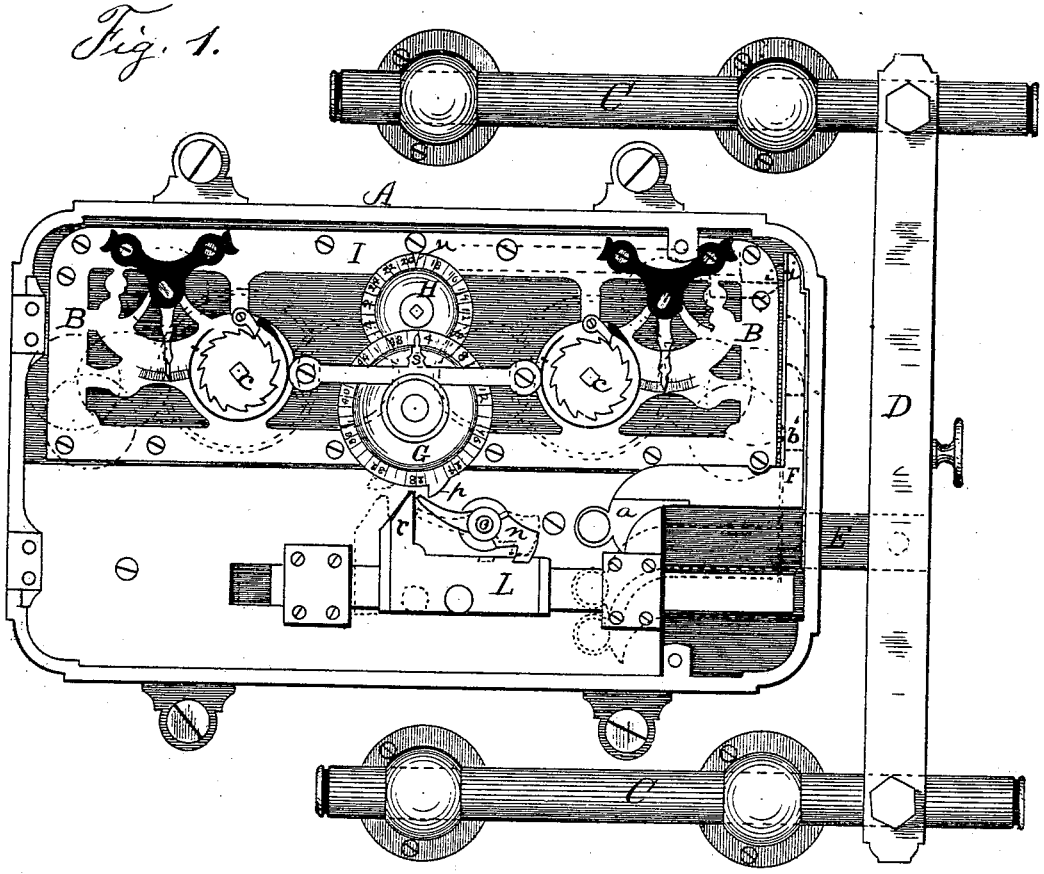
2 Sheets--Sheet 1.

O. E. PILLARD.

Time-Lock.

No. 166,632. Patented Aug. 10, 1875.

Fig. 1.



Witnesses.
John Pollitt
F. H. North

Inventor.
Oliver E Pillard
By James Shepard
Atty

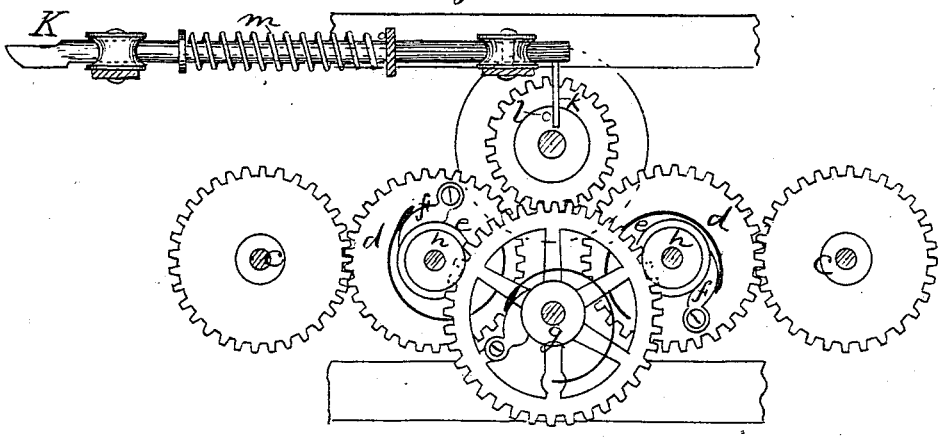
2 Sheets--Sheet 2.

O. E. PILLARD.

Time-Lock.

No. 166,632. Patented Aug. 10, 1875.

Fig. 2



Witnesses.
John Pollitt
F. H. Noble

Inventor.
Oliver E. Pillard
By James Shepard.
Atty.

UNITED STATES PATENT OFFICE.

OLIVER E. PILLARD, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO F. H. NORTH, OF SAME PLACE.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. **166,632**, dated August 10, 1875; application filed July 16, 1875.

To all whom it may concern:

Be it known that I, OLIVER E. PILLARD, of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Chronometer-Locks, of which the following is a specification:

My invention consists in the peculiar construction and combination of devices, all as hereinafter fully described and claimed.

In the accompanying drawing, Figure 1 is a front elevation of a chronometer-lock which embodies my invention, the same being shown with its front cap removed; and Fig. 2 is a vertical section of a detached portion of the same, as viewed from the rear.

A designates the case, which may be of any desired design. In the upper part of this case I place two chronometer movements, B B, both operating upon one and the same dial-shaft, as hereinafter described. C designates the fastening-bolt, which is the same as is used with various locks upon safe-doors, and which I term the train-bolt. Said bolt C is provided with a bar, D, upon which there is an arm, E, arranged to pass in and out through a hole at one end of the case with the sliding of the bolt. Upon the inside of the case A at this end I place a gate, F, and fit it to slide vertically in suitable ways. A handle, *a*, is attached to the gate F for use when the gate is to be raised.

By means of mechanisms hereinafter described the gate F can be set in three different positions—first, as shown in Fig. 1, when it is raised so high that the arm E can readily pass under it, and allow the bolt to be operated; second, in the position indicated by the upper set of broken lines in Fig. 1, representing the gate and its handle when the solid portion of the gate is directly opposite the arm E of the train-bolt, so that it cannot slide into the case, and therefore the train-bolt cannot be unlocked; and, third, in the position indicated by the lower set of broken lines in Fig. 1, representing said gate and its handle, in which position a hole in the gate F (indicated by broken lines at *b* in Fig. 1) is directly opposite the arm E, so that it may enter the case, and the train-bolt be free from all obstructions.

G designates a dial, bearing upon its face forty-eight divisions, and so connected with the train of the chronometers as to revolve once in forty-eight hours, and which I term the unlocking-dial. A little above this dial there is a dial, H, having twenty-four divisions upon its face, and revolving once in twenty-four hours, which I term the locking-dial; but, of course, dials with a greater or less number of divisions, and revolving once in a greater or less period of time, may be substituted for these dials, if desired. The movements B B are independent trains, each of which is provided with an escapement, so as to measure time with reasonable accuracy, which movements of themselves form no part of my invention, and therefore no specific description of them is necessary. I place both of these movements in one frame, I, near the center of which is the main dial G. This dial is connected to the main shaft *c c* of each chronometer by means of a toothed wheel, *g*, Fig. 2, upon the dial-shaft, which wheel meshes into pinions *h h*, rigidly secured to the shaft of the wheel *d d*, the latter meshing into similar wheels on the main shaft *c* of each movement B. Instead of securing the wheels *d d* rigidly to their shafts, I secure them so that they may be revolved on their shafts, which shafts I provide with a friction ratchet wheel or hub, *e*, Fig. 2, and friction pawl or brake *f*. By means of the ratchet upon the wheels *d d*, in case one movement by any accident or otherwise may stop, the ratchet will allow the wheel *d* of the idle chronometer movement to remain stationary while its shaft revolves so long as the other chronometer runs, or, if one runs faster than the other, the ratchet allows a differential movement to take place between the wheel *d* of the slowest moving train and its shaft, and thereby all undue strain upon the teeth of the several wheels is avoided, whereas in case the ratchets were dispensed with, and there was a differential movement of the chronometers, or one movement should stop, the other would have to stop also, or break the teeth of the wheels; but now any derangement of one chronometer has no effect upon the other, and the dial moves on the same, whether one is stopped or not, or whether

one runs faster than the other, or both move together. The upper or locking dial H is propelled by a gear on its shaft meshing into a similar gear, *g*, Fig. 2. The wheels upon the dial-shafts, through which motion is imparted to said shafts, are provided with ratchets like those described for the wheels *d d*, so that the dial may be turned ahead for the purpose of setting the lock.

At the upper end of the gate F there is a shoulder, *i*, (see Fig. 1,) with which one end of a tripping-bar, K, Fig. 2, also indicated by broken lines in Fig. 1, engages, to hold up the gate F in the position shown in Fig. 1. Upon the opposite end of the bar K there is an arm, *k*, which extends downward to a point near the shaft of the dial H, upon which shaft there is a crank-pin or cam, *l*, Fig. 2, that engages with the arm *k* at each revolution of said crank, and moves the tripping-bar K inward so far as to disengage it from the shoulder *i*, and allow the gate F to fall. A spring, *m*, Fig. 2, throws said bar to its former position so soon as the crank-pin *l* releases the arm *k*. The end of the bar K is beveled or inclined, latch-fashion, so that upon the raising of the gate again the inclined end of the bar is struck by the gate, and pushed inward until the projection or shoulder *i* passes the bar, and the spring *m* forces it out, so as to re-engage therewith and hold up the gate, as before described. In the lower part of the case A there is a horizontal tripping-bar, L, moving in suitable ways or on rollers, and of such length that its end may be projected under the lower end of the gate F, as shown in Fig. 1, and prevent it from falling until the tripping-bar L is withdrawn from under the gate F. Just above the horizontal tripping-bar L there is a dog or pawl, *n*, hung so as to oscillate upon the stud or pivot *o*, and provided within the case with a spring (not shown) to force its lower end against the tripping-bar unless otherwise withdrawn. In the upper side of the bar L there is a recess, which, when the bar is brought with its end under the gate F, receives the lower end of the dog *n*, which holds the bar from moving either way, as shown in Fig. 1. Upon the edge of the unlocking-dial G there is a projection, *p*, which, at each revolution of the dial, engages with the upper end of the dog *n*, overcomes the power of its spring, and withdraws the lower end of said dog from the recess in the bar L. Upon the farther movement of the dial the projection *p* strikes the arm *r* of the bar L, and carries said bar along so as to withdraw its end from under the gate F, which, if not held up by the bar K, then falls to its lowermost position, and the bolt C is free to be operated, as before described.

The position of the tripping-bar L when withdrawn from under the gate is indicated by broken lines in Fig. 1.

A pointer, *s*, is fixed over the dial G, and another pointer, *u*, over the dial H. The pointer *s* should be so placed as to be over the greatest number indicated on the dial G just as it draws the tripping-bar L, and the pointer *u* directly over the greatest number on the dial H just as the crank *l* has withdrawn the bar K from the gate F.

As in other chronometer-locks, the devices are placed upon the inside of a safe or vault door.

Sometimes it is desirable to return and gain access to the safe or vault after closing it, and before a late hour in the evening. It is therefore very desirable to have a time-lock that may be set at an early hour, and yet allow access to the safe until a certain later hour, after which it will lock itself, and remain locked until a certain hour in the morning or other future time, when it will unlock itself, all of which is accomplished by my improved lock as follows:

If desired to close the safe at four o'clock, to be unlocked at eight the next morning, or sixteen hours from the time of closing, then the figure 16 or the division indicating 16 upon the dial G is brought, by turning the dial forward, directly under the pointer *s*, and if, until eight o'clock in the evening, or any time previous to four hours after closing, there may possibly be occasion to visit the safe the upper dial is set with the figure 4 under its pointer *u*. The gate F is then raised by lifting upon its handle *a*, and held in an elevated position by the bar K engaging with the shoulder *i* on gate F, and the tripping-bar is thrown to the right, the position of said gate and tripping-bar just mentioned being shown in Fig. 1. The door is then closed and bolted. At any time within four hours after the door may be unbolted; but at the expiration of that time the chronometers, or one of them, will have turned the dial H so as to bring the figure 24 under its pointer, when the crank *l*, through the arm *k*, has withdrawn the bar K, and the gate F falls downward until it rests upon the end of the tripping-bar L, as indicated by the upper set of broken lines designating the gate in Fig. 1. In this position the solid portion of the gate F is directly in front of the arm E of the bolt C, and therefore the safe-door cannot be unbolted. By this time the dial G has also moved four hours, and therefore figure 12 of the dial is under the pointer *s*. In twelve hours more the projection *p* of the dial G has released the dog *n* from its recess in the tripping-bar L, and moved said bar to the left, as indicated by broken lines in Fig. 1, and the gate falls into its lowest position, as indicated by broken lines in Fig. 1, when the hole in the gate is opposite the arm E, so that the door may be again unbolted.

Thus it will be seen that the lock may be set to lock itself in one or more hours or immediately after closing the door, and not unlocked or unbolted again until the elected number of hours have elapsed.

I claim as my invention—

1. The combination of the gate F, one or

more chronometer movements, and a tripping-bar, K or L, constructed to engage with the gate and hold it up until withdrawn by the chronometer movement, when the gate falls, substantially as described, and for the purpose set forth.

2. The combination of the train-bolt C C D E, gate F, two independent tripping devices, K and L, with a chronometer movement, substantially as described, and for the purpose set forth.

3. The combination of the time-indicating dial H, the crank or cam on its shaft, the bar K, and the gate F, substantially as described, and for the purpose set forth.

4. The combination of the unlocking-dial G *p*, dog *n*, horizontal tripping-bar L *r*, and gate F, substantially as described, and for the purpose set forth.

OLIVER E. PILLARD.

Witnesses:
JAMES SHEPARD,
F. H. NORTH.