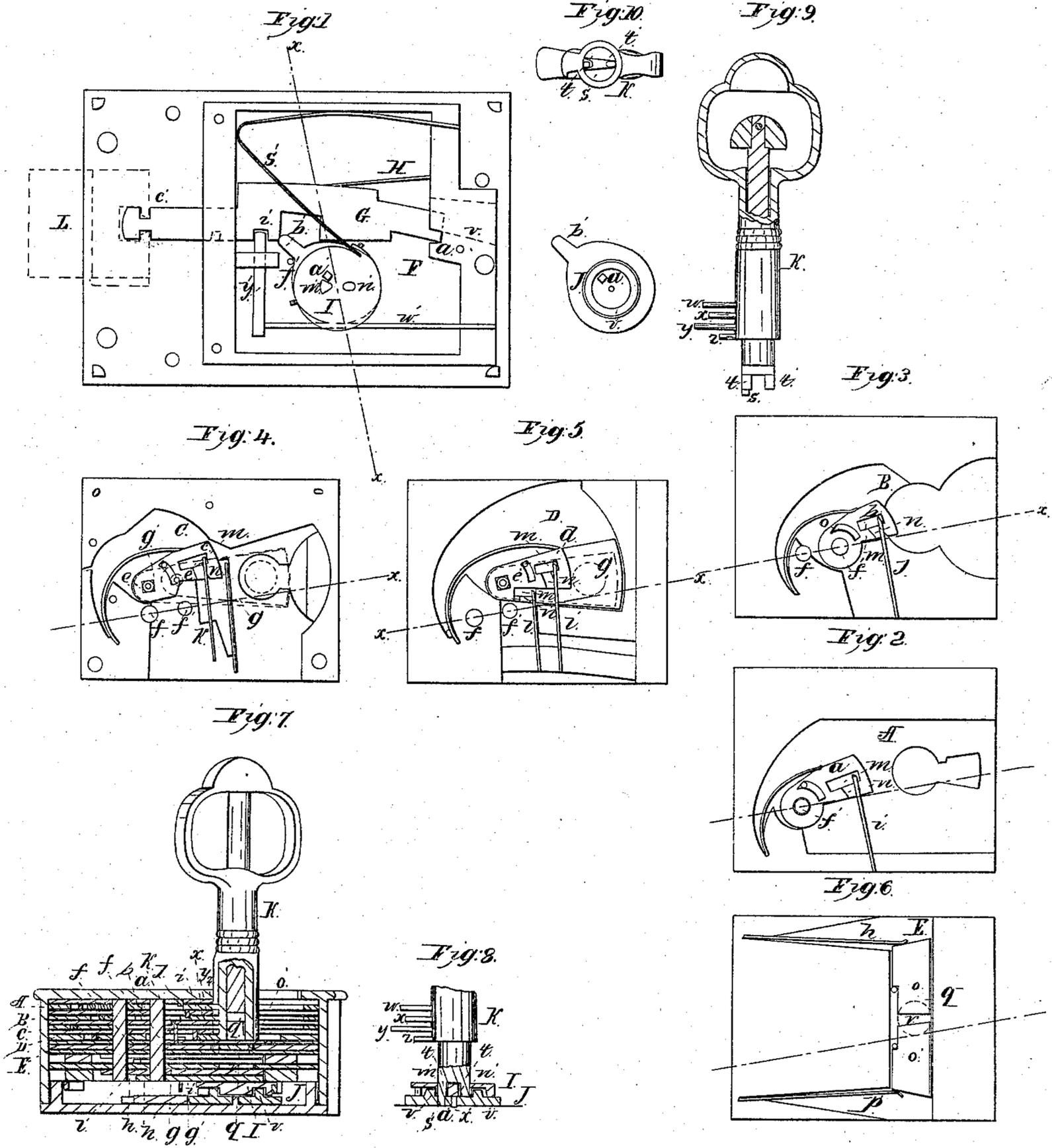


*G. W. Coppermoll,
Lock.*

N^o 15,800.

Patented Sep. 30, 1856.



UNITED STATES PATENT OFFICE.

G. W. COPPERNOLL, OF OHIO, NEW YORK.

LOCK.

Specification of Letters Patent No. 15,800, dated September 30, 1856.

To all whom it may concern:

Be it known that I, G. W. COPPERNOLL, of Ohio, in the county of Herkimer and State of New York, have invented a new and Improved Bank, Vault, and Safe Lock; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, forming part of this specification, in which—

Figure 1 shows the interior of bolt chamber; and eccentrics actuating the bolt. Fig. 2 shows first or outer tumbler and its spring catch. Fig. 3 shows second tumbler and its spring catch. Fig. 4 shows third tumbler and its spring catch. Fig. 5 shows fourth tumbler and its spring catches. Fig. 6 shows the sliding guards in front of entrance to bolt chamber. Fig. 7 is a section on $x x$ showing relative position of the several parts of the guard portion of the lock, and the external key. Fig. 8 shows the movable portion of the key engaged with the eccentrics. Fig. 9 is a view of key, showing the fixed and movable portions thereof. Fig. 10 is an end view of the key.

Similar characters of reference in the several figures denote the same part.

The nature of my invention consists in constructing the lock of an outer or guard portion, and an inner portion containing the bolt and the mechanism by which it is moved: the guards of the outer portion being all moved by tumblers secured by spring catches, actuated by the several fingers of the key; except a sliding guard which is removed by an interior and longitudinally moving portion of the key, which portion of the key after passing through the guards operates progressively to move two superposed eccentrics, which remove certain guards and otherwise act on the bolt as will be hereinafter described to effect the locking and unlocking, the construction of this lock being such that it cannot be picked, nor an impression taken for the construction of a false key.

The details of construction will be understood from the following description, and reference to the drawings, in which the several parts are represented as follows:

A, B, C, and D are the plates of the outer portion of the lock upon which the several guard tumblers a, b, c and d move; which movement of the tumblers partially rotates

shafts e, e', f, f' , and thus move guards g, g', h, h' , secured to the opposite extremities of said shafts. These several tumblers are held in position by spring catches $i, j, k,$ 60 and l, l' . These several catches, having projections within the slots m of the tumblers, which securely hold them, until by the lifting of the catches, the grooves n, n' in the tumblers permit the tumblers to pass clear 65 of the catches. The tumblers $a, b,$ and $c,$ have each one of these spring catches, and the tumbler d has two catches l, l' , thus requiring the action of two fingers of the key to release this last named tumbler. The 70 other tumblers are moved by the same fingers which lift the spring catches. Thus:—finger w lifts catch i and moves tumbler a —finger x operates catch j and tumbler b —finger y and catch k and tumbler c . But 75 to move the inner tumbler d , finger y must move catch l and finger z move catch l' , before the tumbler will move under the action of finger z .

Inside of the parts above described is the 80 plate E having two sliding guards o, o' , kept closed as shown in Fig. 6 by springs p, p' . These guards are directly in front of the circular opening q (Fig. 7), and are pressed aside by the insertion of the movable por- 85 tion of the key, as will be described.

The key K is composed of two parts:—a fixed portion to which the fingers are attached and a secondary portion capable of both rotary and longitudinal movement 90 within its outer case. The protruding end of this secondary key has the form shown in Fig. 10, which enters opening r between the sliding guards o, o' . A small point s projects from the main point t , which turns 95 the inner eccentric.

F is the lock chamber, within which is the bolt G, which when shot, drops downward under the action of a spring H, and is held in recess u . When the bolt is with- 100 drawn its tail moves in channel v . Below the bolt are two eccentrics I and J: the lower J turning on a pin x' , and the upper I having a groove which moves upon the circular flange v' of the lower eccentric. The edge 105 of the upper eccentric presses against the spring w' , and withdraws the bolt y' from notch z' . In the upper eccentric I are two holes m', n' , which are directly under the circular opening through which the second- 110 ary key passes. The points t, t' of this key enter these holes, and by them the eccentric

I is turned a short distance, so as to bring the small point *s* over the hole *a'* in eccentric J. Both eccentrics are then turned with the following effect: I withdraws bolt *y'*,
 5 and J lifts the tail of the main bolt into channel *v*, and arm *b'* withdraws the bolt. If the bolt be in, then the arm of eccentric J shoots the bolt and eccentric I withdraws bolt *y'*. The spring *S'* always returns the
 10 eccentric I to its position. The bolt head L is attached to the bolt by notch *e'*.

The operation of this lock is as follows: Supposing the bolt shot, as is shown in the drawing. The secondary key is drawn
 15 entirely within the main key; which is inserted to the distance shown in Fig. 7; this causing it to rest upon a plate *q'* which forms a part of tumbler *d*. The key is then turned to the right, causing the movement
 20 of the tumblers as above described, and the consequent rotation of shafts *e, e', f, f'*. These shafts remove the guards *g, g', h, h'* from both sides of the circular opening *r'*. As tumbler *d* moves the plate *q'* slides from
 25 under the main key, and unmask the sliding guards *o o'*. The secondary key is then allowed to descend and enter the opening between the slides *o o'*. This key is then turned, causing the slides to part and admit
 30 the circular portion of the key to pass. The secondary key then moves onward through the circular openings *q* and *r'*, and reaches the eccentric I, which it engages and operates as above set forth. To shoot the bolt,
 35 the guards are withdrawn in the same man-

ner as above stated, and the eccentric J moved in the opposite direction. When the key is withdrawn all the guards resume their places not to be moved until the key is again inserted and operated as above described. 40

The swinging guards *g, g', h, h'*, as also all plates in front of the circular openings are of hard steel through which it is impossible to drill.

The swinging guards are only to be moved 45 by the turning of the shafts to which they are attached.

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

1. The swinging guards in front of the 50 bolt chamber actuated by the fixed portion of the key, in combination with the sliding guards actuated by the secondary key; arranged and operating as, and for the purposes specified. 55

2. The eccentrics I and J arranged relative to each other and the bolt as set forth, and actuated by the secondary key, after the removal of the guards, substantially as and for the purposes specified. 60

3. The combination of the swinging guards, tumblers and spring catches, operating substantially as specified.

In testimony whereof, I have hereunto signed my name before two subscribing wit- 65 nesses.

G. W. COPPERNOLL.

Witnesses:

GEO. PATTEN,
 JOHN S. HOLLINGSHEAD.