No. 801,306. PATENTED OCT. 10, 1905.

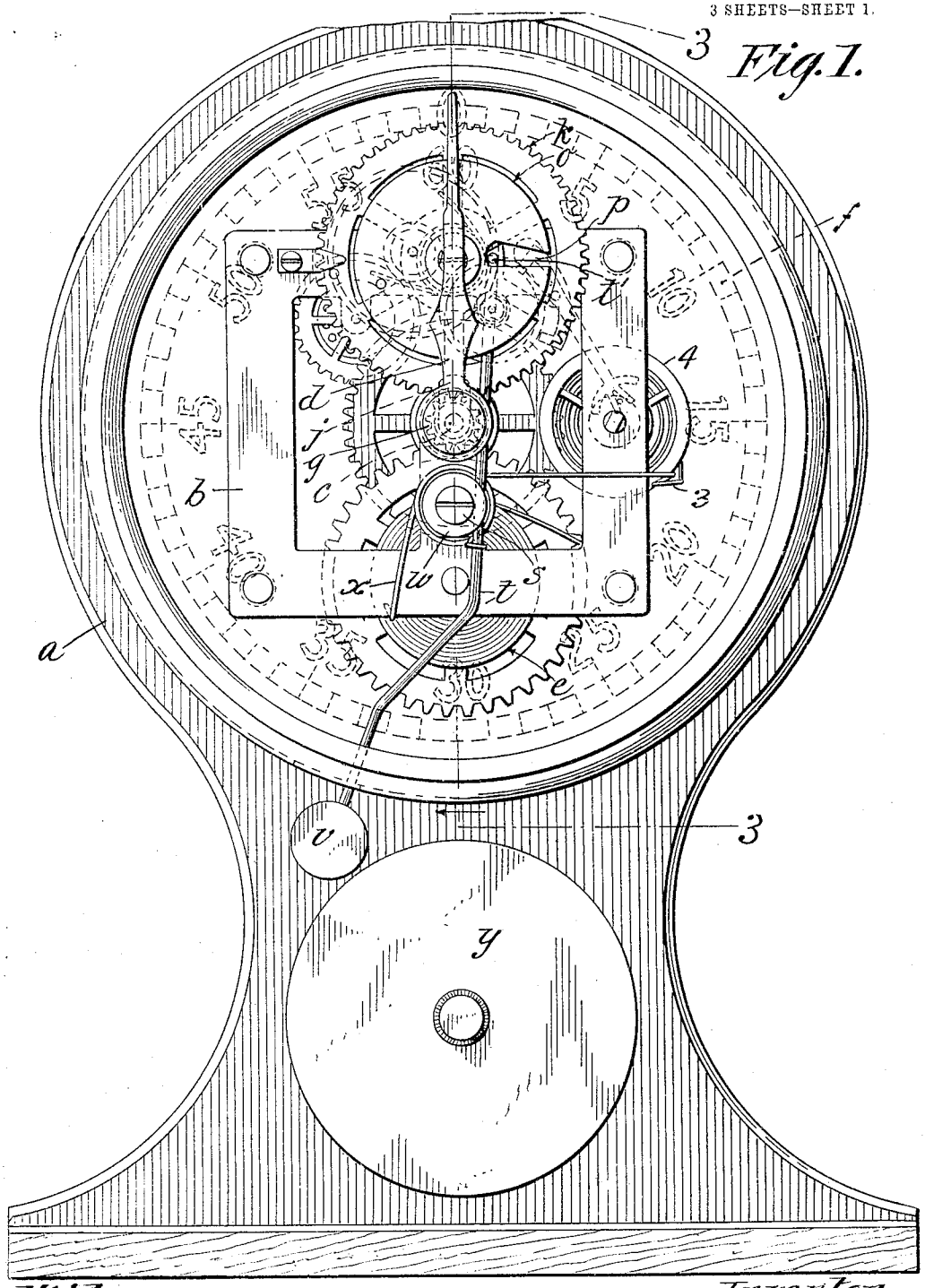
C. J. EMERSON, JR.

TIME ALARM.

APPLICATION FILED MAR. 1, 1905.

3 SHEETS—SHEET 1.

Fig. 1.




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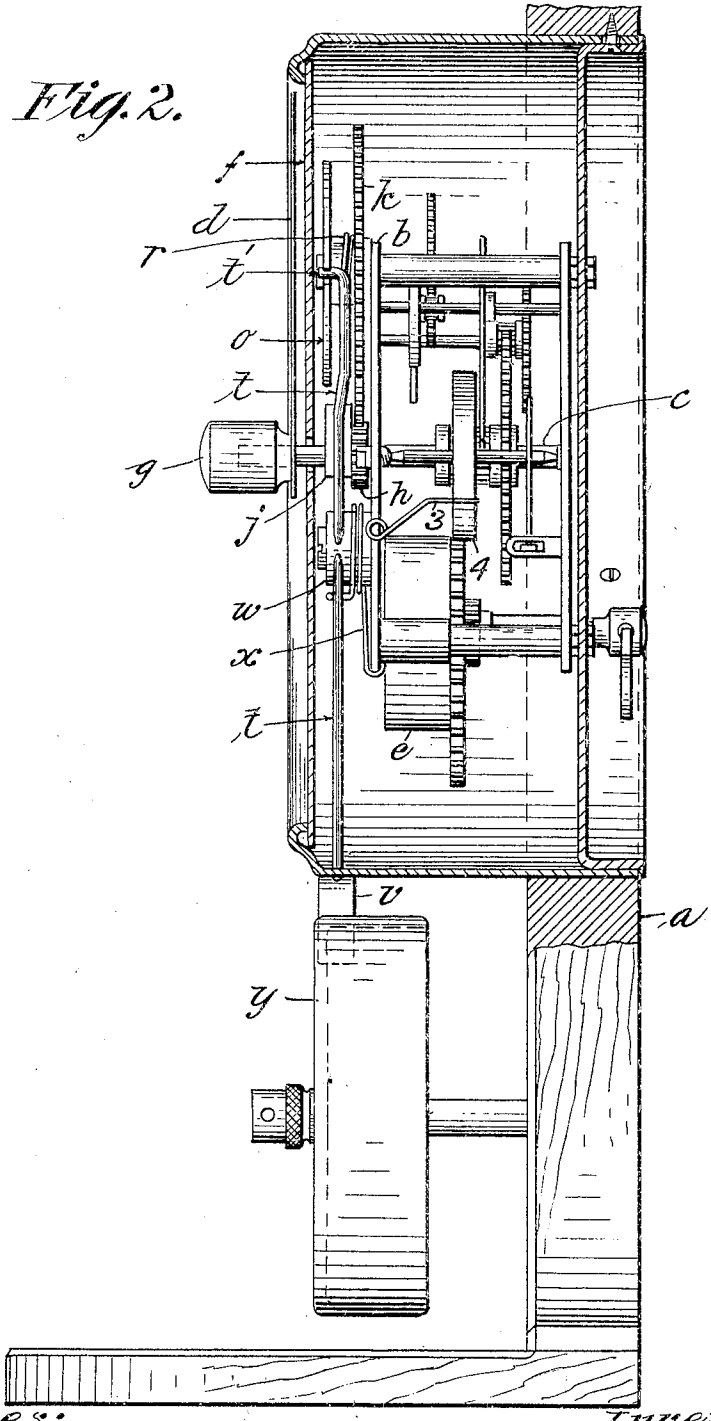
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3 SHEETS—SHEET 2.

Fig. 2.




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TIME ALARM.

APPLICATION FILED MAR. 1. 1905.

3 SHEETS—SHEET 3.

Fig. 4.

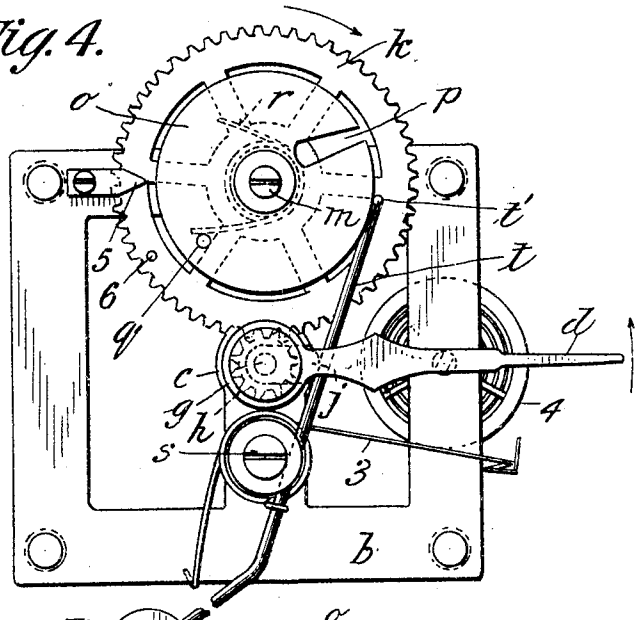



Fig. 5.

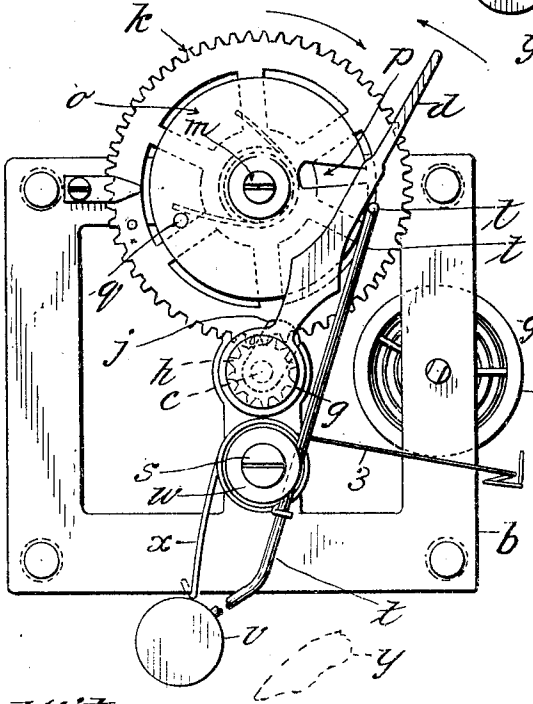
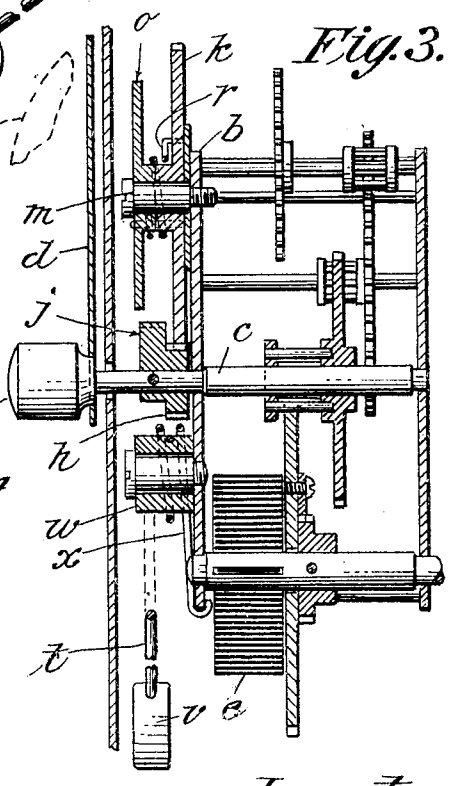



Fig. 3.




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# UNITED STATES PATENT OFFICE.

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## TIME-ALARM.

No. 801,306. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed March 1, 1905. Serial No. 247,917.

*To all whom it may concern:*

Be it known that I, CYRUS J. EMERSON, Jr., a citizen of the United States of America, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Time-Alarms, of which the following is a specification.

This invention relates to time-alarm mechanisms, the object of the invention being to provide a construction of this character in which the alarm mechanism is greatly simplified and so arranged as to be applied to an ordinary time-movement at small expense and to provide a range of action extending from a few seconds to several hours.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the mechanism from which the face or dial has been removed, the latter being shown, however, in dotted lines. Fig. 2 is a side elevation of the mechanism, the case and dial being shown in section. Fig. 3 is a vertical sectional view through the mechanism on line 3 3, Fig. 1. Fig. 4 is a front elevation of that part of the mechanism in which the invention is embodied disassociated from the time-movement, only the balance-wheel of the latter being shown, this figure showing the position of the parts after the initial setting movement. Fig. 5 is a view similar to Fig. 4, showing the position of the parts just prior to the actuation of the alarm mechanism.

Referring to the drawings, *a* indicates a clock-case of any suitable form to contain the clock mechanism or time-movement, the latter being mounted in a frame *b*, secured in the case. The time-movement shown herein is in all respects like an ordinary time-movement, with the exception that the center arbor *c* thereof is extended through what would ordinarily be the back side of the casing, and to this arbor the pointer *d* is secured or is mounted thereon in any convenient way to rotate therewith from right to left.

In one respect the time mechanism differs from an ordinary clock in that the center arbor *c* consists, as shown in Fig. 3, of one piece only, the mechanism connecting said arbor with the mainspring *e* being so arranged as to rotate said arbor at minute-hand speed, the hour-hand mechanism being omitted. The dial or face of this mechanism is indicated by *f*, and, as shown in Fig. 1, it is divided into twelve equal parts, which are numbered from "5" to "60," inclusive, from left to right, zero being located in the position of twelve on a clock-dial. To set the alarm, the pointer *d*, which is provided with a thumb-piece *g*, is turned to the right, the mechanism revolving the same back to zero from right to left.

The parts which are added to the ordinary time-movement are clearly illustrated in Figs. 3, 4, and 5 and consist of a pinion *h*, secured on the center arbor *c* just back of the dial, a cam *j*, preferably integral with the pinion or which may be secured thereto, a gear *k*, loosely mounted on a stud *m* in the frame *b*, and on the same stud a disk *o* is loosely mounted and provided with a substantially radial slot *p* therein, as shown in Figs. 4 and 5. In the disk *o* is a pin *q*, which extends rearwardly from the disk into engagement with one of the spokes of the gear *k*, whereby the rotation of the latter in one direction will carry the disk with it, and applied to the hub of the disk between the latter and the gear is a spiral spring *r*, one end of which engages the gear and the other the disk, whereby the latter through the torsional action of the spring will be yieldingly held in engagement with the gear through the pin *q*, the spring also permitting partial rotatory movement of the disk to the right independently of the gear. On a stud *s*, just below the center arbor *c*, is supported an arm *t*, the upper end of which swings in between the gear *k* and the disk *o*, and, as shown in Fig. 4, the upper end of this arm is bent at right angles thereto, as indicated by *t'*, and extends into the radial slot *p* in the disk. The lower end of the arm *t* is provided with a striker *v*, and around the hub *w* of the arm *t* is a spiral spring *x*, so disposed as to normally press the upper end of the arm *t* toward the axis of the disk *o*, and thereby when the slot *p* arrives in proper position the end *t'* of the arm *t* will be snapped into said slot, throwing the striker *v* on the lower end of said arm against the side of the bell *y*, the parts being so disposed that this will occur when the pointer actuated by the time-movement points to zero on the dial, as shown in Fig. 1. When swung out of the slot *p*, the spring *x* will hold the end of the arm *t* yieldingly against the edge of the disk *o*. Secured to the hub *w* of the arm *t* is a slender wire 3, having its extremity so bent as to come in contact with the edge of the balance-wheel 4 of the time-movement whenever the arm *t* is released, as above described, to strike the

alarm. To set the alarm, the thumb-piece on the pointer is used to turn the latter to the right, and this movement will rotate the center arbor, and with it the cam *j*, which will be swung against the arm *t*, which is contiguous thereto, swinging said arm outwardly; but to permit this arm to be swung it is of course necessary that the disk *o* be independently capable of rotation to the right, owing to the difference between the radii of the disk and the arm *t;* hence the application of the spring *r* as described to the hub of the disk to permit this movement. When the pointer has been swung far enough to carry the end *t'* thereof out of the slot *p*, the spring *r* will immediately throw the disk *o* to the left again until the pin *q* brings up against the spoke of the gear *k*, as shown in Fig. 5. This leaves the pointer *d* approximately in the position shown in Fig. 4—that is to say, it will have traveled through practically an arc of fifteen minutes—and its movement to this position effects the release of the arm *t* from contact with the balance-wheel 4, and upon such release the time-movement immediately starts, and as the center arbor revolves it carries the pointer back toward zero to the left, the pinion *h* rotating therewith and in turn rotating the gear *k* to the right, and the disk *o*, moving with the gear, will eventually bring the slot *p* therein in position to allow the upper end of the arm *t* to snap into it. Therefore it is obvious that when the alarm is to be set for any period of shorter duration than fifteen minutes the pointer must be swung to the right far enough to carry the upper end thereof out of the slot *p* and then be rotated back toward the left by hand until it indicates the number of minutes or the fractional part of a minute desired, and if then left to itself the time-movement will continue the rotation until the pointer is at zero and the alarm is sounded. Thus it is possible to turn back the pointer from the position shown in Fig. 4 toward the left until the end *t'* of the arm is so close to the edge of the slot *p* that only a few seconds must elapse before the alarm is sounded. On the other hand, the alarm may be set for as long a period as is permitted by the diameter of the gear *k*, for it is obvious that the alarm may be set to run as many hours as the diameter of the pinion *h* may be multiplied into the diameter of the gear *k*, and the proportion of these parts may be varied to suit any conditions.

The maximum length of time for which the alarm may be set being represented, as stated, by one revolution of the gear *k*, a finger 5 is rigidly secured to the frame to overlap the edge of the gear *k*, and a stop-pin 6 is inserted in the latter, to the end that the gear *k* may not be rotated so far as to bring the slot *p* around in position to allow the end of the arm *t* to snap into it.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a time-movement and the usual center arbor thereof, of a gear and a disk loosely mounted on the same axis to rotate as one in one direction, the disk being independently rotatable in the other direction, a pinion fixed on the center arbor and meshing with said gear; and a cam rotatable with said arbor; an arm supported to swing in the plane of the disk, the upper end of which bears on the edge of said disk and the lower end of which constitutes a striker, a spring to normally press the end of said arm against said disk, there being a radially-disposed slot in the latter into which the end of said arm may fall to sound the alarm, together with means operated by the movement of the arm to stop the time-movement when the end of said arm enters said slot.

2. The combination with the center arbor of a time-movement, of a rotatable disk, a gear supported on the same axis as the disk, said gear and disk being rotatable as one by the time-movement, a pinion on the center arbor in mesh with said gear, an arm pivotally supported one side of the center arbor to swing in the plane of said disk, and a spring to yieldingly hold the arm against the edge of the latter, there being a radial slot in the disk into which the end of the arm may fall when the disk is rotated to a certain position; means to yieldingly connect the disk and the gear whereby the former may be rotated independently in advance of the latter by the movement of said arm in one direction, said yielding connection serving to return the disk to normal position after being actuated by the movement of the arm, and means actuated by the movement of the arm into said slot, to sound an alarm.

3. The combination with the center arbor of a time-movement rotatable at minute-hand speed, of an arm supported to swing in a plane at right angles to said arbor; a pinion fixed on said arbor, a freely-rotatable gear in proximity to the pinion and meshing therewith; a disk supported on the axis of the gear and rotatable therewith in one direction, there being a slot in the disk to permit one end of said arm to swing toward the axis of the disk, and a yielding connection between the disk and gear whereby the disk may be rotated in advance of the gear by the movement of the arm away from the axis of the disk, said connection serving to return the disk to normal position after said advancing rotation, together with an alarm mechanism actuated by the movement of the arm from the periphery toward the axis of the disk.

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