

(Model.)

2 Sheets—Sheet 1.

E. & H. C. STOCKWELL.

TIME LOCK.

No. 363,918.

Patented May 31, 1887.

Fig. 1.

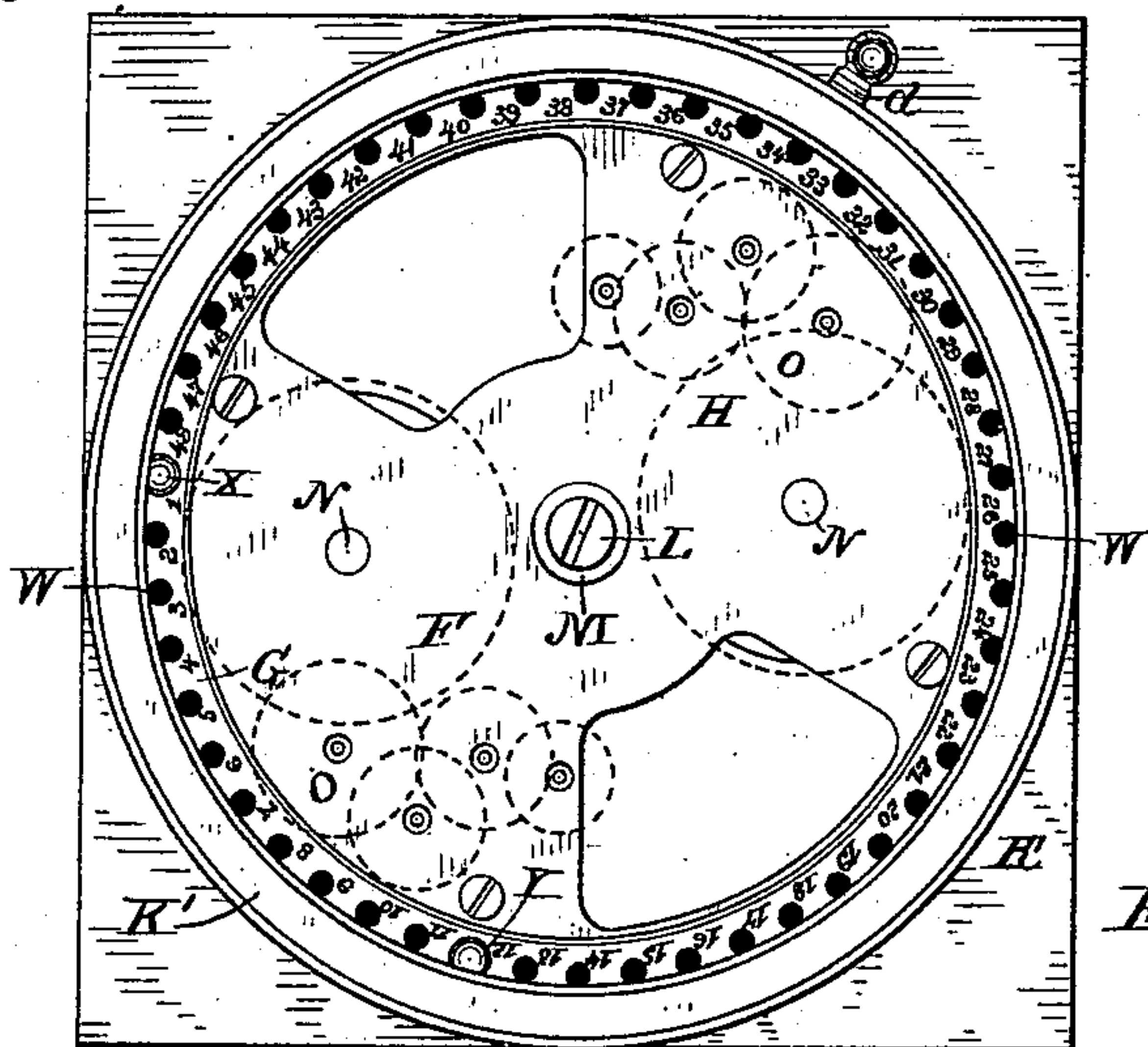


Fig. 2.

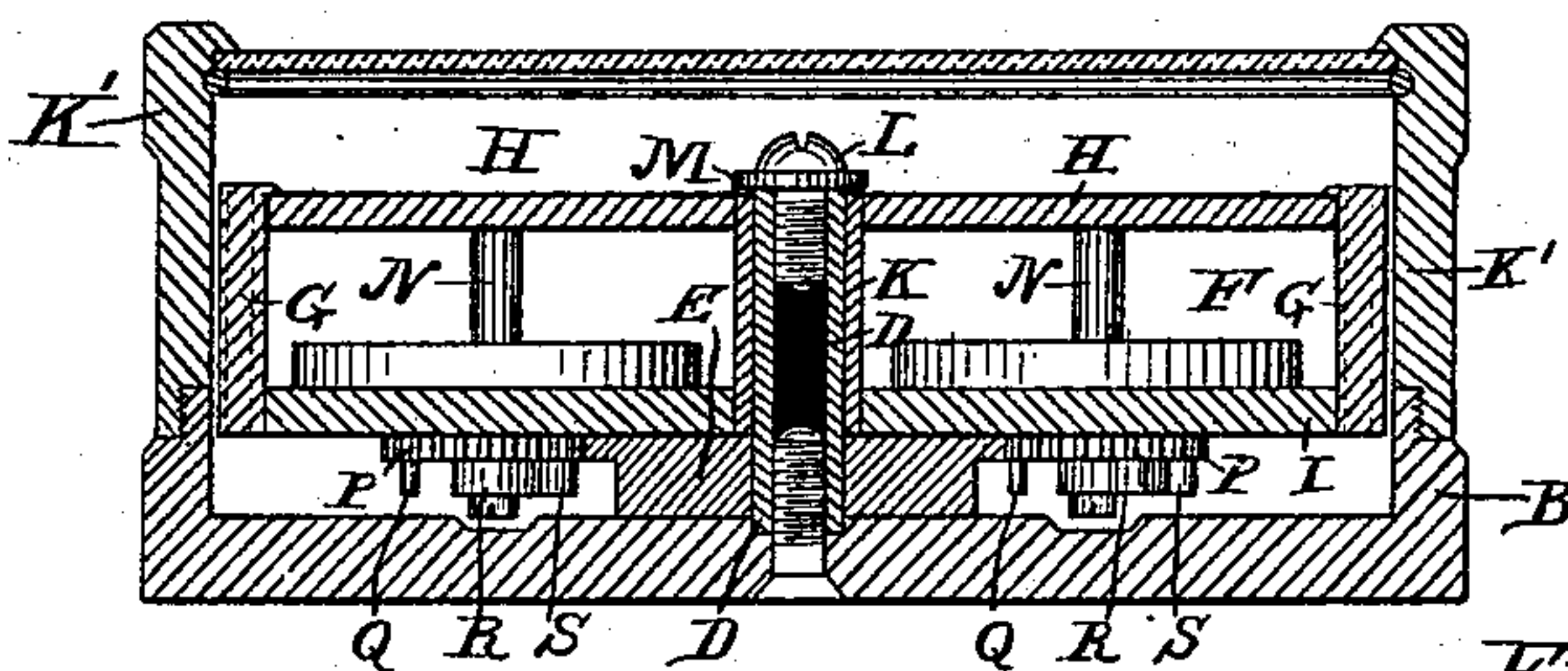


Fig. 3.

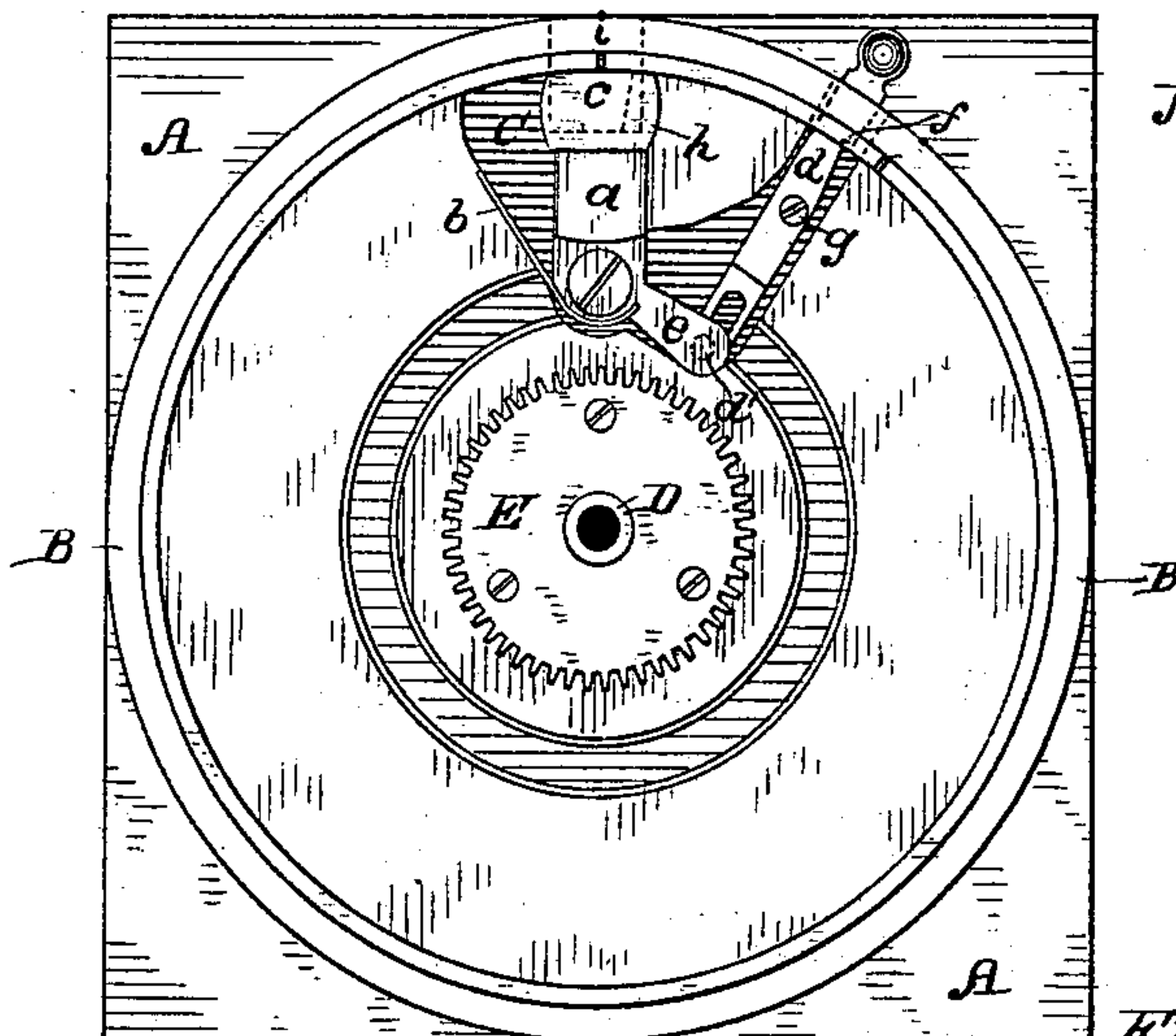


Fig. 4.

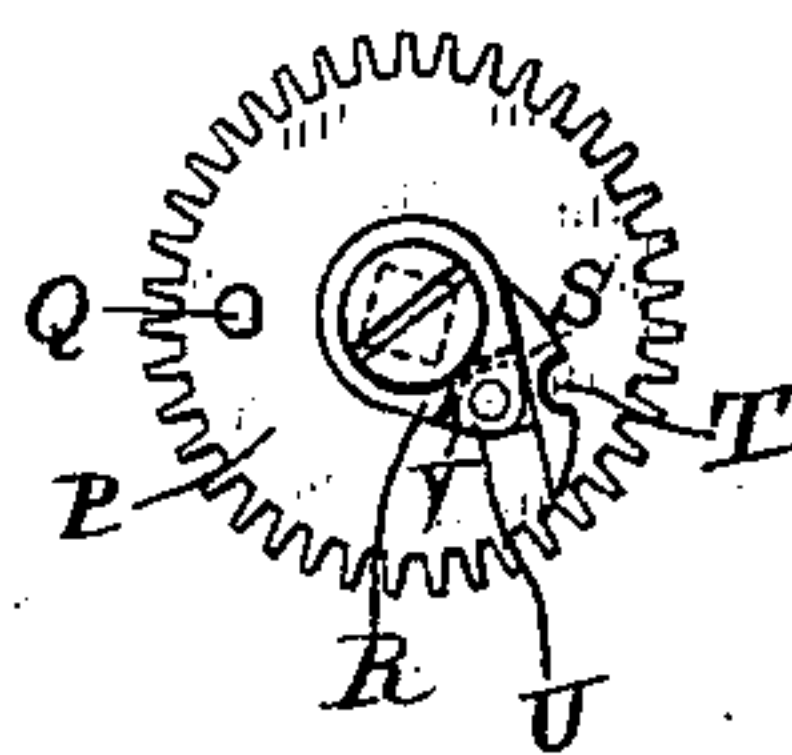
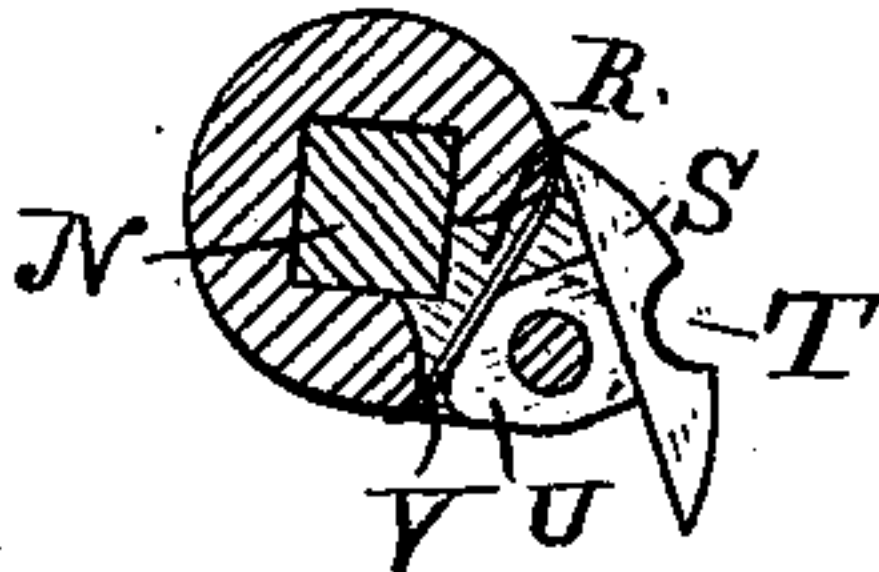


Fig. 5.



WITNESSES

E. C. Newman,
C. M. Newman.

INVENTORS

Emory Stockwell.
By their Attorneys Herbert C. Stockwell.
William Hopkins & Peyton.

(Model.)

E. & H. C. STOCKWELL.

2 Sheets—Sheet 2.

TIME LOCK.

No. 363,918.

Patented May 31, 1887.

Fig. 7.

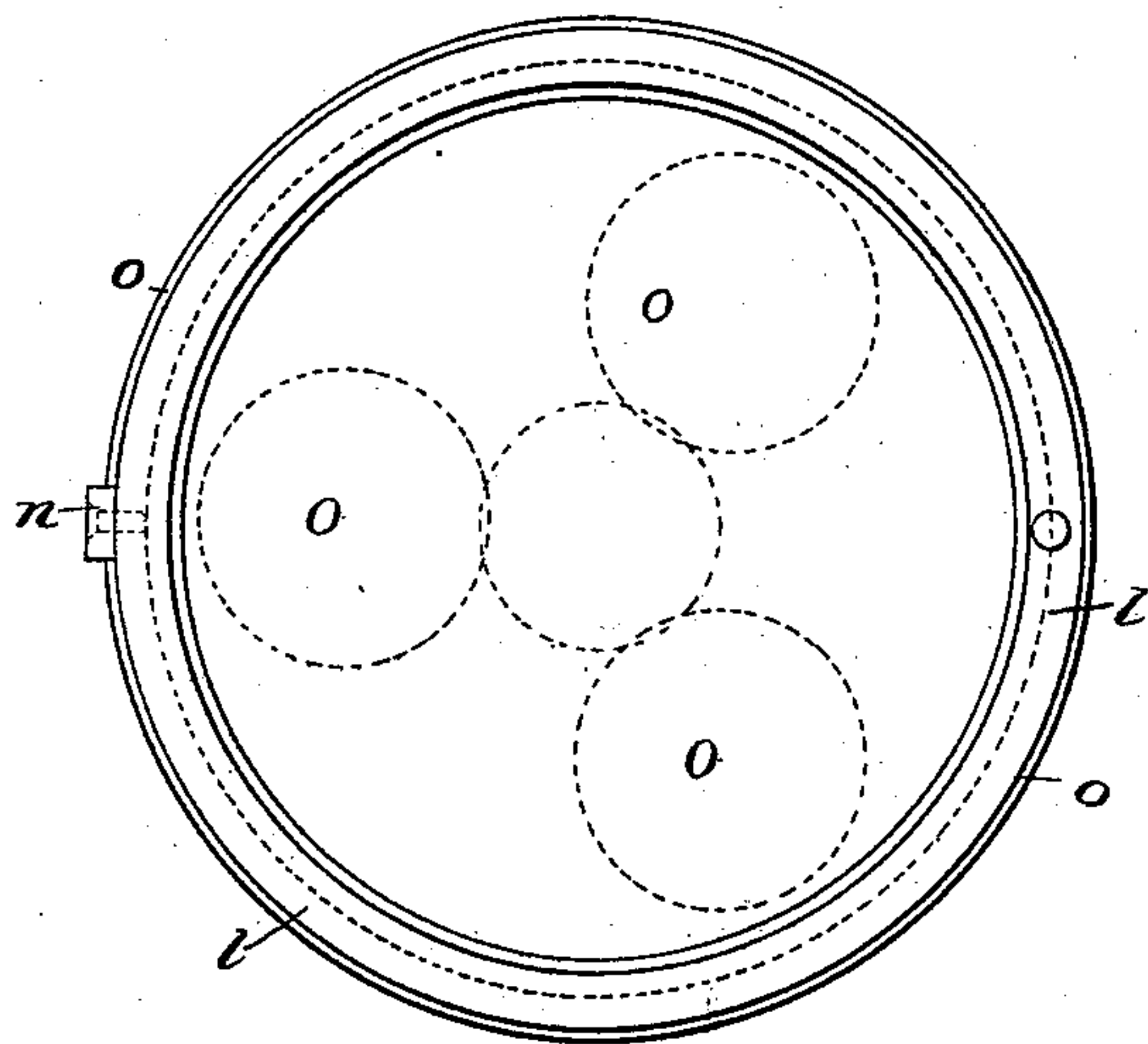


Fig. 8.

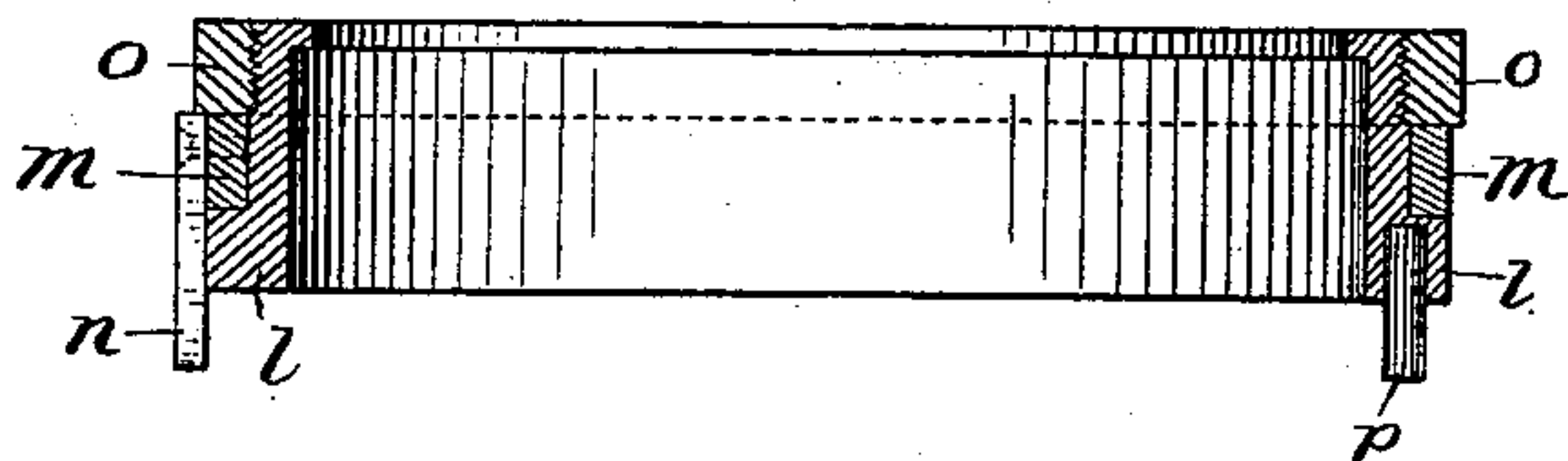
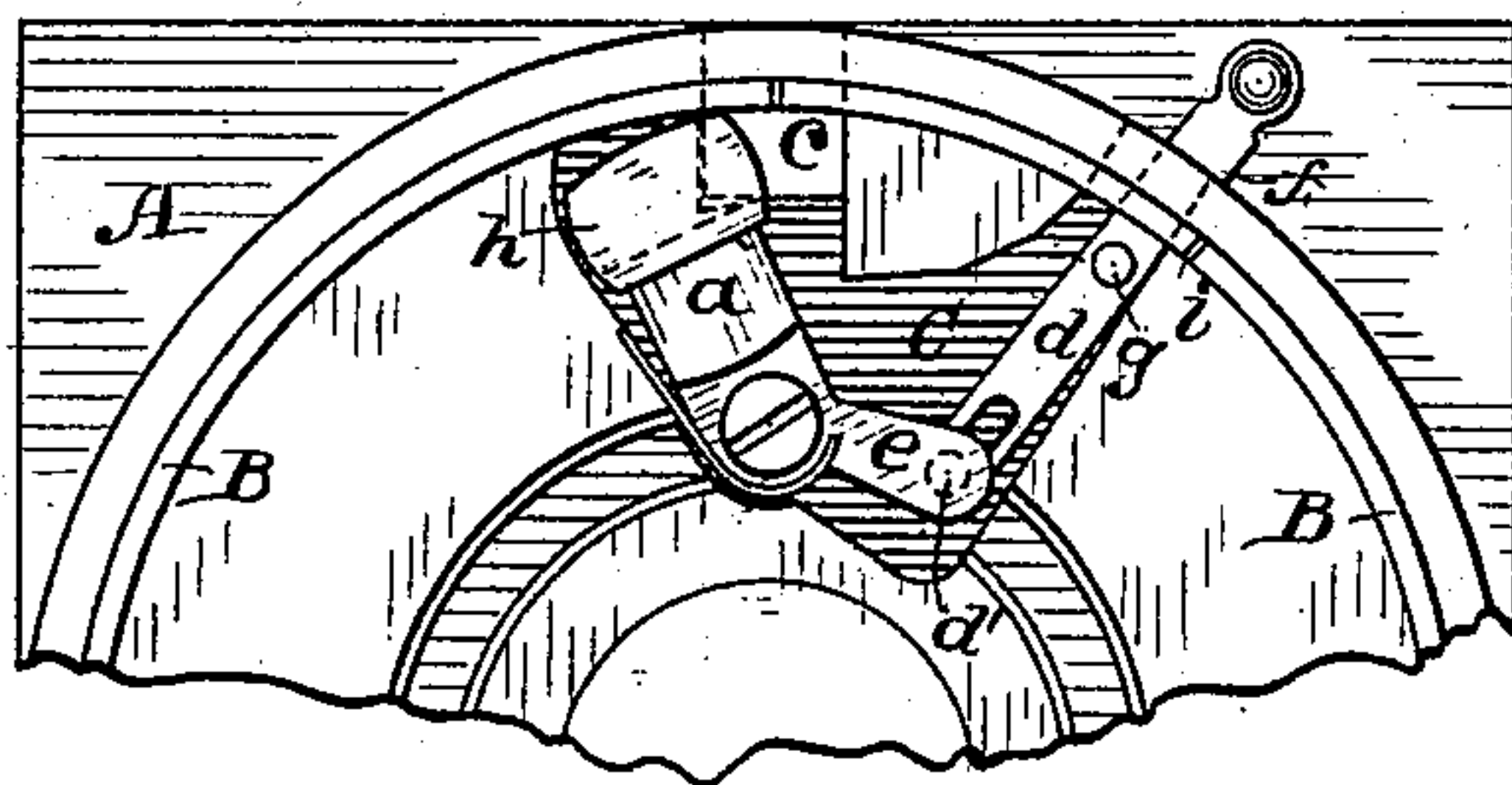


Fig. 6.



WITNESSES

E. C. Newman,
C. M. Newman.

INVENTOR

Emory Stockwell.
By their Attorneys *Herbert C. Stockwell,*
William Hopkins & Peyton.

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 363,918, dated May 31, 1887.

Application filed December 7, 1886. Serial No. 220,895. (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.

The general object of our invention is to provide a time-lock with the minimum number of parts organized on the simplest plan in view of existing knowledge of time-locks, and at once the cheapest to manufacture and the most effective in use, so far as the prime objects of convenience, capacity to serve different important purposes, security, and reliability are concerned.

The problem heretofore encountered in the development of time-locks has been to make them first secure against burglars, and, second, secure against "lock-outs," which result from defects, accidents, or mistakes in the management of the locks. These lock-outs are of two kinds—permanent, or those which, in the absence of means for controlling the time locks from without, necessitate the breaking open of depositories, and temporary, or those which only require waiting for the belated operation of the time-lock mechanism or for some other means to terminate them.

While there is no doubt that time-locks with which it is impossible to communicate, or which cannot be controlled from the outside of depositories, are most secure against burglars, it is also true that in this class of locks as heretofore constructed it is necessary to take the greatest care to prevent lock-outs, owing to the fact that in case of permanent lock-out it is usually necessary to break open the depository to effect an entrance. To guard against accidents of this sort, makers of time-locks have heretofore used the very best movements which they could secure, and in the best class of locks have duplicated the movements, so that in case of failure of one the other would continue to operate the lock. These means have usually accomplished the result, and there can be no doubt that a time-lock of the best class with double movements is, with

proper care, extremely unlikely to cause any trouble; but, with the object of absolutely preventing trouble from lock-outs, various plans have been adopted to enable some one from the outside to open the time-lock in case its movements are stopped. This is done by means of some electrical contrivance, or by connection with the spindle of the bolt-work, or by a secret combination or similar means. The objection to all these systems is that in the first place they weaken the security of the lock, the very essence of which is that it shall be impossible to control the lock from the outside. Furthermore, the necessary complication which they involve has proved to a greater extent a cause of lock-outs and a necessity for breaking open safes than the stoppage of time-movements themselves. Experience has therefore demonstrated that the true solution of the problem of equal and complete security against burglars and lock-outs is the plan which provides for no control whatever of the operation of time-locks from the outside of the depositories which they guard. Following that plan, therefore, our invention consists in certain constructions and combinations, hereinafter described and claimed, of a simple, economical, and efficient character, by which time locks, uncontrollable from without and proof against burglars, are greatly improved, and the danger of lock-outs practically annihilated without adding anything to their cost—i. e., we get better results at an equal or less expense.

In the accompanying drawings, illustrating our invention, Figure 1 is a front view of our improved time-lock. Fig. 2 is a central or diametrical section of the same. Fig. 3 is a view of the bed-plate and parts fixed to it, the case containing the time-movements being removed. Figs. 4 and 5 are details of parts detached for better illustration. Fig. 6 is a section of the bed-plate, showing attached locking and unlocking mechanism in detail. Fig. 7 is a plan view of a modified form of ring for incasing the time mechanism, and showing in dotted lines the position of three time-movements in the case; and Fig. 8 is a diametrical section of the same.

We provide two or more time-movements, preferably three for greater security, with means for simultaneously winding them at one operation. For this purpose the time-movements are contained in a rotary case, and their mainspring-arbors are provided with fixed arms and loose wheels, which latter gear with a fixed winding-wheel; and means are provided for connecting them with the mainspring-arbors, so that by turning the case in one direction the time-movements will be wound.

Referring to the letters upon the drawings, A indicates the bed-plate of the time-lock, provided with a curb, B, and recessed, as shown, at C. This bed-plate and curb may be cast in one piece. In the center of the plate and curb is a fixed shaft, D, and a fixed winding-wheel, E. The bed-plate and curb, one or both, in the form shown, might be omitted, and the fixed winding-wheel, and the curb also, if used, secured to a safe or vault door, or fixed bolt-bars, which would then become in substance the bed-plate; but that formal change is not desirable, and the form of bed-plate with curb made in one piece, as illustrated, is preferable.

F indicates the case for inclosing the operative time-movements, (not shown,) which, as shown, consists of a ring, G, and front and back plates, H and I, of the time-movement.

As time-movements secured in their front and back plates are commonly manufactured and found for sale in the market, it is only necessary to select such as have plates circular in form and purchase them, and fasten on the ring G in any usual way, or else to order time-movements with circular front and back plates from the manufacturer, and secure the ring G to them. To produce a rotary case in this way is very economical—much more so than to first make a case and then secure time-movements within it.

K is a central bushing fitting the fixed shaft D of the bed-plate, forming the pivot upon which the case F, carrying the time-movements, turns.

L indicates a screw, and M a washer, the screw entering the end of the shaft D and serving to hold the time-movement case in place, while leaving it free to turn upon the shaft D. Upon the arbor N of each time-movement O is a loose wheel, P, provided with a pin, Q. Each wheel P gears with the fixed winding-wheel E, and has half the number of teeth of that wheel.

R indicates a slotted and pointed winding-arm fixed upon the mainspring-arbor of each time movement.

S indicates a pivoted extension of the arm R, notched at T, and so placed on its pivot upon the pointed end of each arm R that the pin Q, when turned in one direction, will not pass the pivoted extension S, but will strike against it, so as to wind up the mainspring. Then, as the time-movements run down, the pivoted extension S will bear against the pin and carry the loose wheel P back in the oppo-

site direction till the lock is unlocked. When the loose wheel is turned away from the pivoted extension S on one side and around to the other side it will pass over one end of said extension and enter its notch T and swing it over on the opposite side of the arm R. Thus it will be seen that the pin may ride over the pivoted extension S once in either direction and tilt it as it comes over, so that it will be in position to stand firmly against the pin when the pin comes around to it again. By this means we are enabled to wind up the time-movements simultaneously and equally at one operation by turning the case F, carrying the movements, to the right.

When the movements begin to run down the pivoted extensions of the fixed arms R bear against the pins upon the loose wheels and carry them back to the position for unlocking. In case one time movement should stop, the other or others will continue to do the work, and the pin upon the loose wheel P and the movement which is stopped will strike in the notch T of the pivoted extension of the arm of that movement and tilt it out of the way. Thus the stopping of one movement, or all of the movements except one, will not prevent the operation of unlocking, because each time-movement is thus made entirely independent of every other.

In order to operate the pivoted extension of the arm R with certainty, we provide that its pivot-lug U shall bear against a slight spring, V, within the slot of the arm R in such a way as to hold the pivoted extension securely in position when tilted on either side.

In order to provide for locking and unlocking at the proper times, we make a series of pin-holes, W, around the margin of the ring G and a series of figures opposite these holes running from 1 up to 72, or to any number corresponding with the number of hours the time-movements are constructed to run.

In the drawings only forty-eight holes are shown and a corresponding number of figures. For these holes we provide two pins, X and Y, as shown. The pin X is the unlocking-pin and is placed in the first pin-hole (marked 1) and ordinarily kept there without change. The pin Y is a supernumerary and may be ordinarily kept in the forty-eighth pin-hole or in some other place out of the way, and its use will be described presently.

a indicates a pivoted dog within the recess C of the bed-plate A.

b is a spring tending to keep this dog in the locked position, or so as to close the opening c in the bed-plate.

d indicates a slide or link pivoted by an elongated slot to an arm, e, of the dog a. The elongated slot in the slide is for the purpose of allowing the pivot-pin d' to play in the slot without lifting the slide when the dog is tilted to one side for unlocking. The slide is provided with a notch, f, which is adapted to hook over the edge of the slide-opening when the slide is drawn out and hold it in that po-

sition, as shown in Fig. 6. Drawing out the slide tilts the dog *a*, so as to throw it to one side away from the opening *c*, into which the fence of the bolt or dog for securing the bolt-work of a safe may drop. The latter is not illustrated, because it is familiar to those conversant with this art.

The device above described is a mere time-lock attachment, as will be perceived, complete in itself, and adapted to be applied to a safe or vault door that has the ordinary bolt-work and dog for securing the same in the locked position by holding up the fence of the locking-dog until the time-movements have done the unlocking work.

The slide *d* is provided with a pin or stud, *g*, which, when the slide is drawn out, as shown in Fig. 6, will stand in the path of the inner ends of the pins X and Y.

The inner projecting end of the pin X is set so as to strike lug *h* of the dog *a* and move it to one side away from the opening *c* or into the unlocked position.

The operation of the lock is therefore as follows: Let it be supposed that it is desired to wind the movements up so as to run for eighteen hours and then unlock. The case F is turned to the right until the number 18 comes opposite the notch *i* in the curb B. Then when the eighteen hours have elapsed the inner projecting end of the pin X will strike the lug *h* and tilt the dog *a* away from the opening *c*, which will result in unlocking. Now, in case the movements should by accident be wound to twenty-four hours instead of eighteen, making an error of six hours in the time of unlocking, all that will be necessary to correct it is to insert another pin (or it may be the pin X) in the sixth hole in front of the pin X, which will cause the unlocking to take place at the proper time. In case it is desired that the locking shall be deferred for a few hours after setting the time-lock and closing the safe and locking the combination-lock, which is ordinarily used with the time-lock, it will only be necessary to draw out the slide *d* and secure it by means of its notch or catch *f*, which, as already explained, will hold the dog *a* away from the opening *c*, or in the unlocked position. Now insert the pin Y, the inner projecting end of which is shorter than that of the pin X, into a hole—three or four numbers to the right of the slide *d*, for example—corresponding with the number of hours it is desired to have the safe remain unlocked by the time-lock. As the time mechanism operates it will carry the pin Y against the stud *g* on link *d* and release the catch *f* of the link, when the spring *b* will swing the dog *a* into the locked position and draw in the slide *d*. The end of pin Y, while projecting far enough to hit the stud *g*, is not long enough to strike the lug *h*, and hence will pass over that without disturbing the dog *a*, which will remain in the locked position until the pin X comes around to unlock at the proper predetermined time.

K' indicates an ordinary glazed cap or cover

for protecting the time-movements from dust and disarrangement.

We have above described a peculiar ring, G, provided with pin-holes and pins, which is one form of device for securing proper adjustments to cause the locking and unlocking to occur at the proper times—in other words, to have the dogging mechanism operated suitably for these purposes. Other forms of devices may be employed in connection with a rotary case carrying the time-movements—that is to say, a different kind of a ring may be used, for example, as shown in Fig. 7, where *l* indicates a ring which may be substituted for the ring G, above described. This ring *l* has applied to it so as to move loosely another ring, *m*, provided with a lug or projection, *n*, which constitutes a locking device, being adapted to be set or adjusted by rotation of the ring *m*, so as to strike the stud *g* on the slide *d* in the manner already above described to cause the time-lock to be locked. This ring *m* is held in place by means of a screw ring or nut, *o*, which can be loosened to permit the proper adjustment of the ring *m*, and then can be screwed down to hold that ring firmly in place.

p indicates an unlocking spur or pin projecting from the bottom of the ring *l*.

It is immaterial what form of adjusting device is employed in connection with the rotary case F and the dogging mechanism for operating the latter; but the forms of devices described are very suitable.

On account of the fact that the case carrying the time-movements is mounted on a central pivot, which is its only support, it is very convenient to remove the time-movement case and exchange it for another whenever the time-movements or any one of them become disordered or disarranged from any cause and require repairs or cleaning. This is a great convenience as compared with the method heretofore in vogue for repairing or exchanging time-lock movements, which always involves the employment of an expert. It enables the manufacturer to make cases for time-lock movements of certain uniform sizes, so that to overcome a difficulty or defect in the working of the time-movements is a mere matter of removing the screw L and taking out the time-movement case, putting in another in its place, and re-inserting the screw L, all of which can be done by an attendant in a bank without the employment of any expert or skilled workman.

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

1. In a time-lock, the combination, with the bed-plate and a central pivot or shaft, of a case or support containing two or more time-movements, turning upon its center and carrying said time-movements, and a fixed winding-wheel geared with the winding-arbors of the time-movements by loose gears S, substantially as set forth.

2. In a time-lock, the combination, with the bed-plate and a central pivot or shaft, of a rotary case or support carrying two or more time-movements having loose gears upon their
5 mainspring-arbors, gearing with the fixed winding-wheel attached to said bed-plate, and mechanism for rigidly connecting the loose gears with the mainspring-arbors, whereby the time-movements may be wound simulta-
10 neously at one operation, substantially as set forth.

3. In a time-lock, the combination, with the bed-plate and a central pivot or shaft, of a curb and revolving case or support within the curb
15 carrying the time-movements, substantially as set forth.

4. In a time-lock, the combination, with the bed-plate and a central pivot or shaft, of a rotary case or support carrying the time-move-
20 ments and a locking-dog operated by the rotation of the case, substantially as set forth.

5. In a time-lock, the combination, with the bed-plate and a central pivot or shaft and a fixed winding-wheel, of a rotary case carrying
25 the time-movements, graduated to correspond with the hours the movements run and geared or connected with the mainspring-arbors, so that the turning of the case to set the lock by the graduations will wind the time-movements
30 simultaneously, substantially as set forth.

6. In a time-lock, the combination, with the bed-plate and a central pivot or shaft and a fixed winding-wheel, of a rotary case carrying
35 the time-movements, mechanism for winding the time-movements by rotating the case in one direction, a dogging mechanism, and mechanism between the rotary case and the dogging mechanism for operating the dogging mechanism by the rotation of the case in the
40 opposite direction to that for winding the time-movements, substantially as set forth.

7. In a time-lock, the combination of a rotary case or support pivoted on a central shaft and carrying the time-movements, a fixed
45 winding-wheel, a loose wheel on each mainspring-arbor, carrying a pin and gearing with the fixed wheel, an arm projecting from each

mainspring-arbor and provided with a pivoted extension, substantially as set forth.

8. The combination, with a bed-plate and a
50 pivot or shaft, D, of the case or support pivoted at its center so as to rotate and carrying two or more time-movements, the arms fixed to the mainspring-arbors, the pivoted extensions of the arms, the springs against
55 which the pivoted extensions bear, the loose wheels on the mainsprings provided with pins, and the fixed winding-wheel, substantially as set forth.

9. The combination, with the bed-plate and
60 curb, of a locking-dog provided with a spring for throwing it into the locked position, the slide pivoted to the locking-dog and provided with a stud, and a notch or catch, substantially
65 as set forth.

10. In a time-lock, the combination of a rotary case or support pivoted on shaft D and carrying two or more time-movements, a lock-
ing-dog, and adjustable devices for locking and unlocking at predetermined times by the
70 rotary movement of the case or support, substantially as set forth.

11. In a time-lock, the combination of a rotary case or support pivoted on shaft D and carrying two or more time-movements, all
75 gearing with the fixed central winding-wheel independently, so that the stopping of one or all but one will not prevent the working of the lock, substantially as set forth.

12. In a time-lock, the combination, with a
80 bed-plate and a fixed winding-wheel, of a case or support carrying the time-movements and a shaft or spindle upon which the case is secured, so that the case can be removed and replaced by another at will, substantially as
85 set forth.

In testimony whereof we have hereunto subscribed our names.

EMORY STOCKWELL.
HERBERT C. STOCKWELL.

Witnesses:

SCHUYLER MERRITT,
GEO. E. WHITE.