C. A. MÜLLER.

SAFETY LOCK.

APPLICATION FILED OCT. 27, 1908.

1,092,223. Patented Apr. 7, 1914.

Fig. 1.

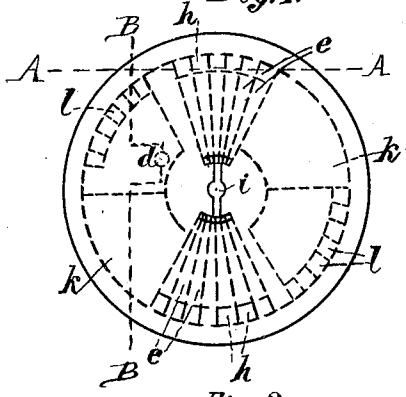


Fig. 5.

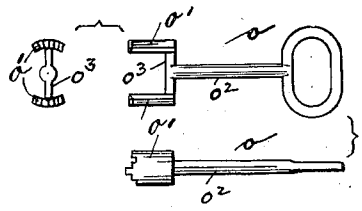


Fig. 2.

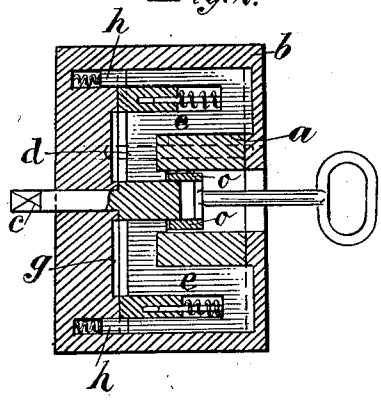


Fig. 3.

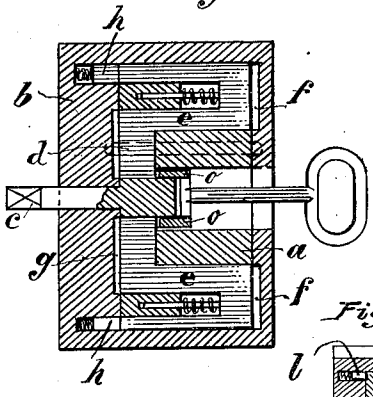


Fig. 7.

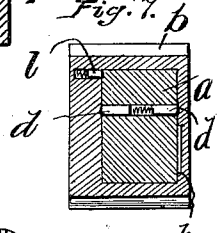


Fig. 4.

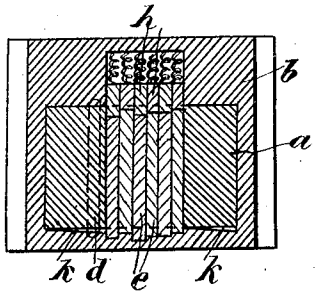
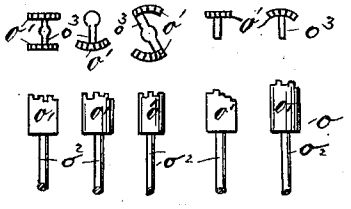


Fig. 6.



Witnesses:

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CARL AUGUST MÜLLER, OF WITZENHAUSEN, GERMANY.

SAFETY-LOCK.

1,092,223. Specification of Letters Patent. Patented Apr. 7, 1914.

Application filed October 27, 1908. Serial No. 459,674.

To all whom it may concern:

Be it known that I, CARL AUGUST MÜLLER, a subject of the Emperor of Germany, residing at Witzenhausen, in Germany, have invented certain new and useful Improvements in Safety-Locks, of which the following is a specification.

The present safety lock is of the kind in which a cylinder or plug rotates in a casing and is locked by tumblers which are adjusted by the key for closing the lock. The shape and arrangement of the tumblers and of the key are features of this invention and the shape of the tumblers on which the key acts is such that the locking parts of the said tumblers do not lie in the same plane as the parts on which the key acts. It is thus impossible to reach the locking parts through the keyhole, whereby the safety of the lock is increased. Moreover, the tumblers are arranged in groups and close to each other, so that a key is necessary for adjusting them, this key being provided with teeth arranged close to each other on a comb situated on a cross-piece of the key stem.

A construction of the safety lock according to this invention is illustrated by way of example in the accompanying drawing, in which—

Figure 1 is a front elevation, Figs. 2 and 3 are each a vertical section, but in two different positions of the tumblers (before and during the locking), Fig. 4 is a section on the line A—A of Fig. 1; Fig. 5 shows the key, Fig. 6 illustrates various modified shapes of the key, and Fig. 7 is a vertical section on a reduced scale through the spring pins *d* of Fig. 1.

The plug *a* rotates in the casing *b* and carries the mandrel projection *c* which passes through the casing and is connected with the roll-back of the lock as is usual in such safety locks. The plug is normally locked by tumblers *e* which are so shaped that their locking parts are not in the same plane as the parts with which they project into the keyhole. Moreover, they are arranged in two groups close to each other. The locking parts of these tumblers engage recesses *f* of the casing *b*. Counter-tumblers *h* act upon the tumblers *e*, the former lying in the casing *b* and being like the tumblers under spring-pressure, so that these counter-tumblers are normally partially in engagement with the plug and lock it. In opening the lock, the tumblers *e* must be displaced to such an extent that they disengage the recesses *f* of the casing *b* and the counter-tumblers *h* disengage the plug *a*. The simultaneous shifting of both groups of tumblers and counter-tumblers is effected by means of the key shown in Fig. 5, the teeth *o* forming horizontal combs which lie on the cross-piece of the key-stem. The shape of these key combs can be varied as shown in Fig. 6. It is not absolutely necessary that two groups of tumblers and counter-tumblers be provided; one group is also sufficient with the corresponding shape of the key, as shown in both constructions of Fig. 6. The proper adjustment of the tumblers can only be effected with the suitable key. If this is not the case, for instance if a skeleton key is used and the tumblers are shifted at too great an extent, they lock at the opposite side in auxiliary recesses *g* of the casing.

In order to make impossible an unauthorized opening of the lock, even when the tumblers have been first released by skeleton keys or the like, there are provided in the casing *b*, within the reach of rotation of the body *a*, special grooves or recesses *k*, shown in Figs. 1, 4 and 7, in which the tumblers *e* can remain suspended if they are not properly arranged during the whole closing operation by means of the proper key. In other words the recesses *k* are adapted to receive the tumblers *e* and thus prevent further rotation of the lock, if the said tumblers *e* are moved too far so as to project beyond the outer surface of the plug *a*. Further, for increasing the safety still more, there are provided additional counter-tumblers *l* (see particularly Fig. 7) which do not ordinarily participate and are resiliently arranged in recesses so that in the event of the tumblers *e* not being moved sufficiently far by the key or skeleton key, so that their inner ends are not quite flush with the plane of separation between the parts *a* and *b*, after a certain partial rotation of the plug they engage with the part *b* and prevent it from turning farther. These counter-tumblers *l* have the same function as the counter-tumblers *h* and only come into effect, *i. e.* engage with the plug *a*, when the main tumblers *e* are improperly adjusted. If the main tumblers *e* are properly

adjusted by the key, they are flush with the surface of the plug *a* and the counter-tumblers *l* find no projections to lodge against.

In order that the plug *a* after one revolution occupies always the same position with regard to the keyhole, a double spring detent pin *d* is provided which catches every time in semi-circular recesses of the casing *b*.

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

1. In a safety lock, a casing, a rotatable plug therein, a plurality of tumblers arranged in said plug and adapted to lock the same, a plurality of counter-tumblers in said casing, and a key controlling said first-mentioned tumblers, which latter are adapted to engage with said counter-tumblers, and said first-mentioned tumblers having such shape that their points of engagement in the casing are not situated in the same plane as the points at which they are engaged by the key, whereby they are rendered substantially inaccessible from the outside.

2. In a safety lock, a casing, a rotatable plug therein, a plurality of tumblers arranged in said plug and adapted to lock the same, a plurality of counter-tumblers in said casing, and a rotatable key controlling said first-mentioned tumblers, which latter are adapted to engage with said counter-tumblers, and having such shape that their points of engagement in the casing are not situated in the same plane as the points at which they are engaged by the key whereby they are rendered substantially inaccessible from the outside, the said key comprising a bit portion, a cross-piece carrying the same, and a stem carrying the cross-piece, the said bit portion having a comb-like formation with the teeth lying in the longitudinal direction of the key stem and being radially arranged to position properly the tumblers and counter-tumblers.

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

CARL AUGUST MÜLLER.

Witnesses:

SOPHIE MÜLLER,

U. V. HAASE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."