No. 883,587. PATENTED MAR. 31, 1908.

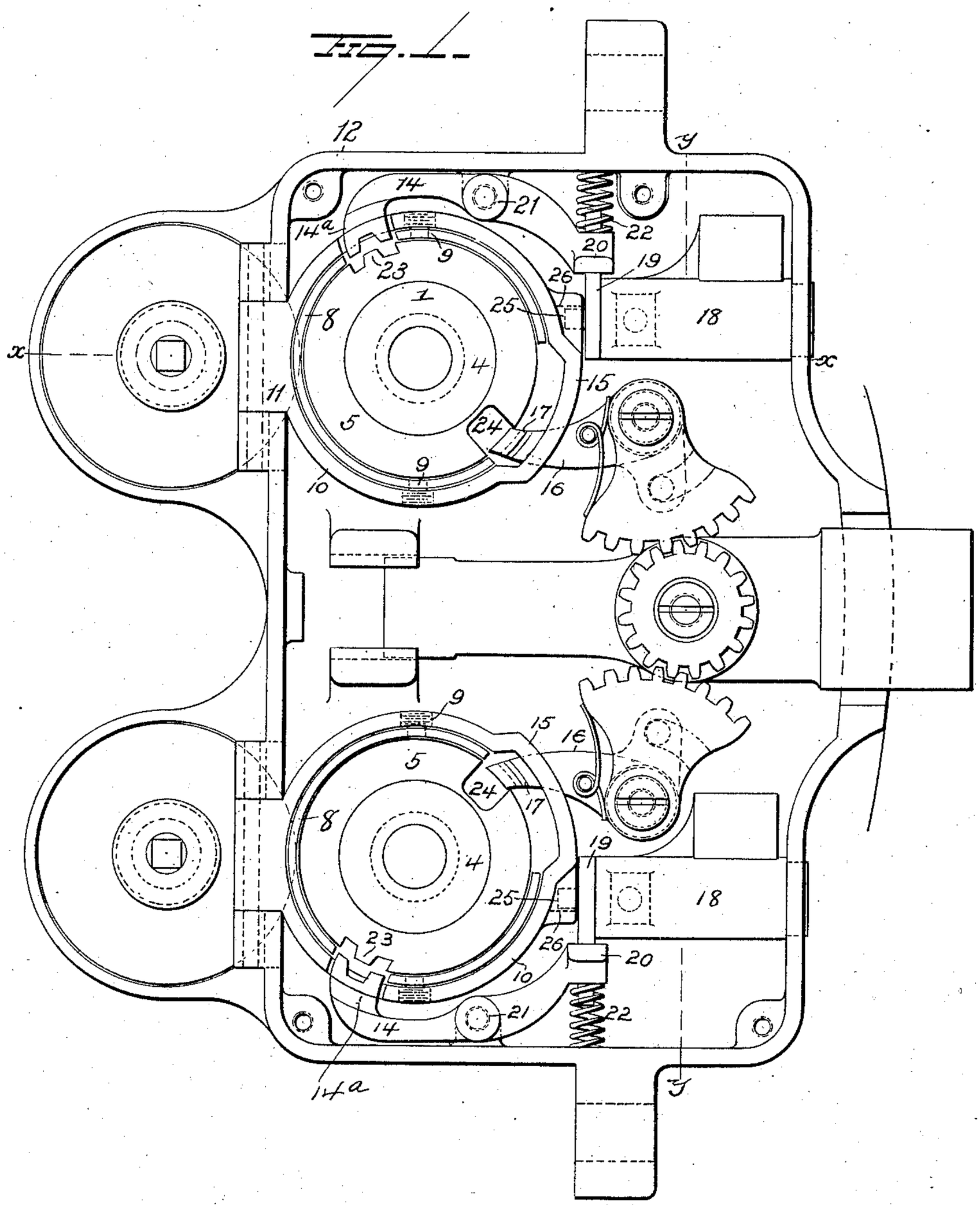
W. H. TAYLOR.

CHANGEABLE COMBINATION LOCK.

APPLICATION FILED JAN. 3, 1907.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES

E. L. Nottingham

G. F. Downing.

INVENTOR

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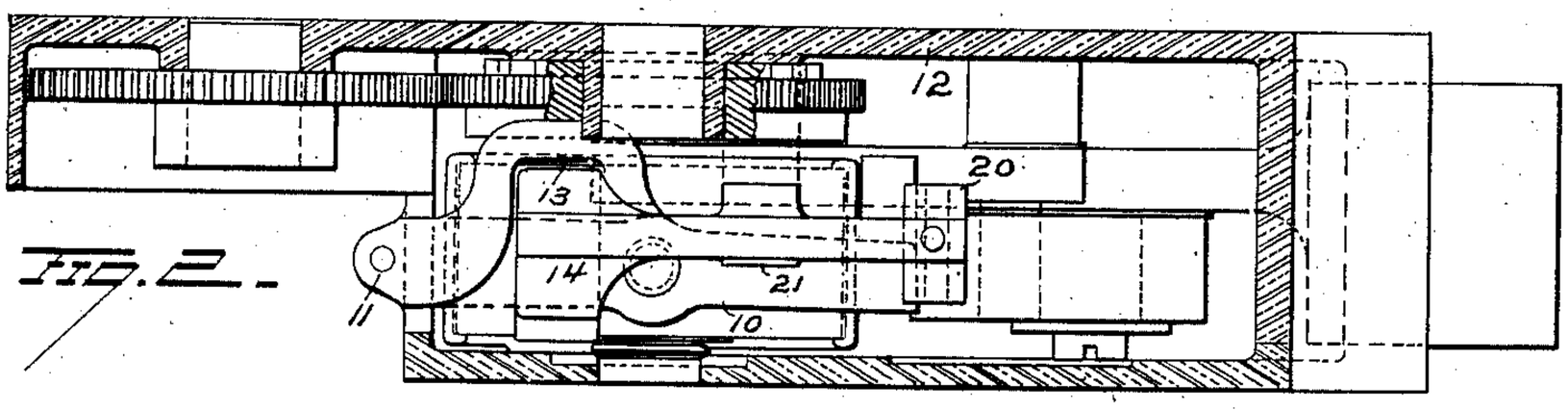

FIG. 2.

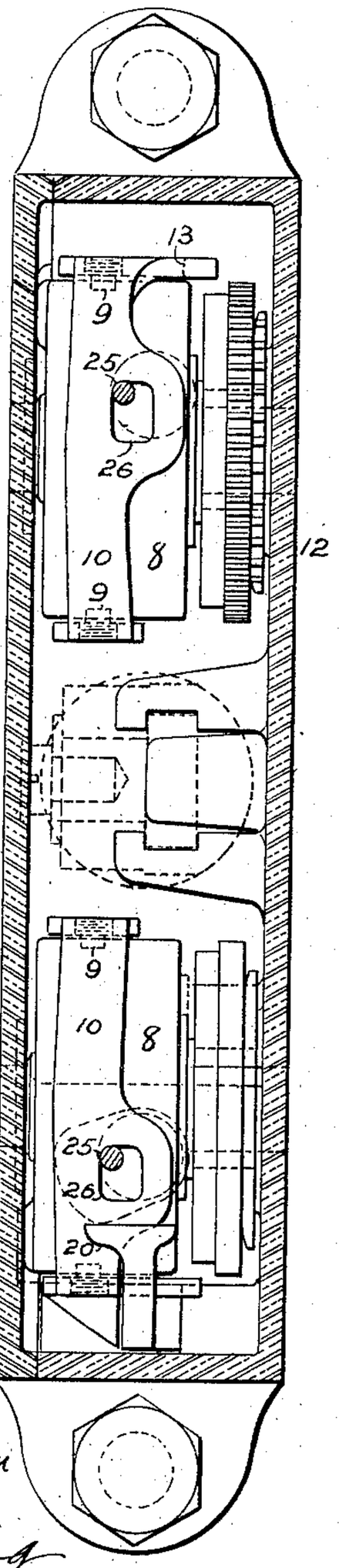

FIG. 3.

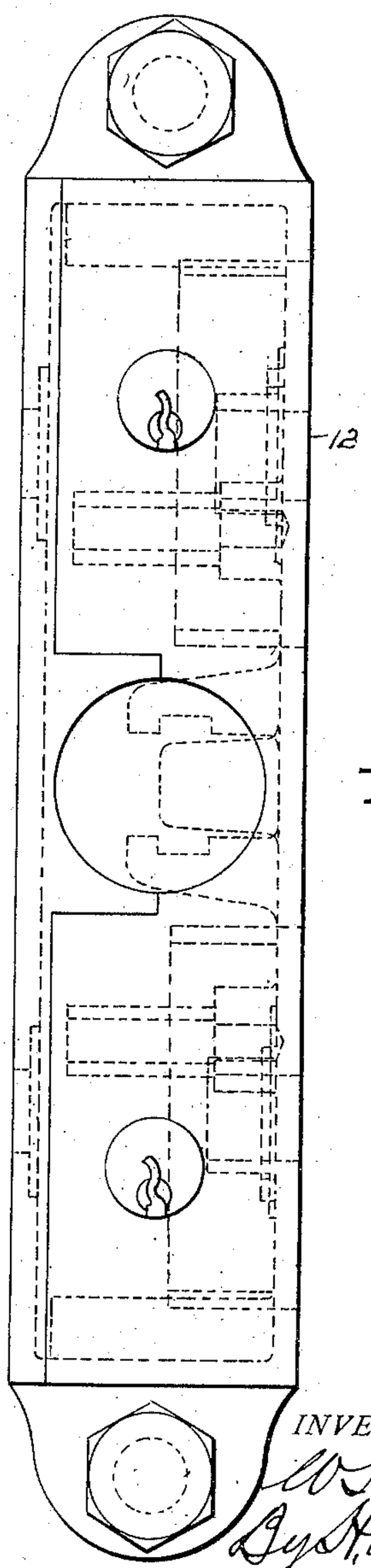

FIG. 4.

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4 SHEETS—SHEET 3.

FIG. 5.

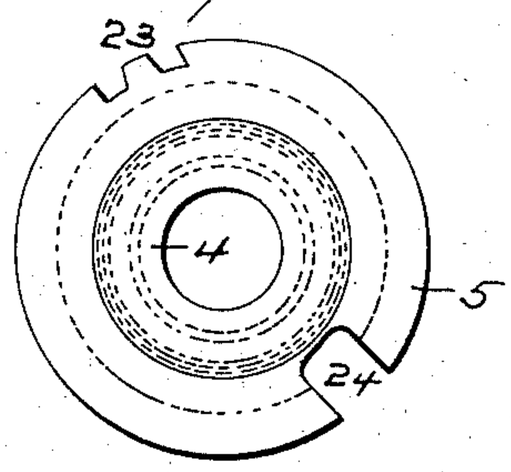


FIG. 8.

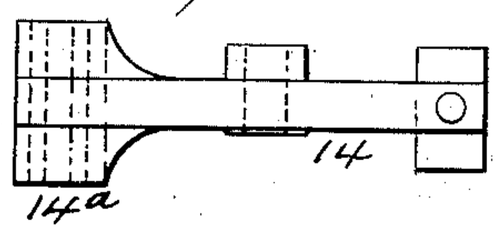


FIG. 6.

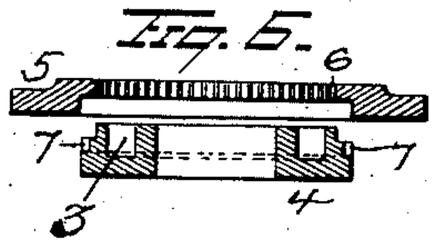


FIG. 9.

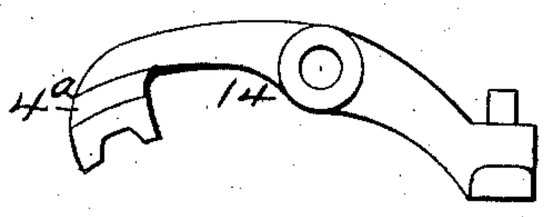


FIG. 10.

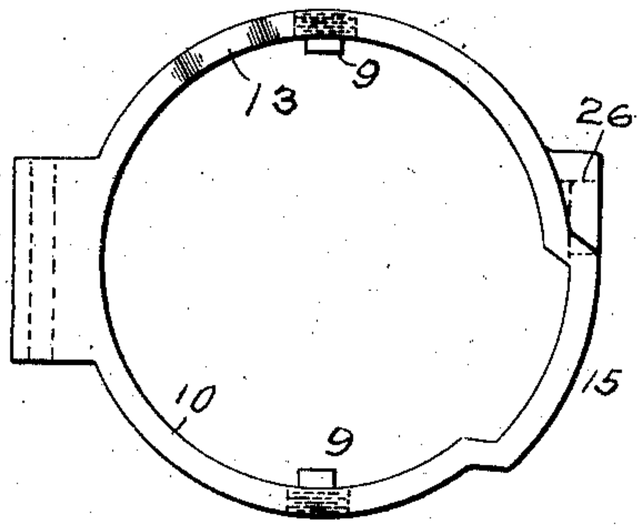


FIG. 12.

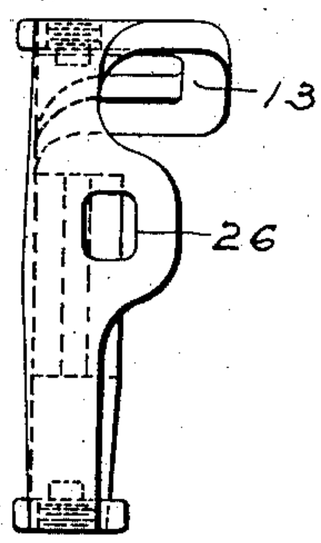


FIG. 13.

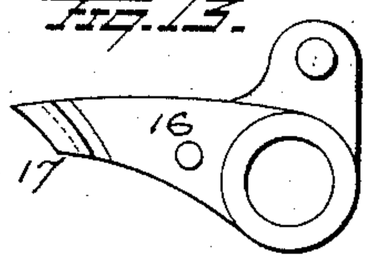


FIG. 14.

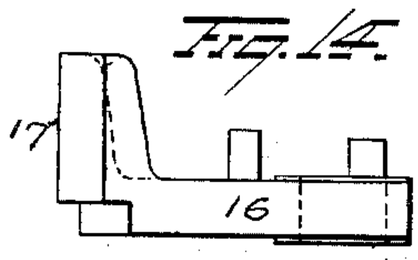
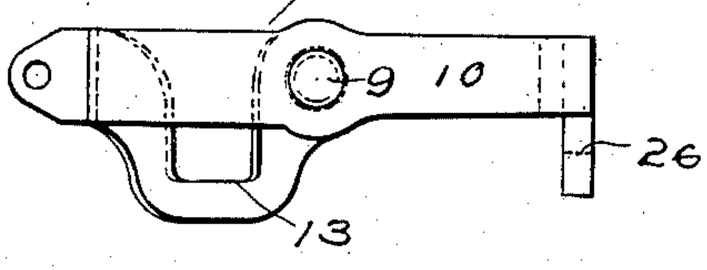


FIG. 11.



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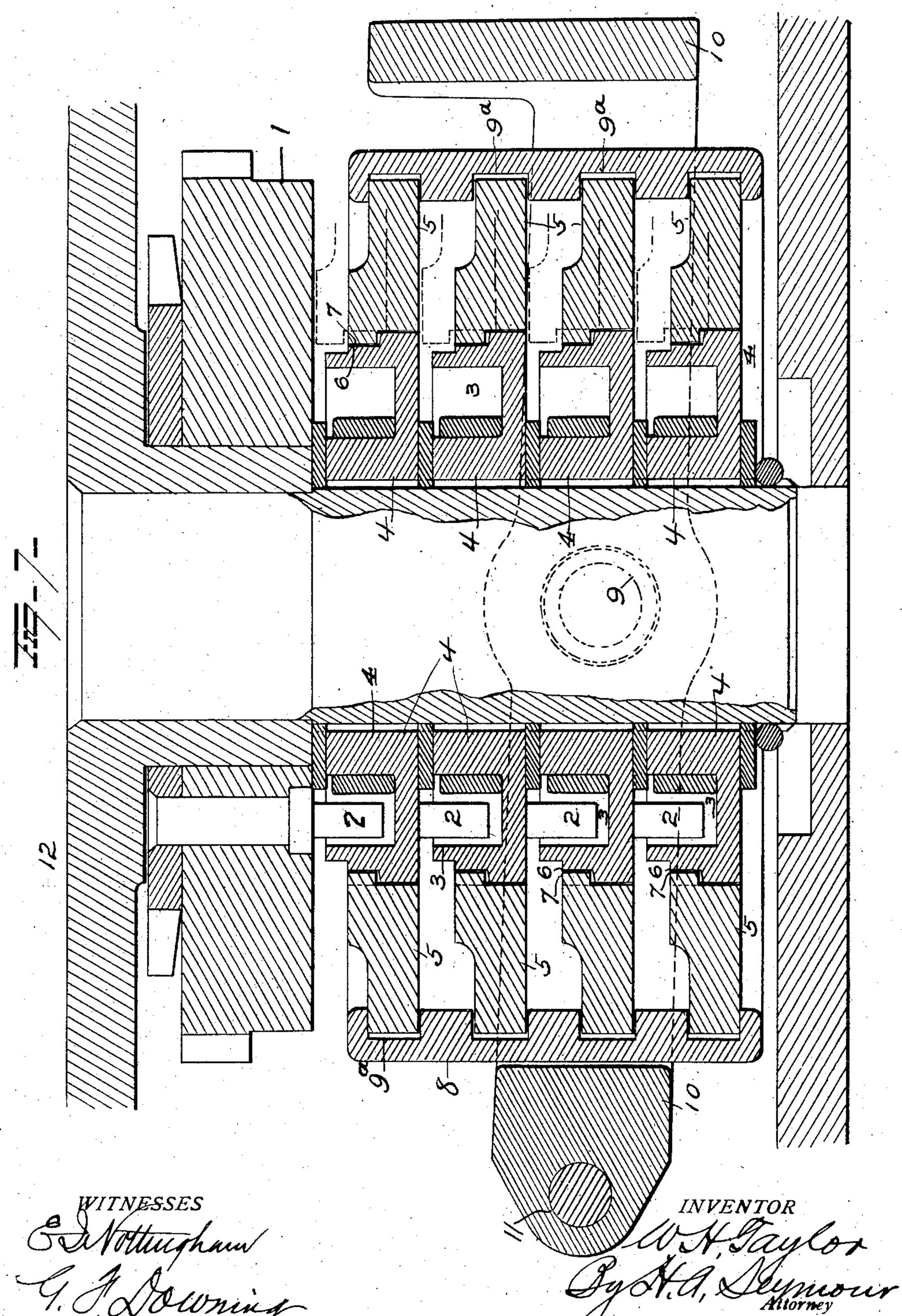

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UNITED STATES PATENT OFFICE.

WARREN H. TAYLOR, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CONNECTICUT.

CHANGEABLE COMBINATION-LOCK.

No. 883,587. Specification of Letters Patent. Patented March 31, 1908.

Application filed January 3, 1907. Serial No. 350,615.

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, and it consists in the parts and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of a duplex lock embodying my invention. Fig. 2 is a view in section of the case taken on line *x*—*x* of Fig. 1, the parts within the case being shown in elevation. Fig. 3 is a view in section on the line *y*—*y* of Fig. 1, some of the parts within the case being omitted and others shown in elevation. Fig. 4 is a view in front elevation of the lock. Fig. 5 is a view in elevation of one of the tumblers. Fig. 6 is a view in section of one of the tumblers showing the two sections of same detached. Fig. 7 is an enlarged view in section, showing the several tumblers properly assembled, the sleeve or casing to which the outer section of the several tumblers are connected, and the movable yoke carrying the casing. Figs. 8 and 9 are views of the lever for locking the outer sections of the tumblers against rotation while the inner sections are being set for a changed combination. Figs. 10, 11 and 12 are several views of the yoke and Figs. 13 and 14 are views of the fence.

In the drawings I have shown a lock adapted to be inserted in a mortise in the edge of the door or in a space at the edge between the front and rear plates, it being secured by bolts or screws passing through lugs on the lock case so that when in place the front face of the lock is the only exposed and accessible part thereof.

1 represents a tumbler fast to or actuated by the dial spindle, and having a pin or projection 2 which engages a shoulder in the annular recess 3 in the next adjacent tumbler. The several tumblers except number 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 one from the second and so on throughout the series.

Each tumbler except the first (tumbler 1) which as before stated is positively actuated by the dial spindle, is made of an inner disk section 4 and an outer ring section 5, the disk sections 4 of the tumblers having the annular recess 3, in which the pins on the next adjacent tumblers rest and move as clearly shown in Fig. 7.

The disk sections of the tumblers are each provided with a peripheral series of teeth 6 shown in Fig. 6 which when the two parts of the tumbler are assembled, as in Fig. 5, mesh with an annular series of teeth 7 also shown in Fig. 6. 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 on the ring section 5 project from the inner faces of the rings 5 and extend only part way across the thickness of the rings, so that when the rings and disks are assembled, as shown in Fig. 7, the teeth projecting from the rings engage the walls at the ends of the teeth on the disks, thus limiting the movement of the rings in one direction but permitting free and unlimited movement in the other direction.

The several sectional tumblers are located within the cylindrical sleeve 8, the peripheries of the rings resting within the annular slots 9[a] formed in the inner face of the sleeve and necessarily movable with the sleeve, sufficient clearance being provided however to permit the rings to rotate within and independently of the sleeve. This sleeve 8 is mounted at diametrically opposite points on the trunnions 9 (shown in Fig. 3) of the yoke 10. This yoke is hinged or pivoted at 11 to the lock casing 12, thus permitting the yoke to rock or swing in the direction of the length of the sleeve 8, and move the sleeve 8 in the direction of the axis of the tumblers.

The yoke 10, shown in detail in Figs. 10, 11 and 12 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 14, this portion 13 extending considerably beyond or in advance 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 rotary movement. The section

of the yoke which is adjacent to the fence 16 is projected outwardly as shown at 15 in Fig. 10, for the reception of the head 17 of the fence 16, when the said head is out of the gates in the several tumblers and also while moving into and out of said gates.

Projecting inwardly from the front face of the lock plate, is a pin tumbler lock 18 (one for each set of tumblers) which is operated by a key in the usual manner. The rear end of the lock plug of this lock 18, carries 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 casing at 21, and its end 20 is engaged by a spring 22, which tends to hold the end 20 of lever 14 in contact with the cam 19, and its toothed head out of contact with the tumblers as shown in Fig. 1. 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 or ring sections of the tumblers from rotating while so engaged by the brake lever.

The teeth 23 on the several tumblers are so located with relation to the gates 24 in the tumblers, that when the tooth 23 is in a position to be engaged by the teeth on the brake lever, the gates in the tumblers will aline with the rear end of the fence 16 as shown in Fig. 1.

The cam 19 on the rear end of the lock plug of the pin tumbler lock 18, is also provided with a pin 25 resting within a socket 26 in the yoke 10. When the cam 19 is turned, this pin engaging the yoke turns the latter on its pivot or hinge connection 11, thus moving the sleeve 8 carrying the outer ring sections 5 of the tumblers, forwardly until the teeth thereon are disengaged from the teeth on the inner or disk section, as shown in dotted line in Fig. 7, thus leaving the inner or disk sections of the tumblers 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 either release the bolt actuating mechanism, or retract the bolt.

To change the combination, the tumblers are first set on their present combination, which as before explained brings the teeth 23 on the several tumblers in a position to be engaged by the teeth on the brake lever. By now inserting the proper key in the pin tumbler lock 18 and turning same, the cam 19 is rotated and operates to first force the toothed head of the brake lever into engagement with the teeth 23 on the peripheries of the ring sections 5 of the tumblers, and thus lock the latter against rotation, but not bearing with sufficient pressure or force to prevent them from being moved forwardly.

The continued movement of the cam 19 causes pin 25 thereon to engage the yoke and swing 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 teeth on the disk sections as shown in dotted lines in Fig. 7, thus leaving the inner or disk sections 4 of the tumblers free to rotate, while the outer sections are held from rotating. The sleeve 8 is slotted for the passage of the head 14^a of the brake lever, and also slotted for the passage of the fence 16.

While the parts are in the positions 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 tumbler, 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 is 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, and withdrawing the brake lever. After the parts have been restored to their normal positions the tumblers may be rotated and the lock operated on the new or changed combination.

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 consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. The combination with a series of disk tumblers, each composed of an outer section and an inner section, the two sections of each tumbler having intermeshing teeth, and means engaging the inner sections of said tumblers for rotating same, of a hinged sleeve embracing all of said tumblers and engaging the outer section of each and means for moving said sleeve and connected outer sections of said tumbler in a direction to disconnect the outer sections from the inner sections.

2. The combination with a series of disk tumblers, each composed of an outer section and an inner section, the two sections of each tumbler having intermeshing teeth, and means engaging the inner sections of said tumblers for rotating same, of a sleeve surrounding said tumblers and engaging the outer section of each, means for moving said sleeve and connected outer sections of said tumblers in a direction to disconnect the

outer sections from the inner sections, and movable means independent of the sleeve and engaging said outer sections for preventing any rotary movement while thus disengaged from their inner sections.

3. The combination with the sectional tumblers and means for rotating same, of a pivoted yoke, a sleeve pivoted to said yoke and surrounding the tumblers and connected to the outer sections thereof, and means for moving the yoke and sleeve carried thereby, for disconnecting the outer sections of the tumblers fron the inner sections.

4. The combination with sectional disk tumblers and means for rotating same, of a lock and means actuated thereby for disconnecting the outer sections of the tumblers from the inner sections, thus leaving the latter free to be rotated independently of the outer sections.

5. The combination with sectional disk tumblers and means for rotating same, of a lock and means actuated thereby for disconnecting the outer sections from the inner sections, and means also actuated by said lock for preventing rotation of the outer sections of the tumbler when the latter are disengaged from the inner sections.

6. The combination with sectional disk tumblers and means for rotating same, of a pivoted yoke, a sleeve pivoted thereto and surrounding the tumblers and connected to the outer section of each tumbler, a brake lever for preventing rotation of the outer sections of the tumblers when said outer sections are disengaged from the inner sections, and a pin tumbler lock adapted when actuated to first set the brake lever against the tumblers and then tilt the yoke and move the sleeve carried thereby in a direction to disconnect the outer sections of the tumblers from the inner sections.

7. In a combination lock, the combination with a series of tumblers, of means whereby the inner portions of the series of tumblers are simultaneously released from the outer portions, thus permitting one portion of each tumbler to remain stationary and the other portions to revolve, said means of release being in line with or parallel to the planes of said tumblers.

8. In a combination lock in which both sides and rear end are covered when in use, the combination with a series of tumblers, of means accessible through the front plate of the lock for simultaneously freeing all the tumblers while the combination is being changed.

9. In a combination lock adapted to be secured in a door between the front and inner surfaces of the latter, the combination with a series of tumblers, of means operable through the exposed outer end or face of the lock for simultaneously putting all the tumblers in a condition for changing the combination.

10. In a combination lock, tumblers and means for holding the tumblers while changing the combination, said means being operable in a plane parallel to the plane of the tumblers, and comprising a lever or arm which may be operated from the exterior of the case so as to engage the exterior portions of the tumblers and hold them against rotation, for the purpose of changing the combination.

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

WARREN H. TAYLOR.

Witnesses:
CHARLES A. BERRY,
B. C. LEWIS.