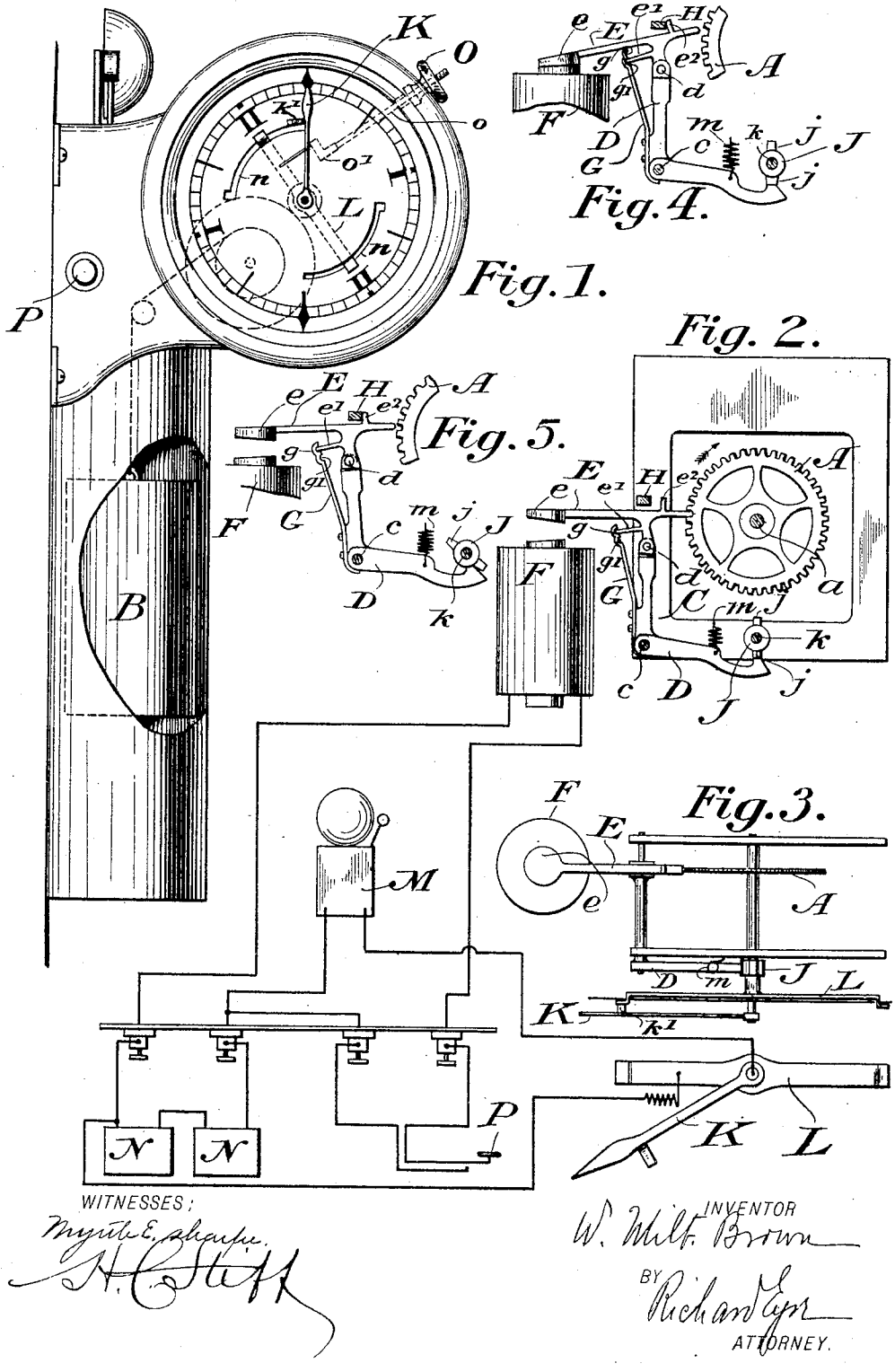
No. 633,951. Patented Sept. 26, 1899.

W. M. BROWN.

TIMING DEVICE.

(Application filed Sept. 26, 1898.)

(No Model.)



WITNESSES:

Myrtle E. Sharpe.

H. C. Stutt

INVENTOR

W. Milt. Brown

BY Richard Eyre

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM MILT. BROWN, OF JOHNSTOWN, PENNSYLVANIA.

TIMING DEVICE.

SPECIFICATION forming part of Letters Patent No. 633,951, dated September 26, 1899.

Application filed September 26, 1898. Serial No. 691,858. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MILT. BROWN, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Timing Device, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to timing mechanisms, and has for its general object the provision of an adjustable timing device which shall be extremely simple and reliable in operation and construction and of such a nature that it can be readily adapted for timing a given duration or a series of durations.

In manufacturing operations there is often the necessity for carrying on some processes of manufacture for a specific length of time, and my invention is intended to be used for such a purpose, so that the length of time may always be uniform and the operator need not lose his efficiency for other work by the necessity of watching the time. The particular device shown was especially devised for use in connection with the electric welding of rail-joints in the track. It has been found necessary in a particular process of track-welding to keep the compression of the welding-tool upon the welded joint for a given space of time—say two minutes—after the weld has been made, a shorter time being deemed detrimental to the strength of the joint and a longer time delaying the operation of the machines, and therefore increasing the cost of the welding. For joints of different rails different durations of time would be required, and my timing apparatus is therefore arranged to be readily adjusted within the limits required.

While I have specified the use for which my invention was specifically designed, I desire to make it clear that this specific use is only one of many to which the apparatus is applicable, for, as will clearly appear hereinafter, it may readily be used for timing any desired duration, either longer or shorter than the one shown in the drawings, or may be used to alternately time different durations, if desired.

With these general ends in view my invention consists in the provision of a combined stopping and starting device which has a member which when moved by suitable means, such as an electromagnet, releases itself from the time-movement and by the same motion by which it releases itself imparts movement to the time-movement, so as to overcome the inertia of the parts.

My invention further consists in the provision of a mechanism by which the motion of the time-movement past a certain point causes the starting and stopping device to again engage and stop the time-movement.

My invention further consists in the provision of an alarm-circuit closed by the engagement of a contact moving with the time-movement and a second contact which may be adjusted to any desired position in the line of the moving contact.

My invention further consists in the construction, arrangement, and combination of parts of the starting and stopping device, as will more fully appear hereinafter, and also in various other specific details of the mechanism to be described.

Referring to the drawings, Figure 1 is an elevation of a completed device. Fig. 2 is a view of the stopping and starting device and actuating parts, showing in diagram the electric circuits which operate the alarm-circuit and act upon the starting and stopping device. Fig. 3 is a plan view of the mechanical parts shown in Fig. 2. Figs. 4 and 5 are views which show the different positions of the starting and stopping device.

A represents one of the cog-wheels of the time-movement, carried by the arbor *a* and actuated through the usual intermeshing cogs (which for the sake of simplicity and ease of description I have not shown) by means of the weight B.

C is a portion of the frame of the time-movement, to which is pivoted at *c* an angle-lever D. Pivoted at *d* to the angle-lever D is a pawl E, which is the locking member of the combination. One end *e* of this pawl is an armature adapted to be attracted by the electromagnet F when current is passing through the coil of the latter.

G is a spring secured to angle-lever D and having two notches *g* and *g'*, either of which is adapted to engage on extension *e'* on the back of the pawl E.

H is a fixed stop secured to the frame C and in the line of movement of an upward projection e^2 on the pawl E.

J is a collar which is movable with the time-movement and is preferably mounted on the arbor k of the indicating-hand K. On this collar are two diametrically opposite lugs j, which are adapted to engage one end of the angle-lever D, thereby imparting movement in one direction to the angle-lever.

m is a spring connected between the angle-lever and the frame of the time-movement and adapted to pull the angle-lever in a direction opposed to that which the lugs j produce.

L is a contact-bar which is loosely mounted upon and insulated from the arbor k. This bar is within the casing of the time-movement, but its ends are bent outwardly so as to pass through slots n in the dial of the device.

k' is a contact carried by the indicating-hand K and adapted to contact with an end of the contact-bar L at a desired point in the travel of the indicating-hand.

The hand K is connected, as shown in Fig. 2, with one side of an electric alarm-bell M. The contact-bar L is in connection with one side of the electric batteries N, while the other side of the alarm-bell is connected to the other side of the batteries.

The contact-bar L may be adjusted at any desired position by turning a thumb-nut O, which engages a threaded wire o, secured to the contact-bar, while an insulator o' insulates the contact-bar from the frame.

The operation of my device is as follows: When the mechanism is at rest, the hand K is either at the position shown in Fig. 1 or at a diametrically opposite position. As the operation is the same in starting from either position, this is not material to the description of the mode of operation. When the hand is in the position mentioned, the position of the various parts of the starting and stopping mechanism is that shown in Fig. 2. In this position the pawl E engages the cog-wheel A, being prevented from falling back by the retaining pressure of the spring G, the top notch g of which engages extension e'. Suppose, now, that a duration of two minutes is to be timed. The operator has turned the thumb-nut so as to adjust contact-bar L to the position shown. He now touches the button or switch P, which, as will be seen by an inspection of the diagram, closes a circuit from the batteries N through the coil of the electromagnet F. This attracts the armature end e of the pawl E, so as to move the same about its pivot b against the pressure of the retaining-spring G. As the lug j engages the opposite end of the angle-lever, any movement of the angle-lever is of course impossible. The weight B tends to move the cog-wheel A in the direction shown by the arrow. When, therefore, the pawl E moves about its pivot, it first imparts motion to the cog-wheel in the direction in which it should move, thus overcoming the inertia of the parts, and then by a further movement releases itself from wheel A and forces the extension e' into the lower notch g' of the spring G. This is the position of the parts as indicated in Fig. 4. The time-movement having thus been started continues its motion until the lug j moves out of engagement with the end of lever D. As soon as this occurs spring m moves the angle-lever about the pivot c. This movement would tend to throw the locking-pawl still farther from the cog-wheel A, because of the outward motion of the pivot d. As, however, the upward projection e^2 of the pawl is already in engagement with the stop H, this movement does not take place, but a knuckle-joint movement is produced, which moves the pawl E in a reverse direction about the pivot d, again changing the point of engagement between extension e' and spring G, this time from the notch g' to the upper notch g. The parts are now in position shown in Fig. 5, and the pawl is once more horizontal and in readiness for being inserted between the teeth of the wheel A. This obviously occurs when the upper lever-engager j moves through half a revolution.

It will be seen that by touching the button P the time-movement starts and continues uninterruptedly for a semirevolution of the indicating-hand K, when it is again stopped. This semirevolution is shown as corresponding to a two-and-one-half-minute duration. When the indicating-hand K during this time came opposite the two-minute mark, the alarm-circuit was closed by the contact between k' and the end of contact-bar L and the bell had notified the operator that he must relieve the compression from the weld or take whatever step is necessary to the particular process he is timing. By stopping the cog-wheel soon after ringing the bell the time-movement is ready for a repetition of the timing operation.

I have shown a dial in which the indicating-hand makes half a revolution in two and one-half minutes, in which a lug j is arranged to stop the mechanism after half a revolution, and in which the contact-bar may be adjusted to any position between one and one-quarter and two and one-half minutes. It is obvious, however, that all of these are details which the mechanic will alter to suit the particular conditions which he may meet, for my invention is equally applicable for the timing of intervals of a few seconds or intervals of many hours or to the timing of alternately varying durations of time. It is also obvious that the specific details which I have shown and described are not material to the scope of my broad invention, for they might readily be modified in many particulars without departing outside the scope of the following claims.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In a timing device, a starting and stopping mechanism, and an engager carried and

actuated by the time-movement and adapted to positively move said mechanism to the position for stopping the time-movement.

2. In a timing apparatus, a starting and stopping mechanism, means for moving said mechanism from the stopping to a starting position, and an engager carried by a part of the time-movement and moving therewith for positively moving said mechanism again to its stopping position.

3. In a timing apparatus, a starting and stopping mechanism comprising a locking member and a lever pivoted together, means for turning the locking member about its pivot to unlock the time-movement, and an engager moving with the time-movement adapted to move the locking member and the lever in unison to stop the time-movement.

4. In a locking mechanism for time-movements, the combination of a locking member and a lever pivoted together, means for moving said locking member about its pivot to release the time-movement, and means for moving the lever and locking member in unison to lock the time-movement.

5. The combination with a cog-wheel of a time-movement, of a locking-pawl engaging the same, a lever pivoted to said locking-pawl, means for disengaging the pawl from the cog-wheel by moving the pawl about its pivot, and independent means for restoring said engagement by moving the pawl and lever in unison.

6. A starting and stopping mechanism for time-movements, comprising the combination of a locking member and a lever pivoted together, said locking member being released from the time-movement by movement about its pivot, in combination with a spring secured to the lever, and a lever-engager carried by a part of the time-movement and adapted to move said lever in opposition to said spring and operate the locking member.

7. In a starting and stopping mechanism for time-movements, a lever, a spring acting upon said lever, a lever-engager carried by a part of the time-movement, and adapted to move said lever in opposition to the pull of said spring, a locking member pivoted to said lever, and a stationary stop limiting the movement of the locking member.

8. The combination of a cog-wheel of a time-movement, the pawl and lever pivoted together, the double-notched spring, the lever-spring *m*, and the lever-engager movable with the time-movement.

9. The combination of a cog-wheel of a time-movement, the pawl and lever pivoted together, the double-notched spring, the fixed stop, the lever-spring *m*, and the lever-engager movable with the time-movement.

10. The combination of lever D, locking member E pivoted thereto, stop H, spring G carried by lever D and engaging locking member E, spring *m* connected to lever D, and lever-engager *j* substantially as set forth.

11. The combination of a cog-wheel of a time-movement, a pawl, an electromagnet adapted to disengage the pawl from the cog-wheel, a lug carried by a moving part of the time-movement, and a lever in the line of movement of said lug and connected to said pawl.

12. The combination with a time-movement of a locking member therefor, an electromagnet lock-releaser, and a lock-actuator comprising a lever pivoted to the locking member and a lever-engager carried by the time-movement.

13. In a timing device, a locking pawl and lever pivoted together, an electromagnet adapted to turn said pawl about its pivot, a stop to limit said movement, a spring adapted to pull said lever in one direction, a lever-engager moving with the time-movement and adapted to oppose the action of said spring, and a spring between the lever and locking member.

14. A pivoted pawl for engaging a cog-wheel forming part of a time-movement, a lever carrying the pivot for said pawl, a spring secured to said lever, and two notches in said spring alternatively engaged by said pawl at two different positions around its pivot.

15. The combination with a cog-wheel of a time-movement, a pawl and lever pivoted together, a spring carried by the lever and having two notches adapted to alternatively engage the pawl to hold the same at either of two positions with relation to the lever, and a stop for effecting a change in the point of engagement from one notch to the other when movement is imparted to the lever.

16. In a timing apparatus, a cog-wheel and a time-movement for actuating the same, a pawl adapted to engage and lock said cog-wheel and means for moving said pawl so that it first imparts rotation to the said cog-wheel and then releases itself therefrom, and means for again automatically moving said pawl to position to engage and lock said wheel.

17. In a timing apparatus, the combination of a cog-wheel of a time-movement, a pivoted pawl engaging therewith, and means for moving said pawl about its pivot so that the end engaging the cog traverses an arc having the same general direction as the direction which the time-movement tends to give that part of the cog-wheel engaging the pawl.

18. The combination in a timing device, of a locking-pawl pivoted to a lever, a spring carried by said lever and having two notches adapted to alternatively engage said pawl, an electromagnet adapted to act upon said pawl to change the point of engagement from one notch of the spring to the other, a stop in the line of pivotal movement of the pawl, a lever-spring adapted to act upon the actuating-lever to force the pawl against the stop and rechange the point of engagement between the pawl and the double-notched spring, and a lever-engager carried by an arbor of the time-

movement, and adapted to move the lever in a direction opposed to the action of the lever-spring.

19. The combination of the indicating-hand and the contact carried thereby and connected in an alarm-circuit, the contact-bar loosely mounted on the arbor of the indicating-hand and extending into the arc of movement of the moving contact, a threaded wire secured to the contact-bar, and an adjusting-nut engaging the said wire.

20. In a timing device, the combination of an electric source of supply, a locking member, an electromagnet adapted to act upon the same, a switch, connections between the switch, electromagnet and electric supply, an alarm-bell, a contact moving with the time-movement, a second contact in the line of movement of said moving contact, and connections between the alarm-bell, the said contacts and the source of electric supply.

21. In a timing mechanism, a cog-wheel, a time-movement for actuating the same, a pawl having a radial engagement with the teeth of said wheel, and means whereby said pawl is actuated to impart a starting motion to said wheel and then withdraws from engagement therewith.

In testimony whereof I have affixed my signature in presence of two witnesses.

W. MILT. BROWN.

Witnesses:

RICHARD EYRE,

H. W. SMITH.