

(No Model.)

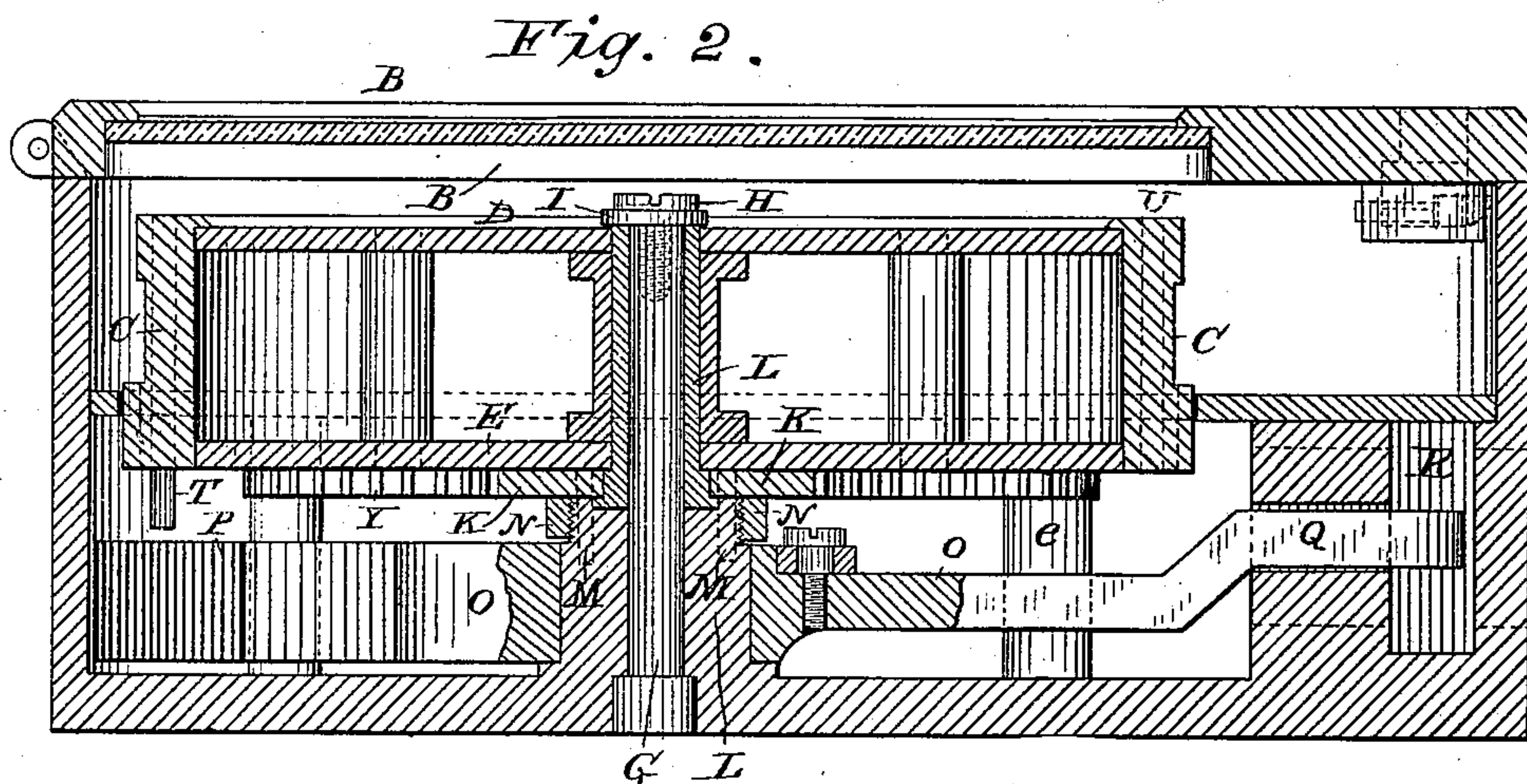
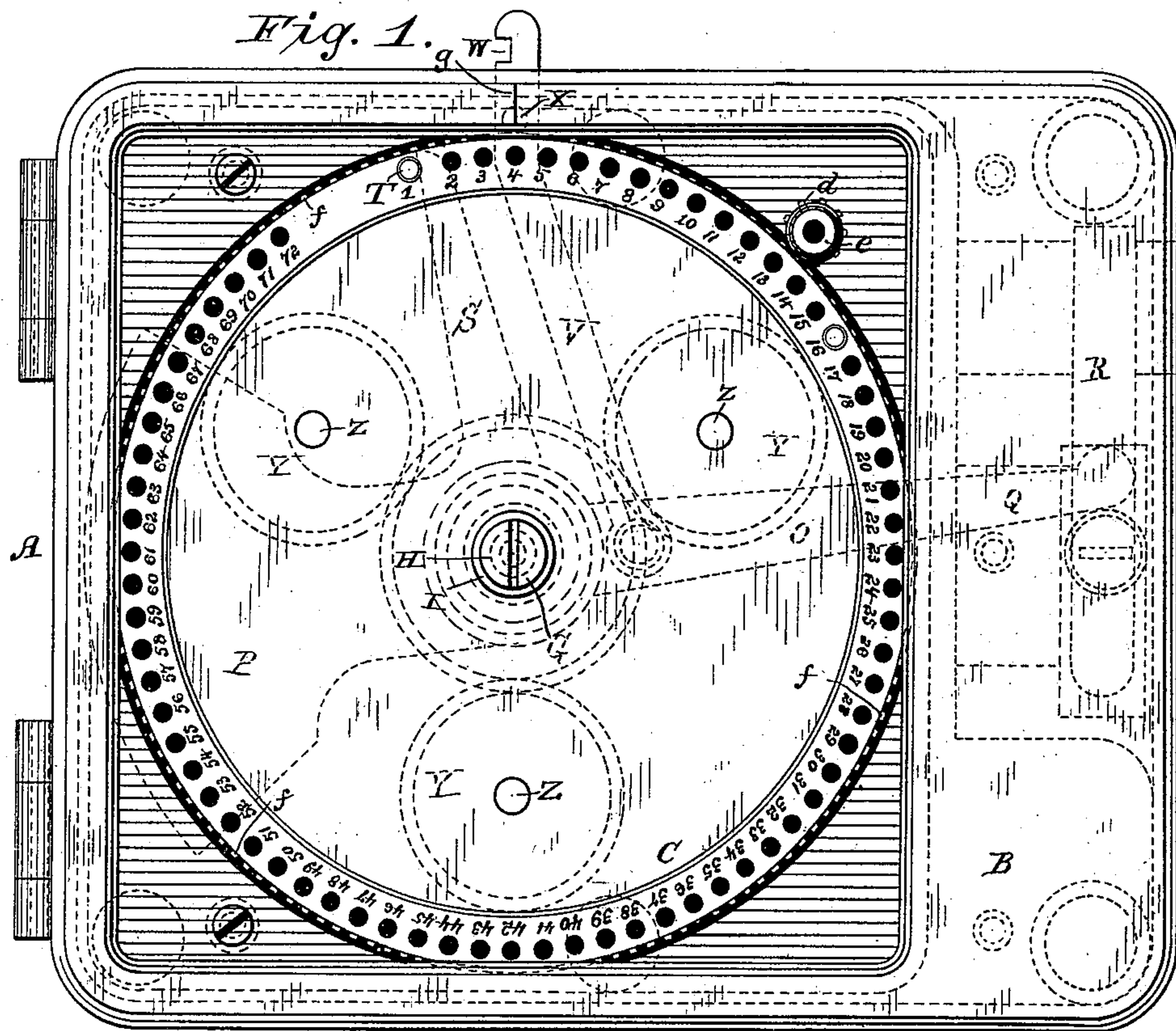
3 Sheets—Sheet 1.

E. & H. C. STOCKWELL.

TIME LOCK.

No. 363,919.

Patented May 31, 1887.



WITNESSES

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

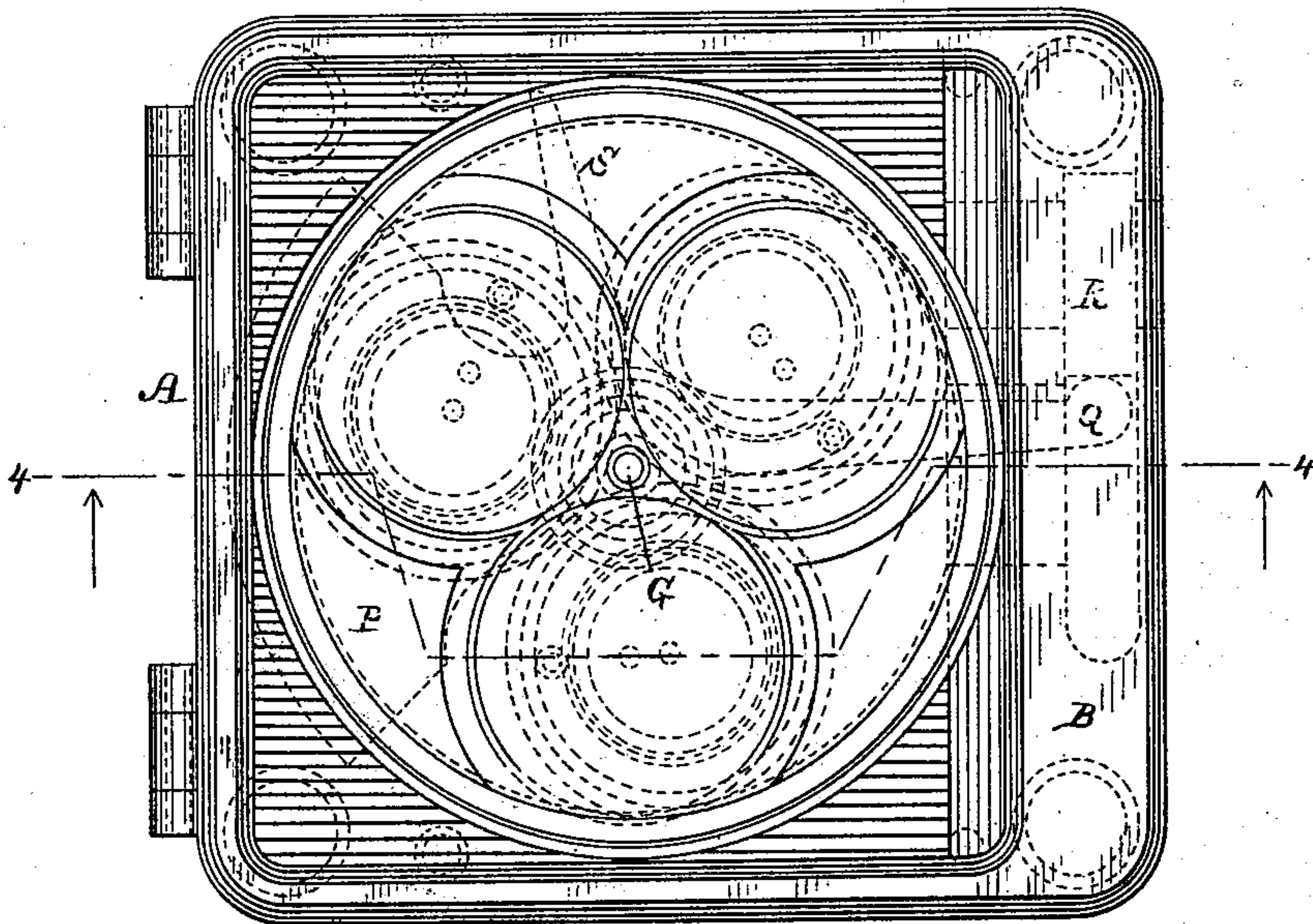


Fig. 4.

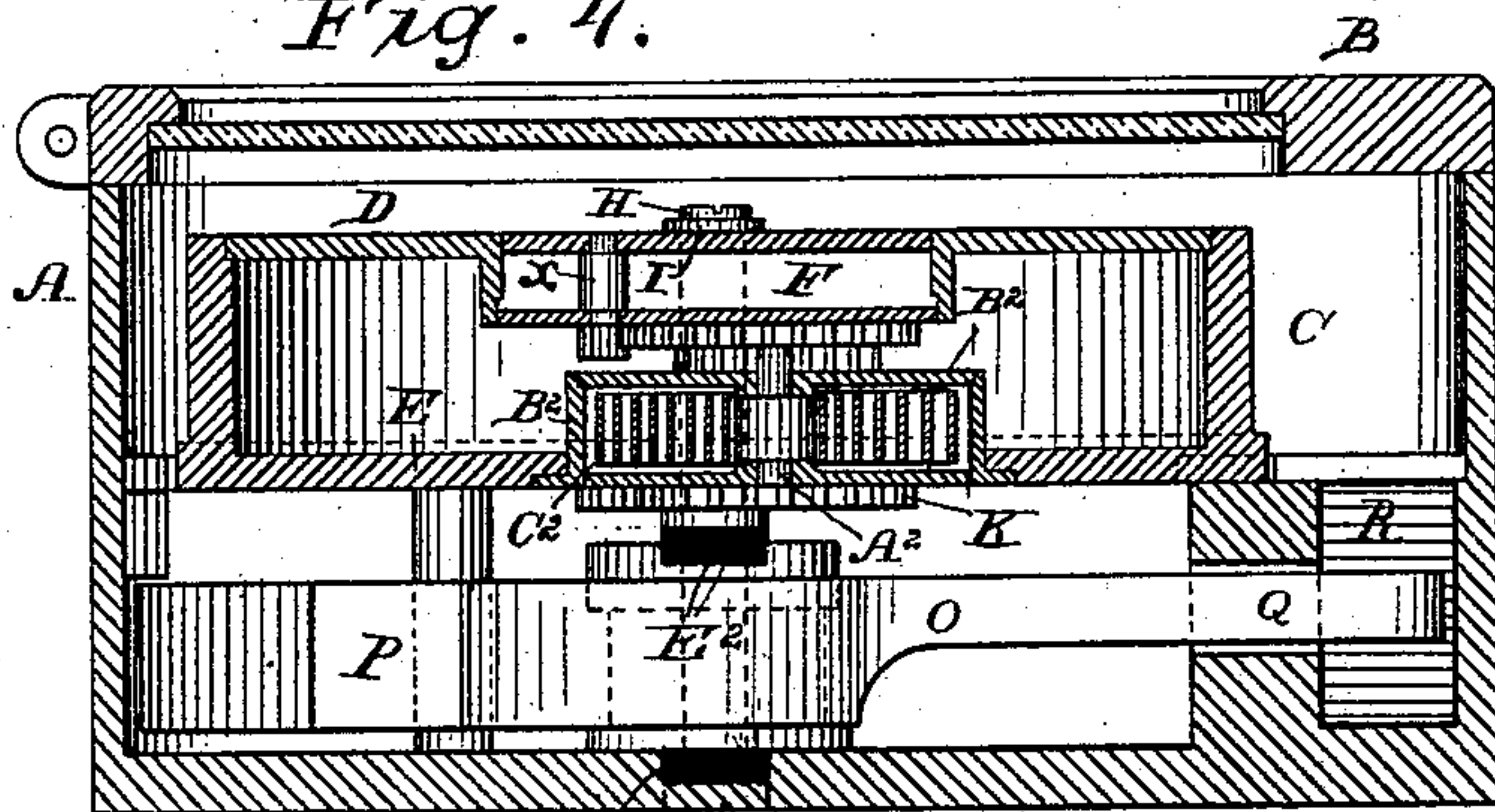


Fig. 5.

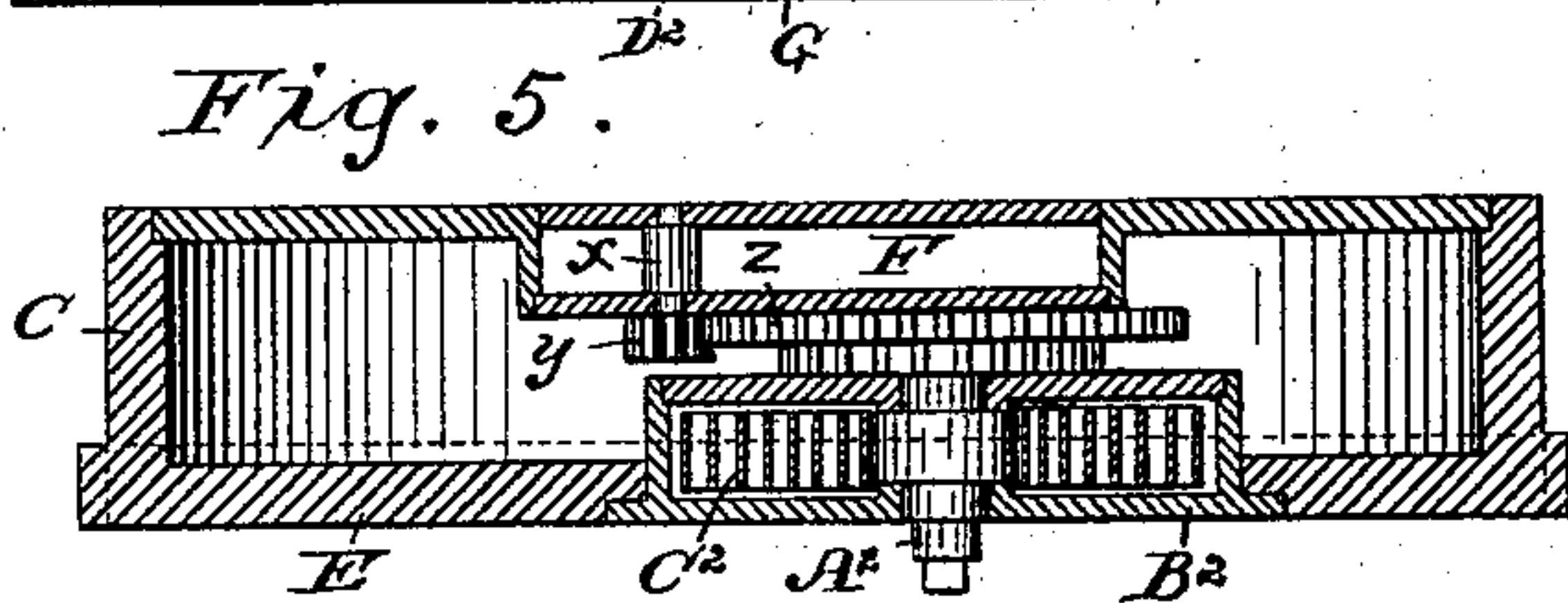
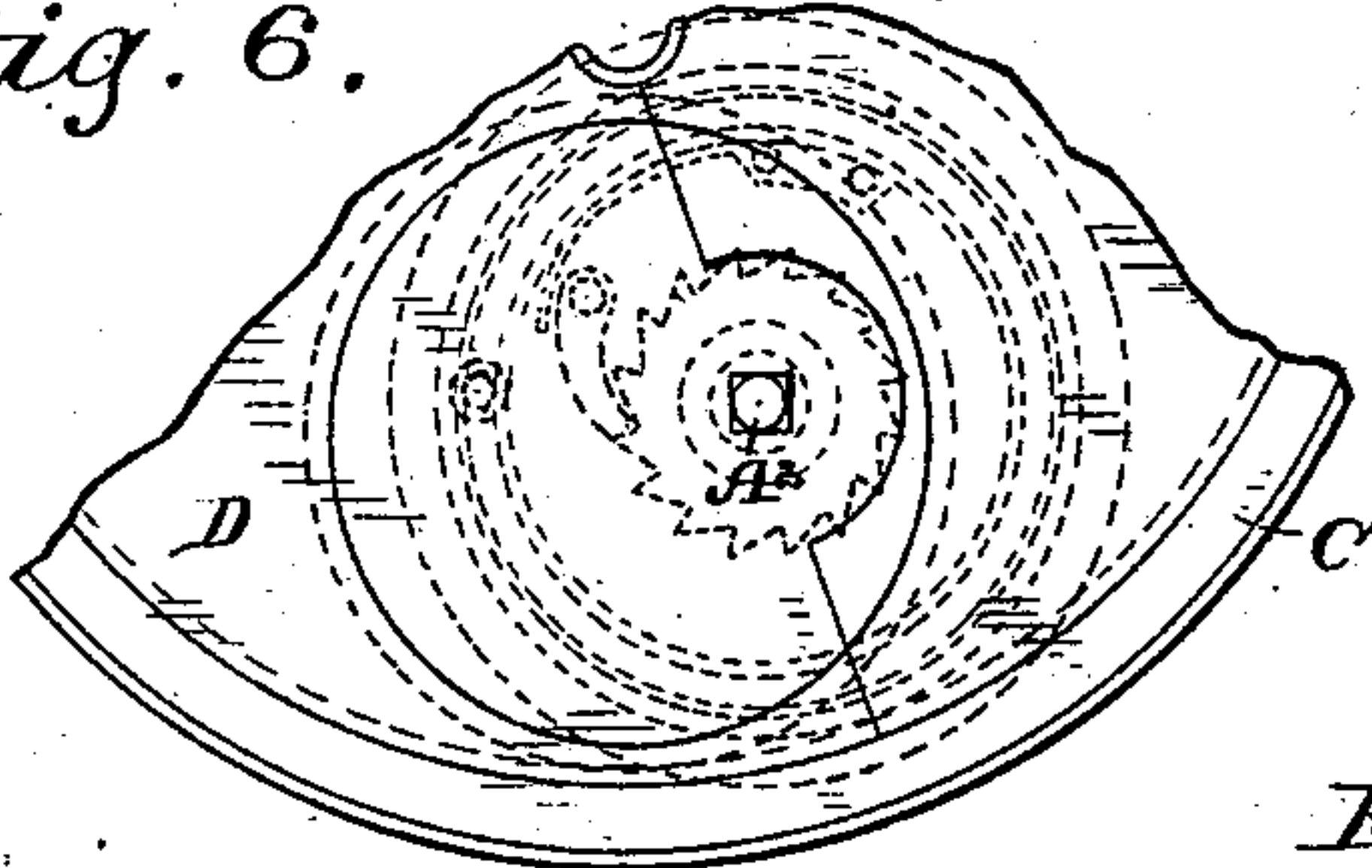


Fig. 6.



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3 Sheets—Sheet 3.

E. & H. C. STOCKWELL.

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Fig. 7.

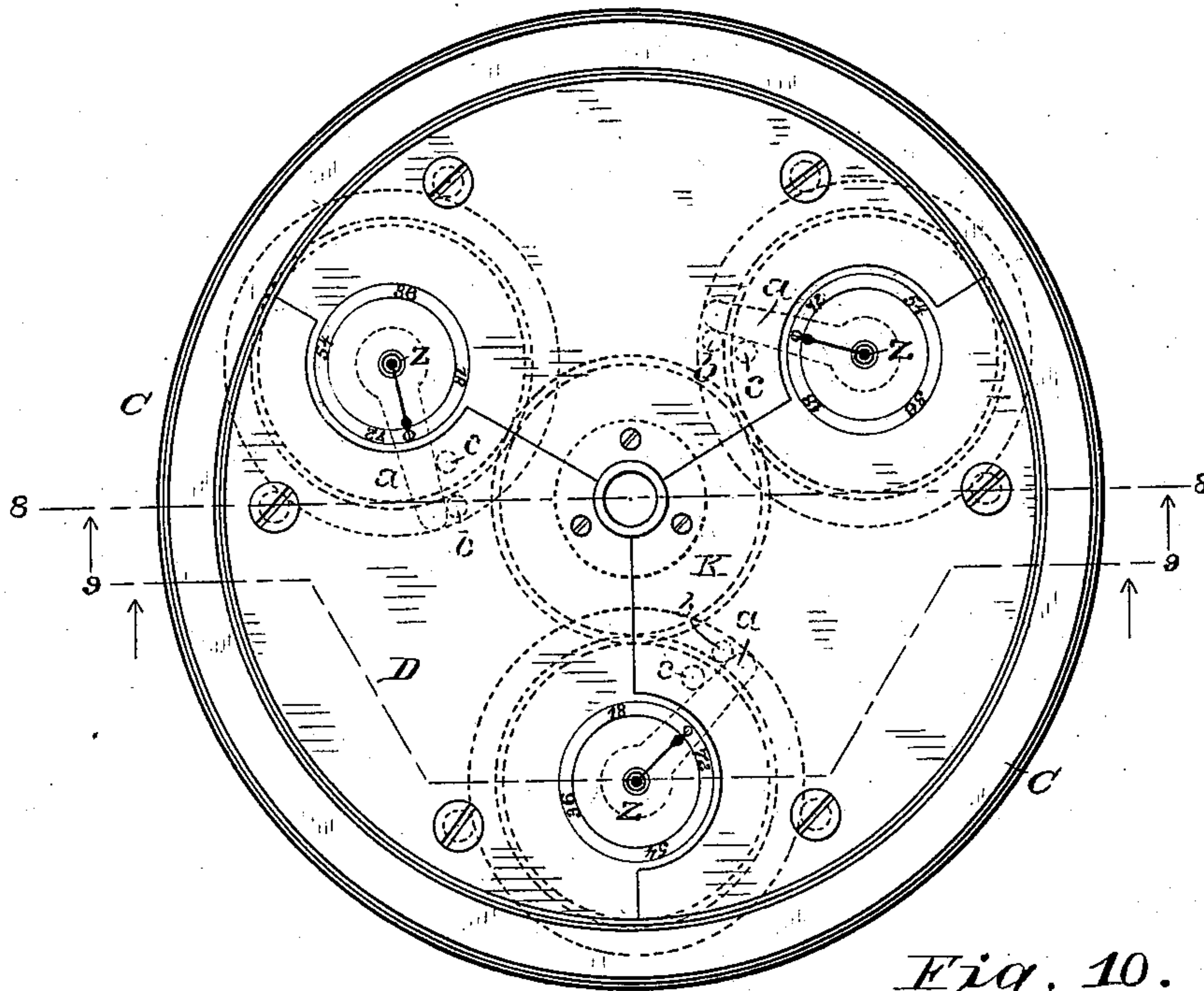


Fig. 10.

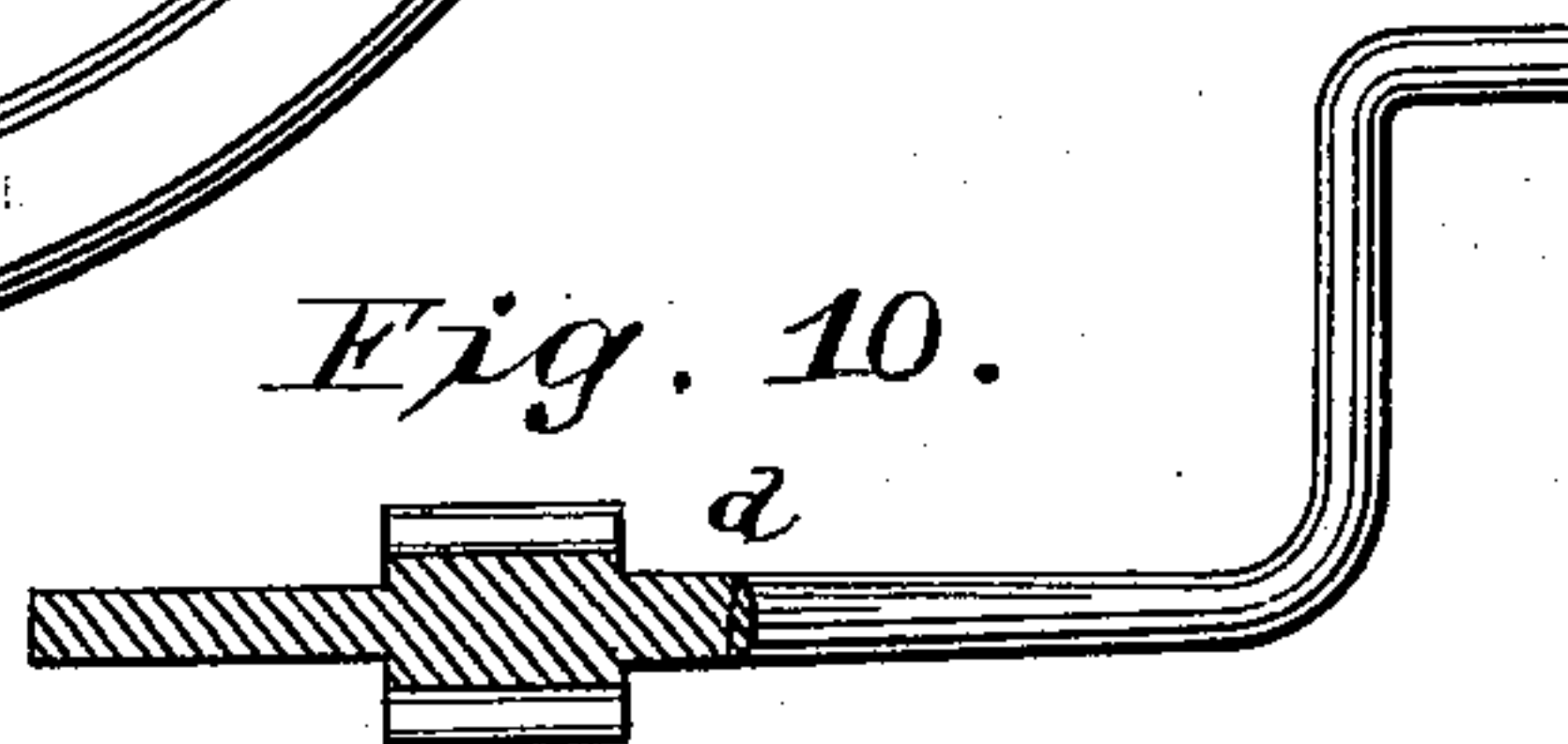


Fig. 8.

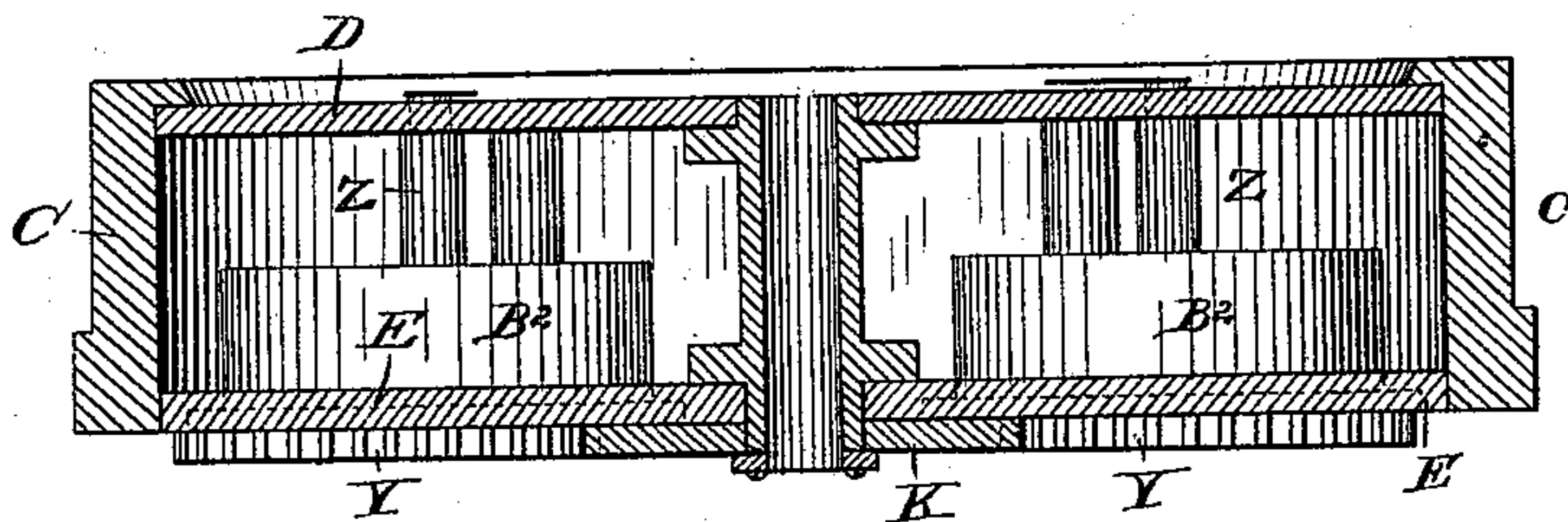
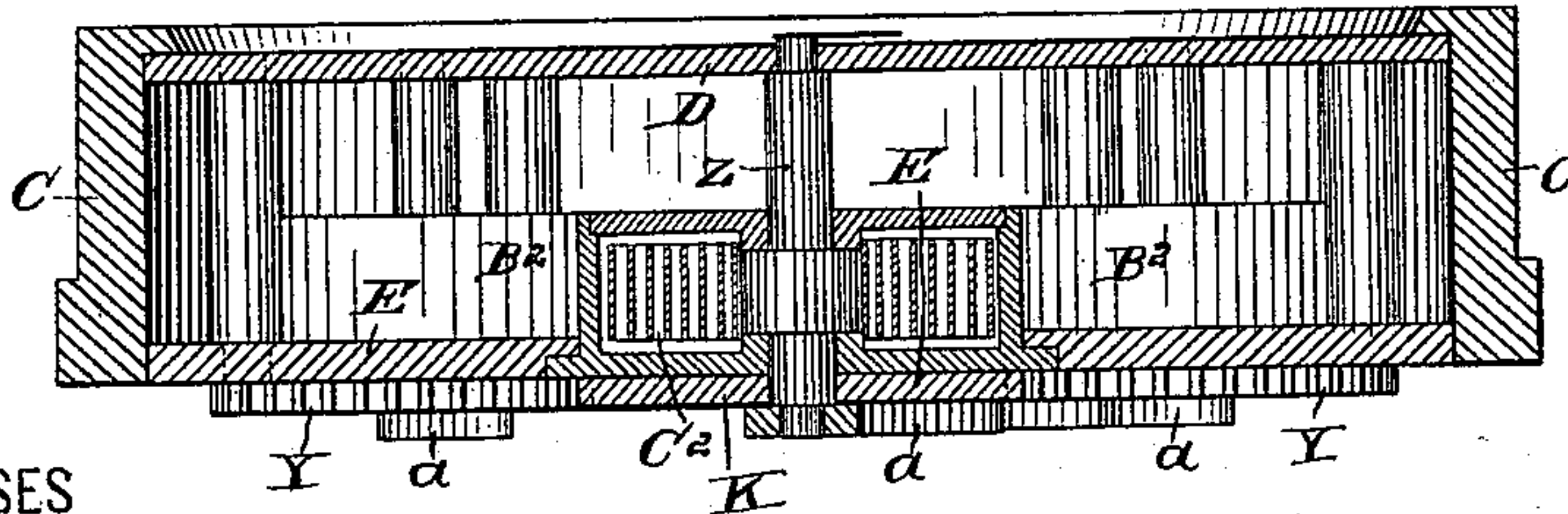


Fig. 9.



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# UNITED STATES PATENT OFFICE.

EMORY STOCKWELL AND HERBERT C. STOCKWELL, OF STAMFORD, CONNECTICUT, ASSIGNORS TO THE YALE & TOWNE MANUFACTURING COMPANY, OF SAME PLACE.

## TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 363,919, dated May 31, 1887.

Application filed December 9, 1886. Serial No. 221,054. (No model.)

*To all whom it may concern:*

Be it known that we, EMORY STOCKWELL and HERBERT C. STOCKWELL, both of Stamford, in the county of Fairfield and State of Connecticut, have invented an Improved Time-Lock, of which the following is a specification, reference being had to the accompanying drawings.

Our invention is in general characteristics similar to that for which we have made application for United States patent, Serial No. 220,895, filed the 7th day of December, 1886; and it consists in several features not contained in the said application, which are hereinafter described in detail, and specified in our appended claims.

In the accompanying drawings, Figure 1 is a front view of a time-lock embodying our improvements. Fig. 2 is a central section of the same. Fig. 3 is another front view of a smaller lock, the circular dotted lines indicating the positions of the three time-movements within the case. Fig. 4 is a central section on the line 4 4 of Fig. 3. Fig. 5 is a section of the time-movement case through one of the time-movements, showing improvements in the time mechanism. Fig. 6 is a detail view. Fig. 7 is a back view of the time-lock case. Fig. 8 is a section on the line 8 8 of Fig. 7. Fig. 9 is a section on the line 9 9 of Fig. 7, and Fig. 10 is a view of a pinion-key.

As in the time-lock set forth in the said application, we provide in the present instance two or more time-movements, preferably three, for greater security, with means for simultaneously winding them at one operation. The time-movements are carried on a single rotary support or contained within a single rotary case, and their mainspring arbors are provided with fixed arms and loose wheels, which latter gear with a fixed winding-wheel of the same size as the loose wheels. The loose wheels are provided with pins, which engage, respectively, with the fixed arms on the mainspring arbors, and thus the winding up of the time-movements and the operation of the time-lock by the running down of these movements are provided for.

Referring to the letters upon the drawings,

A indicates a lock-case provided with a hinged door, B, as usual. Within the lock-case is a centrally-pivoted rotary case or wheel supporting the time-movements, composed of an exterior ring, C, and the ordinary front and back plates, D and E, of the time-movements.

F indicates the time-movements, of which there are three in the present instance, and there may be two or more, as desired.

G indicates the central shaft or pivot, around which the time-movements rotate within their case.

H indicates a screw, and I a washer, the screw entering the end of the pivot-shaft through the washer to hold the time-movement case in place; so that it may rotate freely.

K indicates a winding-wheel fixed to the stump L by means of pins M, or otherwise.

N indicates a nut or collar screwed to the stump L.

O indicates a locking-lever pivoted upon the stump and enlarged or weighted at P. This lever is provided with an arm, Q, which serves to hold up the dog-block R, so as to dog the bolt-work of a safe or vault when the lock is applied in proper position for the purpose, as usual.

S indicates an arm of the lever, projecting upward into the path of the unlocking pin or stud T.

U indicates the holes around the margin of the time-movement case for the locking-pin. These holes and the numbers from 1 to 72, inclusive, are to correspond with the number of hours the time-movements will run and with the spaces through which the time-movement case will move each hour in running down.

V indicates a link pivoted to the lever O, extending up through the top of the case and provided with a notch or catch, W, to engage with the case. This link is provided with a pin or stud, X.

Y indicates three loose wheels upon the respective mainspring arbors Z of the time-movements, which latter are not illustrated in detail and are of the ordinary character employed in time-locks, except as hereinafter described.

a indicates arms fixed on the respective



mainspring-arbors of the time-movements.

*b* indicates stop pins or studs, one for each time-movement, set in the back plate of the time-movements, which stop the arms *a* when the movements run down.

*c* indicates pins or studs upon the loose wheels *Y*, which impinge against the arms *a* and cause the mainspring-arbors to be turned to wind up the mainsprings when the time-movement case is turned in the right direction. When the movements run down, the arms bear against the pins *c* and cause the loose wheels *Y* to revolve around the fixed winding-wheel *K* and rotate the case carrying the time-movements, thereby unlocking the lock in the manner described below.

In order to wind up the time-movements, the time-movement case is rotated to the left, in the present instance, by means of a pinion-key, *d*, which gears with the movement case, as illustrated, and is turned to the right.

*e* indicates a hollow key post or support, the end of the key being inserted into it to effect engagement of the pinion and the teeth *f* upon the time-movement case.

The details of the time-lock case form no part of our invention, and, therefore, are not described.

To wind up the mainspring of the respective time-movements simultaneously at one operation it is only necessary to turn the time-movement case, as in our said application; but in the present instance it is shown as turning to the left instead of to the right. To do this the pinion-key is inserted in the hollow post so that its pinion will engage with the teeth *f* of the time-movement, and it is turned to the right by means of its crank until the number 24, for example, or any other number desired, is brought opposite to the winding-mark *g* on the case, or wherever it may be placed. The time-movements are thus wound up to run twenty-four hours, if that be the number selected, and then to unlock the lock. The manner of unlocking is as follows:

It will be understood from the above description that the running down of the time-movements causes the time-movement case to rotate in the opposite direction from that in which it was turned to wind the movements. The arm *S* is in such a position that it will be struck by the unlocking-pin *T* just before the arms *a* reach the stop-pins *b* and stop the movements. The pin *T*, bearing against the arm *S*, turns the lever *O* to the right, so that its arm *Q* drops down and permits the block *R* to fall out of position for dogging the bolt-work. The parts remain in this unlocked position until the time-movements are again wound. In case it is desired to cause the lock to remain unlocked for a short period after closing the safe-door and then to automatically lock by the operation of the time-movements, such a result can be accomplished by pushing the link *V* downward and engaging its notch

W with the time-lock case. This will carry and hold down the arm *Q* in the unlocked position, and at the same time bring the pin or stud *X* into the line or circle of the pin-holes in the margin of the time-movement case. A pin can therefore be placed in the second, third, or any other hole to the left of the link *V*, so that as the time-movements run down its inner projecting end will strike against the pin *X* and unlatch the link *V*, when the weighted end *P* of the lever *O* will bring the latter into the locked position. In this manner a safe can be locked by a combination-lock alone for a few hours after the ordinary closing time, so as to permit the safe to be visited should occasion require early in the evening, and then afterward the time-lock will automatically take the locked position and keep it until the next morning, or the predetermined time for unlocking.

It is desirable to provide means in connection with a time-lock for ascertaining the extent of winding otherwise than by inspection of the graduating-figures, which is sometimes inconvenient and requires sharp eyesight, on account of dark places in which depositories are often placed. We therefore provide for indicating the extent of winding the time-movements, or, in other words, the number of hours of the locking period, without such inspection. We make the pinion upon the winding-key, for example, with such a number of teeth that one revolution of the key will turn the case containing the time-movements the distance of four pin-holes, or wind the time-movement to run for four hours. A half-turn will of course wind for two hours and a quarter-turn for one hour. By counting the turns and the partial turns of the pinion-key the extent of winding can be determined with sufficient accuracy for all practical purposes in the dark. This is a great convenience.

In order to verify the correctness of the counting of the turns of the key the case of the time-movements may be rotated back in the opposite direction to that for winding and then rotated forward again. Thus any error in counting the turns of the key may be detected and corrected.

Heretofore in the manufacture of time-locks special time-movements have had to be made. These have been very expensive. We have therefore devised a modification of an ordinary watch-movement, such as can be purchased in the market for a small price compared with what time-lock movements made to order have heretofore cost, of the best quality, or any desired quality. Watch-movements of given sizes, it is well known, are established without regard to the different grades or quality. Accordingly, we may employ watch-movements of any desired size established and found in the market, and may vary the grade or quality of the movement according to the wishes of the purchasers of time-



locks. This is a great element of economy in the manufacture of time-locks compared with what has heretofore been done respecting their time-movements, and it enables us to supply the demand for varying qualities of movements in time-locks, which could not heretofore be done at a reasonable cost where time-movements have had to be made to order.

Although the desirability of using ordinary watch-movements for time-locks has heretofore been apparent, no one has been able to use them successfully, for the reason that they are only constructed to run for thirty hours from the time when they are fully wound, while in many instances it is necessary that the movements of a time lock should run for seventy-two hours; and, furthermore, these movements as usually constructed are too weak to operate the mechanism of a time-lock. By our invention both these difficulties are overcome and we secure all the advantages of using ordinary watch-movements, while making a time-lock which is equal, if not superior, to any lock heretofore made.

We take an ordinary one-day watch-movement and remove its mainspring and mainspring-arbor. In place of the arbor we insert a different arbor,  $x$ , which extends through the back plate of the watch-movement and is provided with a pinion,  $y$ , which gears with a wheel,  $z$ , upon a spring-arbor,  $A^2$ , within a spring-barrel, (or fastening for the outer end of a coil-spring,)  $B^2$ , containing a strong mainspring,  $C^2$ , which will cause the time-movement to run a much longer period—for example, seventy-two hours—with one turn of the new mainspring-arbor. This new heavy mainspring is so connected with the train of gearing of the watch-movement as to cause it to run normally and keep accurate time, as usual, and with force enough to operate a time-lock. By this modification of an ordinary one-day watch-movement we are enabled to quickly and satisfactorily produce time-lock movements at a materially-reduced cost, and time-lock manufacturers are thereby enabled to buy their time-movements in the open market and alter them, as described, for use, which is a great practical convenience and economy.

In our improved time-lock it will be observed that the time-movements and all of the delicate operating mechanism of the lock have but a single central pivotal support or attachment to the lock-case.

In Fig. 4 is shown how the parts are cushioned upon this single central support to avoid injury by concussion from without or on account of slamming a safe-door or the like.

In Fig. 4,  $D^2$  indicates a rubber packing-ring around the central shaft or pivot,  $G$ , the lock-case being counterbored from the back side to receive it.  $E^2$  indicates another rubber packing-ring, the stump  $L$  being counterbored to receive it. These packing-rings prevent injuries from blows, jars, concussions, and the like, and may be of metallic or any other sort

of springs, and be of any length, thickness, or diameter desired.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a time-lock, the combination, with a locking-lever, of the arm  $S$ , the ring  $C$ , provided with pin-holes, and the pin  $T$ , substantially as set forth.

2. In a time-lock, the combination of the locking-lever  $O$  with the arm  $S$  and the dog-block  $R$ , the ring  $C$ , and pin  $T$ , substantially as set forth.

3. In a time-lock, the combination, with the case and the locking-lever, of the catch  $V$ , pivoted to the locking-lever and passing through an opening in the case, and the pin  $X$  and ring  $C$ , projecting into the path of the pin  $T$ , substantially as and for the purpose set forth.

4. In a time-lock, the combination of two or more time-movements having fixed arms  $a$  and loose wheels  $Y$  on their mainspring-arbors, and the loose wheels provided with pins  $c$  and gearing with a winding-wheel of the same size as the loose wheels, the fixed arms and pins being directly in contact in the winding and running down of the time-movements, substantially as set forth.

5. In a time-lock, the combination of two or more time-movements, a case or wheel carrying said movements and having teeth around its periphery, a pinion-key gearing with said teeth, a key post or support therefor, and a winding-wheel connected with the arbors of the time-movements, whereby the time-movements may all be wound and the time-lock set simultaneously by turning the key, substantially as set forth.

6. In a time-lock, the combination, with an ordinary time-movement from which the mainspring and its arbor are removed, of an arbor,  $x$ , carrying a pinion,  $y$ , a wheel upon an arbor,  $A^2$ , gearing with pinion  $y$ , a mainspring,  $C^2$ , the outer end of which spring is secured to a fixed barrel or fastening, substantially as set forth.

7. In a time lock, the combination of an ordinary time-movement from which the mainspring and its arbor are removed, set in one plate, and an outside spring set in another plate and connected through gearing with the time-movement, so that the movement will operate the lock, substantially as set forth.

8. In a time-lock, the combination of time mechanism, a rotary case or support carrying it and provided with teeth on its periphery, a winding-wheel connected with the arbors of the time mechanism, unlocking mechanism, a pinion-key gearing with the teeth on the periphery of the rotary case, and a key post or support whereby the turning of the key for winding controls and indicates the setting of the lock for unlocking, substantially as set forth.

9. In a time-lock, the combination of a revolving case or support for the time mechan-



ism, gear-teeth on said case or support, and a  
pinion-key, the teeth on the gear and key being  
so proportioned that each turn of the key will  
wind for a certain predetermined time, to en-  
5 able the lock to be wound and set in the dark,  
by counting the turns of the key, substantially  
as set forth.

In testimony whereof we have hereunto sub-  
scribed our names.

EMORY STOCKWELL.

HERBERT C. STOCKWELL.

Witnesses:

SCHUYLER MERRITT,

GEO. E. WHITE.