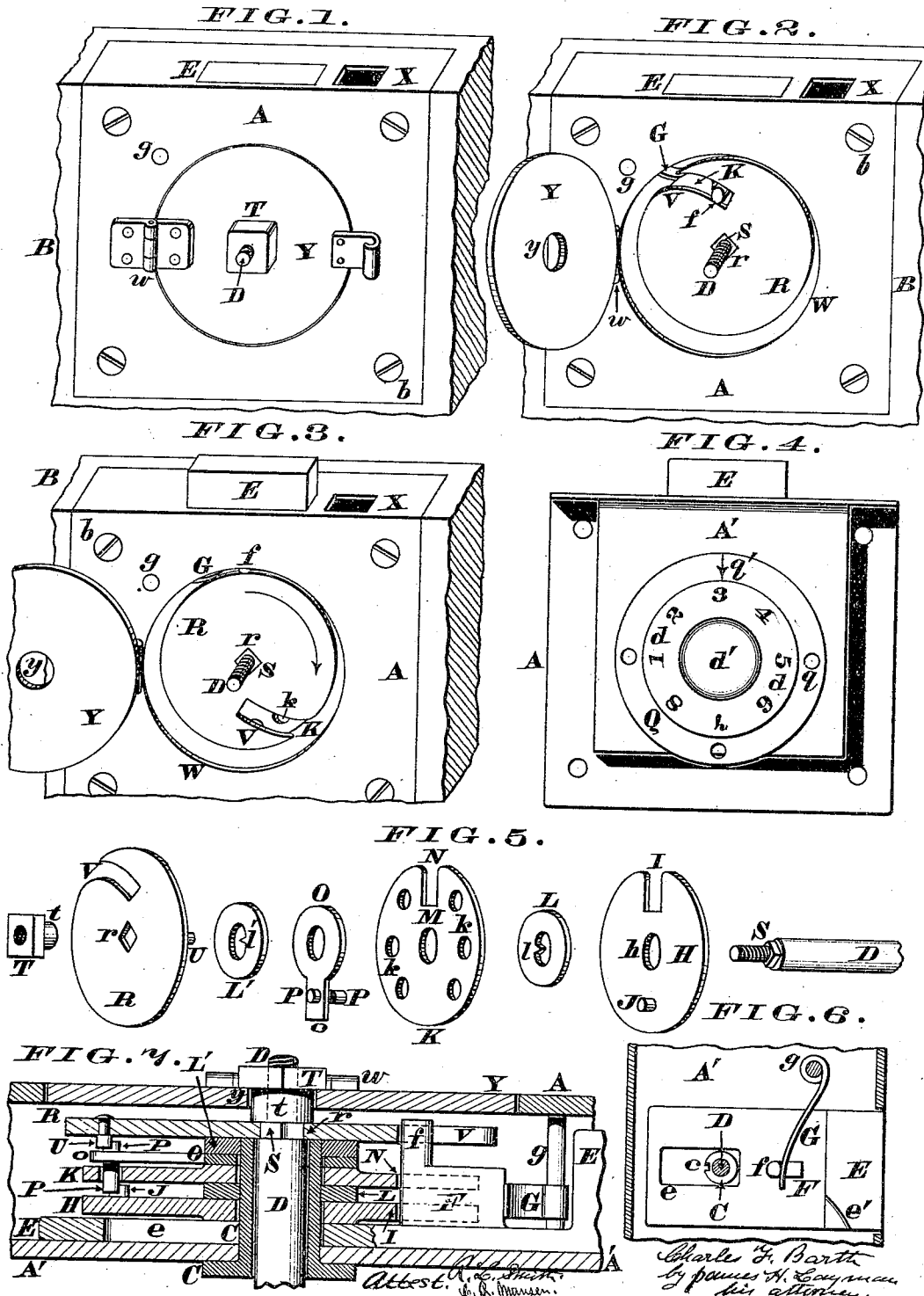


C. F. BARTH.
COMBINATION DRAWER-LOCKS.

No. 178,585.

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UNITED STATES PATENT OFFICE

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IMPROVEMENT IN COMBINATION DRAWER-LOCKS.

Specification forming part of Letters Patent No. **178,585**, dated June 13, 1876; application filed February 14, 1876.

To all whom it may concern:

Be it known that I, CHARLES F. BARTH, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Drawer-Locks, of which the following is a specification:

This invention relates to a cheap and simple form of rotary tumbler-lock, especially applicable to drawers, money-tills, and all other general purposes; and my improvements comprise the following instrumentalities, to wit: First, a hinged shutter or cap applied to the inner side of the lock, which shutter, when opened, admits light to the interior of the case, and enables a person to see through a slot in the top of said case, so as to ascertain on what combinations the tumblers are set; second, a driving wheel or disk secured to a non-circular shank on the inner end of the spindle, said wheel being provided with an eccentric slot that is traversed by a stud constituting part of the stump, which latter projects from the bolt. This wheel acts to protrude said bolt, and also to drive the rotary tumblers. Third, an improved arrangement of devices for changing the combinations of the rotary tumblers, of which latter two or more may be employed. Fourth, arranging the stump in such a manner as to perform the triple functions of engaging with the gates in the tumblers, of serving as an abutment to receive the stress of the spring that retracts the bolt when the drawer is unlocked, and also of being acted upon by the driving-wheel so as to protrude said bolt.

In addition to the above-described features I have devised other, but minor, improvements, the details of which will be hereinafter fully explained.

In the accompanying drawings, Figure 1 is a perspective view, showing my lock applied to a drawer or till, the shutter being closed and the bolt retracted. Fig. 2 is a similar illustration, but showing the shutter opened and the stump engaged with the eccentric slot of the driving-wheel. Fig. 3 is a perspective view, representing the driving-wheel rotated and the bolt protruded. Fig. 4 is an elevation of the front of the lock detached from the drawer. Fig. 5 is a perspective view of the various operative parts of the lock detached

from each other. Fig. 6 is a plan of the bolt and its accessories; and Fig. 7 is an enlarged vertical section through the lock in the plane of the stump.

A represents the lock-case, which case is secured to the inner side of drawer or till B with screws *b* or otherwise. Projecting rearwardly from the front plate *A'* of said case is a tube, C, whose external surface serves as a bearing for the rotary tumblers, the washers, and the changing device, while the bore of said tube is traversed by the spindle D, whose outer end carries the dial *d* and a milled head or knob, *d'*, wherewith said spindle is rotated. Bearing upon the aforesaid front plate of the case is a reciprocating bolt, E, having a longitudinal slot, *e*, which is traversed by the tube C. One side of this bolt is excavated, as shown at *e'* in Fig. 6. Projecting at right angles from said bolt is the stump F, having a prolongation or stud, *f*, which latter traverses the eccentric slot of the driving wheel or disk, as will presently appear.

The lower edge of stump F is adapted to enter the gates of the various rotary tumblers, while the upper edge of said stump sustains the stress of a spring, G, which acts to retract bolt E the moment all of the tumblers and the driving-wheel are brought into a proper position. The fixed end of spring G is secured to a lug, *g*. Resting upon bolt E is a disk-tumbler, H, having a central circular orifice, *h*, that fits snugly around the tube C. This tumbler is gated at I to receive the stump F, and it is provided with a rearwardly-projecting pin, J, whose office will presently appear. Interposed between this tumbler H and the second one, K, is an annular washer, L, which is prevented from rotating around the tube C by means of the tongue *l*, which enters the longitudinal groove *c* of said tube. This groove is seen in Fig. 6. Resting upon this washer is the second tumbler, K, having a central circular orifice, M, a gate, N, and a series of apertures, *k*, said apertures being arranged in a row concentric with the axis of said tumbler. O is a ring adapted to surround the tube C. This ring has an arm, *o*, through whose outer end a pin, P, is passed, so as to project in two opposite directions, as seen in Figs. 5 and 7. The longest member

of this pin projects toward the front plate A', and is adapted to pass through either one of the apertures *k* of tumbler K, so as to drive the other tumbler, H, by contact with the pin J, as seen in Fig. 7.

Located between the ring O and driving-disk R is an annular washer, L' U', precisely similar to the one previously described. The aforesaid driving disk or wheel is of somewhat larger diameter than the tumblers, and it is pierced with a square eye, *r*, that engages over the non-circular shank S of spindle D. This square eye and non-circular shank allow the wheel R to be secured in four different positions, which variations of said wheel produce as many changes in the combinations, independent of those effected with the devices K k O o P. T is a nut, that secures the driving-wheel in position. Projecting from this wheel toward the tumbler K is a pin, U, that engages with the short projection of pin P when said wheel R is rotated. Furthermore, this wheel is furnished with an eccentric slot, V, that is traversed by the stud *f* of the stump F. W represents a suitable opening in lock-case A, which opening is covered with a shutter or cap, Y, hinged to the case at *w*. This shutter has a circular orifice, *y*, at its center, of sufficient diameter to receive the hub *t* of nut T, by which arrangement said nut serves to lock the shutter, and at the same time to secure the disk, tumblers, &c., in their proper positions upon tube C and spindle D; or, if preferred, a glass window may be substituted for said shutter, in which case the orifice *y* can be omitted.

The top of the lock-case has an aperture or slot, X, in it, of sufficient capacity to allow a person to observe the upper part of the tumblers as soon as shutter Y is opened and light admitted to the interior of said case.

Resting upon spindle D, immediately in rear of dial *d*, is a ring, Q, that is secured to the outside of the draw or till by means of screws passing the holes *q*. This ring is provided with a suitable pointer or indicator, *q'*, to designate the exact place where the rotation of dial *d* is to be arrested in unlocking the bolt. When the lock is in its normal condition, as seen in Figs. 1, 2, 6, and 7, the bolt E is retracted, and the stump F is engaged with the gates I and N, the projecting end or lug *f* of said stump being inserted in the eccentric slot V of driving-wheel R. This is the condition the lock is in when it is sold, and the purchaser can throw the bolt by turning the knob *d'* to the left, as indicated by arrow in Fig. 3, which act causes the eccentric slot V to bear against the stud *f* in such a manner as to force the bolt out. A few revolutions of the knob to the left disarranges the tumblers so effectually as to prevent the bolt being retracted until their previous arrangement is exactly restored. To discover the combinations the shutter Y is opened, and the owner of the lock then looks into the case through slot X, and turns the knob *d'* to the

right until the gate I of tumbler H is brought in line with stump F, the excavation *e'* of the bolt E, enabling him to see directly into the gate as soon as the latter is brought vertically above the spindle D. He then refers to the dial *d*, and notices what letter or numeral on said dial is brought in line with pointer *q'*, thereby indicating the letter the tumbler H is set upon.

The knob is now rotated to the left until the gate N of tumbler K is in line with the stump. The operator again refers to the dial and indicator, and notices what letter the second tumbler is set upon, and thus obtains the combinations of the lock. The knob *d'* is now turned to the right, and when the driving-wheel R has rotated far enough the stress of spring G forces the bolt E back, the stump F engaging with gates I and N, and the lug *f* entering the eccentric slot V. This act prevents any further rotation of the knob to the right.

The owner of the lock having thus obtained a knowledge of its combinations, he can at any time open the lock after the bolt has been thrown by the following movements: He first turns the knob *d'* to the left, so as to shoot the bolt, and then he makes a few more revolutions in the same direction to shift the tumblers. After this has been done he turns said knob to the right a number of times, say four or five, and stops as soon as the proper letter for tumbler H is in line with pointer *q'*.

He then reverses the movement, and turns to the left until the letter for tumbler K is twice brought in line with said pointer. The knob is then turned to the right again, and when it has rotated far enough, the stress of spring G drives the stump F into the notches I N V, thereby instantly retracting the bolt, and preventing any further revolution of the wheel R to the right.

If at any time it should be desired to change the combinations, it can be effected in a few minutes by opening the door V, removing the driver R and washer L' U', and then inserting the pin P in a different aperture, *k*, in the tumbler K; or the change can be effected by simply shifting the wheel R upon the square shank S of spindle D; or both of the above-described changes can be made at the same time.

The driving-wheel R is of somewhat greater diameter than the tumblers H and K, and, consequently, said wheel sustains the entire stress of the stump F, when the bolt E is locked, by which means this stump is maintained out of contact with said tumblers, and the friction of the operative parts is reduced accordingly. This enlarged diameter of the driving-wheel renders it an impossibility for a burglar to discover when the gates I and N are in line with each other, as the position of tumblers H K cannot be ascertained by any rotation of disk R, in either direction. In fact, this disk serves to mislead the burglar by the "clicking" noise that is made every

time the stud *f* passes across the open end of slot *V*, as he naturally supposes the sound is produced by the stump striking against the edges of the gates.

In Fig. 7 the various driving-pins *J*, *P*, and *U* are shown as being in the same vertical plane as the gates *I* *N* and slot *V*, so as to avoid confusion in the illustration; but in practice this arrangement would be altered, as far as the position of pin *U* is concerned. Said pin is not placed diametrically opposite slot *V*, but it is so located with reference to the same as to allow wheel *R* to rotate far enough to expel the stump *F* from the gates *I* and *N* before said pin strikes the one, *P*, and shifts tumbler *K*.

I claim as my invention—

1. A drawer-lock, whose case *A* is provided with a shuttered opening, *W* *Y*, and a slot or aperture, *X*, which slot is so located as to permit inspection of the gated tumblers, when said shutter is opened, substantially as described.

2. The driving wheel or disk *R*, secured to spindle *D*, and actuating the tumblers, sub-

stantially as described, said disk being provided with an eccentric slot, *V*, that is traversed by stud *f* of stump *F*, which latter projects from the reciprocating bolt *E*, in the manner set forth.

3. The combination of tube *C* *c*, spindle *D*, reciprocating bolt *E*, stump *F* *f*, retracting-spring *G*, tumblers *H* *h* *I* *J* *K* *k* *M* *N*, washers *L* *l* *L'* *l'*, changing device *O* *o* *P*, and driving-wheel *R* *U* *V*, as and for the purpose stated.

4. The nut *T* *t* for maintaining the driving-wheel *R*, tumblers *H* *K*, and washers *L* *L'* in position upon tube *C*, and at the same time securely closing shutter *Y* *y*, in the manner explained.

5. The notch *e'* in bolt *E*, when the latter is fitted in a slotted lock-case, *A* *X*, to permit inspection of the gated tumblers, as set forth.

In testimony of which invention I hereunto set my hand.

C. F. BARTH.

Witnesses:

JAMES H. LAYMAN,
JOHN BENKNER.