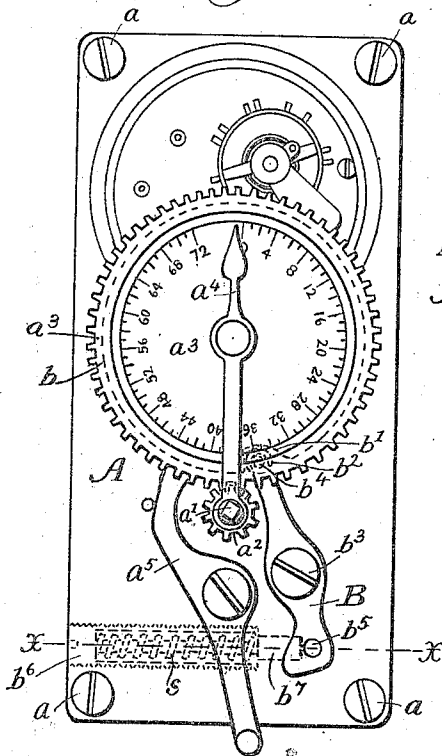


E. M. BENHAM.  
 AUXILIARY MOTOR FOR TIME LOCKS.  
 APPLICATION FILED MAY 20, 1916.

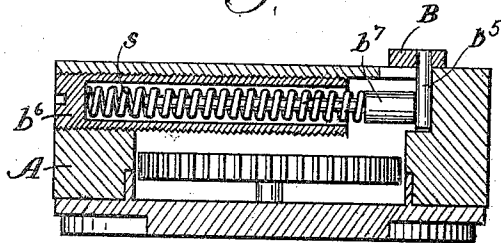
1,206,803.

Patented Dec. 5, 1916.

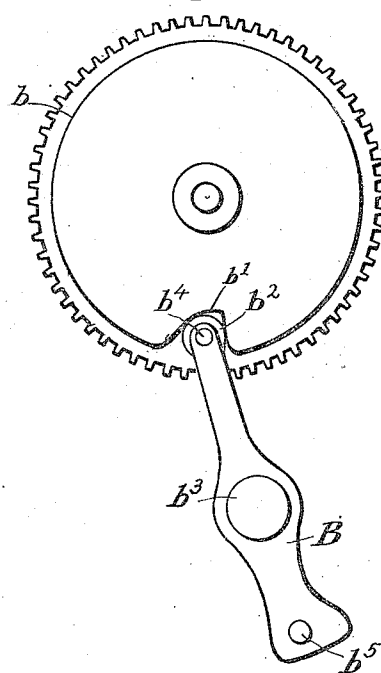
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDGAR M. BENHAM, OF NORWOOD, OHIO, ASSIGNOR TO THE NYDIA BANK LOCK COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

## AUXILIARY MOTOR FOR TIME-LOCKS.

1,206,803.

Specification of Letters Patent.

Patented Dec. 5, 1916.

Application filed May 20, 1916. Serial No. 98,858.

*To all whom it may concern:*

Be it known that I, EDGAR M. BENHAM, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Auxiliary Motors for Time-Locks, of which the following is a specification.

My invention relates to time locks such as are used on safes; and is an auxiliary motor for actuating the throw bar.

The watch movements that actuate the throw bar of time locks are most effective when the main springs are fully wound, and their capacity for exerting pressure decreases as they approach the time for which they are wound, when they are to act upon the bar. During the last few hours before the bar is to be thrown, when their work is being done, the main springs are nearly unwound and hence effective only to their minimum capacity.

My invention provides an independent additional motor connected with the bolt-throwing mechanism of the watch movement so as to be brought into action as an auxiliary thereto at a given time and exert such pressure in addition to that of the time movement as to entirely compensate for the lessened efficiency of the time movement during the last few hours before throwing the bar; and at other times exerts a pressure constantly on the dial edge tending to steady the action of unwinding and thus diminish the strain on the escapement mechanism. My invention, therefore, acts as a relay insuring the withdrawal of the several bolts at the predetermined time.

In a time lock movement of ordinary size, which I have made embodying this invention, the increased pressure of the auxiliary motor is applied during the last 8 hours; the auxiliary motor adds 8 pounds lifting power, dead weight, to each movement, and therefore if the time lock was set for 8 a. m. and all the movement main springs should break any time after midnight, the lock would open at the proper time.

In the particular embodiment of my invention selected for illustration: Figure 1 is a plan view of one of the time movement receptacles showing the rocker arm of the auxiliary motor; and in dotted lines its actuating spring and attendant parts and the roller and its track under the edge of the

dial. Fig. 2 is a cross section along the line  $x-x$  of Fig. 1, through the receptacle and rocker arm. Fig. 3, a detail, is an under plan view of the dial and rocker arm in position.

In the drawings, A is the receptacle in which the time movement is housed in any usual manner, and each receptacle is fastened to the case or other suitable part by the threaded posts,  $a$ . Through the key post  $a^1$  and its pinion  $a^2$ , the dial  $a^3$  with gear toothed periphery is wound, the pointer  $a^4$  indicating the number of hours which the main spring is wound to run. A lever  $a^5$  is adapted to shift the throw bar (not shown) in the usual manner. The rim of the dial is undercut to form a track  $b$  on which a roller  $b^2$  bears. Into this track at a place near the point of unwinding is a notch  $b^1$  whose side first reached by the roller is made sloping so that the pressure of the roller will assist in the rotation of the dial caused by the unwinding of the movement as it runs down. A rocker arm B pivoted to the receptacle at  $b^3$  carries the roller  $b^2$  on an outwardly extending stud  $b^4$  at the dial end and an inwardly extending stud  $b^5$  on the other end.

The receptacle is bored transversely from the edge near the bottom and a hollow threaded plug screw  $b^6$  is screwed into the hole. A plunger  $b^7$  adapted to press against the stud  $b^5$  is held in place by a coiled spring,  $s$ , within the plug screw. The roller is pressing constantly on the track  $b$  of the dial tending to steady the action of unwinding when the main spring is exerting the greatest pressure and thus diminishing the strain on the escapement.

The operation is as follows: When the movement has permitted the rotation of the dial within about eight hours, or other predetermined time, of complete unwinding, the roller  $b^2$  reaches the beginning of the sloping side of the notch  $b^1$  and as the roller enters the notch it presses against the sloping side exerting an auxiliary unwinding pressure. This pressure continues until the dial reaches the unlocking point, that is, when the lever  $a^5$  completes the shifting of the throw bar.

I claim as my invention and desire to secure by Letters Patent of the United States:—

1. In a time lock, in combination with the ordinary time movements and bolt connections, an independent auxiliary normally inactive motor spring suitably connected with

the time movements as a relay to be brought into action when the time movement springs have operated to a point where the normal power is weakened, and insure the withdrawal of the bolt at the proper time.

2. In a time lock, in combination with the ordinary time movements and bolt connections, an independent auxiliary normally inactive motor spring suitably connected with the time movements as a relay to be brought into action when the time movement springs have operated to a point where the normal power is weakened and a dial actuated from said point to throwing position by said relay with or without the aid of the time movement motors.

3. In combination with a time lock mechanism, a winding dial with a track having a notch with a sloping side, a rocker arm bearing a roller adapted to run on said track and enter upon the sloping side of the notch when the dial nears throwing position, and

means for exerting pressure on said rocker arm to insure the pressing of said roller upon said track.

4. In combination with a time lock mechanism a winding dial with a track having a notch with a sloping side, a rocker arm bearing a roller adapted to run on said track and enter upon the sloping side of the notch when the dial nears throwing position, a plunger adapted to so press on said rocker arm as to cause the roller to bear upon the track, a spring adapted to press said plunger against said rocker arm, and a screw to hold said spring in position, and fix the tension.

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

EDGAR M. BENHAM.

Witnesses:

ALICE L. TILDERLEY,  
WALTER A. KNIGHT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."