

(No Model.)

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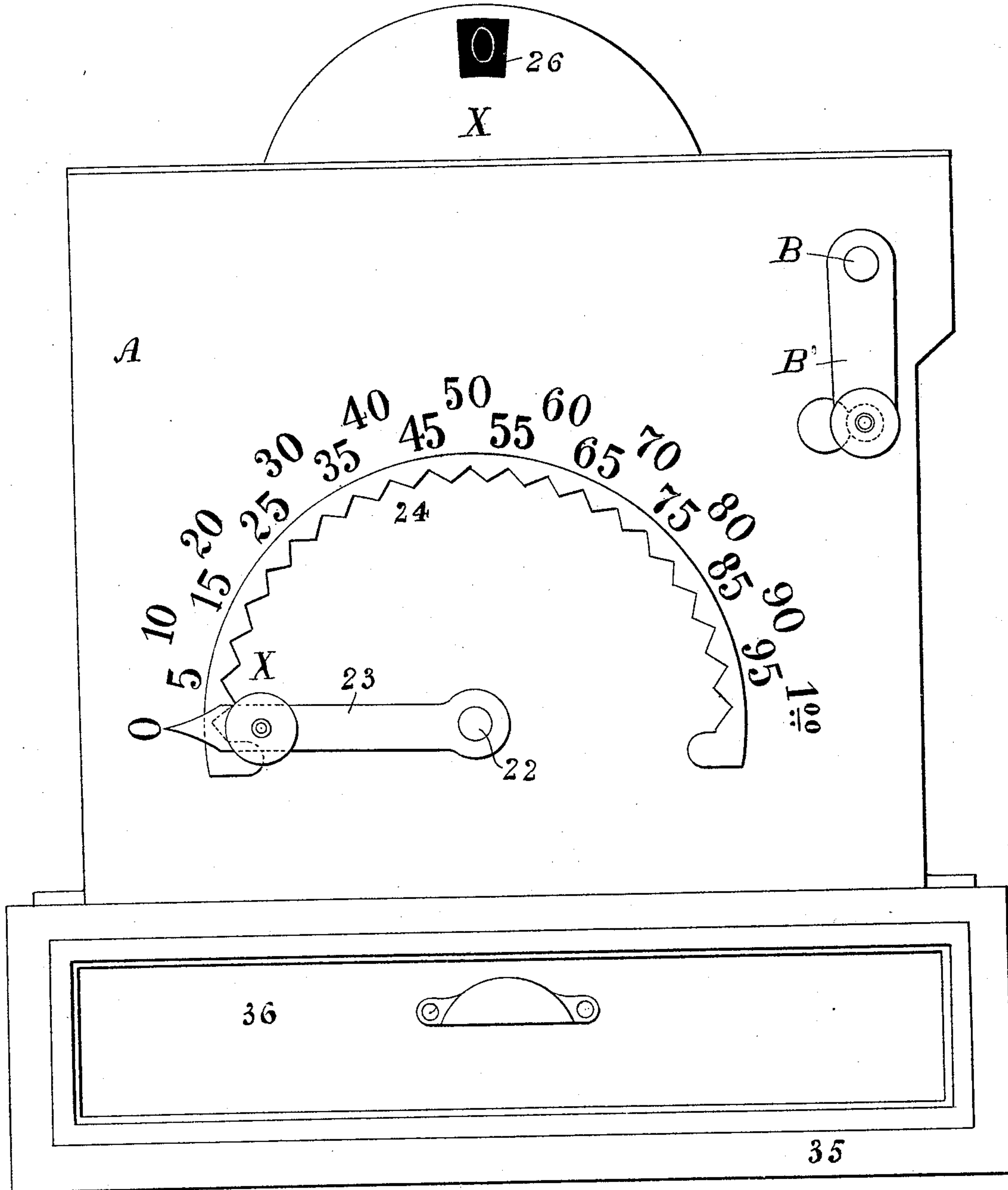
W. KOCH.

PAWL LOCKING DEVICE FOR CASH REGISTERS AND INDICATORS.

No. 509,666.

Patented Nov. 28, 1893.

Fig. 1



Witnesses
Chas. Hanemann
H. Marler

Inventor,
William Koch
By his Attorney
E. H. Graham

(No Model.)

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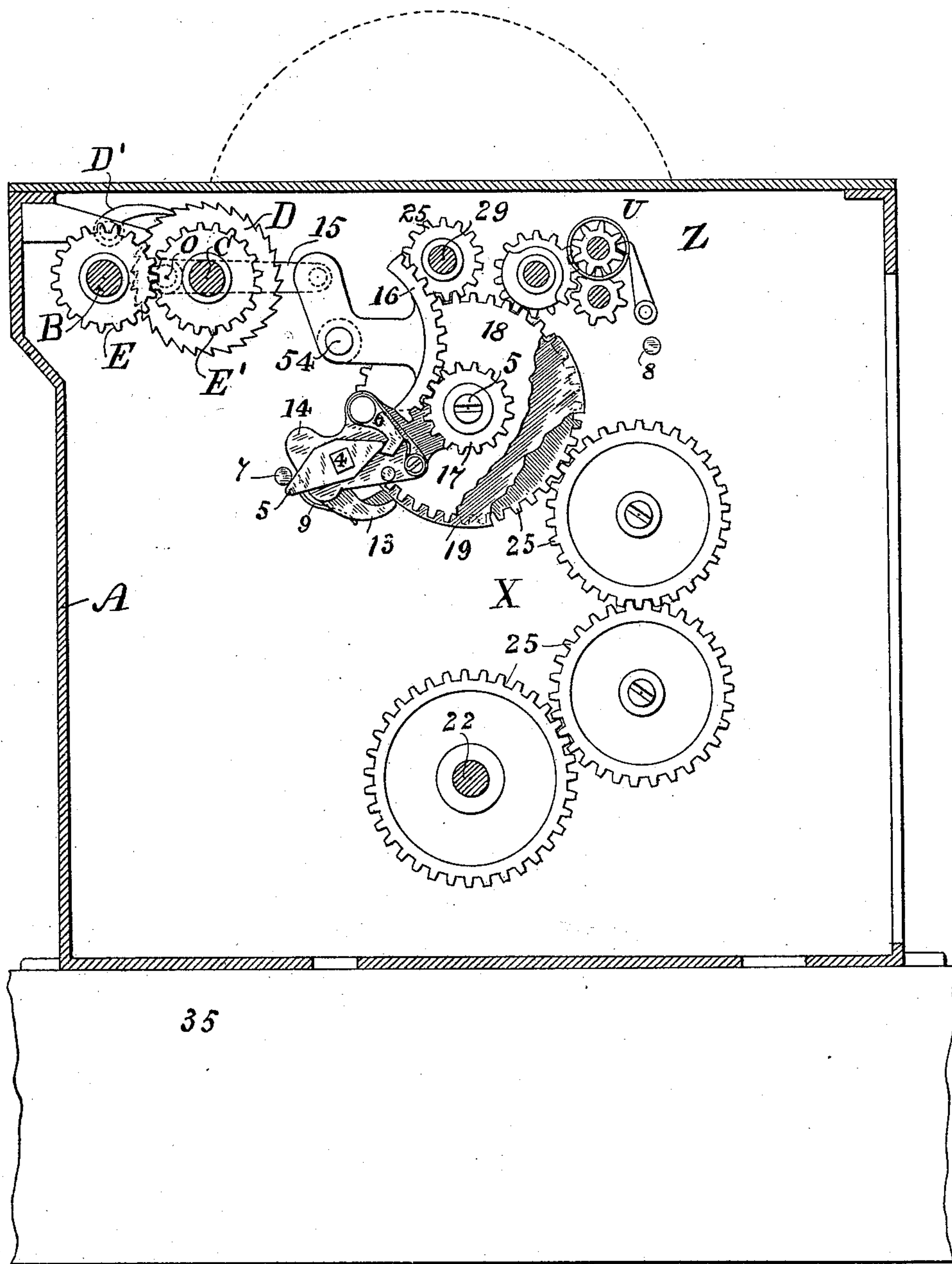
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Fig. 2.



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Fig. 4.

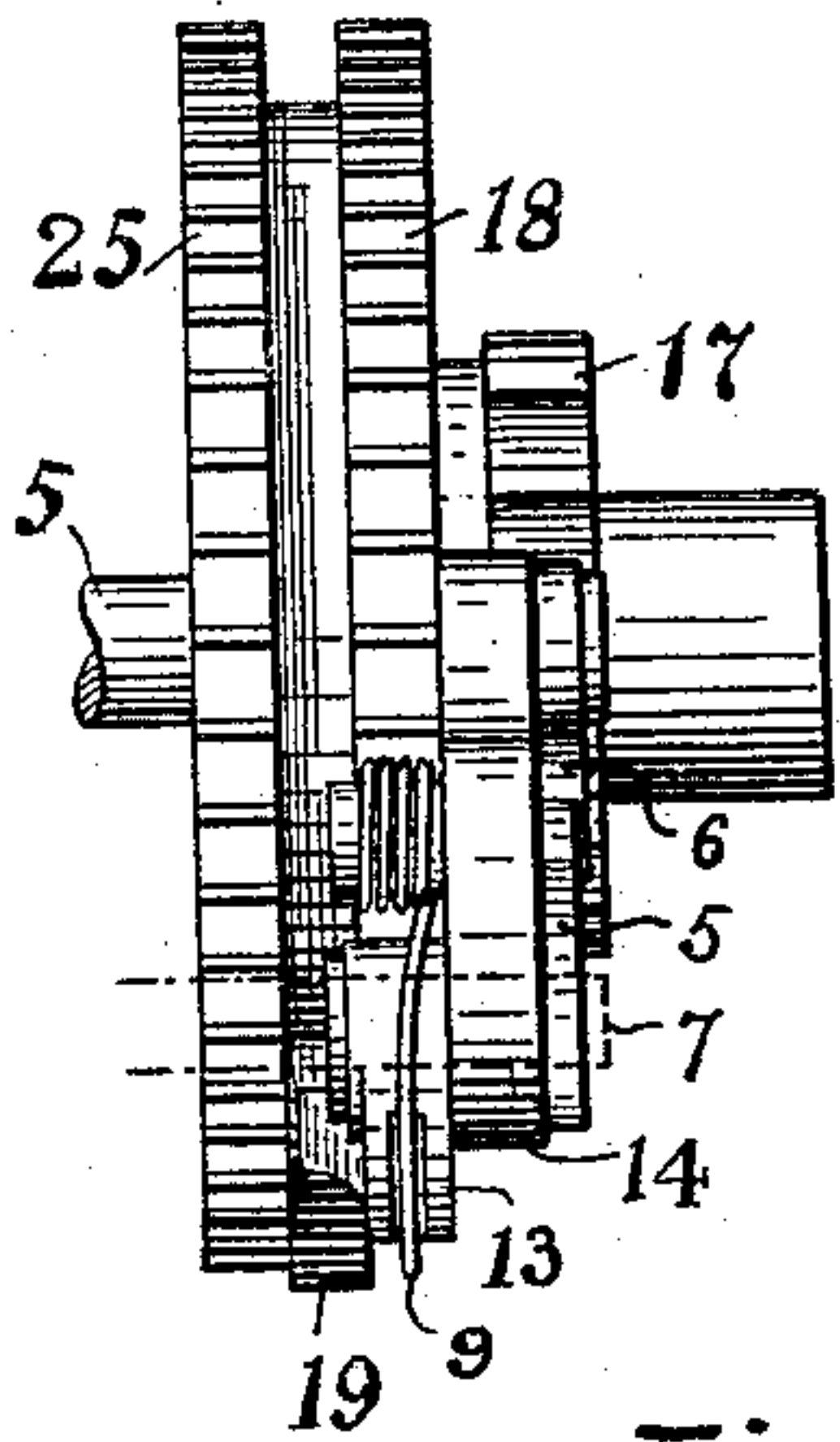


Fig. 3.

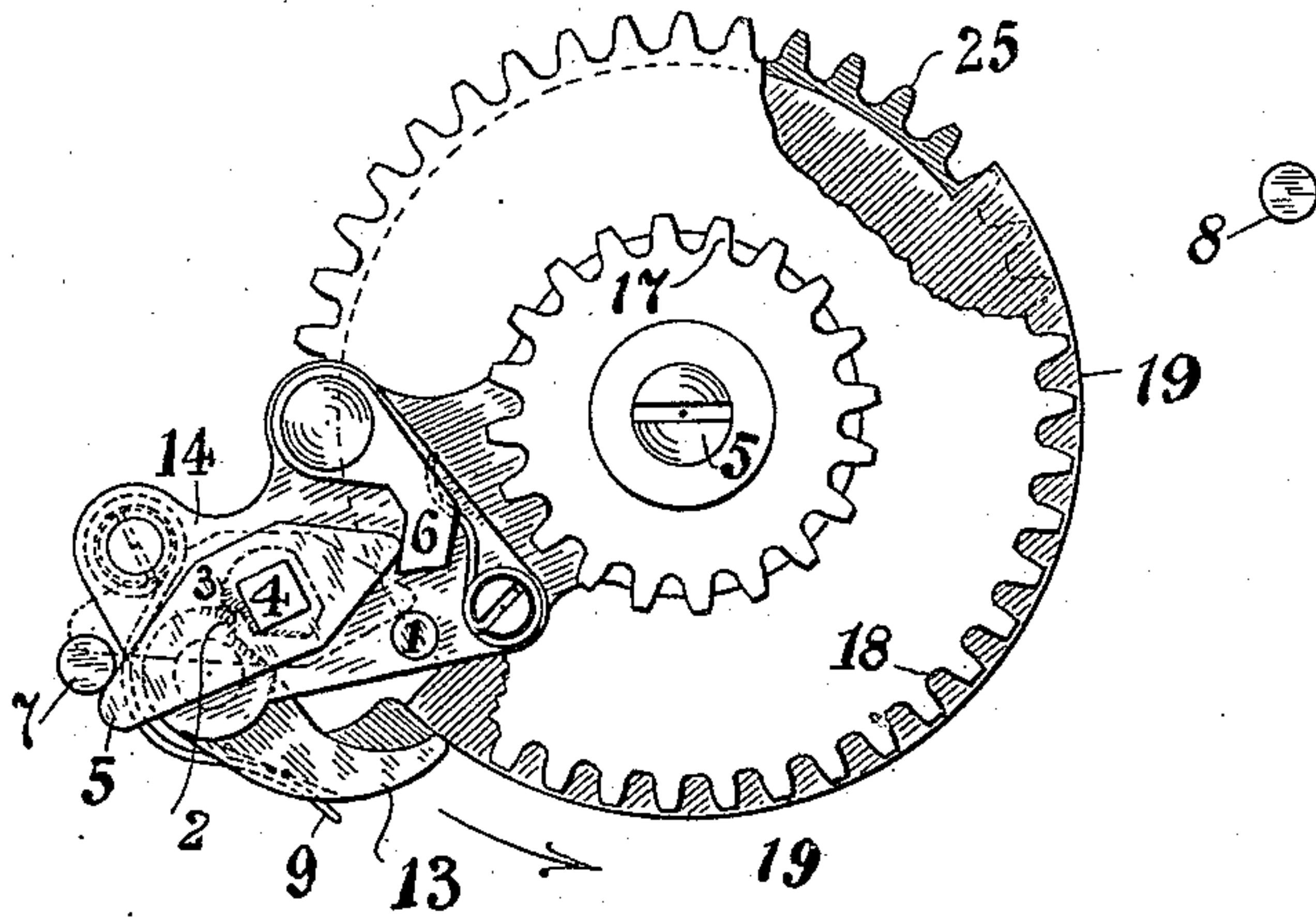


Fig. 5.

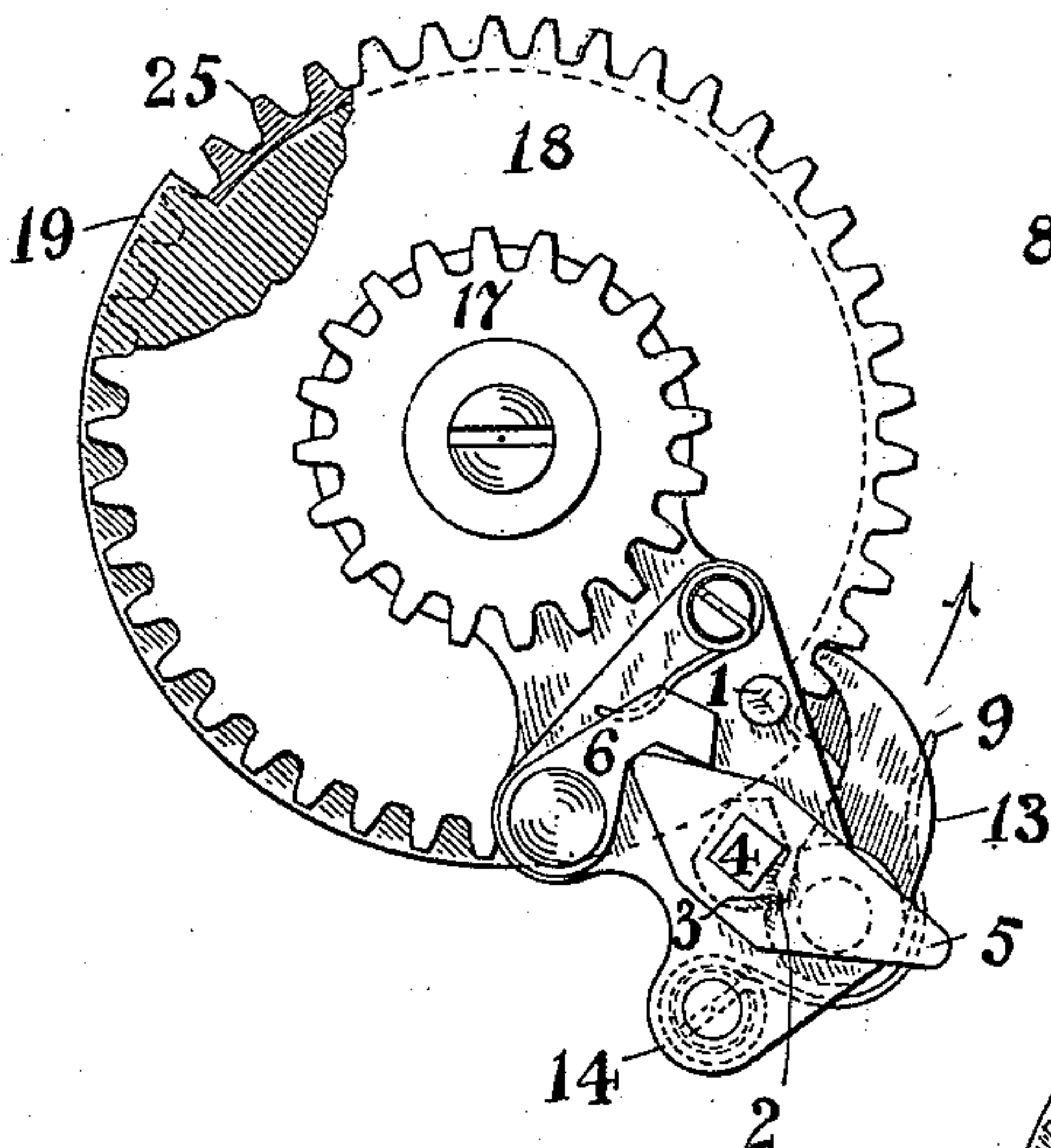


Fig. 7.

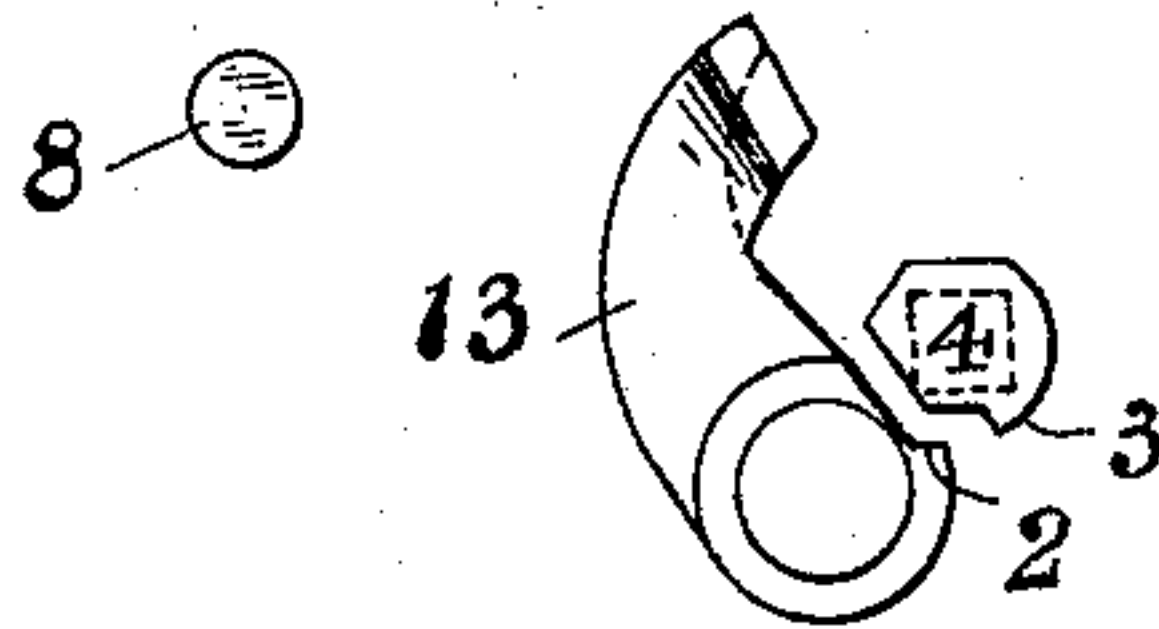


Fig. 8.

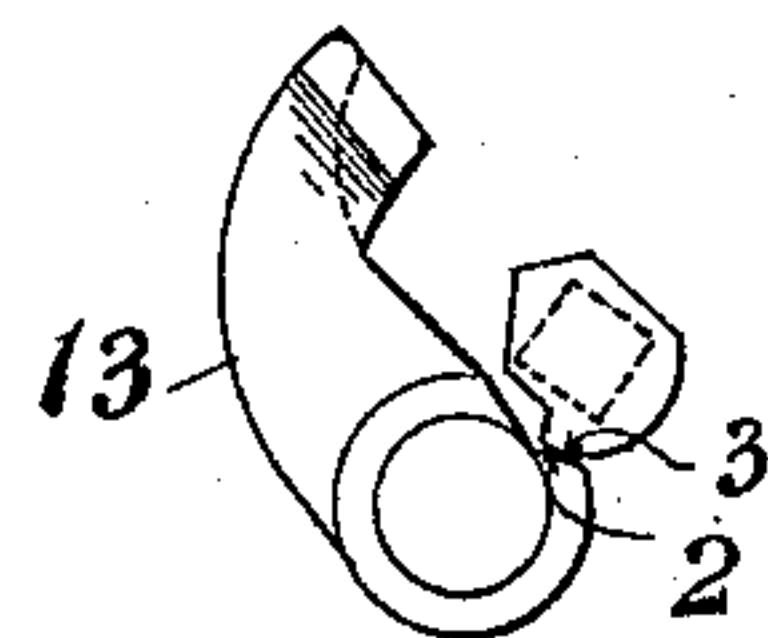
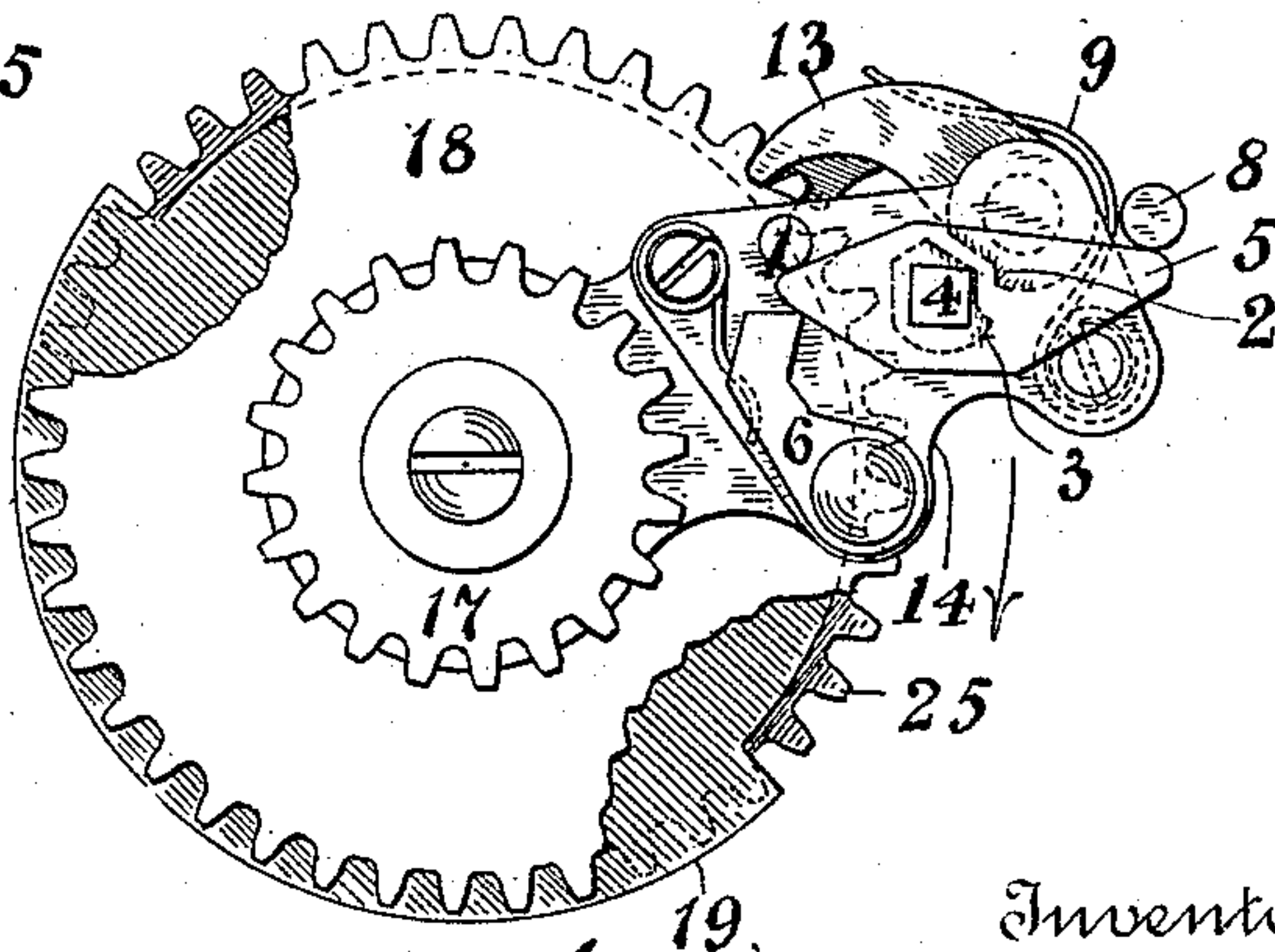


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM KOCH, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO.

PAWL-LOCKING DEVICE FOR CASH REGISTERS AND INDICATORS.

SPECIFICATION forming part of Letters Patent No. 509,666, dated November 28, 1893.

Application filed September 21, 1891. Serial No. 406,303. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KOCH, of the city, county, and State of New York, have invented certain new and useful Improvements in Cash-Registers, of which the following is a specification.

This invention relates generally to cash registers, but more particularly to a means for locking an operating pawl in engagement with a tooth of a wheel that it is to drive; such means being applicable to the operating pawl for moving the registering or adding wheel of a registering machine, such as a cash register, whereby the registering wheels are moved positively the desired distance, obviating the danger of falling short of such movement.

The invention is illustrated in connection with that class of registering machines patented to me by Letters Patent No. 367,213, dated July 26, 1887, as improved by the machine shown and described in Letters Patent No. 428,003, dated May 13, 1890.

In the accompanying drawings:—Figure 1, is a front elevation of a registering and indicating machine embodying the invention. Fig. 2, is a vertical sectional elevation showing a portion of the interior parts of the registering machine looking from the side the reverse of Fig. 1. Fig. 3, is an enlarged detail elevation of the operating pawl, its lock and its immediate connections detached from the machine; a portion of one of the toothed wheels being broken away to disclose underlying parts. Fig. 4, is a side elevation of the same. Figs. 5 and 6, are views similar to Fig. 3, showing the parts in different positions. Figs. 7 and 8 are details of the pawl and its lock looking from the rear side.

Heretofore in such machines the operating pawl has been caused to engage with the teeth or one of the teeth of the wheel with which it engages simply by the action of a spring bearing upon the pawl which was the only medium that tended to hold the pawl in engagement with the wheel and prevent it from moving from engagement therewith. Owing to the absolute necessity that registering machines shall work with great accuracy, and for no reason miss a proper registration, it has been found necessary in practice to provide

some means by which the pawl as soon as it engages with its wheel shall become locked thereto during its operating stroke so that there will be no danger of it jumping out of engagement until it has completed such stroke; and it is to these ends that the present invention is directed.

Before entering upon a detailed description of the novel features of the improvement it may be stated that the machine with which they are shown as embodied, as a means of illustrating one of the uses to which the invention may be put, is contained by a suitable casing A, that is supported upon or secured to a base 35 which provides a compartment to receive a cash drawer or receptacle 36. This machine so far as shown embraces an indicating mechanism X and a registering or adding mechanism Z. The check printing or embossing device, the consecutive numbering device and kindred instrumentalities common to this class of machines being omitted from the drawings, as they do not modify or control the action of the present invention. The indicating mechanism X consists as in said Letters Patents, of a revoluble indicator exposing its indication through an opening at the upper end of the inclosing case. With this revoluble indicator is combined an operating handle 23 bearing an index, mounted upon the outside of the case fixedly to the projecting end of a revoluble shaft 22 that is mounted in suitable bearings within the machine. The operating handle is oscillated over the face of a scale or dial 24 delineated on the front face of the inclosing case, which dial, corresponding to the indications upon the revoluble indicator, is made up of numerals within the capacity of the machine to indicate and register. The shaft 22 carries one gear wheel of a train of gear wheels 25, imparting suitable motion to a spindle 29 mounted at the upper portion of the machine, to which spindle one of said train of wheels is secured. This spindle also carries the revoluble indicator, which consists of a disk or wheel 26 bearing upon its face or upon both of its faces numerals or indications corresponding to those of the spindle or dial on the front of the case; the arrangement of the operating handle 23 and the revoluble indicator being

such that said indicator will be moved to expose through the opening in the inclosing case a number corresponding to that on the scale or dial 24 to which the index or the operating handle 23 may point.

The registering mechanism Z consists as usual of a set of registering or adding wheels U adapted to register or add and to preserve the sum of all the amounts registered by the machine. The registering wheels U are mounted in the usual manner and are moved to register the proper amount from an operating wheel 18 that is mounted upon a stud 5 also carrying one of the train of wheels 25. With this operating wheel there is combined a guard 19 movable in unison with the train of wheels 25, secured or formed integral with its contiguous train wheel; the position of the low part of which guard determines the point at which an actuating pawl 13 shall engage with the operating wheel to rotate the latter more or less according to the amount to be registered.

The operating pawl 13 is pivoted to the outer end of a pawl carrier 14 that is loosely hung upon the stud 5 and has fast to it, concentric with said stud, a pinion 17 that in turn is engaged by a toothed segment 16, mounted upon a stud 54 and moved at the proper time by a crank pin O through a connecting rod 15 as will be hereinafter described, and as is shown in said patents. The operating pawl is borne upon by a spring 9 which tends to force it into engagement with the toothed wheel 18 and the hub of the pawl is provided with a shoulder 2 with which co-operates an abutment 3 that is formed on the inner end of a rock shaft 4. This rock shaft is mounted in the pawl carrier 14 and is provided with an operating arm 5, one end of which is engaged by a yielding or spring pressed stop 6 and the other end projects beyond the pawl carrier so that as the latter arrives at the limit of its movement in either direction the arm 5 will strike one or the other of a pair of fixed abutments 7, 8. The operative face of the yielding stop is inclined in opposite directions so that as the end of the arm 5 bears against either portion of the incline it will tend to force the arm to the limit of its movement in that direction; one movement being limited by a pin 1 and the other by a portion of the stop itself.

The locking devices, consisting of the shoulder 2 and movable abutment 3, are so arranged that when the abutment 3 is in the position shown in Figs. 6 and 7, the pawl is free to move out of engagement with the teeth of the wheel 18; and when the abutment 3 is moved into the position shown in Figs. 5 and 8, it underlies the shoulder 2 of the pawl and prevents the pawl from being moved and thus holds it in positive engagement with said toothed wheel. In each of the positions of the movable abutment 3, the yielding stop 6 acting against the end of the arm 5 tends to hold said abutment in its changed posi-

tions, and should the pawl be out of engagement with the toothed wheel 18, as in Fig. 3, when the movable abutment is moved toward its locking position so that it cannot engage with or underlie the shoulder 2, said abutment under the pressure of the spring pressed or yielding stop will constantly bear against the base of the shoulder so that when the shoulder moves by the dropping of the pawl into engagement with the toothed wheel 18 the abutment will immediately be moved into its locking position to lock the pawl in such engagement.

In the operation of the pawl, it will be supposed that the pawl is in engagement with the toothed wheel, as in Fig. 5, and locked in such engagement by the locking device described and that the pawl-carrier and pawl are moving in the direction of the arrow in said figure. Immediately before reaching the limit of movement in this direction the arm 5 strikes the fixed abutment 8, thereby rocking the movable abutment 3 out of locking contact with the shoulder 2, as in Fig. 6, thereby liberating the pawl at the end of its movement in said direction. Upon the reverse movement of the pawl and pawl-carrier in the direction of the arrow, Fig. 6, the pawl being unlocked is free to pass idly over the teeth of the toothed wheel until the guard 19 is reached, when it is lifted entirely off the toothed wheel and continues its rearward movement resting upon the guard until it reaches the limit of this movement as in Fig. 3. Immediately before reaching this position—its normal starting position, the arm 5 has struck the fixed abutment 7, thereby rocking the movable abutment 3 and tending to resume its locking position as before explained, from which it will be understood that in the effective forward movement of the pawl as soon as it engages with the toothed wheel it is locked in engagement therewith until it reaches the limit of such movement, when it is automatically unlocked so as to be free to return idly and thus leave the toothed wheel in its moved position, and as soon as the pawl reaches the end of this idle movement the locking device is adjusted to again lock the pawl in engagement with the toothed wheel at the desired time.

In the practical operation of the registering machine, the indicator will be set to indicate the amount to be registered, thereby, through the train of gearing 25, simultaneously setting the guard 19 in such position with respect to the stroke of the pawl 13 so that the pawl will leave the guard and engage with the toothed wheel 18 at a point in its stroke that will cause a movement of the toothed wheel a distance equivalent to the amount to be added onto the registering wheels. In the position of the guard 19 shown in Fig. 3, the indicator will not have been moved and will still indicate zero as shown in Fig. 1, so that should the pawl and pawl-carrier be moved, the pawl will simply move idly over the surface of the guard without engaging with the toothed wheel

thereby effecting no movement of the registering wheels. If, however, the train of gears 25 be moved so that the guard occupies the position shown in Figs. 5 and 6, the indicator 5 say indicating 50, the pawl in the movement of its carrier will move idly over the guard for a portion of its stroke in the forward direction and then leaving the abrupt end of the guard will engage with the toothed wheel, become 10 locked therewith and during the remainder of its stroke to the position shown in Fig. 6 move that wheel a distance equal to 50 and thus have caused a corresponding movement of the registering wheels and have added 50 thereto. 15 As before explained, the return stroke of the pawl and its carrier is an idle one back to its normal position indicated in Fig. 3.

The pawl and its carrier in its present embodiment of the invention are rocked by the 20 rotation of a crank B', fast to the outer end of the shaft B which shaft through the gears E E' rotates the crank shaft C which through its crank pin O and connecting rod 15 rocks the toothed segment 16 that is in gear with the 25 pinion 17 fast to the pawl carrier. One complete rotation of the crank B' suffices to cause a complete stroke of the pawl and its carrier from their normal position forward and return to said position, so that the stroke of the pawl 30 is always a constant one, the extent of movement imparted to the toothed wheel 18 being governed by the position of the guard 19.

It is obvious that the improved pawl locking device may be modified without departing 35 from the spirit of the invention.

What is claimed is—

1. The combination of a toothed wheel, a reciprocating actuating pawl therefor, a locking 40 device moving with the pawl and operating to lock it to the wheel as soon as engaged therewith, and a stop co-operating therewith to unlock the pawl at the end of its registering stroke, substantially as described.

2. The combination of a toothed wheel and 45 guard plate, a reciprocating actuating pawl for the wheel co-operating with the guard-plate, a locking device moving with the pawl-carrier and co-operating with the pawl to automatically lock it in engagement with the 50 wheel as soon as it clears the guard-plate, and movable into and out of locking position, means for yieldingly holding it in each of such positions, and means for shifting it from one to the other, substantially as described.

3. The combination of a toothed wheel, a 55 reciprocating actuating pawl therefor, an oscillating locking device or abutment moving with the pawl-carrier and co-operating with the pawl to lock it in engagement with the 60 toothed wheel, fixed stops at the opposite ends of the stroke of the pawl for shifting said locking device from one position to another,

and a spring-pressed stop or detent yieldingly holding the locking device in its opposite adjusted positions, substantially as described. 65

4. The combination of a toothed wheel, a pawl-carrier hung loosely upon the axis of the wheel and carrying a pawl spring-pressed toward the wheel, a rock-shaft journaled in the pawl-carrier, a locking abutment upon said 70 shaft co-operating with the pawl to hold it in engagement with the toothed wheel, an arm fast upon said rock-shaft, two fixed stops at the opposite ends of the strokes of the pawl co-operating with said arm to rock the shaft 75 and move the locking abutment into and out of locking position, and means for yieldingly holding the rock-shaft in its opposite positions, substantially as described.

5. The combination with the pawl carrier 80 and pawl and its toothed wheel, of a shoulder on the pawl and a movable abutment mounted in the pawl-carrier for engaging the shoulder of the pawl and locking the pawl in engagement with the wheel, substantially as 85 described.

6. The combination with the pawl and its toothed wheel, of a shoulder on the pawl, an engaging abutment for locking the pawl in engagement with the wheel, an arm connected 90 with the abutment and a fixed abutment with which the arm contacts, substantially as described.

7. The combination with the pawl and its toothed wheel, of a shoulder on the pawl, a 95 coacting abutment, an arm connected with the abutment, a yielding stop engaging with one end of the arm, and a fixed abutment in the path of the other end of the arm, substantially as described. 100

8. The combination with the pawl and its toothed wheel, of a shoulder on the pawl, a coacting abutment, an arm connected with the abutment, a yielding stop engaging with 105 one end of the arm and two fixed abutments in the path of the other end of the arm, substantially as described.

9. The combination with the pawl and its toothed wheel and coacting guard, of a locking device for the pawl and abutments for 110 moving said locking device into and out of operative position, substantially as described.

10. The combination with the pawl and its toothed wheel and coacting guard, of a locking device for the pawl and a spring holding 115 said locking device to duty, substantially as described.

In witness whereof I have signed my name, in the presence of two witnesses, this 16th day of September, 1891.

WILLIAM KOCH.

Witnesses:

N. MARLER,
GEO. H. GRAHAM.