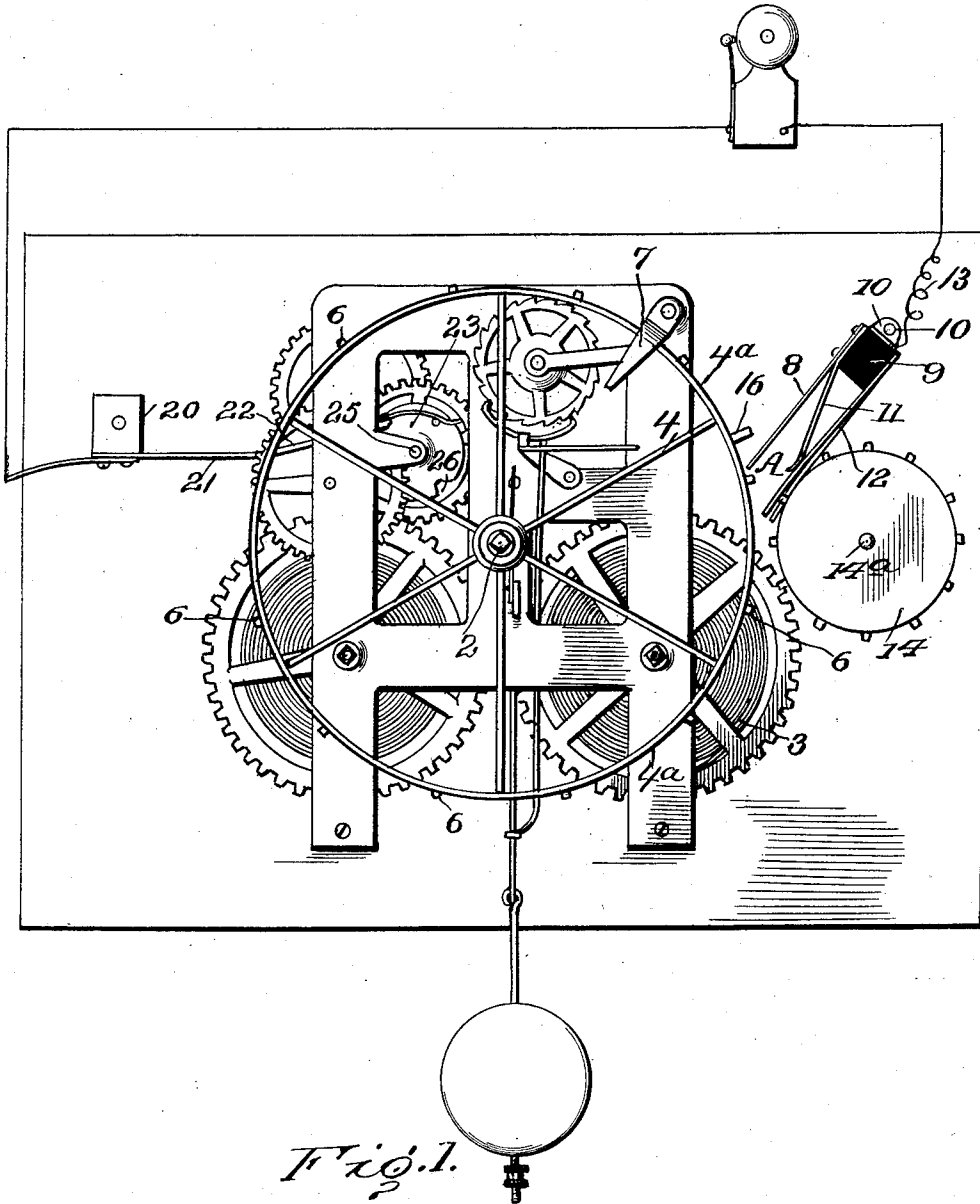


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 APPLICATION FILED DEC. 8, 1909.

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Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.



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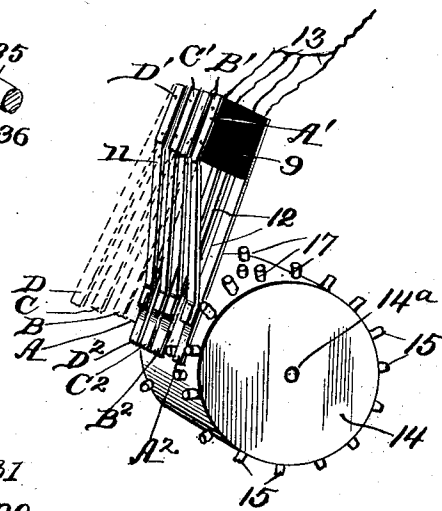
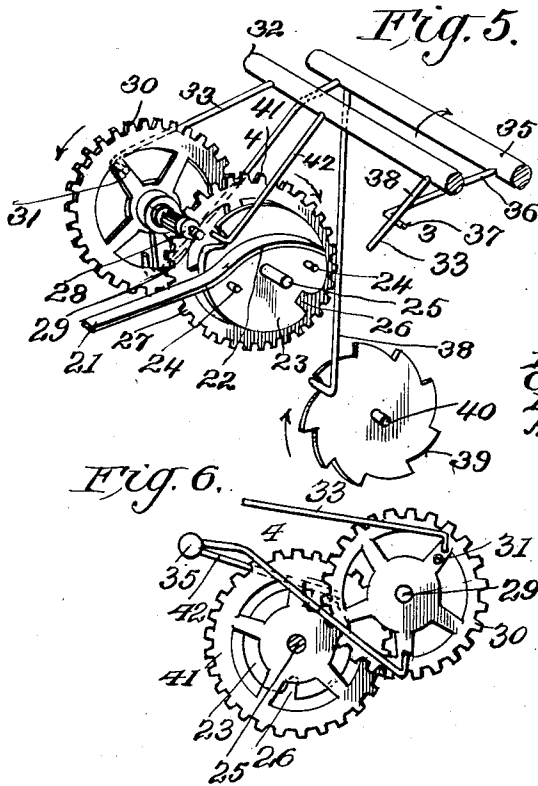
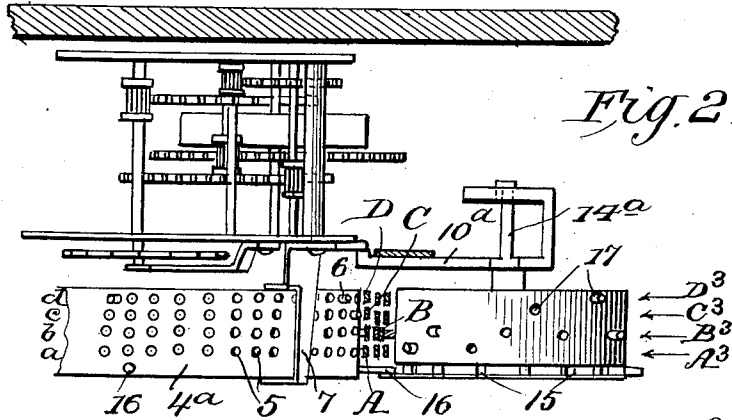


Fig. 4.

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# UNITED STATES PATENT OFFICE.

LEVI D. IKENBERRY, OF NORTH MANCHESTER, INDIANA.

AUTOMATIC ALARM-ACTUATING MECHANISM.

1,018,664.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed December 8, 1909. Serial No. 532,108.

*To all whom it may concern:*

Be it known that I, LEVI D. IKENBERRY, a citizen of the United States, residing at North Manchester, in the county of Wabash and State of Indiana, have invented certain new and useful Improvements in Automatic Alarm-Actuating Mechanisms, of which the following is a specification.

My invention relates to that class of signal-actuating devices in which a signal is automatically actuated at predetermined intervals, the object of the invention being to provide mechanism for actuating a signal or alarm at certain intervals during one definite period of time, and for actuating the signal or alarm at other intervals during a successive period or periods.

My invention includes to that end a motor-actuated pin wheel or like member having a plurality of series of pin perforations, a corresponding series of contact fingers located adjacent to the wheel, and a selecting wheel which in its rotation acts to move one or another of the contact fingers into position to be engaged by the contact pins on the pin-carrying wheel.

To the further end of making and breaking a circuit through the alarm or signal mechanism at regular intervals, I provide a clock-operated intermittent making and breaking device which operates simultaneously with the making of contact between the contact fingers and the contact pins on the pin wheel.

The invention also consists in the arrangement of parts and details of construction as set forth in the accompanying specification and more particularly stated in the claims appended.

For a full understanding of the invention and the merits thereof, and to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a front view, the outer case being removed; Fig. 2 is a fragmentary top view; Fig. 3 is a detail of one of the contact pins; Fig. 4 is a detail perspective view of the several series of contact fingers and the selector; Fig. 5 is a perspective view of the means for breaking and making the circuit through the alarm; and, Fig. 6 is a rear face view of the mechanism shown in Fig. 5.

Corresponding and like parts are referred

to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to these drawings, 2 designates the main arbor of a clock work motor which completes one rotation in a given interval of time, as in twelve hours.

3 designates the spring for operating the shaft through the train of gearing forming the clock work motor. This train of gearing is not particularly described, for the reason that various forms of gearing trains may be used for rotating the main shaft or arbor.

Carried upon the main shaft (which in this case is a hollow shaft) is a wheel 4 provided upon its rim 4<sup>a</sup> with a plurality of series of perforations 5, the series being respectively lettered *a*, *b*, *c* and *d* and adapted to receive contact pins 6. As an illustration, I have shown my actuating mechanism as capable of operating an alarm or signal at intervals of five minutes. Hence I have provided one hundred and forty-four perforations or pin holes 5 in each series, or one perforation for each five minutes, during a period of 12 hours. The pins 6 are adapted to be placed in any one of the perforations desired, and said pins are flattened at their sides so as to be easily withdrawn or inserted by means of a suitable implement.

Mounted upon the frame of the motor, and projecting over the edge of the rim 4<sup>a</sup> is the angular guide 7. This simply acts to hold the wheel 4 in its proper position so that it will not move out of proper alignment.

A, B, C and D designate a series of conducting fingers arranged in alinement with the series of pin holes *a*, *b*, *c* and *d*. These conducting fingers are supported upon a block 9 of insulating material which in turn is mounted upon a bracket 10 connected to the frame of the mechanism or supported in any suitable manner. The ends of these conducting fingers A, B, C and D, which I shall hereafter denominate generically as 8, project into the path of travel of the projecting pins 6 so that as the wheel 4 rotates, the pins which may be inserted upon the rim of the wheel, will come in contact at intervals with one or the other of the fingers 8. Supported in contact with the conducting fingers 8 are downwardly extending spring fingers 11 which are specifically des-

ignated A', B', C', and D', and mounted upon the opposite side of the block 9 and projecting below the fingers 11 are the spring contact fingers 12 which are specifically denoted A<sup>2</sup>, B<sup>2</sup>, C<sup>2</sup>, and D<sup>2</sup>. These are normally out of contact with the fingers 11, but are capable of being moved into contact therewith, as will be later described. Attached to the fingers 12 are the wires 13 which lead to any suitable alarm mechanism.

Supported adjacent to the ends of the contact fingers 12 is the selecting wheel 14 which is rotatably mounted upon a spindle 14<sup>a</sup> in a bracket 10<sup>a</sup>. This selecting wheel has projecting from it a plurality of series of pins 17 adapted to engage with the contact fingers 12 as the selecting wheel rotates. The selecting wheel 14 also has upon it the projecting teeth 15 which are adapted to be engaged by a tooth 16 projecting from the rim 4' of the pin-carrying wheel. It will be seen that the selecting wheel will move one step for each complete revolution of the pin-carrying wheel 4. The pin-carrying wheel, as before remarked, is intended to rotate once in every twelve hours, and therefore will move the selecting wheel once every twelve hours, the selecting wheel being provided with fourteen teeth 15, or one tooth for each twelve hours during the week. The selecting wheel is also provided with a plurality of series of selecting pins 17, these series being respectively designated A<sup>3</sup>, B<sup>3</sup>, C<sup>3</sup> and D<sup>3</sup> corresponding to the series of contact fingers and the series of pin holes in the rim of the wheel 4.

The operation of this portion of my invention will be obvious, it being assumed that the arbor of the wheel 4 is electrically connected in circuit with an alarm and with the wires 13. We will suppose that my device is intended to be used in a school, for actuating signals therein indicating the commencement or end of certain periods of study, or the time at which certain duties are to be performed. The first series *a* of perforations will be for the purpose of closing the circuit through the signaling apparatus at certain predetermined times during the regular week days. The second series of perforations *b* will be for the purpose of supporting contact pins which will give desired night signals. The third series *c* we will suppose is used for giving signals which are necessary on Saturday when the greater part of the studies are omitted and comparatively few signals are necessary. The fourth row or series of pin perforations *d* is for the purpose of receiving contact pins which will make the necessary signals for Sunday.

It will be understood that I have only used the above signals as illustrations of the capacity of my device and for clearness of

description, as it will be obvious that the device might be adapted for giving signals under entirely different circumstances.

It will be seen that inasmuch as the wheel 4 rotates once in twelve hours, all the signals would be given every twelve hours, were it not that I have provided means for placing only certain of the conducting fingers in circuit at any one time. Thus, at night, it is necessary of course that the finger A which contacts with the pins placed in the series of perforations *a* should be in some manner cut out, while the finger B should be placed in circuit with the signaling mechanism so that the pins which are in the second series of perforations will operate the signaling mechanism. Further, it is necessary that on Saturday both the fingers A and B should be out of circuit, while on Sunday, the fingers A, B and C should be out of circuit. It will be seen that the pins 17 on the selecting wheel governing the fingers 12 should be alternately set to these fingers on the selecting wheel actuating the pins A<sup>2</sup>, C<sup>2</sup> and D<sup>2</sup>, as it is obvious that every night the fingers B, B' and B<sup>2</sup> must be put in circuit with the signaling mechanism, and all other contact fingers cut out.

In operation, the clock work will cause a rotation of the wheel 4 once in every twelve hours. As the pin on the wheel engages with any conducting finger which is in circuit with the wires 13 the circuit through the signaling mechanism will be closed and the signal will be sounded just so long as the pin 6 is in engagement with the conducting finger. Inasmuch as the wheel 4 is only moved very slowly, making a complete revolution in twelve hours, it is obvious that the engagement between the pin 6 and the contact finger 8 will be considerably prolonged and would therefore cause a continuous actuation of the signal or alarm during its whole period of contact. It is to avoid this that I have provided the mechanism now to be described.

Projecting from any suitable support, as 20, is a contact strip 21 having a curved terminal 22 whose inner face is adapted to contact with contact studs 24 projecting from the face of a disk 23 carried on a shaft 25 driven by the spring 6. This disk is oppositely notched, as at 26, and the curved contacting end of the contact strip 22 contacts with one or the other of the pins or studs 24 during a portion of the revolution of the disk 23.

Mounted on the shaft 25 is the gear wheel 27 which engages with a pinion 28 on a shaft 29. Mounted on this shaft is a wheel 30 having projecting from its face the stud 31 which forms a stop. From a rock shaft 32 projects an arm 33 whose extremity is bent to engage over the stud 31 when the arm falls. When the arm 33 is engaged

with the stud, it will of course prevent the rotation of the train of gear wheels and prevent the rotation of the disk 23 which is therefore held in the position shown in Fig. 5 with neither of its pins 24 contacting with the contact strip 22. In order to raise the stop and release the train of wheels, I provide a rock shaft 35 whose bent extremity 37 engages with an arm 38 projecting from the rock shaft 32. Thus, when the rock shaft 35 is rocked in one direction, it will raise the arm 37, thus raising the arm 33 and releasing the stud 31. In order to operate the rock shaft 35, I provide the arm 38 whose bent extremity rides over the face of a ratchet wheel 39 on a shaft 40, which shaft takes the place of the ordinary minute hand shaft of the clock, and is driven in the usual manner. This ratchet wheel 39 has teeth whose inclined faces are gradually curved, and there is a tooth on the ratchet wheel 39 for each five minutes of the hour, the ratchet wheel rotating once an hour. As it rotates the arm 38 will be gradually raised, thus gradually rocking the shaft 35 until a point is reached where the rotation of the shaft 35 has rotated the shaft 32 sufficiently to release the stud 31, whereupon the wheel 30 will turn until the stud 31 strikes the bent end of a stop arm 41 attached to the rock shaft 35. At this time, the arm 38 has not ridden fully up to the apex of the ratchet tooth. Projecting from the shaft 32 is an arm 42 whose bent end engages in one or the other of the notches 26 and which rests in one or the other of the notches when the arm 33 is engaged with the stop 31. As the arm 33 is raised out of its engagement, the arm 42 will be raised out of the notch 26, all as before stated. As soon as the arms 33 and 42 are raised, the wheel 30 will rotate as before described, until stopped by the arm 41, thus allowing the shaft 25 to rotate. When the arm 38 has risen to the apex of the ratchet tooth of the ratchet wheel 39, the stop, arm 41 will be moved from its engagement with the stop 31, and the shaft 25 and the disk 23 will be rotated through a half circle, or until the arm 42 again drops into one of the notches 26. As soon as this occurs, the rock shaft 32 is rocked to bring the arm 33 into position to engage the stop 31 and again hold the parts in the position shown in Fig. 5.

It is plain that by the mechanism before described, an escapement device is provided whereby at intervals of five minutes the shaft carrying the disk 23 is released so that the disk may be rotated and in its rotation cause its studs 24 to be brought into contact with the contact strip 22 and thus close the circuit through the bell. If, during this period, one of the pins 6 on the wheel 4 contacts with one of the strips 8, then the circuit will be entirely completed through the

bell, and the bell will sound during such period as the pin 24 is in contact with the strip 22. As soon as one of the pins 24 has passed the strip 22, the circuit through the clock work will be broken, and the signal cease to sound or show, notwithstanding that a pin 6 may be in contact with one of the contact fingers 8.

While I have shown what I believe to be the best form of my invention, I do not wish to be limited to this, as it is obvious that there are many changes which might be made, without departing from the spirit of the invention. It will also be obvious that the construction is adapted to giving series of signals for various purposes, though I have found it particularly adapted for schools and like institutions.

The construction as described is capable of operating week in and week out without any attention except that of winding up the springs 3 and 21. I have found in practice that it is particularly effective; that it may be easily adapted for various circumstances, and that it is entirely effective in use.

Having thus described the invention, what I claim is:

1. The combination with an electric signal, of a rotatable main contact carrier electrically connected to the signal and having a plurality of series of shiftable contact pins projecting therefrom, a series of contact fingers corresponding to the series of contact pins, each movable into position to complete a circuit through the pins and through the signal, a cylindrical selector having a circumferential series of pins electrically engaging with one of said contact fingers, and a plurality of series of pins electrically engaging with the other contact fingers and set alternately to the first series, and means for rotating the selector one step for each complete revolution of the main contact carrier.

2. The combination with an electric signal, of a rotatable main contact carrier electrically connected to the signal and having four series of shiftable contact pins projecting therefrom, four contact fingers, each movable into position to complete a circuit through the pins and through the signal, and a rotatable selector carrying four circumferential series of adjustable pins, one series of pins electrically engaging one of said contact fingers, the other series of pins electrically engaging with the other contact fingers and set alternately to the first series of pins, and means for rotating the selector one step for each complete rotation of the main contact carrier.

3. The combination with an electric signal, of a rotatable main contact carrier in electrical connection with the signal and having a plurality of series of shiftable

contact pins projecting therefrom, a plurality of contact fingers, one for each series of pins each finger movable into position to complete a circuit through the corresponding series of pins and through the signal, and a rotatable selector having a plurality of series of pins contacting with said contact fingers, one of the series of pins actuating the night signals and being set alternately with respect to the other series of pins actuating the day signals, the main contact carrier being provided with means whereby it may be rotated once in every twelve hours, means being provided whereby a complete rotation of the main contact carrier shall cause a partial rotation of the selector equal to the distance between a pin of the day series and the alternately set pin of the night series.

4. The combination with an electric signal, of a rotatable main contact carrier in electrical connection with the signal and having four series of contact pins projecting therefrom, one of said series actuating the signals for Saturday, one actuating the signals for Sunday, one actuating the signals for the remaining week days, and one actuating the night signals for all the days of the week, four contact fingers, each finger being independently movable into position to complete a circuit through the pins and through the signal, a rotatable selector electrically connected to the signal having a series of night signal pins electrically engaging with one of said contact fingers, and a plurality of series of day signal pins electrically engaging the other contact fingers and set alternately to the first set, means for giving a complete ro-

tation to the main contact carrier every twelve hours, and means for giving a partial rotation to the selector upon each complete rotation of the main contact carrier.

5. The combination with an electric signal, of a rotatable main contact carrier in electrical connection with the signal and having four series of contact pins projecting therefrom, four contact fingers, each movable into position to complete a circuit through the contact pins and through the signal, a rotatable selector having four series of pins, one of said series having five adjustable pins therein corresponding to five successive days of the week, the next adjacent series having seven pins therein corresponding to the nights of the week, the pins for the night signals being set alternately with respect to the pins for the signals first referred to, a pin adapted to electrically engage with the third finger of the series of fingers and corresponding to the seventh day of the week, and a pin electrically engageable with the fourth contact finger of the series and corresponding to Sunday, means for giving a complete rotation to the main contact pin carrier once for every twelve hours, and means for giving a partial rotation equal to the distance between one pin and the next pin to the selector upon each complete rotation of the main contact carrier.

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

LEVI D. IKENBERRY. [L. S.]

Witnesses:

EDWIN L. LEUTZENHISER,  
MARION F. ADAMS.