3 Sheets—Sheet 1.

J. BURGE.

TIME-LOCKS.

No. 194,506. Patented Aug. 21, 1877.

Fig 1

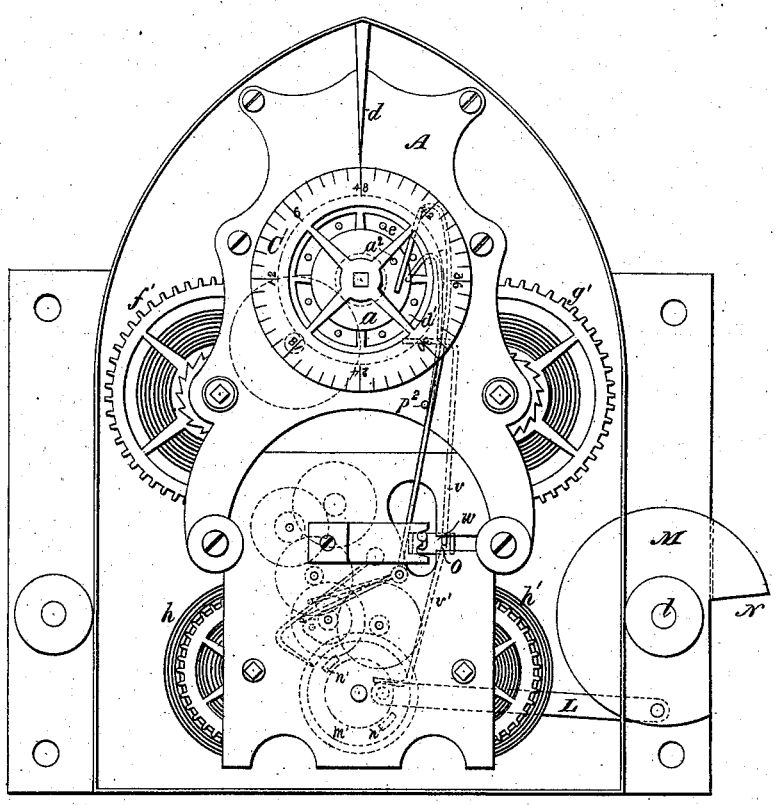
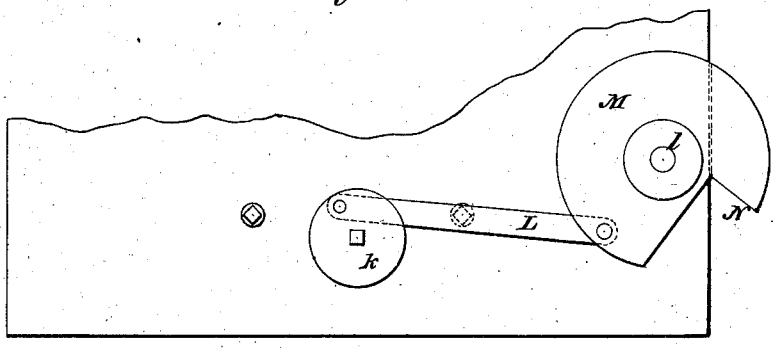


Fig 2.



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3 Sheets—Sheet 2.

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Fig 3.

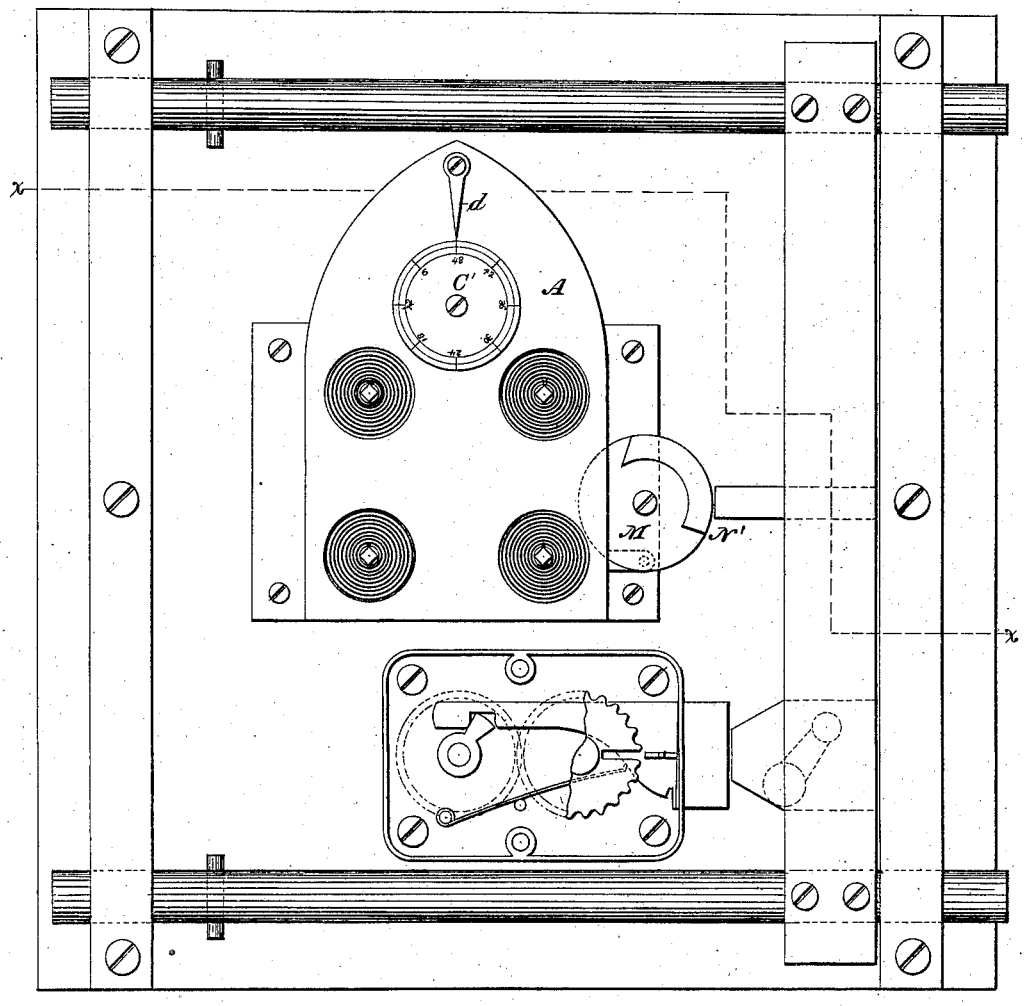

Fig 4

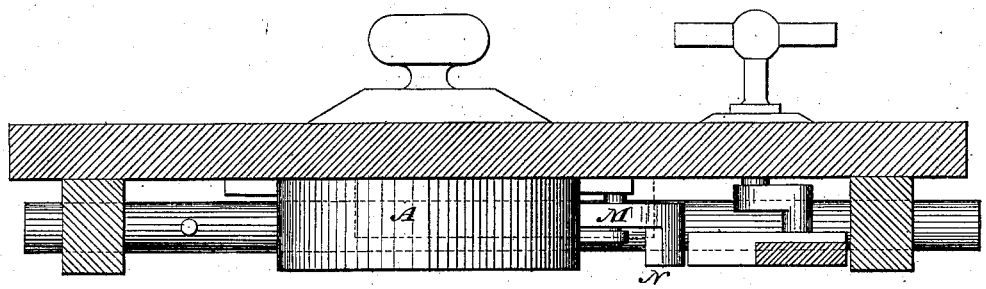

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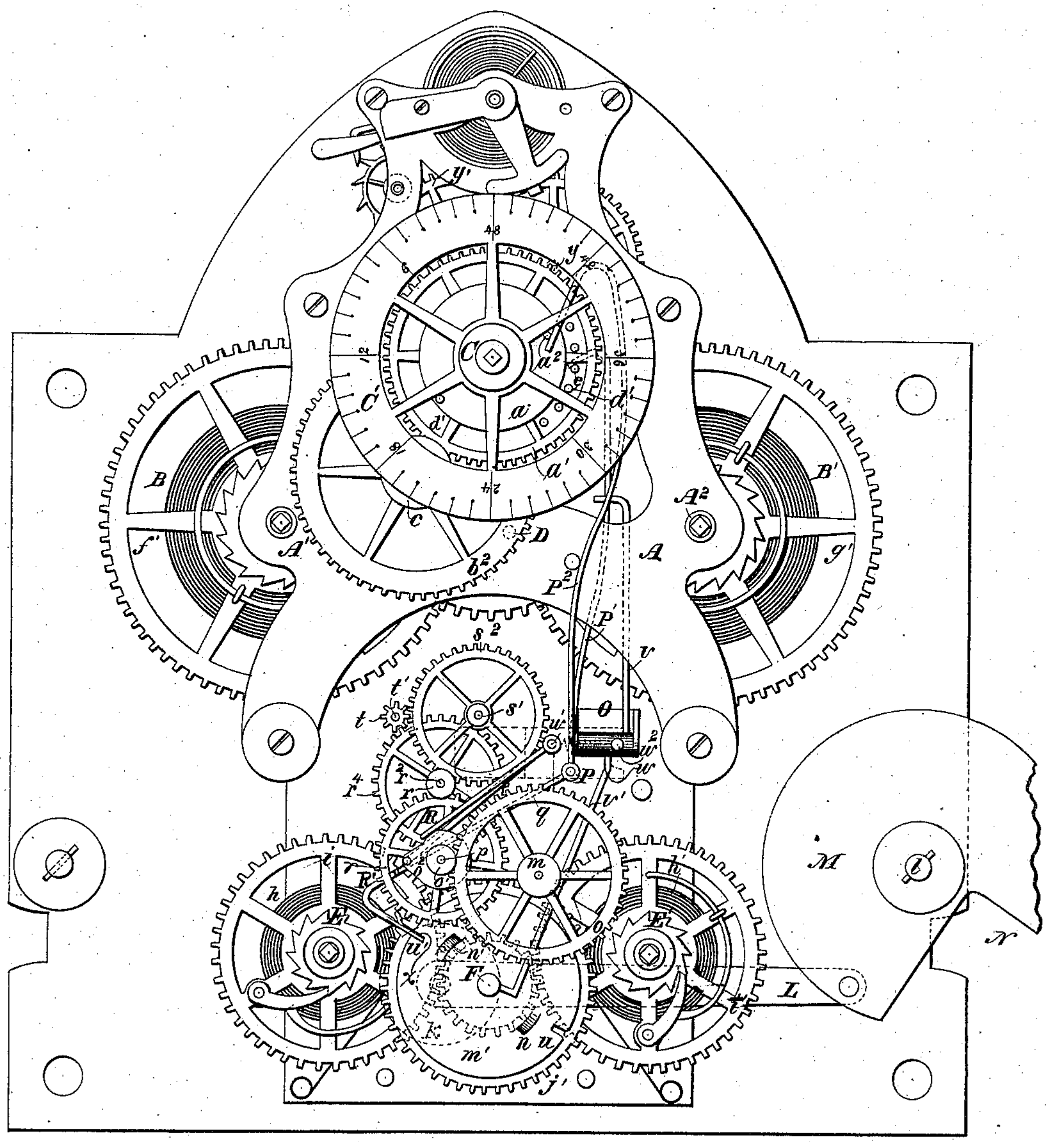
Fig 5



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UNITED STATES PATENT OFFICE.

JOHN BURGE, OF CIRCLEVILLE, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE YALE LOCK MANUFACTURING COMPANY, OF STAMFORD, CONN.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. **194,506**, dated August 21, 1877; application filed August 15, 1876.

To all whom it may concern:

Be it known that I, JOHN BURGE, of Circleville, in the county of Pickaway and State of Ohio, have invented certain new and useful Improvements in Time-Locks; and that the following is a full, clear, and exact description of the same, which will enable any one skilled in the art to make and use my invention, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a novel and useful mode of construction of chronometric locks.

I employ a curvilinear revolving bolt or dog, which is isolated from the time mechanism, so that the pressure or violence applied to it will not be transmitted to said mechanism, and so that when it is oscillated to lock or unlock it is not worked by the time-movements, but is separated from them and operated by another agency; and which is, further, so constructed as to require a minimum of power from the clock-work to induce its operation.

In the accompanying sheets of drawing, Figure 1 is a front view of my time-lock with the dog in the unlocked position; Fig. 2, a detail thereof, showing the dog in the locked position. Fig. 3 is an elevation of the inside of a safe-door, showing the time-lock applied thereon. Fig. 4 is a cross-section of said door, taken on the line *x x* of Fig. 3. Fig. 5 is a front elevation of my time-lock, showing the details of its mechanism.

I will now proceed to describe the construction and operation of my time-lock, having reference in so doing to Fig. 5 of the drawings.

A represents the frame of a duplex time-movement. A^1 A^2 are the respective winding-posts of the two mainsprings B B′. Each of the main wheels driven by these springs gears into a common train of wheels, so that either one or both of said mainsprings are capable of driving the train, thus guarding against stoppage by the failure of a single mainspring. At the upper part of the movement is the ordinary escapement, and beneath that the post or arbor C, attached to the upper end of which is the dial C′ for regulating the time at which the time-lock shall unlock. Beneath the time-movement, and in the lower part of my lock, is a train of gearing corresponding to alarm mechanism, or the striking part of a clock; also, for greater security, driven by two mainsprings, the purpose of which is to operate the dogging device M. This second train of gearing, which, for convenience, I will term "clock-work," is entirely independent of the time mechanism, but the periods of its operation are controlled and determined by said time mechanism.

The dogging device M consists of a disk turning upon a center, and having a portion of its periphery notched or cut away, so that when turned to the position shown in Fig. 1 it permits a tongue-piece or projection attached to the bolt-work to pass under the shoulder or projection N, thus allowing the bolt-work to be unlocked, and if turned into the position shown in Fig. 2, after the bolt-work is thrown, will secure the bolt-work until the projection N is again raised by the rotation of the dogging device M to the position shown in Fig. 1.

Referring to the time mechanism, it will be seen that behind the wheel C′, and secured to the arbor C, is a disk or plate, *a*, projecting from the face of which is a pin, a^2, adapted to strike against the bent end of the wire or lever P^2. Behind the disk *a*, and also attached to the arbor C, is the wheel a^1, and behind that again the wheel *d′*, on the face of which latter is a series of pins, *e*.

Referring to the spring-actuated clock-work for operating the bolting device, it will be seen that the motion thereof is prevented by means of the ordinary detent or clapper lever engaging with one of its moving parts, which lever is liberated by means of the wire connections P^1 P^2, which, in turn, are controlled by the time mechanism.

The bridge O affixed to the back plate of the lock carries the rock-shaft *w*, attached to which, and extending upward, is a wire, *v*, the upper end of which is bent at a right angle to engage with the wire P^1, and projecting downward from this rock-shaft is another

wire, v', the lower end of which is also bent at a right angle, so as to be acted upon by the inclines n n', which project from the surface of the disk m'.

Near the bridge O is a second rock-shaft, P, projecting upward from which are two wires, P^1 P^2, the wire P^1 passing beneath the frame A, and the wire P^2 being above it, while projecting downward from the rock-shaft P is a third wire, q. Near the rock-shaft P is a third rock-shaft, w', projecting downward from which are two wires, R R', the ends of which are bent at right angles, one engaging with the disk o^2, and the other, R', engaging with the notch w' of the disk m', thus preventing the action of the clock-work for operating the dog until it is released by the disengagement of the wire R' from the notch w' at a time controlled by the time mechanism.

Now, the time mechanism being properly wound and running, when it is desired to close the door the dial C' is turned by hand (being secured by friction only to the arbor C) by bringing that one of its gradations which indicates the number of hours that shall elapse before the unlocking of the time-lock beneath the index or pointer d. When the given time shall have elapsed, the rotation of the arbor C and disk a by the time mechanism will cause the pin a^2 to impinge on the bent end of the wire P^2, thus pressing it to the right and causing the wire, q, projecting downward from the rock-shaft P, to elevate the wire R'. The lower end of the wire R', being thus elevated, is disengaged from the gating w' of the disk m', thus permitting the latter to revolve by reason of the tension of the springs h h' acting through the train of gearing.

Connected with this clock-work is the wheel j', revolving on the arbor F, and attached to this arbor is the disk crank or eccentric k, secured to which is the connecting-rod L, the other end of which is attached to the dogging device M, so that the rotation of the eccentric k will cause the dogging device M to rotate from the position shown in Fig. 5 to that shown in Fig. 1, thus bringing the opening beneath the projection N into coincidence with the projecting tongue-piece of the bolt-work, and so permitting of the retraction of the latter. When the shaft F has been rotated through a semi-revolution the notch u, in the periphery of the disk m', will be brought into coincidence with the flattened end of the wire R', which latter will immediately engage therewith, and thus arrest the motion of the clock-work, leaving the dogging device M in the position shown in Fig. 1.

To effect the locking of the time-lock after the closing of the door to which it may be attached, it is necessary that the pin or wire w^2, projecting from the rock-shaft w, be moved downward by hand, slightly rotating the rock-shaft w. This motion will cause the wire v to be elevated, and its upper bent end being beneath or behind the wire P^1, it will cause the latter to be moved forward, so that its upper end will be brought into engagement with the pins e projecting from the inner face of the wheel d'. The rotation of the wheel d' will, within a short interval of time, cause one of the pins e to impinge against the upper end of the lever P^1, which, in turn, acting through the rock-shaft P, will release the flattened end of the lever R' in precisely the same way as when it is released in the act of unlocking, and will permit the rotation of the disk m' through one-half of a revolution, thus rotating the dogging device M back from the position shown in Fig. 1 to that shown in Figs. 2 and 5, thus effecting the locking of the time-lock.

I have thus described in detail the construction of the time-lock illustrated in the accompanying drawings, in order that the same may be clearly understood; but I do not confine myself to the particular details of construction, intending merely that my time-lock may be constructed in any desired manner so as to accomplish that object of my invention which consists in effecting the locking and unlocking of the time-lock by the partial rotation, of predetermined times, of the dogging device M.

The construction of my time-lock being thus described, the manner of its combination with the bolt-work of a safe-door will be readily understood by reference to Figs. 3 and 4, in which I have represented such bolt-work arranged to be operated from the outside of the door by means of the ordinary handles.

My time-lock is provided with a revolving dogging device, M, on the face of which is a raised rim, N', which corresponds to the projection or offset N shown in Figs. 1, 2, and 5, and performs precisely the same function. In line with dogging device M, and secured to the bolt-work of the door, is a rigid tongue-piece, which abuts against the projection N of the dogging device, and when the latter is in the position shown in Fig. 3, also prevents the retraction of the bolt-work. The rotation of the dogging device M by the clock-work will turn the projection N out of alignment with the tongue of the bolt-work, and thus permit the retraction of the latter.

It will be seen that the dogging device represented in Fig. 3 is slightly varied in construction from that shown in Figs. 1, 2, and 5; but my invention contemplates the use of any oscillating dogging device having the proper opening or offset for engagement with the bolt-work of the door.

I do not in this case claim the combination of a time-lock, a non time-lock, and a bolt-work upon a safe-door, for I have made that combination the subject of an application filed June 2, 1875; but my present invention is confined to my time-lock merely, and its mode of operation upon a safe or vault door, in connection with the ordinary bolt-work thereof, substantially as I have above set forth.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

The combination of the oscillating notched dogging device, isolated from the time mechanism, the spring-actuated gearing for oscillating it, and the time mechanism for determining the time of setting into action the spring-actuated gearing for oscillating the dog for unlocking, and devices for connecting and operating the parts, substantially as described.

In testimony whereof I have hereunto subscribed my name.

JOHN BURGE.

Witnesses:
ALFRED WILLIAMS,
RACHEL S. PICKERING.