907,915.

W. H. TAYLOR.
CHANGEABLE COMBINATION LOCK.
APPLICATION FILED APR. 20, 1908.

Patented Dec. 29, 1908.
3 SHEETS—SHEET 1.

Fig. 1.

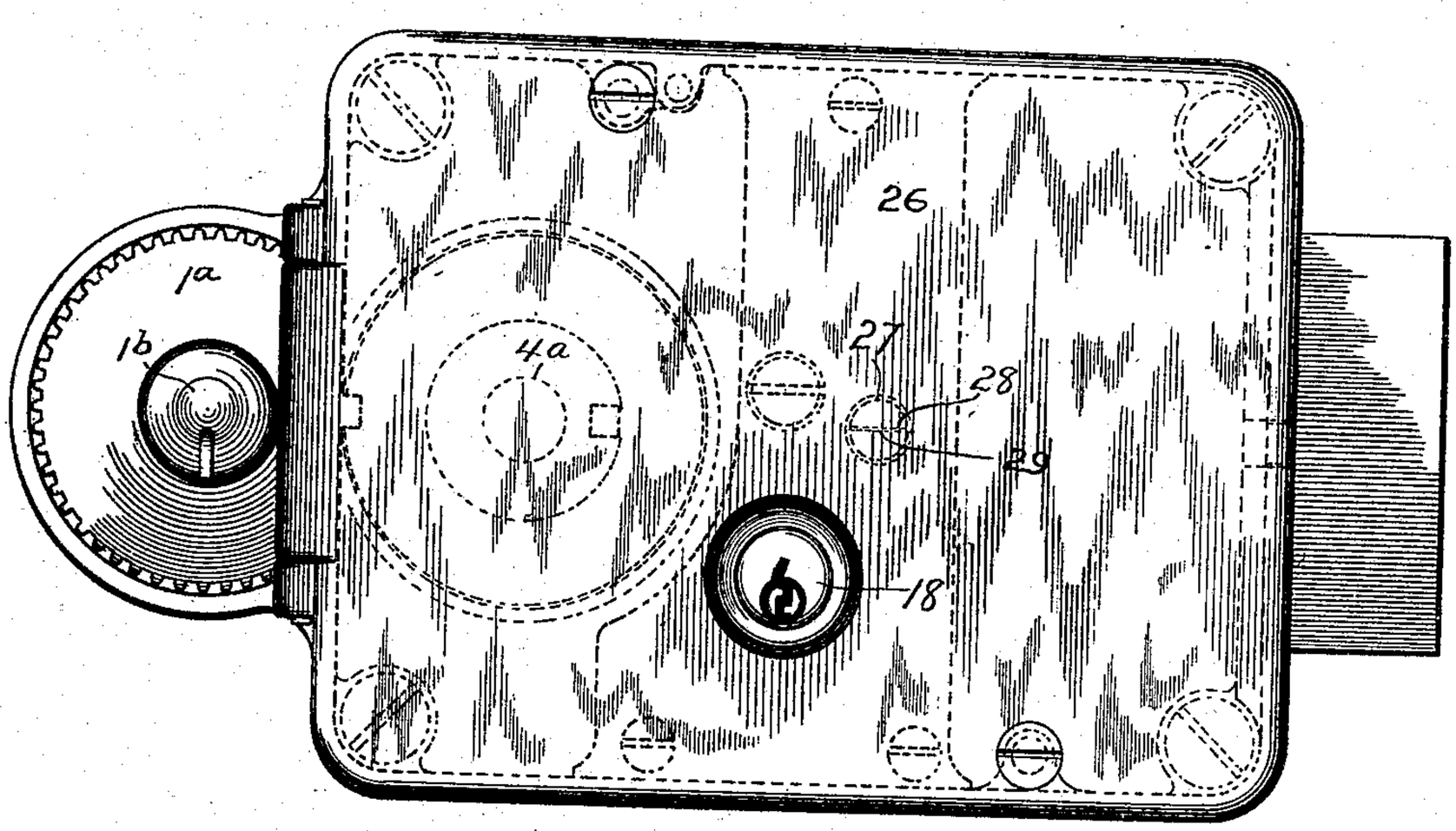
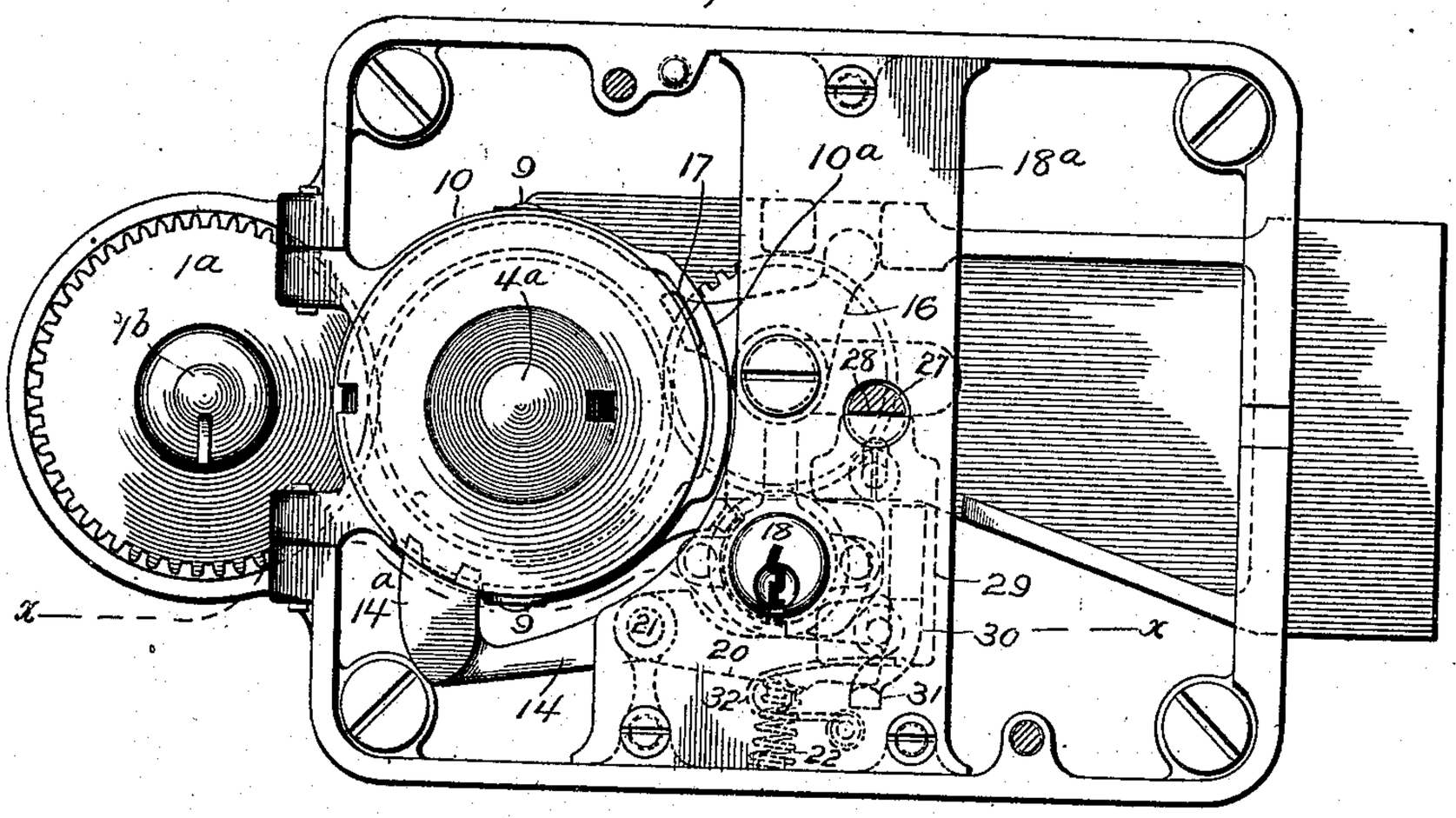


Fig. 2.



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3 SHEETS—SHEET 2.

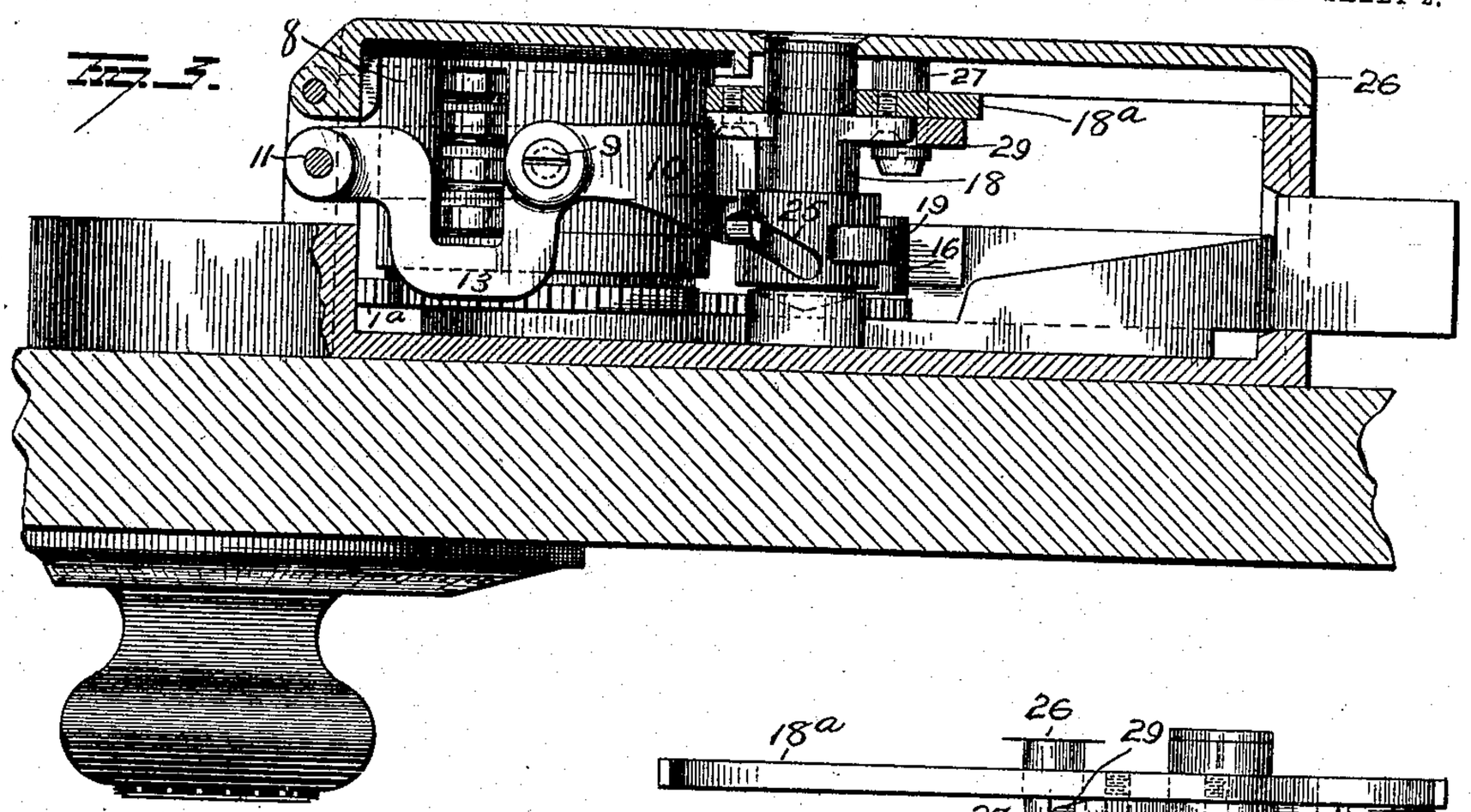

FIG. 3.

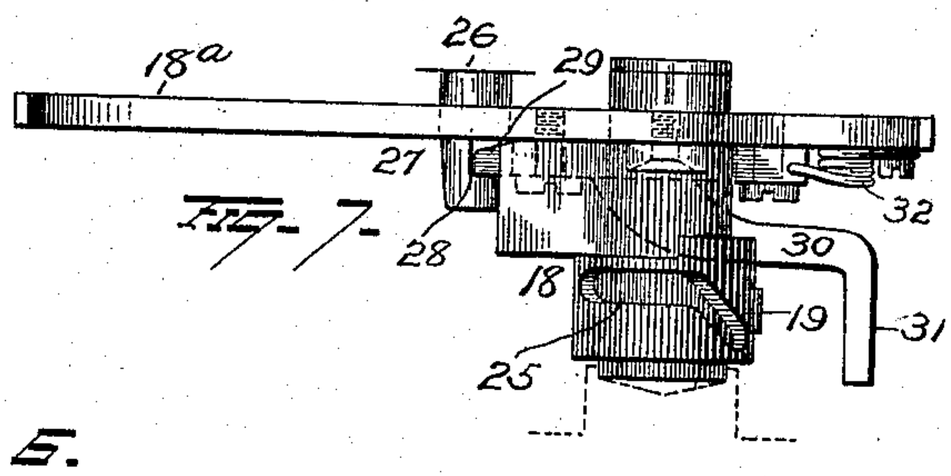

FIG. 7.

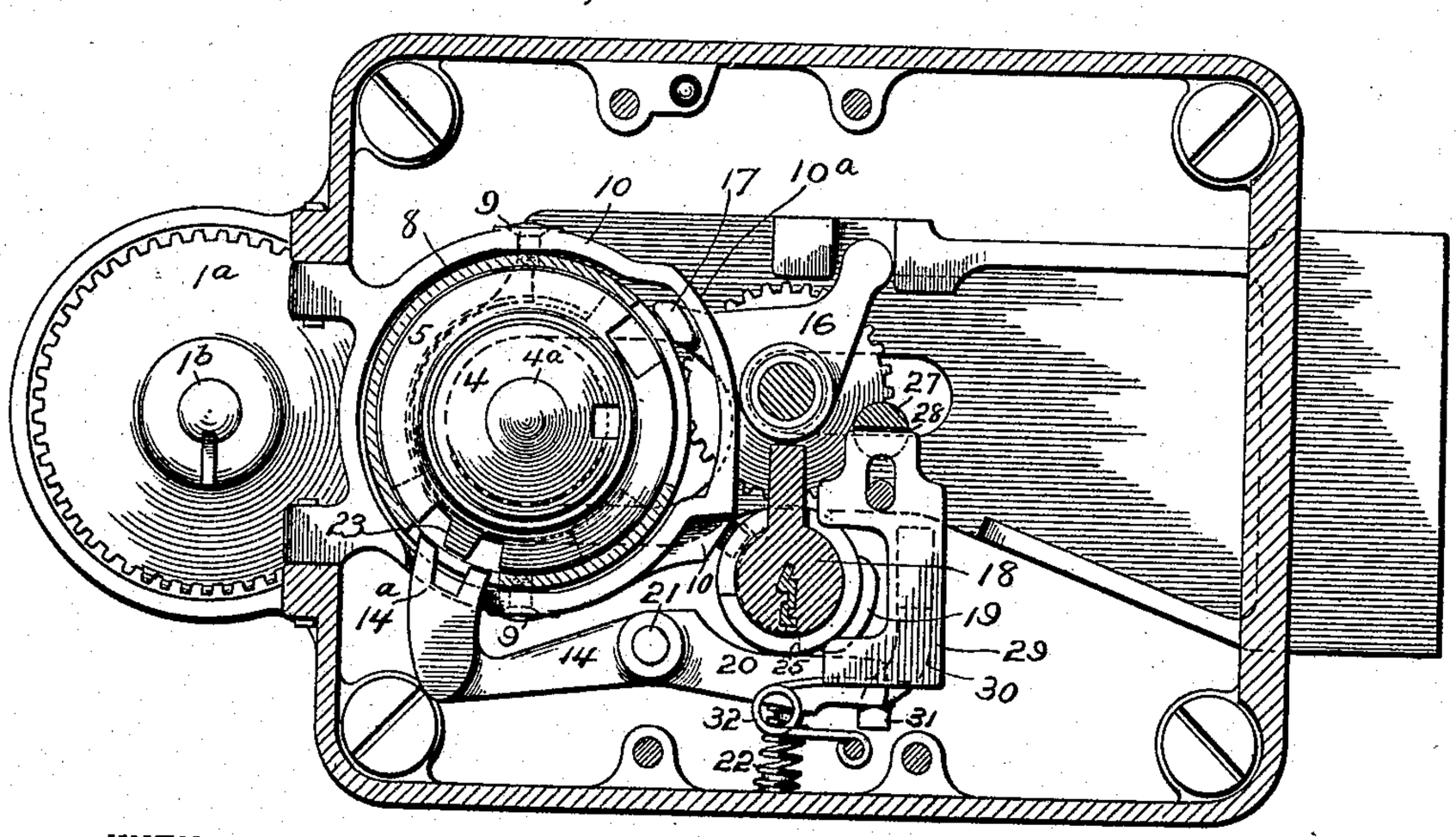

FIG. 5.

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3 SHEETS—SHEET 3.

Fig. 4.

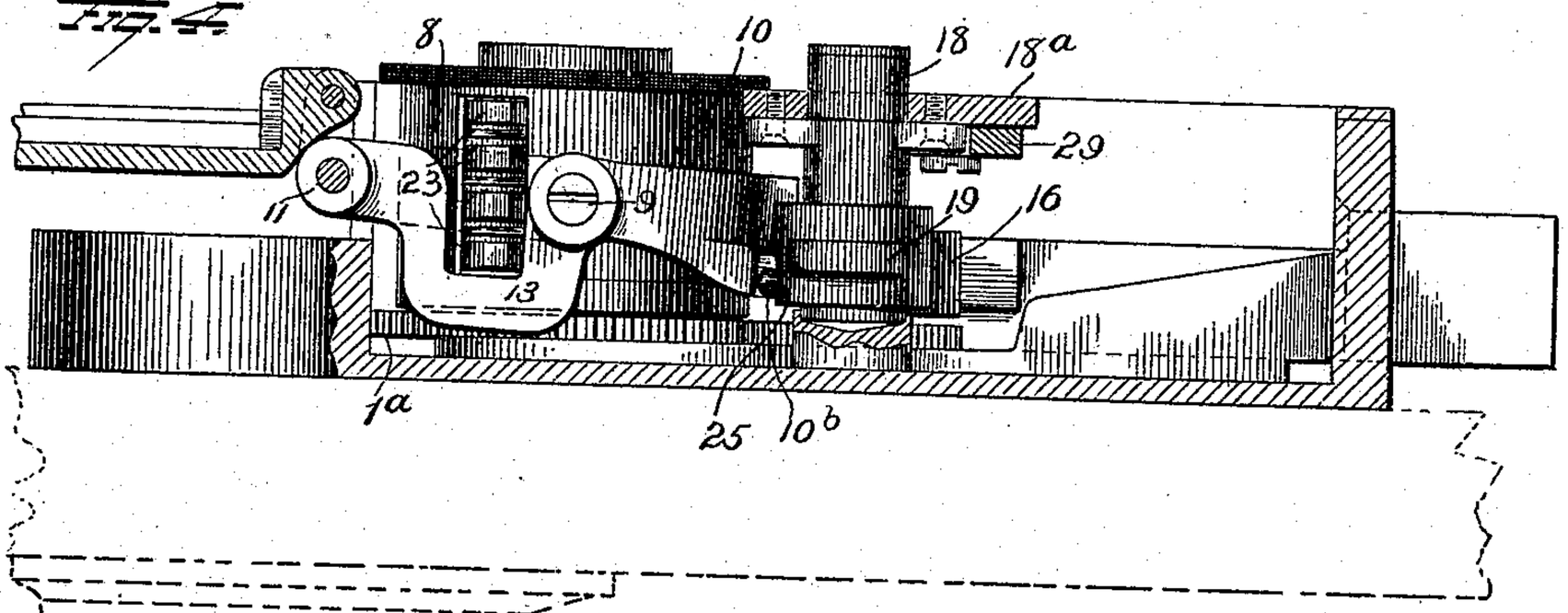


Fig. 5.

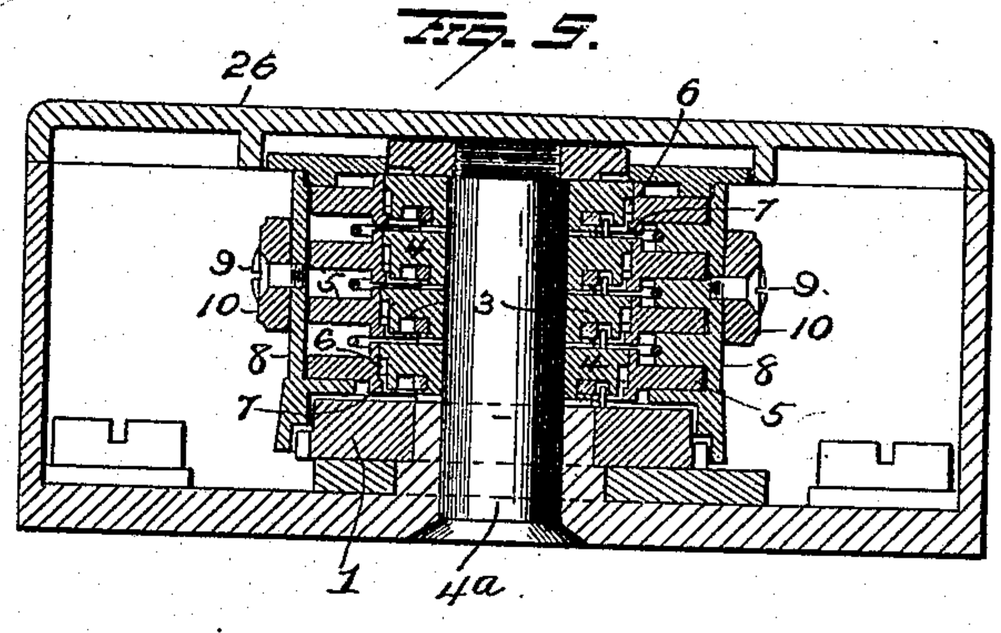


Fig. 8.

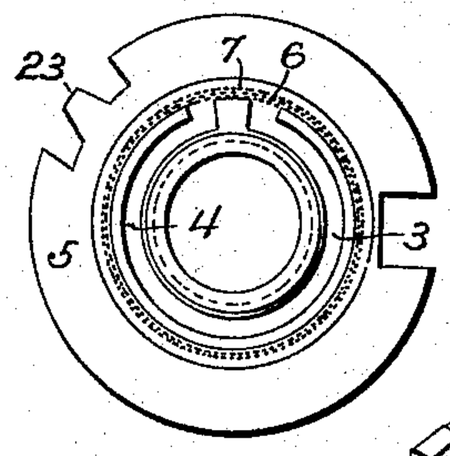


Fig. 9.

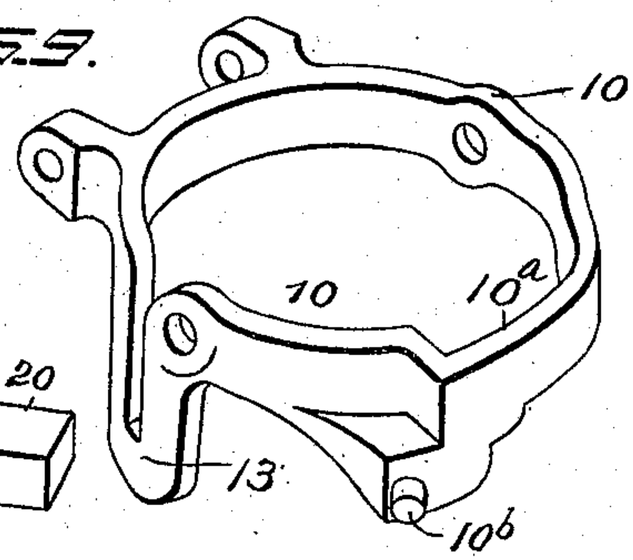


Fig. 10.

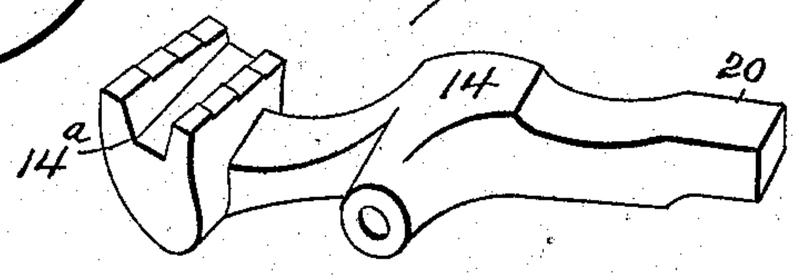


Fig. 11.

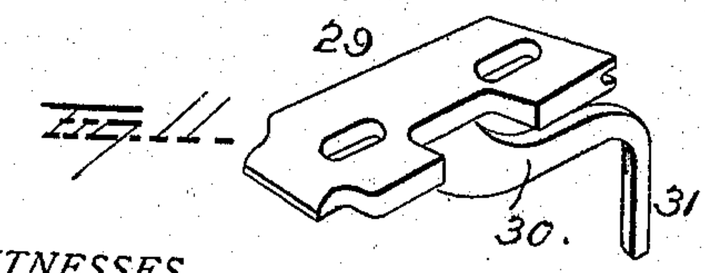
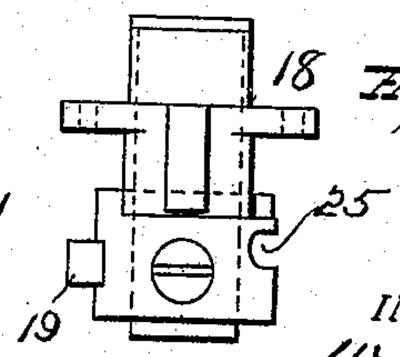


Fig. 12.



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UNITED STATES PATENT OFFICE.

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CHANGEABLE COMBINATION-LOCK.

No. 907,915. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed April 20, 1908. Serial No. 428,153.

To all whom it may concern:

Be it known that I, WARREN H. TAYLOR, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Changeable Combination-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 an improvement in changeable combination locks, the object being to provide improved means for simultaneously separating one section of each tumbler from its companion section whereby the latter may be rotated by the dial spindle to change the combination.

A further object is to provide means actuated by key mechanism accessible through the cover or rear plate of the lock for disconnecting the tumbler sections.

A further object is to provide means actuated by key mechanism accessible through the rear or cover plate of the lock, for disconnecting the tumbler sections, and means also actuated by said key mechanism for locking the outer sections of the tumblers against rotation.

A further object is to provide improved means for locking the cover plate of the lock to the lock case.

With these objects in view, my invention consists in the parts and combination of parts, and in the details of construction as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in rear elevation of the lock, the cover plate being in position. Fig. 2 is a similar view with the cover plate removed. Figs. 3 and 4 are views in section on the line x—x of Fig. 2 showing the sleeve carrying the outer sections of the tumbler in its two positions. Fig. 5 is a view in section through the case, tumbler sleeve, yoke and tumblers showing the tumbler sections disconnected. Fig. 6 is a view partly in rear elevation and partly in section, the bridge 18^a being removed and the cylinder lock and tumbler case being shown in section. Fig. 7 is a view in side elevation of the bridge showing the parts carried thereby. Fig. 8 is a view in elevation of one of the tumblers. Fig. 9 is a view in perspective of the yoke. Fig. 10 is a similar view of the brake. Fig. 11 a view of the cover locking latch, and Fig. 12 a view of the cylinder lock.

1 represents a tumbler actuated by the pinion 1^a on dial spindle 1^b. This tumbler has a pin or projection, which engages a shoulder in the annular recess 3 in the next adjacent tumbler.

The several tumblers except 1 are constructed alike, and are connected by pin and shoulder connection in the well known manner, whereby the second tumbler receives its motion from the first, the third from the second and so on throughout the series.

Each tumbler except the first, which as before stated is actuated by the dial spindle, is made of an inner disk section 4, and an outer ring section 5, the disk section of the tumbler having the annular recess 3, in which the pin of the next adjacent tumbler rests and moves. The disk sections of the tumblers are each provided with a peripheral series of teeth 6, which, when the two parts of the tumbler are assembled, mesh with an annular series of teeth 7 on the outer or ring section. The teeth on the disk section of the tumbler are flush with the outer face of the disk, and extend only part way the thickness of the disk, while the teeth 7 on the ring section 5 project from the inner face of the ring, and extend only part way the thickness of the ring, so that when the sections are assembled, the teeth projecting from the ring, engage the teeth on the disk and also the walls at the ends of the teeth on the disk, thus limiting the movement of the ring in one direction, but permitting free and unlimited movement in the other direction. All the tumblers except tumbler 1 are thus constructed, and are located within the cylindrical sleeve 8, the peripheries of the rings resting between the fixed shoulders or lips secured to, or formed in, the inner face of the sleeve and necessarily movable with the sleeve, sufficient clearance between the shoulders or lips being provided to permit the rings to rotate within and independently of the sleeve.

The disk sections of the tumblers are mounted to rotate on the fixed post 4^a, and the sleeve 8 is pivotally mounted at diametrically opposite points on the trunnions 9 of the yoke 10. This yoke is hinged or pivoted at 11 to the lock case 12, thus permitting the yoke to rock or swing in the direction of the length of the sleeve 8, and move

the latter in the direction of the axis of the tumblers. The yoke 10 carries the trunnions 9 on which the sleeve is mounted, and is provided with a U-shaped portion 13 for the passage of the head of the brake lever, this portion 13 extending considerably in advance of the body of the yoke, so as to accommodate the head 14[a] of the brake lever 14, which head is designed to engage the entire series of sectional tumblers and hold the outer ring sections against rotation. The section 10[a] of the yoke adjacent to the fence 16 is also projected outwardly as shown, for the reception of the head 17 of the fence, when said head is out of the gates of the several tumblers, and also while moving into and out of said gates.

Carried by the bridge 18[a], which is secured to the lock case in advance of the tumblers, is the pin tumbler lock 18, the face of which projects through an opening in the cover or rear plate of the lock. The rear end of the lock plug of this lock 18, is provided with a cam 19 which rests in contact with the front end 20 of the brake lever 14. This brake lever is pivoted to the lock case at 21, and is engaged near its front end by a spring 22, which tends to hold the end 20 of lever 14 in contact with cam 19, and its toothed head out of contact with the tumblers. Each tumbler is provided with a single tooth 23, and the head of the brake lever is provided with two teeth which engage the tooth 23 and prevent the outer ring sections of the tumblers from rotating while so engaged by the brake lever.

The teeth on the tumblers are so located with relation to the gates in the tumblers, that when the gates are in position to receive the end of the fence, the teeth 23 will be in position to be engaged by the two teeth on the brake lever. The sleeve 8 is not continuous but is made in separated sections carried by the tumbler curb, thus leaving openings for the passage of the head of the brake lever and the end of the fence. The rear end of the plug of lock 18, is also provided with a cam groove 25 in which the end of the yoke 10 rests. When the plug or cylinder of lock 18 is turned by its key, the cam 19 engaging the end of brake lever, turns the latter and forces the teeth thereon into engagement with the single tooth on each tumbler ring thus absolutely locking the latter against rotary movement but permitting them to be moved lengthwise the teeth. The continued movement of the cylinder or plug of lock 18, now causes the walls of the cam groove to engage the pin 10[b] of the yoke thus moving the latter, and the sleeve and ring sections of the tumblers forwardly or toward the front of the lock, until the ring sections of the tumbler are clear of the teeth on the disk sections, thus leaving the latter free to be rotated independently of the outer ring sections. The fence 16 is pivoted in a position to engage the several tumblers, and operates in the usual manner to throw or retract the bolt.

To change the combination the tumblers are first set on their present combination, which as previously explained brings the gates in the tumbler in line with the end of the fence, and the teeth on the outer edges of the ring sections of the tumblers in position to be engaged by the teeth on the brake lever. By now inserting the proper key in pin tumbler lock 18, and turning same, the rotation of the cylinder or plug of lock 18, brings the cam 19 into contact with the end of the brake lever and forces the toothed head of the latter into engagement with the teeth 23 on the ring sections 5 of the tumblers, thus locking the latter against rotation, but not preventing them from being moved forwardly. The continued movement of the plug or cylinder of the lock 18, causes the walls of cam groove 25 to engage the end of the yoke and move same forwardly on its pivot 11, thus carrying the ring sections 5 of the tumblers forwardly until the teeth thereon are out of engagement with the peripheral teeth on the disk sections of the tumblers, thus leaving the inner or disk sections of the tumbler free to be rotated, the outer sections, in the meantime being held against rotation.

While the parts are in the position last described, the combination may be changed, by first turning the dial spindle to the right the proper number of times to set the first tumbler, reversing to set the second, again reversing to set the third and so on throughout the entire series of tumblers, thus setting the inner sections to the new combination. After this has been done, the pin tumbler lock plug should be returned to its original position, which causes the yoke and its connected sleeve carrying the outer or ring sections of the tumblers, to move back until the outer sections of the tumblers are in engagement with their disk sections. This movement of the plug of the pin tumbler lock also withdraws the brake lever, thus leaving the outer sections of the tumblers free to rotate. After the parts have been restored to their normal conditions, the tumblers may be rotated and the lock operated on the new or changed combination.

The cover plate 26, may be secured to the case by screws as shown, but I prefer to hinge it to the case at one end. This plate 26 is provided with an opening conforming to the face of the pin tumbler lock 18 through which access may be had to the latter from the rear of the main lock case, and is also provided on its inner face with an integral lug 27, adapted to pass through an opening in the bridge, and provided with a slot 28 to be engaged by the sliding latch 29. This

latch 29 is mounted to slide on the bridge, and is provided with an arm 30 having a forwardly projecting toe 31 which rests under the brake lever. This latch 29 is normally held elevated by the spring 32, but may be forced down by the engagement of the beveled end of the lug 27. By locating the toe 31 under the brake lever, it will be seen that by depressing the latter the latch 29 will be depressed thus releasing the cover. If the cover be secured by screws as shown they must of course be first removed, but if the cover be hinged, immediately upon the release of the latch 29, the cover can be moved rearwardly sufficiently to carry the slot in the lug out of the path of movement of the latch, and now by withdrawing the key, the cover may be removed or turned back thus giving free access to the parts.

It will be observed that the tumblers prevent movement of the brake lever, except when the tumblers are set to the proper combination and the bolt in its locking position, hence it follows, that as the latch is operated by the brake lever, the latch cannot be actuated and the cover removed except when the tumblers are set up to the proper combination. Again, should the door be unlocked and the combination lost, by putting the key in the pin tumbler lock, and turning the dial first in one direction and then in the other, keeping a slight pressure on the key of the pin tumbler lock, so as to hold the brake lever in contact with the peripheries of the tumblers, the combination may be picked up and a new combination made without destroying or injuring the lock, as would be the case if the combination were lost and no method for picking same.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described, but,

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

1. In a changeable combination lock, the combination with a series of two part rotary tumblers, of means for moving the outer portions of the tumblers out of contact with the inner portions thereof, means for holding the outer portion of each tumbler stationary while the inner portion is rotated, and single means operable through the rear or cover plate of the lock for actuating the means which hold and move the outer sections of the tumblers.

2. In a changeable combination lock, the combination with a series of two part rotary tumblers, of means for moving the outer portions of the tumblers out of contact with the inner portions thereof, means for holding said outer portions against rotation, and a lock operable through the rear or cover of the main lock for actuating said moving and holding means.

3. In a changeable combination lock the combination with a main lock case, a removable cover plate therefor, means for locking the latter in place, and a series of sectional tumblers, of means for separating the sections of the tumblers preparatory to changing the combination, and a lock for releasing the cover plate and for actuating said operating means.

4. In a changeable combination lock, the combination with a series of sectional tumblers, means for moving one section of each tumbler out of contact with the other, and means for holding the sections so moved against rotation, of a cover, means for locking same to the case and a lock adapted to release the cover, and also actuate the tumbler releasing and holding means.

5. In a changeable combination lock, the combination with a series of sectional tumblers, means for separating said sections and means for holding the outer section against rotation while separated from their inner sections, of a cover plate for the lock, a latch for locking the same in closed position and a lock for releasing the cover plate and for actuating the tumbler separating and holding means.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WARREN H. TAYLOR.

Witnesses:
FLORENCE M. BRADSHAW,
WM. EWART WESSON.