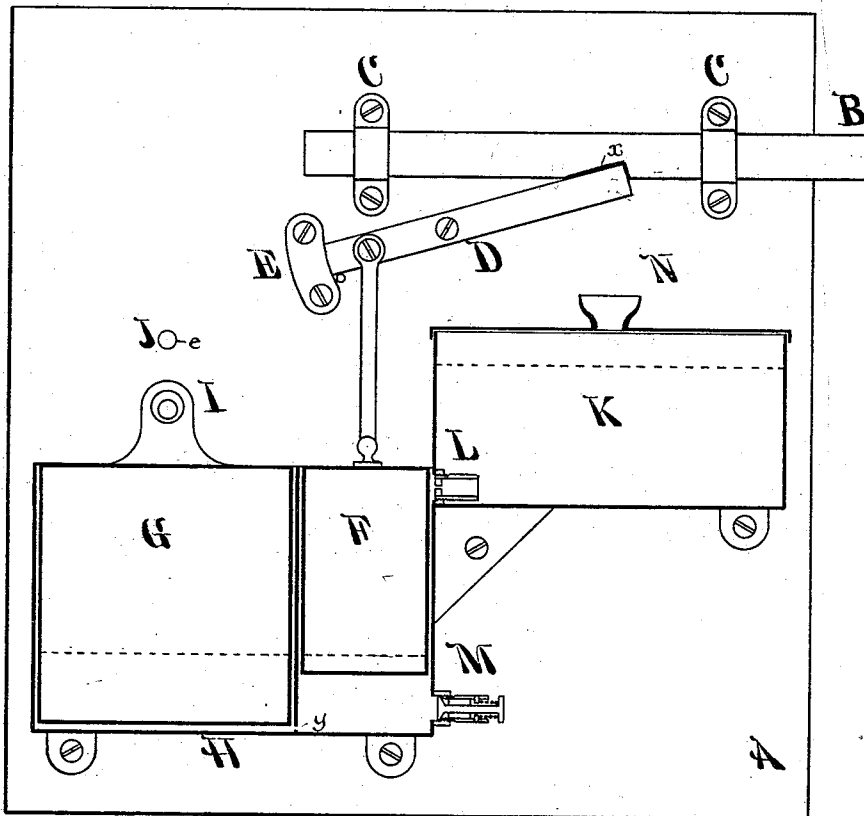


T. SHAW.
Time-Lock.

No. 215,777.

Patented May 27, 1879.



WITNESSES:

Elias J. Shaw
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THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. **215,777**, dated May 27, 1879; application filed March 6, 1878.

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Hydrodynamic Time Bank-Lock; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the application to a safe-lock bolt of an independent locking-pawl actuated by floats or plungers, with tanks containing fluids, in the manner and for the purpose hereinafter described.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawing, which forms part of the specification, the figure represents a section of the inner face of an ordinary safe-door, A, provided with one or more of the usual bolts, B, playing in ordinary guides C. D is a pawl swinging upon a pivot at D. One end of said pawl fits into any suitable notch, *x*, of the bolt B, to prevent the shooting back of said bolt when the pawl D is in the position shown. The rear end of said pawl bears against a stopper-piece, E, of sufficient strength to resist any forcing of bolt B.

F is a float or plunger, suspended by a short pitman-arm to the pawl D. Said plunger F plays freely in a tank, H, surrounding the same. Said tank H is made of sufficient capacity to receive also a plunger, G, a partition intervening between the plungers F and G. Said partition is provided with an aperture, *y*, (shown at the bottom thereof,) to permit fluid communication between the two chambers, for the purpose hereinafter described.

The plunger G is held in position by pin I, adapted to openings *e* in the door, for the purpose hereinafter described.

K is a tank for containing mercury, and N is an aperture in the lid of the same for convenience in filling the tank. L is the short outlet-tube, provided with a perforated disk at one end. The aperture in said disk permits the mercury in the tank K to escape into the tank H in a slow, but constant and regular,

manner. The inner part of the tube L is provided with any suitable screen to prevent any foreign matter from entering.

M is an ordinary spring-valve, opening inward to permit the withdrawal of mercury from the tank H, when desired.

The tanks are made of iron, and of a size in accordance with the safe or bolts to be operated.

The operation is as follows: The tank K is filled with mercury to the dotted line shown previous to closing the safe for the night. As soon as the safe is locked by any of the ordinary locking devices the pawl D catches in the notch in the bolt B, and maintains that position by reason of the preponderance of the weight of the plunger F, and so long as the pawl D remains in that position it will be impossible to unlock or push back the bolt B.

The mercury in tank K passes slowly and gradually through the aperture in tube L into the tank H until it fills the latter to a point indicated by dotted line, when the plunger F will float upward, and thus turn the pawl D from the notch in the bolt B, and will maintain the pawl in that position, permitting the bolt to be retracted and the safe to be unlocked freely with the ordinary key or usual unlocking devices.

The period of time required for the mercury to flow into tank H covers twelve hours, more or less, as desired, the time being controlled by the size of the aperture in the tube L, through which the mercury passes.

The plunger G is simply a solid block, made to occupy nearly all the space in that part of tank H which it occupies, and is proportioned for a period of thirty-six hours, which time intervenes between Saturday night and Monday morning. By elevating the plunger G the space for the mercury in the tank H is enlarged, so that a longer time must elapse before the mercury will rise to a level sufficient to float the plunger F and permit the unlocking of the safe. The capacity of chamber K is great enough to hold mercury in excess of the requirements of tank H.

After the safe is unlocked the mercury is permitted to remain in the tank H until just before closing the safe for the night, when it is drawn off through valve M into an ordinary

tumbler or vessel and is poured into tank K. As soon as the mercury is drawn off the weight of plunger F upon pawl D tilts the latter into the notch in the bolt B, where it is certain to remain until sufficient mercury has passed into the tank H to float the plunger F.

This operation can be repeated indefinitely without any alteration in the result, and variations in the time for which the safe must be locked are fully provided for by the adjustment of plunger G as before described.

It will be observed that this method of operating the pawl D is one of great certainty of action, that time is a ruling element in its operation, and that the power is sufficient to overcome any resistance of the pawl, in the fact that as soon as the mercury shall have reached the plunger F any further flow of mercury very rapidly fills the slight intervening space between the plunger F and the sides of the tank H. A very slight rise of mercury in this space operates forcibly upon the plunger F, in proportion to the elevation or head of mercury in the space mentioned.

It will be evident that other fluids can be substituted for mercury, and that the tanks and pawl can be considerably modified without any alteration in the result.

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

1. In a time-lock, the combination, with the lock-bolt B and retaining-pawl D, of a plunger, F, tank H, receiving the plunger, and feeding tank or reservoir K, arranged and constructed to permit the contents to flow in regular quantities into the tank H, substantially as set forth.

2. The combination, with the tank H, receiving the plunger by which the pawl D is operated, of an adjustable plunger, G, whereby the fluid-receiving capacity of said tank may be regulated, for the purpose set forth.

THOMAS SHAW.

Witnesses:

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ELIAS J. SHAW.