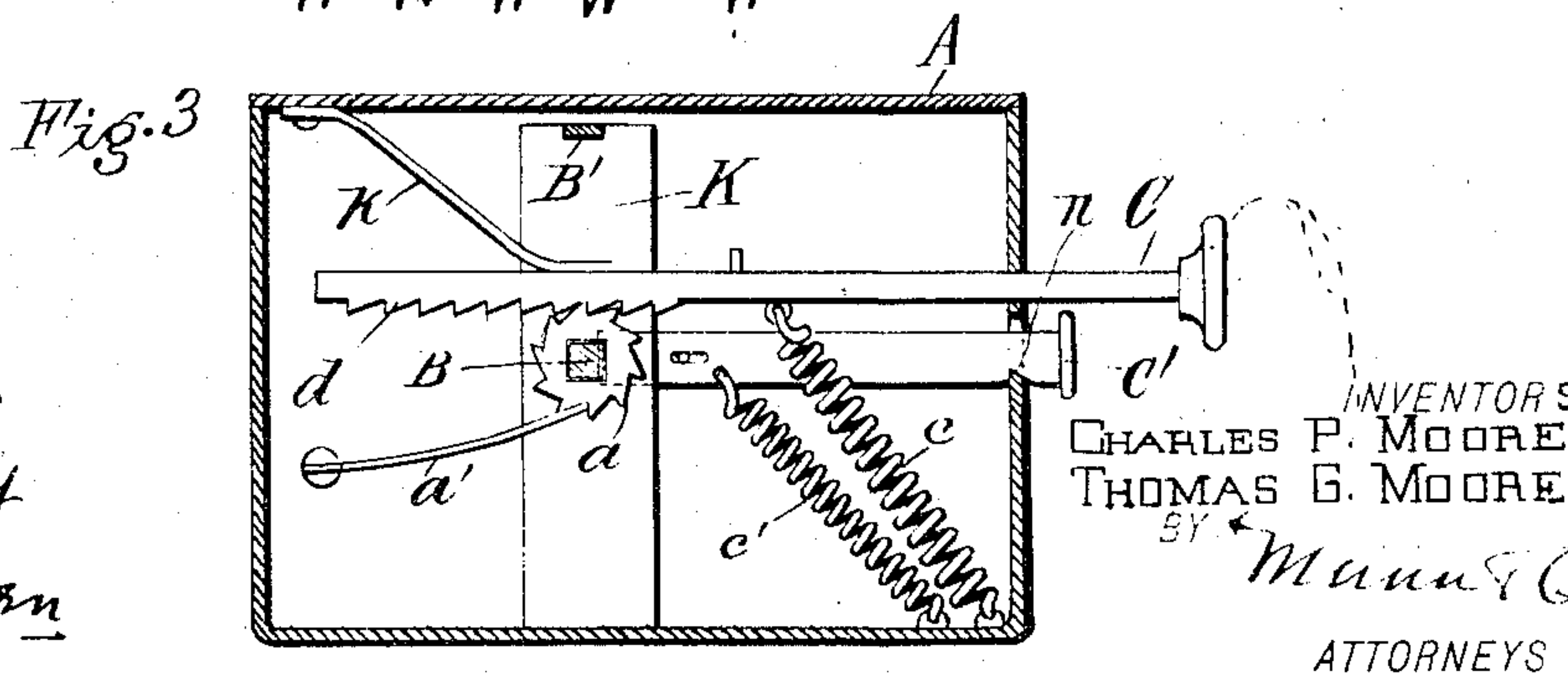
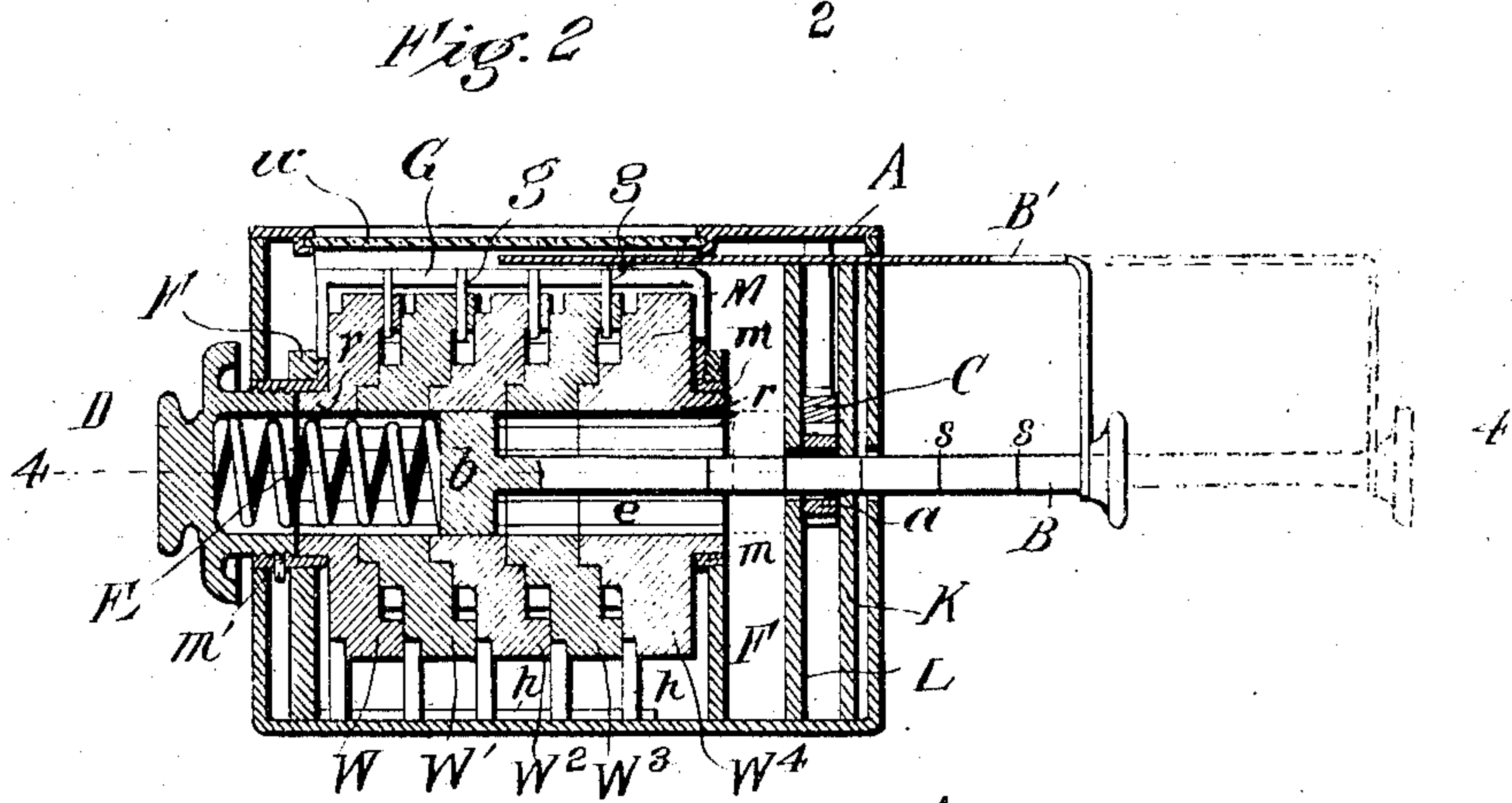
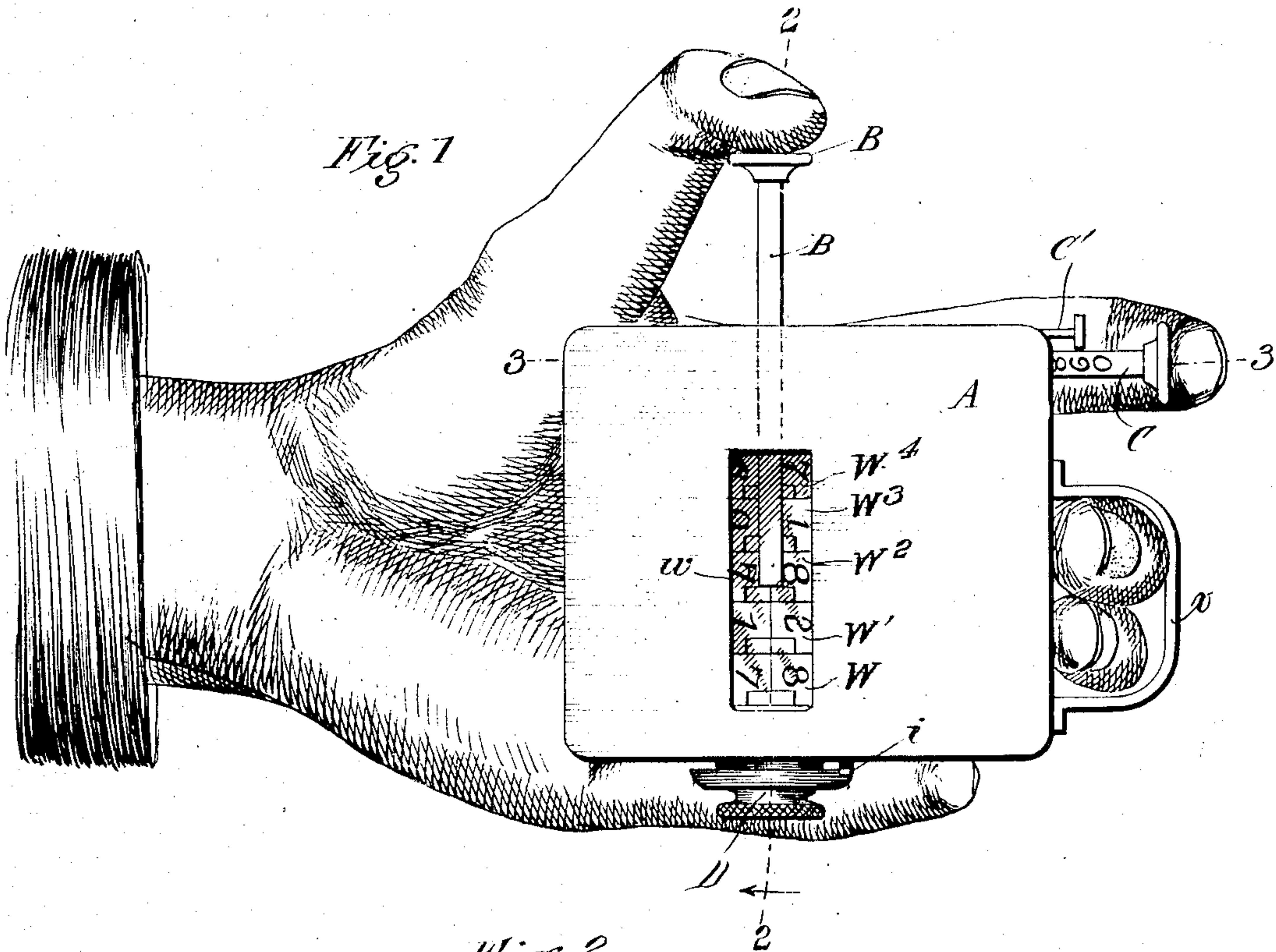


No. 865,200.

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 ADDING MACHINE.  
 APPLICATION FILED JAN. 4, 1907.

PATENTED SEPT. 3, 1907.

2 SHEETS—SHEET 1.



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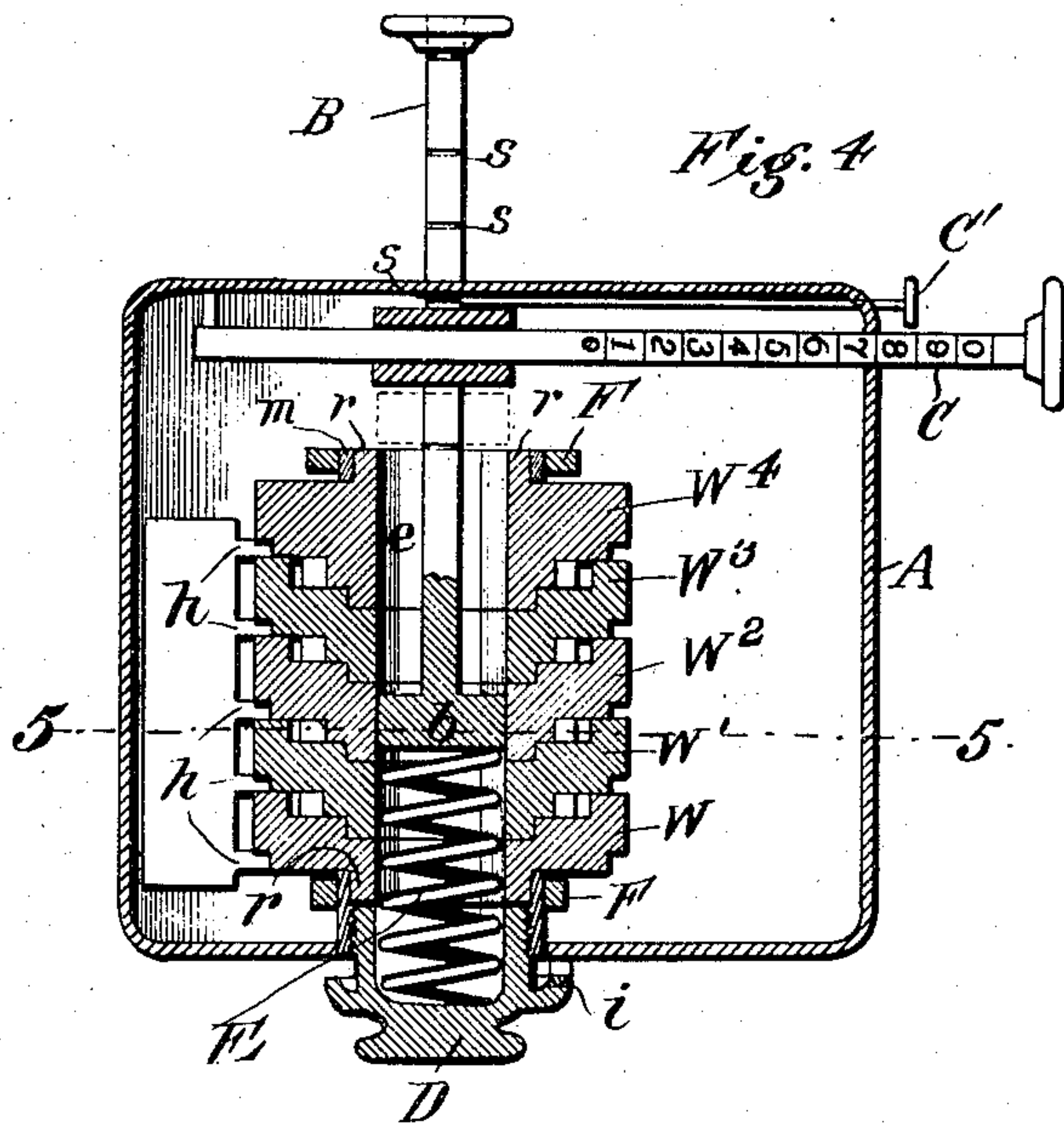


Fig. 5

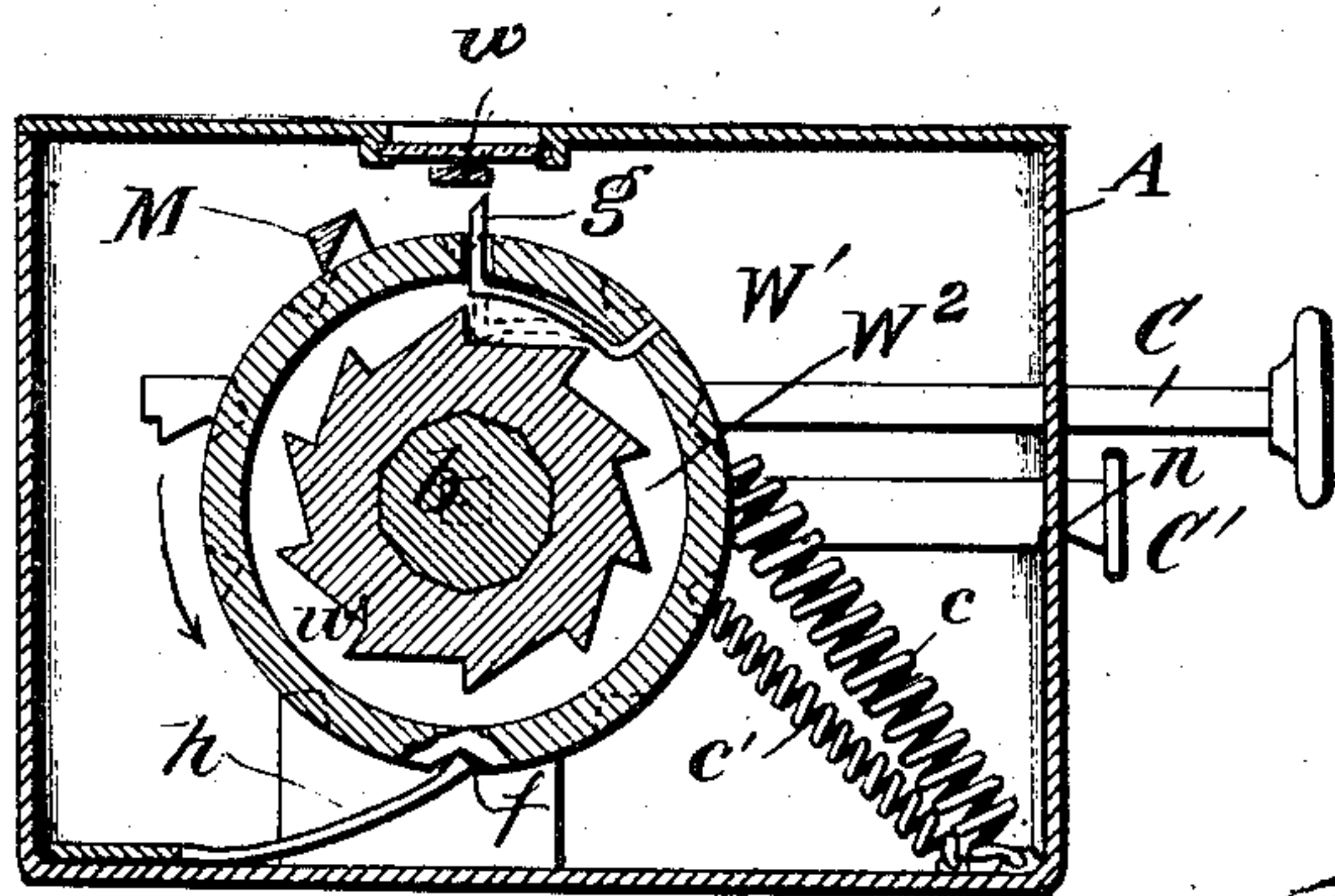


Fig. 9

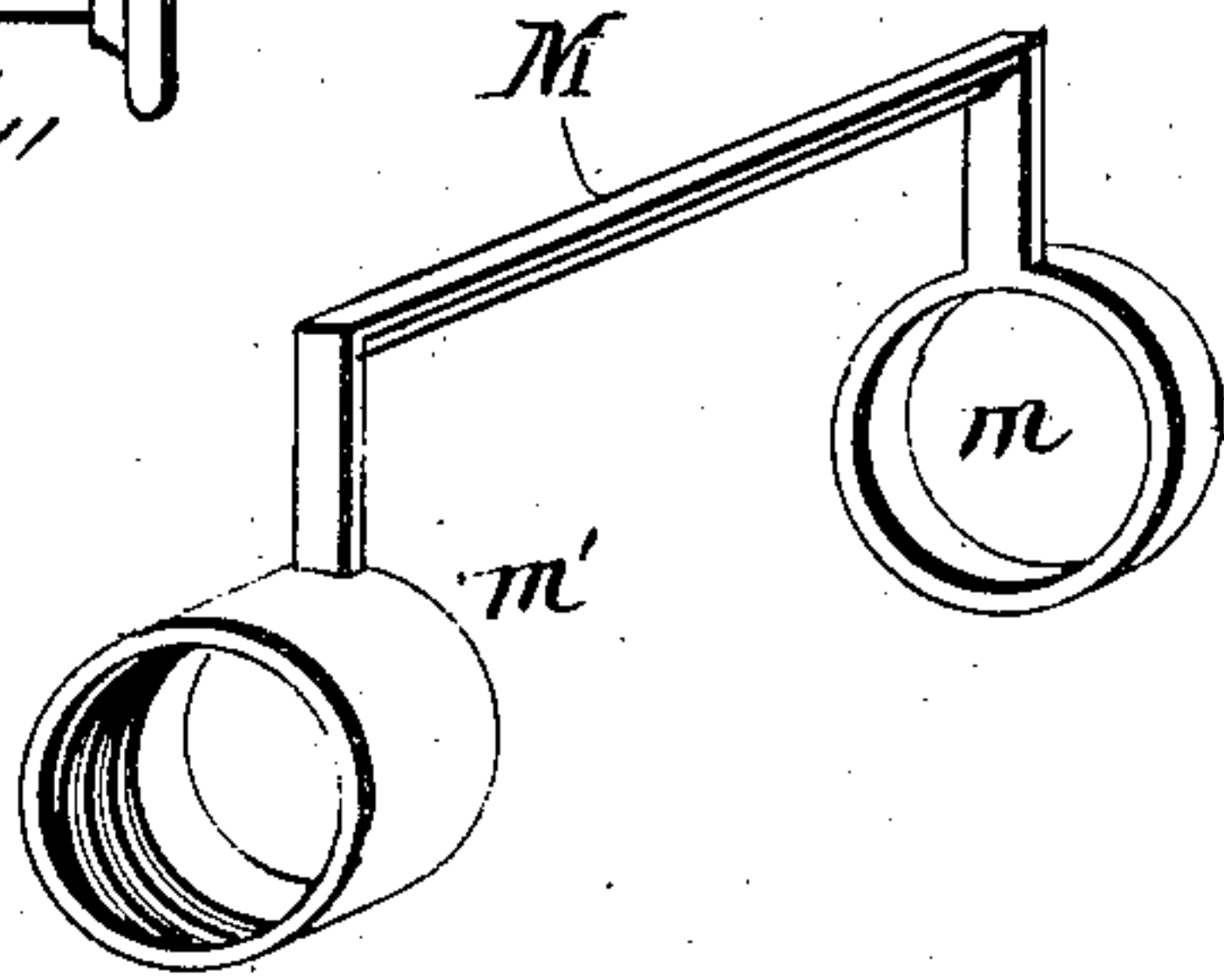


Fig. 6

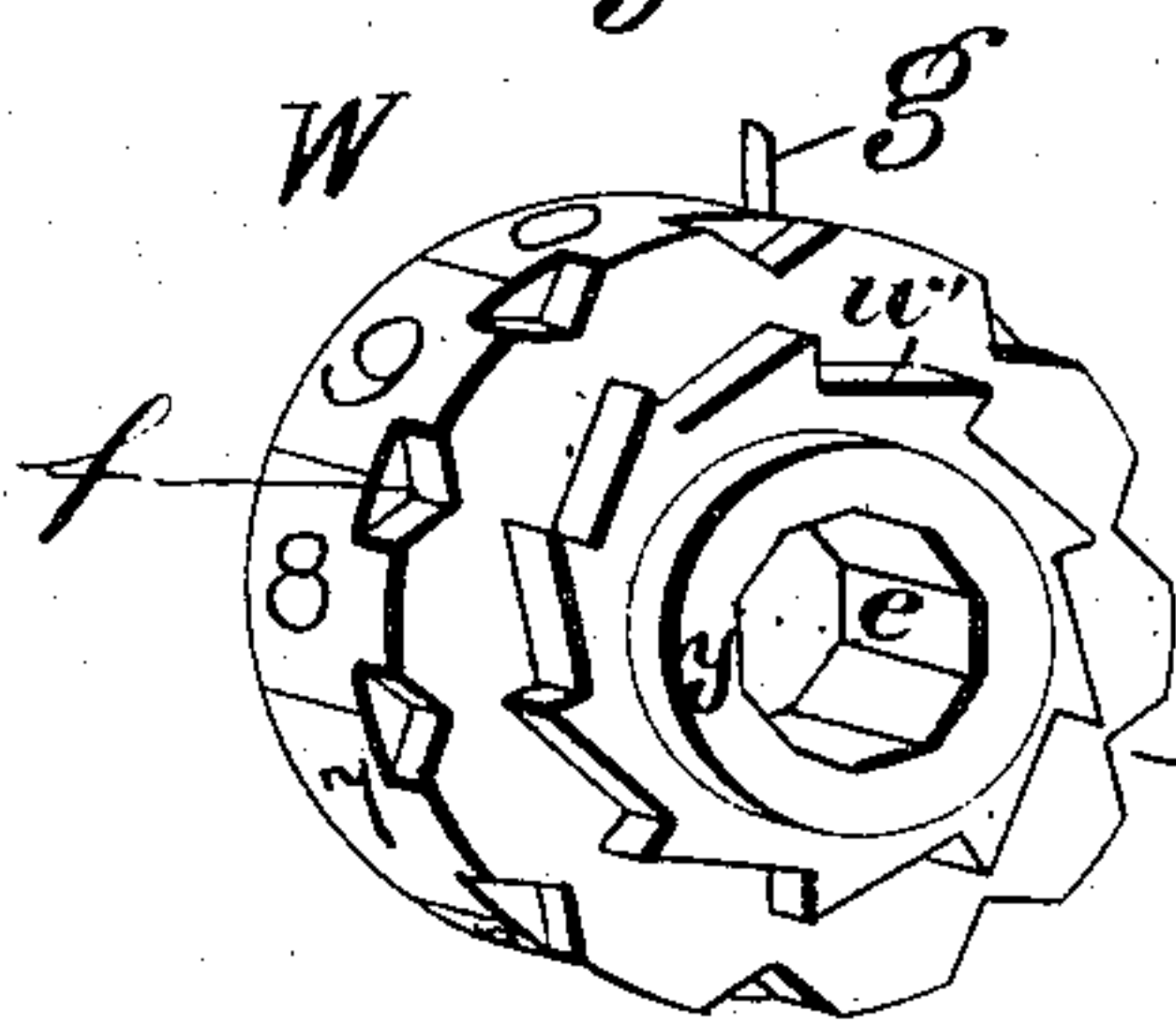


Fig. 7

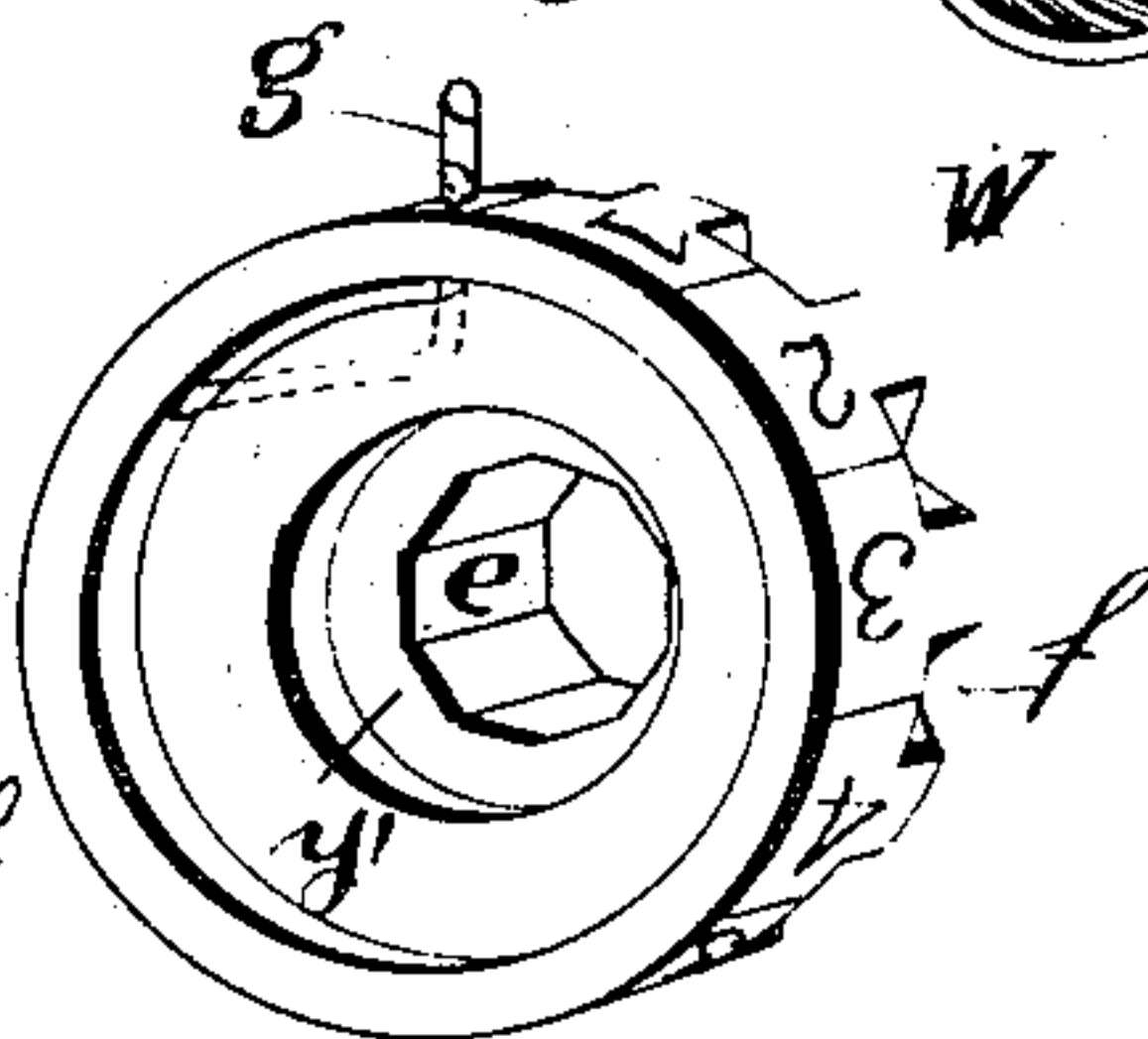
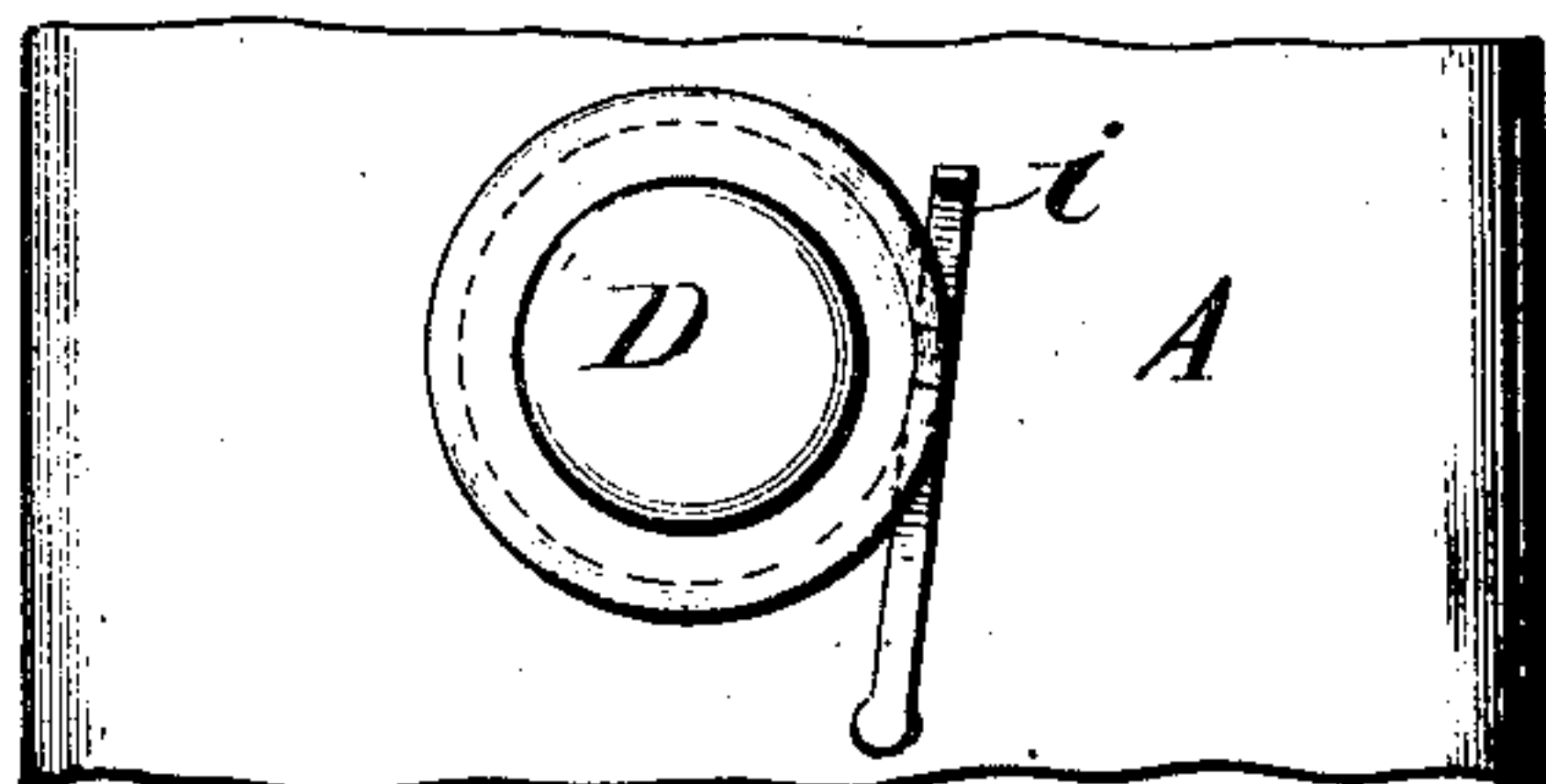


Fig. 8



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# UNITED STATES PATENT OFFICE.

CHARLES P. MOORE AND THOMAS G. MOORE, OF RAVENSWOOD, WEST VIRGINIA.

## ADDING-MACHINE.

No. 865,200.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed January 4, 1907. Serial No. 350,716.

To all whom it may concern:

Be it known that we, CHARLES P. MOORE and THOMAS G. MOORE, citizens of the United States, residing at Ravenswood, in the county of Jackson and State of West Virginia, have invented a new and useful Improvement in Adding-Machines, of which the following is a specification.

Our invention is in the nature of a small and convenient adding machine designed to be carried in the palm of the hand and be operated by the thumb and forefinger of the hand sustaining it, leaving the other hand of the accountant free to handle a pencil and keep place in the column of figures, as they are added on the machine

It consists in the novel construction and arrangement of parts operating upon the above described principle as will be hereinafter more fully described with reference to the drawings, in which

Figure 1 is a top face view of the machine in position in the hand for operation. Fig. 2 is a vertical section on line 2—2 of Fig. 1 looking in the direction of the arrow. Fig. 3 is a vertical section on line 3—3 of Fig. 1. Fig. 4 is a horizontal section on line 4—4 of Fig. 2. Fig. 5 is a vertical section on line 5—5 of Fig. 4. Figs. 6 and 7 are opposite face views in perspective, of two juxtaposed adding wheels. Fig. 8 is an end view in detail of the turning button D and Fig. 9 is a detail in perspective of the yoke for readjusting the adding wheels to zero.

In the drawing, A represents a rectangular case of a size adapted to be conveniently grasped in the palm of the hand. This case contains a series of adding wheels which are successively turned as the adding progresses. This turning of the adding wheels is effected by the action of two plungers working at right angles to each other. One of these plungers C is worked by the forefinger, as seen in Fig. 1, and this plunger is the working plunger which actually turns the wheels. The other plunger B works at right angles to C and is under the control of the thumb and its function is merely to select the particular adding wheel which the plunger C is to turn.

$W$   $W^1$   $W^2$   $W^3$   $W^4$  are the adding wheels of different denomination.  $W$  represents units,  $W^1$  tens,  $W^2$  hundreds and so on. Each wheel has its face divided into ten equal parts which bear in regular succession the figures 0 to 9. Each wheel is independently rotatable. The two end wheels have outside collars  $r$  that swivel in annular bearings in standards  $F$   $F$  as seen in Fig. 2, and each inside wheel has collar  $y$ , Fig. 6, that fits into a corresponding annular recess  $y^1$ , Fig. 7, of the adjacent wheel and as the end wheels are supported in the standards  $F$   $F$  and all the inner wheels are interlocked by their collars and recesses it will be seen that the wheels mutually sustain each

other in swiveling relation without a central shaft. Through the center of each wheel there is formed an axial channelway  $c$ , see Figs. 6 and 7, of angular or polygonal sides, and in this central channelway with angular sides there slides a correspondingly shaped head  $b$ , see Fig. 2, mounted on the inner end of the selective plunger B which head  $b$  is capable of entering and passing through the channelway  $c$  of each wheel or of stopping in the plane of any one wheel. When so stopped in the plane of any wheel and rotated, it locks with and rotates that wheel, all other wheels being held stationary.

For holding the wheels stationary and locking them, with the numbers on the face of one wheel in alignment with the numbers on the faces of the other wheels, each wheel has on its periphery equally spaced notches  $f$ , see Figs. 5 and 6, into which engage a corresponding series of spring fingers  $h$ , Figs. 2, 4 and 5, but as the wheels are turned in the direction of the arrow in Fig. 5 each spring finger leaves its notches until another notch comes above it, making a change in the numeral on the face of the wheel showing through the window  $w$  in the top of the case.

When the selective plunger B carries the head  $b$  into the plane of any wheel its position in relation to that wheel is indicated externally to the eye of the operator by a marker bar  $B^1$ . This bar, see Figs. 1 and 2, is connected to the plunger B in a loose swiveling manner and rises therefrom to near the top of the case and then is bent at right angles and passes horizontally into the case just below the glazed window  $w$  and above the adding wheels and terminates immediately above the head  $b$  of the plunger B so that when the plunger head  $b$  is in the plane of any adding wheel, the end of the marker bar  $B^1$  also lies immediately above that same wheel in full view of the operator and thus indicates to the operator the particular denomination which he is to operate in for adding.

$E$  is a spiral spring arranged in the central channel of the adding wheels and bearing at one end against the plunger head  $b$  and at the other end against a cup-shaped button D.

The plunger B is forced in and its head  $b$  compresses the spring  $E$  and when the pressure of the thumb on the plunger B is released the spring  $E$  carries the plunger head  $b$  in the opposite direction and may carry it entirely out of the adding wheels, as indicated by dotted lines in Fig. 2.

Having shown how the plunger B may select and engage any one of the adding wheels, we will now proceed to describe how that adding wheel is rotated a definite number of spaces to effect the addition. For this purpose the plunger shaft B is rotatable in its terminal thumb button, but is made square or angular throughout its length, as seen in Fig. 3. This squared shaft



passes through a square hole in a ratchet wheel *a* which is held against back movement by a detent *a*<sup>1</sup>. The main operating plunger C which is thrust in by the forefinger is formed within the case with a straight series of ratchet teeth *d* which are pressed into engagement with the subjacent ratchet wheel *a* by a spring *k* depending from the top of the case. The plunger C is normally held out of the case by its spring *c*, but when pressed inwardly by the forefinger, as indicated in Fig. 3, the teeth *d* engage and turn the ratchet wheel *a* and with it the squared shaft of the plunger B, thus giving the selecting plunger head the necessary rotation to turn the wheel with which it may be engaged. The ratchet wheel *a* is restrained against lateral movement between two uprights K and L, Fig. 2, and the plunger C is also guided between these uprights just above the wheel.

To enable the operator to know how many spaces to turn any wheel the top of the plunger C, see Figs. 1 and 4, is laid off in graduations and numbered to correspond to the progression of the numerals on the face of the adding wheels, so that when the operator notes the number of figures which have passed into the case he knows he has turned the adding wheel that number of spaces and has added that number of digits.

When a long column of a given denomination is to be added the selective plunger B may be forced in to coaction with that wheel and held there as long as desired. For this purpose the shaft of plunger B is provided with a series of transverse grooves *s* spaced apart a distance equal to the distance between the center planes of the adding wheels. A detent bar C<sup>1</sup>, see Fig. 3, is arranged to be held out of engagement with the grooves *s* of the plunger by a spring *c*<sup>1</sup> but the forefinger may be shifted to the button on the end of bar C<sup>1</sup> to force it in and cause its inner end to enter one of the grooves *s* of plunger B and when so engaged bar C<sup>1</sup> is locked by a notch *n* engaging the side of the case. As long as the locking device is engaged the plunger C will always turn the same denomination of adding wheel. To disengage the locking devices the bar C<sup>1</sup> is pushed up by the forefinger and the spring *c*<sup>1</sup> throws it out of engagement.

When any adding wheel is rotated through ten spaces it must carry one to the next wheel of higher denomination. For this purpose each adding wheel has an elbow spring *g*, see Figs. 5, 6, 7, the outer end of which projects radially through a hole in the flange of the wheel and the inner end of which is bent to the curve of the wheel and is secured to the flange as seen in Fig. 5. This elbow spring may be forced inwardly, as in dotted lines in Figs. 5 and 7, so as to come in range of engagement with ratchet teeth *w* on the next adjacent wheel of higher denomination and so turns that one notch, the ratchet teeth *w* being of the same number as the figures on the adding wheel. In order to thrust the elbow spring in to carry to the next wheel a stationary cam bar M, see Figs. 5 and 9, is arranged above the adding wheels in parallel position to their axis and as its lower face is inclined or wedge shaped the wheels in carrying the projecting springs *g* under it are forced inwardly to effect engagement with the ratchet teeth of the next wheel. After the spring passes cam bar M the spring again moves outwardly and is thereby disengaged from the next wheel so that

the latter is only turned one tooth. The cam bar M is formed as a yoke with ring shaped ends *m* and *m*<sup>1</sup>, as seen in Fig. 9, and these rings swivel inside of the standards F or are capable of being adjusted therein in a rotary manner. This is to cause the bar M to catch against and aline all of the springs *g* so as to restore all wheels to zero preparatory to beginning a new addition. For turning this yoke-shaped cam bar, one of its rings *m*<sup>1</sup> is made wide and screw threaded and into it is screwed in rigid engagement the cup-shaped flange of the button D as seen in Fig. 2. Now by turning the button D a rotary swing is given to the bar M. To lock it stationary a spring catch *i*<sup>1</sup>, see Figs. 4 and 8, engages a notch in the flange of the button D and is released therefrom by being pushed in by the finger when seizing the button D to turn it.

To hold the case firmly in the hand, when adding, a loop *x*, Fig. 1, is arranged to receive one or more of the fingers.

An important distinction in my invention is to be found in making the annular bearings for the end adding wheels of larger size than the central channelways and smaller than the wheel itself. This not only avoids the necessity of an axial shaft, but it allows the central channelway to open through the annular bearing for the insertion of the plunger and with a minimum of rotary friction consistent with a centrally perforated wheel.

We claim

1. An adding machine, comprising a case with adding wheels and two plungers at right angles to each other, one of which is arranged to select the adding wheel and the other to turn the adding wheel. 95
2. An adding machine, comprising a case with adding wheels, a selecting plunger for selecting the adding wheel, and a turning plunger for turning the adding wheel, the case and plungers being made of dimensions to be held in one hand and be operated by the thumb and a finger of that hand. 100
3. An adding machine, comprising a case, a series of wheels each having a registering central channel of polygonal form, a plunger movable through said channels and having a polygonal head closely fitting the central channels for interlocking with any wheel, annular bearings smaller than the wheels and of greater diameter than the central channel located at the ends of the series of wheels and outside of the same, for holding the end wheels in alinement to form an open central channelway, means for holding the inner wheels in alinement and means for turning the wheels. 105 110 115
4. An adding machine, comprising a case, a series of centrally perforated adding wheels, annular bearings smaller than the wheels located outside of the end wheels of the series for holding the wheels in alinement to form an open central channelway, said annular bearings being larger than the central channelway, means for holding the inner wheels in alinement, a selecting plunger with a locking head movable through the wheels into the plane of any one of the wheels and an operating plunger arranged at right angles to the selecting plunger and means connecting the two plungers for converting the reciprocating movement of one into a rotary movement of the other. 120 125
5. An adding machine, comprising a case, a series of centrally perforated adding wheels, annular bearings smaller than the wheels located outside the end wheels of the series for holding the end wheels in alinement to form an open central channelway, the annular bearing being larger than the central channelway, means for holding the inner wheels in alinement, a plunger with interlocking head, an attached marker for the plunger extending over the tops of the adding wheels and inside the case to indicate the plane of the interlocking head, and means for turning said head. 130 135
6. An adding machine, comprising a case, centrally per-



forated adding wheels, a plunger with interlocking head movable through all the wheels, said plunger having equally spaced transverse grooves corresponding to the spacing of the adding wheels, and a locking device engaging said grooves to hold said plungers to a fixed position as regards longitudinal movement.

5 7. An adding machine, comprising a series of alined centrally perforated adding wheels, an axial selecting plunger movable at right angles to the plane of the wheels, a central spring for forcing the plunger in one direction and a removable holder for the end of the spring.

10 8. In an adding machine, the carrying devices, consisting of ratchet teeth on one wheel and an elbow spring on the adjacent wheel lying in the plane of the above named  
15 ratchet teeth and projecting beyond the periphery of the wheel, and a stationary cam-bar arranged to be struck by the elbow springs to force the latter into engagement with the ratchet teeth within.

9. In an adding machine, the combination with a set of adding wheels having projecting carrying springs; of a yoke-shaped cam-bar hung coaxially to the adding wheels and an external axially arranged handle for axially swinging the yoke-shaped cam-bar and means for locking the same. 20

10. In an adding machine, a series of coaxially arranged adding wheels having an open central channelway and interlocking and swiveling collars and recesses, the end wheels having also external collars, supporting bearings for these external collars, and means for selecting and turning the adding wheels. 25

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Witnesses:

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J. H. WETZEL.