

935,207.

3 SHEETS--SHEET 1.



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 AUTOMATIC FLASHER FOR ELECTRIC LIGHTS.
 APPLICATION FILED MAY 22, 1908.

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Patented Sept. 28, 1909.
 3 SHEETS—SHEET 2.

Fig. 3.

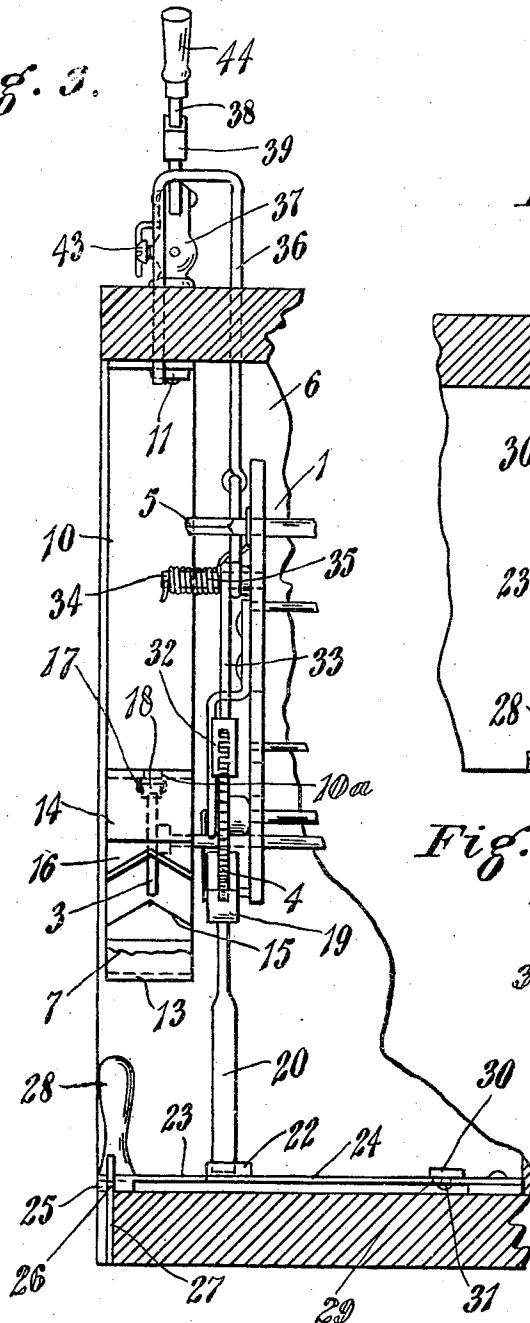


Fig. 4.

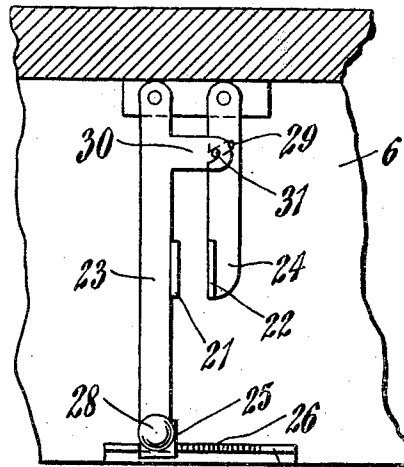
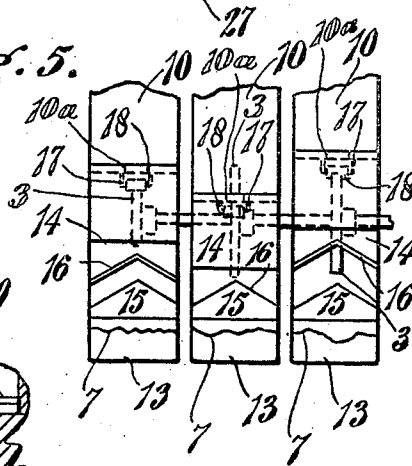


Fig. 5.

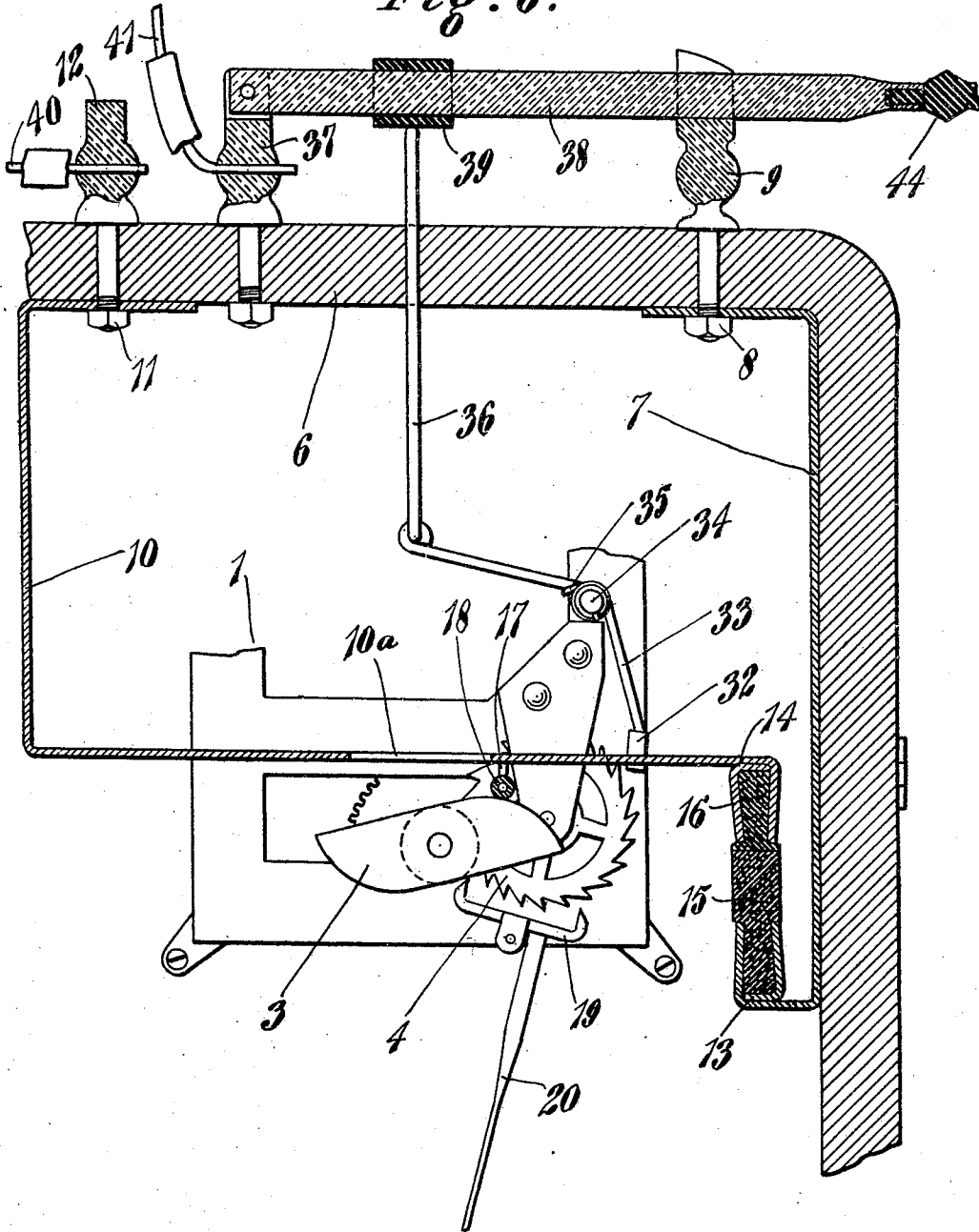


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Fig. 6.



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AUTOMATIC FLASHER FOR ELECTRIC LIGHTS.

935,207.

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To all whom it may concern:

Be it known that I, JOHN O. HOUSER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Automatic Flashers for Electric Lights, of which the following is a specification.

My invention relates to automatic switches, and its object is to provide a simple and economically constructed device for periodically turning on and turning off electric lights, as in the operation of an electric sign.

My invention consists in the combination with a spring motor, of an interrupter adapted to be operated thereby and means for varying the speed of the motor, as well as in the parts and in the combination and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawings: Figure 1 is a front elevation of a device embodying my invention. Fig. 2 is a detail perspective view of one of the improved binding posts. Fig. 3 is a sectional side elevation on a line corresponding to the line $x-x$ of Fig. 1 of the device, parts of the spring motor being broken away. Fig. 4 is a plan view partly in section on a line corresponding to the line $y-y$ of Fig. 1, better illustrating part of the regulating mechanism. Fig. 5 is a partial end elevation illustrating a modification of my improved device. Fig. 6 is a vertical transverse section, better illustrating the construction of the switch and the interrupter, parts of the motor, casing and speed varying mechanism being omitted for the sake of clearness.

Constructed as illustrated, the spring motor 1 consists in a train of gear wheels transmitting the motion of the spring 2 to the cam 3, and also to the escapement wheel 4. These gear wheels are so arranged that the escapement wheel 4 turns considerably faster than does the cam 3. The spring 2 is wound up by turning the shaft 5 by means of a key. The spring motor 1 is mounted on the rear wall of the case 6 which is constructed of fireproof insulating material, such as porcelain. Mounted on the interior of one of the side walls is a bar 7 which runs vertically of the wall and is bent horizontally and runs along the interior of the top of the case, where it is held in position by means of a nut 8 on the lower end of the

screw stud of the post 9. On the interior of the other side wall of the case the bar 10 runs vertically thereof, and is bent horizontally to run along the interior of the top of the case, where it is held by means of a nut 11 on the screw stud of the binding post 12. The bar 7 at its lower end is bent horizontally and then upwardly to form one of the jaws of a clamp 13, the other jaw of the clamp being formed by an additional piece secured to the bar 7. The bar 10 is also bent horizontally and runs across the case to a point above the clamp 13 on the bar 7 and is bent downward to form one jaw of a clamp 14, the other jaw being formed by an additional piece secured on the bar 10.

In the clamps 13 and 14 are secured the contact pieces 15 and 16, respectively, of the interrupter, preferably of carbon. The lower contact piece 15 in the clamp 13 is so shaped that its upper edge forms a salient angle, while the upper contact piece 16 in the clamp 14 is so shaped that its lower edge forms a reëntering angle, the salient angle of the piece 15 being equal to the reëntering angle of the piece 16, so that the contact pieces may be brought together and form efficient electrical contact along the entire surfaces of the adjacent edges. The lengths of the bars 7 and 10 are so proportioned that these contact pieces 15 and 16 will be allowed to be brought together, as above described, and they are normally held together by the pressure exerted, due to the resiliency of the bar 10 which passes across the case 6. This bar 10 passes in front of the spring motor 1, and the cam 3, which is mounted on the spring motor 1 and adapted to be turned thereby, is positioned under the bar 10 so that it will raise it and draw the contact piece 16 away from the contact piece 15 and then release it, allowing the contact of the pieces to be resumed. As illustrated, this is accomplished by providing a slot in the bar 10 so positioned with respect to the cam 3 that the cam 3 may rotate throughout part of its revolution without engaging to raise the bar 10, but that during part of its revolution it will engage to raise the bar 10 the desired distance. Preferably the edge of the cam 3 does not engage directly with the surface of the bar 10, but the bar 10 is provided with a staple 17, and this staple 17 has journaled thereon a roller 18, which makes contact with the edge of the cam

with the effect of decreasing the friction of the operation of the device.

From the above it will be understood that the regular rotation of the cam 3 by the operation of the spring motor will cause regular rising and falling, and consequently regular making and breaking of the contact between the contact pieces of the interrupter. The controlling of the speed of the spring motor is the purpose of the escapement wheel 4, which, as hereinbefore stated, turns considerably faster than does the cam 3. For thus controlling the speed of the motor the escapement wheel 4 is provided with an anchor 19 pivoted on the frame of the spring motor and having pallets adapted to engage alternately with the teeth of the escapement wheel 4. This anchor 19 is provided with a downwardly extending flat spring 20 reaching to a point closely adjacent to the bottom of the case 6, where two lugs 21 and 22 are provided, one of them being on each side of the lower end of the spring 20, which is adapted to alternately engage with them and have the length of its vibration limited thereby. Thus constructed, the escapement wheel 4 is rotated simultaneously with the rotation of the cam 3, in consequence of which the speed of rotation of the cam 3 will be proportional to the speed of rotation of the escapement wheel 4. The anchor 19 and its downwardly extending spring 20 will be vibrated, due to the alternate engagement of the pallets of the anchor with the teeth of the escapement wheel 4. The interval of time elapsing between the engagement of one pallet of the anchor with the teeth of the escapement wheel 4, and the engagement of the other pallet with the teeth will be proportional to the length of time elapsing between the engagement of the flat spring 20 with one of the lugs 21 or 22 and the engagement thereof with the other of the lugs, and this length of time will be proportional to the distance between the two lugs 21 and 22. Thus, since at each vibration of the spring 20, one tooth of the escapement wheel is released, the rotation of the escapement wheel and consequently the speed of the motor will be proportional to the time of vibration of the flat spring 20.

In consequence of the above conditions, the speed of the spring motor may be varied by varying the distance between the lugs 21 and 22. For this purpose the lugs 21 and 22 are mounted on levers 23 and 24, each of which is pivoted separately, near the rear of the case 6, as is best illustrated in Fig. 4 of the drawings. The lever 23 is somewhat longer than the lever 24, and its free end is provided with a lug 25, which may engage in any one of a series of notches 26 in a plate 27 mounted on the front edge of the bottom of the case 6, and which is properly

labeled to indicate the direction in which the lever 23 should be moved to increase or decrease the speed of the motor. This lever 23 is also provided with a suitable handle 28 for conveniently manipulating it. In order to cause the lever 23 to transmit its motion to the lever 24, a slot 29 is provided in the lever 24, which extends in a direction not concentric to the pivotal mounting of the lever 24, and the lever 23 is provided with a laterally extending lug 30, which has a stud 31 projecting into the slot 29 of the lever 24. Thus, when the lever 23 is moved toward the lever 24, the lever 24 will also move toward the lever 23, and when the lever 23 is moved away from the lever 24, the lever 24 will also move away from the lever 23. This arrangement has the effect, when the levers are properly positioned, of maintaining each of the lugs 21 and 22 at its proper distance relative to the other, from the middle point of the vibration of the spring 20, equalizing the impact of the spring 20 thereon.

For conveniently stopping the motor and allowing it to start, a shoe 32, preferably of leather or similar material so as not to injure the teeth of the escapement wheel, is mounted on a bell crank lever 33 in such a position as to engage with the teeth of the escapement wheel 4 to stop the motor, or be disengaged therefrom by the movement of the lever 33 to allow the motor to start. This bell crank lever 33 is pivoted on a stud 34 in the frame of the motor, and a spiral spring 35 is mounted on the stud 34 and engages with the lever 33 so as to normally hold the lever 33 in position to present the shoe 32 against the teeth of the escapement wheel 4 and hold the motor stationary. The other arm of the bell crank lever 33 has pivoted to its free end, a rod 36, which passes vertically upward through the top of the case 6, where it is preferably bent horizontally, and then vertically downward to again pass through the top of the case 6, whereby it may be guided in its vertical movement. Thus arranged, when the rod 36 is depressed, the shoe 32 will be drawn away from the teeth of the escapement wheel 4 against the pressure of the spiral spring 35 on the stud 34, and the motor will be allowed to start. In addition to the post 9 and the binding post 12 on the top of the case 6, a binding post 37 is provided and is bifurcated and has pivoted, between its two members thus formed, the blade 38. The post 9, with which the bar 7 is electrically connected, is also bifurcated, and the blade 38 is adapted to enter between the members of the post 9 so that electrical contact may be made between the bar 7 and the binding post 37. An insulating piece 39 is mounted on the blade 38 in such position as to engage with the rod 36 and depress it when the blade 38

is made to enter between the members of the bifurcated post 9.

My improved device is electrically connected to the electric current producing apparatus and to the electric lights, which it is desired to turn on and off thereby, by means of wires 40 and 41, the bared ends of which are inserted in the binding posts 12 and 37, respectively, and clamped by means of screws 42 and 43 therein, respectively. As hereinbefore described, when the rod 36 is depressed, it disengages the shoe 32 from the teeth of the escapement wheel 4 and allows the spring motor to start. Also, with the electrical connection above described, when the blade 38 is caused to enter between the members of the bifurcated post 9, the electrical current will be allowed to flow through the bar 7 and contact pieces 15 and 16, and through the bar 10, and will then only be interrupted by the breaking of the contact between the contact pieces 15 and 16. Thus, the flow of the electric current may be started and the spring motor may be started, simultaneously, with the one operation, which consists in depressing the blade 38. This blade 38 is provided with an insulating handle 44 for manipulating it. Also, when the blade 38 is raised to stop the flow of the electric current, the rod 36 will be allowed to rise, and the spring 35 will operate the bell crank lever 33 to engage the shoe 32 with the teeth of the escapement wheel 4 and stop the motor. The screws 42 and 43 are each provided with two slots at right angles to each other, and a wire is rigidly secured in each of the binding posts, extending horizontally therefrom, and then downwardly and into one of the slots of the screw, to prevent it from turning after it has been adjusted to clamp one of the wires 40 or 41 in the binding post. The case 6 is provided with a hinged door 45, also of fireproof insulating material, by means of which the front of the case may be closed. It will only be necessary to open the hinged door 45 for winding the spring motor or for changing its speed by means of the regulator hereinbefore described. The contact pieces 15 and 16, secured in the clamps 13 and 14, respectively, may be conveniently removed and replaced by new ones when they become worn from use.

It will be noted that the entire current is utilized in operating the electric lights, it not being required to use any of it in operating the interrupter, which results in increased economy in use, while, due to the simplicity of the device, its first cost is also minimized.

My improved device may be modified, as illustrated in Fig. 5 of the drawings, by lengthening the shaft on which the cam 3 is mounted, and providing any desired number of additional cams 3 thereon in various posi-

tions for turning on and off any number of different sets of electric lights, in which case an increased number of bars 7 and bars 10, with contact pieces 15 and 16, respectively, held in the clamps 13 and 14 thereon, respectively, may be provided. Each of the bars would be provided with the rollers 18 journaled on the staples 17 for contact with the cams 3.

While I have shown and described certain specific details of construction and arrangement, I do not wish to be understood as limiting myself thereto, but

What I claim as new and desire to secure by Letters Patent, is:

1. In an automatic flasher for electric lights, a spring motor, a case in which the motor is mounted, separate bars secured to the walls of the case, contact pieces on the bars, a cam on the motor adapted to be rotated thereby and to move one of the bars, a switch adapted to complete an electrical connection between the bars, an escapement wheel on the motor, means for regulating the speed of the spring motor, a shoe adapted to engage with the escapement wheel, a lever on which the shoe is mounted, and a rod attached to the lever and extending through one of the walls of the case and adapted to be engaged by part of the switch, substantially as and for the purposes specified.

2. In an automatic flasher for electric lights, a spring motor, means for varying the speed of the spring motor, an interrupter adapted to be operated by the spring motor, an escapement wheel on the spring motor, a shoe adapted to engage with the escapement wheel, a lever on which the shoe is mounted, and a spring adapted to bear on the lever to normally engage the shoe with the escapement wheel, a switch adapted to control the flow of current to the interrupter, and engaging means between the lever and the switch whereby the flow of the current to the interrupter and the starting of the motor are simultaneously controlled, substantially as and for the purposes herein set forth.

3. In an automatic flasher for electric lights, a bar carrying a contact piece, another bar carrying another contact piece and having a slot therein, a cam adapted to rotate through the slot in the bar, means for engagement between the cam and the bar, and means for electrically connecting the bars with the electric lights and to the source of an electric current, substantially as and for the purposes herein set forth.

4. In an automatic flasher for electric lights, a spring motor, a case of fireproof and insulating material in which the motor is mounted, separate bars secured to the interior walls of the case, contact pieces on the bars, a cam on the spring motor adapted to be rotated thereby and to move one of the bars, a switch adapted to complete an elec-

trical connection between the bars, an escape-
ment wheel on the spring motor, means for
regulating the speed of the spring motor,
a shoe adapted to engage with the escape-
5 ment wheel, a lever on which the shoe is
mounted, and a rod attached to the lever and
extending through one of the walls of the

case and adapted to be engaged by part of
the switch, substantially as and for the pur-
poses specified.

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