

M. K. BAUER.
TIME CONTROLLED MECHANISM.
APPLICATION FILED SEPT. 16, 1907.

900,053.

Patented Sept. 29, 1908.
3 SHEETS—SHEET 1.

Fig. 1.

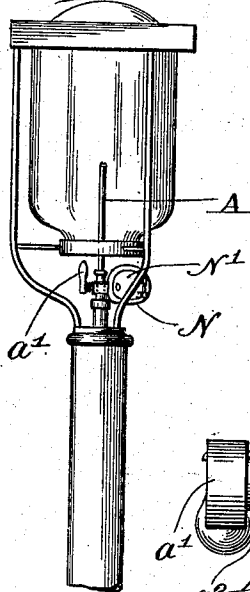


Fig. 2.

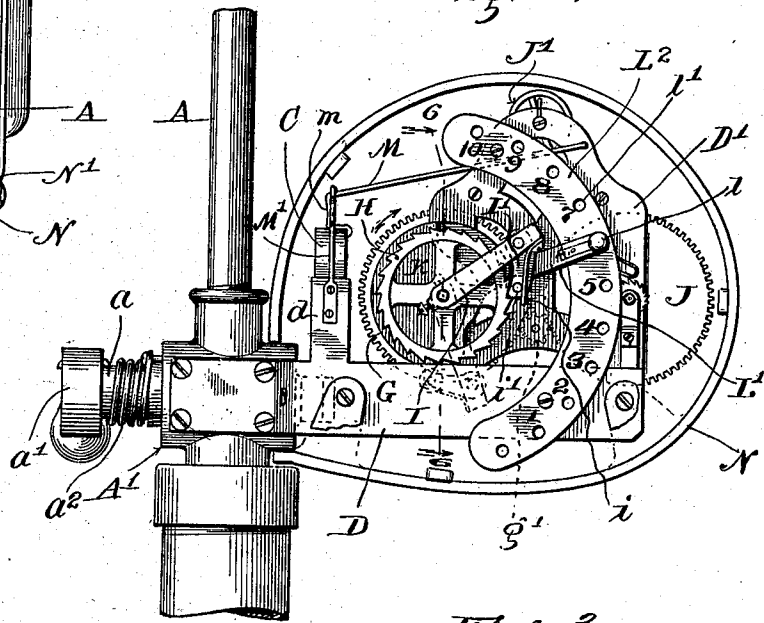


Fig. 3.

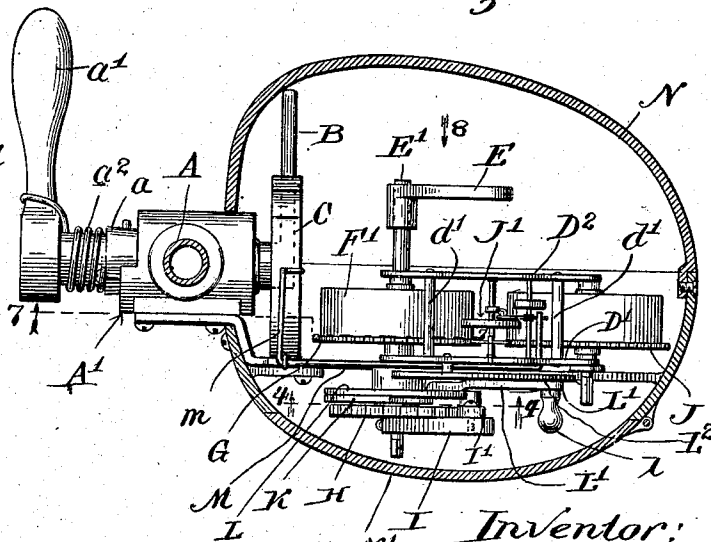
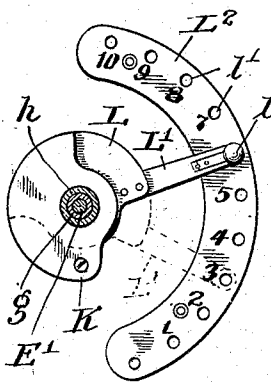


Fig. 4.



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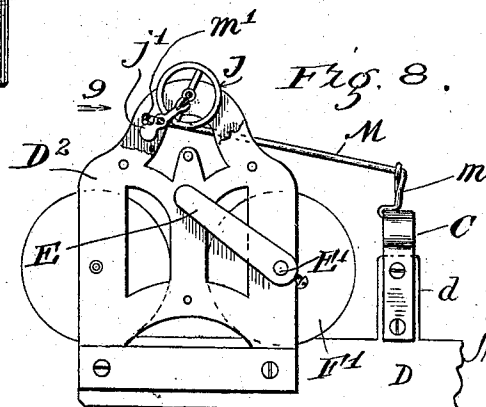
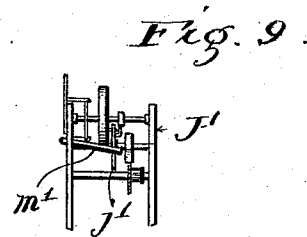
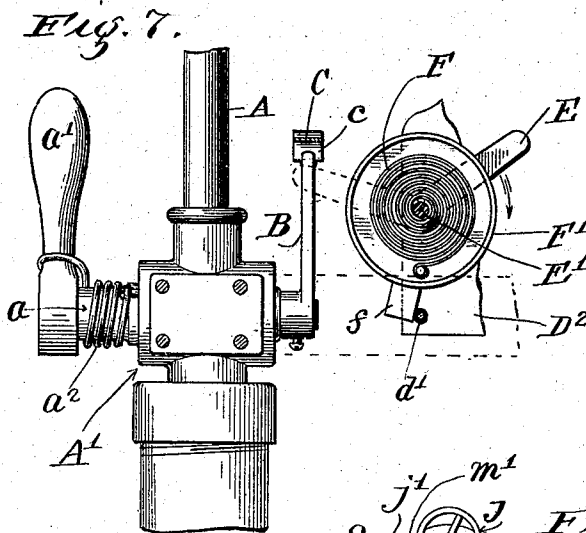
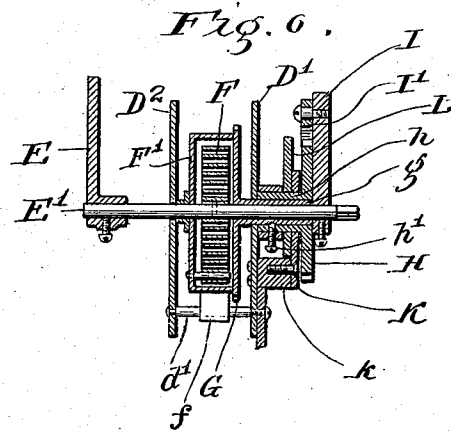
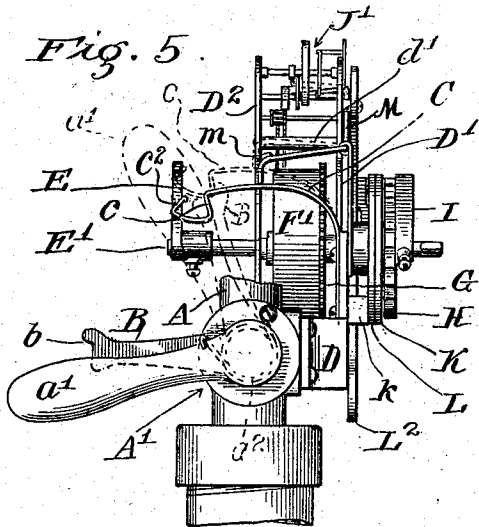
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 10.

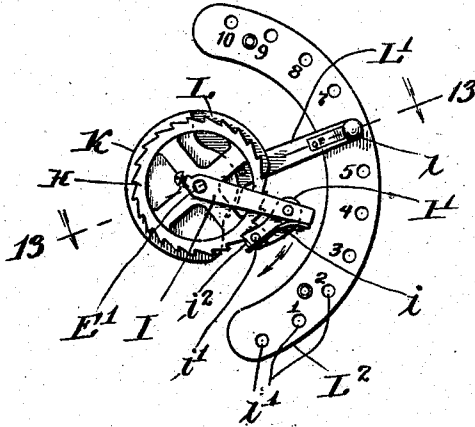


Fig. 11.

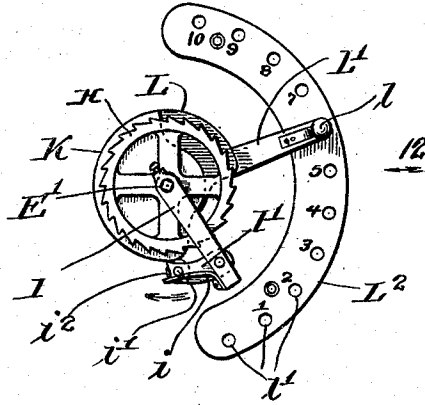


Fig. 13.

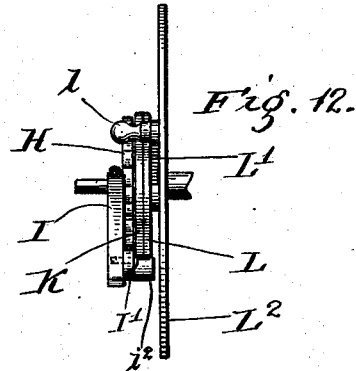
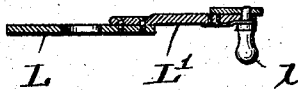
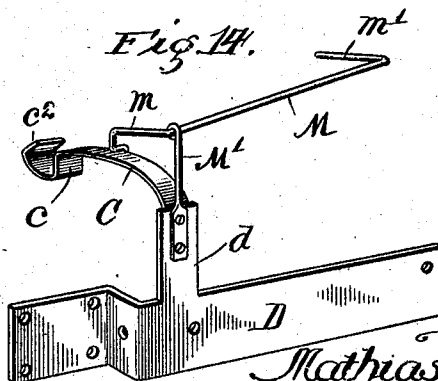


Fig. 14.



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UNITED STATES PATENT OFFICE.

MATHIAS K. BAUER, OF EVANSTON, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOSEPH HEINZEN, OF GROSS POINT, ILLINOIS.

TIME-CONTROLLED MECHANISM.

No. 900,053.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed September 16, 1907. Serial No. 393,128.

To all whom it may concern:

Be it known that I, MATHIAS K. BAUER, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Time-Controlled Mechanisms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in time controlled mechanisms designed to operate automatically at any predetermined period for controlling the operation of another device or mechanism. The mechanism is herein shown as applied to the valve of a gas burner in a manner to automatically close the same at a predetermined period and thus extinguish the light.

The invention consists in the matters hereinafter more particularly set forth and pointed out in the appended claims.

In the accompanying drawings:—Figure 1 is a view in elevation of a gas lamp showing my improved time controlled mechanism applied thereto. Fig. 2 is an enlarged view in side elevation of the operating mechanism. Fig. 3 is a top plan view thereof with the casing shown in section. Fig. 4 is a section on line 4—4 of Fig. 3. Fig. 5 is a view in end elevation of the operating mechanism. Fig. 6 is a section on line 6—6 of Fig. 2. Fig. 7 is a section on line 7—7 of Fig. 3, showing the parts in changed position. Fig. 8 is a view in elevation looking in the direction indicated by the arrow 8 in Fig. 3. Fig. 9 is a view in elevation of the escapement mechanism looking in the direction indicated by the arrow 9 in Fig. 8. Fig. 10 is a view similar to Fig. 2 with some of the parts in changed position, and other parts omitted. Fig. 11 is a view similar to Fig. 10 with parts in changed position. Fig. 12 is a view in end elevation looking in the direction indicated by the arrow 12 in Fig. 11. Fig. 13 is a section on line 13—13 of Fig. 10. Fig. 14 is a view in perspective of the frame plate with the spring detent arm attached, showing also a device for stopping the clock mechanism upon operation of the valve closing device.

As shown in said drawings, A indicates the burner tube of a gas lamp provided with a cut-off valve A¹. The valve embraces a rota-

tive valve stem *a* provided at its outer end with a familiar form of crank-handle *a*¹. A coiled spring *a*² surrounds the valve stem *a* which acts to close and hold the valve closed. The valve is held open during the period in which it is desired the burner should operate by a suitable detent which is released from said stem at a predetermined time by a tripping arm operated by said time controlled mechanism. These parts will now be described.

To the end of the rotative valve stem remote from the handle *a*¹ is fixed a radial arm B which is enlarged at its outer end and fashioned to interlock with the free end of a curved spring detent arm C. Said detent arm C is fixed at one end to a short vertical arm *d* of the frame-plate D which is mounted on the casing of the valve A¹. The detent arm is bent at its free end to form a shoulder *c*¹ (Figs. 5 and 14) which engages the radial arm B of the valve stem to hold the valve open against the action of the spring *a*². This position of the parts is indicated in dotted lines in Fig. 5. The frame plate D constitutes a support for a pair of flat, parallel frame members D¹ D², between and on which are mounted other parts of the mechanism. Said frame members D¹ D² are held in fixed relation to each other by cross-rods or members *d*¹ *d*².

Referring now to the mechanism for tripping the detent arm out of engagement with the valve stem arm to permit the spring actuated valve to close, said part is made as follows: E designates an arm fixed to a rotative, spring actuated shaft E¹ and is adapted to move in a circular path in the direction indicated by the arrow in Fig. 7, and to make contact with the end of the detent arm C in a manner to release the same from engagement with the valve stem arm B. A coiled flat spring F is attached at one end to said shaft and at its other end to a spring barrel F¹ which is loosely mounted on the shaft E¹, and is held from turning in one direction by a stop-arm *f* on the barrel which engages one of the rods *d*¹ of the main frame (Fig. 7). Said spring acts to rotate the shaft in the direction indicated by the arrows and to cause the tripping arm E to be brought into contact with the underside of the end of the detent arm C as described. The said shaft E¹ is normally restrained from free rotation in a manner to prevent the tripping arm to swing

under the action of the spring F into contact with the detent arm and thus release the valve to permit it to close. The means for so restraining the shaft E¹ and arm E and the
 5 time controlled mechanism for releasing said parts to permit the tripping arm to release the valve arm will now be described, and are made as follows: G designates a gear-wheel rotatably mounted upon the shaft E¹ at the
 10 side of the spring-barrel and provided with a hub g which surrounds said shaft and extends laterally through the frame member D¹. To the outer end of the sleeve is fitted a ratchet wheel H, said ratchet wheel being
 15 shown as provided with a hub h surrounding the gear wheel hub and affixed thereto by a set-screw h¹. I designates a radially extending arm which is fixed to the shaft E¹ laterally outside of the ratchet-wheel H. I¹ designates a pawl which is pivoted to the outer
 20 end of said arm and is pressed with its toothed end into engagement with the teeth of said ratchet wheel H by means of a spring i fixed to said arm and engaged with a pin i¹ extending laterally from one side of the pawl.
 25 The gear wheel G meshes with a pinion g¹ (Fig. 2) which is mounted on a shaft extending between the side members D D¹ of the main frame, and said pinion meshes with a
 30 large gear-wheel J, constituting the main drive wheel of a train of clock-work. Said clock-train comprises other gear-wheels not here shown and an escapement mechanism indicated as a whole by the letter J¹. By
 35 means of said clock-train the gear-wheel G and ratchet-wheel H are slowly rotated in the direction indicated by the arrows in Figs. 2, 10 and 11, the pawl I¹ and the arm I following said ratchet wheel under the action
 40 of the spring F. K designates a fixed cam disk which is located laterally inside of and parallel to the ratchet-wheel H. Said cam disk is rigidly fixed to the frame member D¹ by a lug k which is attached to or made part
 45 of the cam disk. A rotative or angularly adjustable cam disk L is mounted upon the hub h of the ratchet-wheel H at the side of the fixed cam disk K and parallel therewith, (Figs. 4, 6, 10 and 11). Said stationary and
 50 angularly adjustable cam disks have curved cam surfaces, the concentric portions of which are struck from the same center so that when the adjustable disk is advanced beyond the stationary disk it has the effect of
 55 lengthening the peripheral or active surface of the cam composed of the two cam members, whereby the cam is made adjustable to vary its action on the time controlled releasing pawl I¹. A laterally projecting stud carrying a cam roller i² is arranged at the outer
 60 end of the pawl I¹ in such position that at a predetermined point in the travel of the arm I it will ride upon the periphery or active surface of the cam and disengage the pawl from
 65 the teeth of the ratchet-wheel H (Fig. 11),

thus allowing the shaft E¹ to be quickly rotated under the influence of the spring F and causing the tripping arm E to strike the end of the detent arm C to release it from engagement with the valve stem arm B. The spring
 70 a² thereafter acts to close the burner valve.

The bearing roller i² of the pawl is held out of engagement with the teeth of the ratchet wheel until it rides off of the periphery of the cam, whereupon the spring of the pawl acts
 75 upon the latter to reengage the pawl with a tooth of the ratchet wheel H thus arresting the movement of the shaft E¹ and arm E. The position of the adjustable member L of the cam determines the point in the circumference of the ratchet-wheel H where the
 80 pawl I reengages one of the teeth of said ratchet-wheel, and the distance between said point and the point at which the pawl is disengaged by means of the member K of the
 85 cam determines the period of time, as measured by the movement of the clock mechanism, which will elapse between successive operations of the device. It is evident that by shifting the position of the adjustable cam
 90 member L this period of time may be varied at will. For such purpose, the said cam member is provided with a radially extending arm or lever L¹ provided at its outer end with a spring detent l which may be placed
 95 in engagement with any one of a series of holes l¹ in a locking segment L².

It may be desirable after the operation of the device to arrest the movement of the clock mechanism in order to avoid useless
 100 unwinding of the clock spring. For this purpose a rod M is provided, which is bent at its forward end to form a crank-arm m that is attached to the detent arm C and the rear end of said rod is bent to form a crank-arm m¹
 105 arranged to be depressed, when the detent is released from the valve arm B, into contact with a member j¹ of the escapement mechanism in a manner to arrest the clock movement. The said rod M has a rocking bearing
 110 in a standard M¹ carried by the arm d of the frame plate D and the rod partakes of a rocking movement when the detent arm is swung downwardly after its release from the valve stem arm B, so that the crank portion m¹
 115 thereof comes in contact with the escapement mechanism member and thereby operates to stop the clock mechanism, in the manner stated.

The spring F may be rewound from time
 120 to time when necessary either by turning the spring barrel F or the shaft E¹. When the spring is to be rewound by turning the shaft E¹ the said shaft may be turned by a key fitted to the angular end of the shaft or by
 125 grasping the pawl carrying arm I and rotating said shaft E¹ in the direction opposite that which it is rotated by the spring. In order that the shaft may be thus reversely rotated without hindrance by engagement of
 130

the tripping arm E with the detent arm, the said detent arm is formed at its outer or free end with an upwardly inclined surface c^2 so disposed with respect to the path of the tripping arm as to permit the detent arm to be swung downwardly by engagement with the tripping arm sufficiently to permit the latter to pass the same.

The entire device is inclosed in a case or housing N provided with a hinged door N¹ whereby access may be had to the interior.

I claim as my invention:—

1. The combination with an oscillating, spring-actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated tripping device for releasing the locking means, means for normally restraining said spring actuated tripping device, embracing a rotative pawl and ratchet mechanism, one member of which is driven by the clock train, and means disposed in axial alinement to the axis of rotation of the members of the pawl and ratchet mechanism for disengaging said members from each other at a predetermined point in the rotation thereof to effect the release of the tripping device.

2. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated tripping device for releasing said locking means, pawl and ratchet mechanism controlled by the clock train for normally restraining said spring actuated tripping device, and a cam disposed in axial alinement to the axis of oscillation of the pawl for releasing the pawl of the pawl and ratchet mechanism to permit the operation of said tripping device.

3. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated tripping device for releasing said locking means, pawl and ratchet mechanism controlled by the clock train for normally restraining said spring actuated tripping device, and a cam disposed in axial alinement to the axis of oscillation of the pawl for releasing the pawl of the pawl and ratchet mechanism to permit the operation of said tripping device, said cam being adjustable to vary the periods of operation of the mechanism.

4. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated rotative tripping device for

releasing said locking means, a ratchet wheel geared to said clock train, an arm rotating with said tripping device and carrying a pawl which engages the teeth of said ratchet wheel, a cam located at the side of said wheel and adapted for engagement by a bearing on the pawl to throw the pawl out of engagement with the teeth of the ratchet wheel and to hold it out of engagement therefrom for a predetermined time, said cam thereafter permitting reengagement of the pawl with the ratchet wheel.

5. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated, rotative shaft carrying a tripping arm for releasing said locking means, and means controlling said shaft embracing a ratchet wheel geared to said clock train, an arm fixed to said shaft and carrying a pawl engaging the teeth of said ratchet wheel, and a cam mounted on said shaft and arranged to disengage said pawl from said ratchet wheel and to hold it out of engagement therefrom to permit said shaft to rotate and the tripping arm to release said rotative part.

6. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking said oscillating part against the action of its spring, a spring actuated tripping device for releasing said locking means, a ratchet wheel geared to said clock train, an arm rotating with said tripping device and carrying a pawl engaging the teeth of said ratchet wheel, and means for disengaging said pawl from said ratchet wheel at a predetermined point in its travel and operating to permit reengagement of the pawl with the ratchet wheel at variably predetermined points in the travel of the pawl.

7. The combination with an oscillating, spring pressed part, of a time controlled mechanism comprising, in combination with a clock train, a detent arm adapted to lock said part against the action of its spring, a rotative shaft provided with a tripping arm which is adapted for contact with said detent arm to release the same from said rotative part, an arm fixed to said shaft and provided with a pawl, a ratchet wheel geared to said clock train, the teeth of which are yieldingly engaged by said pawl, and means mounted on said shaft for disengaging said pawl from said ratchet wheel at a predetermined point in its travel and operating to permit reengagement of the pawl with the ratchet wheel at variably predetermined points in the travel of the pawl.

8. The combination with an oscillating, spring actuated part, of time controlled mechanism comprising, in combination with

a clock train, means for locking said oscillating part against the action of its spring, a spring actuated tripping device for releasing said locking means, a ratchet wheel geared to said clock train, an arm rotating with said tripping device and carrying a pawl engaging the teeth of said ratchet wheel, a cam located at the side of said ratchet wheel comprising a stationary and an angularly movable part arranged in overlapping relation, whereby the cam is adjustable, and a bearing on the pawl adapted for engagement with the cam to throw the pawl out of engagement with the ratchet wheel and hold it disengaged therefrom for a predetermined period.

9. A time controlled mechanism comprising, in combination with a clock train, a locking detent, a spring actuated rotative tripping device adapted to release said locking detent, and means for controlling said tripping device embracing a ratchet wheel geared to said clock train, an arm rotating with said tripping device carrying a pawl engaging the teeth of said ratchet wheel, a cam for disengaging the pawl from the ratchet wheel comprising a stationary cam member and an angularly adjustable cam member both having concentric cam surfaces adapted for engagement by a part carried by said pawl for throwing the pawl out of engagement with said ratchet wheel and means for locking the angularly adjustable cam member in adjusted positions.

10. A time controlled mechanism comprising, in combination with a clock train, a locking detent, a spring actuated, rotative shaft, a tripping arm carried by said shaft adapted to release said locking detent and means for controlling said shaft embracing a ratchet wheel concentric with said shaft and geared to said clock train, an arm fixed to the shaft carrying a pawl yieldingly engaging the teeth of said ratchet wheel and a cam concentric with said shaft arranged to disengage said pawl from the ratchet wheel and to hold it out of engagement therefrom to release the tripping arm shaft.

11. The combination with an oscillating spring actuated part, of time controlled mechanism comprising, in combination with a clock train, means for locking the oscillating part against the action of its spring, and means controlled by the clock train for releasing said locking means and means ac-

tuated by the releasing means for stopping the clock train.

12. A time controlled mechanism comprising, in combination with a clock train, a detent arm, a spring actuated tripping device for releasing said detent arm, means for normally restraining said spring actuated tripping device embracing a pawl and ratchet mechanism, one member of which is driven by the clock train, means for releasing one member of the pawl and ratchet device from the other at a predetermined point in the movement thereof, and means actuated by the detent arm for stopping the clock train.

13. A time controlled mechanism comprising, in combination with a clock train, a locking detent, a spring actuated, rotative shaft, a tripping arm carried by said shaft adapted to release said locking detent and means for controlling said shaft, embracing a ratchet wheel geared to said clock train, an arm fixed to the shaft carrying a pawl yieldingly engaging the teeth of said ratchet wheel and a cam arranged to disengage said pawl from the ratchet wheel and to hold it out of engagement therefrom to release the tripping arm shaft, said detent being arranged to permit the said tripping arm shaft to be turned backwardly for the purpose of rewinding the actuating spring of said shaft.

14. In a time controlled mechanism, the combination with a clock train and a spring actuated tripping shaft, of means for controlling the shaft embracing a ratchet wheel geared to the clock train, an arm fixed to the shaft carrying a pawl engaging the teeth of the ratchet wheel and a cam for disengaging the pawl from the ratchet wheel comprising a stationary and an angularly adjustable cam member, both having concentric cam surfaces adapted for engagement by a part carried by the pawl for throwing the pawl out of engagement with the ratchet wheel, and means for locking the angularly adjustable cam member in adjusted positions.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 27th day of August A. D. 1907.

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Witnesses:

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