

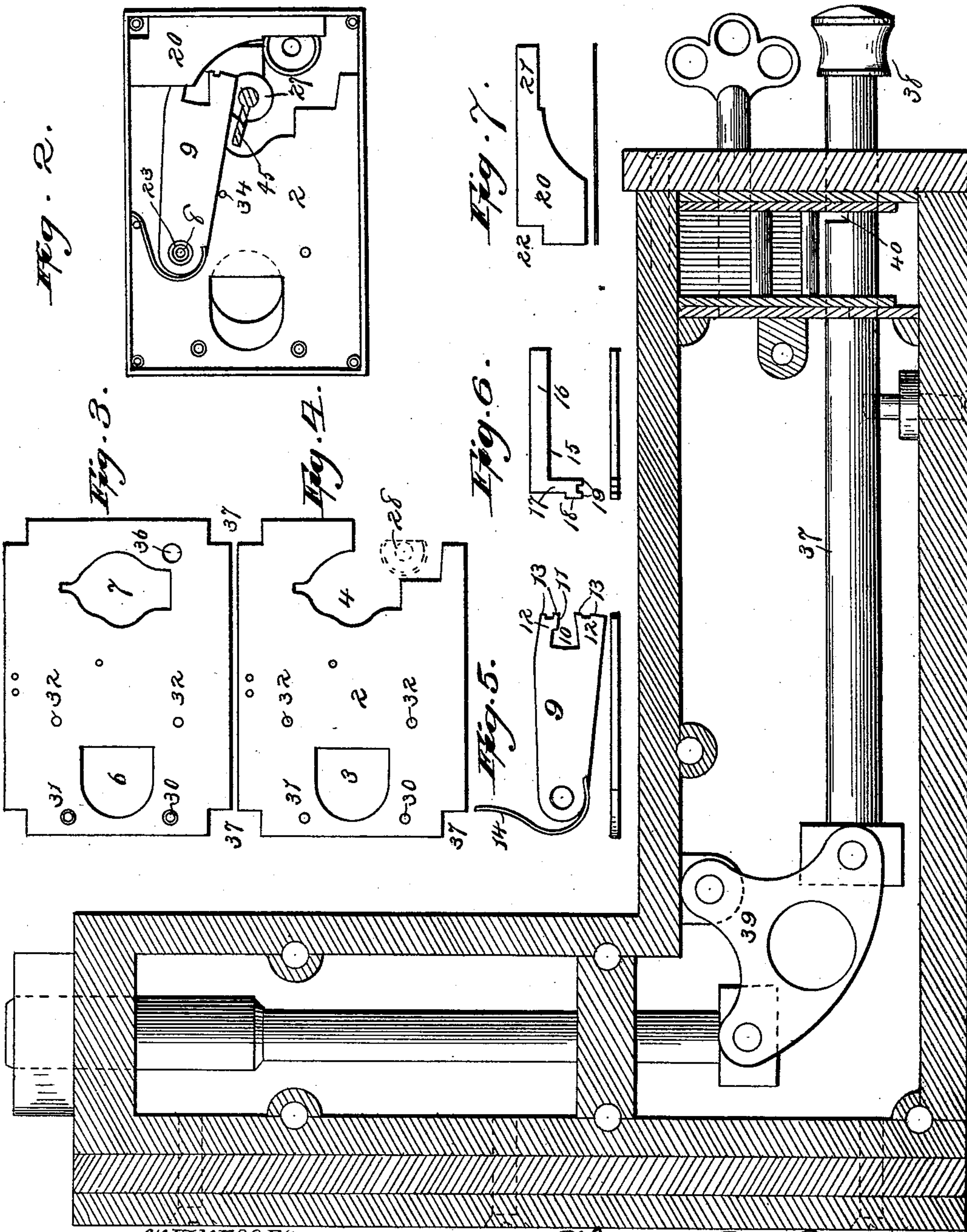
(Model.)

2 Sheets—Sheet 1.

C. L. LINCOLN.
LOCK.

No. 461,350.

Patented Oct. 13, 1891.



WITNESSES

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Fig. 1.

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(Model.)

2 Sheets—Sheet 2.

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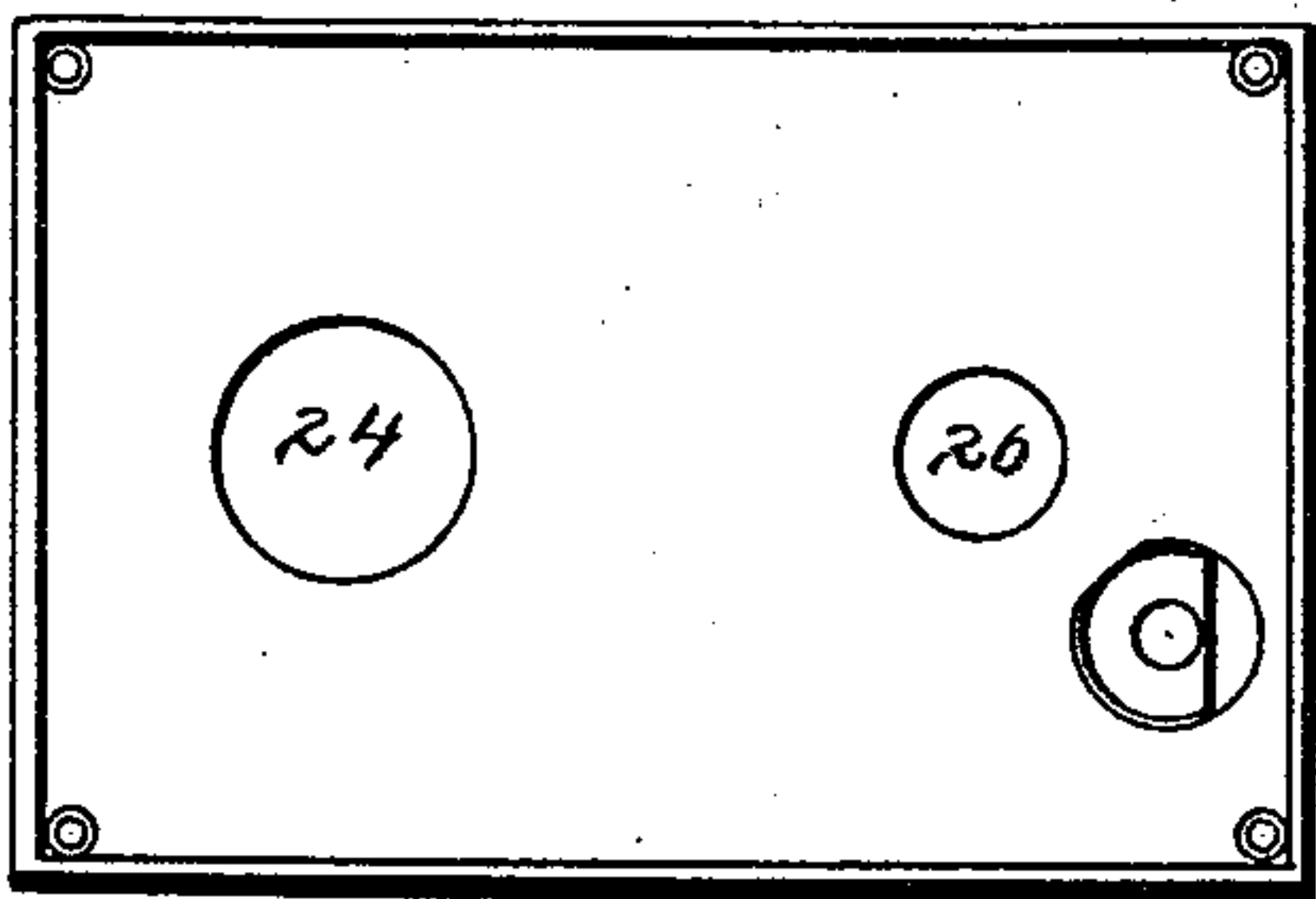


Fig. 8.

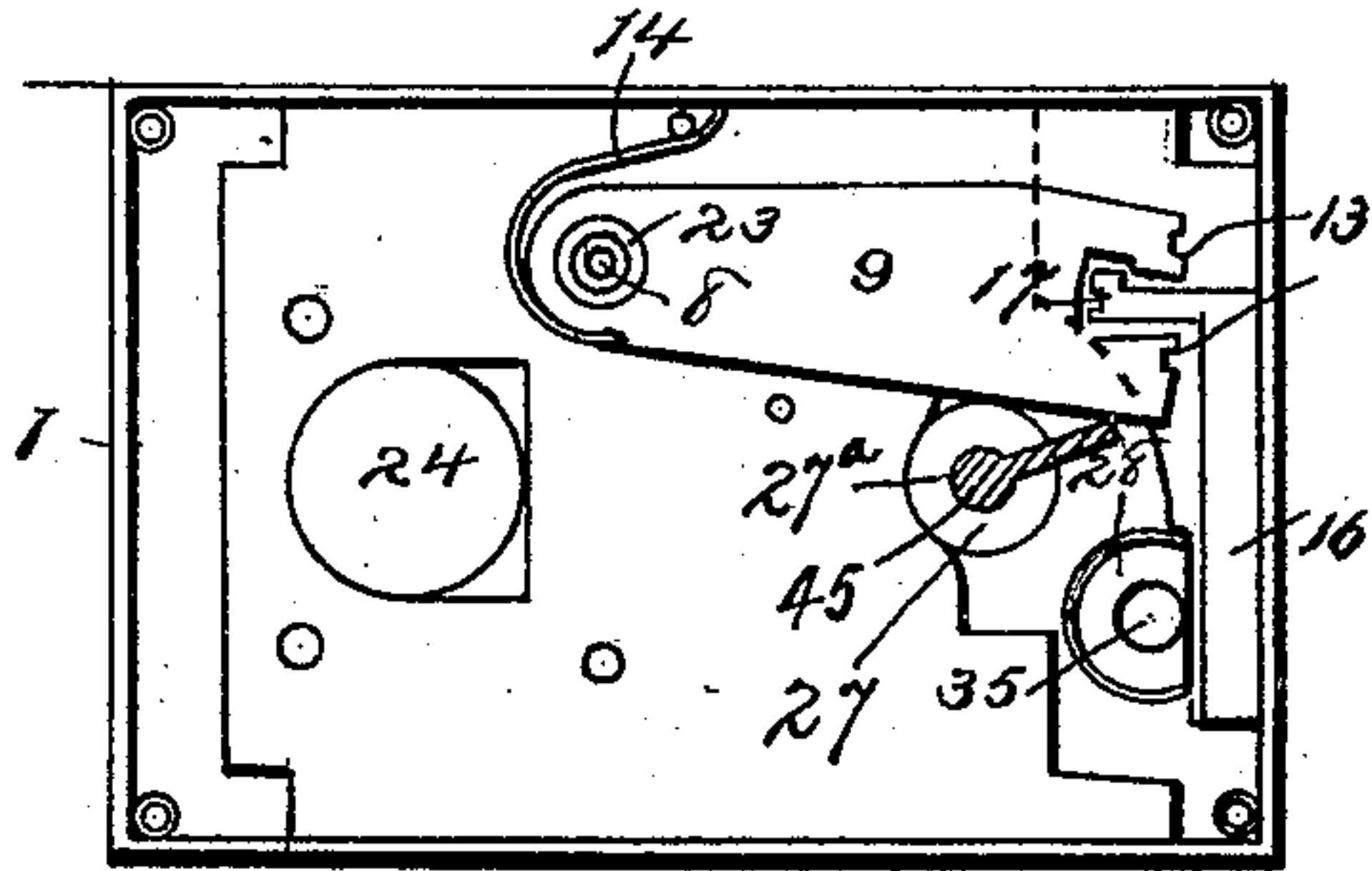


Fig. 9.

Fig. 10.

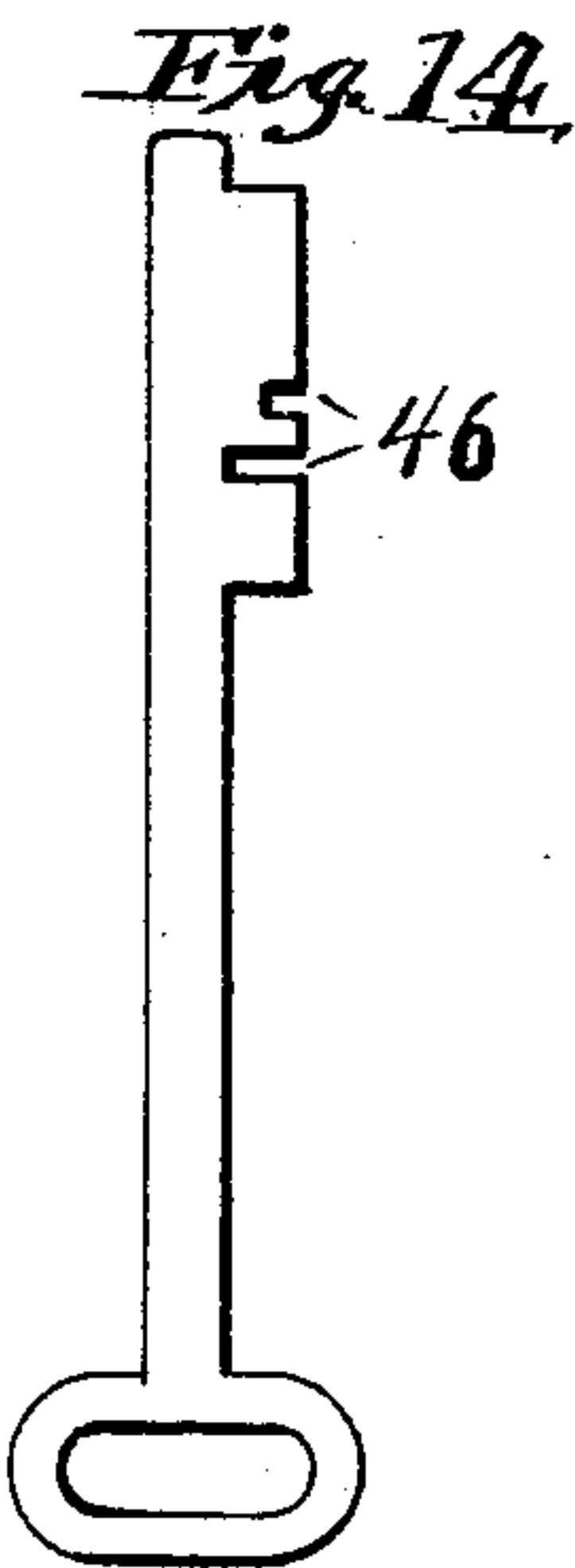


Fig. 14.

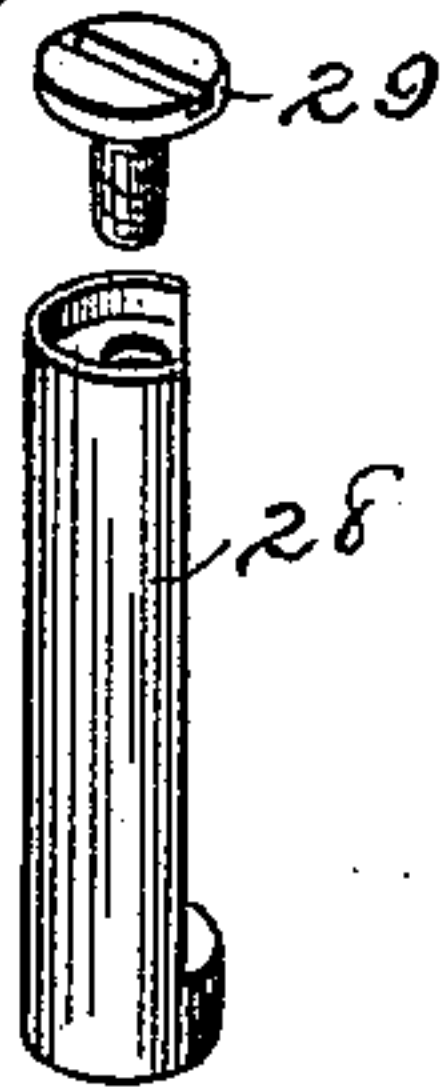


Fig. 13.

Fig. 11.

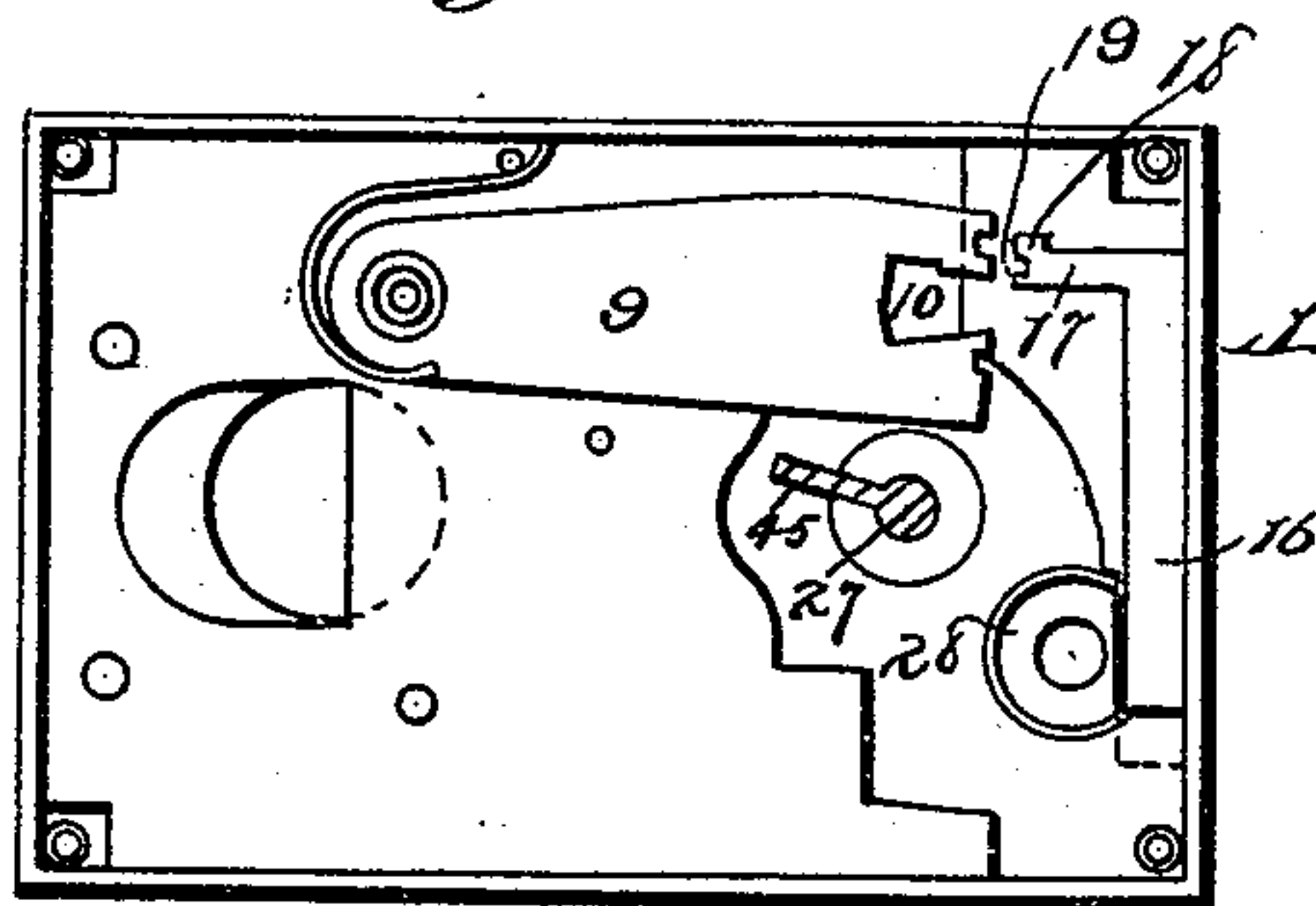
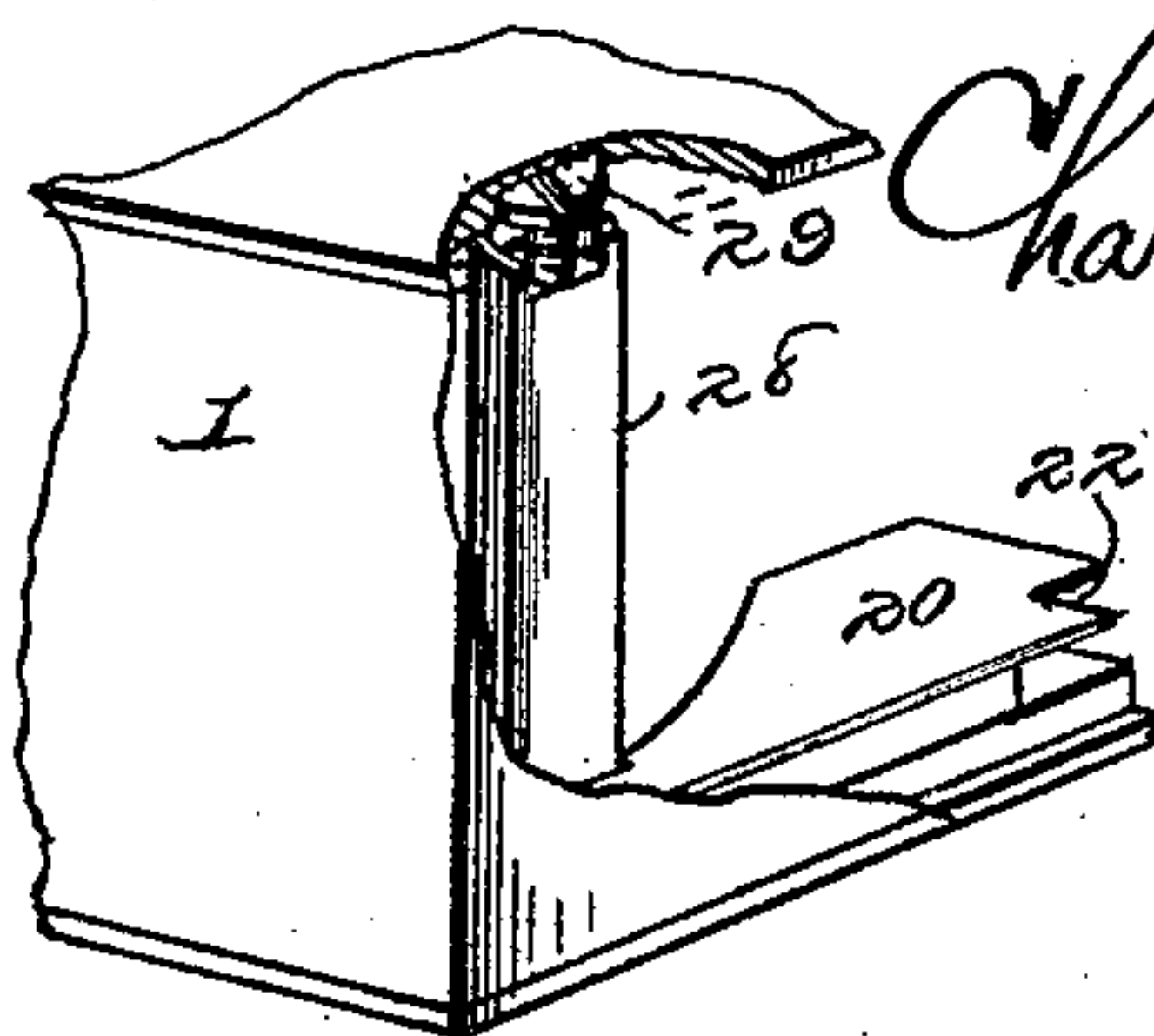


Fig. 12.

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UNITED STATES PATENT OFFICE.

CHARLES L. LINCOLN, OF STAMFORD, CONNECTICUT.

LOCK.

SPECIFICATION forming part of Letters Patent No. 461,350, dated October 13, 1891.

Application filed November 29, 1890. Serial No. 373,051. (Model.)

To all whom it may concern:

Be it known that I, CHARLES L. LINCOLN, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in locks; and it consists in certain novel features of construction and arrangement of parts, as will be fully described in the following specification and accompanying drawings, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a top plan view showing the lock in section. Fig. 2 is a side elevation of the lock with the top removed. Fig. 3 is a plan of the outer bolt. Fig. 4 is a plan of the inner bolt. Fig. 5 is a side and edge view of one of the tumblers. Fig. 6 is a side and edge view of one of the fences. Fig. 7 is a side and edge view of one of the guides. Fig. 8 is a top plan of the casing with the lid and contents removed. Fig. 9 is a perspective side view of the set-screw post and set-screw removed from the casing and separated from each other. Fig. 10 is a side elevation of the lock in an unlocked condition. Fig. 11 is a similar view showing a locked condition. Fig. 12 shows set-screw raised, so that its head will project into the seat provided for it on the inner face of the outer bolt. Fig. 13 is a perspective view of the collar 27, into which the key is entered. Fig. 14 is a plan of the key provided with clefts.

Referring to the several parts by their figures of designation, 1 is the body or casing, which may be made rectangular or of other preferred form, and is intended to inclose the various details of the lock and secure the same in their operative position. The bottom of the box will be referred to as the "inner side," and has formed therein at its corners suitable holes, in which standards are erected which secure the parts of the casing together. The top will be referred to as the "outer side" of the box, and is in like manner provided with suitable holes to receive the

other ends of the standards just referred to.

The object of my improved lock is to provide simple and effective means of enabling any one to readily change the combination at will. Heretofore it has been necessary in effecting a change of combination in locks of this character to employ some one skilled in the mechanism forming the lock, while I have produced a lock of which the combination may be easily changed without the necessity of removing any part of the lock or without it being necessary to open the same, as will be fully described.

Arranged parallel and adjacent to the inner side of the casing is one of the locking bars or bolts, a view of which is shown in Fig. 4 of the drawings. This bolt consists of a piece of sheet metal of any preferred kind, and is provided with the hole 3 in its left-hand end, the outer side of such hole presenting the periphery of a semicircle, while the inner end terminates in a rectangular form, the diameter being greater horizontally than vertically. The other end of the bolt is provided with a hole 4, which is practically cylindrical, excepting that its upper periphery is extended to form the truncated apex of a cone, while its lower right-hand side is cut away. The object in thus cutting away the hole 4 is to make it possible that the said bolt may be reciprocated without coming in contact with the set-screw post 28, the position of which is shown by dotted lines in Fig. 4.

Fig. 3 represents the outer bolt, which corresponds in its function with bolt 2 and is similarly provided with holes 6 and 7, which correspond in shape, respectively, with holes 3 and 4 in bolt 2, except that the lower right-hand corner of hole 7 is not cut away, as in case of the opening 4.

Within the casing and between the bolts just described are mounted the various parts forming the operating mechanism of the combination-lock, which I will now proceed to describe.

The said bolts are connected by standards at several different points, upon one of which 8 is mounted the series of tumblers 9, one above the other. These tumblers consist of a piece of sheet metal and are somewhat oblong in form, one end being provided with the

cylindrical opening to receive the post 8, while the other is cut away to form the opening 10, which may be of any preferred shape.

When the tumblers are placed upon the stand-
5 ard or post 8, they will have a vertical swing thereon, and in order that their free ends may be held normally downward I provide the spring 14, one end of which is feathered in, preferably, the lower or inner edge of the
10 tumbler and then bent around such end and brought parallel with the upper side of the tumbler and arranged to bear against the side of the casing, where it may be secured by any suitable means. Each of the tumblers is ar-
15 ranged to engage with a fence 15, which is formed of a piece of sheet metal, having a slightly-greater thickness than the tumblers, and it consists of the body 16, of a sufficient length to reach nearly across the end of the
20 casing, while its inner end is provided with the extension 17, which reaches inwardly toward the tumblers and lies at right angles with the body and substantially parallel with the tumblers.

25 In building up the combination of the lock I place upon the post 8 the first of a series of tumblers, which it is adapted to carry. A fence 15 is then placed so that its body 16 will lie nearly at right angles with the tumbler
30 and its inner end 17 reaching into the opening 10. Upon the fence thus placed is laid the guide 20, which consists of a piece of thin sheet metal and is formed as shown in Fig. 7 of the drawings. The lower end 21 of the
35 guide, it will be seen, is cut away, so as to have the remaining part conform in width to the body of the fence, while the upper right-hand corner 22 is provided with the rectangular notch, which is adapted to prevent contact
40 with the corner-post by which the casing is held together. Between the tumblers 9 I arrange the washers 23, which serve to bring each tumbler up to the proper level to engage with its respective fence 15, and which also
45 prevent friction between the sides of the tumblers.

I have described but one of the many forms of construction that may be followed in forming the contacting ends of the tumblers and
50 fence; but it will be readily understood that many variations of construction may be used, as preferred.

The tumblers and fences with their intervening guides and washers may be multiplied
55 in number, as preferred, and it will be readily seen that the larger the number of these parts employed the greater the capacity of the lock for having changes in its combination made.

The inner and outer sides of the casing are
60 each provided with cylindrical diametrical openings 24, which form a seat for the bar or locking-bolt proper 37, which is mounted therein and adapted to slide longitudinally, as will be seen by reference to Fig. 1 of the
65 drawings. These parts are also provided with similar holes 25 and 26, which provide a seat for the collar 27, extending entirely through

from one side of the casing to the other and is arranged to turn with the key, its larger end being secured or countersunk in the lid. 70

I secure near the right-hand end of the side of the casing the set-screw post 28, which has two functions, one of which is to hold the fence loosely between itself and the end of the casing, while its second function is to pro- 75
vide a seat for the set-screw 29, the object of which will now be made apparent. It will be observed that the side of the set-screw post adjacent to the fence is cut away, so that the top of the set-screw will project over said 80
fence and secure the same when the screw is turned home. It will be also observed that the top of the post is countersunk, so that the head of the set-screw may disappear in or be-
come parallel with the top of the projecting 85 edges of the set-screw post.

Each corner 37 of the bolts 2 and 4 are properly cut away, so that each end of the bolt may be brought closely in contact with each end of the casing, as will be readily un- 90
derstood from the foregoing description.

The two bolts 2 and 4 carry the operating mechanism and are adapted to slide or reciprocate within the casing proper. In order that the bolts may be firmly connected to- 95
gether suitable posts 30, 31, 8, and 32 are erected at proper places and their respective ends secured in the inner and outer bolts. Immediately above the set-screw I form in the inner face of the outer bolt the seat 33, 100
which is of a sufficient depth to receive the head of the set-screw when it is partly withdrawn from the set-screw post. In order that the tumblers may be prevented from depress-
ing lower than the upper periphery of the 105 hole 25 I erect the post 34, and secure the same between the inner and outer bolts.

The required number of tumblers and fences with their guides and washers are placed in position when the set-screw 29 is 110
turned home in the set-screw post, when its projecting edge will reach over and firmly secure the small ends of the guides and the intervening ends of the fence. The outer bolt is then placed in position so as to receive 115
the upper or outer ends of the several standards, when it may be secured by brazing or upsetting such ends, as may be preferred. The collar is then placed in position so that its inner end will be received by the opening 120
25, while its outer end will be suitably countersunk in the lid of the casing.

When the lock is being put together, the bolts or locking-plates 2 5, which move together, are slid back into their unlocked po- 125
sition, as shown in Fig. 10, and as the series of tumblers 9 are placed on the pivoted post and the series of fences 15 are placed in position their inner ends 17 are fitted into the openings 10 of the several tumblers. The 130
springs 14 press the free recessed ends of the tumblers downward, and the fences 15 are thus slid and normally held down in their lowermost position through the pressure of

the tumbler-springs 14. A screw-driver adapted for the purpose is then inserted through a hole 35 made in the outer casing immediately above the head of the set-screw
 5 and through a registering-hole 36, formed in the outer bolt of the locking-plate, as shown in Fig. 3, and the set-screw 29 is partly withdrawn from the top of the post 28 by partly
 10 unscrewing it until its head rises into the seat 33, formed in the inner side of the outer locking-plate. The key 45 is then inserted through the key-hole 27^a in the collar 27. Any desired number of recesses or clefts 46, the
 15 position and depth of which may be varied as desired, are formed in the blade or web of the key, each recess registering with one of the spring-actuated tumblers 9. The key
 20 after being inserted is turned around to raise the tumblers 9, the tumblers being raised to different heights, according to the depth of the recesses 46 in the web of the key, with which they register. As the several tumblers
 25 are thus moved up they carry with them their respective fences 15. When the web of the key is thus turned around into its upward vertical position, moving the tumblers and fences up with it, as described, the set-screw
 30 29 is screwed tightly down, so as to hold the several adjustable fences 15 firmly at the point to which they have been moved or adjusted by the tumblers. By now turning the
 35 key to the left the locking-plates 2 3 will be slid to the left, or into their locked position, as the web of the key presses against the curved sides of the openings 4 and 7 and engage with the transverse grooves or recesses
 40 40 in the locking-bolt proper 37.

To unlock the lock, it is only necessary to turn the key to the right, when its notched
 40 web will raise the several tumblers 9, and, owing to the previous adjustment of the fences 15, before described, which are removably held in their adjusted position by the pivoted set-screw 29, when the web of the key
 45 has raised the several tumblers to their different heights (according to the depth of the notches in it) it begins to slide the locking-plates 2 5 back. The openings 10 of the several tumblers will exactly register with the
 50 arms 17 of the fences 15, so that said arms will enter the said openings as the tumblers are carried back by the sliding locking-plates.

It will be seen from the foregoing that the combination of the lock can be changed at
 55 any time by the owner without opening the lock by using a key with differently-arranged web notches or notches of different depth and by simply loosening the set-screw 29 and adjusting the tumblers and fences with the
 60 key, as above described, and then turning the set-screw to a proper point to hold the fences in their adjusted positions.

It will further be seen that the key used in setting the combination will be the only
 65 key with which it is possible to unlock it.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A lock having the sliding bolts 2 and 5, joined together by securing-posts 30, 31, 32, 70 and 8, the latter pivotally securing the series of tumblers, the former bolt provided with the holes or openings 3 and 4 and the latter with the openings 6, 7, and 36, the inner side of the latter opening being cut away or coun- 75 tersunk to provide a seat for the head of the set-screw when it is partly withdrawn from the set-screw post, the fences having their bodies placed parallel with the end of the casing and their inner ends adapted to enter the 80 openings provided in the free ends of the tumblers when unlocked, as set forth.

2. In a lock, the combination of the body or casing, the tumblers pivotally mounted therein upon the post 8 and provided on 85 their free ends with the opening 10 and the teeth 11 and 13, the fence 15, having its body arranged at right angles to the tumblers, the inwardly-reaching end 17, adapted to enter the opening 10 in the tumbler when the 90 lock is unlocked, the set-screw post 28, having one side thereof partly cut away, the set-screw mounted in said post and having its rim arranged to reach over the cut-away section of the post, and thus secure the fence 95 and guides firmly together when it is turned home, and the sliding bolts held together by suitable posts and mounted within the casing and carrying said tumblers, fences, guides, and set-screw post in their respective oper- 100 ative positions, and provided with openings 3, 4, 6, and 7, all arranged to slide or reciprocate longitudinally within the casing, as set forth.

3. In a lock, the combination of the casing, 105 the sliding bolts secured therein and having their ends adapted to enter grooves in the locking-bolt, the series of tumblers, guides, and fences constructed and arranged substantially as described, mounted between the 110 sliding bolts, the set-screw post erected upon the inner bolt, and the set-screw secured in said post and adapted to hold the fences and guides in a set position when said screw is turned home or have its head enter the seat 115 provided for it on the inner side of the outer bolt when withdrawn from said post, the locking-bolt reaching through holes 24 in the casing and secured against further longitudinal movement when the sliding bolts enter 120 the grooves provided in said locking-bolt, all substantially as described, and for the purpose named.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. L. LINCOLN.

Witnesses:

RUDOLPH HOEHLER,
 NATHL. R. HART.