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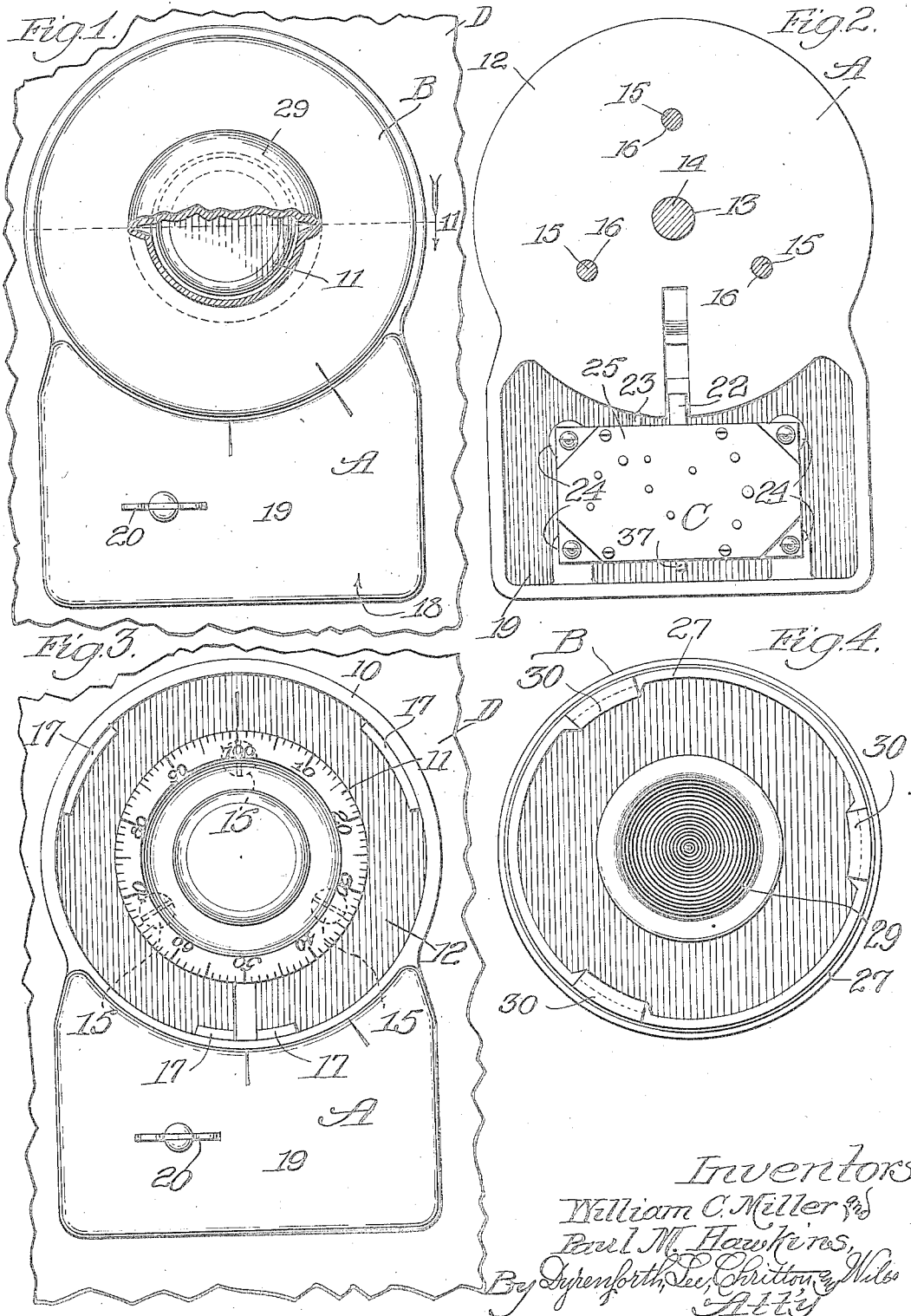
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2,039,019

DELAYED CONTROL TIMELOCK GUARD

Filed Nov. 15, 1933

4 Sheets-Sheet 1



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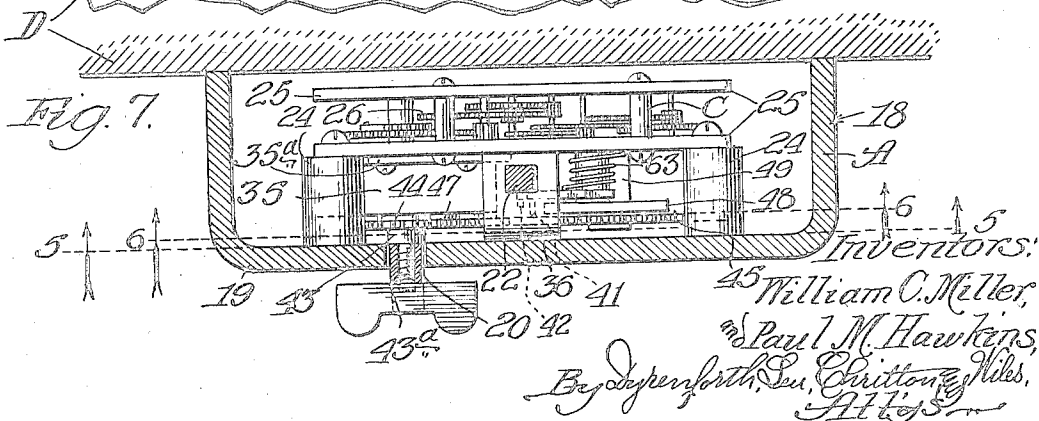
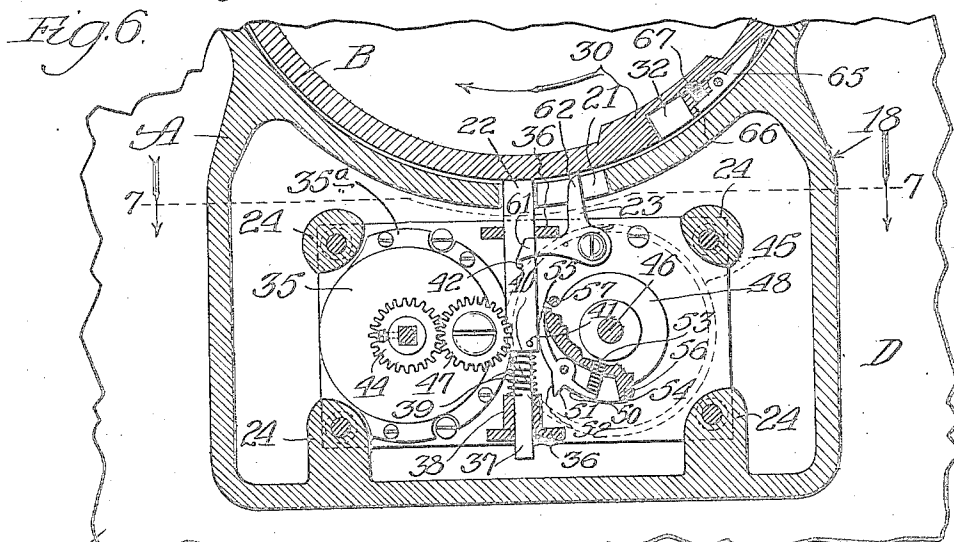
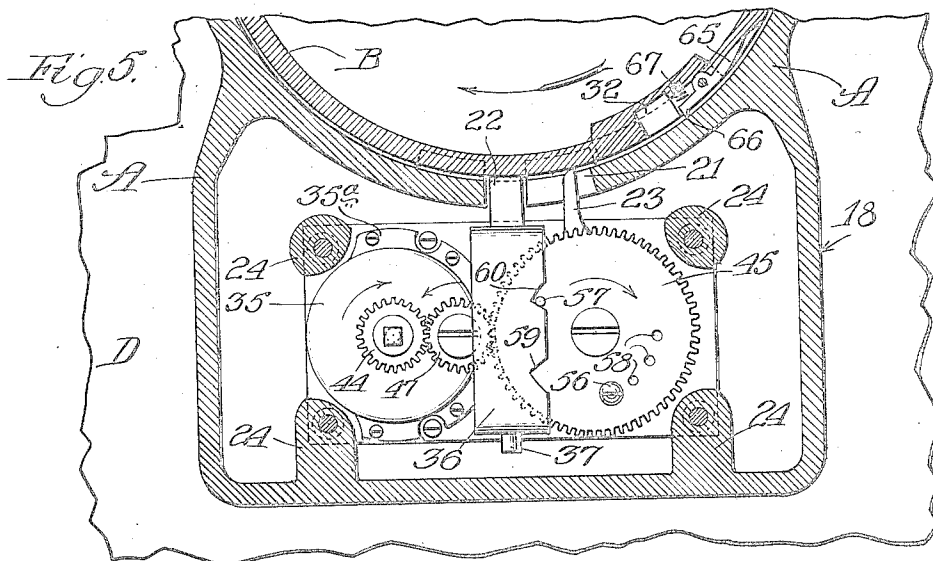
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4 Sheets-Sheet 2



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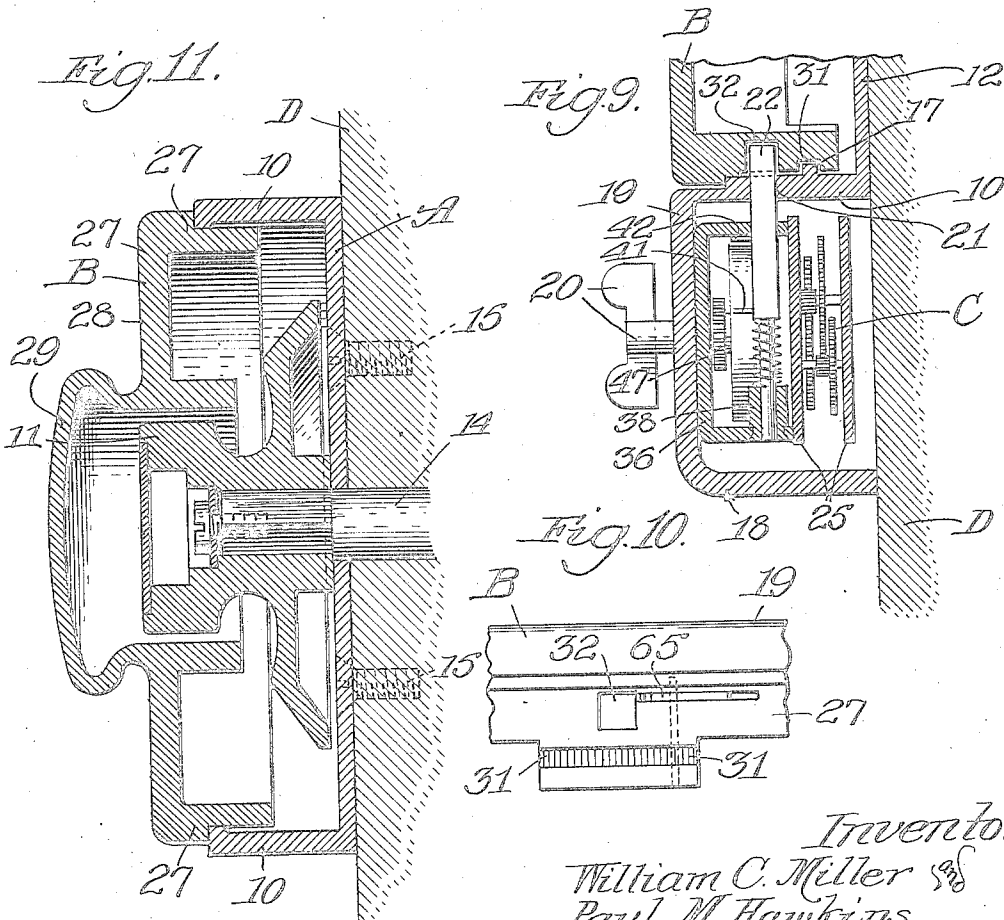
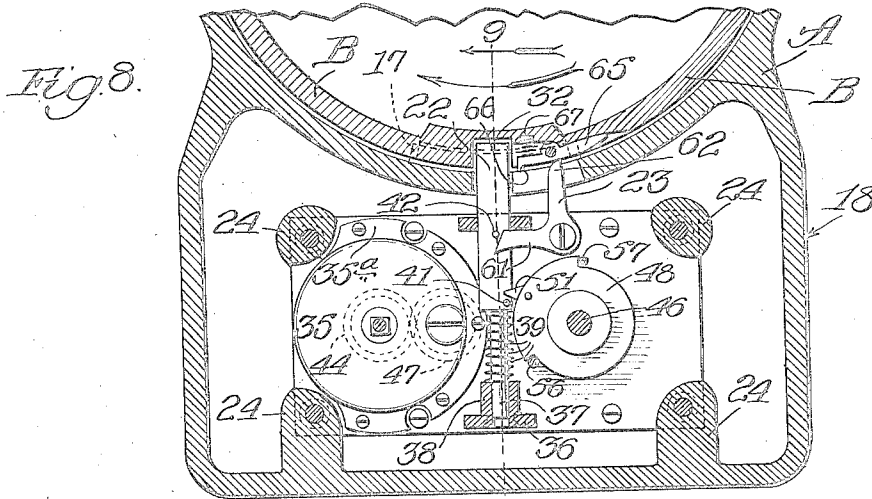
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DELAYED CONTROL TIMELOCK GUARD

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4 Sheets-Sheet 3



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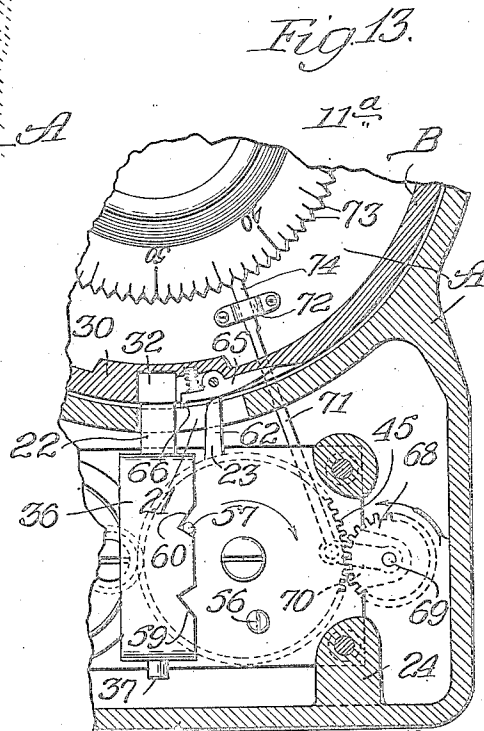
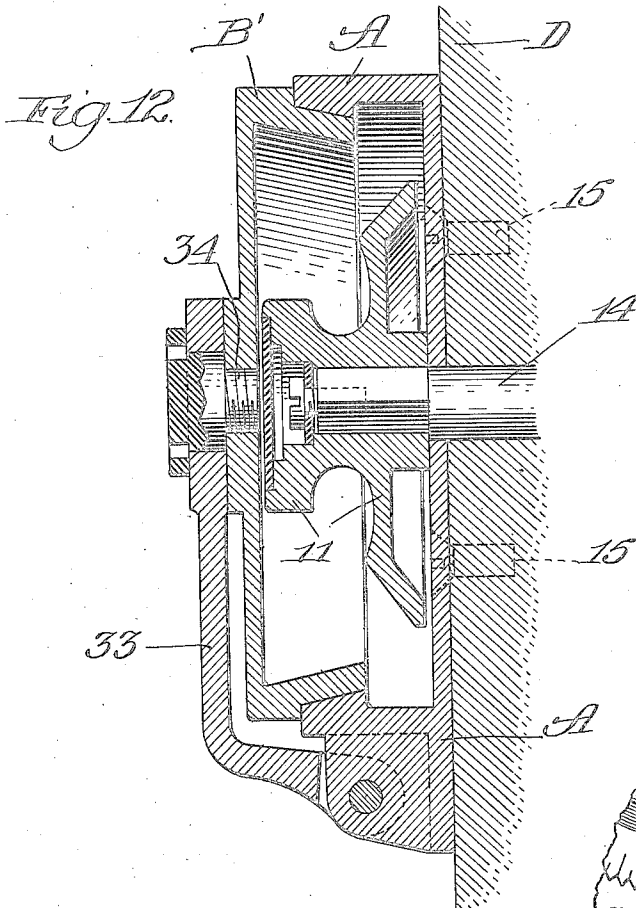
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DELAYED CONTROL TIMELOCK GUARD

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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DELAYED CONTROL TIMELOCK GUARD

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18 Claims. (Cl. 70—26)

This invention relates to a delayed control timelock guard and more particularly to time-control mechanism for protecting the dial of a combination lock and for controlling access to key-controlled locks, the handles of locks, and other means by which locks may be manipulated to closed or opened position.

An object of the invention is to provide guard mechanism for locks by which access to means for manipulating the locks is prevented until a predetermined time has elapsed. Another object is to provide improved clockwork-control mechanism, which is normally idle or unrestrained, and which may be energized by the operator to release the guard after a predetermined time and thus provide access to the lock-control means. A further object is to provide a dial-guard and clockwork-control means for maintaining the guard in locked position, the clockwork being normally idle but capable of being energized by the operator for effecting the release of the locking means after a predetermined time. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a view in elevation of our improved delayed control guard; Fig. 2, a rear face view; Fig. 3, a front face view with the protecting cover or cap removed; Fig. 4, an inner face view of the cover or cap; Figs. 5 and 6, enlarged broken sectional elevations taken respectively at the lines 5—5 and 6—6 on Fig. 7; Fig. 7, a plan sectional view taken as indicated at line 7 on Fig. 6 and showing the locking bolt actuating mechanism; Fig. 8, a view similar to that in Fig. 6, but showing the locking bolt in locking engagement with the cover or guard cap; Fig. 9, a broken vertical sectional view taken as indicated at line 9—9 of Fig. 8; Fig. 10, a broken side elevation of the cover or cap showing one of the grooved locking lugs and the socket for the reception of the locking-bolt; Fig. 11, a plan sectional view taken as indicated at line 11—11 of Fig. 1; Fig. 12, a sectional view similar to that in Fig. 11, showing the dial-cover equipped with a hinge support; and Fig. 13, a broken rear view in elevation of a modified form of device in which the dial is held against movement for a purpose which will be later set out.

For the purpose of illustration, the invention is shown in connection with the dial of a combination lock, although it will be understood that the guard may be employed in connection with

key-controlled locks or with manually operated handles, etc.

In the illustration given in Figs. 1 to 11 inclusive, A designates a dial-guard casing; B, a removable guard cap or cover; and C, clockwork-control locking mechanism for securing the cover or guard cap to casing A.

The casing A may be of any suitable construction and of any suitable material. Preferably, drill-proof steel or other metal is employed. As shown more clearly in Figs. 2, 3, 5, 7, and 9, the casing A provides at its upper side a circular housing 10 adapted to receive the dial 11 of a combination lock. The housing 10 is open at its front and at its rear is provided with a wall 12 centrally apertured at 13 to receive the dial stem 14. The tumblers, lock and other parts of the combination lock on the inside of the door, being of well known construction, are not shown. In Figs. 1 and 2, the housing 10 is shown secured to the wall of a safe door D, screws 15 passing through perforations 16 in wall 12 of the housing and into the wall of the door. Any suitable means for securing casing A to the door wall may, of course, be used. The housing 10 is provided with a number of curved locking lugs 17 which are adapted to interlock with elements carried by the guard cover B, as will be later described.

The casing A also comprises a housing 18 for the clockwork and locking mechanism C. As shown more clearly in Fig. 9, the housing 18 is formed integrally with housing 10 but is turned outwardly, downwardly and rearwardly to form a chamber which is open at its rear end. The front wall 19 of housing 18 is perforated to receive the stem of a winding key 20. The top wall of housing 18 is apertured at 21 to permit the extension therethrough of a locking bolt 22 and a release member 23. Interiorly of housing 18 and integrally formed with the front wall 19 thereof are supporting posts 24 which extend rearwardly and support the framework 25 of timing mechanism 26.

The cover or guard cap B may also be of any suitable construction. In the illustration given, the cover is provided with cylindrical side walls 27 adapted to be received within the housing 10. The front wall 28 is provided centrally with a hollow extension forming a knob or handle 29. Formed integrally with the side walls 27 are three spaced and rearwardly extending locking lugs 30. Each of the locking lugs 30 is provided with a groove 31, as shown more clearly in Fig. 9, adapted to receive the locking lugs 17 carried by housing 10. With this construc-

tion, when the lugs 30 and 17 are aligned so that lugs 17 are received within grooves 31 of lugs 30, the guard-cover cannot be removed without further rotation of the cover to disengage the interlocking lugs. Such further rotation is prevented by engagement of the locking bolt 22 with a recess 32 which is located in wall 27 of the guard-cover B adjacent one of the lugs 30, as shown more clearly in Fig. 9.

If desired, the dial-guard cover may be in the form indicated by B' in Fig. 12. With this construction, the cover is supported by the hinge member 33 which rotatably supports cover B' on pin 34. With this construction, the dial cover may be rotated, after the locking lug has been retracted, so as to disengage the locking lugs and the cover may then be swung on hinge member 33 back to an unobstructing position.

The lock-controlling mechanism C may also be of any suitable construction. In the illustration given, the frame 25 is secured by screws to supporting lugs 24 within housing 18. The frame 25 carries on its rear side clockwork mechanism of well known construction. On the front side of frame 25 is supported the main spring casing 35 and mechanism for controlling the operation of the locking bolt 22. A curved bracket support 35^a is secured to frame 25 and serves to lock the spring casing 35 rigidly in position. The locking bolt 22 is guided for longitudinal movement within a supporting metal strap 36 which is secured to the frame 25. At its lower end 37, the bolt 22 is reduced in diameter and extends through a collar 38 carried by the lower end of the metal strap 36. A compression spring 39 seats upon collar 38, and at its upper end, engages the shoulder 40 formed by the reduced lower end of the bolt. Just above the shoulder 40, a bolt-release pin 41 is carried by the bolt 22. Bolt 22 is also provided with a latch pin 42 which is positioned above pin 41, as shown more clearly in Fig. 6.

The main spring within the casing 35 is connected through shank 43 and the reduced threaded end 43^a with the internally threaded stem 29 of the winding key. Also, fixed upon shank 43 of the main spring is a pinion 44. As shown more clearly in Fig. 7, a driving gear 45 is carried upon the free end of shaft 46 which, in turn, is supported by frame 25. The driving gear 45 is connected through idler pinion 47 with the main spring pinion 44 so that the gear 45 rotates directly with the rotation of the main spring stem 43.

The cam release disk 48 is also freely mounted upon shaft 46 and held in adjacent relation to the driving gear 45 by means of sleeve member 49 which extends about shaft 46. As shown more clearly in Figs. 6 and 7, the disk 48 is provided on one side with a groove in which is pivotally mounted a cam latch device 50 having a latch projection 51 with an inclined cam surface 52 on its upper side. A spring 53 urges the lower arm of the member 50 outwardly. Adjacent the ends of the latch member 50 are shoulders 54 and 55 adapted to be engaged by pins 56 and 57, respectively. The pins 56 and 57 are secured to the driving gear 45. The gear 45 is preferably provided with a series of adjustment openings 58 which are interiorly threaded to receive the threaded pin 56. By shifting pin 56 from one to another of the openings 58, the period of the delayed movement can be varied. The metal strap 36 is provided with a stop notch 59 adapted

to engage pin 56 and a stop notch 60 adapted to engage pin 57.

The bell crank latch member 23 is provided with a latch arm 61 extending under the top portion of metal strap 36 and engages pin 42 when the bolt 22 is in its lowered or retracted position, as shown more clearly in Fig. 6. The other arm 62 of the bell crank extends in a vertical direction and into the slot 21. A spring 63 urges the arms 61 and 62 in a clockwise direction. The guard cap or cover B is provided with means for tripping the latch or bell crank 23 to release pin 42 and the locking bolt 22. The release mechanism is shown clearly in Figs. 5, 6, and 8. Adjacent the bolt socket 32 is a small chamber 64 in which is pivoted a release cam member 65. The member 65 is provided at one end with a downwardly turned head 66 adapted to engage the end of the lever 62. A compression spring 67 urges the head 66 in a downward direction.

In the modification illustrated in Fig. 13, mechanism is provided for locking the dial against movement. The dial can be freed for scattering the tumblers by a slight turn of the winding key. Meshing with gear 45 is a rotatably supported pinion 68. Fixed to the shaft 69 upon which pinion 68 is also fixed is a crank arm 70. Pivotally connected to the end of crank arm 70 is a latch bar 71 which is guided within bracket 72 secured to the casing A. The dial 11^a is provided at its edges with spaced notches 73 adapted to be engaged by the pointed end 74 of latch rod 71.

Operation

In the operation of the mechanism, assuming that the dial guard B is removed and that the locking bolt 22 is held in retracted position by the latch member 23, the combination is operated in the usual manner for throwing the locking bolt (not shown) to locking position, the tumblers being scattered by rotating the dial member 11 as in the ordinary operation. The dial-cover B is then placed in position over the dial and rotated so that the ribs 17 of the casing A interlock with the grooves 31 of the dial-guard B. When the guard is rotated to the position shown in Figs. 5 and 6, a slightly additional rotation brings the release member 65 into engagement with the arm 62 of the bell crank 23 and swings it in a forward direction. This movement causes the latch arm 61 to depress the locking bolt 22 against spring 39 until the latch bar 61 slips over pin 42. The locking bolt 22 is now free and as soon as the socket 32 is aligned with the bolt 22, the bolt springs upwardly into the socket under the force of spring 39, as shown more clearly in Fig. 8. The guard B is now securely locked in position and cannot be rotated to free it from engagement with casing A.

When it is desired to open the safe and to remove the dial guard B, the operator grasps the winding key and turns it in the direction for winding the clockwork heretofore idle. As shown more clearly in Fig. 5, the pinions 44 and 47 and the driving gear 45 are moved in the direction indicated by arrows in Fig. 5 during the winding operation. As the gear 45 rotates in clockwise direction, the cam member 50 passes the pin 41, rocking on its pivot to permit the latch 51 to pass the pin. The stop 59 engages pin 56 and prevents further winding of the clockwork. When the key is released by the operator, the clockwork, which is unrestrained, immediately

drives the pinions 44 and 47 and driving gear 45 in the direction opposite to the arrows shown in Fig. 5. The rotation of gear 45 in counterclockwise direction brings pin 57 into engagement with shoulder 55 of the cam member 48 and eventually latch 51 engages pin 41. After a predetermined time, the latch 51 draws the locking bolt 22 to the lower position shown in Fig. 6, at which point the latch arm 61 slips over pin 42 and locks it against upward movement. The cam member 48 continues to move until the latch 51 slips off the pin 41 and the member 50 reaches the position shown in Fig. 6. The guard-cover B may now be rotated slightly to disengage the pin 17 from grooves 31 and the cover may be removed. If a hinge support is employed, as illustrated in Fig. 12, the cover B' may, after the disengagement of the locking lugs, be swung to one side on the hinge arm 33.

Opposite the openings 53 may appear numerals (not shown) indicating the number of minutes such as 10, 15, 20, 30, etc., during which the release of the locking bolt will be delayed. It will be observed that the shifting of pin 56 to the opening farthest from shoulder 54 will cause the pin 57 to move a greater distance from shoulder 55 when, in the winding operation, the gear 45 is turned to bring the pin 56 into engagement with shoulder 54. This requires that the driving gear 45 will move through a greater circuit, with a greater lapse of time, before pin 57 engages shoulder 55 and begins to rotate the cam member 48.

In the operation of the modification shown in Fig. 13, the dimensions of pinion 68 and the length of crank arm 76 are such as to cause the latch bar to move into engagement with the notches 73 of the dial 11a only after some time has elapsed after the release of locking bolt 22. During the time interval between the release of locking bolt 22 and the engagement of latch bar 72 with the dial notches 73, there is plenty of time for the operator to remove the guard and to manipulate the dial to effect the release of the combination lock. If the operator delays for a considerable time before removing the guard, it will be necessary for him to slightly turn the winding key in order to release the latch bar for the dialing operation. After the safe has been opened and it is desired again to lock the safe, the engagement of latch bar 71 with the dial notches 73 prevents the operator from scattering the tumblers and requires him to turn the winding key slightly. This is sufficient to remind the operator that the guard cover should be placed in position after the tumblers have been scattered. With the construction shown in Fig. 8, the presence of the hinge arm and the dial-cover adjacent the dial also serves to remind the operator that to complete the locking operation, the dial-cover should be placed in position.

While we have shown specific mechanism adapted to produce certain results indicated, it will be understood that such mechanism is for the purpose of illustration and that other parts and devices may be readily substituted without departing from the spirit of our invention. The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

We claim:

1. A dial-guard comprising a base-casing

adapted to be supported adjacent the dial, a cover for the dial, a locking bolt adapted to engage a recess in said cover to lock the same to the base-casing, a spring urging said bolt toward said recess, releasable means for maintaining the locking bolt in retracted position, and means actuated by said cover for actuating said releasable means to release said locking bolt.

2. Dial-guard mechanism comprising a base-casing, means for securing said casing adjacent the dial of a lock, said casing providing a dial chamber extending around the dial and equipped with spaced locking lugs and said casing providing also below said dial chamber a closed clockwork housing, a dial-guard adapted to be mounted in said dial chamber and equipped with recesses adapted to receive the said locking lugs, a vertically guided locking bolt supported in said housing and adapted to engage a recess in said cover, clockwork in said housing, means driven by said clockwork for withdrawing the bolt when said means is moved in one direction and not affecting the position of the bolt when driven in the opposite direction.

3. A dial-guard for a combination lock comprising: a base-casing adapted to be supported adjacent the dial, a removable cover rotatably mounted in said casing about said dial, releasable locking means including a locking bolt for securing the cover to the base-casing, and means actuated by the rotation of said cover for actuating said releasable locking means to secure said cover to the casing.

4. In combination with a combination lock equipped with a dial, timing mechanism, means for energizing and starting said timing mechanism, and means actuated by said timing mechanism for locking said dial against movement.

5. In combination with a combination lock equipped with a dial, timing mechanism, means for energizing and starting said timing mechanism, and manually-releasable means actuated by said timing mechanism for locking said dial against movement.

6. In combination with a combination lock equipped with a dial, clockwork, means for winding and starting said clockwork, means actuated by said timing mechanism for locking said dial against movement, and means actuated by the winding of said clockwork for releasing said dial-locking means.

7. In combination with a combination lock equipped with a dial, means for locking said dial against movement, timing mechanism controlling the movement of said dial-locking means, and means for energizing and starting said timing mechanism.

8. In combination: a safe door equipped with a lock having manipulating means exterior to said door; and a protecting unit comprising a housing mounted on the outer side of said door, said housing being equipped with a removable closure normally preventing access to the lock and equipped also with a clock-housing; means serving to lock said closure in closed position; and clock mechanism mounted in said clock-housing serving to unlock said closure after a predetermined period of operation, said clock mechanism being equipped with externally accessible winding means.

9. Means as specified in claim 8, in which the first-mentioned housing comprises a member attached to the front face of the safe door having a forwardly extending flange adapted to encircle

the manipulating means of the first-mentioned lock, said member having said clock-housing formed integral therewith.

10. A structure as specified in claim 8, in which
5 the first-mentioned housing comprises a member adapted to be attached to the safe door, having a forwardly extending peripheral flange and in which said clock-housing comprises a rearwardly open chamber having its walls formed integral
10 with one portion of said forwardly extending flange.

11. A lock-protecting device comprising: a casing for a dial-plate comprising a casing-member adapted to be secured to a door and having an
15 opening for a dial-spindle, said casing-member carrying at one edge a housing; a complemental cover-member having interlocking relation with said casing-member and having one edge-portion adjacent said housing; a locking-bolt in said
20 housing adapted to lockingly engage said cover-member; and clock-mechanism in said housing having a gear-train controlling said locking-bolt.

12. A lock-protecting device comprising: a casing for a dial-plate comprising a casing-member adapted to be secured to a door and having an
25 opening for a dial-spindle, said casing-member carrying at one edge a housing which is integral with the casing-member and has an open side adapted to lie adjacent the outer surface of the door; a complemental cover-member having
30 interlocking relation with said casing-member and having one edge-portion adjacent said housing; a locking-bolt in said housing adapted to lockingly engage said cover-member; and clock-
35 mechanism in said housing controlling said locking-bolt.

13. A structure as specified in claim 11, in which said housing is carried by the lower edge-portion of said casing-member and in which said
40 locking-bolt is disposed in substantially vertical position.

14. A structure as specified in claim 11, in which said housing has an open side adapted to be closed by the front surface of the door when
45 said casing-member is secured to the door, and in which said clock mechanism is carried by a frame inserted through the open side of said housing and secured internally to said housing.

15. A structure as specified in claim 11, in

which said clock-mechanism is mounted in a frame within said housing and said frame is equipped with a spring for projecting said locking-bolt to locking position and with a detent
5 controlling the movement of said locking-bolt.

16. In combination: a door; a rotatable lock-actuating spindle extending through the door and projecting at the outer side thereof; a casing-member secured to the door having an opening
10 through which said spindle projects, said casing-member being of circular contour and having one edge-portion thereof equipped with a housing; a complemental cover-member having interlocking relation with said casing-member adapted to be rotated to non-interlocking position for
15 removal; a dial secured on said spindle and housed by said casing-member and cover-member; and a frame mounted in said housing equipped with a locking bolt adapted to engage said cover-member and having mounted therein
20 said clock-mechanism controlling the actuation of said locking-bolt.

17. Lock-protecting mechanism comprising: a casing-member having means to support a cover rotatably and permit turning movement of the
25 cover about a lock; a removable cover associated with said casing-member and adapted to turn with relation thereto; a bolt; a spring serving to project said bolt; a cover-actuated latch-device which restrains said bolt but permits pro-
30 jection of the bolt when actuated by the cover in the operation of turning the cover to locked position; and time-mechanism controlling retraction of said bolt.

18. Lock-protecting mechanism comprising: a
35 casing-member having means to support a cover rotatably and permit turning movement of the cover about a lock; a removable cover associated with said casing-member and adapted to turn
40 with relation thereto; a bolt; a spring serving to project said bolt to locking position; a cover-actuated latch restraining said bolt until the cover is turned to locking position; time-mechanism; and means actuated by said time-mechanism
45 for automatically retracting said bolt to non-locking latched position.

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