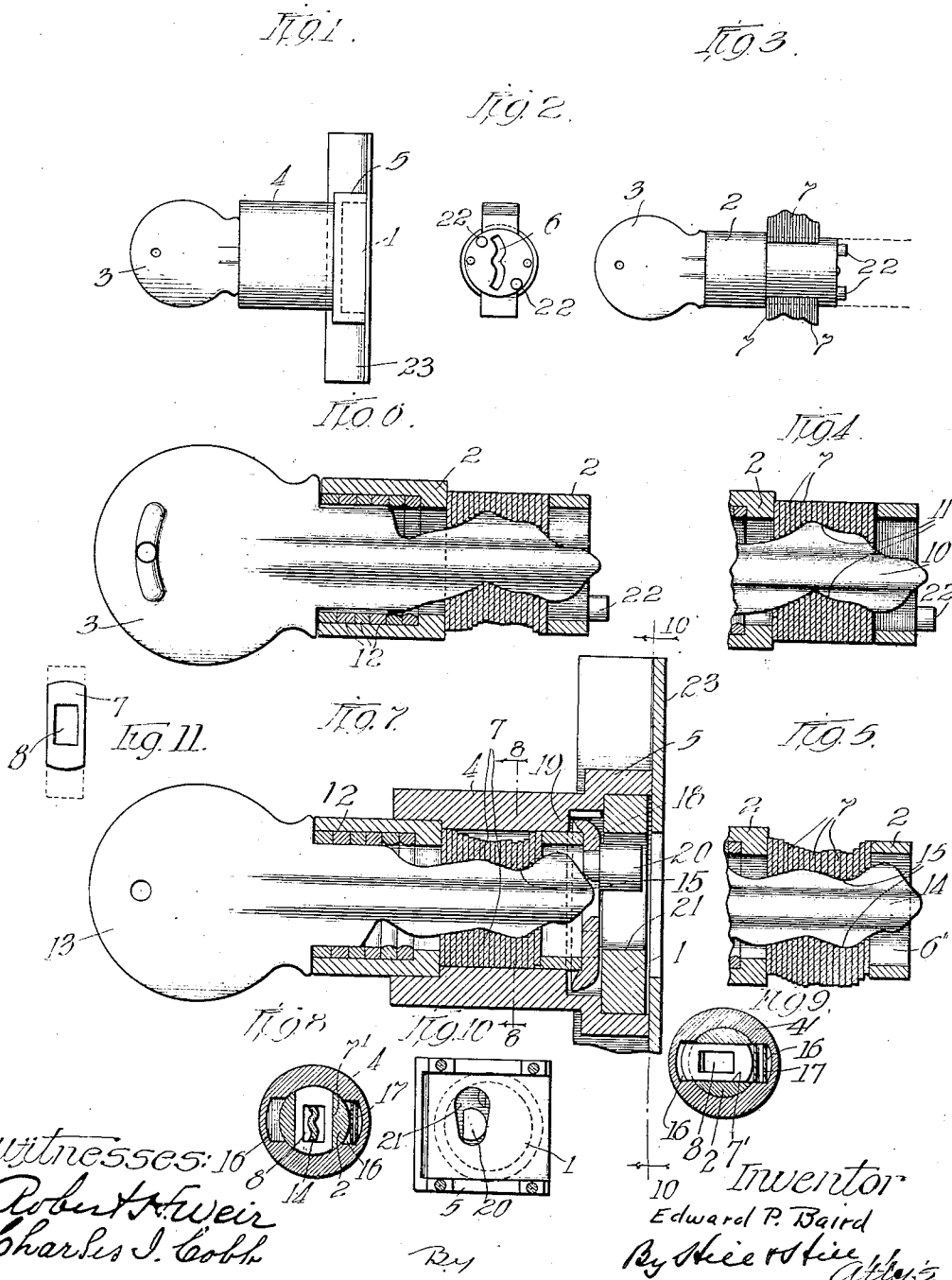


E. P. BAIRD.
MANUFACTURE OF LOCKS.
APPLICATION FILED NOV. 5, 1915.

1,240,530.

Patented Sept. 18, 1917.



Witnesses: 16
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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF LOCKS.

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Specification of Letters Patent. Patented Sept. 18, 1917.

Application filed November 5, 1915. Serial No. 59,819.

To all whom it may concern:

Be it known that I, EDWARD P. BAIRD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Manufacture of Locks, of which the following is a description.

My invention belongs to that general class of devices known as locks and the manufacture thereof, and particularly to that type of lock which may be termed a plate tumbler lock. It is customary to vary the construction of locks and keys so that any particular lock can be operated only by its individual key, or where desired, by a master key adapted to control a plurality of locks. The invention has among its objects the production of a simple, convenient, efficient and satisfactory lock of the kind described in a comparatively simple manner, which lock is constructed of a minimum of parts, and more particularly among the objects is the inexpensive manufacture of a lock suitable for innumerable key changes, and which may be easily mastered, if so desired. The ease with which the lock may be constructed, each lock having a different key, or the same key with any number of them for a master key, is one of the desirable features of the invention.

To this end my invention consists in the novel construction, arrangement, combination of parts and construction thereof herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Figure 1 is a side elevation of a complete lock;

Fig. 2 is a view in elevation of the inner end of the spindle with its plates inserted before cutting same off;

Fig. 3 is a side elevation of the spindle and plates with the key in position;

Fig. 4 is a sectional view through a portion of the spindles and plates, the key inserted with the projecting ends, with the plates cut off so that the ends align;

Fig. 5 is a similar view with another key inserted;

Fig. 6 is a sectional view through the spindle with the key in place, the plates project-

ing beyond the spindle, cut off, with key shown in Fig. 4 inserted;

Fig. 7 is a sectional view similar to Fig. 6, including the barrel into which the spindle is inserted and associated parts of the lock, a key similar to that shown in Fig. 5 inserted;

Fig. 8 is a sectional view taken substantially on line 8, 8 of Fig. 7;

Fig. 9 is a view similar to Fig. 8, the spindle rotated and the key withdrawn;

Fig. 10 is a reduced sectional view taken substantially on line 10, 10 of Fig. 7; and

Fig. 11 is a view of one of the plates.

Referring to the drawings, in which one form of the lock is shown, 1 represents a lock or latch bolt operatively connected with a spindle 2, so that when the spindle is rotated, the bolt 1 will be thrown in or out of locking position, as the case may be. Two forms of key are shown, key 3 being in place in Figs. 1, 3, 4 and 6, the other key 13 in Figs. 5 and 7. A barrel 4 is provided to receive the spindle 2, and is carried by a casing part 5, in which the bolt 1 is arranged. The spindle is also provided with a keyway 6 at the front and rear thereof, the front keyway being more particularly described hereafter.

The spindle 2 is also preferably slotted for a portion of its length, as indicated at 7', and of a size to receive the tumblers 7, which are each formed with a keyway 8 there-through, as most clearly shown in Fig. 11. In constructing the lock it may be mentioned that with this particular type of lock the locks are preferably constructed to fit the keys, this being the most simple and economical way of constructing the lock. The key 3 is provided with a shank 10 and the edges 11 preferably arranged with a series of undulations, which on the illustrative keys are shown parallel. The plates 7, as formed are of greater length than the diameter of the barrel or spindle 2, and are inserted in place substantially as shown in Fig. 3. The shank 10 of the key 3 is then inserted in the keyway 6, causing the plates to take positions, for example, substantially as shown in Fig. 3 referred to. The ends of the plates 7 are then suitably cut off, either by turning, or in any other preferred way, so that they are aligned at their ends and substantially conform to the contour of the barrel 2, and en-

tirely confined within the spindle, as shown in Fig. 4. The spindle is then inserted in the barrel 4 and the same operatively connected with the bolt 1. The barrel 4 is provided with a slot or groove 16, preferably on opposite sides thereof, as most clearly shown in Figs. 8 to 9, so that when the key is in place the spindle may be rotated in the barrel, but when the spindle is turned so as to align the plates with the slot 16 and the key withdrawn the spindle will be locked against rotation by the plates. As is obvious, cutting off the plates to fit the key determines the relative positions of the apertures 8 in the plates, so that the plates will only be aligned when the same, or an identical key is inserted. When only a primary key is desired the lock is complete as described.

Where it is desired to have the lock with any desired other locks controlled by a master key, a master key is provided. I have shown, for example, a master key 13, having a shank 14 with the edges 15 differing in contour from the edges of the shank 10 of key 3. However, with a key of this design the plates are not aligned at both ends, as shown in Fig. 5, or perhaps at either end, this depending on the contour of the master key. The plates are then cut off again so as to align at their ends where they would have otherwise projected beyond the spindle. If now the spindle is inserted in the lock barrel 4, as shown in Fig. 7, and the key is inserted, the plates will be moved substantially to the position shown in Fig. 6, but the same not projecting beyond the spindle, the spindle may be turned in the barrel 4. Likewise, when the key 13 is inserted, as shown in Fig. 7, the plates are not projected beyond the spindle. This method or process of constructing the lock may be repeated as to other keys, so that a lock might have a master key. In this way each individual lock would have its individual key, and a portion or all of the locks could be actuated by a master key, or a portion of the locks could have one master key and a portion another, and all have a key that would be a common master key, and actuate any, and so the operations could be continued. It will be noted that in a construction of this kind the lock in itself is not varied in its essential details in mastering, but merely the lock constructed in a simple manner, to-wit, again cutting off the plates the same is mastered without adding an additional element except a master key.

I have also shown a built up keyway constructed of plates 12 in Figs. 6 and 7. As most clearly shown in Figs. 1, 7 and 10, the spindle 2 is secured to a plate 18 formed to engage the shoulder 19 of the inner barrel and provided with an extension or lug 20 adapted to cooperate and work in a slot 21 with the bolt 1. The plate 18 may be very

conveniently secured to the spindle by forming lugs 22 on the spindle, and then upsetting or rusting the same down so as to secure the plate in place. I have shown a spring 17 arranged in one of the grooves 16, it being understood that the same may be omitted, or an equivalent may be employed for positively throwing the plates out of alignment when the key is withdrawn after the barrel has been turned into the position shown in Fig. 9. It happens that the keys shown in the figures with the upper ends of the plates shown in Fig. 6 are aligned when one key is inserted, and the bottom ends when the other key is inserted; that is, as the devices are shown in the drawings, but it is, of course, obvious that this depends entirely on the contour of the keys and that either of the keys shown might be the master and the other the primary, and that the operation might be performed with either key being used first.

The advantages of the construction have been previously pointed out, to-wit the simplicity and low cost of manufacture, together with the extreme sensitiveness of the lock, as one plate out of proper position would prevent the lock from being actuated; and the many other advantages will appear to those skilled in the art. I am aware that various modifications and changes in the method of manufacture may be adapted from the disclosures herein given.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same within the scope of the appended claims without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact construction, arrangement or combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:—

1. The herein described manufacture of locks, consisting in associating a plurality of tumblers and inserting a key in the tumblers, then cutting off the ends of the tumblers so that they align at the ends, then withdrawing the key and inserting a different key in the tumblers, and then again cutting off the ends of the tumblers.

2. The manufacture of plate tumbler master locks of the kind described, operable by a common key, consisting in inserting a suitable master key in the locks and cutting off the tumblers at the ends, whereby the same will clear a cooperating engaging part when the key is in the lock.

3. The herein described manufacture of locks, consisting in associating a plurality of suitably formed plate tumblers in a slotted spindle, said tumblers being of a length to project beyond the spindle, then inserting a key to adjust the tumblers and cutting off

the tumblers flush with the spindle, whereby when the spindle is inserted in a suitable barrel arranged for engagement with said tumblers, the tumblers will be moved out 5 of or in operative engagement with the barrel upon the insertion or withdrawal of the key.

10 4. The herein described manufacture of locks, consisting in associating a plurality of plate tumblers and arranging them with a suitable key, then cutting away portions whereby when the same are inserted within a suitable spindle the same will be entirely

contained within the confines thereof, then again arranging them and cutting away portions 15 whereby when a dissimilar key is employed to rearrange the tumblers they will also be entirely contained within the confines of the spindle.

In testimony whereof, I have hereunto 20 signed my name in the presence of two subscribing witnesses.

EDWARD P. BAIRD.

Witnesses:

ROY W. HILL,

CHARLES I. COBB.