

No. 656,157.

Patented Aug. 21, 1900.

H. A. ALM.
PERMUTATION LOCK.

(Application filed May 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

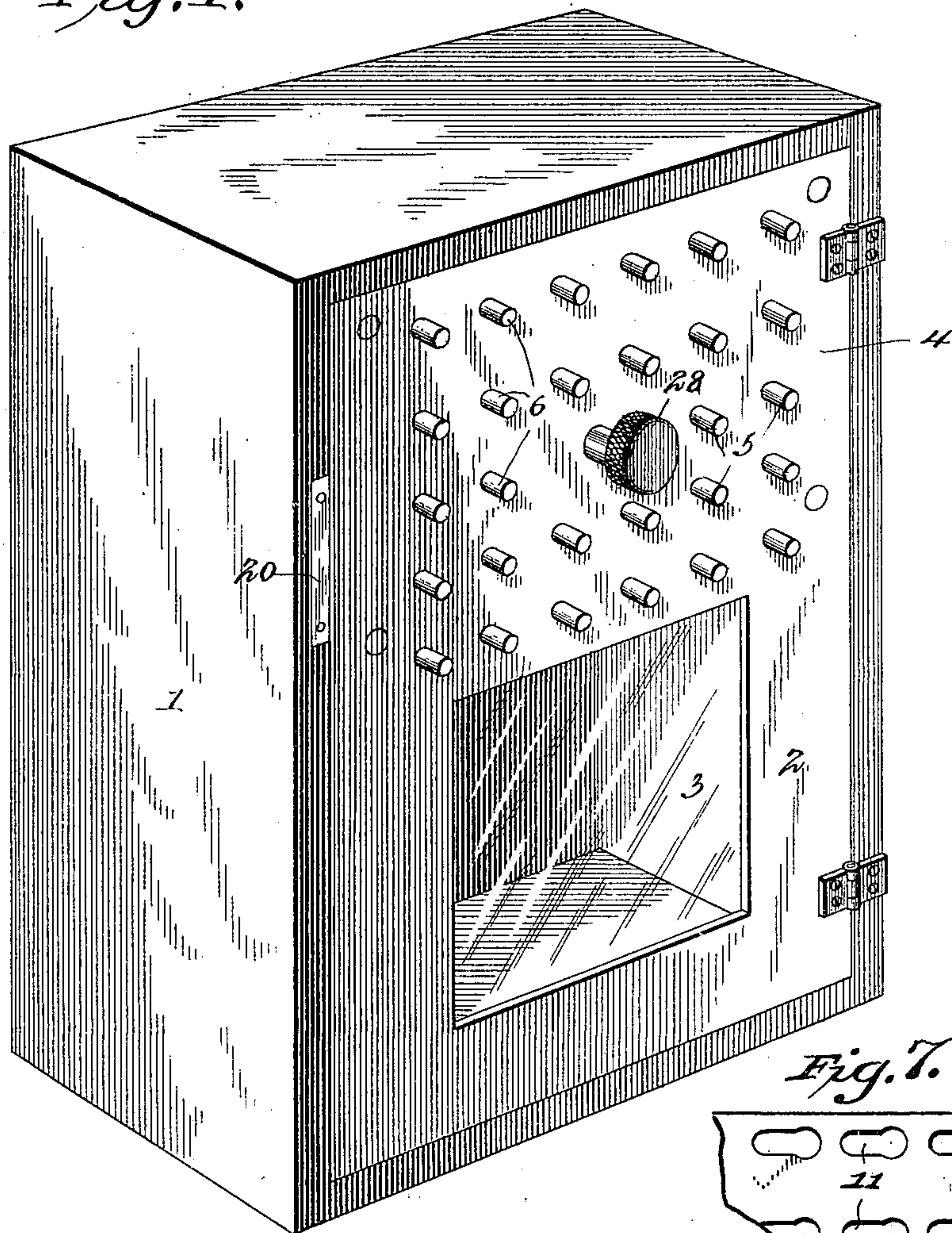


Fig. 7.

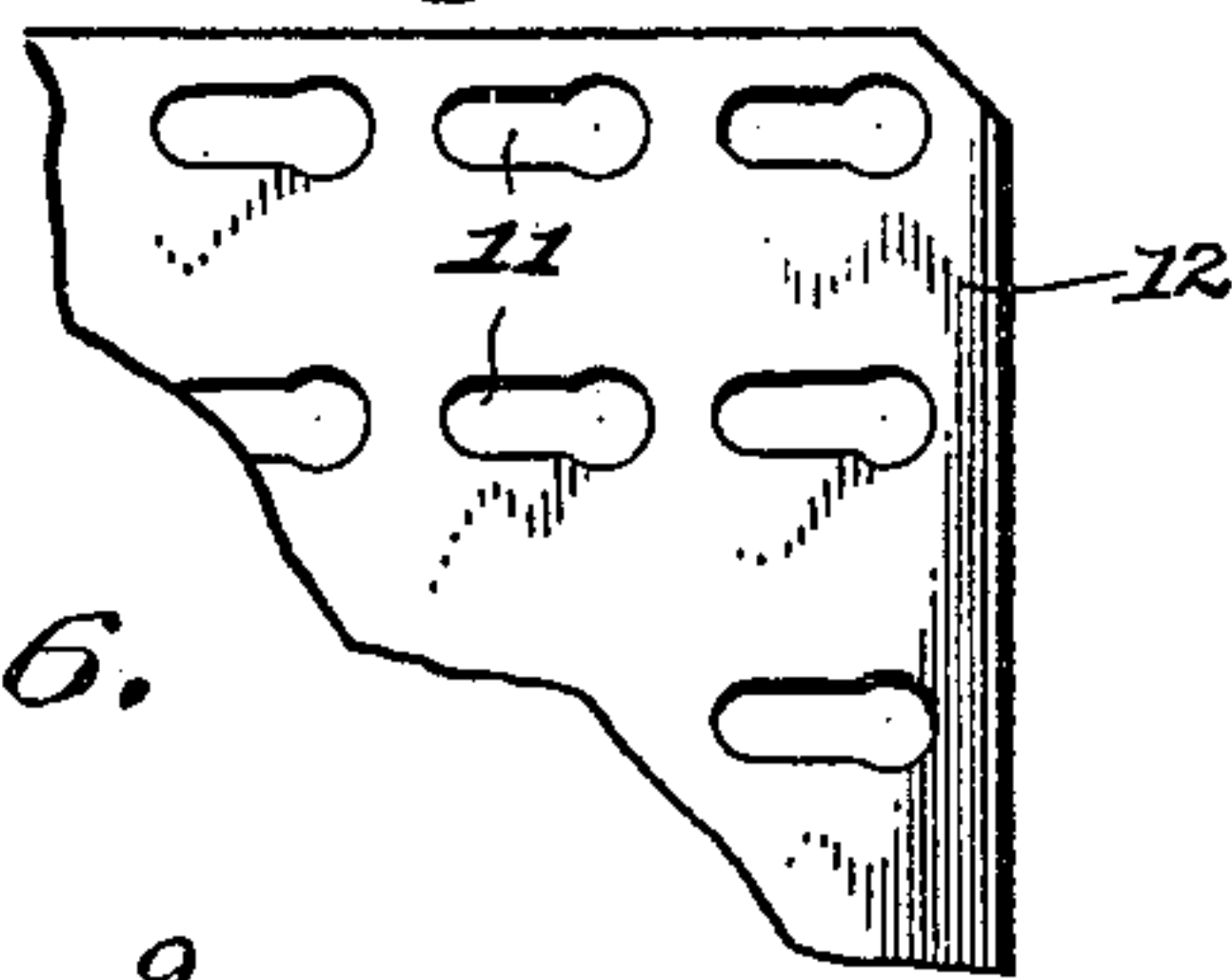


Fig. 5.

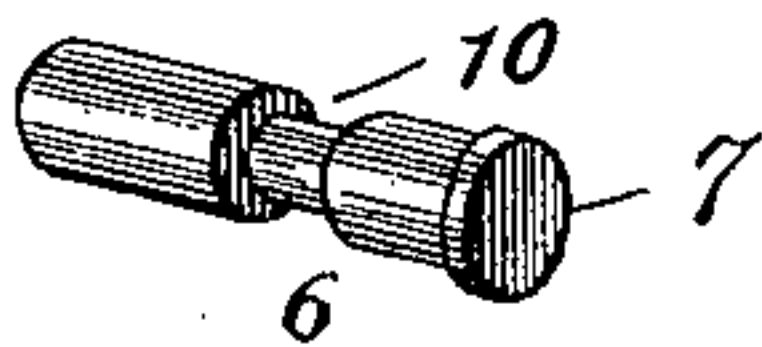
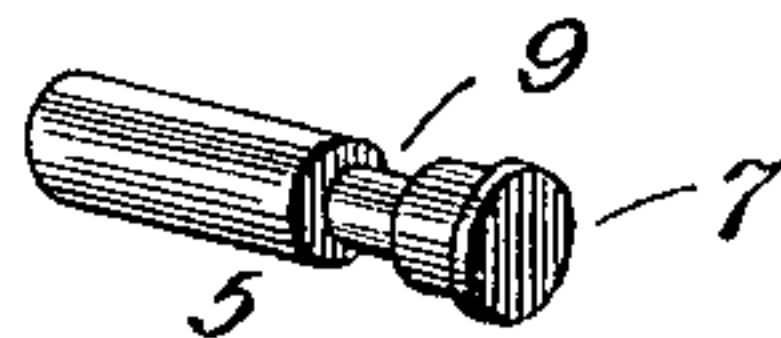


Fig. 6.



Witnesses
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2 Sheets—Sheet 2.

Fig. 2.

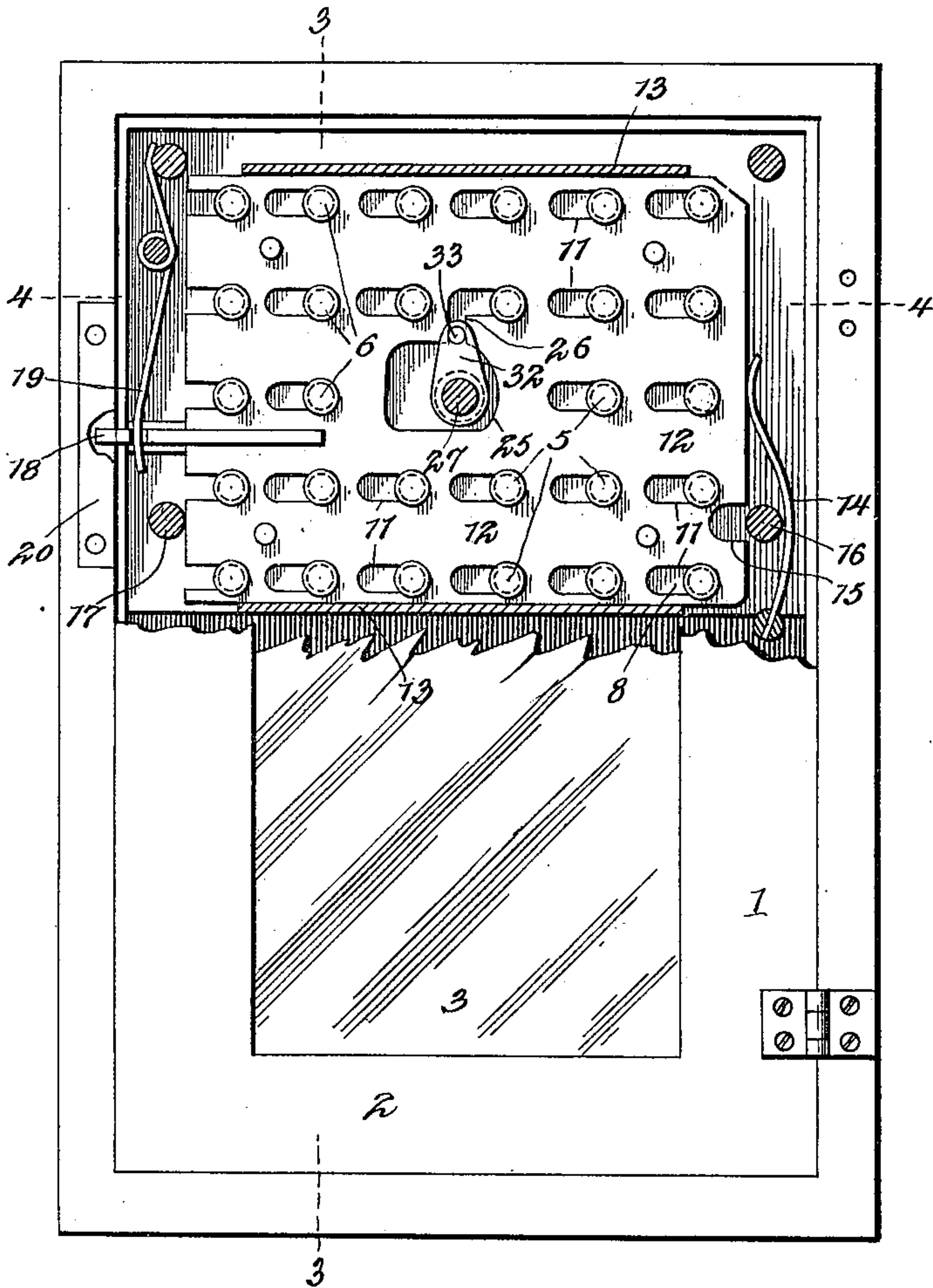


Fig. 3.

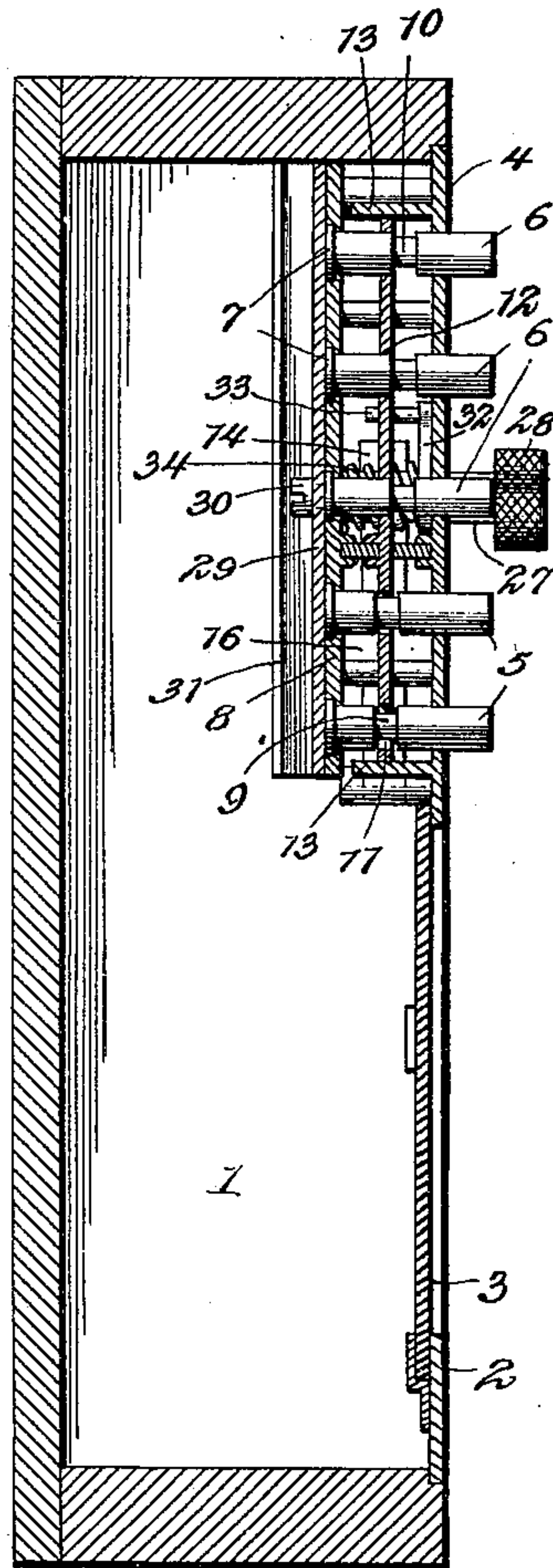
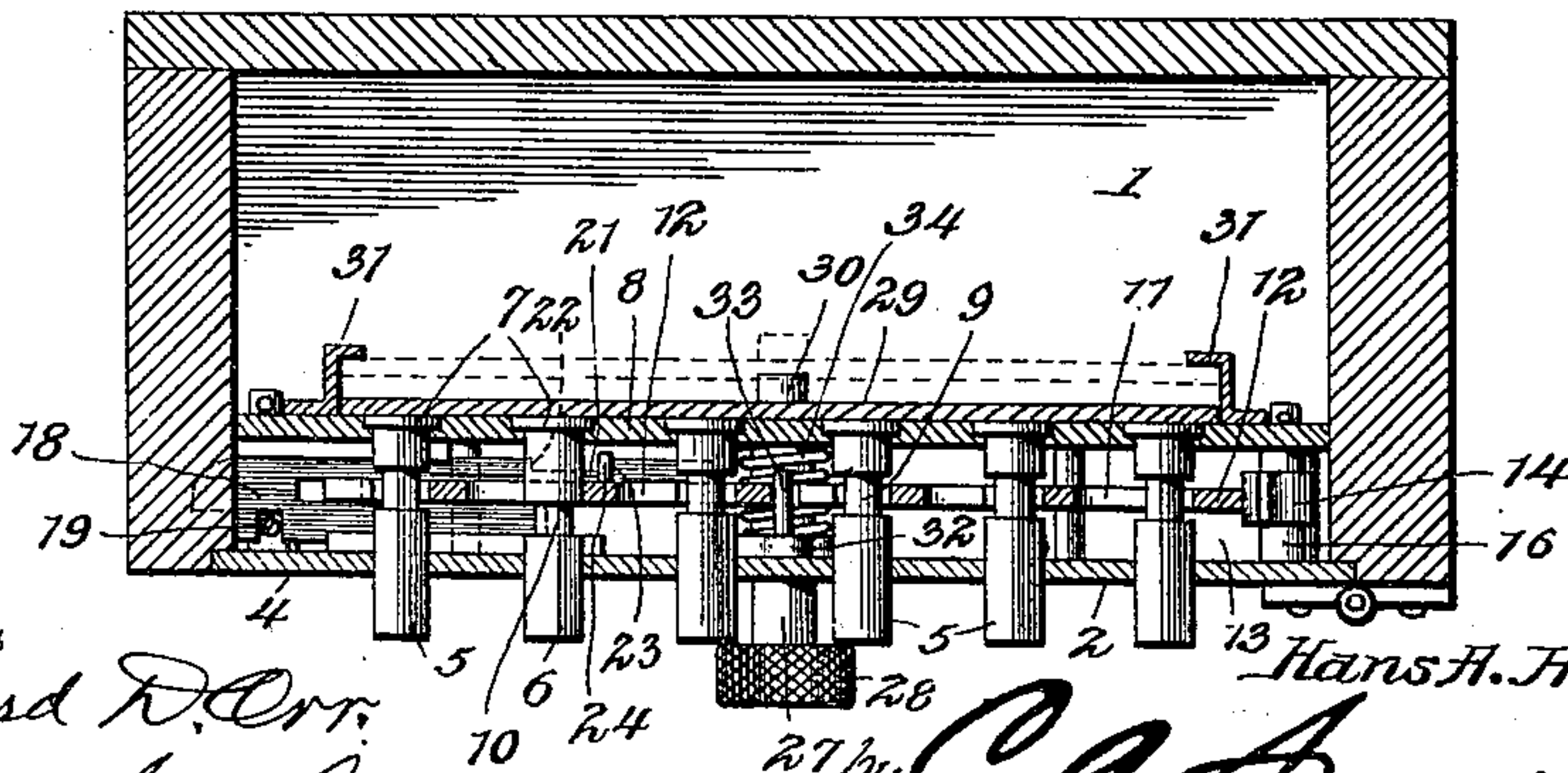


Fig. 4.



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UNITED STATES PATENT OFFICE.

HANS A. ALM, OF HANKINSON, NORTH DAKOTA.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 656,157, dated August 21, 1900.

Application filed May 1, 1900. Serial No. 15,082. (No model.)

To all whom it may concern:

Be it known that I, HANS A. ALM, a citizen of the United States, residing at Hankinson, in the county of Richland and State of North Dakota, have invented a new and useful Permutation-Lock for Post-Office Boxes, of which the following is a specification.

This invention relates to a permutation-lock for post-office lock-boxes, and the aim and purpose of the same is to provide a simple and effective lock of this character of a strong, durable, and positively-operating construction particularly adapted for use on post-office lock-boxes to overcome the many disadvantages of the ordinary key-lock used almost exclusively at present and wherein the locks on different boxes will have varying opening combinations known only to the several renters, and thereby have the several boxes securely fastened in such manner as to completely resist the attempts of unauthorized persons to open the same.

The invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of a post-office lock-box having the improved permutation-lock thereon and showing how it appears from the exterior. Fig. 2 is a sectional elevation of the box and improved lock, showing the interior mechanism. Fig. 3 is a transverse vertical section of the box and improved lock on the line 3 3, Fig. 2. Fig. 4 is a horizontal section through the box and lock, showing a dotted position of a portion of the mechanism on the line 4 4, Fig. 2. Figs. 5 and 6 are detail perspective views of different forms of pins used in the improved device. Fig. 7 is a detail view of a portion of the tumbler-plate, showing the form of the slots therein.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a lock-box of ordinary form, which may be an individual box for domestic or house use or one of a number of similar boxes arranged, as usual, in tiers in post-offices, and having a metal door 2, supplied with a lower sight-glass 3 for inspection of the interior of the box. The upper part

of the door is in the form of a smooth or flat plate 4, having a plurality of pins 5 and 6 movably mounted therein and extending transversely therethrough, the pins 6 in this instance being three in number and serving in the present arrangement as active combination-pins, and the pins 5 are dummies for purposes which will be presently explained. The rear or inner ends of all the pins are formed with circumferential shoulders 7 and disposed in a supporting-plate 8 to move rearwardly through and from the latter a predetermined distance, but are prevented from having an outward extent greater than the distance between the normal position of the shoulders 7 in the plate 8 and the normal projection exterior of the plate 4 of the said pins. The pins 5 have circumferential grooves 9, one in each, in the same position and located nearer the rear ends of the same, and the pins 6 have grooves 10 of same width as the grooves 9 and nearer the outer ends of the pins in which they are formed. The pins all extend through elongated slots 11 in a tumbler-plate 12, there being one slot for each pin, and all the slots alined longitudinally and transversely and enlarged at one end, as shown by Fig. 7, the grooves 9 of the pins all coinciding with the slots or so that the reduced portions of said pins will normally be located in the slots, and at the same time, unless otherwise arranged by manipulation, the grooves 10 of the pins 6 normally stand outward in advance of the said plate 12. The plate 12 is so disposed that when in normal position the enlarged extremities of said slots will be in line with the major diametrical portions of the pins to permit the latter to be moved therethrough, and the slots for the pins 6 have the portions of the latter in rear of the grooves 10 normally resting therein. The plate 12 is free to slide between upper and lower guide-flanges 13 and is held in locking position by a spring 14 bearing against the right edge thereof, and to stop the said plate in its releasing movement to the left the right edge is formed with a recess 15 to fit over a stop post or pin 16, secured in adjacency to the supporting-plate 8. To limit the left movement of the said tumbler-plate, a stop-pin 17 is also employed and carried by the plate 8, and slidingly attached to the left

end of the tumbler-plate is a latch-arm 18, held outward in normal position by a spring 19 to engage a striker 20 in line therewith in the outer portion of the adjacent box end.

5 While the latch-arm 18 is permitted to have a sliding movement on the tumbler-plate to accommodate closing operation of the door of the box and automatic locking of said door, it will be understood that the said arm will
10 be drawn to the right with said tumbler-plate when the combination has been set or arranged to allow the latter to shift. This operation of the arm 18 is accomplished by forming the rear portion of the shank of the same
15 with a recess 21 to form opposite stop-shoulders 22 and 23, and the recessed portion is spanned or engaged by a fixed guide 24 and is caused to contact with the one shoulder 23 of the arm 18 when the tumbler-plate is
20 moved to the right to thereby draw the said arm in the same direction. The tumbler-plate also has an enlarged opening 25 through the center thereof, and communicating therewith and with one of the slots 11 above the
25 same is a short vertical slot 26.

A rotatable operating shank or spindle 27 extends centrally through the plate 4 between the series of pins, and also through the opening 25 in the tumbler-plate 12, and is adapted
30 to freely move through the supporting-plate 8. The outer end of the said spindle 27 is supplied with a milled head 28, and to the inner or rear end a resetting-plate 29 is attached by a screw 30 or other fastening, the
35 said resetting-plate having rearward and forward play or movement between rear guides 31, secured to the supporting-plate. The spindle also carries a fixed crank 32 in advance of the tumbler-plate, and on the free
40 extremity thereof is an operating-pin 33, which extends rearward through the slot 26 and adapted to contact with the rear vertical wall of the latter, and to restore the spindle and the resetting-plate connected thereto to
45 normal position (shown by full lines in Fig. 4) a coiled spring 34 is mounted on said spindle and located between the crank 32 and the supporting-plate.

To operate the lock to open the door carrying the same, the spindle 27 is first pressed
50 inwardly to clear the resetting-plate 29 from the rear side of the supporting-plate 8 and to bring the operating-pin into the slot 26. The pins 6 will then be free for inward depression
55 to cause the grooves 10 thereof to coincide with the slots 11, through which said pins pass, and after this adjustment a turning movement of the spindle 27 to the right while still held pressed inwardly will shift the tumbler-plate 12 in a similar direction and release
60 the latch-arm 18 from the striker 20 and permit the door to be opened. It will be seen that it will be impossible to move the tumbler-plate until the pins arranged for releasing
65 said plate have been operated, and if the dummy-pins 5 be pressed inward against and move the resetting-plate their grooves will be

thrown out of coincidence with the slots 11, and a further obstruction will be interposed
70 against the movement of the said tumbler-plate. It will also be understood that the combination can be varied indefinitely by changing the position of the solving-pins, and that one, two, four, or more pins could be
75 utilized for the same purpose. The dummy and combination solving-pins will be lettered or numbered or be supplied with other suitable distinguishing characters both at the
80 front and rear to make it convenient in solving as well as changing the combination at will. The use of a large number of pins will
85 make the combination appear perplexing and complex and also give the tumbler-plate a well-balanced support when at rest and during movement of the same, and at any time
90 the combination can be changed in the same lock, so that the box can be used by different persons without liability of subsequent users having fear of previous ones knowing the combination then in operation.

One of the most important features of the improved lock is that the combination is reset by the closing of the door of the box and without any manipulation of parts as in the
95 use of well-known dial combinations. This is important in view of the fact that in a post-office a number of persons are usually congregated and are curious to know the means
100 or combination by which the box is opened, and by the present construction and arrangement no information can be derived either in opening or closing the door, because both of such operations are rapidly pursued.

The several parts of the lock are strong and durable and capable of being easily separated and reassembled in changing the combination, and though the improved lock is
105 specially adapted for post-office lock-boxes in view of its simplicity and safety it will be understood that it is proposed to apply the same to any device to which it may be applicable.

Changes in the form, size, proportions, and minor details may be resorted to without in the least departing from the principle of the
115 invention.

Having thus described the invention, what is claimed as new is—

1. In a permutation-lock for the purpose set forth, the combination of a support therefor, a sliding tumbler-plate having a plurality
120 of slots therein in regular arrangement, a latch carried by and movable with said plate, a plurality of pins movable in said plate, a portion only operating to release the plate, a movable plate back of the pins, and a rotatable
125 repressible spindle for moving the tumbler-plate to an unlocking position.

2. In a permutation-lock of the character set forth, the combination of a support, a sliding tumbler-plate, a latch carried by and
130 movable with said plate, a plurality of pins extending freely through the said plate, a portion only of the said pins being operable to release the plate, a resetting-plate in rear

of the pins and movable by and with the latter, and means for moving the tumbler-plate when the latter is free.

3. In a permutation-lock of the character set forth, the combination of a support, a sliding tumbler-plate having a locking device movable therewith, a plurality of pins movably extending through the plate, a portion of said pins being used for solving the combination, a resetting-plate in rear of the pins and the tumbler-plate, and a repressible spindle for moving the said resetting-plate and having a projection to engage the tumbler-plate.

4. In a permutation-lock of the character set forth, the combination of a support, a sliding tumbler-plate having a locking device movable therewith and provided with a series of slots, a plurality of pins movably extending through the plate and having grooves, the grooves of a part of the pins being in a different position from those of the others, a movable resetting-plate at the back of the support against which the rear ends of the pins contact, and means for shifting the said tumbler-plate when the latter is free to be so operated.

5. In a permutation-lock of the character set forth, the combination of a support, a tumbler-plate carrying a locking device, said plate having a plurality of slots therethrough, a plurality of grooved pins movable in the slots of said plate, the grooves of some of the pins being in a different position relatively to those of the others, and a movable reset-

ting-plate engaging the rear ends of the pins and operated to restore the pins to normal position.

6. In a permutation-lock for the purpose set forth, the combination of a spring-actuated tumbler-plate with a plurality of slots therein having end enlargements, a plurality of grooved pins movable through said plate, the grooves in a part of the pins being in a position different from that of the others, a movable resetting-plate engaging the rear ends of the pins, and means for sliding said tumbler-plate on the pins when the latter is free to be so operated.

7. In a permutation-lock, the combination of a slidable tumbler-plate having a plurality of slots therein and a central opening, a latch-arm slidable on the said plate and also shiftable with the latter, a plurality of grooved pins freely movable in the said plate, the grooves of a part of the pins being in a position different from that of the others, a rotatable repressible spindle extending through the plate and having a movable resetting-plate connected to the rear thereof and also provided with a projection to operate the tumbler-plate, and means for returning the parts to normal position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HANS A. ALM.

Witnesses:

E. L. KINNEY,

L. J. BLEECKER.