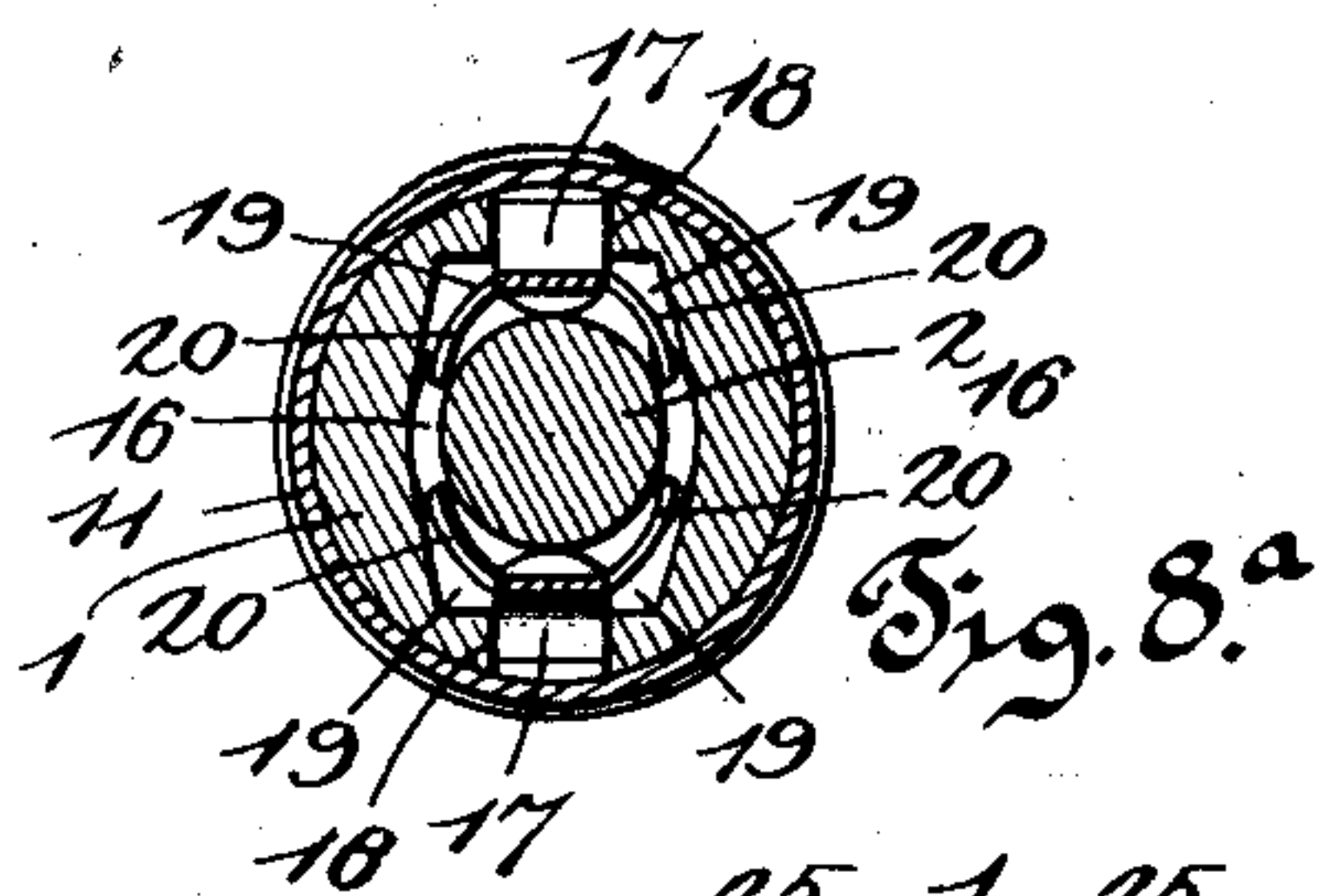


Fig. 8a.

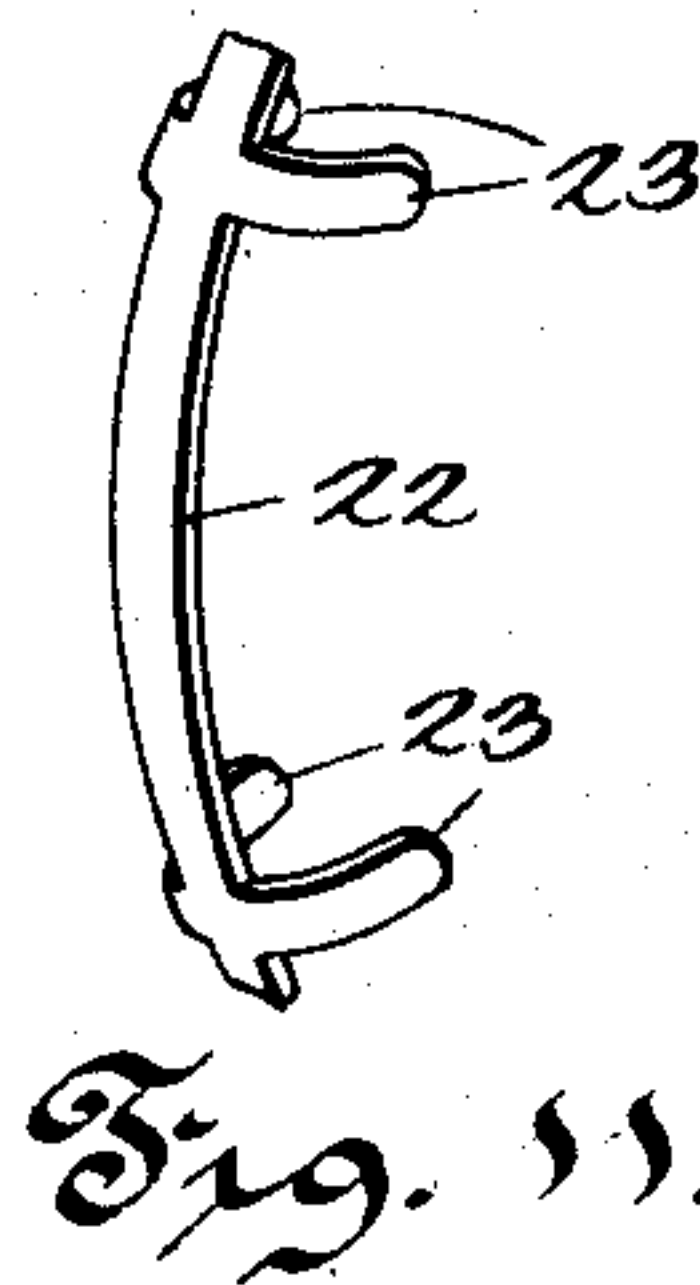


Fig. 11.

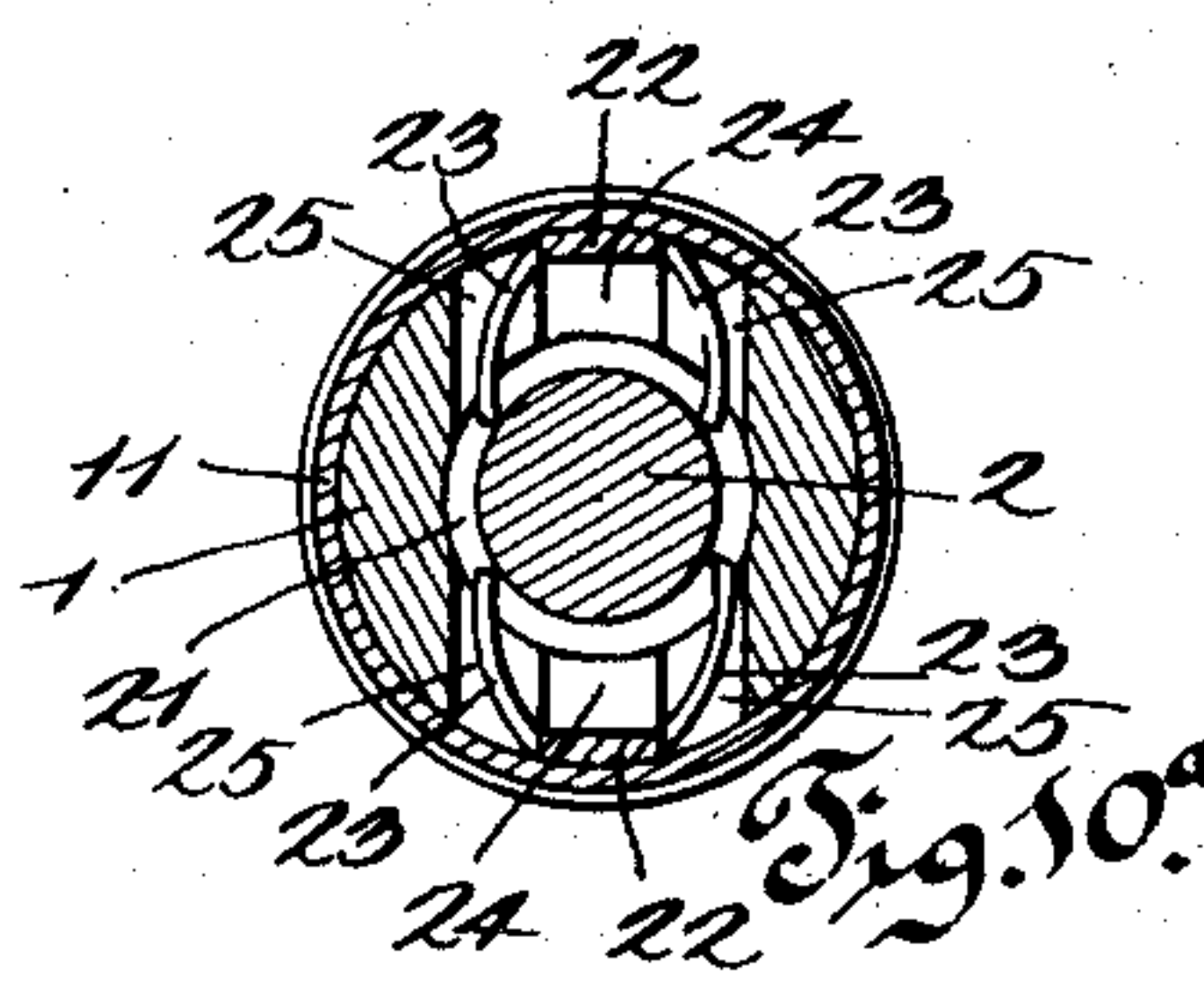


Fig. 10a.

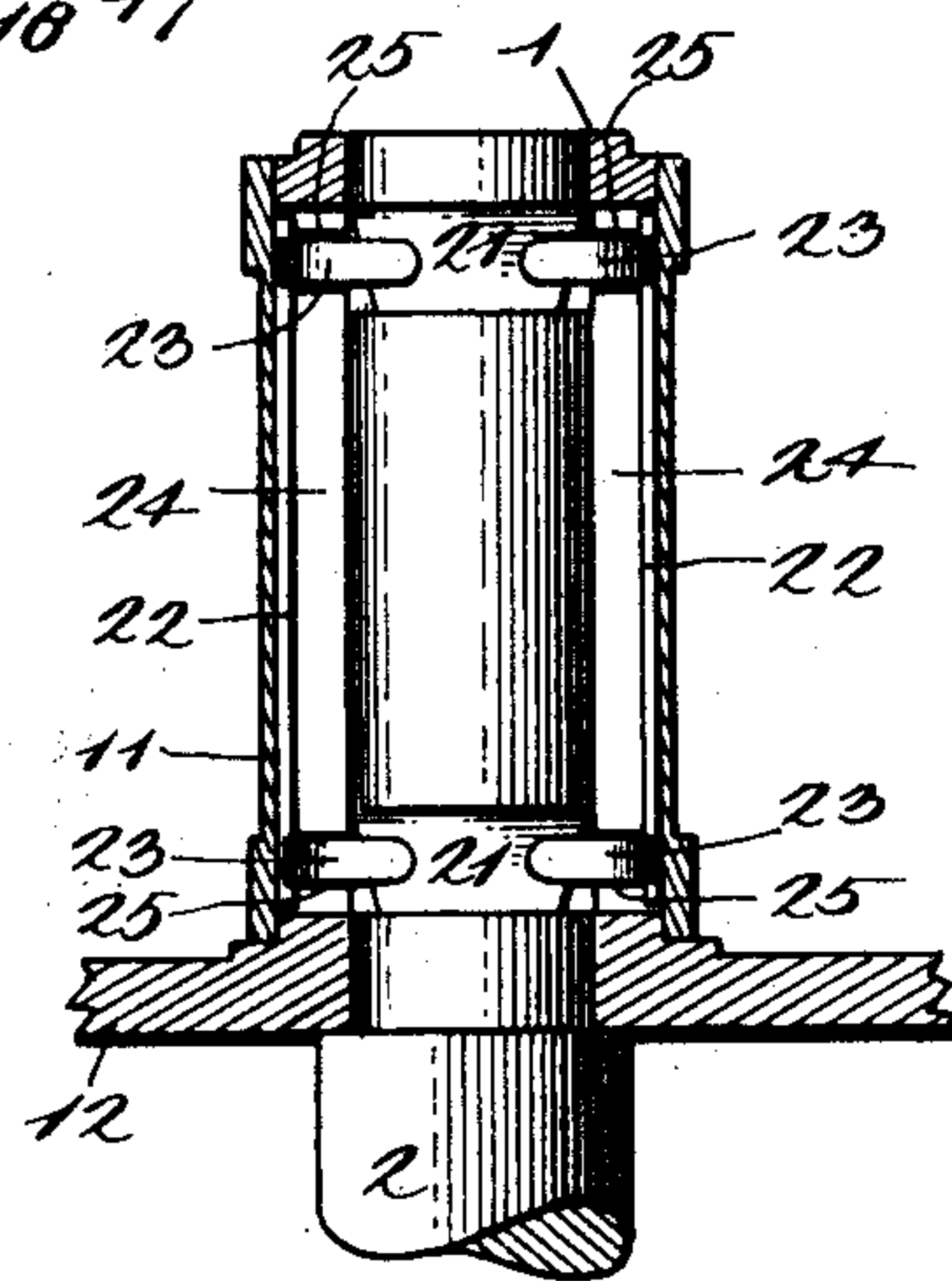


Fig. 9.

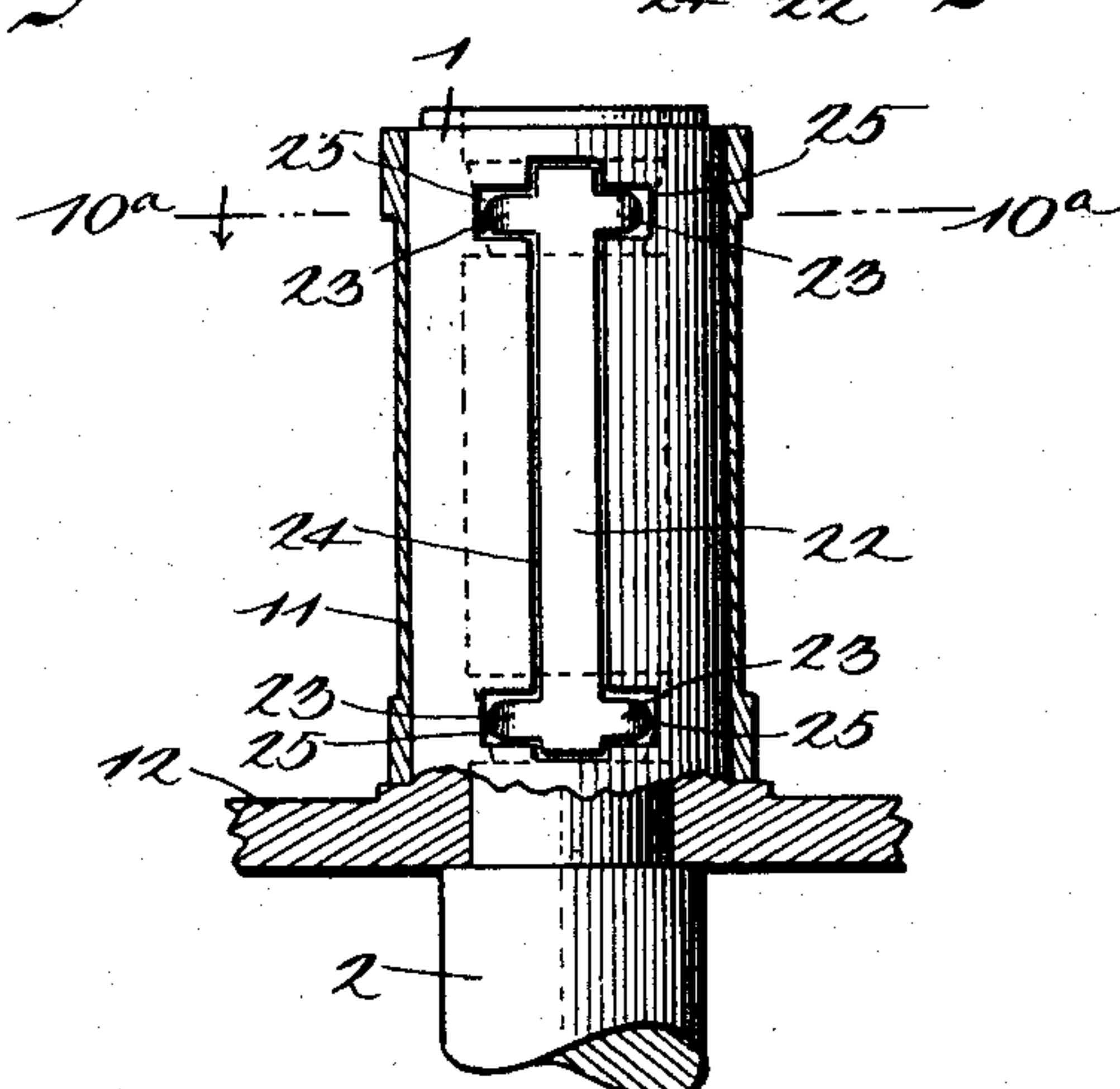


Fig. 10.

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UNITED STATES PATENT OFFICE.

MICHAEL SPORLEDER, OF COLORADO CITY, COLORADO, ASSIGNOR OF
ONE-HALF TO ARTHUR LALONDE, OF SAME PLACE.

CANNON-PINION FOR WATCHES.

SPECIFICATION forming part of Letters Patent No. 669,128, dated March 5, 1901.

Application filed September 29, 1900. Serial No. 31,509. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL SPORLEDER, a citizen of the United States, residing at Colorado City, in the county of El Paso and State of Colorado, have invented a new and useful Watch-Pinion, of which the following is a specification.

This invention relates to cannon-pinions for watches; and the object of the same is to provide simple and effective means for mounting such devices and render the assemblage of the same in relation to intimate parts of the watch-movement more advantageous and positive.

The difficulty with the cannon-pinions now in use is that it is impossible in the integral spring structures included therein to obtain sufficient spring action to cause the springs to fall or work into a quite deep retaining bevel or groove, and after the pinion becomes worn it is exceptionally difficult to have the same remain properly in position without a tendency of working up against the dial. In the improved construction the bevels or notches can be cut as deep as necessary, and the springs will follow up the same with an abundance of friction on the arbor, and if one of the springs breaks any watchmaker can readily file up one, or the tool and material supply houses and agencies could keep the same in stock at a small cost.

The invention primarily contemplates the general arrangement of the springs in individual construction in relation to a pinion-arbor and cannon-pinion and a shield for protecting the same, together with a varying groove provision for the spring-terminals to produce a positive engagement of the same to overcome the disadvantages heretofore encountered.

The invention further consists in the details of construction and arrangement of the several parts, which will be more fully herein-after described and claimed, and subject to a wide range of modification in the form, size, proportions, and minor details within the principle of the invention.

In the drawings, Figure 1 is a sectional elevation embodying an arbor, a pinion, a shield, and a spring involving the features of the invention in one form. Fig. 2 is a section

through a portion of the devices shown by Fig.

1. Fig. 2^a is a horizontal section of the same devices. Fig. 3 is a detail elevation of the arbor shown by Figs. 2 and 2^a. Fig. 4 is a similar view of a modified and additionally-grooved arbor and the springs in engagement therewith. Fig. 5 is a detail perspective view of the protecting shield for covering the parts. Fig. 6 is a detail perspective view of one of the springs. Fig. 7 is a section similar to Fig. 2, showing a modification in the construction of the spring-groove and the springs. Fig. 8 is a sectional elevation of the parts shown by Fig. 7 and the one spring in front elevation. Fig. 8^a is a horizontal section through the parts shown by Figs. 7 and 8. Fig. 9 is a view similar to Fig. 7, showing a further modification. Fig. 10 is a sectional elevation of the parts shown by Fig. 9 and the one spring in front elevation. Fig. 10^a is a horizontal section of the parts shown by Figs. 9 and 10. Fig. 11 is a detail perspective view of the form of spring shown by Figs. 9 and 10.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

Referring to Figs. 1, 2, 2^a, 3, 5, and 6, the numeral 1 designates a cannon-pinion mounted on the usual arbor 2, the latter having an upper double bevel-groove 3 and a lower single bevel-groove 4, terminating at the bottom in a square shoulder 5 in a plane at a right angle to the surface of the arbor. At diametrically opposite points in the pinion 1 slots 6 are formed and have intermediate laterally-extending branches or members 7 in planes at right angles to the main slots. Within these slots are loosely fitted independent springs 8, having intermediate laterally-projecting convex arms or wings 9, which are located in the members 7 of the main slots 6 and serve to hold the springs in desired normal position and against displacement, though not interfering in the least with the free resilient action of the same. The said springs are longitudinally bowed, and the wings 9 curve inwardly, the ends 10 of the springs being blunted by swaging or upsetting the same or primarily making the metal thicker, and the upper and lower ends of the springs constructed as set forth loosely engage the grooves

3 and 4, respectively, of the arbor 2, as clearly shown by Fig. 2. The bow of the springs is of such degree that when they are applied in the manner just set forth their outer central portions are approximately flush with the outer adjacent surface of the pinion 1 and so that they will have contact with the opposite inner intermediate portions of a cylindrical shield 11, frictionally fitted over the said pinion and bears at its lower terminal on the usual toothed wheel or pinion 12, that gears with the hand motion and disposed over the ordinary pillow-plate 13. It will be understood that the hour-wheel rotates on the cylindrical shield, and the portions of the springs at their central outer portions bearing on the said shield are formed straight, as shown at 14, to render the contact thereof with the shield of a positive and reliable nature, and by directing the terminals of the wing 9 as set forth they are prevented from contacting with the walls of the slot members with which they engage, and thus obviate any obstruction to the free action of the main portions of the springs and at the same time obtain the retentive operation of the said wings, as set forth. The cylindrical shield has been set forth as being frictionally fitted over the cannon-pin; but an obvious equivalent change in the manner of securing the said shield is to internally screw-thread the inner extremity thereof for engagement with corresponding threads on the pinion, though this latter expedient is more cumbersome and expensive.

In the construction thus far described the cannon-pin is firmly held in connection with the arbor, and by the formation of the upper double bevel-groove 3 the said pinion and shield can be withdrawn unitedly from the arbor without requiring any preliminary detachment of the spring-terminals. In Fig. 4, however, the construction therein disclosed will not permit the shield and pinion to be unitedly removed, and for many reasons this construction might be preferred by manufacturers, though it is considered that the first-described form is far preferable for general purposes. In the modified construction set forth by Fig. 4 the upper double bevel-groove 3 leads to an upper circumferential stop-groove 15, and the upper ends of the springs in this instance are without the blunted construction, as heretofore set forth, to allow said ends to work into the said stop-groove and bear against the upper wall thereof. It will be observed that it will be necessary to first remove the shield in this modified construction and then disconnect the springs from the arbor, for otherwise a withdrawal of the shield and pinion together would cause the upper ends of the springs to lodge in the groove 15 and resist disconnection of the said parts. This modified construction does, however, admit of a double use or operation in relation to the removal of the shield and pinion and the application of the same, as it will be seen that if the springs therein are reversed

or turned end for end to bring the present lower ends uppermost said latter ends will ride over the stop-groove 15, and the same operation can be pursued as in the first-described form. This duplex provision in one structure is exceptionally beneficial in view of the fact that the choice or selection and demands of various users and manufacturers can thus be satisfied by one device by a simple reversal of the springs.

In Figs. 7, 8, and 8^a a further modification in the construction is disclosed, and this form of the improved mechanism comprises an arbor 2, with a single central bevel-groove 16, and the springs 17 are reversely bowed and have a convex projection inwardly, the cannon-pin also in this instance having opposite diametrically-located slots 18, with lateral slots 19 extending from the interior partially outwardly therethrough to give a seating to intermediate wings 20 of the springs to hold the latter in steady working position, and the upper and lower ends of said springs are blunted and bear against the upper and lower inner portions of the cylindrical shield, as shown.

In Figs. 9, 10, 10^a, and 11 a still further modification is shown, and in this instance the arbor 2 is formed with upper and lower single bevel-grooves 21, and the springs 22 have upper and lower laterally-projecting wings 23, which engage the said grooves. The springs 22 are perfectly straight in this construction and play in longitudinal slots 24 in the opposite sides of the cannon-pin 1, the lateral wings 23 being located in upper and lower lateral members 25 of the said slots. The springs 22 are of the form shown by Fig. 11 before they are placed within the slots of the cannon-pin and engaged by the shield fitted thereover, and it will be seen that they are thus forced inward to cause the wings thereof to engage the upper and lower grooves of the arbor with considerable friction, and thus maintain the connected relationship of the several parts. The springs 17 are also primarily of a more contracted bow, and after they are engaged by the shield their central portions are projected against the center of the arbor with strong frictional force, and to set up a practical engagement of the said latter springs with the single-grooved arbor shown by Figs. 7 and 8 they are provided with inwardly-projecting bearing lugs or cones 26, which engage the groove of the arbor, as shown.

The foregoing main disclosure and modifications are of course subject to many other variations, and the change in the form of the springs might be continued indefinitely; but the number of different forms shown indicate with certainty the idea of covering all classes of springs loosely resting or mounted in slots in the cannon-pin and engaging or having members engaging different portions or a single portion of the arbor and held in positive locking position to prevent the pinion from

being accidentally moved or obstruct its working loose, but at the same time permit it and the shield to be disconnected or applied in a simple and effective manner and with benefit to the entire movement in relation thereto. It will be seen that the springs in all the forms are held in the best possible position to obtain the most reliable frictional contact thereof with the arbor, and in all the forms also the shield plays an important part in combination with the slotted cannon-pinion and the springs, and the appended claims will embody the salient structural features in the broadest sense possible without limitations to specific details. The several constructions are simple and involve immaterial changes in the ordinary organization of the parts to which they are applied compared to the manifold advantages accruing from their utilization.

Having thus described the invention, what is claimed as new is—

1. The combination of a cannon-pinion provided with opposite slots having lateral branches, a grooved arbor receiving the pinion, and the oppositely-disposed springs loosely mounted in the said slots and engaging the grooved arbor, said springs being provided with laterally-projecting arms arranged in the lateral branches of the slots and retaining the springs in position, substantially as described.

2. The combination of a cannon-pinion provided with opposite slots having lateral branches, a grooved arbor receiving the pinion, springs loosely mounted in the slots of the pinion and having laterally-extending arms arranged in the lateral branches of the slots and retaining the springs in position, said springs engaging the grooved arbor, and a shield slipped over the pinion and engaging

the springs to cause the latter to frictionally bear against the arbor, substantially as described.

3. The combination of a cannon-pinion having diametrically-disposed slots provided with laterally-extending branches, springs loosely mounted in the slots and provided with laterally-extending arms arranged in the said branches and adapted to retain the springs in position, a grooved arbor receiving the pinion and engaged by the springs, and means for causing the springs to engage the arbor, substantially as described.

4. The combination of a cannon-pinion having opposite slots provided with lateral branches, springs loosely arranged in the slots and having laterally-extending arms arranged in the lateral branches of the slots and retaining the springs in position, an arbor having upper and lower grooves engaged by the springs, and a shield arranged over the pinion and causing the springs to engage the arbor, substantially as described.

5. The combination of a cannon-pinion provided with slots arranged diametrically opposite each other and having laterally-extending branches arranged in pairs, springs loosely mounted in the slots and provided with laterally-extending arms arranged in pairs and located in the lateral branches of the slots to retain the springs in position, and an arbor engaged by the springs, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MICHAEL SPORLEDER.

Witnesses:

CHAS. N. SNYDER,
JOHN F. MURRAY.