

(No Model.)

2 Sheets—Sheet 1.

P. A. KILSTROM.
COMBINATION LOCK.

No. 538,969.

Patented May 7, 1895.

Fig. 1.

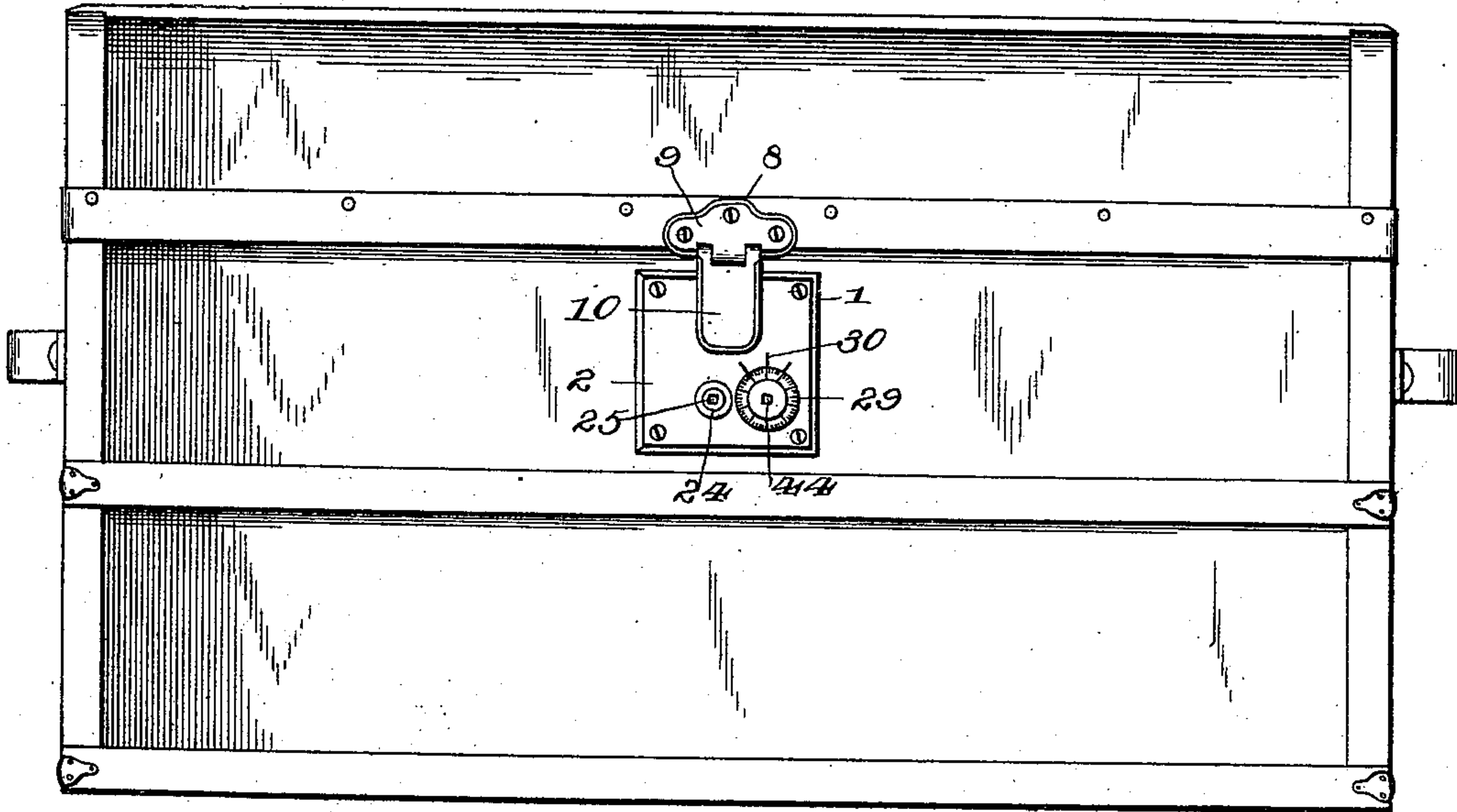


Fig. 7.

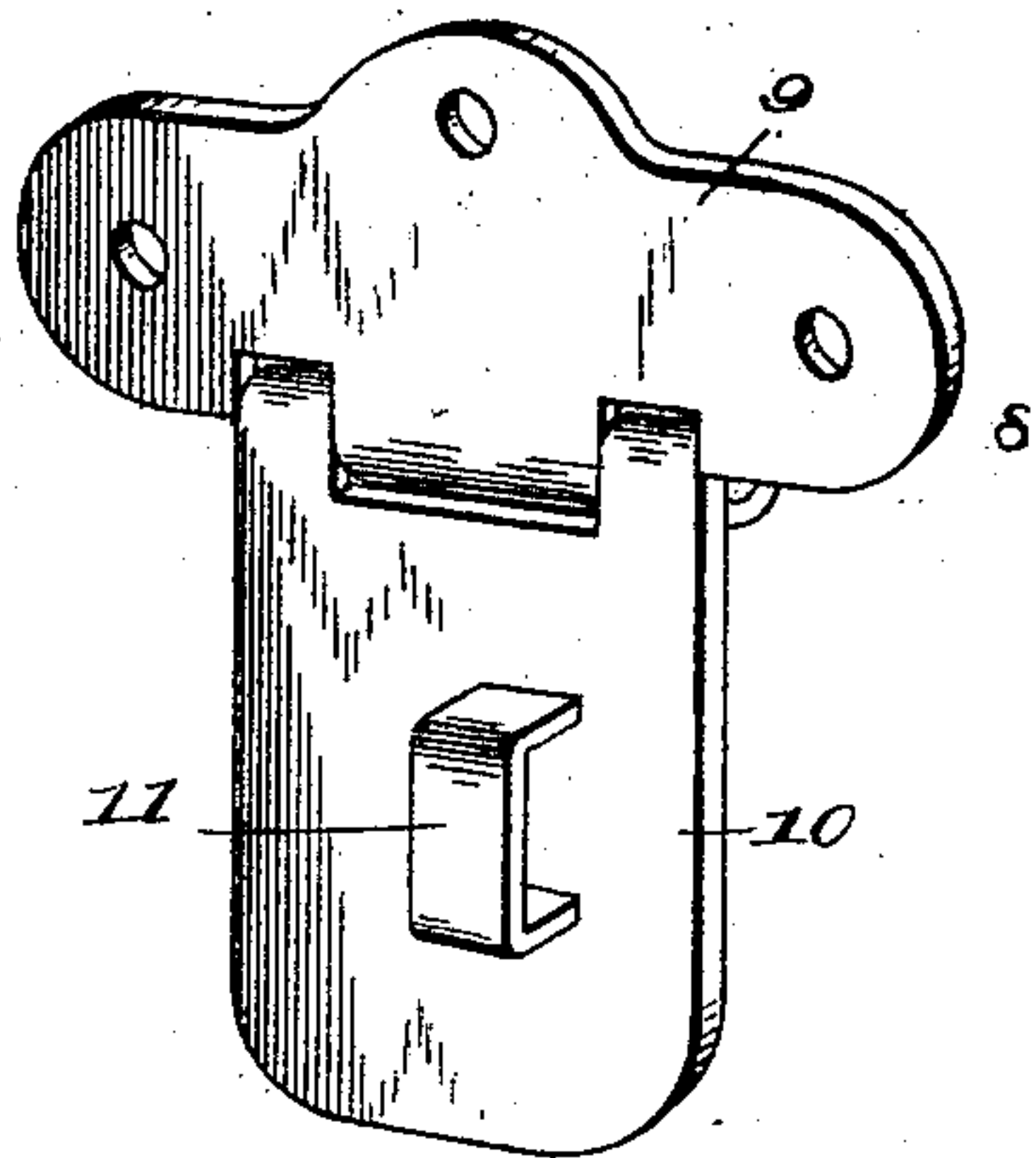
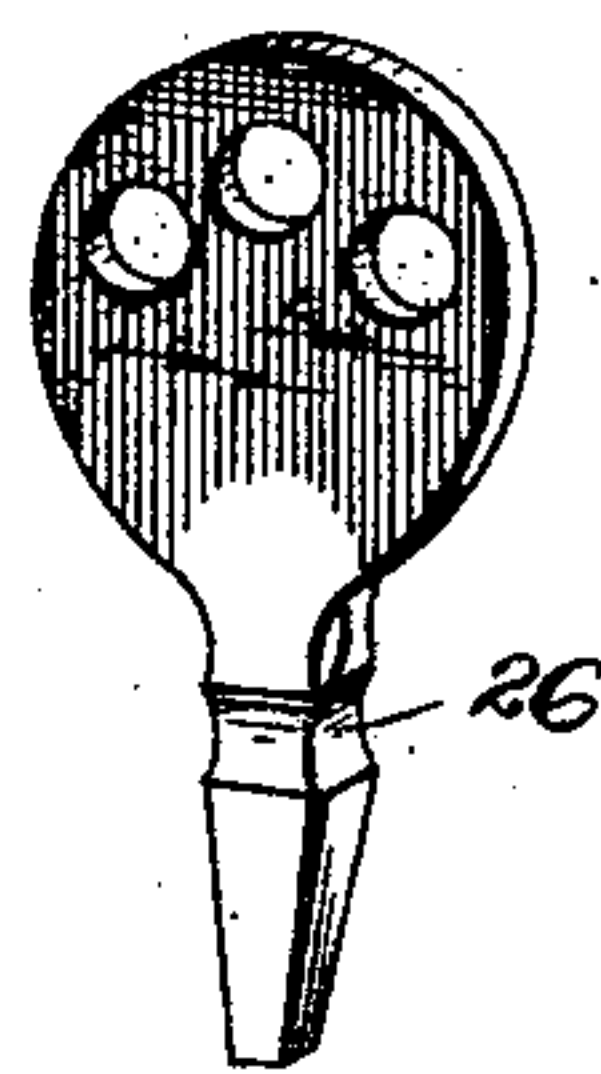


Fig. 8.



Inventor

Peter A. Kilstrom,

Witnesses

C. A. Ford.

[Signature]

By *h* 1 s Attorneys,

C. A. Snow & Co.

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2 Sheets—Sheet 2.

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Fig. 2.

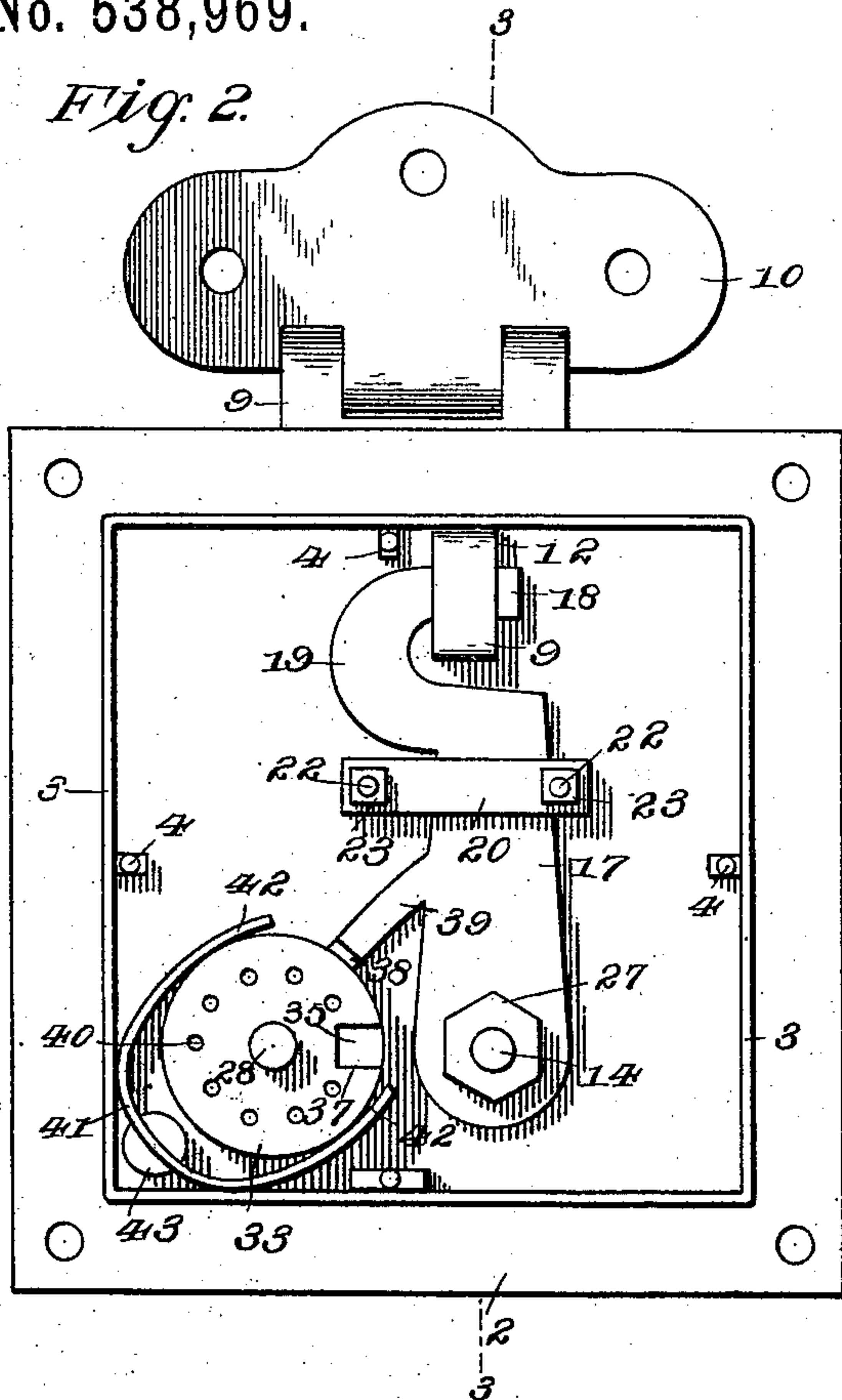


Fig. 3.

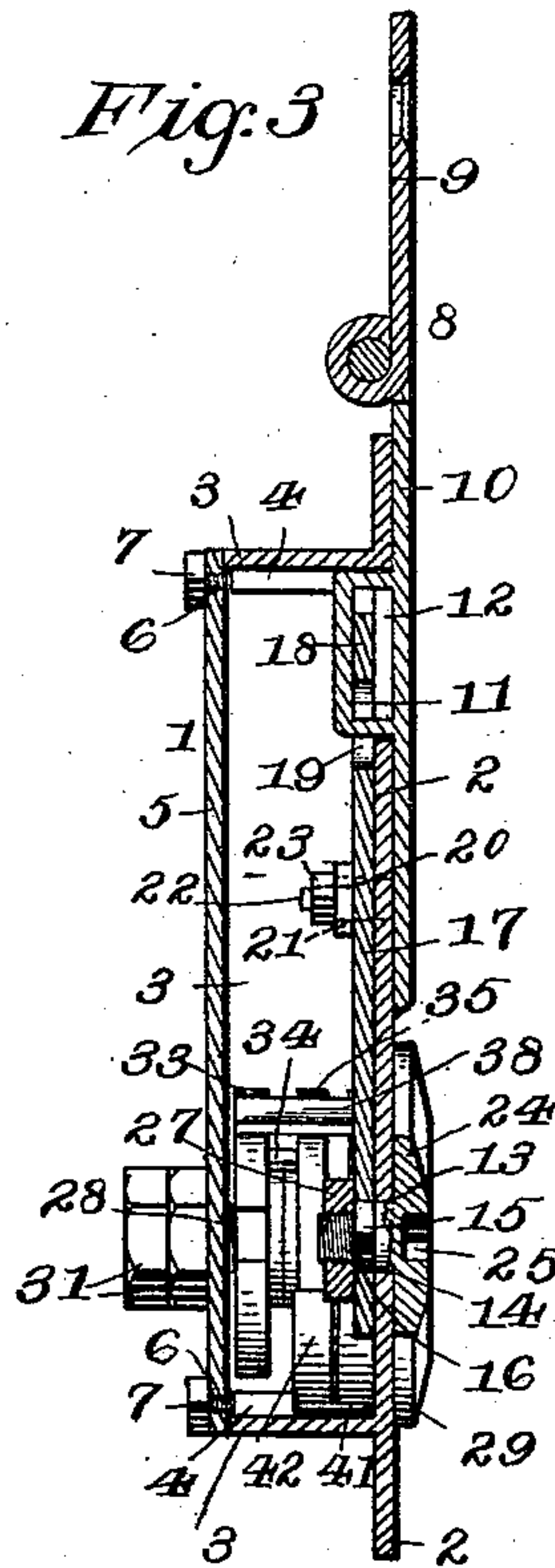


Fig. 6.

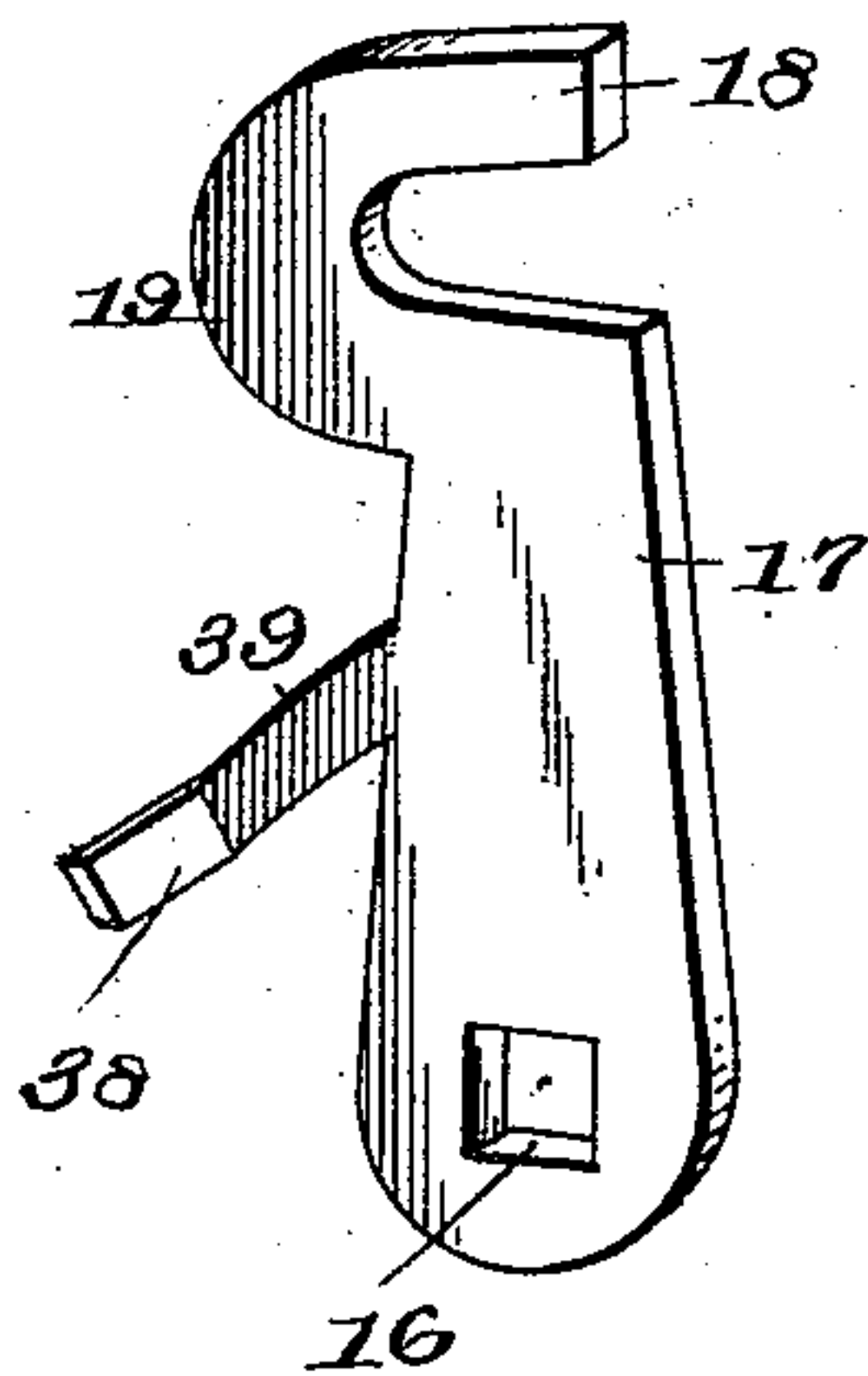


Fig. 5.

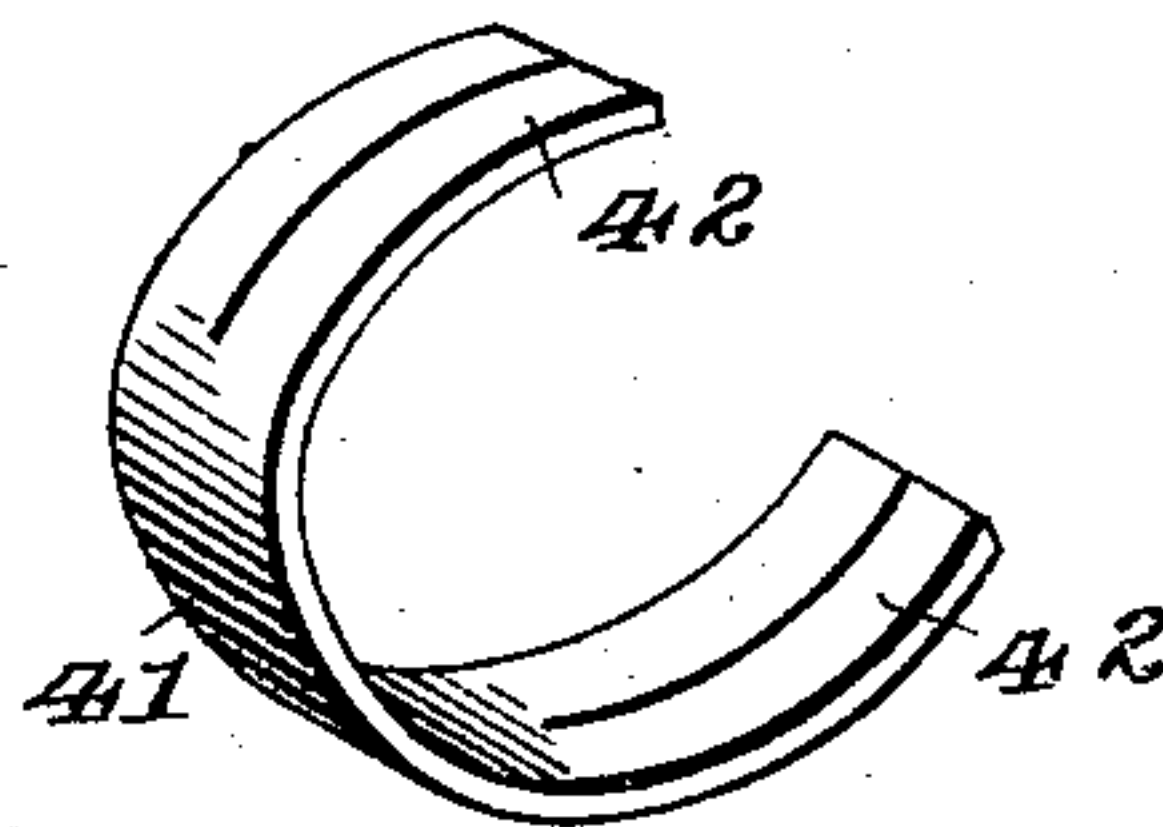
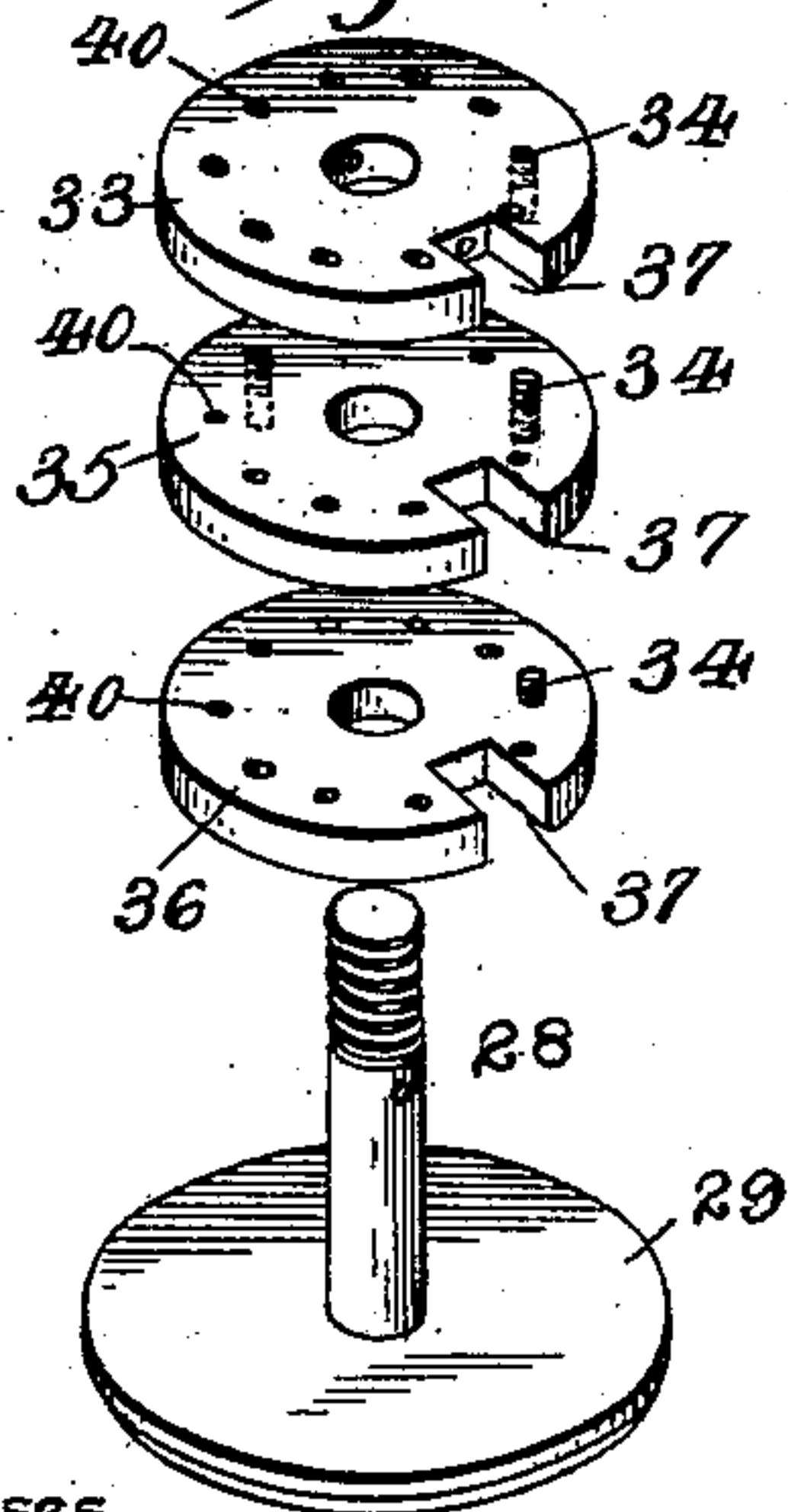


Fig. 4.



Witnesses

C. A. Ford.

[Signature]

By his Attorneys,

Inventor
Peter A. Kilstrom,

Cashow & Co.

UNITED STATES PATENT OFFICE.

PETER A. KILSTROM, OF ISHPEMING, MICHIGAN.

COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 538,969, dated May 7, 1895.

Application filed April 24, 1894. Serial No. 508,839. (No model.)

To all whom it may concern:

Be it known that I, PETER A. KILSTROM, a citizen of the United States, residing at Ishpeming, in the county of Marquette and State of Michigan, have invented a new and useful Combination-Lock, of which the following is a specification.

My invention relates to combination or permutation locks, adapted especially for use in connection with trunks, but also designed, with immaterial modifications, to be adapted for use in connection with drawers, doors, and the like; the objects in view being to provide a simple, inexpensive, and efficient device comprising a minimum number of parts or members, wherein the combination may be changed with facility; and, furthermore, to provide simple means for holding the tumblers during manipulation against accidental rotation, such means being so constructed as to avoid jar when a correct number of the combination is reached in order to prevent the lock from being opened by trial.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claim.

In the drawings, Figure 1 is a front view of a lock embodying my invention applied in the operative position to a trunk. Fig. 2 is a rear view of the same with the rear plate removed. Fig. 3 is a vertical section on the line 3 3 of Fig. 2. Fig. 4 is a detail view, in perspective, of the tumblers and arbor detached. Fig. 5 is a similar view of the retaining or friction spring. Fig. 6 is a similar view of the bolt. Fig. 7 is a similar view of the hasp. Fig. 8 is a similar view of the key which is employed in connection with the improved lock.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates the casing, which may be rectangular, as shown in the drawings, or of any other suitable shape, and it consists of the face-plate 2, which carries the side walls 3 and the bolts 4, which are extended in rear of the rear edges of said walls and are threaded, and the rear plate 5, which is perforated, as shown at 6, for the reception of the rearwardly pro-

jecting extremities of the bolts 4, upon which are fitted the nuts or taps 7.

8 represents the hasp having the securing-plate 9, which is adapted to be attached by means of screws or similar devices to the lid of the trunk, and the hinged plate 10 which is provided upon its rear side with a loop 11 adapted to pass through an opening 12 in the face-plate, whereby when the parts are in their locked positions said loop extends within the lock casing and projects slightly beyond the plane of the face-plate.

Rotatably mounted in a suitable bearing 13 near the lower side of the casing is a spindle 14 provided within the lock-casing and adjacent to the face-plate with a squared portion 15 upon which is fitted a squared opening 16 in the lower end of the pivotal bolt 17, said bolt being arranged in a substantially vertical position within the casing, and being provided at its free end with a transversely disposed tongue 18 forming one side of a hook-shaped extension 19 of the bolt. This transversely disposed tongue 18 is adapted to engage an inwardly projecting portion of the loop carried by the hasp-plate, as shown clearly in Fig. 2, and the bolt is guided by a keeper 20 disposed transversely at a point between the pivotal point and the free end of the bolt, and consisting of a flat bar or plate, the extremities of which are held in place by means of fixed studs or posts 21, terminating in threaded extensions 22 which project through perforations in the end of said bar or plate and are engaged by nuts or taps 23. These studs or posts, in addition to supporting the guiding bar or plate, serve as stops to limit the opposite movements or oscillations of the bolt. The spindle 14 is extended beyond the front surface of the face-plate and terminates in a disk 24 provided with a central angular socket 25 for the reception of the end of the key 26, which is shown in Fig. 8. The inner end of the spindle is engaged by a nut 27 to retain the bolt in engagement therewith.

Mounted rotatably in a suitable bearing in the face plate adjacent to the spindle 14, and preferably in the same horizontal plane therewith, is an arbor 28 provided upon its front end with a graduated dial 29, the marks of which are adapted to be aligned with an in-

dicating point 30 on the face-plate. To the inner end of the arbor which extends through the rear plate of the casing are attached the nuts 31, one of which is adapted to serve as
 5 a lock nut, and said nuts serve to prevent unnecessary vibration of the arbor and enable the pressure of the front dial upon the face-plate to be varied to increase or diminish the difficulty of rotating the arbor. Fixed to the
 10 arbor adjacent to the plane of the inner surface of the rear plate is a tumbler 33, provided with a pin 34 to engage a corresponding pin upon an adjacent spaced tumbler 35 which is loosely mounted upon the arbor.
 15 Said tumbler 35 also carries upon its opposite side a pin or stud similar to those above described, to engage a corresponding pin or stud upon the adjacent spaced tumbler 36, which is also loosely mounted upon the arbor
 20 adjacent to the plane of the front plate. It will be understood that any desired number of these tumblers may be employed, but I have shown that three, as shown in the drawings, are sufficient for ordinary purposes.
 25 These tumblers are provided at one side with a recess or notch 37, and when the recesses or notches of all of the tumblers are aligned they are adapted to receive the terminal stud 38 upon the locking arm 39 carried by the
 30 bolt. This locking arm is arranged approximately concentric with the pivotal point of the bolt, and the terminal stud on the locking arm is of a length equal to the distance between the rear side of the fixed tumbler
 35 and the front side of the loose tumbler at the opposite end of the series.

In order to provide for changing the combination of the lock each tumbler is provided with a series of threaded apertures 40, in
 40 which are fitted the ends of the pins or studs 34, which may, as shown in the drawings, be made in the form of small screws. To prevent independent rotation by jarring or otherwise and prevent rattling during the manipulation of the lock, I provide a retaining or pressure spring 41, consisting of the approximately
 45 parallel inwardly concaved arms 42, which bear upon opposite points of the edges of the tumblers, said spring being secured at its center to the casing by means of a split or bifurcated post 43. The arms of this spring are preferably split to form independent parts which bear respectively against the edges of the loose tumblers.
 50

55 The operation of the lock will be readily

understood from the above description without further explanation, and it will be seen that owing to the fact that no handles or knobs are employed and that the manipulation of the bolt and of the tumbler-carrying
 60 arbor is accomplished by means of a key fitting in sockets formed respectively in a disk on the front end of the bolt spindle and the dial on the front end of the arm (said dial being provided with a socket 44 similar to that
 65 described in connection with the bolt spindle), all danger of injuring the parts of the lock by rough handling is avoided. It will be understood, furthermore, that the construction of the lock is simple, and that the number of
 70 parts is small, and that said parts may be readily disconnected for purposes of repair, &c.; and, furthermore, that various changes in the form, proportion, and the minor details of construction may be resorted to without
 75 departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having described my invention, what I claim is—

In a lock, the combination with a casing
 80 having a removable rear plate, and a face plate provided with an opening for the reception of the loop of a hasp, a spindle mounted in the face plate and provided within the casing with a squared portion, a bolt fitted upon
 85 said squared portion of the spindle and having a transversely disposed tongue to engage the loop of a hasp, a guide spanning the bolt at an intermediate point and provided with terminal stops, a rotatable arbor, tumblers
 90 fitted upon said arbor, means for communicating motion from one tumbler to the adjacent tumbler, a split plate spring secured at its center to a stationary object with its split terminals bent toward the arbor and bearing
 95 against opposite sides of said tumblers, a rigid locking arm carried by the bolt and having a terminal stud to fit in corresponding recesses or notches in the tumblers, and a dial carried by the arbor, the front ends of
 100 said arbor and spindle being provided with sockets for the reception of a key, substantially as specified.

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

PETER A. KILSTROM.

Witnesses:

AUGUST F. KILSTROM,
 H. GUNDERSON.