



No. 756,434.

PATENTED APR. 5, 1904.

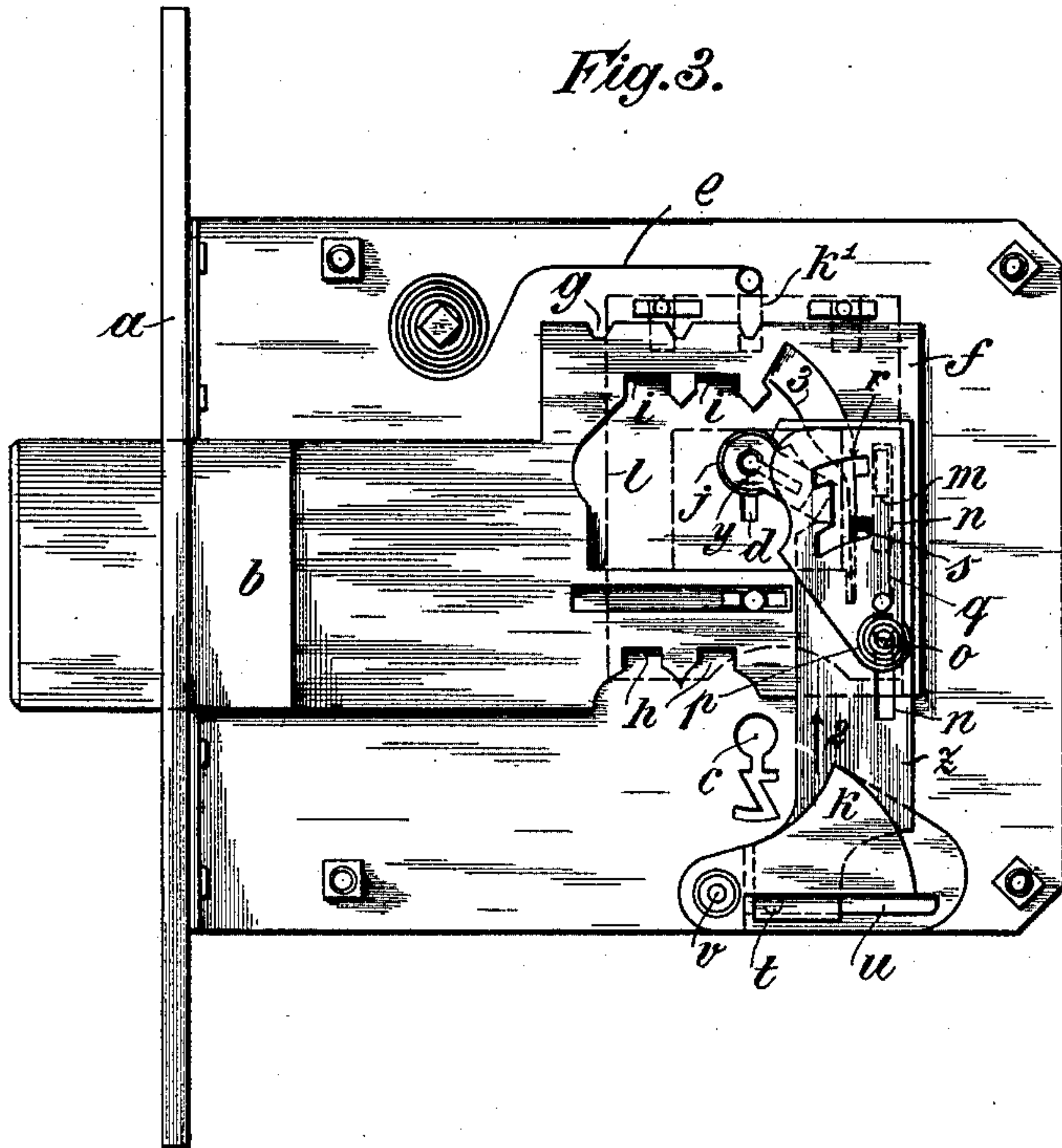
P. TROPP.  
LOCK.

APPLICATION FILED SEPT. 20, 1902.

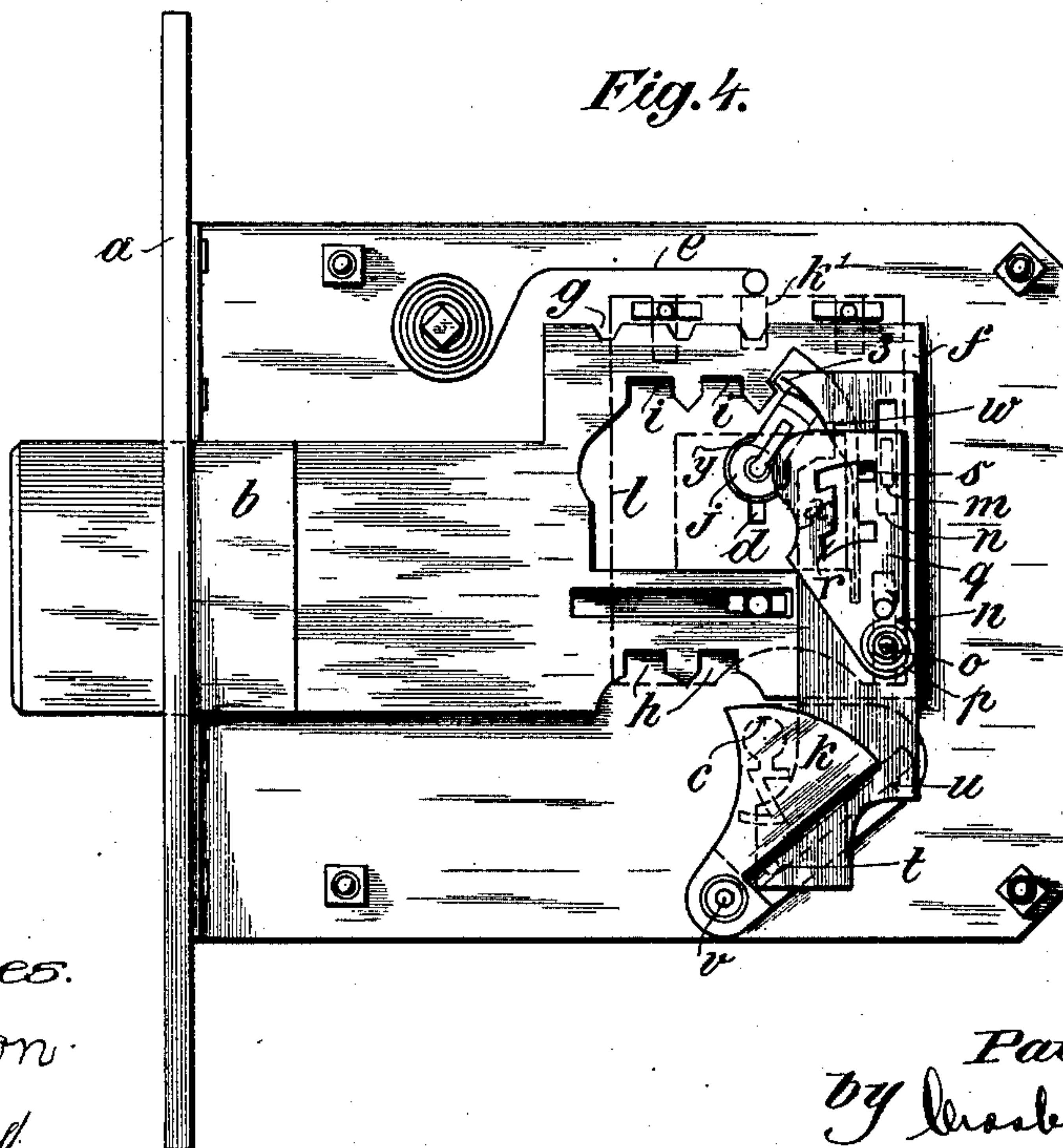
NO MODEL.

4 SHEETS—SHEET 2.

*Fig. 3.*



*Fig. 4.*



*Witnesses.*  
*J. W. Lutton.*  
*W. C. Lunsford.*

*Inventor.*  
*Paul Tropp,*  
*by Crosby Gregory, Atty's.*



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4 SHEETS—SHEET 3.

Fig. 10.

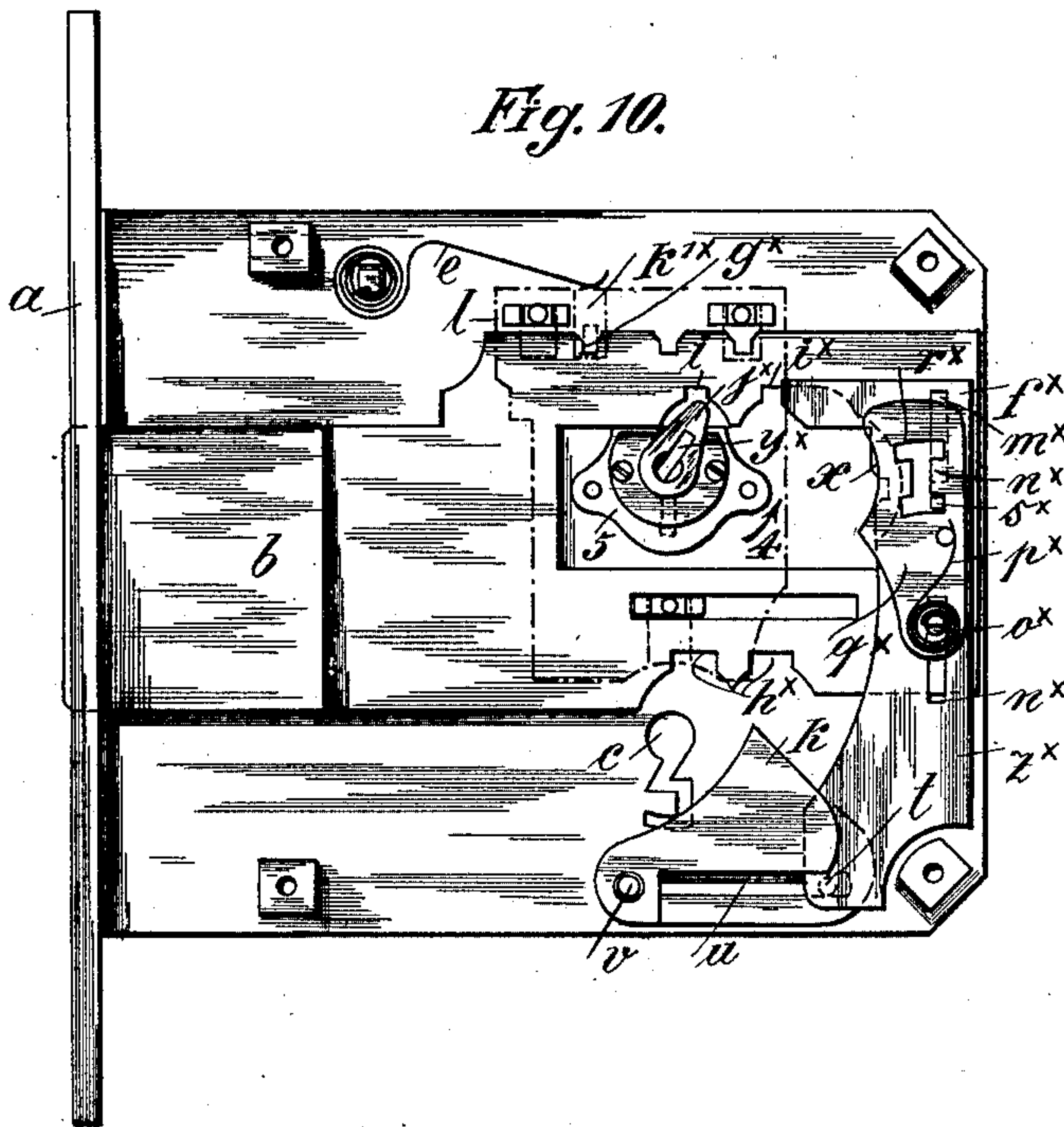
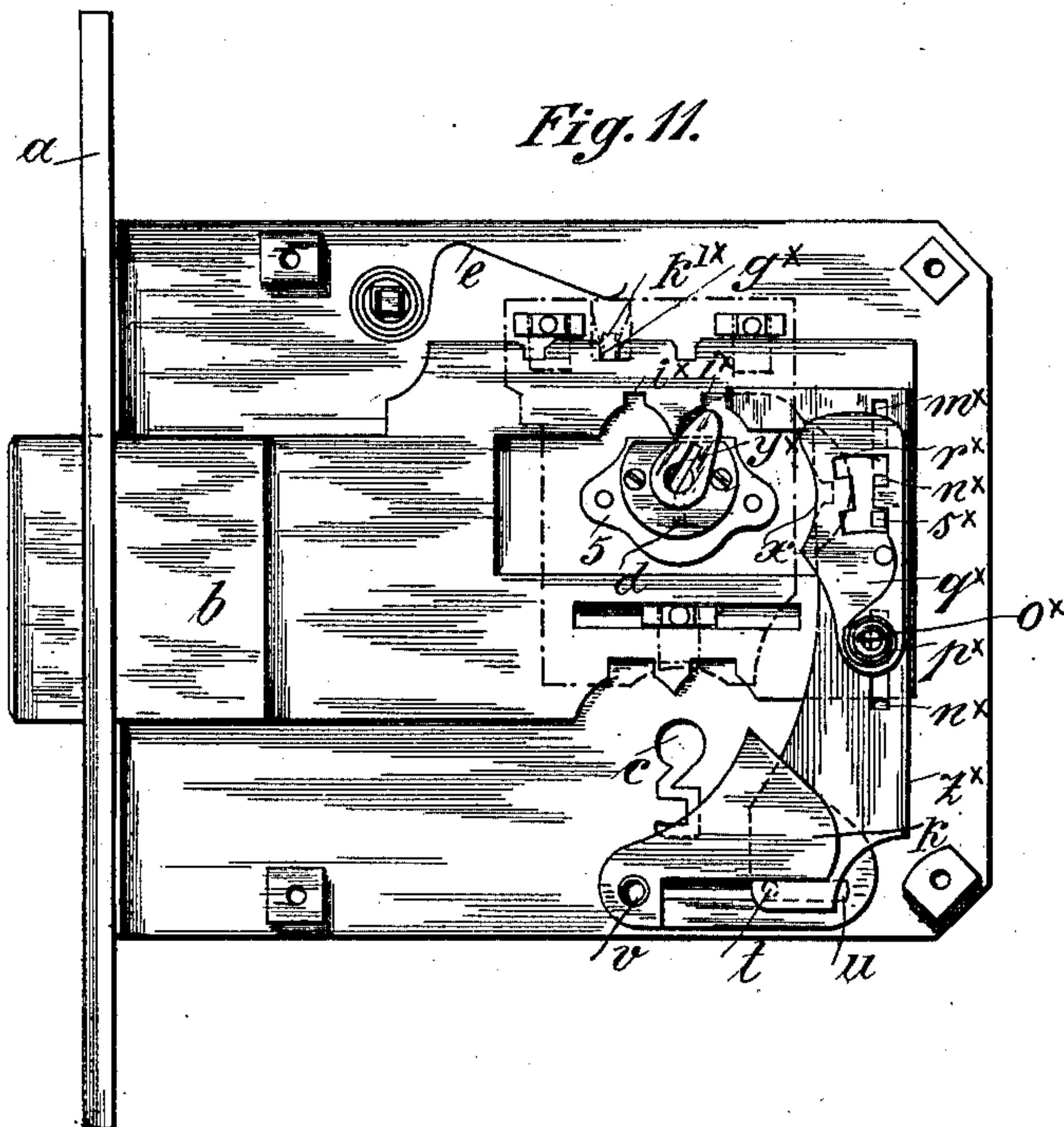


Fig. 11.



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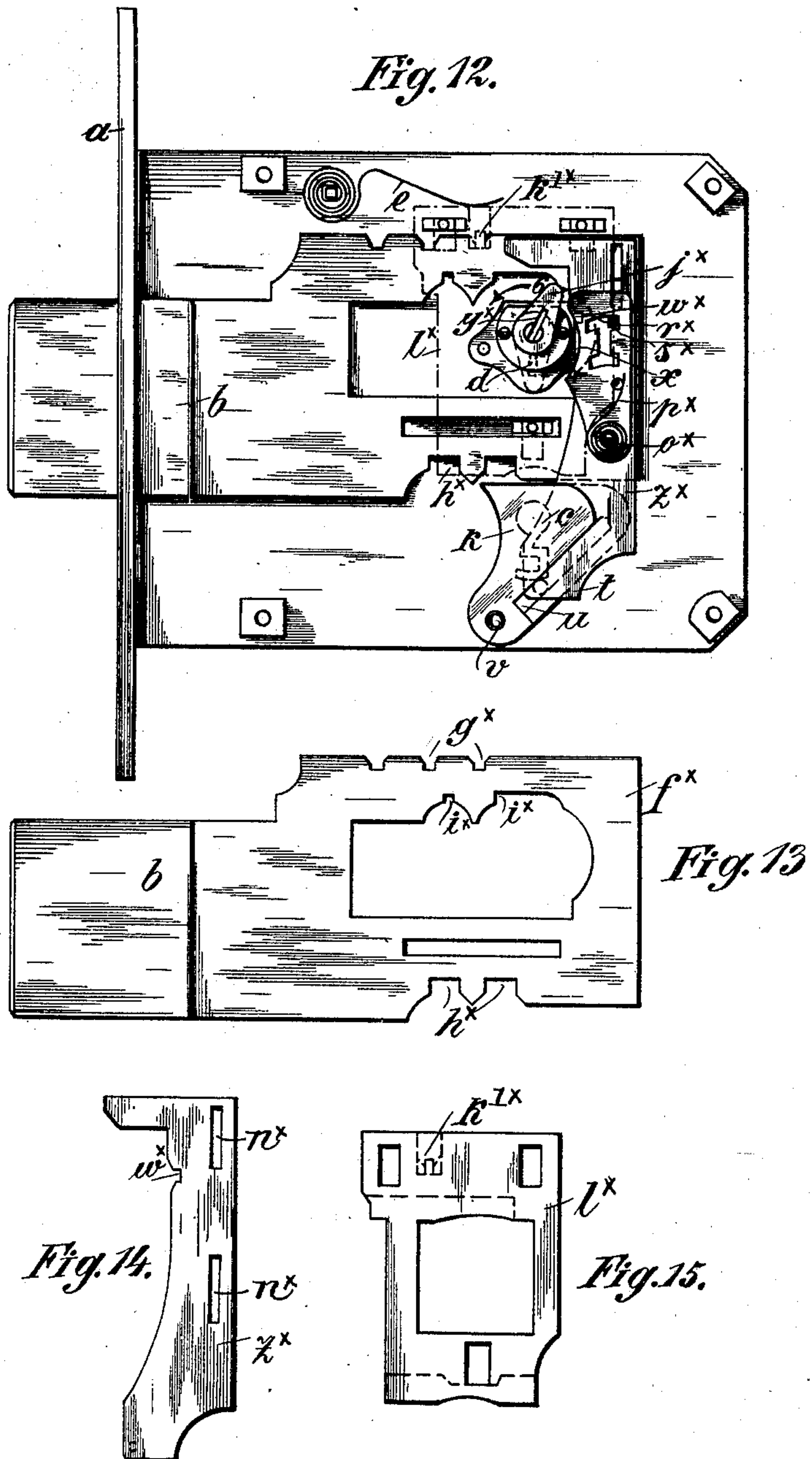
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4 SHEETS—SHEET 4.



Witnesses:  
J. W. Lutton  
H. C. Linnaford

Inventor:  
Paul Tropp,  
by Crosby & Gregory, Attys.



## UNITED STATES PATENT OFFICE.

PAUL TROPP, OF BERLIN, GERMANY.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 756,434, dated April 5, 1904.

Application filed September 20, 1902. Serial No. 124,143. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL TROPP, architect, a subject of the Emperor of Germany, residing at 11 Albrechtstrasse, Berlin, Germany, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates to a lock in which the bolt is operated from two points by two different keys and wherein the keyhole receiving one of the keys may be blocked by the other key in locking the lock.

Now the essential feature of the invention is that for the purpose of preventing access to the lock by one of the keys a special locking arrangement is provided, and the arrangement is such that its bolt through the main bolt of the lock becomes amenable to the action of one key the moment the said main bolt has been brought to the locked position. The main bolt is so constructed as to permit the key to move the additional or auxiliary bolt, hereinafter termed the "actuator," without its being moved forward itself. This arrangement in addition to its characteristic advantage of permitting the lock to be so locked with the main or master key that it cannot be opened with the ordinary key has the further property of enabling the bolt to be brought to the locked position both with the ordinary key and the master-key. The lock is preferably arranged for two turns of a key, so that the bolt may be brought to the second locked position by means of either of the two keys, and the improved construction further enables the lock to be so arranged as to be capable of being secured by any desired "safety" device.

The improved construction of the lock is illustrated in the accompanying drawings in two forms.

Figures 1 to 9 illustrate the first form of lock carried out in accordance with this invention. Fig. 1 is an elevation of the open lock. Fig. 2 shows the position of the parts after the first locking of the lock. Fig. 3 shows the position of the parts after the second locking of the lock. Fig. 4 illustrates the manner in which the keyhole receiving the ordinary key is by means of the special bolting mechanism blocked or shut off to further se-

cure the lock. Fig. 5 is a side elevation of the bolt. Figs. 6, 7, and 8 represent parts of the bolting mechanism, and Fig. 9 shows the tumbler for the bolt. Figs. 10 to 15 represent the other or modified form of lock. Fig. 10 is an elevation of the open lock. Fig. 11 is a similar view showing the positions of the parts of the lock after it has been locked the first time. Fig. 12 shows the position of those parts after the second locking. Fig. 13 shows the bolt forming part of this lock. Fig. 14 shows the part serving for the operation of the tongue of the bolting mechanism, and Fig. 15 shows the tumbler for the bolt.

The bolt *b*, guided by the face-plate *a*, is adapted to be operated by two differently-shaped keys—viz., by the ordinary key, which is to be inserted into the keyhole *c*, and by the main or master key, to be inserted into the keyhole *d*. Both locking mechanisms coöperate with the bolt *b* as they would do in any lock arranged to be locked by two turns of the key.

In the extension *f* at the rear of the bolt there are provided notches *g*, three being shown, in which the pin *h'* of the tumbler *l* engages in well-known manner every time the key is turned. The tumbler is controlled by the spring *e* and movable at right angles to the direction of motion of the bolt, (this being shown in Fig. 9 and indicated in dotted lines in Figs. 1 to 4.) The said extension *f* is furthermore provided with notches *h* on its lower side for the hinged piece or key-hub *j* to engage in, and said key-hub is adapted to be turned by the master-key inserted through the keyhole *d* and into the slot *y* of the key-hub itself. While the lock is open the said key-hub *j* occupies the position indicated in Fig. 1. When it is desired to lock the lock—say by means of the master-key—the said key-hub *j* is turned in the direction of the arrow 1, Fig. 1, so that it co-operates with the first notch *i* of the bolt extension *f*, (shown in full lines in Fig. 1,) two of such notches being provided. By making the key-hub *j* complete an entire revolution the bolt is brought to its first locked position, Fig. 2, and the said key-hub *j* becomes capable of engaging with the next notch *i* of



the bolt extension  $f$  for the purpose of moving the bolt to its second locked position, as illustrated in Fig. 3. Now as the key-hub  $j$  is turned farther the keyhole  $c$ , provided for the insertion of the ordinary key, is blocked by a shield  $k$ , revoluble on the fixed pivot  $v$ . To attain this result, the following arrangement is adopted.

With the extension  $f$  there is movably connected an actuator, shown as a plate  $z$ , guides  $m m$ , which form part of the said extension, engaging in slots  $n n$ , formed in the said actuator  $z$  to guide the latter in its movement relative to and transversely of the bolt. One of the guides carries a pivot  $o$ , on which is revolubly mounted a latch  $q$ , controlled by a spring  $p$ , said latch having notches  $r r$ , which are adapted to engage alternately with the pin  $s$  of the actuator  $z$  in the manner presently to be described. The actuator at its lower end is connected with a shield  $k$ , for which purpose a pin  $t$  of the actuator enters a slot  $u$  of the pivotally-mounted shield, the actuator being provided in its side near its upper end with a notch  $w$  for the key-hub  $j$  to engage in, while the latch  $q$  is so formed at  $x$  that when the key is turned it is pressed to one side, thereby into position to release the actuator.

Normally the parts of the lock occupy the position shown in Fig. 1, so that when the key-hub  $j$  is turned in the manner already described the actuator  $z$  is, owing to the transfer of the bolt from the position of Fig. 1 to the position Fig. 2, moved bodily by the extension  $f$  in the direction of motion of the bolt  $b$ , the pin  $t$  during this movement sliding within the slot  $u$  of the shield  $k$ . When the bolt has been projected as shown in Fig. 2, it is in locking position, and at such time the keyhole  $c$  is accessible to the ordinary key. When the key-hub  $j$  is turned farther, however, the position then being such as shown in Fig. 3, the effect of the coöperation of the said key-hub  $j$  with the notch  $w$  and the end or bit of the key, of suitable shape, with the curved edge  $x$  of the latch  $q$  will be to move the actuator  $z$  at right angles to the direction of motion of the bolt in the direction of the arrow 2 or upward after the latch  $q$ , which has been pressed out of the way by the key, has released the pin  $s$  from the lower notch  $r$ . The moment the actuator  $z$  has reached its highest position, in which it is represented in Fig. 4, the said pin  $s$  as the turning of the key is continued engages or enters the upper notch  $r$  of the latch  $q$ , which has by this time been released by the key, and the latch then locks the actuator in raised position. As a result of the displacement of the actuator just described the shield  $k$ , owing to the engagement of the pin  $t$  with the slot  $u$ , has been so turned that the keyhole  $c$  has become blocked—i. e., inaccessible to the other key. In this position the lock can only be opened with the master-key.

In order to enable the master-key to be removed from the lock when the key-hub  $j$  is in the position shown in Fig. 4, an aperture coinciding with the then position of the slot  $y$  of the key-hub  $j$  is provided in the cover-plate (not shown) of the lock. To secure the said key-hub  $j$  in the position Fig. 4, a spring 3 may be provided, such spring being secured to the bolt extension  $f$  and adapted to be pushed aside when the said key-hub is turned.

For some purposes it is desirable to provide the lock with special safety mechanism to secure it from being opened by unauthorized persons. In such cases the modified form shown in Figs. 10 to 15 of the accompanying drawings may be adopted. As in the arrangement previously described, the bolt  $b$ , guided by the face-plate  $a$ , may be operated by an ordinary key inserted into the lock through the keyhole  $c$  and also by a master-key inserted through the keyhole  $d$ , both keys actuating the bolt in the manner usual in locks arranged for two turns of a key, (double-locking.) In the bolt extension  $f^x$  (shown separately in Fig. 13) there are provided notches  $g^x g^x$ , with which the pin  $k^x$  of the tumbler  $l^x$  (shown in full lines in Fig. 15 and in dotted lines in Figs. 10 to 12) engages every time the key is turned. The tumbler is controlled by the spring  $e$ , as hereinbefore provided. In the extension  $f^x$  notches  $h^x h^x$  are provided for the key when it is inserted through the keyhole  $c$  to engage with and also notches  $i^x i^x$  for the key-hub  $j^x$  to engage with, such key-hub being adapted to be turned by the master-key when it is inserted through the keyhole  $d$  and engages in the slot  $y^x$  of the key-hub. The hub  $j^x$  in this form of the lock is fitted to the case 5 of a lock-securing or safety mechanism, whereof the construction is known and need not, therefore, be illustrated in the drawings. It substantially consists of a number of movable plates or tumblers of a shape corresponding to that of the bit of the key, so that only a key of that particular shape may be inserted to operate the lock, as in the well-known "Yale" type of lock. With the extension  $f^x$  the plate  $z^x$  is connected, for which purpose the guides  $m^x$  of the said flap engage in the slots  $n^x$  of the actuator  $z^x$ . One of the said guides carries a pivot-pin  $o$ , on which the latch  $q^x$  is fulcrumed and controlled by a spring  $p^x$ , the notches  $r^x$  of said latch alternately engaging with the pin  $s^x$  of the actuator  $z^x$ , as in the form of lock first described. The actuator  $z^x$  is at one end operatively connected with the shield  $k$  in the manner described of the first form of the lock. Near the other end the actuator is provided in its side with a notch  $w^x$ , with which the key-hub  $j^x$  is adapted to engage, while the latch  $q^x$  is so formed at  $x$  that when the key is turned it presses it to one side.

While the lock is open the key-hub  $j^x$  occupies the position shown in dotted lines in



Fig. 1. Suppose, for example, that the lock is to be locked by means of the master-key. The key-hub is then turned by such master-key in the direction of the arrow 4, Fig. 10, so that it engages with the first notch  $i^x$  of the extension  $f^x$ , as shown in full lines in Fig. 10. By a complete revolution of the key-hub the bolt is moved to its first locked position, (shown in Fig. 2,) and the key-hub may then engage with the next following notch  $i^x$  of the extension, (see Fig. 11,) so as to move the bolt to its second locked position, Fig. 12.

In the position dotted in Fig. 12 the key-hub has completed two revolutions; but the shield  $k$  does not yet cover the keyhole  $c$ . The key-hub is still capable of performing a further complete revolution, when it will so co-operate with the notch  $w^x$  of the actuator  $z^x$  that the latter will be moved upward at right angles to the bolt after the latch  $q^x$ , having been moved aside by engagement with the bit of the key, has released the pin  $s^x$ . This pin as soon as the actuator  $z^x$  has taken up its highest position (shown in Fig. 12) will as the turning of the key is continued engage in the other lower notch  $r^x$  of the latch  $q^x$ , released by the key. Owing to the displacement of the actuator  $z^x$  the shield  $k$  by reason of the engagement of the pin  $t$  in the slot  $u$  has also been so turned that the keyhole  $c$  has become blocked and inaccessible to the other key. The lock can now be opened only by means of the master-key.

In the position of the key-hub  $j^x$  shown in full lines in Fig. 12 the key, owing to the arresting action of the safety mechanism, cannot be withdrawn as in the first form of lock. This only becomes possible when the key has completed another turn—i. e., has been turned far enough to enable the key-hub to resume the position dotted in Fig. 12. It will thus be seen that in this case the key-hub remains idle during more than one-half of its revolutions. Thus whereas in the first form of lock—say in locking—the latch completes about two and one-half revolutions it may in the second form perform three complete revolutions, thereby permitting the additional safety device to be used.

The details of construction may vary without departure from the principle of the invention. The arrangement described is applicable to mortise-locks, box-locks, or padlocks.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a lock having two keyholes and a bolt adapted to be operated by two different keys, a shield to cover one of the keyholes, an actuator therefor movable with and also relatively to the bolt, and a latch to coöperate with said actuator and retain it in either of two positions, complete projection of the bolt by either key moving said actuator into po-

sition to be acted upon by the master-key only, final movement of the latter acting first to cause the latch to release the actuator and then to move the latter relatively to the bolt, to thereby move the shield into position to close its keyhole.

2. In a lock having two keyholes and a bolt adapted to be operated by two different keys, a key-hub operable by the master-key, a shield to cover the other keyhole, an actuator operatively connected therewith and movable bodily with and relatively to said bolt, a pin on said actuator, a latch having a plurality of locking-notches to be entered by said pin, and a spring to normally govern the latch, complete projection of the bolt by either key moving the actuator into position to be engaged by the key-hub, subsequent movement of the latter by the master-key causing the latch first to release the actuator and then moving the actuator relatively to the bolt to position the shield in front of its keyhole and close the latter.

3. In a lock having two keyholes and a bolt adapted to be operated by two different keys, a shield to cover one of the keyholes, an actuator therefor movable bodily with the bolt and also slidably connected therewith to be moved at right angles thereto, a latch pivotally mounted on said actuator and adapted to lock it from movement relatively to the bolt, and a key-hub operative by the master-key, additional movement of said key-hub by the master-key after complete projection of the bolt effecting release of the actuator from the latch and movement of said actuator at right angles to the bolt, to cause the shield to close the keyhole adjacent thereto and render it inaccessible to its key.

4. In a lock having two keyholes and a bolt adapted to be operated by two different keys, a shield to cover one of the keyholes, a key-hub operative by the master-key, an extension on the bolt provided with two sets of notches, to coöperate respectively with the key-hub and a key inserted in the keyhole having a shield, whereby by a double revolution of either key the bolt is fully projected, and means carried by said bolt extension to operate the shield, complete projection of the bolt bringing said means into position to be actuated by the key-hub by an additional movement thereof, without moving the bolt itself, such actuation of said means causing the shield to close or block its keyhole.

In testimony whereof I have hereunto set my hand, in presence of two subscribing witnesses, this 28th day of August, 1902.

PAUL TROPP.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.