(Model.)

J. ROCHE.

LOCK.

No. 280,517. Patented July 3, 1883.

Fig. 1.

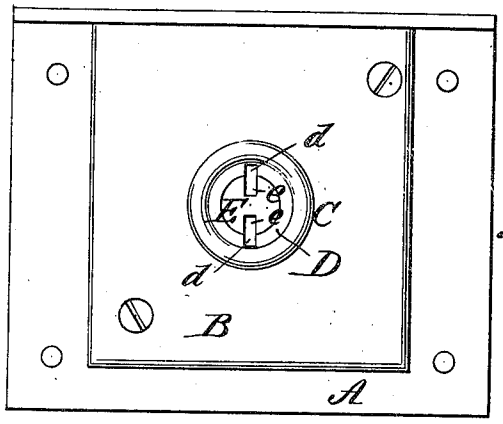


Fig. 2.

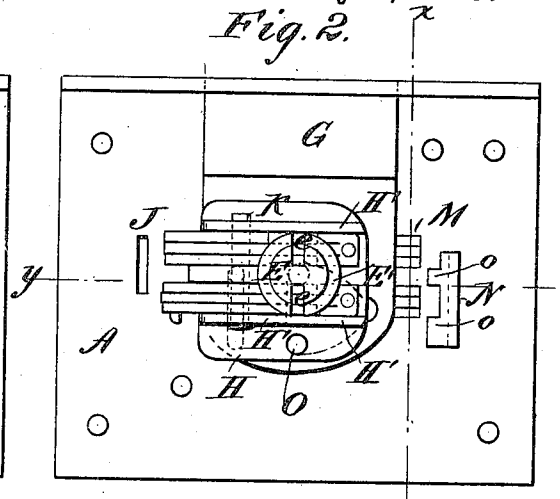


Fig. 3.

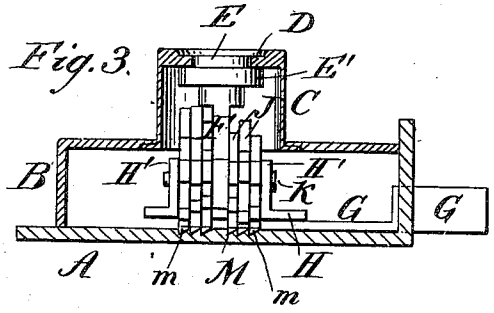


Fig. 4.

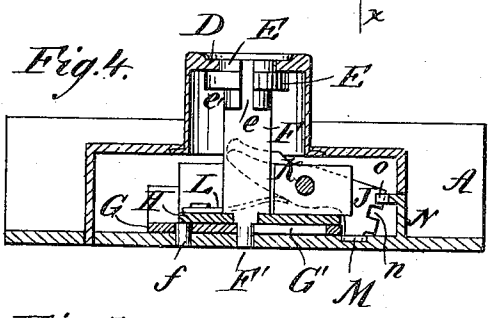


Fig. 6.

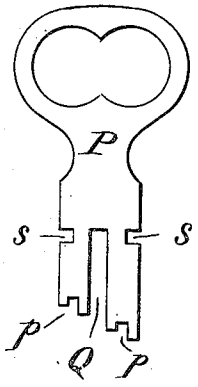
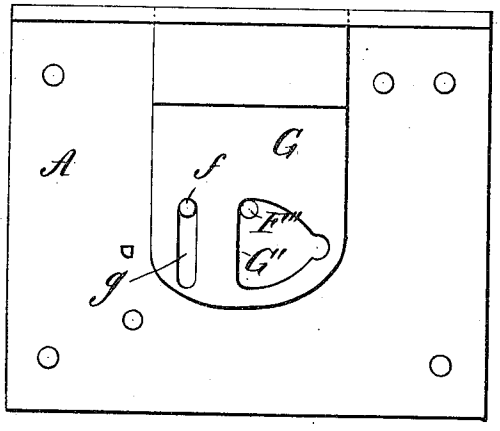


Fig. 5.



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LOCK.

SPECIFICATION forming part of Letters Patent No. 280,517, dated July 3, 1883.

Application filed February 12, 1883. (Model.)

To all whom it may concern:

Be it known that I, JAMES ROCHE, of Terryville, in the county of Litchfield and State of Connecticut, have invented a new and Improved Lock, of which the following is a full, clear, and exact description.

My invention relates to that class of locks having a sheet-metal key which is inserted in a projecting key-barrel.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the lock. Fig. 2 is an elevation of the same, showing the front plate removed. Fig. 3 is a cross-sectional elevation of the same on line *x x*, Fig. 2. Fig. 4 is a longitudinal sectional elevation of the same on line *y y*, Fig. 2. Fig. 5 is a longitudinal view of the back plate and bolt, showing the other lock mechanism removed. Fig. 6 is a longitudinal view of the key used for my improved lock.

On the back plate, A, a cap or box, B, is secured by means of screws or otherwise, which cap or box contains the lock mechanism, and is provided with a barrel or cylinder, C, projecting from the said cap, which barrel is provided at its outer end with an inwardly-projecting annular flange, D, provided with two diametrically-opposite notches, *d*, which annular flange forms a guide for the key while the same is being turned on its longitudinal axis when inserted in the barrel, as will be fully described hereinafter. Into the circular opening in the outer end of the barrel C a circular head, E, fits, which is formed on the upper end of a spindle, F, provided at its lower end with a pivot, F′, passing into an opening, F″, in the back plate, A, on which pivot F′ the spindle F and its head E turn, the center of the said pivot F being in the longitudinal central axis of the barrel C. The head E is provided with a laterally-projecting annular ridge, E′, fitting against the under side of the annular flange D. The head E is provided with two diametrically-opposite vertical notches, *e*, of the same width as the notches *d*. The pivot F′ passes through an opening, G′, in the bolt G, which is held to slide on the back plate, A, the said bolt being guided in its movement by a pin, *f*, projecting upward from the upper surface of back plate into a longitudinal guide-slot, *g*, in the bolt G. A plate, H, rests loosely to turn on the bolt G, and is united with the spindle F in such a manner that it can turn with the same; and the said plate H is provided with two upwardly-projecting ridges or jaws, H′, in which a series of tumblers, J, are pivoted between their ends by means of a transverse pintle, K, passing through the vertical plates or jaws H. The tumblers are each of a different shape, as in all locks, and are so placed that one end of each tumbler projects beyond the edge of the plate H. Springs L, secured to the plate H, press the opposite ends of the tumblers upward, so that those ends projecting beyond the edge of the plate H will be pressed downward. Those ends of the tumblers projecting beyond the edges of the plate H have their lower edges, *m*, beveled, to adapt the said edges to fit into beveled recesses, forming a rack, M, in the upper surface of the back plate, A. A bridge-ward, N, consisting of a bridge projecting from the upper surface of the back plate, is provided in its upper end with one or more teeth, *o*, projecting toward the central pivot of the lock. The tumblers are provided at the ends projecting over the plate H with notches *n*, through which the teeth *o* pass when the lock is being opened or closed. A pintle, O, projects from the plate H into the opening G′ in the plate G. The key P is provided with a longitudinal recess, Q, in its lower end, and also with a series of notches, *p*, in the lower end, which notches are arranged according to the shapes of the tumblers, and can be arranged in various different ways. In its longitudinal edges the key is provided with two opposite notches, *s*, which are of sufficient width to permit the annular flange D of the barrel C to pass into them. The upper end of the longitudinal recess Q must project up to the upper edges of the notches *s*.

The operation is as follows: When the bolt is thrown, as shown in Fig. 3, to lock the drawer or other article to which the lock is fastened, the beveled ends of the tumblers J engage with the teeth of the rack M, the said beveled ends of the tumblers being pressed into the recesses between the teeth of the rack

by the springs L. As long as the teeth are in this position the plate H, which carries the entire lock mechanism, and which moves the bolt, cannot be turned; and, furthermore, even if the ends of the tumblers could be forced out of the rack the ends of the tumblers would strike against the teeth *o o* of the bridge-ward N, and would thus prevent the turning of the plate H and the withdrawing of the bolt. The plate H can only be turned when the tumblers J have been raised to such an extent that the notches *n* of the several tumblers are in a line and on a level with the teeth *o*, so that the said teeth can pass through the notches *n;* but the tumblers can only be raised in the above-described position by means of a key the inner end of which is notched in such a manner that it depresses the tumblers more or less—that is to say, depresses each tumbler only to such an extent that its outer end will be raised to the desired height to permit the teeth *o* to pass through the notches *n*. As the tumblers are pivoted between their ends, their outer ends will be raised, when the inner ends are depressed, by means of a key, and as the tumblers are pivoted near their middle, they will be almost balanced, and but very weak springs L will be required to raise the inner ends of the tumblers, and no great exertion or force is required to press the key into the barrel and to depress the inner ends of the tumblers for releasing the plate H. It is absolutely necessary that the key should always be held in the same position while it is being turned, as otherwise it might happen that some of the tumblers are raised or lowered while the key is being turned. When the bolt is thrown or contained altogether within the lock-casing, the notches *e e* will be opposite the notches *d d*, and through the aperture formed by the notches *d e* the shanks of the key can be inserted. When the key has been inserted to such an extent as to depress the inner ends of the tumblers as much as is requisite, the key can be turned, as the notches *s* of the key will then be in such a position that the annular flange D can pass into the same. The annular flange D forms a guide for the key while the same is being turned, and prevents the key from being raised or lowered during the above-described movement. The key turns the head E, the spindle F, on which the head is formed, and the plate H, connected with the spindle F, which plate carries the entire lock mechanism. I have thus provided a lock in which the entire mechanism turns with the spindle, which is turned by the key. The lock is perfectly secure, as it can be opened only by the key fitting the same. It is very simple in construction, is cheap, and innumerable variations and modifications can be made for any variety of keys without deviating from the general principle of the lock.

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

1. The combination, with the back plate, A, having opening F″ and pin *f*, and the lock-cap barrel C, provided with a circular opening at the outer end, and a flange having opposite notches, *d d*, of the spindle F, having circular head E, with ridge E′ and notches *e*, and the pivot F′, the slide-bolt G, slotted at *g*, and provided with opening G′, and the tumbler-plate H, adapted to turn with the spindle, whereby the mechanism will turn with the spindle, as described.

2. The combination, with the plate H, having jaws H′, of the differently-shaped tumblers J, pivoted in said jaws, projecting with one end beyond said plate and beveled at their lower edges, the rack M on plate A, the springs L, and the bridge-ward having teeth *o*, whereby the plate H is locked, so that only a key of the form specified will avail to shoot the bolt back, as described.

3. In a lock, the combination, with a back plate, A, provided with a rack, M, of the tumblers J, having beveled ends adapted to engage with the teeth of the said rack, and the plate H, for carrying the tumblers, substantially as herein shown and described, and for the purpose set forth.

4. In a lock, the combination, with a bolt, G, provided with an opening, G′, of the plate H, provided with a pintle, O, extending into the opening G′, the standard F, on which the plate H is mounted, the bridge-ward N, and a series of tumblers pivoted on the plate H, substantially as herein shown and described, and for the purpose set forth.

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R. J. PLUMB.