

(No Model.)

H. H. PULVER.  
MAINSRING WINDER.

No. 333,251.

Patented Dec. 29, 1885.

Fig:1.

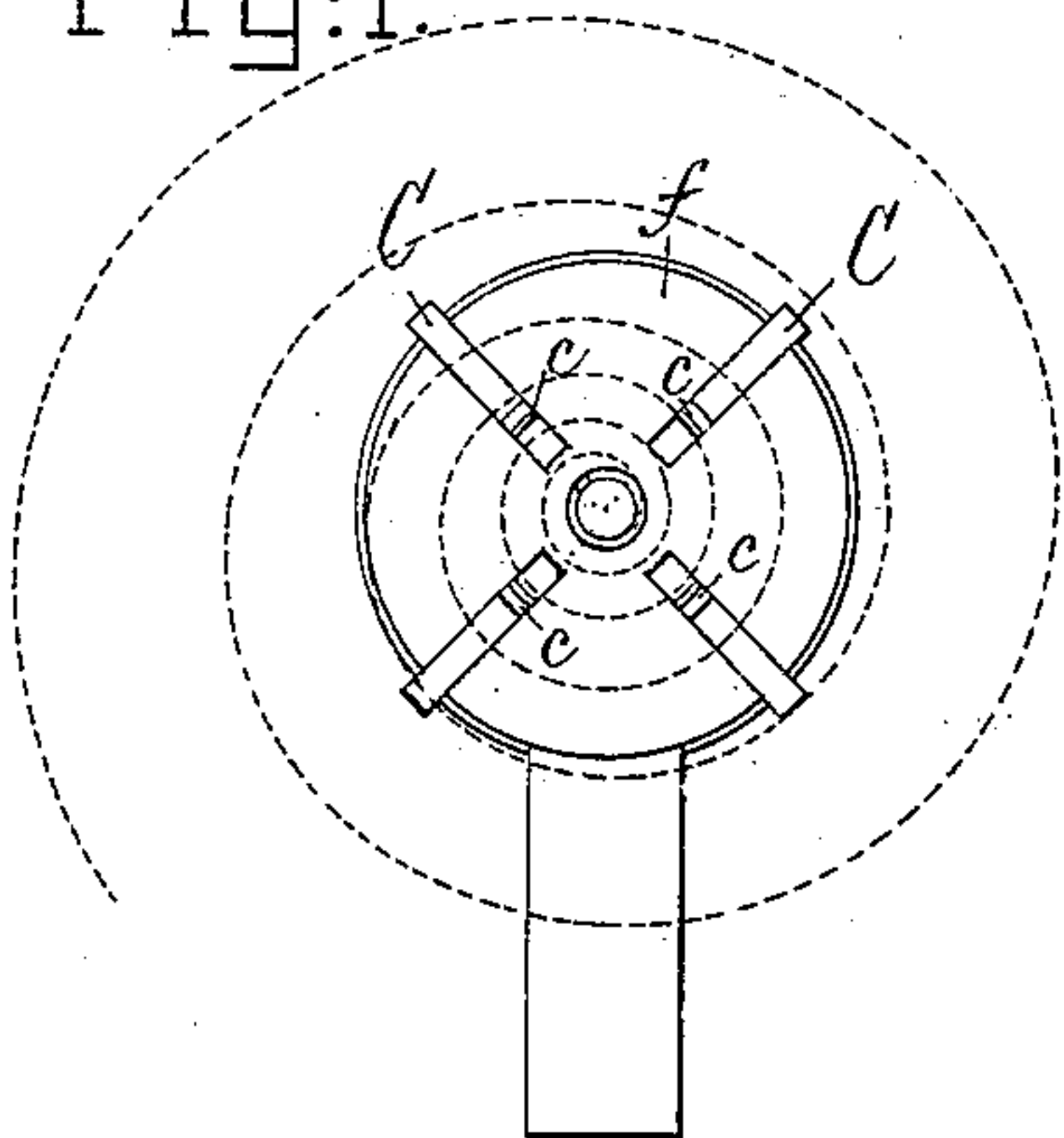


Fig:3.

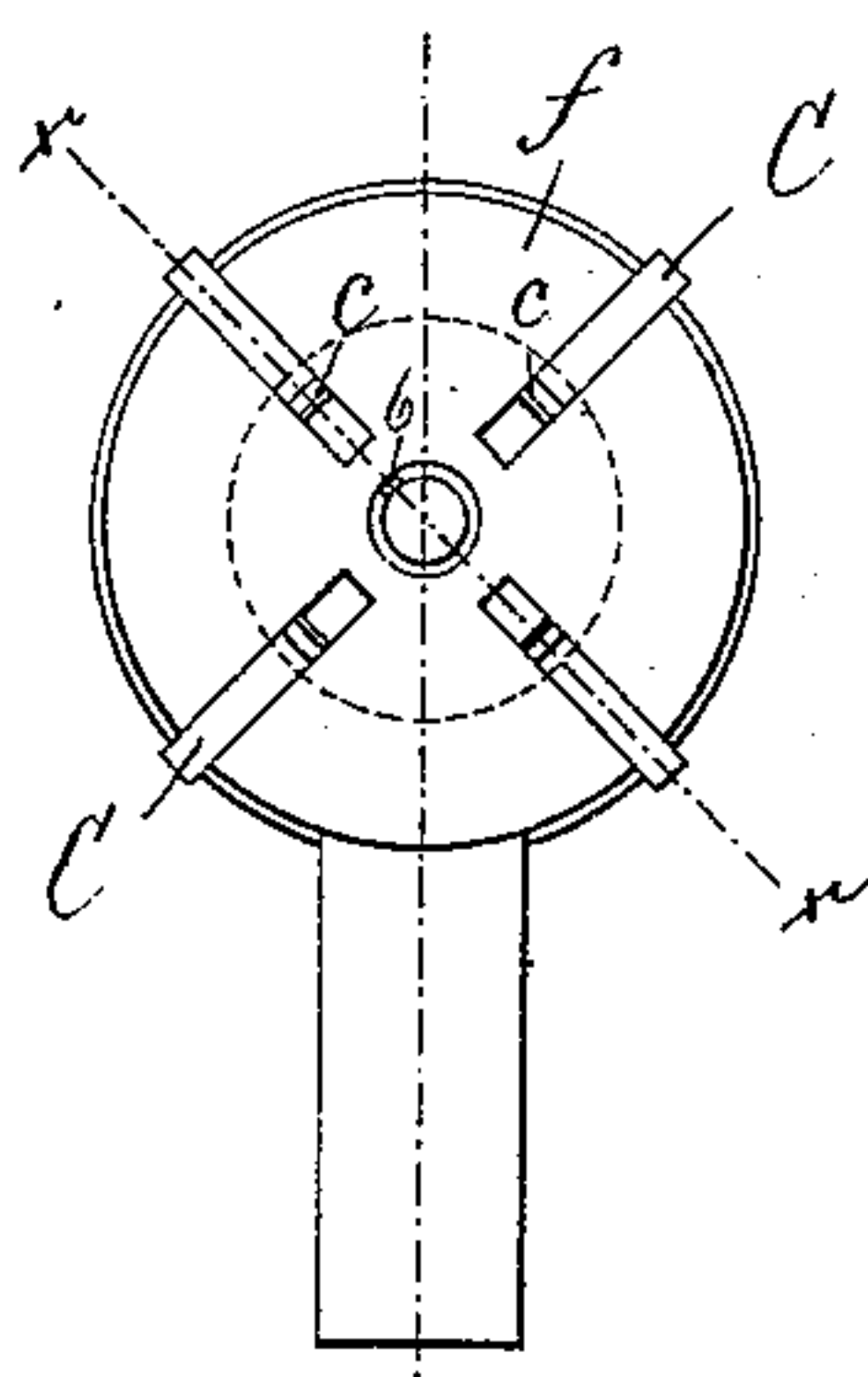


Fig:5.

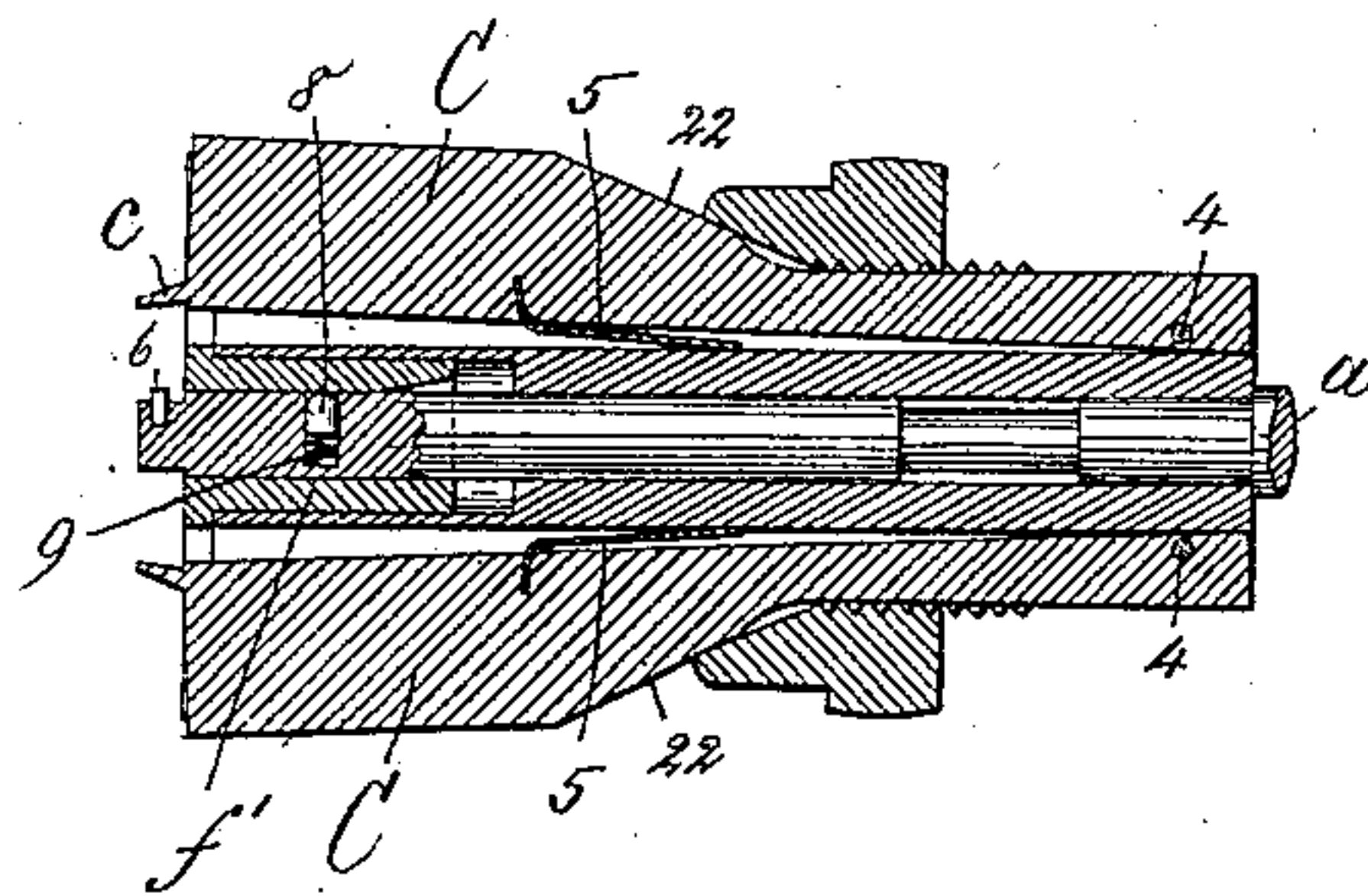


Fig:2.

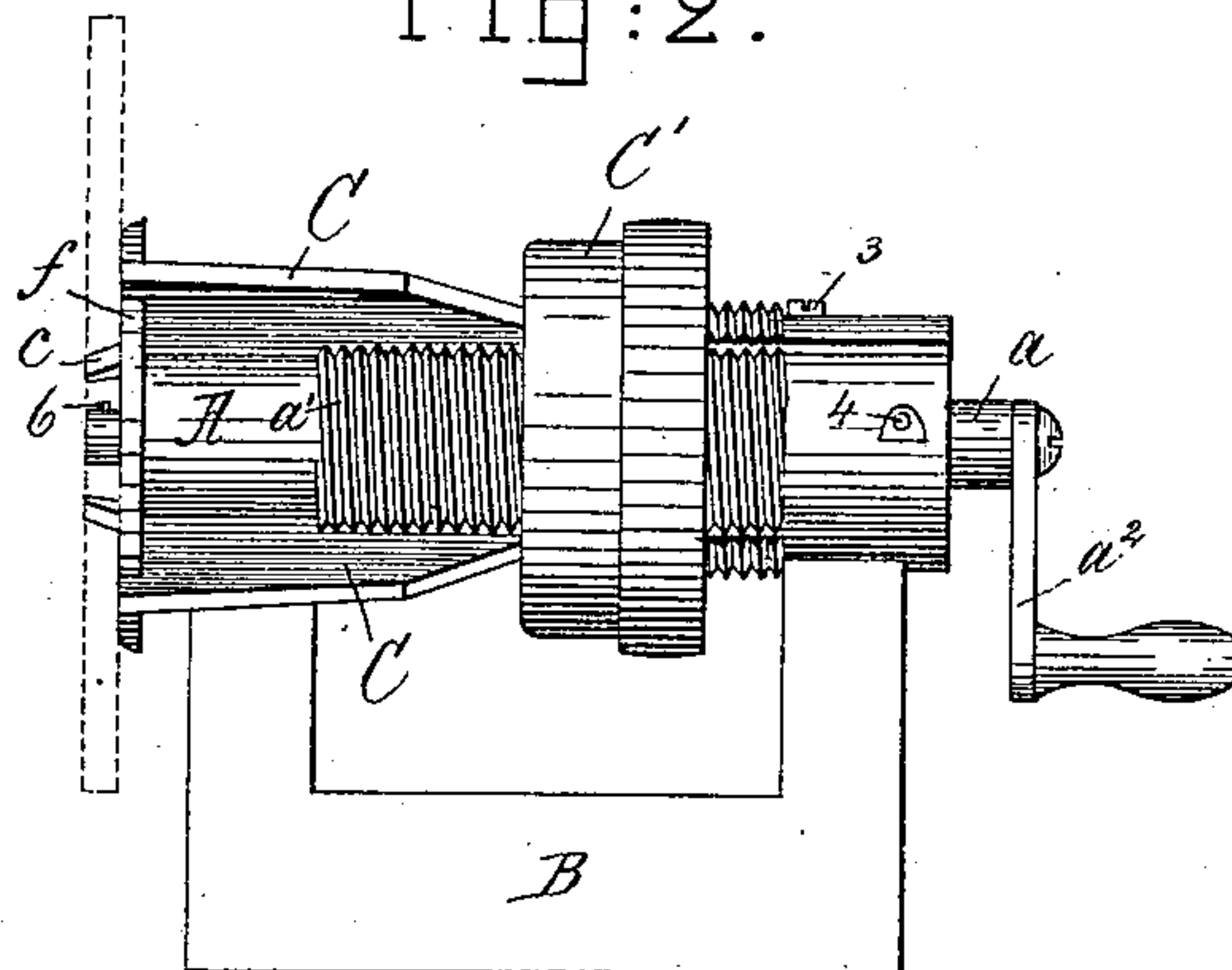


Fig:4.

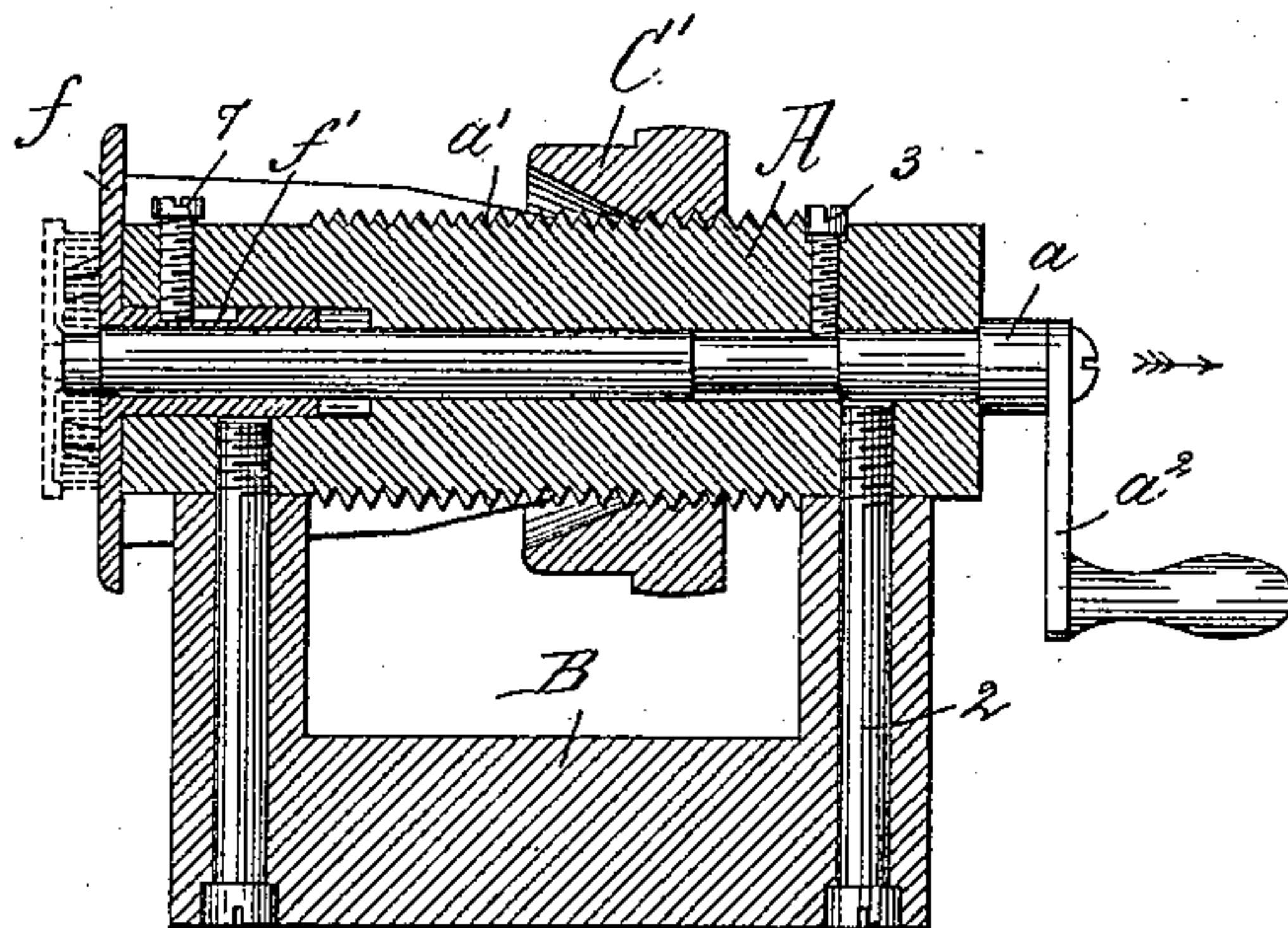
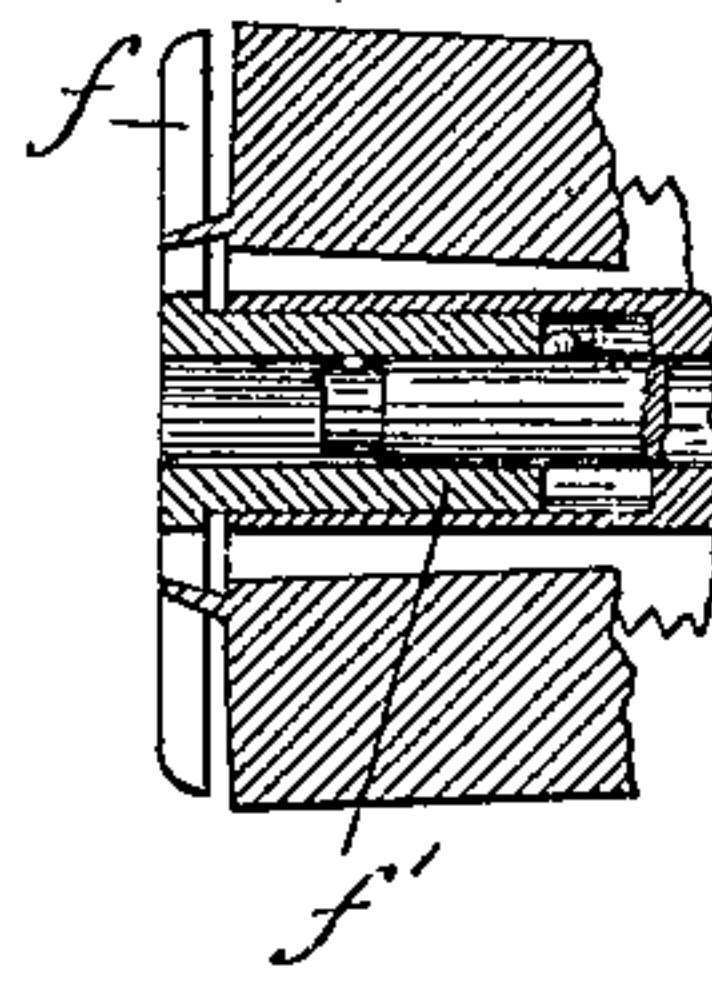
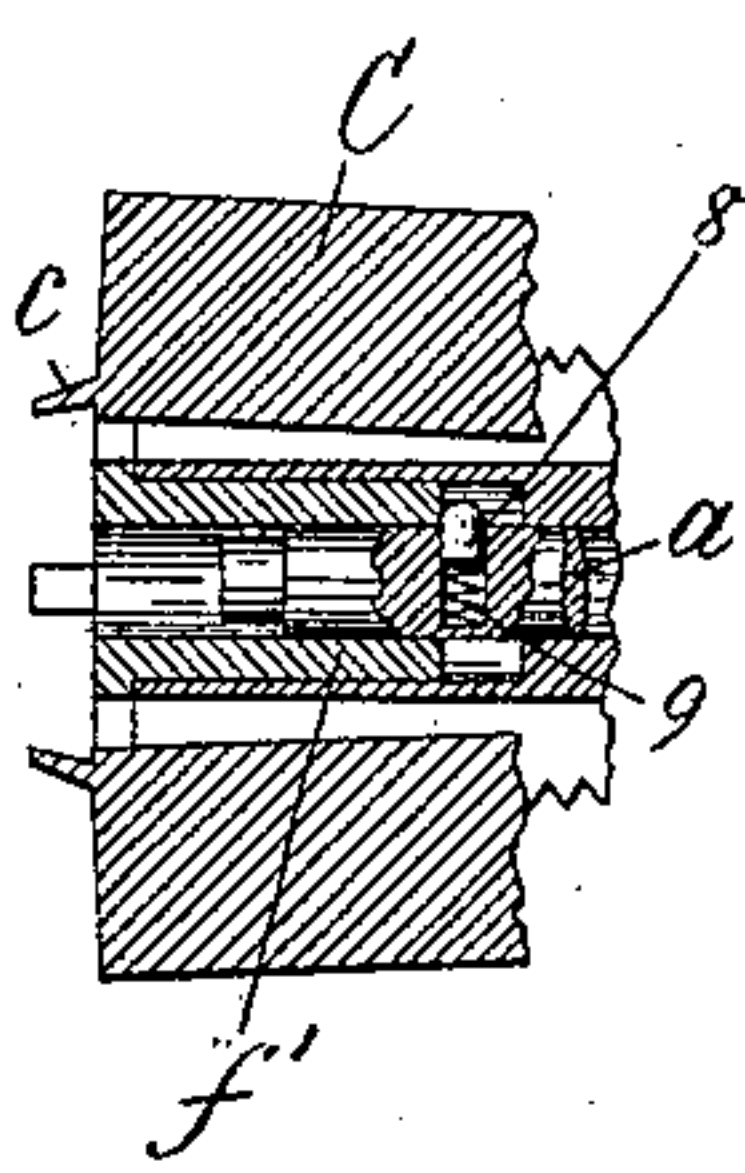


Fig:6.

Fig:7.



Witnesses.

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# UNITED STATES PATENT OFFICE.

HENRY H. PULVER, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN STARK, JR., OF SAME PLACE.

## MAINSRING-WINDER.

SPECIFICATION forming part of Letters Patent No. 333,251, dated December 29, 1885.

Application filed August 24, 1885. Serial No. 175,188. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY H. PULVER, of Waltham, county of Middlesex, and State of Massachusetts, have invented an Improvement in Apparatus for Winding Mainsprings, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object to construct a simple and efficient device by which mainsprings of watches, &c., may be properly and quickly wound and placed within the usual barrels, ready for use.

15 The invention consists, essentially, of a head-block bored axially to receive a rotating spindle, combined with radially-movable spring-holding jaws mounted in said head-block, adjustment of the free ends of the said jaws, determining the diameter externally for the coil of mainsprings to be wound, thereby enabling each spring to be wound to fit the particular barrel to which it is to be applied; also, in combination, with the head-block, its spindle, and 20 the adjustable spring-holding jaws, mounted in said head-block, of a discharge plunger or follower operated by the spindle to free each mainspring after it is coiled, as will be hereinafter more fully described.

30 The adjustable jaws project forward sufficiently to form a holder, within which the springs may be coiled. The spindle normally projects forward sufficiently to permit the mainspring to be wound thereon, and is provided with a spur to engage the end of the said mainspring while it is being wound. The spindle is also capable of a longitudinal reciprocating movement, so that after the spring has been wound thereon within the projecting 35 ends of the adjustable jaws the spindle may be withdrawn, leaving the spring within the said adjustable jaws, it being held thereby by its tendency to recoil. The spindle after being withdrawn is made to engage the discharge-plunger and force the latter forward, freeing the spring from the adjustable jaws, the barrel into which the spring is desired to be deposited being previously placed over the adjustable jaws, so as to receive the spring as it 45 is forced outward between the ends of the said adjustable jaws by the discharge-plunger.

Figure 1 represents a front end view of an apparatus for winding mainsprings, a mainspring placed in position to be wound being shown in dotted line; Fig. 2, a side elevation thereof; Fig. 3, a similar view to Fig. 1, the spring being coiled; Fig. 4, a longitudinal section of Fig. 2, the spring being coiled, a barrel, shown by dotted lines, being applied to receive the spring as it is discharged; 55 Fig. 5, a section in the dotted line *x x*, Fig. 3, of a portion of the apparatus, showing the adjustable jaws; and Figs. 6 and 7 are details to be referred to.

The head-block A, preferably of cylindrical 65 form, is securely fixed to a frame or yoke, B, by screws 2. The head-block A is bored axially to receive a shaft or spindle, *a*, which is herein shown as rotated by the crank *a*<sup>2</sup>, a screw, 3, passing into the head-block A and 70 entering a reduced portion of the spindle *a*, preventing the latter from being removed. Each adjustable spring-holding jaw C (herein shown as four in number) is pivoted within the head-block A by a pin, 4, so as to be 75 moved radially with relation to the spindle *a*. The free ends of the adjustable jaws C normally project a little beyond the face of the head-block A, and for a portion of their length between their pivotal points 4 and their free 80 ends the said jaws are beveled or tapered, as at 22, to be acted upon by the beveled inner face of the jaw-adjusting nut C' turning on a screw-threaded portion, *a*', of the head-block, movement of the nut toward the free ends of 85 the jaws closing the said jaws, uniformly bringing them into the desired position, such inward movement of the jaws acting to compress the springs 5; and consequently it will be understood that by rotating the adjusting-nut C' 90 in one or the other direction the free ends of the jaws may be moved radially toward or from the shaft *a*. The forward ends of the adjustable jaws C are provided with spring-holding spurs *c*, which project therefrom sufficiently far to receive and hold mainsprings 95 of ordinary widths, and the spindle *a* normally projects forward for substantially a like distance, said projecting portion being provided with a spur, 6, which may be made to engage 100 one end of the mainspring and hold the latter while it is being wound. As the barrels



in which the mainsprings are to be placed are of various diameters, it has been found necessary to provide some means by which the springs may be quickly coiled to fit the various-sized barrels.

By the apparatus herein described the barrel into which a spring is to be deposited is placed over the spurs *c* of the adjustable jaws and the adjusting-nut *C'* is rotated until the spurs loosely fit the interior of the barrel, when the latter is removed, the outer sides of the spurs thus serving as a gage. The mainspring to be wound is then made to engage the spur 6 upon the projecting end of the spindle *a*, when the latter is rotated by the crank *a*<sup>2</sup> to wind the spring on the said spindle, the spurs *c* of the adjustable jaws *C* being located radially with relation to the axis of the spindle *a*, forming, as it were, sections or arcs of an inclosing-ring within which the main spring is wound. As the natural tendency of the mainspring is to recoil, it will completely fill the inclosing-ring or bear against all the spurs *c*, whatever distance they may be placed from each other.

After the mainspring has been wound upon the spindle *a* and between the spurs *c* of the adjustable jaws *C* it is discharged therefrom by a discharge-plunger, *f*, of suitable diameter, provided with a sleeve, *f'*, loosely socketed in the cylindrical head-block at its forward end, the screw 7 passing into the head-block, preventing its removal. The plunger *f*, with its sleeve *f'*, serves as a bearing for the forward end of the spindle *a*, and said plunger is slotted radially, as shown in Figs. 1 and 3, to permit the adjustable jaws *C* with their spurs *c* to pass freely. The screw 7 enters a slot or recess of the sleeve *f'*, which is of sufficient length to permit said sleeve with its attached plunger to have a longitudinal reciprocating movement, and the reduced portion of the spindle *a*, into which the screw 3 enters, is of sufficient length to permit of a similar movement of the spindle.

After the mainspring has been wound and it is desired to discharge the same into a barrel the spindle *a* is withdrawn in the direction of the arrow, Fig. 4, until it arrives at the position shown in Fig. 6, when a pin, 8, forced forward by a spring, 9, engages the rear end of the sleeve *f'*, the mainspring, by its tendency to recoil, operating against the spurs *c*, which retain it. The barrel (shown by dotted lines, Fig. 4) into which the mainspring is to be deposited is placed over the spurs *c* of the adjustable jaws *C*, and while held by the hand of the operator the spindle *a* is moved forward, so that the pin 8 forces the plunger *f* forward until it arrives at the position shown in Fig. 7, at which time the mainspring is freed from the spurs *c* and enters the barrel.

When it is desired to provide an ordinary Swiss barrel with a spring, the withdrawal of the spindle *a* gives opportunity for the arbor to enter the head-block, thus permitting the barrel to be brought flush against the face of

the plunger *f*; but for ordinary barrels such movement is not essential.

As both hands are required by the operator, the device is held in a vise, the jaws of which grip the yoke *B*, thus holding the device with sufficient rigidity to work very fast.

It is obvious that two or more adjusted jaws may be employed, as deemed necessary.

It will readily be seen that the mainsprings may be very quickly wound or coiled into any diameter desired by the apparatus herein described and be discharged from the spurs *c* to enter the barrel with great facility.

I claim—

1. In an apparatus for winding mainsprings, a head-block and rotating spindle passing therethrough, combined with two or more adjustable jaws mounted in said head-block, whereby the diameter of a mainspring to be wound may be gaged, substantially as described.

2. In an apparatus for winding mainsprings, a head-block and rotating spindle passing therethrough, combined with two or more adjustable jaws having spurs between which the spring is wound, and over which a barrel may be placed to adjust the said jaws to the diameter of the barrel, that the spring may fit any particular barrel after it has been wound, substantially as described.

3. In an apparatus for winding mainsprings, the head-block and spindle *a*, passing therethrough, having a rotating and a longitudinal reciprocating movement, and the adjustable jaws mounted in said head-block, combined with a discharge-plunger capable of being forced forward by the said spindle *a* when it is desired to discharge a spring from the apparatus, substantially as described.

4. In an apparatus for winding mainsprings, a head-block and rotating spindle, *a*, passing therethrough, upon which the spring may be wound, combined with two or more adjustable jaws mounted in said head-block, and movable radially with relation to its axis, and having spurs between which the spring is wound, and over which a barrel may be placed to adjust the said jaws to the diameter of the barrel, that the spring to be wound may fit its barrel and the adjusting-nut *C'*, substantially as described.

5. In an apparatus for winding mainsprings, a head-block and spindle passing therethrough, upon which a mainspring may be wound, said spindle having a rotary and a longitudinal reciprocating movement, combined with the adjustable jaws mounted in said head-block, and provided with spurs *c*, over which a barrel may be placed to gage the diameter it is desired that the spring to be wound shall have, and between which the spring may be wound and retained when the spindle is withdrawn, the discharge-plunger engaged as it is withdrawn, freeing the main spring from the spurs *c*, over which latter the barrel is placed to receive it, substantially as described.



6. In an apparatus for winding mainsprings, the head - block and spindle passing there-  
through, having a rotary and a longitudinal  
reciprocating movement, and having a pin, 8,  
5 and spring 9, and the adjustable jaws mount-  
ed in said head-block, combined with a dis-  
charge-plunger capable of being forced for-  
ward by the spindle *a* when it is desired to  
discharge the spring from the apparatus, sub-  
10 stantially as described.

7. In an apparatus for winding mainsprings,  
the head-block and adjustable jaws mounted

therein, combined with a spindle having a  
longitudinal reciprocating movement, where-  
by the spindle may be withdrawn to permit 15  
the entrance of the arbor of a barrel, substan-  
tially as described.

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

HENRY H. PULVER.

Witnesses:

G. W. GREGORY,  
B. J. NOYES.