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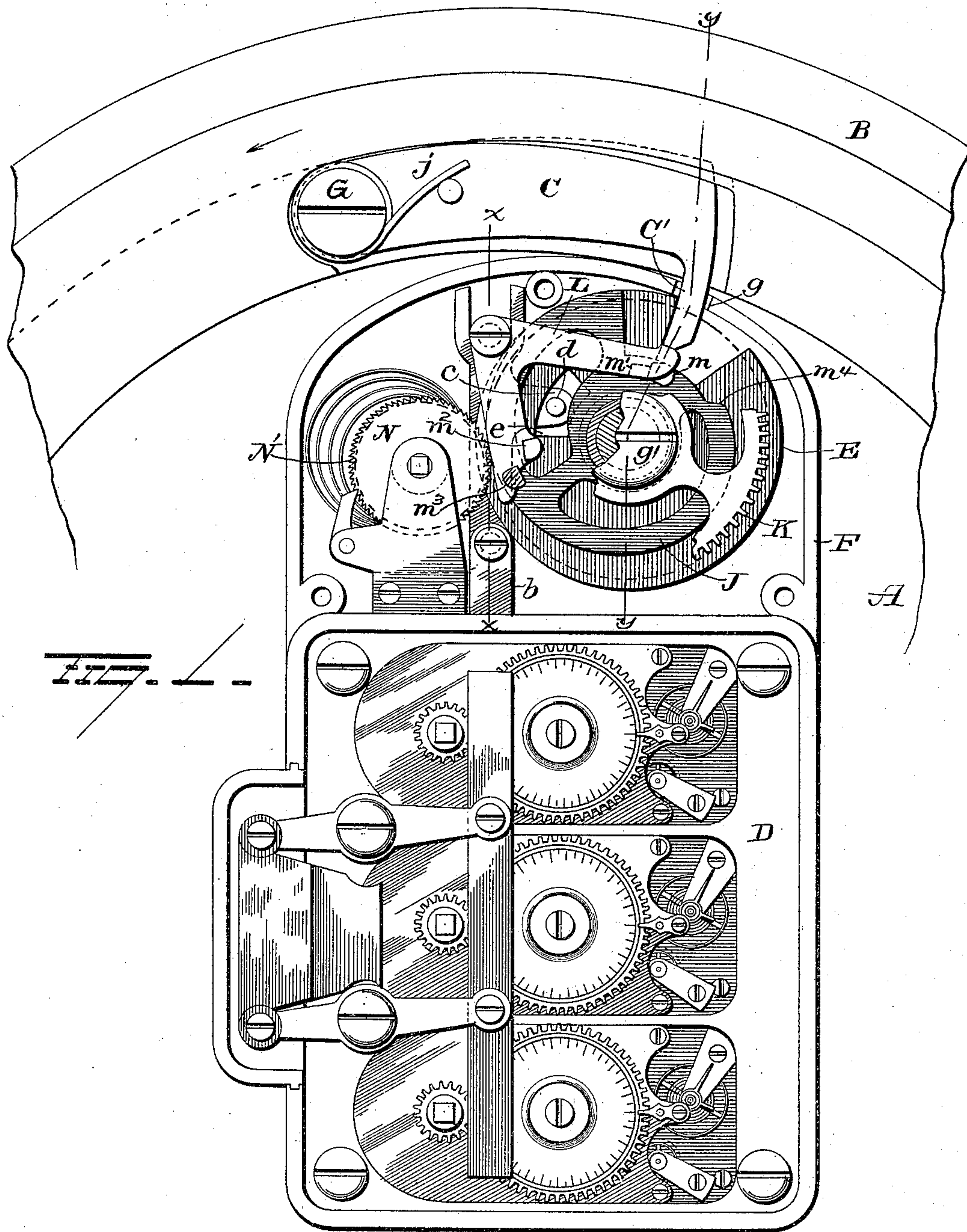
Patented Dec. 12, 1899.

W. H. TAYLOR.
BOLT MECHANISM FOR SAFES.

(Application filed Sept. 9, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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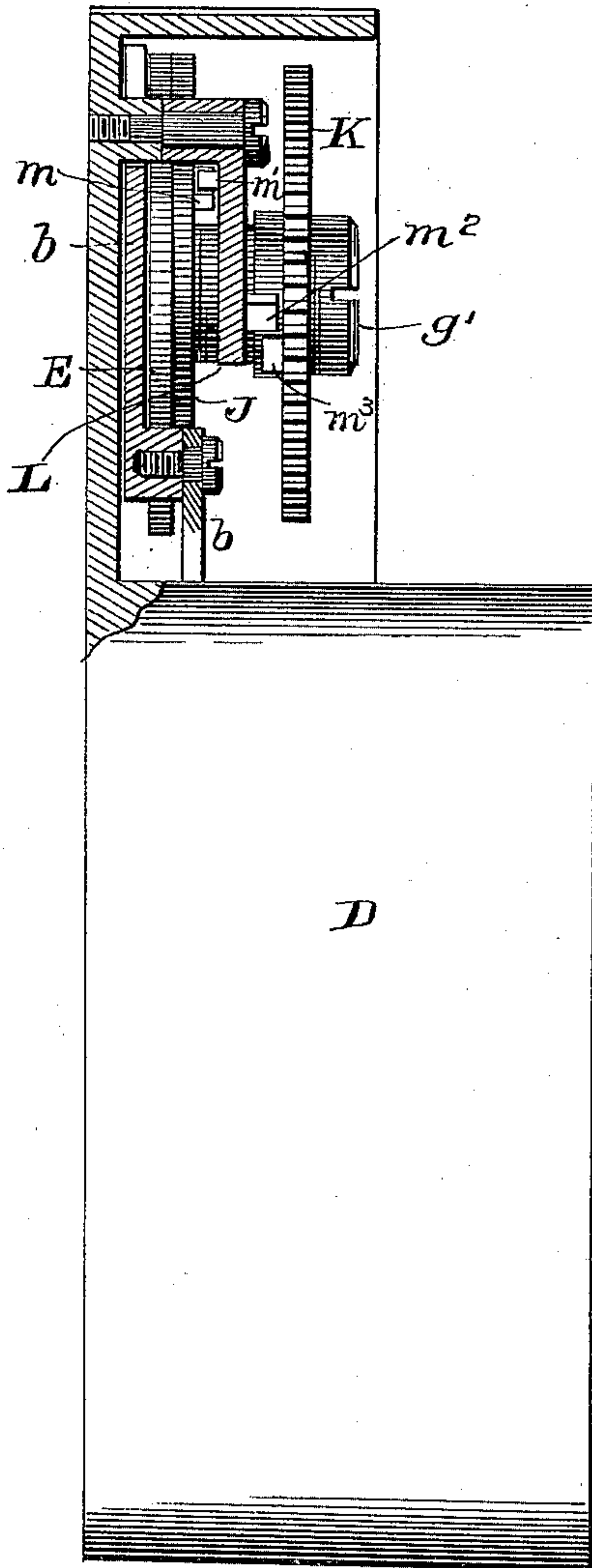


FIG. 2.

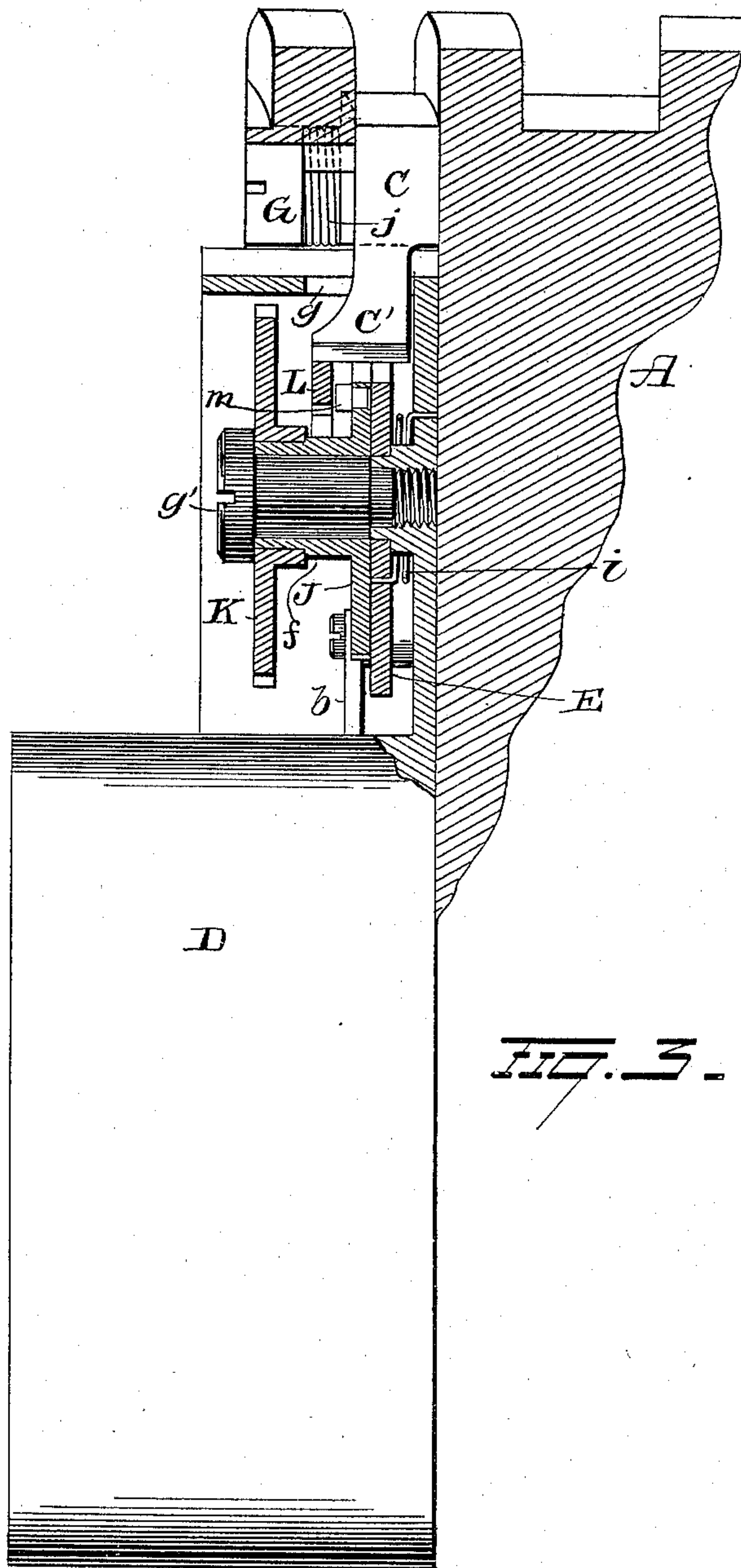


FIG. 3.

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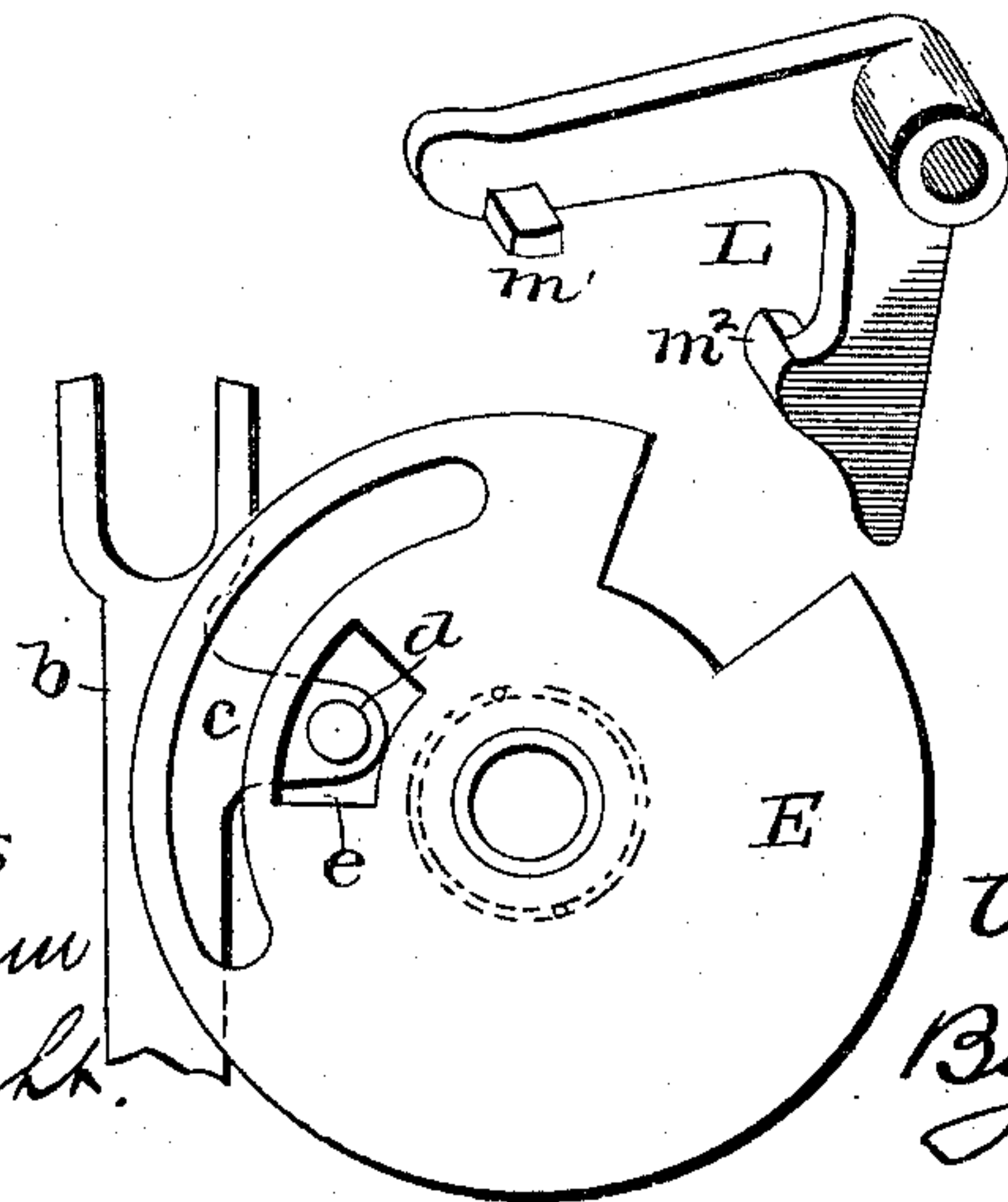
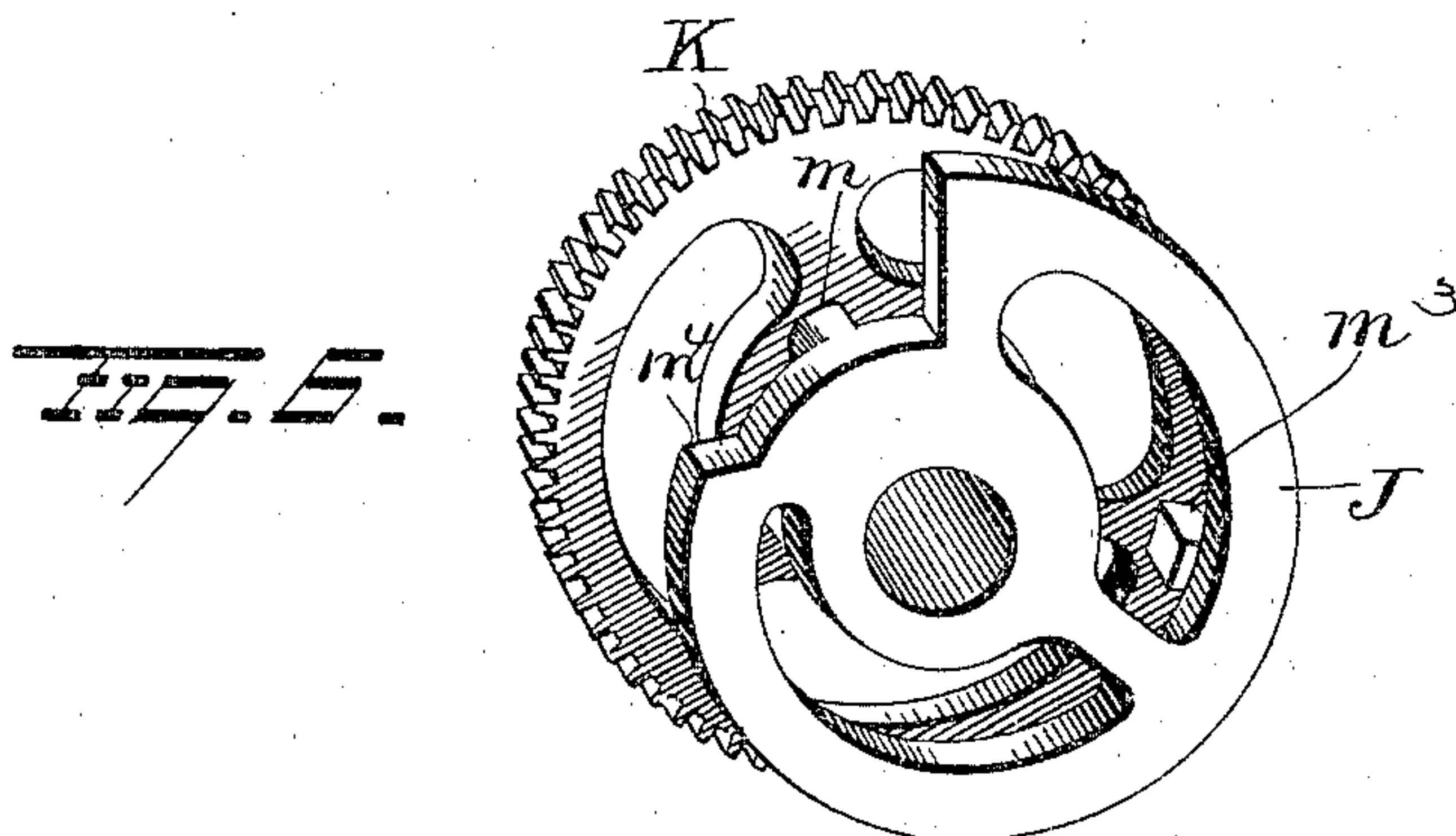
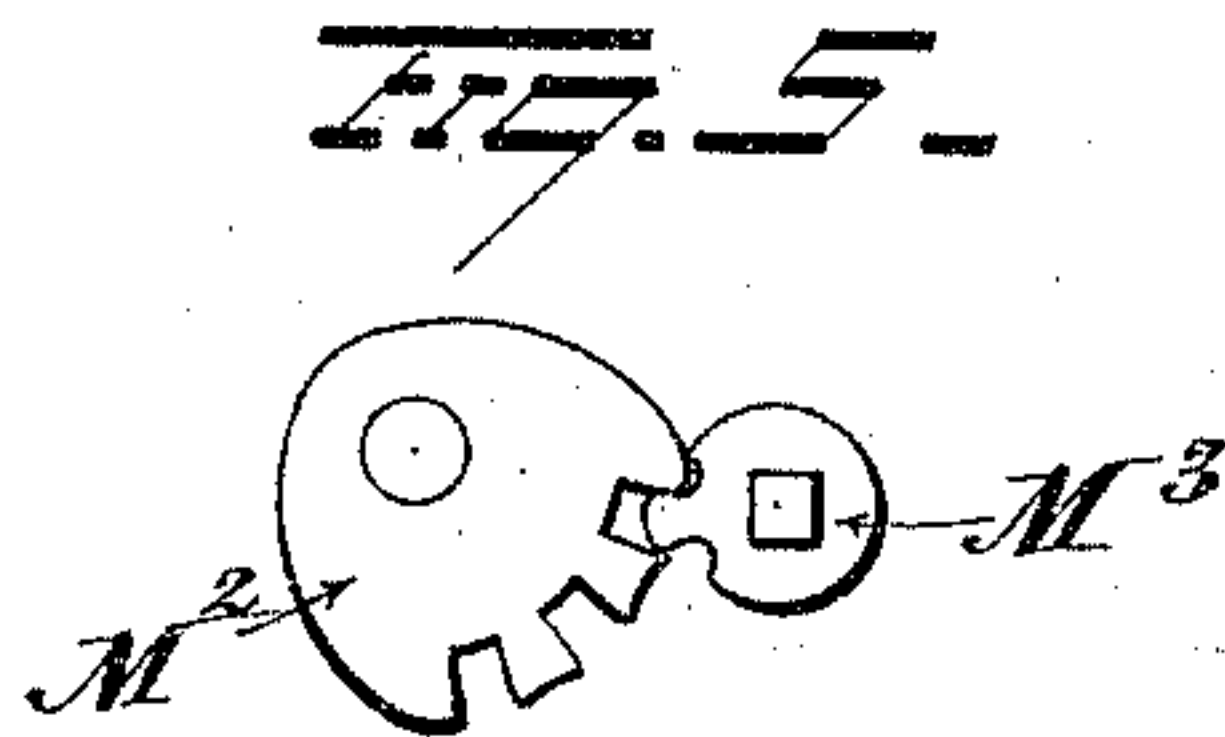
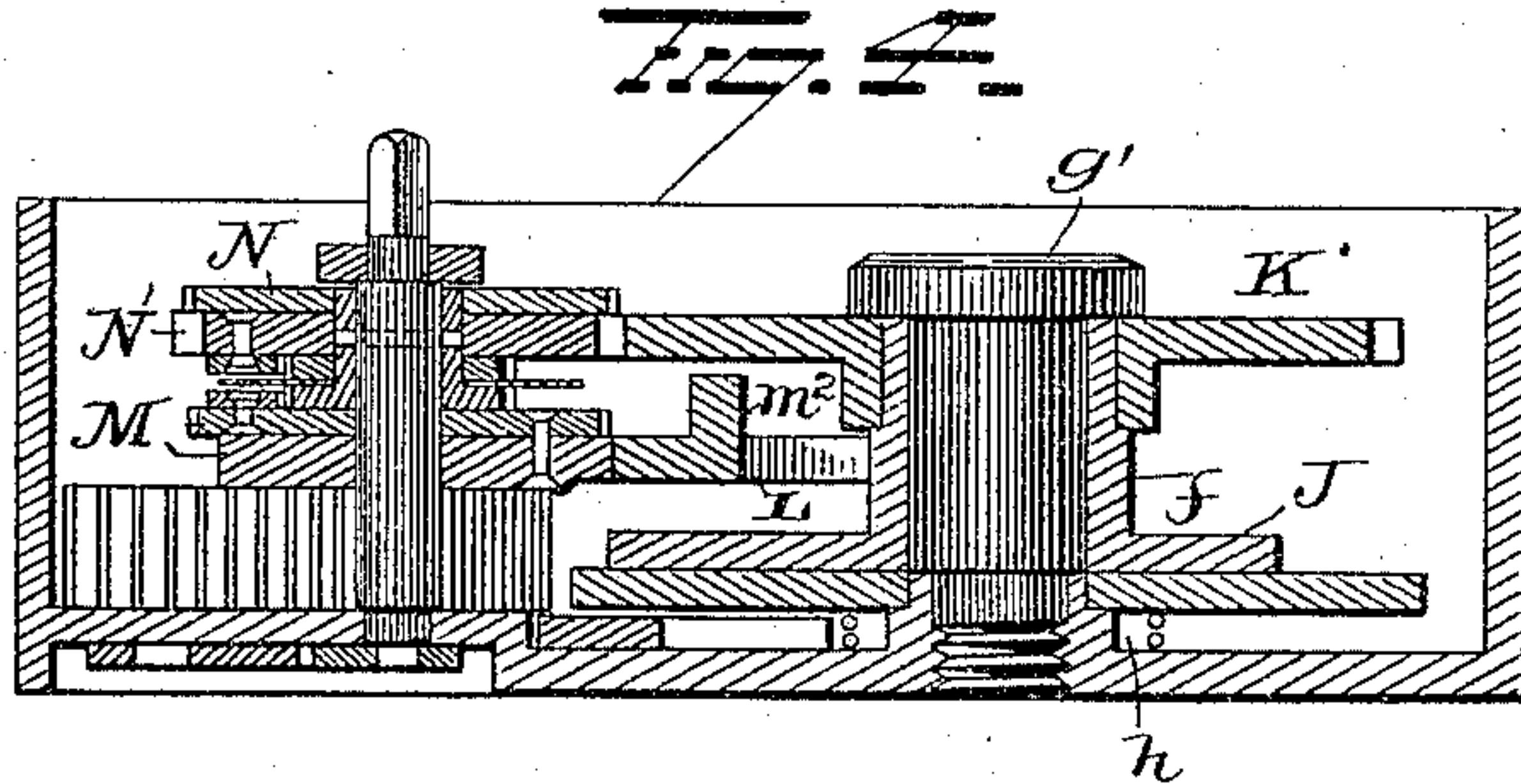
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UNITED STATES PATENT OFFICE.

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

BOLT MECHANISM FOR SAFES.

SPECIFICATION forming part of Letters Patent No. 638,892, dated December 12, 1899.

Application filed September 9, 1899. Serial No. 729,993. (No model.)

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
5 useful Improvements in Bolt Mechanism for Safes; 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
10 use the same.

My invention relates to an improvement in bolt mechanism for safes, and more particularly to safes having circular doors with threaded peripheries which engage corresponding threads in the door-jambs; and it
15 consists, primarily, in a bolt and means for normally holding it in its unlocked position combined with a motor mechanism adapted to automatically throw the bolt to its locked
20 position when the safe-door is closed, means for dead-locking the bolt, and means for releasing the bolt.

My invention further consists in the parts and combinations of parts, as will be more
25 fully explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of the inner face of a section of a safe-door, showing my improvement applied thereto, the face of the casing being
30 removed. Fig. 2 is a sectional view on the line *xx* of Fig. 1. Fig. 3 is a view on the line *yy* of Fig. 1. Fig. 4 is a view in transverse section through the bolt-lifting mechanism. Fig. 5 is a detail view of the stop mechanism of the motor. Fig. 6 is a detached view
35 of the cam, large gear-wheel, and lever; and Fig. 7 is a view of the tumbler and a portion of the sliding bar.

A represents a safe-door of the circular
40 type having a threaded periphery adapted to engage threads in the door-jamb, which latter is also provided with a pocket adapted to receive the bolt C, carried by the door A. This door is rotated by gearing in the usual manner and carries on its inner face the time-lock
45 mechanism D, which operates to turn the tumbler E to a position to release the bolt C. The time mechanism D may be of any approved form, but for the purpose of illustration I have shown my improvement in connection with the time mechanism disclosed in

the Stockwell patent, No. 479,379, granted July 19, 1892.

With my improvement the time mechanism D actuates the sliding bar or rod *b*, which is
55 provided near its outer free end with a laterally-projecting arm *c*, carrying a pin *d*, resting in a slot *e* in the tumbler E. This tumbler E is preferably circular in form and provided with a gating within which the tail of
60 the bolt rests when the door is unlocked. This tumbler E is centrally mounted on the stud *h* and is connected to a spring *i*, the function of which is to hold the gating to one side of the opening *g* in the casing, thus bringing
65 the periphery of the tumbler immediately under the tail of the bolt and holding same in its locked position. The periphery of the tumbler rests in close proximity to the inner face of the casing F, adjacent to the opening
70 *g* therein, so that when the tumbler is in its normal position, with the door locked, the tail C' of the bolt rests on the tumbler, thus throwing the body of the bolt well out into the pocket formed therefor in the door-jamb. 75
As the period for which the time mechanism was set nears its end the pin *d* on the arm *c* of the bar *b* engages the end wall in slot *e* of tumbler E and slowly turns the latter until the gating passes under the tail of the latch
80 or bolt, thus permitting the bolt or latch to fall or be forced to its unlocked position and leaving the door free to be turned and opened.

The bolt C is shaped as shown, is mounted on a screw-bolt G, secured to the door, and is engaged by a spring *j*, which tends to force the
85 bolt away from the door-jamb, and as the spring is assisted by gravity it will be seen that means must be provided for forcing the bolt outwardly into its locked position, and as such
90 mechanism is carried on the inner face of the door, hence inaccessible when the door is closed, and as the bolt cannot be moved to its locked position until the door has been fully
95 closed, it will be seen that the mechanism for actuating or throwing the bolt to its locked position must be positive and automatic in its operation. This mechanism for throwing the bolt to its locked position comprises a cam-wheel J, a pinion K, a spring-motor, and a bell-
100 crank lever L. The cam-wheel J rests against the tumbler E and is provided with a sleeve

f, to the end of which is rigidly secured the pinion K, the said pinion and cam being held in place by the screw-bolt *g'*, which is screwed into a threaded socket formed in the stud *h*, which, as before stated, forms a seat for the tumbler E. Pivotaly mounted in the casing E, with its members resting between the cam J and pinion K, is the bell-crank lever L. One end of this lever rests under or in line with the opening *g* in casing F, so as to be engaged by the tail *C'* of the bolt C, while the other or depending member of the lever rests in proximity to the cam M on the spring-motor.

The cam J is provided with a stop *m*, and the lever L is provided with a pin *m'*, which latter when the parts are in position for closing and locking the safe-door rests behind and in contact with the stop *m* on the cam and holds the latter against rotation. The lever L is also provided near its opposite end with a pin *m²*, adapted to engage a stop *m³* on the gear-wheel K after the cam has made one revolution and lifted the tail *C'* of the latch or bolt above the tumbler. The spring-motor N, which may be of any suitable construction, carries a pinion N', which meshes with the pinion K, and the motor-arbor carries the cam M, before referred to.

In setting the lock the time-movements are first wound up, and the spring-motor is also wound up the full limit, which is regulated by the toothed stop *M²* engaging and limiting the movement of the single toothed wheel *M³*, secured on the lower end of spring-motor arbor. As the spring-motor arbor is wound up the pinion N' thereof turns pinion K and cam J, connected thereto, until the stop *m* on cam J comes in contact with stop *m'* on the bell-crank lever L. The contact of this stop and pin stops all further movement of the cam and holds the latter with its surface nearest the axis of the cam immediately under the tail of the bolt.

It is of course understood that while setting the lock the tail of the bolt or latch rests within the gating in the tumbler in close proximity to the periphery of the cam. Now when the door is closed and revolved in the direction of the arrow the bolt will be forced inwardly by its contact with the screw-thread on the jamb, and the tail of the bolt coming in contact with the end of the lever will depress same until the pin *m'* thereon passes below the stop *m* on the cam, thus releasing the latter and permitting same to turn. By this time, however, the beveled end of the tail *C'* of the bolt has moved into contact with the periphery of the cam and coming in contact with the beveled shoulder *m⁴* on the cam arrests for a time the further revolution of the latter. The bolt being held in its depressed position last referred to by its contact with the jamb prevents any further movement of the cam until the door is screwed

home, and when this position of the door has been reached the bolt C rests opposite its pocket in the jamb and is thus free to be moved upwardly by the cam J. This removal of pressure from the bolt releases the cam, and the latter is then turned by the spring-motor before referred to and gradually elevates the tail of the bolt until the free end of the latter clears the tumbler. As the tumbler has been held back by its contact with the tail of the bolt, it will be seen that as soon as the tail is elevated above the tumbler the latter will fly under the tail of the bolt and then hold the latter in its locked position until the tumbler shall have again been retracted by the time mechanism. After the bolt has been lifted by the cam the latter continues its movement until stopped by the engagement of the pin *m²* on the lever L with the stop *m³* on the inner face of gear-wheel K. After the bolt has been released by the time mechanism the parts are reset by first winding up the time mechanism and then the motor. As the motor is wound up the cam M thereon engages the depending member of the bell-crank lever and turns the latter until the pin *m²* thereon is out of the path of the stop *m³* on the gear-wheel K. As soon as pin *m²* leaves the stop *m³* the gear-wheel K and its connected cam J begin to turn; but as the movement of the lever to release the gear-wheel and cam carries the pin *m'* on the opposite end of said lever within the path of stop *m* on the cam the movement of the cam will be just sufficient to bring its smallest diameter under the tail of the bolt. The parts are now again in position for locking the safe, and it will be seen that by screwing in the door the cam will be released, as previously explained, and carry the tail of the latch or bolt clear of the tumbler, thus releasing the latter and locking the bolt.

With this construction the bolt is shot to its locked position by a motor independent of the time mechanism. Hence with my improvement the time mechanism simply operates the tumbler and is not encumbered with the additional duty of forcing the bolt to its locked or unlocked position.

It is evident that numerous slight changes might be resorted to in the relative arrangement of parts herein 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 herein shown and described; but,

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

1. The combination with a bolt carried by a safe-door and means for moving the bolt from its locked position into, and normally retaining it in its unlocked position, of a motor for automatically throwing the bolt into its locked

position, and means for locking the motor against action until released by the contact of the bolt with the door-jamb.

2. The combination with a bolt and means for normally holding it in its unlocked position, of motor mechanism adapted to automatically throw the bolt to its locked position when the safe-door is closed, automatic means for dead-locking the bolt, and a time-lock adapted to release the bolt at a predetermined time.

3. The combination with the bolt of a safe and means for normally holding it in an unlocked position, of a tumbler a motor and cam mechanism actuated thereby for throwing the bolt into its locked position, thus releasing the tumbler and permitting the same to move into position for locking the bolt.

4. The combination with the bolt mechanism of a safe-door and means for normally retaining it in its unlocked position, of an independent mechanism adapted to automatically throw the bolt mechanism, means for dead-locking the bolt mechanism and a time-lock adapted to release the bolt mechanism at a predetermined time.

5. In bolt mechanism, the combination with a bolt, a tumbler and mechanism for actuating

the tumbler to release the bolt, of a cam adapted to bear against the bolt and a spring-motor and gearing for rotating the cam.

6. In bolt mechanism for safes the combination with a bolt a tumbler and mechanism for actuating the tumbler to release the bolt, of a cam for moving the bolt to its locked position, a motor and gearing for actuating the cam, and a lever for controlling the movements of the cam, the said lever being actuated in one direction by its contact with the bolt.

7. In bolt mechanism for safes the combination with a bolt, a tumbler for holding same in its locked position, and time mechanism for moving the tumbler to release the bolt, of a spring-motor, a cam adapted to be engaged by the tail of the bolt, gearing connecting the motor and cam, and a lever for regulating and controlling the movements of the cam.

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

WARREN H. TAYLOR.

Witnesses:

CHAS. A. BERRY,
W. C. FELL.