(No Model.) 2 Sheets—Sheet 1.

I. G. BLAKE.

TIME LOCK.

No. 588,627. Patented Aug. 24, 1897.

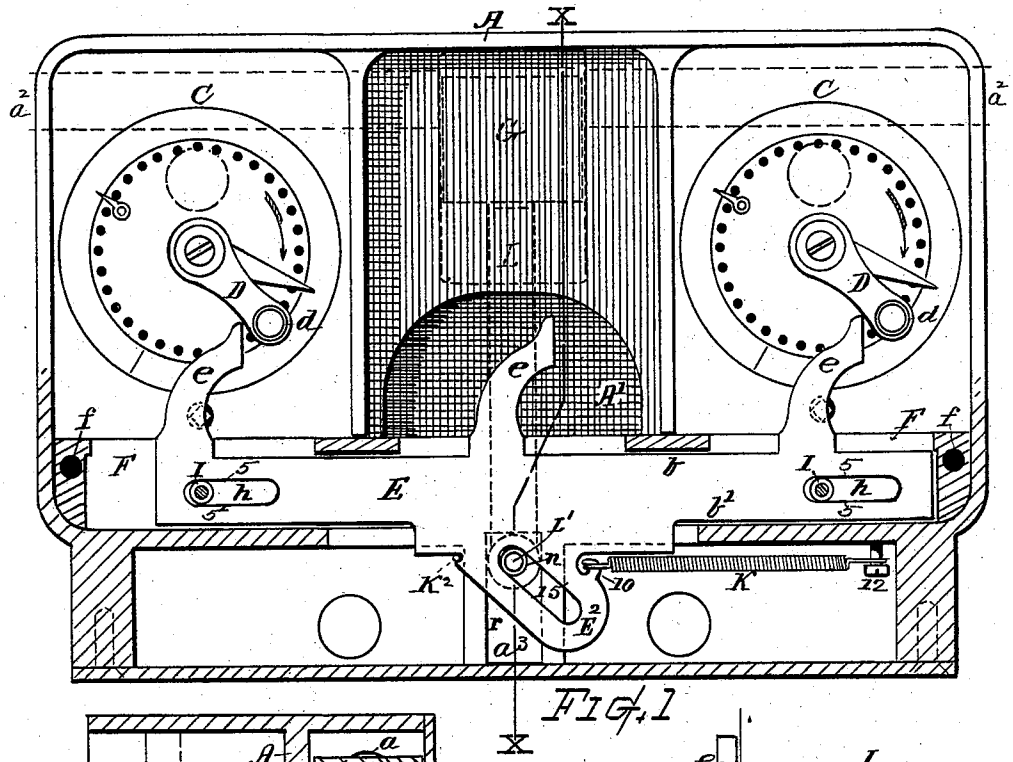


FIG. 1

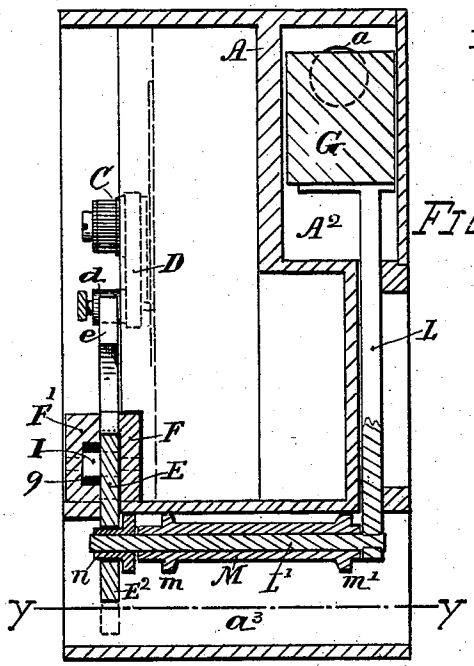


FIG. 2

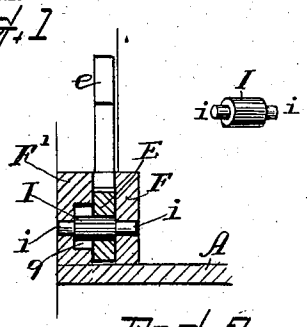


FIG. 3

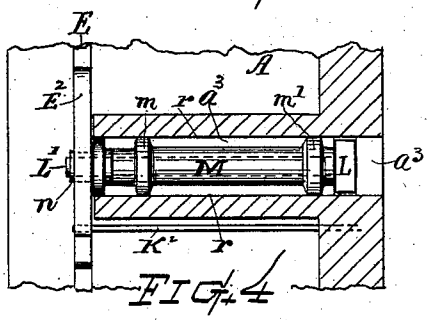


FIG. 4

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(No Model.) 2 Sheets—Sheet 2.

I. G. BLAKE.

TIME LOCK.

No. 588,627. Patented Aug. 24, 1897.

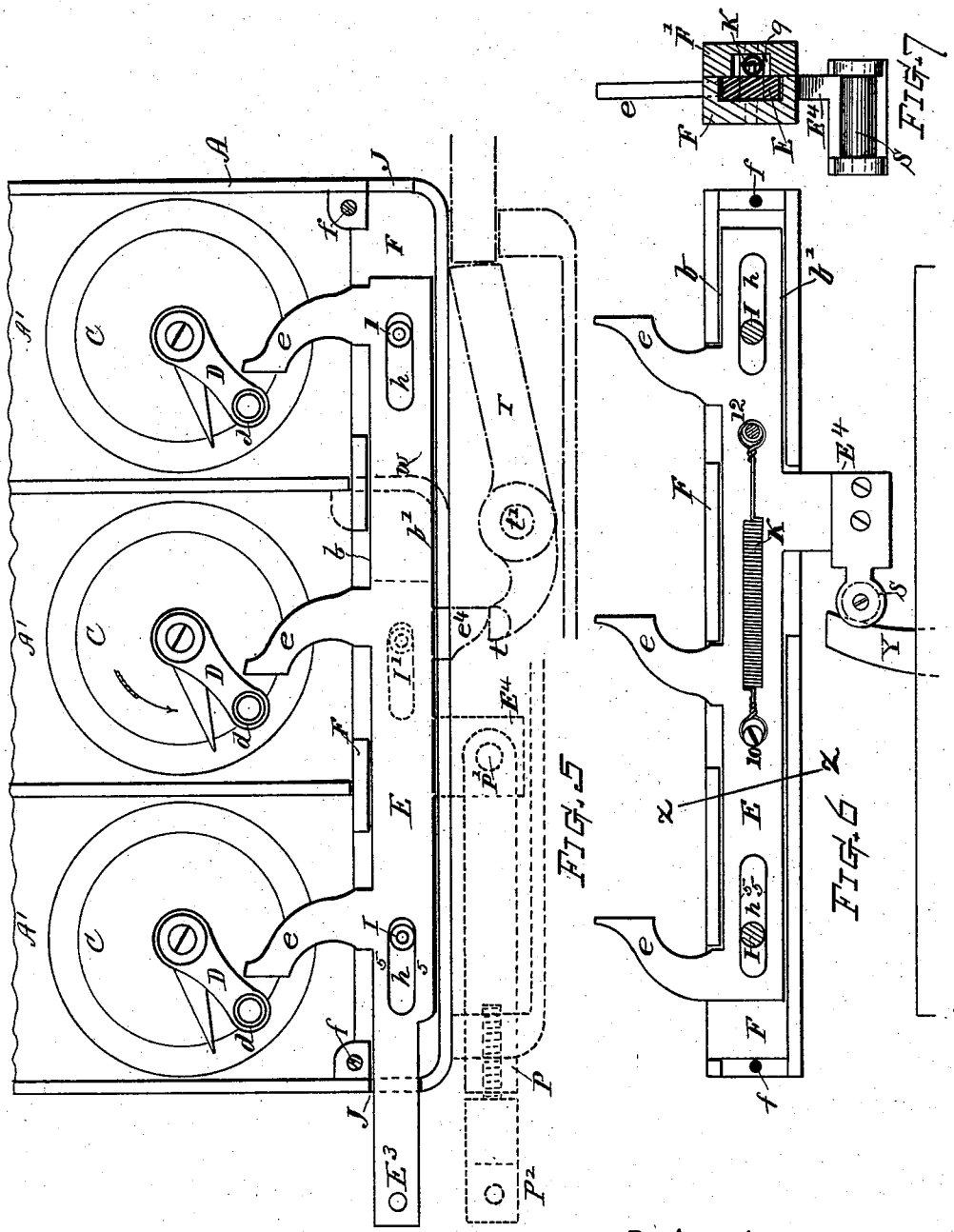


FIG. 5

FIG. 6

FIG. 7

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UNITED STATES PATENT OFFICE.

IRA G. BLAKE, OF WORCESTER, MASSACHUSETTS.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 588,627, dated August 24, 1897.

Application filed May 4, 1897. Serial No. 634,979. (No model.)

To all whom it may concern:

Be it known that I, IRA G. BLAKE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Time-Locks, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The prime object of my present invention is to provide free-working and accurate guidance for the draw-bar which controls the unlocking devices and receives motion from the hand or arm of the timing mechanism, thus rendering the time-lock more perfectly operative and better adapted for use in upright, inverted, or other positions; also, avoiding the necessity of specially fitting the slide-bar to correspond with some particular position in which the lock is to operate.

Another object is to provide a time-lock-controlling mechanism for universal application as to position and adaptable to the various different varieties of locking-bolt mechanisms in use, either to push or pull, or for displacing clogs, stops, or trip devices to effect unlocking action and rendering the mechanism especially desirable for screw-door safes or in cases where the lock is overturned or revolved in the closing or opening of the safe-door or where available space requires some special position of the time-lock.

Another object is to provide a detachable guard-bar for mounting the reversible draw-bar in the case and which case can be readily removed from and replaced in position to afford access to the timing-clocks, also to the draw-bar and its rolling supports, as hereinafter explained.

Another object of my invention relates to the arrangement, in combination with the horizontally-moving draw-bar and a vertically-moving dog-block, of means for effecting or transmitting motion to said dog-block from said slide-bar by a steady, direct, and easily-effected movement.

I attain these objects by mechanism organized substantially as illustrated in the drawings, wherein—

Figure 1 is a face view of a time-lock mechanism embodying my invention with the front plates removed the better to reveal the improvements. Fig. 2 is a vertical section at line X X on Fig. 1. Fig. 3 is a vertical section of the removable guard-bar and draw-bar. Fig. 4 is a horizontal section at line *y y* on Fig. 2, looking upward. Fig. 5 is a front view of a time-lock, showing the draw-bar in reversed position, also illustrating the draw-bar as constructed to extend through the end of the lock-case, and by dotted lines indicating some modifications in the adaptation of the invention for combining it with different kinds of locking-bolt mechanism. Fig. 6 is a front view of the guard-bar and a draw-bar provided with a finger-tripping device, and Fig. 7 is a cross-section at line *z z*, Fig. 6.

Referring to parts, A denotes the frame or case of the time-lock, provided with suitable facilities for its attachment to the vault or safe door, and having cells A′, within which the timing mechanisms or chronometers C are disposed and secured. The chronometer mechanism may be of any suitable kind, but not being of my present invention is not illustrated in detail. Preferably a timing mechanism of the kind described in Letters Patent No. 526,555 is employed, and reference can be had to such patent for a full description of the construction and manner of winding and setting the timing mechanism. Two or more chronometers C are usually employed, each provided with the adjustable hand or arm D, that revolves with the time movement and is furnished at its outer end with a striker-roll *d*, that contacts with the detent *e* of the draw-bar E for moving said bar and releasing the locking appliance in accord with the winding and setting of the chronometer C, substantially as disclosed in the before-mentioned patent.

In the present drawings, Fig. 1 shows the case A as designed for three chronometers, two of which are indicated in outline, while from the central cell the time mechanism is omitted and dotted lines introduced to indicate the position of a dog-block G, arranged for operating in conjunction with endwise-movable plunger-bars.

As a feature of my present invention the draw-bar E, having the detents *e*, that engage with the hand D of the timer C, is provided

with longitudinal slots *h*, having parallel side surfaces 5, and said draw-bar is mounted within the guard-bar F upon free-running rollers I, that extend through the slots *h*. The end axles or journals *i* of said rollers are supported in bearing-holes formed in the guard-bar and in its cap-plate F'. That portion of the roller which is within the draw-bar is made with a diameter that corresponds with the width of the slot *h*, so that it will fit accurately and work freely between the two parallel sides or surfaces 5 of the slot without undue looseness, but so as to afford a central rolling support and guide for the draw-bar whether the pressure thereon is upward or downward, the roller turning freely accordingly as the pressure of contact is in one direction or the other. The draw-bar, being centrally supported upon the guide-rollers I, permits of its edges being fitted to run clear of the inner surface of the guard-bar, the contact being with the parallel edges 5 of the slot *h* upon the freely-rotatable roller I instead of the edge surfaces *b b'*, resting against the interior faces of the guard-bar F, and the upper and lower edges *b b'* of the draw-bar are thus free from sliding contact with the interior surfaces of the case or guard-bar, which serves as a housing for the draw-bar. The draw-bar is best made in such form and the supporting-rollers so located that said draw-bar can be reversed in its position for either right or left operation, or to be retracted by a timer-hand D, moving in the direction shown in Fig. 1, or as in Fig. 5, thus accommodating the lock to right or left hand situations without necessitating a special construction of lock for each situation.

The guard-bar F is fitted to the front of the lock-case A and secured by screws *f*, so that it can be conveniently removed, together with the draw-bar, to permit the removal and replacement of the chronometer C.

The draw-bar is arranged in a longitudinal chamber within said guard-bar, with its detents projecting through suitable spaces at the edge thereof. The cap or front plate F' of the guard-bar is removable from the main part for releasing the draw-bar when desired. The cap-plate F' can be made flat, or, if preferred, made, as indicated in Figs. 3 and 7, with a longitudinal groove 9 on its inner side for the reception and concealment of the bar-retracting spring K, which spring is best strained from a stud 10, fixed on the draw-bar to a stud 12, fixed in the cap-plate F' or frame, or the spring consisting of a resilient bar K^2 may be used, as in Figs. 1 and 4.

The ends of the draw-bar E, one or both, if desired, may be extended through to the exterior of the case A, while the ends of the guard-bar preferably terminate within and match the ends of the case.

This invention in the mounting of the draw-bar is applicable to different styles of locking-bolt mechanism, as well as for shifting a dog-block G within a chamber in the case. For instance, as shown in Figs. 1 to 4, the case is provided with an upright chamber A^2, with side openings *a* leading thereinto for the plunger-bolts a^2, and a movable dog-block G, similar in its nature of operation to that disclosed in my prior Letters Patent No. 573,855. For the operation of this dog-block G, I provide by my present invention an endwise-movable lifter L, arranged beneath the block, while on the lower end of said lifter there is fixed a rod or spindle L', that extends forward through a guideway-space a^3, having parallel side surfaces *r* in the lower part of the case. The fore end of said rod L^2 is arranged through an inclined slot 15, formed in a downwardly-extended portion E^2 of the draw-bar E. Upon the body of the rod and turning loosely thereon I arrange a long quill M, having flanges or roller-surfaces *m m'* near its ends, the diameters of which fill the dimension between the parallel surfaces *r*, thus forming a rolling guide for the spindle L' of rod L. The front flange *m* and rear flange *m'*, having positive connection through the quill, are caused to roll upon the surface with uniform rotation and tend to keep the spindle in parallel movement and obviate liability of cramping, as the parts are vertically moved by the lateral sliding of the inclined slot 15. A flanged roller *n* is arranged on the end of the spindle that passes through the inclined slot 15.

Fig. 5 illustrates several modifications in adaptation for meeting the requirements of different styles of boltwork. The full lines show the draw-bar E as extended through an opening J at the end of the case, so as to make connection directly to the projecting end E^3 of said bar. This view also shows the bar in reversed position and with the timer-arms D revolving in opposite direction from that of Fig. 2. The dotted lines at the lower left-hand portion of Fig. 5 illustrate the arrangement of an unlocking-rod P, attached by pivot P' to a downwardly-extending portion E^4, fixed to the draw-bar E. The end of the rod P^2, to which connection of the boltwork is joined, is made adjustable by a screw-shank.

The form of time-lock connection, as at E^3 or P^2, is adapted for the screw-door Mosler safes and for style of boltwork known as the "Damon automatic" or for similar attached boltwork.

At the lower right hand in Fig. 5 there is indicated by dot-and-dash lines a tilting clog T for illustrating the application of my improved draw-bar mounting to an unlocking mechanism of that class. In this case the cam-lug e^4, fixed to the draw-bar E, is formed for engaging the heel *t* of the clog and swinging it on its pivot *t'*.

Fig. 5 also indicates by dotted lines at *w* the form and size of a lock having two instead of three time movements. In such instance the roller I and slot *h* would be located, as per dotted lines, at I'. Again, the draw-bar may be provided with its dependent lug E^4 and with a roller S (see Figs. 6 and 7) for throwing a trip-finger Y, that works the

unlocking apparatus as used in connection with the Burton and Harris locking-bolt mechanisms.

What I claim as of my invention herein, and desire to secure by Letters Patent, is—

1. In a time-lock, in combination with the timing mechanism, the draw-bar actuated thereby for withdrawing or unlocking door-fastening devices, said draw-bar being provided with longitudinal slots therein, the rotatable free-turning rollers fitting in said slots for supporting and guiding said draw-bar, and suitable bearing-supports for the roller-journals, substantially as set forth.

2. The combination, of the removable hollow guard-bar having rollers mounted transversely therein, the draw-bar having longitudinal slots supported upon said rollers within the guard-bar, chronometric mechanism adapted for moving said draw-bar, the bar-retracting spring and means operatively connecting said draw-bar with the unlocking devices.

3. In combination, with the lock-case, and a plurality of chronometer mechanisms each carrying a revoluble setting-arm or actuating member; of the removable guard-bar fitted in the front of the case, the draw-bar mounted upon rollers therein and provided with usual detents to engage said chronometer-arms, and having suitable means for effecting operation of the bolt-controlling member.

4. In a time-lock, the draw-bar having the usual detents formed thereon, and longitudinal slots cut through its body; and a plurality of rollers respectively fitting between the parallel sides within said slots and supporting the draw-bar, said detents, slots and rollers being arranged and located in such relative positions that said draw-bar can be reversed end for end, for right or left operation, in combination with the lock-case and a chronometric mechanism.

5. The combination, with the chronometric mechanism, the revolving arm carried thereby, and the devices that effect the unlocking action; of the reversible draw-bar having detents for engagement with said arm, and connections for moving the unlocking devices, said draw-bar provided with longitudinal slots therethrough, and the guide-rollers arranged through and fitting within said slots with their ends journaled in the guard-bar, and the said guard-bar detachably secured within the lock-case, substantially as set forth.

6. The combination with the lock-case having cells for the reception of chronometric mechanism, and the chronometric mechanism arranged therein; of the removable channeled plate or guard-bar extending across the cells horizontally in front of the chronometers, the endwise-movable draw-bar inclosed therein and having upwardly-projecting detents, longitudinal slots through its body, and means for connecting with or moving the unlocking devices, a plurality of rollers journaled in said guard-bar and rolling within the slots for supporting said draw-bar within the guard-bar with its edges free from sliding contact therewith, for the purpose set forth.

7. In a time-lock, the combination with the case having the upright chamber with plunger-bolt openings thereinto, a guideway-space with parallel side surfaces, and the movable dog-block within said chamber; of a lifter for said dog-block having a spindle-rod extending through said guideway, a quill or roller mounted to turn loose on said spindle, its peripheral surfaces fitting between the parallel side surfaces of the guideway, the draw-bar having therein an inclined slot that engages the end of said spindle-rod, a chronometric mechanism for moving said draw-bar, and a spring normally acting on said draw-bar in opposition to the chronometric movement, substantially as set forth.

Witness my hand this 1st day of May, 1897.

IRA G. BLAKE.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.