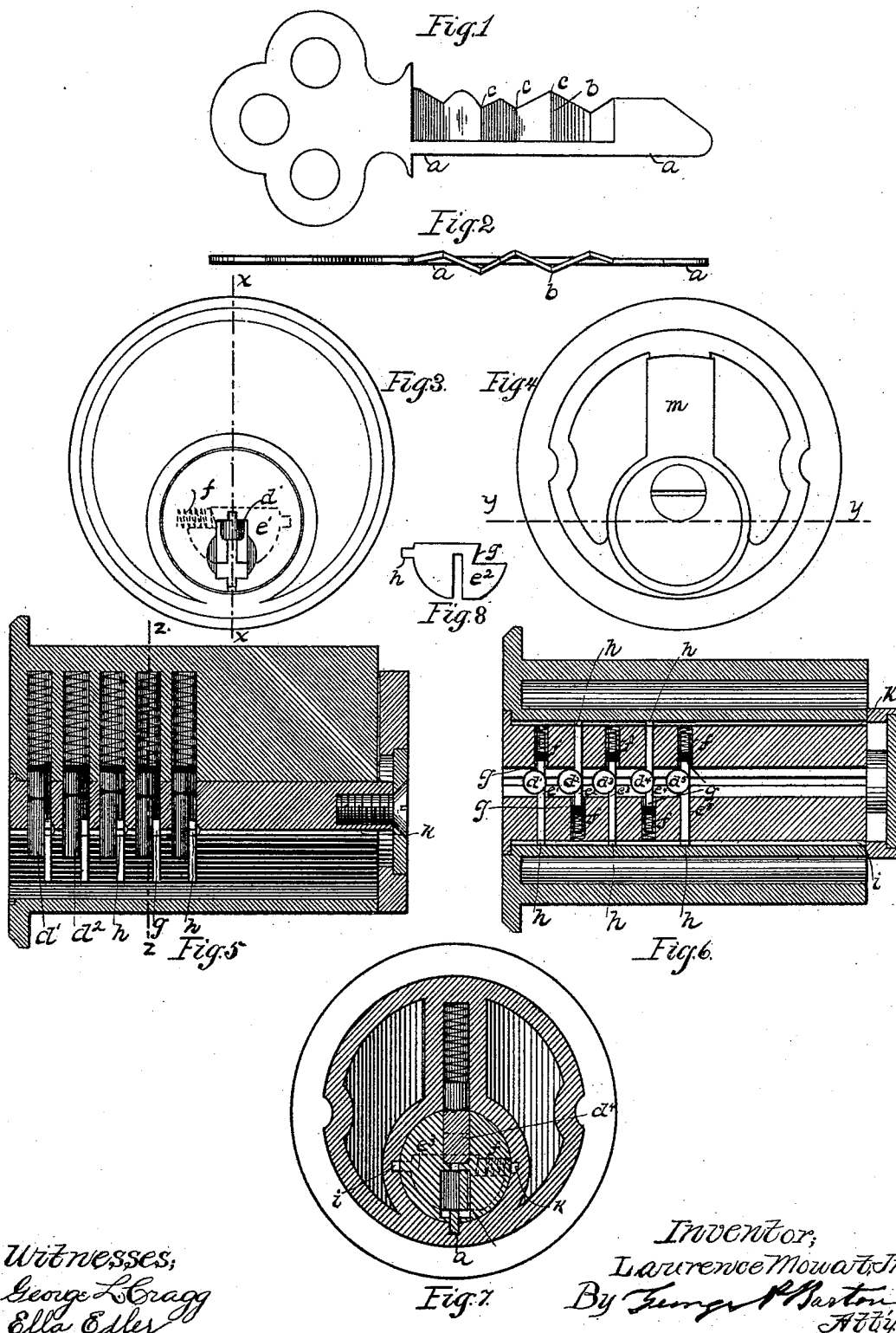


(Model.)

L. MOUAT, Jr.
CYLINDER LOCK AND KEY.

No. 464,579.

Patented Dec. 8, 1891.



UNITED STATES PATENT OFFICE.

LAURENCE MOUAT, JR., OF CHICAGO, ILLINOIS.

CYLINDER LOCK AND KEY.

SPECIFICATION forming part of Letters Patent No. 464,579, dated December 8, 1891.

Application filed June 15, 1891. Serial No. 396,271. (Model.)

To all whom it may concern:

Be it known that I, LAURENCE MOUAT, JR., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Cylinder Locks and Keys, (Case 5,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to combination-locks and keys therefor; and it consists, first, in a key provided with a straight edge on one side and a zigzag edge or portion on the other side, the zigzag edge or portion being preferably provided with a bit and the straight edge being preferably extended beyond the zigzag portion or brought to a point, so as to be readily inserted through the tumblers of the lock; second, in a lock having a case preferably in the form of a cylinder, this case being provided with a cylindrical opening, into which a cylindrical barrel provided with a key-hole and tumblers is fitted to be rotated therein, said barrel carrying upon its inner end an arm or wing which serves to throw the bolt of the lock in one direction or the other, accordingly as the barrel is turned to the right or left. This barrel is preferably provided with two sets of tumblers, and I have found it convenient to use five of each kind, the pin-tumblers being arranged vertically and in the line of the axis above the key-hole, and the plate-tumblers having notches or slots being placed in slots provided in the barrel, so that the key as it is inserted must pass through the notches or slots provided in these plate-tumblers one after the other. A portion of these plate-tumblers—say every other one—may be normally forced by their springs in one direction to enter a longitudinal groove in the bore or opening in the casing, while the others of the side plate-tumblers are forced each by its spring in the opposite direction, so as to enter a corresponding longitudinal slot on the other side of the said bore or opening in the frame. The pin-tumblers are placed, preferably, above the barrel and in line with the short pins in the barrel and corresponding in size thereto, said short pins being of such length that when the key is in-

serted the bit thereof, coming under said short pins, will force them up against the pin-tumblers in the corresponding holes in the casing, so that the upper ends of the short pins will be just flush with the outside of the barrel—that is to say, the short pins of the barrel will force the spring-pins of the casing into their holes in the casing just far enough so that there will be no engagement between the barrel and the opening in the casing to which it is fitted. Moreover, when the key is inserted the zigzag edge thereof is, so to speak, worked through the notched or slotted plate-tumblers and acts to move said plate-tumblers to the right and left until the key is fully inserted, whereupon said plate-tumblers will be held by the key against the force of their springs, so as to be out of engagement with the case—that is, the key being fully inserted disengages all the tumblers from the casing and so leaves the core free to be turned to the right or left as may be required to turn the bolt.

My invention is illustrated in the accompanying drawings, in which—

Figures 1 and 2 are side and edge views, respectively, of the key. Figs. 3 and 4 are front and rear views of the casing with the barrel in place. Fig. 5 is a sectional view upon line *xx* of Fig. 3. Fig. 6 is a sectional view upon line *yy* of Fig. 4. Fig. 7 is a transverse sectional view upon line *zz* of Fig. 5. Fig. 8 is a side view of one of the plate-tumblers.

Like parts are indicated by similar letters of reference throughout the different figures.

The key, as shown in Figs. 1 and 2, consists of the straight edge *a*, and the fluted or zigzagged portion *b*. The bit *c* is formed upon the zigzagged side, and may be of any desired outline, according to the combination of the tumblers. Such bitting of a key, the contour thereof conforming in outline in each instance to the particular combination of the tumblers is old in the art. The straight edge *a* and a fluted portion *b* in the same key, either with or without the bitting *c*, I believe to be broadly new, and by this construction I am enabled to compel the filling of the key-hole—that is, with the key—in order that the tumblers operated by the bitting may be made accessible—

that is to say, the lock is provided, as shown in Figs. 5, 6, and 7, with pin-tumblers d' d^2 , &c., in a manner well understood, and, in addition, with the notched plate-tumblers e' e^2 , &c. These plate-tumblers e' , &c., are placed one after the other, so that the slots or notches therein will break joints across the key-hole. Each of these plate-tumblers is held by a spring normally in position to enter a groove provided in the cylinder in which the barrel is placed. These plates e' e^2 , &c., may be of the form shown in Figs. 3 and 8. The spring f of each presses against the shoulder g , provided in the plate, so as to force the lug h into the appropriate groove or slot. Thus, as shown in Fig. 6, the plates e' e^2 , &c., are placed one behind the other, the alternate plates being in reverse position—that is to say, the lugs h of plates e' e^3 e^5 normally are held in the slot or groove i on the side of the cylinder, while the other plates e^2 e^4 are caused to engage with the groove k on the other side of the cylinder, and, as before explained, the insertion of the zigzagged key spreads these tumblers apart against the force of the springs pressing against the same to disengage the plate-tumblers from the cylinder.

It is evident that the spring-plate tumblers may be varied in construction and arrangement without departing from my invention as long as the insertion of the key disengages the said tumblers or in any way acts by compressing the springs thereof to permit the barrel to be freely revolved in the cylinder.

As shown most clearly in Fig. 5, the lower portions of the pin-tumblers rest upon the plate-tumblers. Thus the lower portion of pin-tumbler d' is provided with a shoulder, which shoulder rests, as shown, upon the edge of the plate e' . This construction I have found convenient, though it is evident that any other suitable stop or support might be provided instead of using the plate-tumblers. Bitting c of the key should be such that when inserted under the lower ends of the pin-tumblers d' d^2 , &c., they will be raised so that the division or divisions of these pins will come on a line with the surface of the barrel, so that there will be no engagement between the barrel and this cylinder. As previously described, the insertion of the key through the slots or notches in the plates e' e^2 , &c., on account of the zigzag construction of the portion b of the key, will act to disengage the lugs h of the plate-tumblers from the grooves i k of the cylinder. Thus when a key of the proper shape is inserted in the key-hole all the tumblers are brought into position, so that there will be no engagement between the barrel of the cylinder, and the key being turned turns the barrel with it. Projecting from the rear end of the barrel is an arm m , and as the barrel is turned by the key this arm m will be also turned. This arm engages with the bolt and throws the bolt when the key is thus turned.

I have not deemed it necessary to show the

bolt, since it is evident that the arm m may be made to throw the bolt in the usual manner.

When it is desired to lock and unlock the door from both sides, two locks are employed in connection with a single bolt in a well-known way. The alternate plates e' e^2 , being forced by their springs into opposite directions, cause their notches or slots to break joints across the key-hole, so that access cannot be had to the tumblers d' d^2 , or more especially to those tumblers farthest from the front, as tumblers d^3 d^4 d^5 , by inserting an instrument into the key-hole. It is therefore impossible to pick my lock. The only way to cause the joints in the pin-tumblers to register with the line between the barrel and the interior of the cylinder is to insert the zigzag key provided with the bit of the specific contour or outline required by the tumblers. It is evident that my key provided with the zigzag portion might be usefully employed in connection with locks in which the pin-tumblers were entirely omitted, in which case there would be no need of the biting upon the key. The key being inserted would simply serve to disengage the plate-tumblers from the grooves i k and so permit the barrel to be turned.

It is evident that my key having the zigzagged portion may be usefully employed with other forms of locks, and I therefore claim my key broadly—that is, without limitation as to any special form of the lock or of the tumblers which are operated by the zigzagged portion thereof.

Since the biting c might be cut in the straight side or portion a of the key instead of in the transversely corrugated or zigzagged portion b , I do not limit my claims on the key to the precise construction shown. It is evident that the key with the biting on either side might be used with locks having spring pin-tumblers and also spring plate-tumblers. Either the pin-tumblers or the plate-tumblers might be omitted if it should be desired to dispense with the function or work of either of these forms of tumblers.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The key provided with a straight edge on one side and a transversely-corrugated portion on the other side, in combination with a lock provided with tumblers, said tumblers having slots breaking joints across the key-hole, said key when inserted being adapted to force the tumblers apart, substantially as and for the purpose specified.

2. The key for the cylinder-lock, provided with a straight edge on one side and a transversely-corrugated portion on the other side, the edge of the transversely corrugated or zigzagged portion being provided with a biting and the straight edge being extended at the point of the key, substantially as and for the purpose specified.

3. The key having one side straight to serve as a guide and the other side transversely corrugated, one edge of said key being provided with a bitting and the straight side being extended beyond the bitting to form a flat point in the same plane with the straight side, substantially as and for the purpose specified.

4. The combination, with the cylinder-lock having the barrel provided with spring pin-tumblers and spring plate-tumblers, the plate-tumblers being provided with slots and placed one after another across the key-holes zigzag, or so as to break joints, and the key provided with a corresponding zigzag portion, of a bitting on the key corresponding in outline to the combination of the pin-tumblers, whereby on inserting the key the spring plate-tumblers are compressed by the zigzag portion of the key and the pin-tumblers compressed by the bitting of the key, all the tumblers being thus disengaged on the insertion of the key to permit the barrel to turn within the cylinder, substantially as and for the purpose specified.

5. The combination, in the lock, of a series of spring plate-tumblers provided with slots which normally break joints across the key-hole to prevent picking the same, and a key provided with a transversely-corrugated portion adapted to be inserted in said lock, substantially as and for the purpose specified.

6. A cylinder-lock provided with a barrel having two independent sets or series of tumblers which normally engage with the cylinder in which the barrel revolves, and a key having a bitting for one of said series of tumblers and a corrugated portion for the other set of tumblers, whereby on inserting the key the barrel is disengaged from the cylinder, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 13th day of June, A. D. 1891.

LAURENCE MOUAT, JR.

Witnesses:

GEORGE P. BARTON,
GEORGE L. CRAGG.

Correction in Letters Patent No. 464,579.

It is hereby certified that in Letters Patent No. 464,579, granted December 8, 1891, upon the application of Laurence Mouat, Jr., of Chicago, Illinois, for an improvement in "Cylinder Locks and Keys," an error appears in the printed specification requiring correction as follows: In line 24, page 1, the word "fisted" should read *fitted*; and that the Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 22d day of December, A. D. 1891.

[SEAL]

CYRUS BUSSEY,

Assistant Secretary of the Interior.

Countersigned:

W. E. SIMONDS,

Commissioner of Patents.