No. 676,061. Patented June 11, 1901.

W. E. ARNOLD.

AUTOMATIC LOCKING SIGNAL FOR SCREW SAFE DOORS.

(Application filed July 21, 1901.)

(No Model.)

Fig. 1.

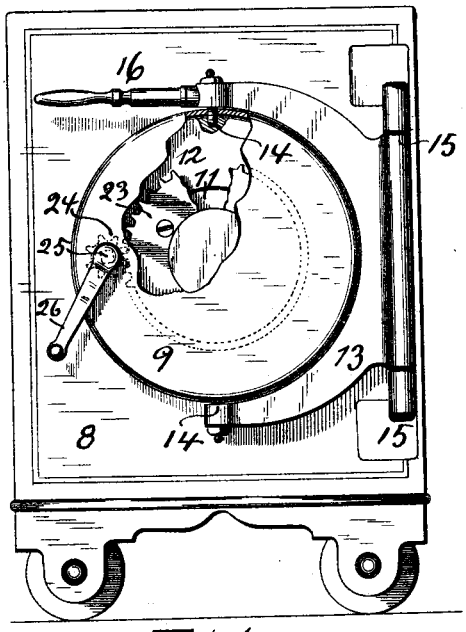


Fig. 2.

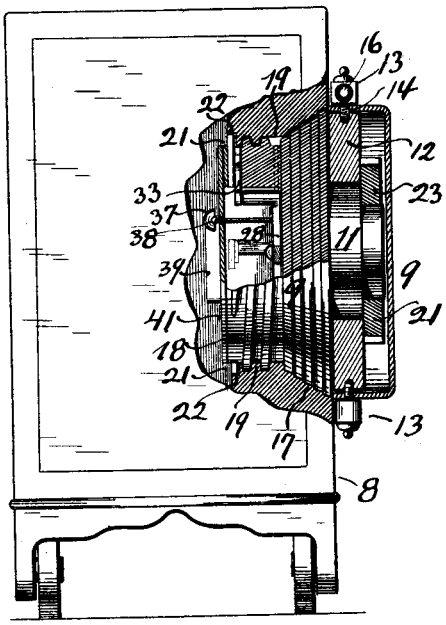


Fig. 4.

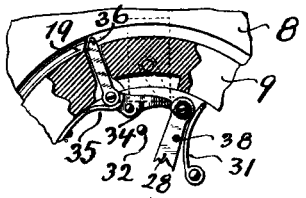


Fig. C.

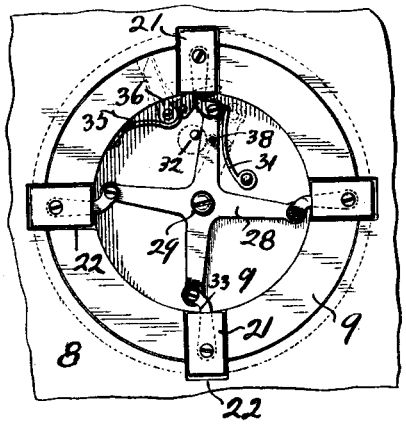
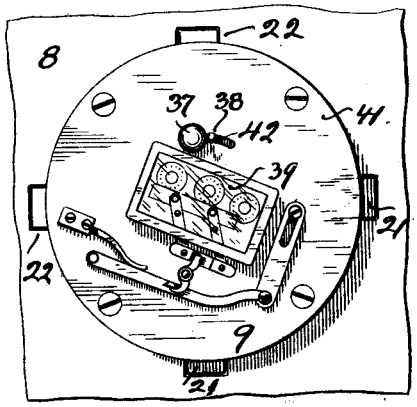


Fig. 5.



Witnesses
J. A. Williams.
Arthur Kline

Inventor
Wilber E. Arnold
by O. Spengel Atty.

UNITED STATES PATENT OFFICE.

WILBER E. ARNOLD, OF MADISONVILLE, OHIO, ASSIGNOR TO THE VICTOR SAFE AND LOCK CO., OF CINCINNATI, OHIO.

AUTOMATIC LOCKING-SIGNAL FOR SCREW SAFE-DOORS.

SPECIFICATION forming part of Letters Patent No. 676,061, dated June 11, 1901.

Application filed January 21, 1901. Serial No. 44,024. (No model.)

To all whom it may concern:

Be it known that I, WILBER E. ARNOLD, a citizen of the United States, residing at Madisonville, Hamilton county, State of Ohio, have invented a certain new and useful Automatic Locking-Signal for Screw Safe-Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form also a part of this specification.

This invention relates to improvements in safes which are automatically locked by the act of closing the door. Safes having circular doors, screw-threaded around their edge and adapted to close the opening for which they are intended by engaging a similar thread around such opening, are usually locked in this manner. This screw engagement requires rotation of the door and support of the same accordingly. The rotation of the door is utilized to actuate mechanism, when fully closed and screwed home, which operates so as to cause, at the moment rotation ceases, bolts carried by the door to advance into and occupy sockets, thereby locking the door in its closed position by preventing the rotation of it required to unscrew the same. The unlocking of such safes is usually also automatic and proceeds by time-locks operating to withdraw said bolts after a certain interval of time during which the safe remains inaccessible. There are no indications sensibly perceptible from the outside showing whether the expected automatic operation of the mechanism for locking the safe has actually occurred, and such cannot be found out unless tried by an actual attempt to reopen the door. This is of course objectionable, and it is desirable that such event be ascertained without requiring the effort and time which such actual test would necessitate.

The object of my invention is, therefore, to provide means, being practically a signal, operating automatically and indicating in a manner perceptible from the outside whether the bolts have actually moved into and occupy the proper position which is necessary to lock the door after the same has been fully closed.

In the following specification, and particularly pointed out in the claim at the end thereof, is found a full description of the invention, together with its operation, parts, and construction, which latter is also illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a safe closed by means of a screw-door, parts of which are broken away. Fig. 2 is a side elevation with parts broken away and the door shown partly in edge view and partly in section. Fig. 3 shows an inside view of the inner side of the safe-front with the door in locking position and the innermost covering-plate of the door removed. Fig. 4 is a sectional detail view of the upper part of the preceding figure, showing bolts in their unlocked position. Fig. 5 in a view similar to Fig. 3 shows an inside view of the safe-door complete. The scale of the three last figures is somewhat enlarged.

8 is the front of the safe of customary construction, provided with a circular opening to receive the circular door 9. This door on its front side is provided with an outwardly-projecting journal 11, fitted to occupy a bearing in a ring 12 and within which said door is capable of rotation. Both are carried on a crane-frame 13, to which they are pivotally held by vertically-disposed trunnions 14, which engage ring 12. Crane 13 is hinged at 15 to front 8 of the safe and provided with a handle 16, whereby the door may be swung to or from its opening.

The circular side or edge of the door is in part tapering or conical and stepped off, as shown at 17, and in part straight, which straight part is provided with a screw-thread 18 and fitted to a similar thread 19 within the door-opening. The parts are so arranged that rotation of the door causes the screw-threads to engage, and when such engagement has reached its limit the stepped part 17 has also reached its proper position and is in close fit and contact with the similar stepped part of the door-opening, thus closing this latter tightly. At that time bolts 21, carried by the door, also arrive opposite sockets 22 within the door-opening of the safe-front, and at the

moment rotation of the door ceases these bolts advance into and occupy such sockets. This prevents rotation of the door in reverse direction, and thereby locks the same against opening and access. The rotation of the door is by means of a gear-train consisting of a cog-wheel 23 and a pinion 24, which latter is on ring 12 and carries an outwardly-projecting key 25, fitted to the socket of a suitable crank-handle 26, used for manipulation while rotating the door. Cog-wheel 23 is rigidly attached to the door by being connected to journal 11, projecting therefrom, thereby transmitting the rotation received from pinion 24 to it, and by projecting over the non-rotary ring 12 it serves as a collar to hold journal 11 of the door in place in its bearing within said ring.

The means for causing bolts 21 to automatically advance into their sockets 22 at the time the door is fully closed may be of any suitable construction or they might be constructed as shown in Patents Nos. 629,764 and 645,448, both assigned to and owned by the Victor Safe and Lock Company, of Cincinnati, Ohio. In that construction a spider-frame 28 is pivotally secured at 29, so as to be capable of oscillating as impelled by a spring 31 against a stop 32, which is the limit of such oscillation. In such position bolts 21, connected to the ends of the oscillator-arms by links or toggle-levers 33, are in their locking position, as shown in Fig. 3. Normally, however, this oscillator-frame is held against the action of spring 31 and in a position indicated in Fig. 4, in which bolts 21 are held out of sockets 22 and in their unlocked position by a lever 34, held by a spring 35 in a position to bear against the end of one of the spider-arms. To the other end of this lever is connected a trip 36, the beveled end of which projects into the path of the outer end of thread 19 in the door-opening. This trip is so located that it strikes this end and is depressed thereby at the time the screw-door is fully run in and ceases to further rotate. At that time bolts 21 have also arrived opposite their sockets 22 and are ready to dart in, which they immediately do, being moved so by the spider-frame 28 after released by lever 24 and impelled by spring 31. Now, as before stated, there are no means indicating to the person closing the safe that all these events accompanying the locking have actually occurred, and while in most cases they will occur as expected there might be a time when, by reason of imperfection or breakage, caused by wear or accident, the parts may not properly operate, and therefore to guard against such possibilities, as well as to have the satisfaction of knowing in all cases whether the mechanism has properly operated and locked the safe, I provide a signal operated automatically by the motion of the parts expected to operate, also automatically, for effecting the locking of the safe. This signal consists of a bell 37, to be struck by a hammer 38, carried by the parts expected to operate at the time the safe is locked. By preference I connect this hammer to one of the arms of the oscillating spider-frame and locate it so that when this spider-frame oscillates after released by the trip-lever to move bolts 21 into their locking positions then said hammer strikes the bell. Oscillation of this spider-frame in reverse direction to unlock the bolts is usually effected through the intervention of a time-lock 39; but this part of the mechanism forms no feature of my invention and has no bearing thereon. This time-lock is usually mounted on a plate 41, causing the inside of the door to inclose the mechanism thereat. The signal-bell 37 is also mounted on this plate, and a slot 42 is provided, through which the shank of bell-hammer 38 projects.

Having described my invention, I claim as new—

In a safe having a circular door with a screw-thread around its edge adapted to engage a similar thread around the opening which it is intended to close, bolts adapted to move into sockets to lock the screw-door when it is fully run in, an oscillating spider-frame to which the bolts are connected for such movement, mechanism operating automatically to oscillate this spider-frame to move the bolts, a bell-hammer connected to this spider-frame and a bell so located as to be capable of being struck by the bell-hammer when the same moves with the spider-frame upon the closing and locking of the door.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

WILBER E. ARNOLD.

Witnesses:
C. SPENGEL,
ARTHUR KLINE.