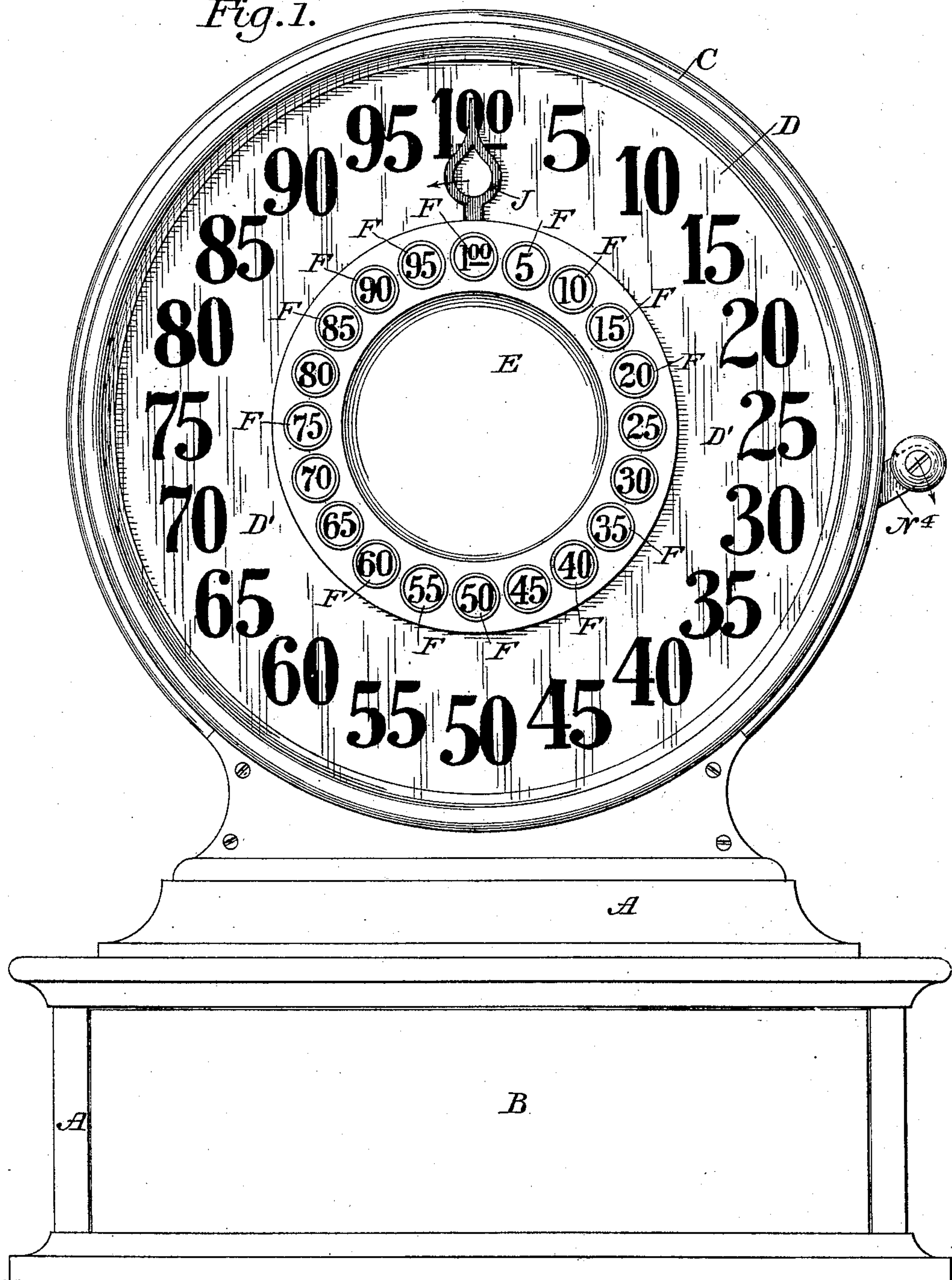


5 Sheets—Sheet 1.

No. 443,024.

Patented Dec. 16, 1890.

*Fig. 1.*



*Attest:*

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E. M. Watson

*Inventor:*

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By David A. Weiss  
Atty.

(No Model.)

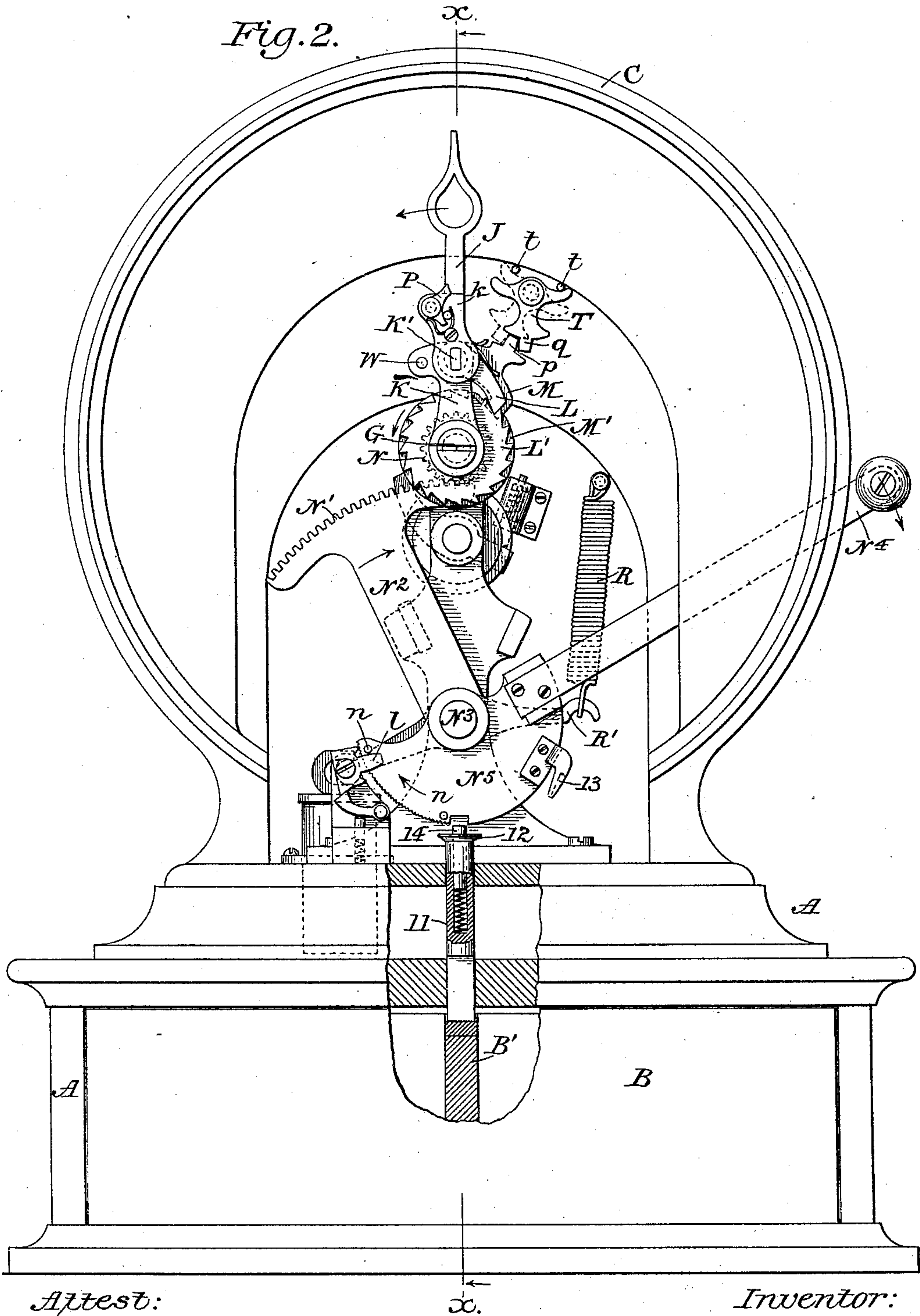
5 Sheets—Sheet 2.

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Fig. 2.



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5 Sheets—Sheet 3.

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Fig. 5.

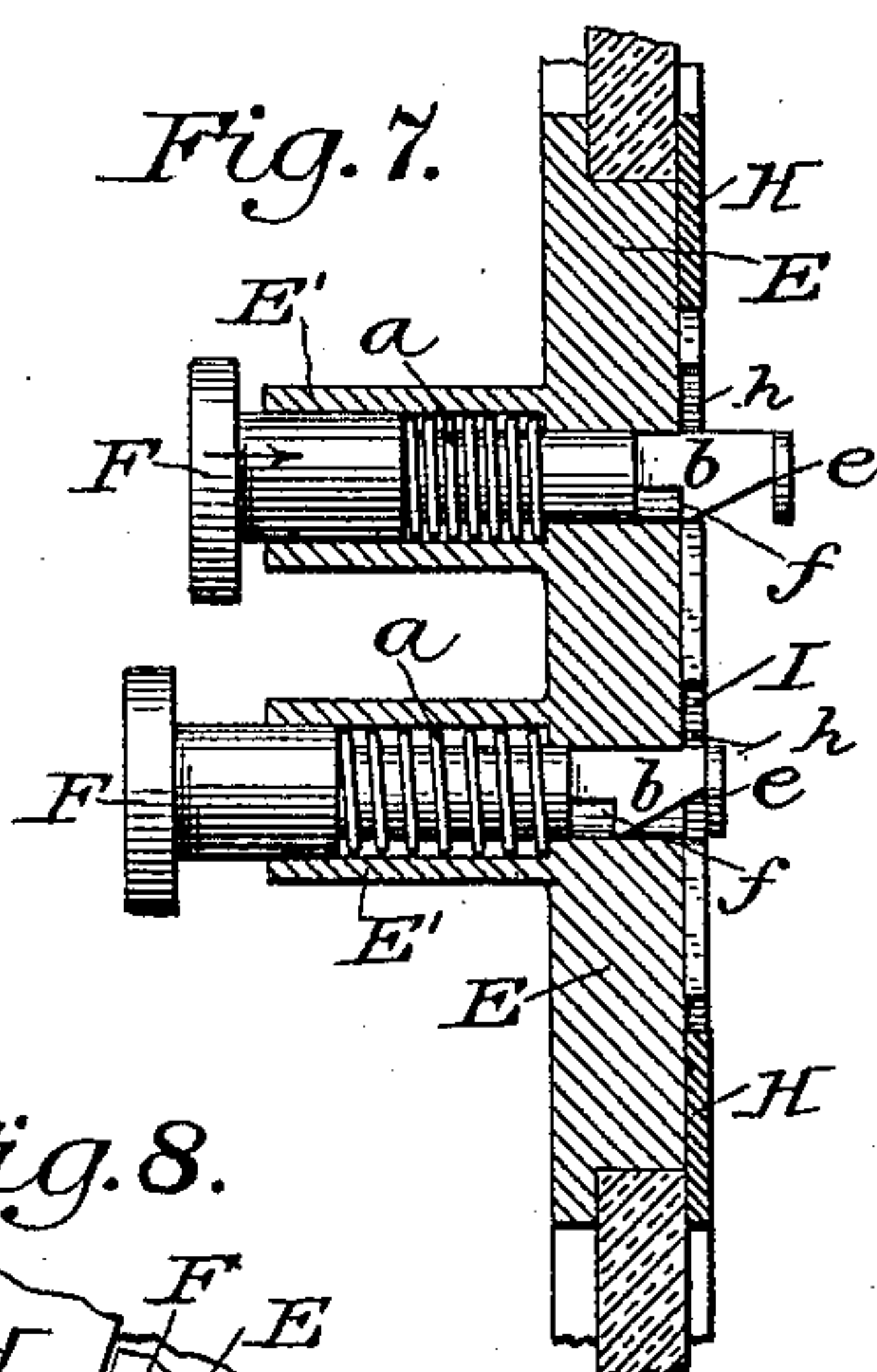
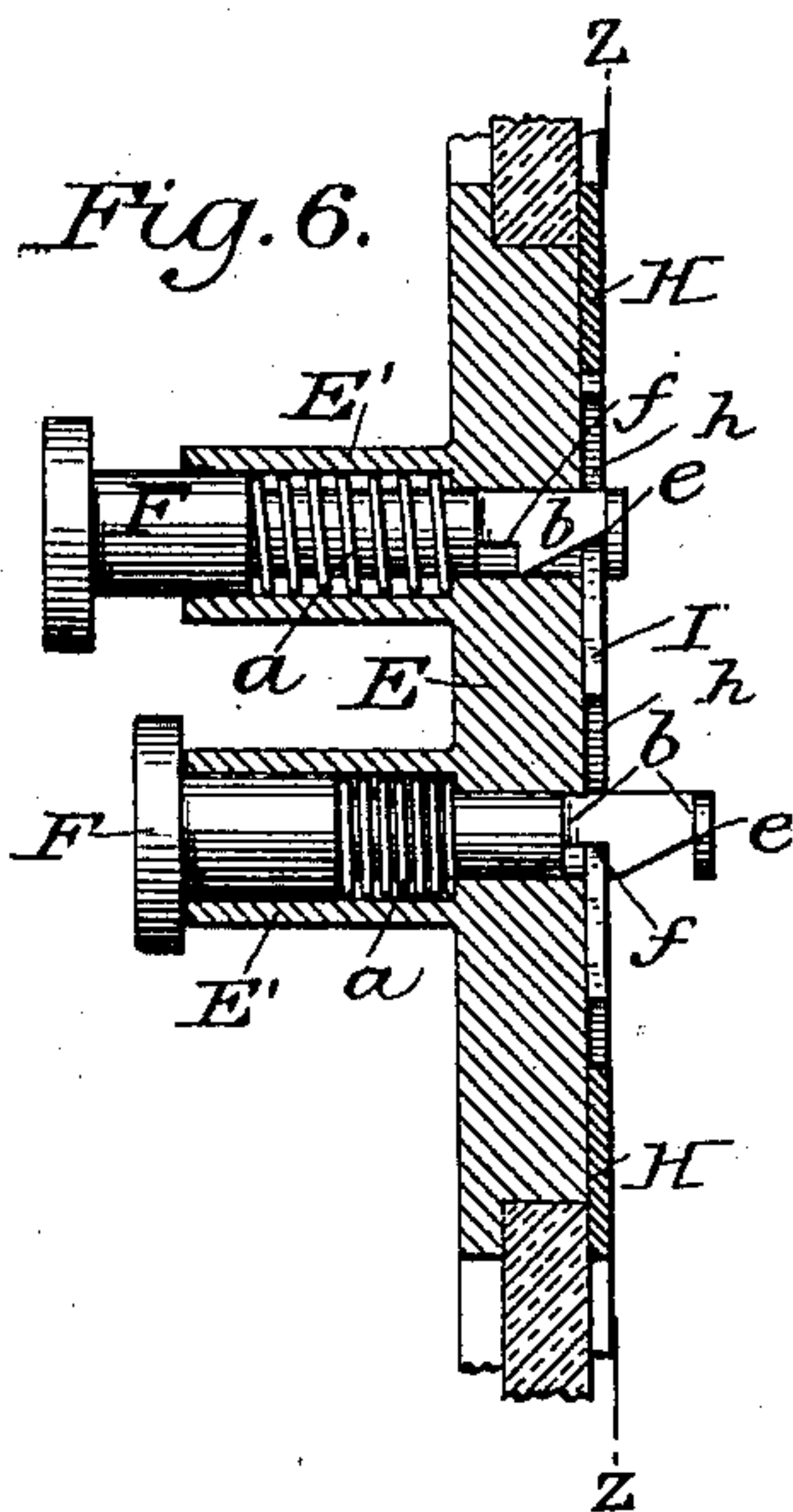
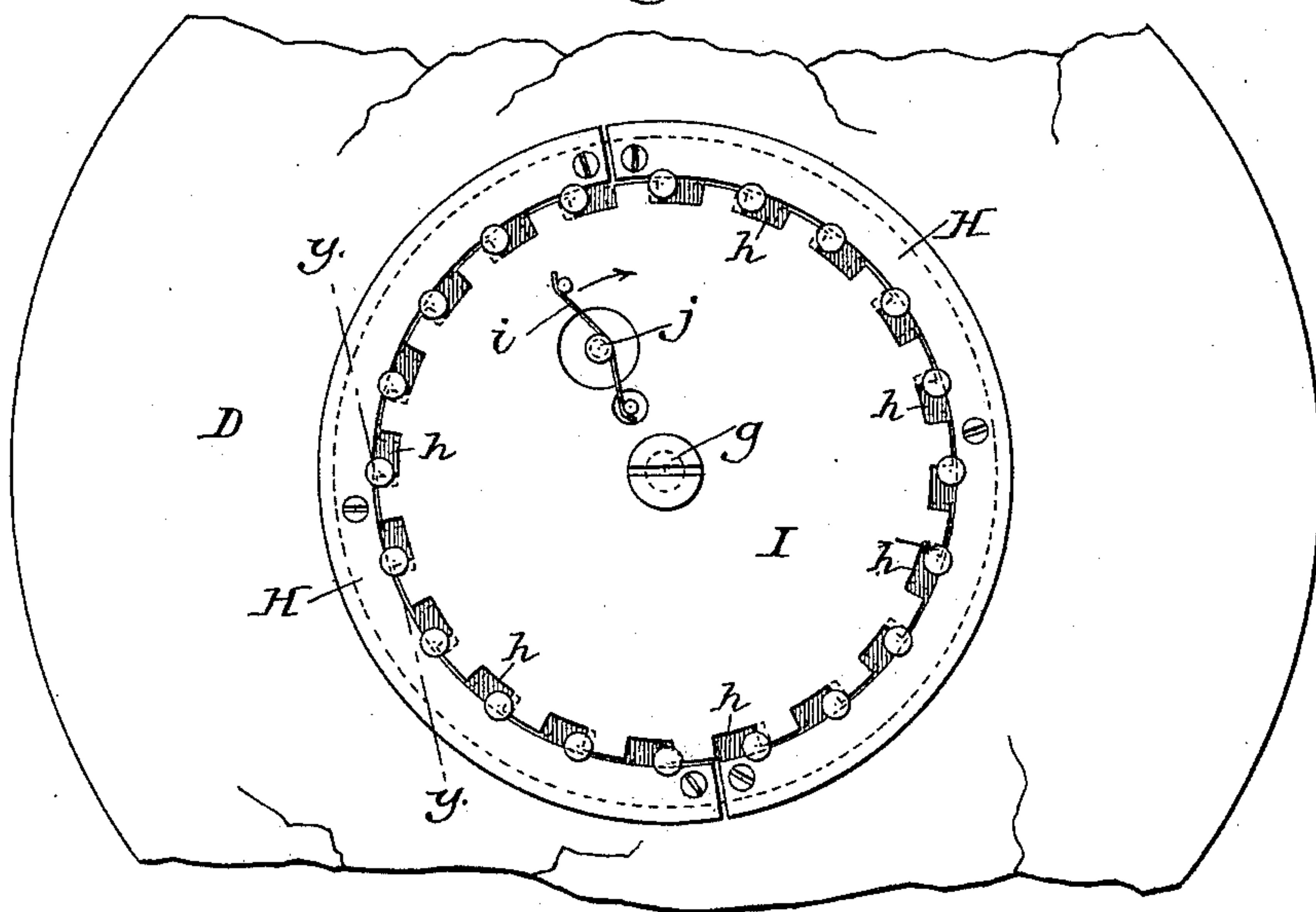
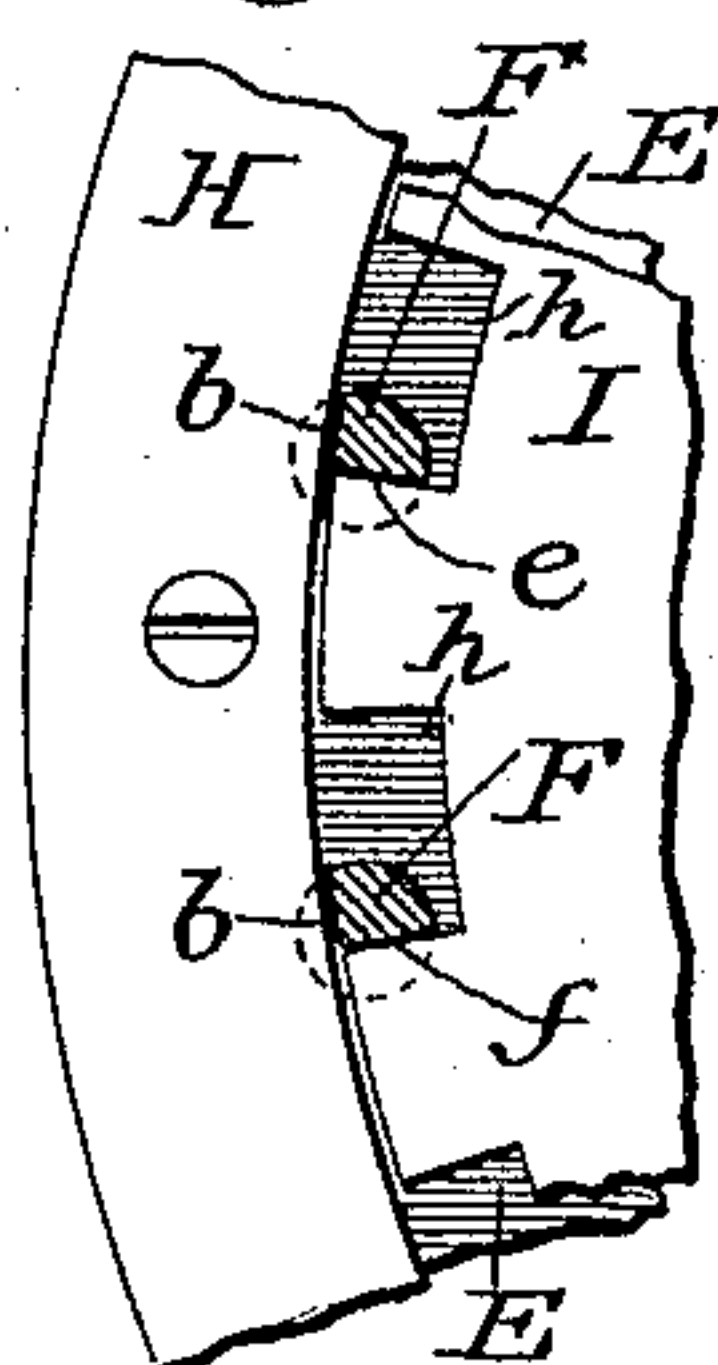


Fig. 8.



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(No Model.)

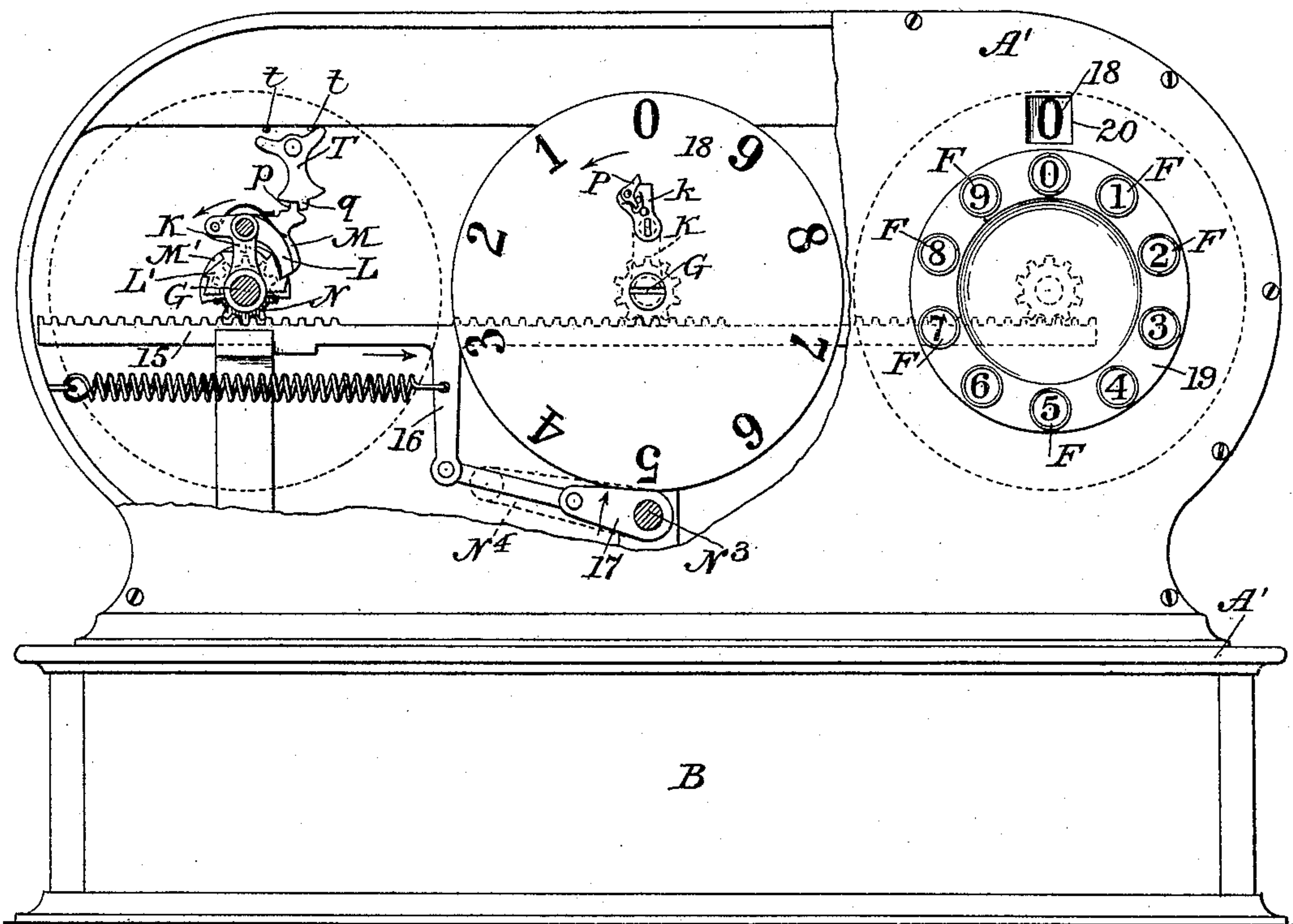
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Patented Dec. 16, 1890.

*Fig. 9.*



*Attest:*

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# UNITED STATES PATENT OFFICE.

CARL W. WEISS, OF NEW YORK, N. Y., ASSIGNOR TO THE KRUSE CASH REGISTER COMPANY, OF NEW YORK.

## CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 443,024, dated December 16, 1890.

Application filed July 5, 1890. Serial No. 357,719. (No model.)

*To all whom it may concern:*

Be it known that I, CARL W. WEISS, of the city, county, and State of New York, have invented certain new and useful Improvements in Cash Indicating and Registering Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, making a part of this specification.

My invention relates to improvements in cash indicating and registering machines, and has for its object to simplify the construction and reduce the cost thereof.

It consists in the novel combination and arrangement of parts embraced in the construction of the machine, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a front elevation of my improved cash indicating and registering machine; Fig. 2, a front elevation of the same, partly in section, with the front plate carrying the keys and the dial-plate removed; Fig. 3, a vertical section in line *x x* of Fig. 2; Fig. 4, a detached detail in perspective, on an enlarged scale, of the coupling devices connecting the indicator with the operating-crank and with the adding mechanism; Fig. 5, an elevation of the rear face of the front plate, showing the annular locking-plate for the keys. Figs. 6 and 7 are enlarged detail sections on the line *y y* of Fig. 5 of the keys and key-locking plate in different positions thereof. Fig. 8 is a transverse section on line *z z* of Fig. 6, illustrating the manner in which the keys are engaged by the retaining-ring and locking-disk. Fig. 9 is a front elevation, partly in section, illustrating a modification of my invention.

Similar letters and figures indicate like parts in all of the figures.

A represents the casing for the machine, and B a drawer fitted in the base of the casing to slide in and out at the front thereof.

C is an enlarged annular frame at the front of the case, within which is properly secured a glass front plate D. In the center of this glass plate D is a fitted a circular metallic plate E, having a series of cylindrical bosses E' E' projecting outwardly from its rim.

These projections E' E' are arranged concentrically at equal distances apart and correspond in number with the series of values to be indicated by the machine, and each of them is perforated longitudinally to serve as the bearing for the stem of a stop or key F. The portion of the stem of each key within its bearing is reduced sufficiently in diameter to make room for an encircling spiral spring *a*, so disposed as that its stress shall operate automatically to carry the key outward. (See Figs. 6 and 7.) The inner end of each stem is made to project through the supporting-plate E, and is laterally recessed, as at *b*, to embrace the inner rim of an annular retaining-plate H, secured upon the outer rim of the plate E to project beyond it and overlap the proximate rim of the front plate D. The inner end of each stem is also provided with two notches therein, (see Figs. 6 and 7,) each cut at a right angle to the lateral recess *b*, the first notch *e* being at the extreme outer end of the key, so that it will remain clear of the plate E when the key is in its normal position, and the second *f* at a point so far removed from the first as that its notch will barely clear the plate E when the key is fully pushed inward against the stress of its spring, as shown in Figs. 6 and 7.

A circular disk I, of a diameter to fit closely within the annular plate H, is pivoted to revolve upon a central pivot *g* against the inner face of the supporting-plate E. The edge of this disk I is formed with a series of notches *h h* therein corresponding in number with the keys F F, and these notches are so proportioned and arranged as that the corresponding end of each shall pass under the notch *e* in the end of each key, and thereby lock the key. The disk is automatically turned to enforce this engagement by means of a spring secured to a pin *j*, projecting from the supporting-plate E through an aperture in the disk.

The portion of the stem of each key F between the outer and inner notches *e f* therein is so inclined as to form a wedge which as the key is pushed inward is brought to bear against the contacting edge of the notch in the revolving disk I in such manner as to cause the disk to turn upon its pivot against



the stress of its spring *i* far enough to disengage the disk from the notch *e* in any key held outwardly thereby, while so soon as the operative key has been pushed in far enough to carry its second notch *f* into registry with the edge of the disk the disk will spring back into said notch to hold said key in its outward position, and, entering the first notch *e* in each of the other keys, will be in position to be turned in like manner by the movement of any one of them. Thus each key when pressed inward to project beyond the inner face of the supporting-plate *E* will be caught and locked in this inward position until some other key is pressed inward, and so soon as released by the movement of another key will automatically spring out to its first position.

A shaft *G* is mounted in suitable bearings within the casing back of the front plates *D* and *E* and in a right line with the center thereof. An arm *K* is fitted to revolve loosely upon the front end of this shaft *G* in proximity to said front plates at the rear thereof, and to this arm *K* an indicating-pointer *J* is secured. Preferably, instead of attaching the pointer directly to the arm, a rotatory pin *K'* is fitted parallel with the shaft *G* in a suitable bearing upon the outer end of the arm, and the pointer *J* is secured to the front end of said pin to extend radially therefrom. The pointer is thus permitted to vibrate independently of the arm *K*, with which it revolves about the shaft *G* as a center over an annular dial *D'*, fitted under the glass plate *D* so as to be visible through it. Upon this dial are marked the several values corresponding to the values represented by the keys *F F*, and which in the machine shown in the drawings increase by fives from zero to one hundred, (see Fig. 1,) the 100-mark being made the initial point from and to which the pointer *J* revolves.

A spring-actuated trip-latch *P* may be pivoted to the arm *K*, but preferably is pivoted to the base of the indicating-pointer *J*, which is enlarged to receive it. In either case it is made to register with the inner end of the keys *F F*, and in such proximity to the disk *I* on the key-plate *E* as that when a key is pushed inward so that its inner end shall project beyond the disk it will come into contact with the outer end of the latch. The latch is so adjusted as that when brought into contact with one of the keys in the first or forward movement of the pointer it will trip and yield, so as to pass by it; but on the return movement it will not yield when it strikes the key, but will operate to stop the pointer and prevent its further movement.

A pawl *L* and a detent *M* are pivoted upon the rear end of the pin *K'*.

A ratchet-wheel *L'*, having teeth corresponding in number with the keys *F F*, is fixed upon the shaft *G* in position to be engaged by the pawl *L*, the teeth being so inclined as that the pawl in its revolution about

the shaft *G* will engage the wheel as the indicating-pointer *J* is moving forward only. A wheel or disk *M'* is mounted to turn loosely on the same shaft *G* in position to allow the swinging detent *M* to rest upon its periphery, and a single notch *m*, Fig. 4, is formed in the periphery of the disk to engage the detent *M*. This disk *M'* is made fast to a pinion *N*, revolving loosely on the shaft *G*, and which meshes with a segmental rack *N'* on the end of an arm *N<sup>2</sup>*, projecting from a rock-shaft *N<sup>3</sup>*, mounted in the casing parallel with and beneath the shaft *G*, and which is actuated by means of a crank *N<sup>4</sup>*, fitted thereto to project out laterally from the casing through a vertical slot therein. The rack *N'* and pinion *N* are so proportioned as that one complete movement of the lever and rack in either direction will produce a single complete revolution of the pinion, the movements of the lever being limited by means of suitable stops.

The engagement of the detent *M* with the notch *m* in pinion-disk *M'* is enforced by means of a spring *k*, secured to a pin *W*, projecting parallel with the pin *K'* from an offset *n* on the arm *K*. A second spring *o*, secured to the same pin *W*, operates to enforce the engagement of the pawl *L* with its ratchet-wheel *L'*. The spring *k* serves to couple by a yielding connection the detent *M* with the arm *K*, carrying the pointer *J*, so that when the detent *M* is in engagement with the disk *M'* the revolution of the disk will cause the arm *K* and pointer *J* to revolve in unison with it about the shaft *G*, the spring-actuated detent *M* operating as a clutch to couple the pointer with the pinion and its operating-crank. When, however, the pointer is arrested in its movement by the positive engagement of its trip-latch *P* with the projecting end of one of the keys *F*, the spring connecting the detent *M* with the pointer will yield sufficiently under the continued strain upon the detent of the moving disk *M'* to allow the detent to spring out of the notch *m*, and so permit said disk *M'* and the crank *N<sup>4</sup>* operating it to continue their movement until the stroke of the crank is fully completed. A reverse movement of the crank *N<sup>4</sup>* after its movement in either direction has begun is prevented until its stroke in the one direction is fully completed by means of a serrated segment *N<sup>5</sup>*, oscillating with the shaft *N<sup>3</sup>*, and whose teeth are engaged by a double-acting spring-actuated pivoted dog or detent *l*, which is tripped and reversed in the customary manner at the end of each stroke by stop-pins *n* on the segment. (See Fig. 2.) The automatic return of the crank-arm *N<sup>4</sup>* and of the devices geared thereto to their first position after the crank has been carried to the end of its first or forward stroke is secured by means of a spring *R*, engaging an arm *R'* on the crank-shaft *N<sup>3</sup>*, as shown in Figs. 2 and 3.

The shaft *G* may be geared in any approved manner to a train of adding-wheels *S*, (see



Fig. 3,) so that the rotation of the shaft will produce a corresponding movement of the adding mechanism.

Since the pawl L, which partakes of the movements of the indicating-pointer J, moves idly over the ratchet-wheel L' on said shaft while the pointer is making its first or forward revolution under the first or down stroke of the crank-arm N<sup>4</sup>, this forward movement does not affect the adding mechanism; but so soon as the pointer begins its return movement the pawl L, engaging the ratchet-wheel L', will cause the shaft G to revolve in unison with it, and thus bring the adding mechanism into play, and will actuate it until the movement of the pointer is arrested by contact with the particular key which has been pressed inward. Hence the distance between the point at which the forward movement of the indicator terminates and the key which serves to arrest it upon its return movement will determine the extent of the movement of the adding mechanism and will be proportionate to the value of said key.

To prevent the indicating mechanism from overrunning at the end of its movement in either direction, the detent M is provided with an extra tooth p, made to project into engagement with a tooth q upon a swinging latch T, pivoted to the casing so as to overhang the detent M, and whose oscillating movement is limited by stop-pins t or other devices. When the pointer J approaches the end of its stroke in either direction, the engagement of the tooth p on the detent M with the tooth q on the latch will operate to swing the latch in the direction of the movement of the pointer until it is arrested by the appropriate stop-pin t, whereupon it will operate as a positive stop for the pointer at the moment the latter has fully completed its movement in that direction.

The drawer B when left free is automatically thrown outward by the stress of a spring 10, which is made ready for action by the closing of the drawer. The drawer is automatically locked so soon as closed by means of a bolt 11, placed vertically under the crank-shaft N<sup>3</sup>, in register with the periphery of the segmental detent-plate N<sup>5</sup>, attached to the crank-arm N<sup>4</sup>. This bolt is fitted to drop by its gravity through an aperture in the casing into engagement with a socket in a longitudinal strip B' on the drawer, the socket being brought into registry with the bolt when the drawer is fully closed, as shown in Figs. 2 and 3. The upper end of the bolt is flanged, as at 12, Figs. 2 and 3, and a hook 13, having an inclined inner face, is made to project from the periphery of the segmental detent-plate N<sup>5</sup> in such position as to pass under the flanged head of the bolt just as the crank-arm N<sup>4</sup> is completing its first or downward stroke, and in passing under the flanged head the inclination of the hook operates to raise the bolt far enough to lift its lower end out from and clear of the socket, thereby leaving the drawer free to fly

open under the stress of its spring 10. A spring-actuated auxiliary bolt 14 is seated longitudinally in the upper end of the bolt 11, by which the drawer is locked, so as to form a telescoping joint therewith, said auxiliary bolt being left normally free to project to such a height above the head of the main bolt, as shown in Figs. 2 and 3, as that when the drawer B is closed and the main bolt 11 has dropped into its socket in the drawer, as shown in Fig. 2, the head of the auxiliary bolt will barely clear the periphery of the segmental detent-plate N<sup>5</sup>, and when the main bolt is lifted out of the socket, as when the drawer is open, the head of the auxiliary bolt 14 will be carried up thereby to bear against the periphery of the detent-plate, and when the crank N<sup>4</sup> has completed its return-stroke and reached its normal position will spring into a notch in said detent-plate and thereby securely lock the crank and prevent any further movement of the machine until the drawer is closed. When the drawer is closed, the drop of the main bolt 11 will free the auxiliary bolt 14 from its said engagement with the notch in the detent-plate and unlock the crank. (See Fig. 2.)

Where the machine is constructed, as shown in the drawings, to indicate and register values from zero to one hundred, the initial key representing 100 is not notched, so that its inner end may not project, as do the others, into position to engage the pointer in its movement; but the pointer is automatically brought to a stop opposite said key 100 by the limitation placed upon the movements of the operating-crank N<sup>4</sup>.

In the operation of the machine the key representing the value to be indicated and registered—as, for example, the key F<sup>10</sup>, representing ten cents—being pushed inward, is thereupon automatically held in its inward position by the engagement of the spring-actuated locking-plate I with the second or inner notch on the stem of the key. The operating-crank N<sup>4</sup> is then actuated to move the indicating and adding mechanism, and for this purpose is first swung downward, and being released at the end of its stroke is carried back by its spring R to its first position. During the first or downward stroke of the crank N<sup>4</sup> the pointer J will be carried forward so as to make one complete revolution, this being accomplished by the engagement of the disk M', geared mediately, as described, to the arm N<sup>4</sup>, with the detent M, coupled to the pointer, the pawl L meanwhile being carried free over the ratchet-wheel L', fixed to the shaft G, to which the adding mechanism is geared. In this revolution of the pointer J the trip-latch P will strike the projecting end of the key F<sup>10</sup>, but yielding as it strikes will pass under it without arresting the movement of the pointer. So soon as the crank begins its upward or return stroke and the pointer J is made, consequently, to begin its return movement the pawl L will engage the



teeth on the ratchet-wheel  $L'$ , governing the adding-train, and hence the adding-wheels will be moved by said return movement until the pointer, reaching again the projecting end of the key  $F^{10}$ , is arrested, in manner as described, by the engagement of the latch  $P$  with the end of said key. The arrest of the pointer and the consequent strain upon the detent  $M$  will cause the spring  $o$ , Fig. 4, connecting the latter with the pointer, to yield sufficiently to allow the detent to disengage itself from the actuating-disk  $M'$ , and the pointer, thereby uncoupled from the disk  $M'$  and crank  $N^4$ , will remain stationary over the pin  $F^{10}$  and the corresponding character on the dial, while the crank continues and completes its return-stroke. The arrest of the pointer  $J$  will also stop the movement of the pawl  $L$ , and consequently of the adding mechanism, so that the latter will have been moved only in proportion to the distance of the stop-key  $F^{10}$  from the initial point or point from which the pointer having completed its revolution began its return movement. Since a reverse movement of the crank  $N^4$  is prevented until its stroke is completed, it follows that after a key has been played and the crank set in motion the value indicated by said key must be indicated and registered before any other move can be made. Moreover, the key last played remains locked to prevent the registry of any other value than that indicated until a second key is played. In the meantime the cash-drawer will fly open so soon as the first or down stroke of the crank is completed, and, since the crank itself becomes automatically locked by the open drawer so soon as the return-stroke is completed, no further movement of the machine can be made until the drawer is closed.

In the modification of my invention shown in Fig. 9 the pinion  $N$  is geared to a straight horizontally-disposed rack-bar 15, which operates as an equivalent for the segmental rack  $N'$ . (Shown in Figs. 2 and 3.) This rack-bar 15 is coupled by a link 16 to an arm 17 on the rock-shaft  $N^3$ , actuated by the crank  $N^4$ , so that the oscillating stroke back and forth of the crank will produce a reciprocating movement of the slide-bar, and during its stroke in the one direction will produce a complete revolution of the pointer  $J$  about the shaft  $G$  in one direction, and in the opposite direction will carry the same back until it is arrested by a stop-key, and will thereupon operate to uncouple it in manner as hereinbefore described.

As a further modification a dial-plate 18 is attached to the arm  $K$  to revolve with it upon the shaft  $G$  as a substitute for the pointer  $J$ . (Shown in Figs. 1 and 3.) The several values corresponding to those of the keys are marked upon this dial 18 and are brought to view at a single sight-opening 20 (seen at right in Fig. 9) in a face-plate 19, which covers the dial. In such case this plate 19 may serve as a substitute for the plate  $E$  to support the keys  $F F$ .

The use of the horizontal rack-bar 15 to gear the actuating-crank  $N^4$  with the indicating mechanism permits of the combination of a number of distinct registering and adding machines with the same crank and in the same outer casing, so that the units, tens, hundreds, &c., may be separately indicated each by means of an independent set of keys operating an independent registering and adding mechanism. This modification of my invention is illustrated in Fig. 9, in which the front of the casing and the keys and dial for the units at the left of the figure are broken away to disclose the arrangement of the rack-bar 15 and its gear with the crank  $N^4$ . In the center of the figure the key-plate and keys alone are removed, disclosing the arrangement of the revolving dial-plate 18 for the tens-register, while at the left the front of the casing over the register and adder for the hundreds is left intact to illustrate the position of the keys  $F F$  and of the indicating-opening 20 in the face-plate 19, through which the values marked on the underlying dial-plate are brought to view.

While I prefer to cause the adding mechanism to be operated upon the return movement of the crank-arm  $N^4$ , it is evident that by gearing the indicating mechanism so that the arm  $K$  shall at its first movement from the zero-point move to the right instead of to the left the crank-arm may be made to operate the adding mechanism during its first or forward movement instead of, as above described, during its return movement. In such case the indicator, after being arrested and locked in its forward movement by contact with the key which has been pushed in, is released to return automatically to the zero-point so soon as a second key is played.

I claim as my invention—

1. The combination, in a cash-indicating machine, of a series of movable stops or keys severally designated by characters representing the values to be registered, a revoluble arm carrying an indicator and mounted to travel back and forth in a path intersecting the line of movement of each and every key and be arrested by the movement of any one of them and thereby indicate its value, and an automatic latch made to engage and hold each key operated and be released from said key by the movement of any other key, substantially in the manner and for the purpose herein set forth.

2. The combination, in a cash indicating and registering machine, of a series of movable stops or keys severally designating the different values to be registered, an indicating device mounted to travel back and forth in such relation to the keys as to admit of being arrested by the movement of any one of them and thereupon indicate its denomination, an automatic latch made to engage and hold each operating-key and be released therefrom by the movement of any other key, and an adding mechanism geared to the indicator-



arm to be actuated thereby only as it traverses the interval between the extreme limit of its travel in one direction and the point at which its movement in the reverse direction is arrested by any one key, substantially in the manner and for the purpose herein set forth.

3. The combination, in a cash indicating and registering machine, of a series of movable stops or keys severally designating different values, an indicating device mounted to travel back and forth in such relation to the keys as to admit of being arrested by the movement of any one of them and thereupon indicate its denomination, an automatic latch made to engage and hold each operating-key and be released therefrom by the movement of any other key, an adding mechanism geared to the indicating device to be actuated thereby only as it traverses the interval between the extreme limit of its travel in one direction and the point at which its movement is arrested by any one key, a reciprocating crank whose stroke is limited in each direction, restraining-pawls operating to prevent a reverse movement of the crank in either direction until its full stroke is completed, and an automatic coupling device between the crank and indicating device, which when the indicator is arrested is thereby released to permit the crank to complete its stroke and return independently to its first position, substantially in the manner and for the purpose herein set forth.

4. An indicating mechanism having a fixed frame, a revoluble arm carrying an indicator and whose movement in either direction is limited to a single revolution from the initial point and is reversed at said point, a series of keys mounted in the fixed frame, marked to correspond with the indicator, and each movable into position to intercept and arrest it in its travel, and a motor actuating said arm to carry it at each movement first forward to the initial point and then in the reverse direction to an extent determined by the key moved to intercept it, substantially in the manner and for the purpose herein set forth.

5. In an indicating mechanism, a revoluble arm having a reciprocating movement, a key adjustable in a direction to intercept the movement of the arm, and a trip-latch carried with the arm to engage the key and allow the arm to pass it in its forward movement, and to arrest it upon its return movement, substantially in the manner and for the purpose herein set forth.

6. A revoluble arm having a reciprocating movement, a key adjustable to intercept the arm in its movements, a trip-latch carried by the arm to trip upon and pass the key in its forward movement and to engage it and

thereby arrest the arm in its return movement, and a registering mechanism geared to said arm to partake of its movement and be disengaged therefrom during said movement, substantially in the manner and for the purpose herein set forth.

7. The combination, in an indicating and registering mechanism, with the spindle actuating the registering-wheels and a ratchet-wheel secured upon said spindle, of a reciprocating motor, a disk revolving loosely upon the spindle and geared to the motor, an indicating-arm pivoted loosely upon the same spindle, a spring-actuated detent pivoted to the arm to engage a notch in the disk and couple the disk and arm, a pawl pivoted to the same arm to contact with the ratchet-wheel and travel loosely over it as the arm swings forward and engage it upon its reverse movement, a pointer jointed to the arm to move therewith and have a slight independent movement, a spring to control said movement and couple the pointer with the detent, a series of keys representing values corresponding with those to be indicated and each movable to and from the indicating-arm transversely to its line of movement, and a trip-latch on the indicating-arm in position to be struck by each key when moved inwardly, all substantially in the manner and for the purpose herein set forth.

8. The combination, in an indicating-machine, with the indicating mechanism and the operating-lever actuating the same, of a self-opening cash-drawer, an automatic bolt locking the drawer when the drawer is closed and held back by the drawer while open, a finger carried by said operating-lever into engagement with the bolt to retract it and free the drawer in its forward movement, and an auxiliary bolt forming a movable extension of the main bolt and carried by the retraction of said main bolt into engagement with the lever to lock it at the end of its return movement, substantially in the manner and for the purpose herein set forth.

9. The combination, in a cash-indicating machine, with its operating mechanism and a self-opening drawer, of a self-extending bolt formed in two sections and interposed between the drawer and operating mechanism to lock the one and the other, substantially in the manner and for the purpose herein set forth.

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

CARL W. WEISS.

Witnesses:

A. N. JESBERA,  
E. M. WATSON.