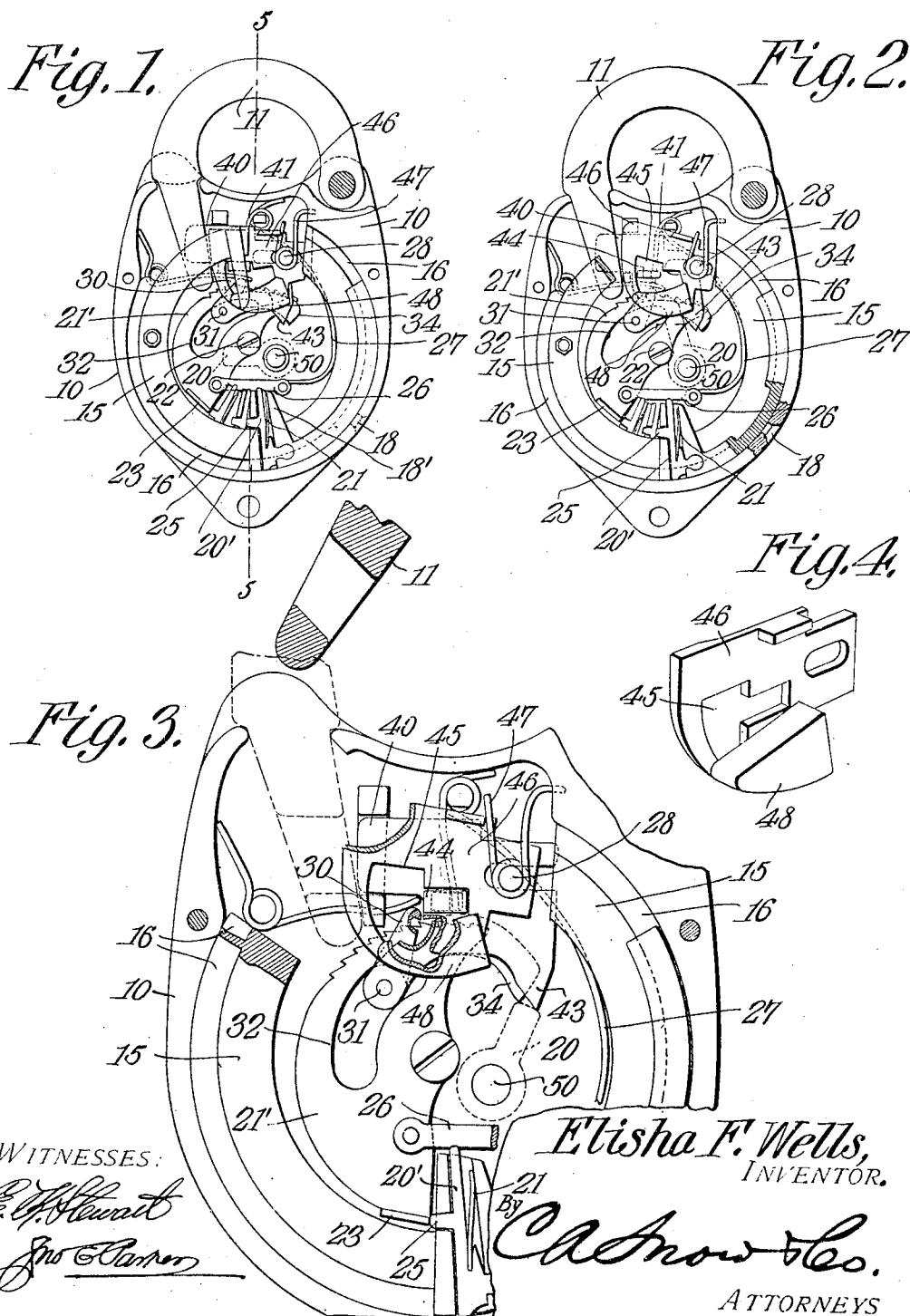


No. 844,702.

PATENTED FEB. 19, 1907.

E. F. WELLS.
REGISTERING LOCK.
APPLICATION FILED NOV. 13, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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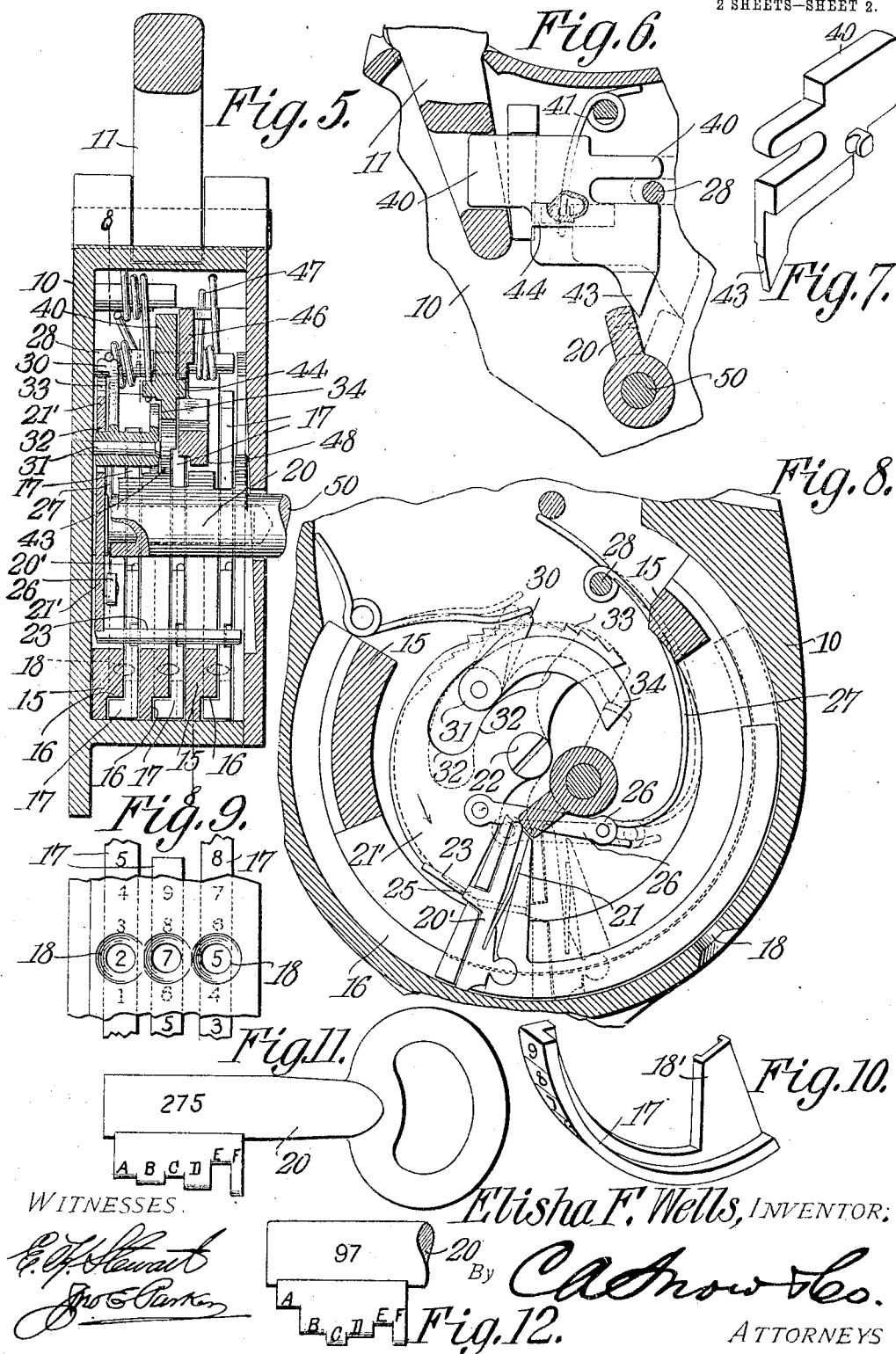
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ELISHA FORD WELLS, OF MIAMI, FLORIDA, ASSIGNOR OF ONE-HALF TO
JOHN NEWTON LUMMUS, OF MIAMI, FLORIDA.

REGISTERING-LOCK.

No. 844,702.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed November 13, 1906. Serial No. 343,264.

To all whom it may concern:

Be it known that I, ELISHA FORD WELLS, a citizen of the United States, residing at Miami, in the county of Dade and State of Florida, have invented a new and useful Registering-Lock, of which the following is a specification.

This invention relates to registering-locks, and has for its principal object to provide a novel form of lock which may be opened by a large number of keys of different shape, each bearing a number or other designating character, the lock being so constructed as to automatically register the number of the key last used to open it.

A further object of the invention is to construct a lock in which after the tumblers or other locking devices have been moved to release the bolt or shackle it will be impossible to remove the key from the lock-casing until after the number of the key has been registered.

A still further object of the invention is to improve and simplify the construction of locks of this type and to provide mechanism whereby the registering devices are automatically restored to zero or initial position immediately after the unlocking has been accomplished and before the registering operation takes place.

A still further object of the invention is to provide an improved form of lock in which the bolt or similar member is held from movement by a pivoted tumbler or locking device which must first be raised before the bolt can be withdrawn.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a face view of a lock constructed in accordance with the invention, the outer cap-plate or cover being removed and the shackle being locked. Fig. 2 is a similar view showing the initial operation of the key in moving the

bolt-tumbler to the released position. Fig. 3 is a face view of a portion of the structure shown in Figs. 1 and 2, drawn to a somewhat larger scale and showing the shackle unlocked. Fig. 4 is a detail perspective view of the bolt-locking tumbler detached. Fig. 5 is a vertical section of the lock on the line 5 5 of Fig. 1 drawn to an enlarged scale. Fig. 6 is a detail view of the end of the shackle and its locking-bolt, showing the operation of the key in withdrawing the bolt. Fig. 7 is a detail perspective view of the rear face of the locking-bolt. Fig. 8 is a vertical section on the line 8 8 of Fig. 5, showing the operation of the registering mechanism. Fig. 9 is a view of a portion of the edge of the lock-casing, showing the registering-segments and the display-openings at which the numerals of such segments are exposed to view. Fig. 10 is a detail perspective view of one of the registering-segments. Fig. 11 is an elevation of one form of key which may be used. Fig. 12 is a similar view of a portion of another form of key.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The lock forming the subject of the present invention is designed to automatically register the number of the key employed, and is especially adapted for use as a switch or signal lock where the train-hands and other employees may carry keys of different construction, each bearing a different number and all capable of opening the lock. In the present instance the lock is constructed to register keys from number "1" to "999," inclusive; but by the addition of another indicating-segment the number of keys can be increased to nine thousand nine hundred and ninety-nine, or by adding two additional segments the number of keys may be increased to ninety-nine thousand nine hundred and ninety-nine.

The lock-casing 10 is shown as of the ordinary padlock form provided with a pivoted shackle 11 of ordinary construction, although it is to be understood that the invention is applicable to other forms of locks, and the shape and contour of the casing, as well as the character of the shackle or bolt, may be altered in any manner.

Fitting within the circular cavity of the lock-

casing is a curved guide 15, which follows the curved wall of the cavity and is in the form of an incomplete ring, the ends of which are spaced to admit the locking end of the shackle and the locking mechanism proper. This ring is provided with three peripheral grooves 16, which preferably are stepped in cross-section, as shown more clearly in Fig. 5, and mounted in these grooves are arcuate bars 17, one of which is shown in Fig. 10. These bars are provided with numerals, letters, or other symbols, which are exposed through openings 18, formed in the edge of the lock-casing, and the number exposed indicates the number of the key which was last used in opening the lock.

Projecting from one end of each of the indicating-bars 17 is an arm 18, the arms being arranged in lines substantially radial from the center of the casing and being adapted to be engaged by the bits of the keys 20, the keys being of different shape and so arranged that they will move the arms and the indicating-bars to different distances for the purpose of exposing different numbers or groups of numbers at the display-openings 18.

In order to prevent accidental displacement of the indicating-bars, especially where the locks are exposed to rough usage, each of the arms 18' is provided with a slot in the upper face for the reception of a friction-pawl 20', the latter being acted upon by a spring 21, that tends to force its outer end into frictional engagement with the curved inner wall of the lock-casing, and thus hold the indicating-bar in the position to which it is moved by the key.

In the bottom of the cavity or recess of the casing is a restoring device in the form of a plate 21', that is pivoted on a stud or screw 22 and is provided with an arm 23, arranged to engage the several arms 18', and in order that the restoring device may move the indicating-bars back to the initial position the arm 23 engages lugs 25, that project from the friction locking-pawls 20', so that the first effect of the movement of the restoring device is to engage all of the friction-pawls and move the same out of frictional contact with the lock-casing, after which the continued movement of the restoring device moves all of the indicator-bars to zero.

The restoring-plate 21' is connected by a link 26 to a spring 27, that is mounted on a suitable pin or stud 28, the spring tending normally to move the plate 21' in the direction indicated by the arrow in Fig. 8. This movement is resisted, however, by a locking-pawl 30, pivoted on a pin 31, that extends through an arcuate slot 32, formed in the plate 21', and engages a series of ratchet-teeth 33, formed in the curved edge of the plate 21'. Mounted on the pin 31 is an arm 34, that is in position to be engaged by one of the bits of the key as the latter is

turned, so that during or slightly after the unlocking operation the key-bit riding under the arm 34 will lift the outer end of the same, thereby turning the pin 31, thus disengaging the pawl 30 from the teeth 33 and releasing the restoring-plate 21', which will be turned for the purpose of moving all of the indicating-bars to the zero position in advance of the engagement of the bits of the key with the arms 18'.

The free end of the shackle is provided with an opening for the reception of a locking-bolt 40, that is pressed toward locking position by a suitable spring 41, and said bolt has a projection 43, that is arranged to be engaged by one of the bits of the key during the unlocking operation. On the upper face of the bolt is a lug 44, which enters a stepped locking-recess 45, formed in a spring-actuated tumbler 46, the latter being normally held in bolt-locking position by a spring 47. This tumbler has a depending projection 48, so arranged as to be engaged by one of the bits of the key in advance of the movement of the bolt, the tumbler being first raised in order to release the bolt, and on continued movement of the key the bolt is withdrawn from the opening in the shackle.

Each of the keys is provided with bits for engaging the tumbler, the bolt, and the arm 34 and also is provided with bits for engagement with the several arms 18' of the indicator-bars.

The bits are designated, for convenience, A, B, C, D, E, and F, the elements B and D being precisely the same in all of the keys. The bit D is arranged to engage with the projection 48 of the tumbler 46 and move the same upward to release the bolt, while the bit B is arranged to engage with the projection 43 for the purpose of withdrawing the bolt from the shackle. The bit B also engages with the arm 34 immediately after the unlocking operation and moves said arm for the purpose of releasing the locking-pawl 30 and permitting the movement of the restoring disk or plate 21' by the spring 27, so that the arm 23 of the restoring device may move all of the indicating-bars to the initial or zero position.

In the operation of unlocking the key is inserted through the face-plate and is fitted on the key-post 50, the latter being located at one side of the axis of the curved indicator-bars. The key is turned to the right or clockwise from the position shown in Fig. 1 toward the position shown in Fig. 2 and during this movement will raise the tumbler to release the bolt. On further movement in the same direction the key engages the projection 43 of the bolt in the manner shown in Fig. 6 and moves the same from the full-line position to the dotted-line position in Fig. 6. After passing beyond this dotted-line position the key cannot be turned backward; but

must make a complete rotation before it can be withdrawn. Slight further movement of the key brings the bit D into engagement with the arm 34, swinging the latter from the full-line position to the dotted-line position of Fig. 8, and this releases the pawl 30 and allows the spring 27 to move the restoring-plate 21' from the full-line to the dotted-line position. During this movement the arm 23 of the restoring-plate engages the lugs 25 of the friction-pawls and moves the same to a position to release the indicating-bars and then continuing the movement turns all of the indicating-bars to the initial or zero position. (Indicated by dotted lines in Fig. 8.) As the turning movement of the key is continued the bits A, C, and E, which differ in the several keys, engage one or more of the arms 18' of the indicator-bars and move said bars a distance determined by the shape and length of the bits, and the extent of this movement is indicated by the numerals exposed through the openings 18 at the edge of the lock-casing. Key No. 1 will engage only one of the arms 18' and will move the latter a very short distance, while key No. 2 will engage the same arm, but move the indicator-bar a further distance. All the keys bearing two numbers—such, for instance, as "10," "23," "99," &c., will engage two of the arms 18', and all of the keys bearing three numerals will engage all three of the arms, the lock in the present instance being so constructed as to register the numbers of all keys from "1" to "999."

By the addition of another indicating-bar and another bit on each key the lock may be made to register the number of all keys up to "9,999," or by the addition of two bars and two bits the lock may be made to register all keys from "1" to "99,999."

I claim—

1. In an indicator-lock, a movable indicator having an inwardly-extending arm, a spring-actuated restoring-plate having a projecting member arranged to engage said arm, said restoring member being provided with ratchet-teeth, a pawl engaging said ratchet-teeth, and means engageable by an inserted key for moving said pawl out of engagement with the ratchet-teeth in advance of each registering operation.

2. In an indicator-lock, a casing having a display-opening, a plurality of arcuate indicator-bars, each having an inwardly-extending

arm, a pivotally-mounted restoring-plate having a projecting member arranged to engage all of said arms, said plate being provided with ratchet-teeth, a spring for actuating the plate, a pawl engaging the teeth and holding the restoring device from movement, and an arm connected to said pawl and arranged in the path of movement of one of the bits of an inserted key.

3. In an indicator-lock, a plurality of arcuate indicator-bars each provided with an inwardly-extending arm, a restoring-plate fitting within the casing and provided with ratchet-teeth, an arm projecting from the restoring-plate and arranged to engage the indicator-bars, a spring tending to actuate said restoring-plate, a pawl engaging the ratchet-teeth, and an arm connected to said pawl and arranged to be engaged by the bit of an inserted key.

4. In an indicator-lock, a plurality of arcuate indicator-bars, each having an inwardly-extending arm, means for guiding said bars, a pivotally-mounted restoring-plate having a projecting arm arranged to engage the indicator-bars, means for actuating said restoring-plate, friction-pawls carried by the indicator-bars, and provided with lugs projecting therefrom and arranged to be engaged by the restoring-arm in advance of the returning movement of said indicator-bars.

5. In an indicator-lock, a plurality of indicator-bars having inwardly-projecting arms, friction-pawls carried by said arms and each provided with a projecting lug, and a restoring device arranged to engage with the lugs to effect release of the pawls before the returning movement of the indicator-bars.

6. In an indicator-lock, a casing having a display-opening at the edge, a curved guide within the casing and provided with a plurality of arcuate slots, indicator-bars mounted in said slots and provided with inwardly-extending arms arranged to be engaged on one side by the keys, and a restoring device for engaging the opposite sides of the bars and moving the same backward to zero position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELISHA FORD WELLS.

Witnesses:

ROY A. McLEOD,
J. I. WILSON.