

No. 860,200.

PATENTED JULY 16, 1907.

O. M. FARRAND.
COMBINATION OR KEYLESS LOCK.

APPLICATION FILED JUNE 4, 1906.

2 SHEETS—SHEET 1.

FIG. 1.

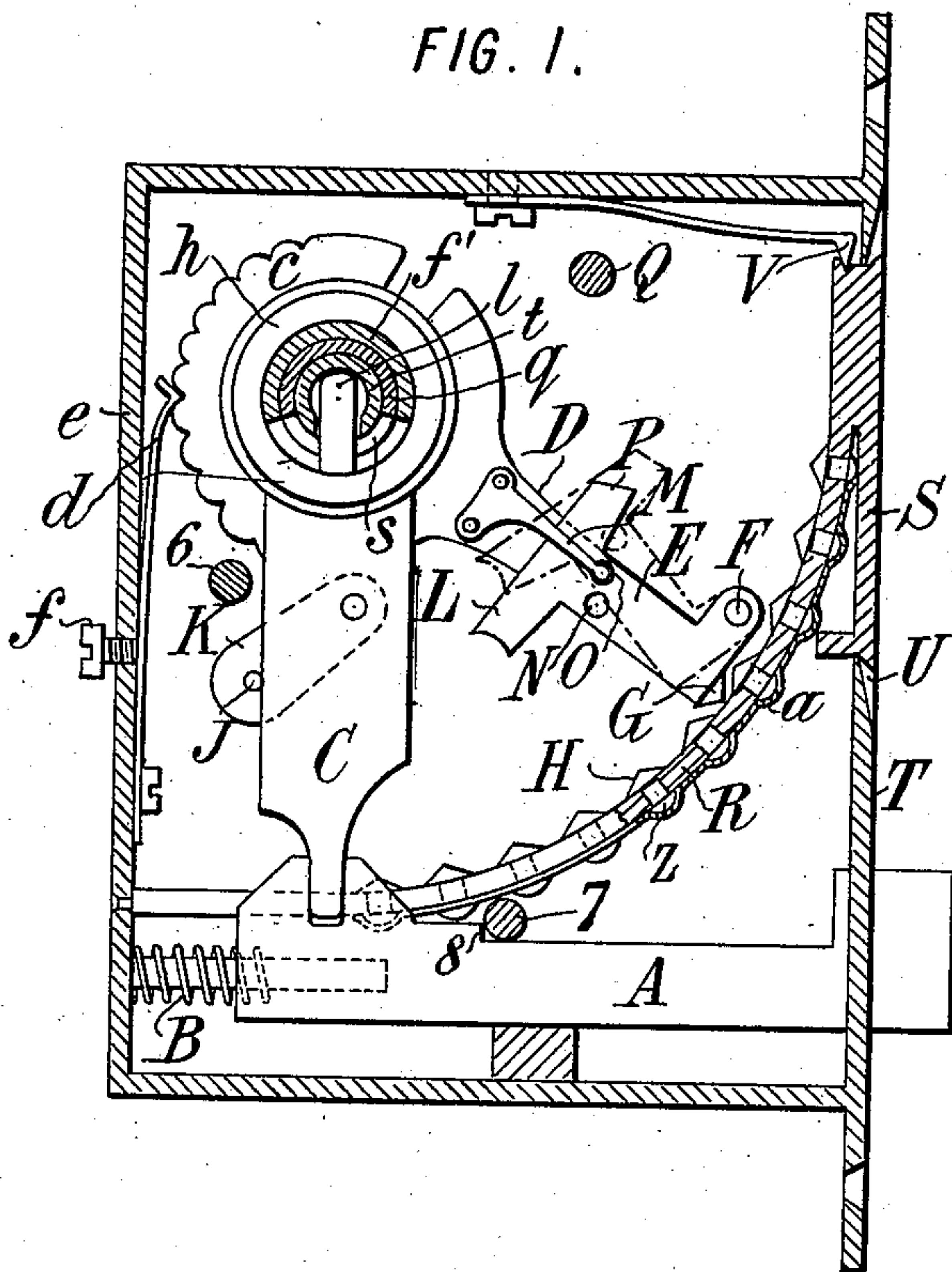


FIG. 2.

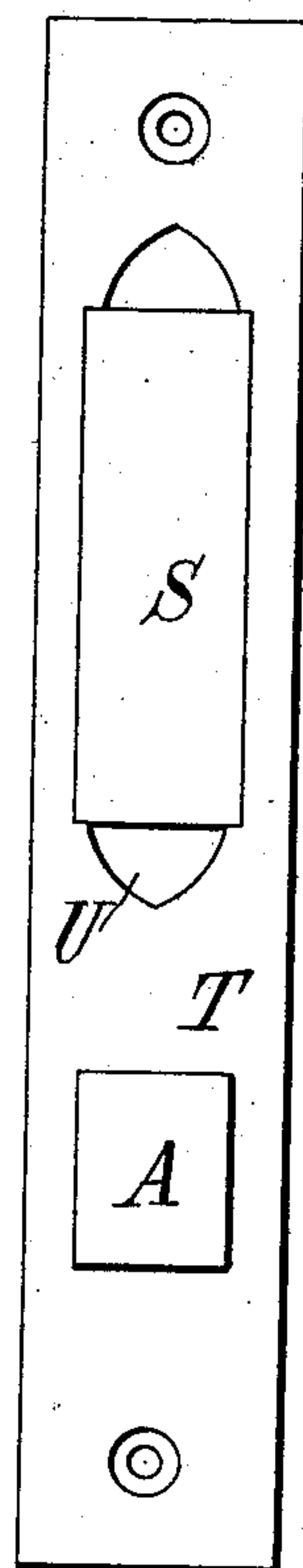


FIG. 3.

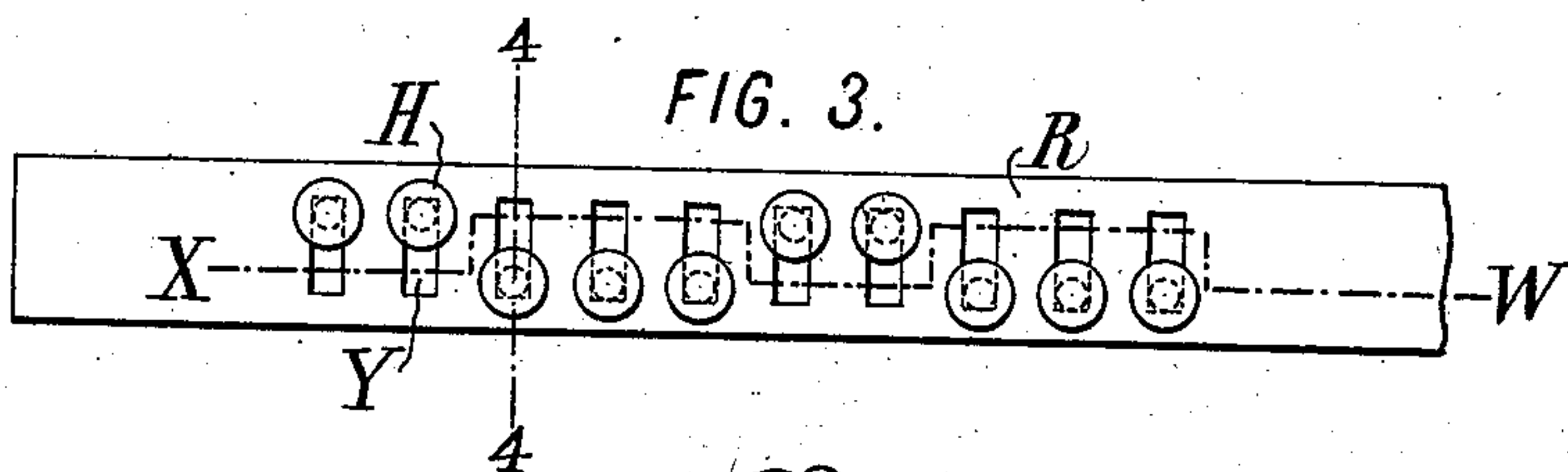


FIG. 4.

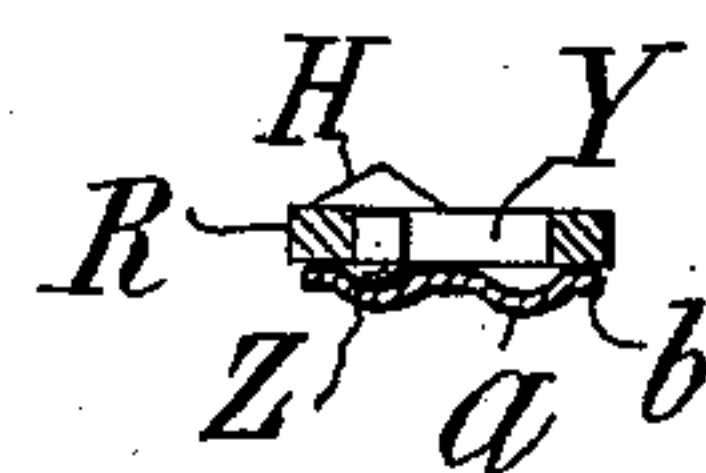
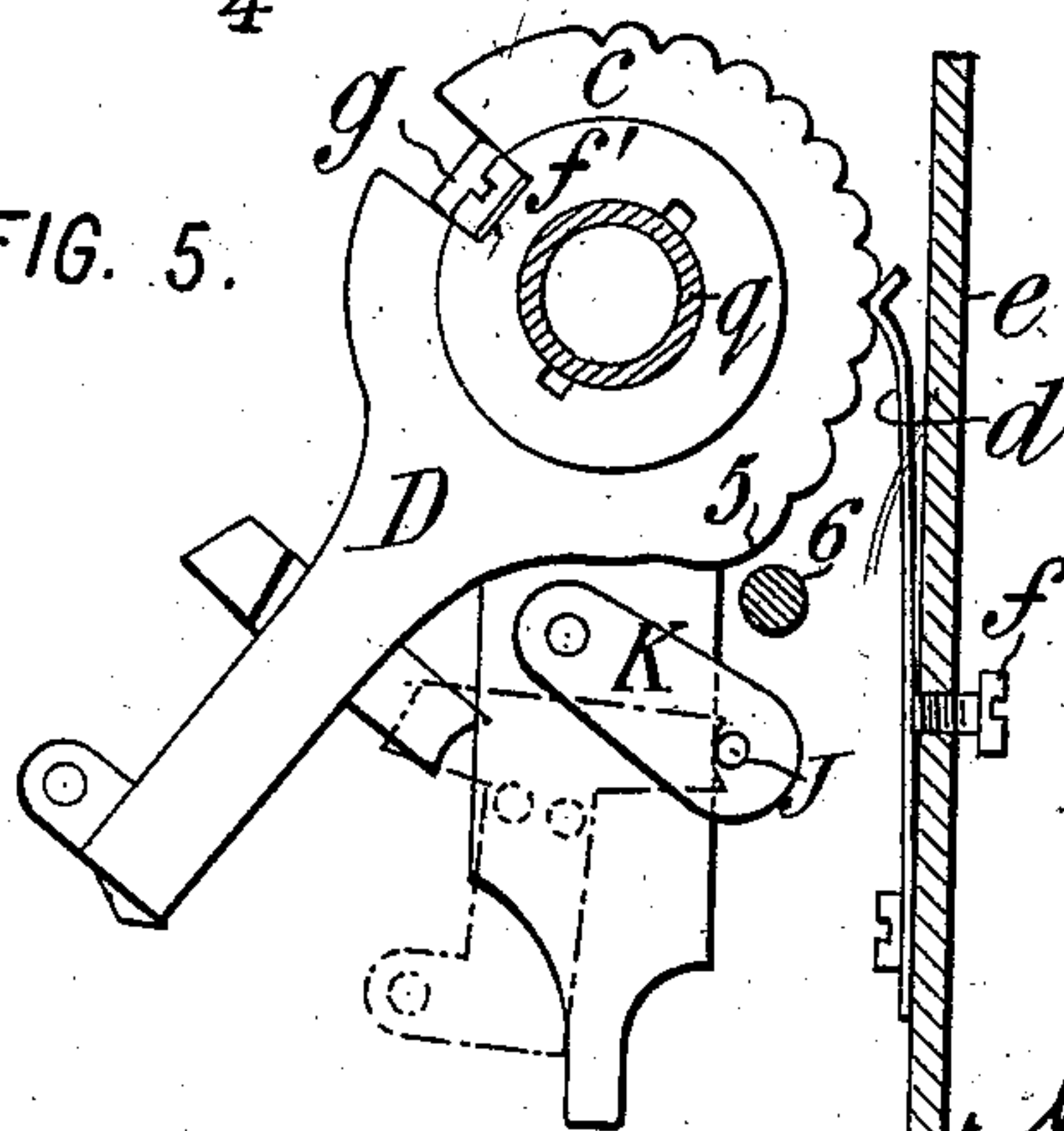


FIG. 5.



WITNESSES:

Fred White
Rene' Meune

INVENTOR:

Oliver M. Farrand

By Attorneys

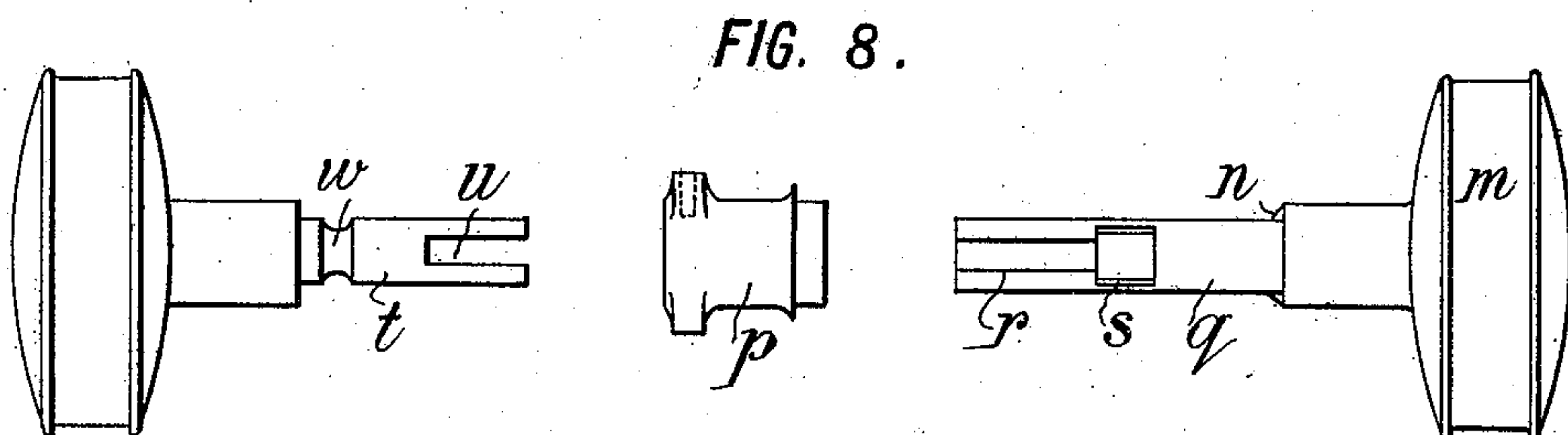
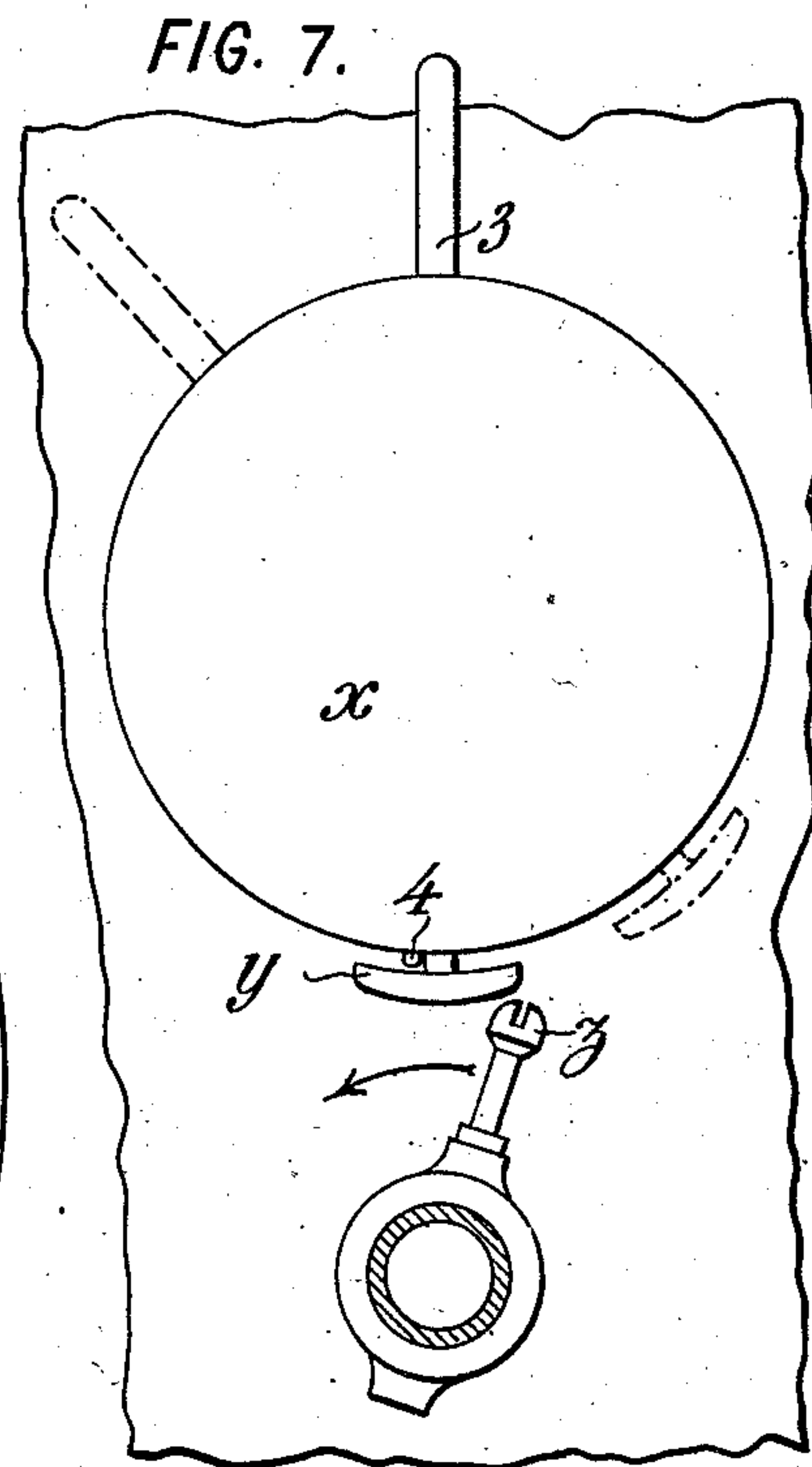
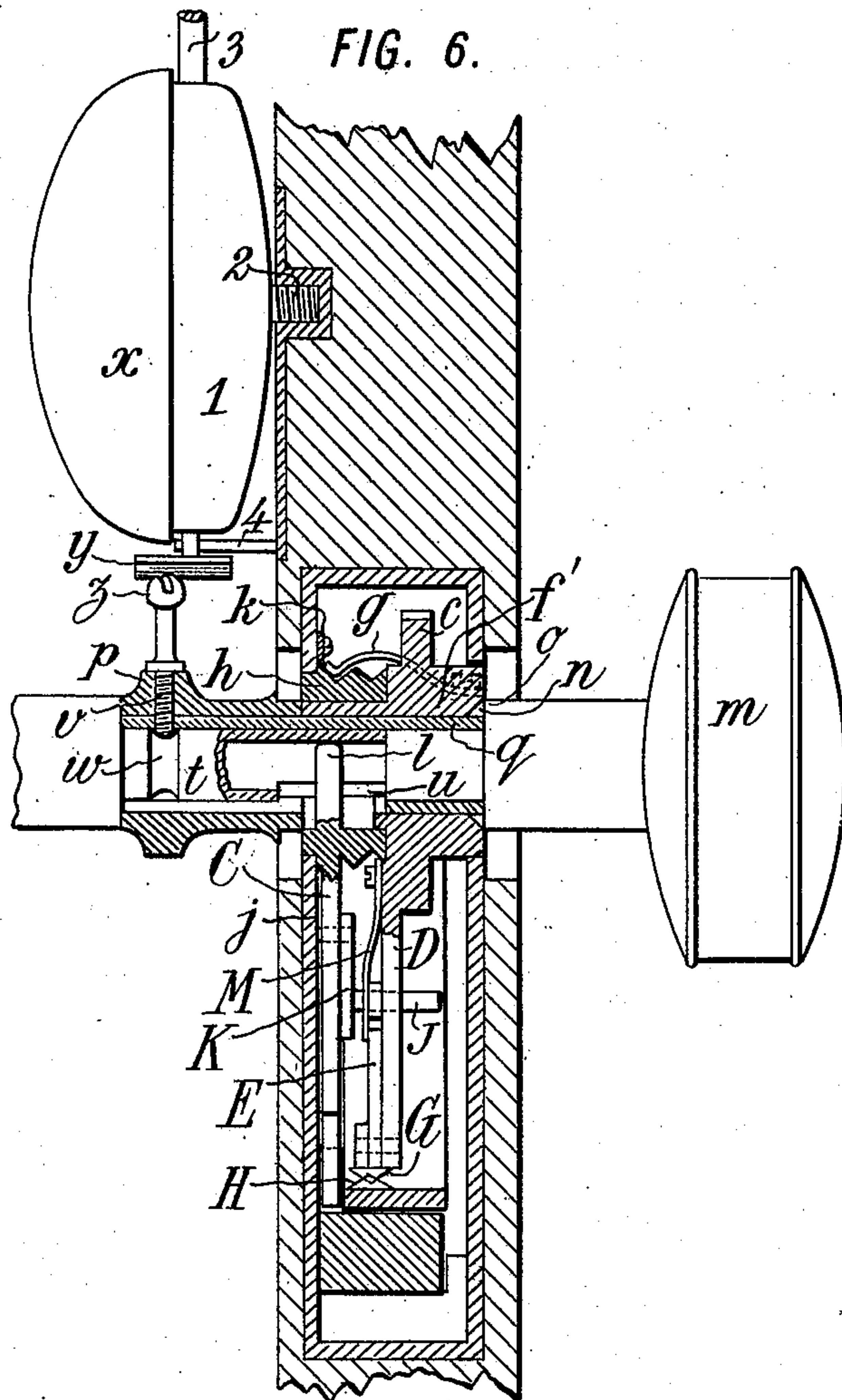
Arthur C. Frazer & Co.

No. 860,200.

PATENTED JULY 16, 1907.

O. M. FARRAND.
COMBINATION OR KEYLESS LOCK.
APPLICATION FILED JUNE 4, 1906.

2 SHEETS—SHEET 2.



WITNESSES:

Fred White
Rene' Muine

INVENTOR:

Oliver M. Farrand

By Attorneys,

Arthur Fraser & Co.

UNITED STATES PATENT OFFICE.

OLIVER M. FARRAND, OF NEW YORK, N. Y.

COMBINATION OR KEYLESS LOCK.

No. 860,200.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed June 4, 1906. Serial No. 319,997.

To all whom it may concern:

Be it known that I, OLIVER M. FARRAND, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have
5 invented certain new and useful Improvements in Combination or Keyless Locks, of which the following is a specification.

This invention aims to provide certain improvements in keyless or combination locks adapted for
10 use in any situation, but especially for house doors or front doors of apartments or the like, and adapted to be operated by the sense of touch, the means for counting the numbers constituting the combination being invisible so that it may be operated by a deaf
15 or a blind person and equally well at night or in the day time.

The construction is extremely simple, and is perfectly reliable in operation.

A feature of especial advantage is the facility for
20 changing the combination.

Various other advantages are referred to in detail hereinafter.

The accompanying drawings illustrate an embodiment of the invention.

25 Figure 1 is an elevation of the principal parts within the casing, the casing and certain parts being shown in section. Fig. 2 is an edge view of the casing. Fig. 3 is a plan of a curved member carrying certain stops, the member being developed into a plane. Fig. 4
30 is a cross-section on the line 4—4 of Fig. 3. Fig. 5 is a view of certain parts of Fig. 1 looked at from the opposite direction. Fig. 6 is a transverse section through the lock and the door. Fig. 7 is an elevation of an alarm on the inside of a door, the inside knob
35 being removed. Fig. 8 is a plan of the knobs and spindle and an intermediate sleeve separated from each other.

Referring to the embodiment of the invention illustrated, the usual or any suitable bolt A is pressed
40 outward by means of a spring B, and is drawn by means of a bolt-operating arm C the end of which fits into a groove in the rear end portion of the bolt. A second arm D, which I call a controlling arm and which is movable independently of the operating arm C, carries
45 at its end a member E which is pivoted at F and which has a conical or pointed end G adapted to move over a series of stops H, and adapted, when it engages any one of said stops, to throw the member E to such a position as to render the lock inoperative.

50 The means for transmitting the movement of the controlling arm D to the operating arm C, comprise a pin J carried on the free end on an arm K which is pivoted on the operating arm C, and an arm L on the member E in position to engage the pin J when the

parts are in their operative position, or to swing above
55 the pin J so as to fail of any effect upon the operating arm O when the end G of the member has engaged one of the stops and the member has been thrown from the operative to the inoperative position. The member E is held in any position to which it is thrown,
60 by means of a flat spring M having a downwardly projecting end adapted to fit in either one of the two depressions N or O, so as to hold the device impositively or yieldingly in either of two positions which it may assume.

The means for transmitting the movement of the
controlling arm D to the operating arm C has a peculiar advantage in that it throws the device E from the
operative to the inoperative position by the very act
of drawing the bolt. Consequently if the knob be
70 then released so as to allow the bolt to spring outward, it cannot again be drawn without following the entire combination from the beginning, because the member E will have been pressed back until the depression N comes under the spring M and will be
75 held there, and if the arm D be again turned in the direction to operate the arm C the end of the arm L will pass above the pin J and have no effect. The pivotal support of the pin J allows, during normal operation, the arm L to remain in engagement with
80 it, even though the arm L is moved upward by the first pressure; but after the knob has been released the pin J swings down to the position of Fig. 1, so that upon the second movement the arm L misses it. The engaging end of the arm L is slightly hollowed to
85 insure its holding the pin J during normal operation. The member E is also provided with a rear arm P, which, after the lock has been withdrawn and the device has been thrown backward to its inoperative position, lies in such a position as to come into contact with the pin Q when the controlling arm is swung
90 back to the starting position. This pin Q then throws down the point G so that the member E is restored to its operative position, and remains so until either the point G strikes one of the stops H, or the pin J is
95 engaged by the arm L to draw the bolt.

The stops H are carried upon a curved member R having an extension S adapted to lie flush with the edge of the casing. The edge T of the casing is provided with an opening at opposite ends of which are
100 recesses U to admit the end of a finger or thumb. The member S is held in place flush with the edge of the casing, and consequently the member R is held in place within the casing by resting the lower edge of the member S upon the corresponding edge of the
105 member T of the casing, and by bringing the grooved upper edge of the member S into engagement with a spring latch V adapted to yield to a comparatively

slight pressure in either direction. By means of this arrangement it is only necessary to pull the upper end of the member S, in order to remove entirely from the casing the member R carrying the stops.

5 These stops are arranged in two parallel lines, and the lock is opened by swinging the arm D and shifting it in alternate axial directions in such a way that the point G passes over the blank spaces of the member R. For example, with the arrangement of the

10 stops shown in Fig. 3 the point G will pass along the dotted lines W—X, and the combination expressed in numbers would be 3, 2, 3, 2. It is desirable to be able to change the combination without special tools, and for this purpose each stop H is arranged with a

15 shaft passing through a slot Y across the member R, and with a head Z on its under side adapted to fit in either one of two sockets *a* in a leaf-spring *b* fastened on the under side of the member R and extending from end to end thereof, so that the stop H will be

20 held impositively or yieldingly at either end of the slot to which it may be shifted, the shifting requiring only a slight pressure.

For counting the combination by the sense of touch, a toothed plate *c* is provided, either integral with or

25 at least turning with the controlling arm D, the teeth being spaced at corresponding angular intervals to the successive stops H, and being arranged to click past a leaf spring *d* fastened to the inside edge *e* of the casing, through which may pass an adjusting screw *f*

30 for determining the pressure of the spring *d*. As the knob carrying the plate *c* is rotated, one can feel distinctly the jar or shock of the spring *d* entering the grooves between the successive teeth, even though they are so slight as to make no sound, and thus the

35 combination may be counted in the dark. In order to determine accurately the two positions to which the controlling arm D and its connected parts are moved in the axial movement of the knob, the hub *f'* (Fig. 6) of the disk *c* carries a spring *g* with a pointed

40 end adapted to take into one or the other of two grooves in a ring *h* which is rotatively mounted in the inside face *j* of the casing, but is held from axial movement by means of a ring *k* extending partly around its circumference and overhanging a flange on

45 the ring *h*. The ring *h* is in fact a hub which carries the operating arm C. This ring carries also a pin *l* projecting inwardly and by means of which the movement of the inside knob is communicated to the operating arm, so that the lock may be always operated

50 from the inside without the necessity of following the combination.

The outside knob *m* is provided with fins or keys *n* taking into corresponding grooves in the hub *f'* of the controlling arm, so as to rotate this hub with the

55 knob. It is provided also with a shoulder *o* and with a removable sleeve *p* at the end of the shank, the hub of the controlling arm being held between the shoulder *o* and the removable sleeve *p*, so as to partake of the axial movements of the knob. The shank *q* of

60 the outside knob is hollow, and is provided at its end with a narrow slot *r* (Fig. 8) which permits the shank to be passed over the inward projection *l*, and with a widened slot *s* which permits the necessary rotary movements of the shank *q* (through approximately a

quarter of a circle) without touching the pin *l*; it being understood that the pin *l* and the arm C must only be moved from the outside by means of the controlling arm D and connected parts. The shank *t* of the inside knob, however, is provided with a slot *u* of approximately the same width as the inside pin *l*, and engages

70 said pin, so that when the inside knob is turned the motion thereof is communicated directly to the operating arm C. The parts of the shank are assembled by arranging the sleeve *p* on the end of the shank *q*, and the shank *t* within the shank *q*, and then passing

75 the screw *v* through the sleeve and the shank *q* to fix these two parts together. In this position the rounded inner end of the screw projects into a groove *w* on the outside of the shank *t*, so that the two shanks may rotate independently of each other, but must move to-

80 gether when one of them is moved axially.

I provide also a bell or other alarm adapted to be operated when the knob is turned, and means for rendering the bell operative or inoperative by a very simple movement. Preferably the bell is a simple

85 spring bell *x* of well known type which continues to ring as long as a button *y* is pressed until the spring runs down, the spring being rewound by turning the gong of the bell. The button *y* is made to project near the lower edge of the bell, and the screw *v* extends

90 outward a considerable distance to form an operating pin *z*. The base 1 of the bell is pivotally attached, as by means of a screw 2, to the inner face of the door, and is provided with a thumb-piece or lever 3 whereby it may be swung from the dotted line position to the

95 full line position in Fig. 7, or vice versa, a stop 4 in the form of a pin lying in the path of the stem of the button *y* being provided for determining when the button is in operative position. Now when the outer knob is turned at the very beginning of its movement the pin

100 *z* presses the button *y* and rings the bell. Each time that the operator has to go back to the starting position, the bell rings again. By reason of this fact it can be easily ascertained that some one is trying the door who is not familiar with the combination. Either in

105 addition to the bell arranged directly on the door, or in place thereof, a bell may be provided at a distance, as in the bed room, far removed from the door, and may be operated by the making and breaking of an electrical contact by the pin *z*, in a manner entirely

110 similar to that explained for the bell *x*.

The construction and arrangement of the shaft for the knobs are designed to make it impossible to remove the knobs from the outside, which would prevent the opening of the lock. It serves the additional purpose

115 of providing another means of ringing the alarm bell.

The last tooth 5 on the disk or plate C is made wider than the others, so that after the bolt has been withdrawn and the knob is released the arm D will be thrown back by the spring *e* a distance greater than

120 that of one of the regular teeth, and sufficient to disengage the arm L from the pin J and allow the latter to drop. In this connection it is to be observed that the arm K is preferably made wider and heavier at its lower end so as to facilitate its dropping to its normal

125 position.

Besides the stop Q, there are additional stops 6 and 7, all of which are made also in the form of screws for

fastening the casing together, the stop 6 serving to limit the movement of the operating arm C, and the stop 7 serving to support the lower end of the member R and at the same time to limit the outward movement of the bolt by engagement with the shoulder 8 thereon.

Though I have described with great particularity of detail certain specific embodiments of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made without departure from the invention.

What I claim is:—

1. A lock including in combination an arm, a series of stops arranged in parallel lines, means for moving the end of said arm over such lines and giving it axial movements at suitable intervals to avoid engagement with said stops as it is so moved, and a pivoted member constituting the end of said arm, and adapted when engaged by one of said stops to render the lock inoperative.

2. A lock including in combination a controlling arm D, a series of stops arranged in parallel lines, means for moving the end of said arm over such lines and giving it axial movements at suitable intervals to avoid engagement with said stops as it is so moved, a pivoted member E constituting the end of said controlling arm, an operating arm having a part adapted to be engaged by a part of said pivoted member E in the normal position of the latter, and adapted to be out of line with said member E when the latter has been moved by engagement of its end with one of said stops, so that by such engagement the lock is rendered inoperative.

3. A lock including in combination a controlling arm D, a pivoted member E constituting the end of said controlling arm, an operating arm having a pin J adapted to be engaged by a part of said pivoted member E in the normal position of the latter, said pin J being pivotally supported and adapted when engaged by said part of the pivoted member E to swing the latter out of its normal position, so that when the two are separated the pin J swings back to its normal position and leaves said part in its inoperative position.

4. In a combination lock, a member carrying stops the position of which determines the combination according to which the lock is opened, said member adapted to be removably held in the casing of said lock and to be yieldingly held in place therein so as to permit removal of same by merely pulling it.

5. A combination lock having a member R carrying stops the position of which determines the combination, an extension S of said member adapted to fit in a recess in the edge of the casing, and a spring V arranged to hold said extension and member in place yieldingly so as to permit removal by merely pulling it.

6. In a combination lock a member carrying stops the position of which determines the combination, the individual stops being shiftable on said member to vary the combination and yieldingly held in position thereon.

7. A combination lock having stops H the position of which determines the combination, said stops being carried in a member R having slots Y, said stops having shafts passing through said slots with heads on their under sides, and a spring b having recesses adapted to engage said stops to hold them impositively in position.

8. A combination lock including an arm, a series of stops arranged in parallel lines, means for moving the end of said arm over such lines and giving it axial movements at suitable intervals to avoid engagement with said stops, and a plate c arranged to rotate as said arm is moved, said plate having teeth on its edge, and a spring d fastened to the casing and having its free end engaging said teeth and adapted to click over the same as the arm and plate are moved.

9. A combination lock having a shaft q for an outside knob, a shaft t for an inside knob, a sleeve p fitting over the inner end of the shaft q, said inside shaft t having a groove w, and a screw v passing through the sleeve and the outside shaft and fastening them fixedly together and having its end entering the groove w so as to permit rotation of the shafts relatively to each other while preventing relative axial movement.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

OLIVER M. FARRAND.

Witnesses:

DOMINGO A. USINA,
THEODORE T. SNELL.