Aug. 12, 1924. 1,505,047

P. V. McCASH

MAKE AND BREAK ELECTRICAL SIGN CONTROL

Filed May 15, 1922 2 Sheets-Sheet 1

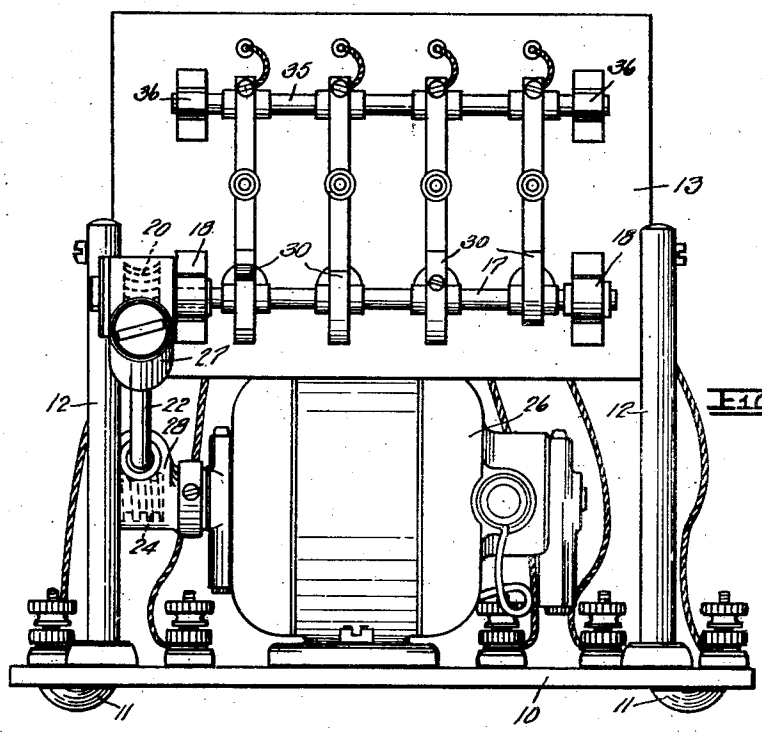


FIG-1

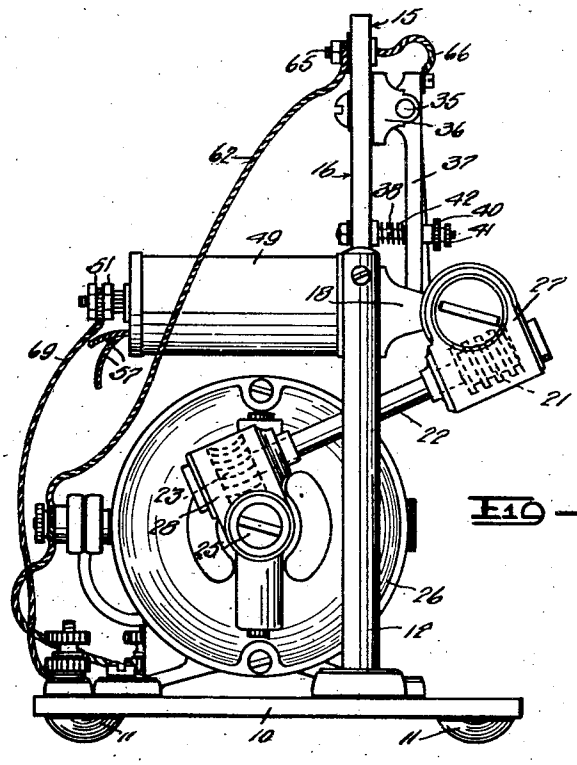


FIG-2

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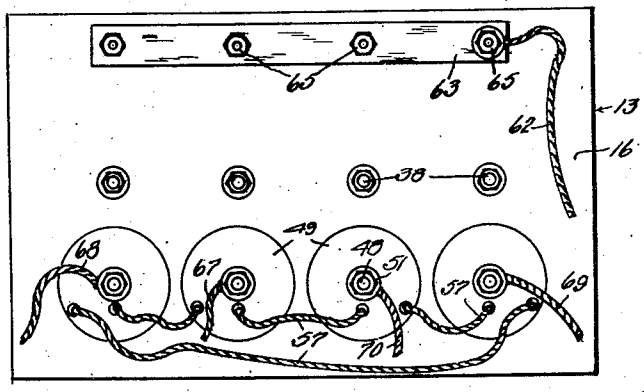


FIG-3

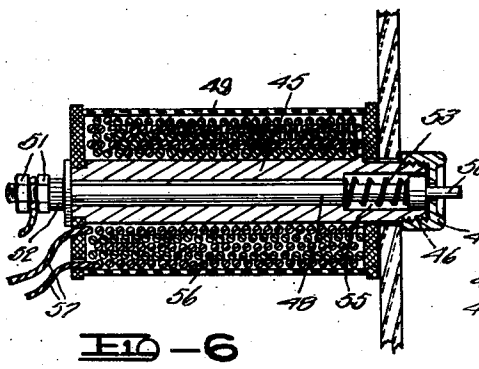


FIG-6

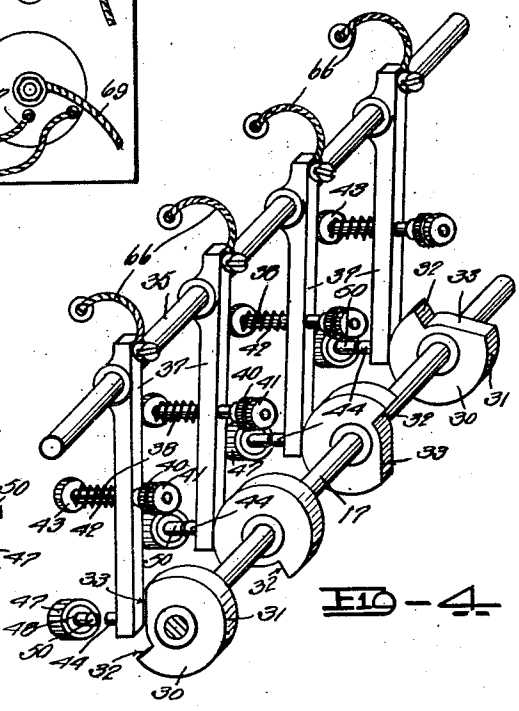


FIG-4

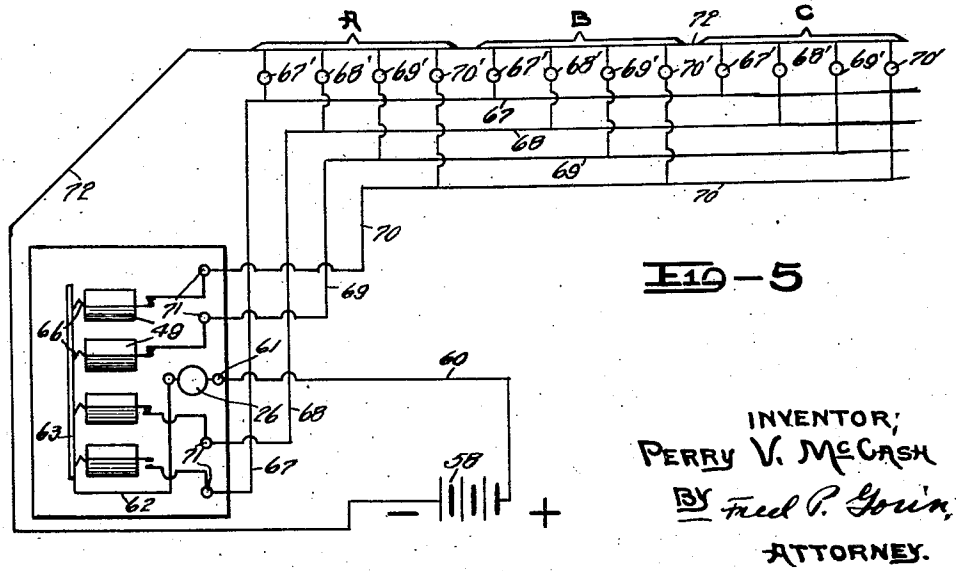


FIG-5

INVENTOR;
PERRY V. McCASH
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Patented Aug. 12, 1924. 1,505,047

UNITED STATES PATENT OFFICE.

PERRY V. McCASH, OF SEATTLE, WASHINGTON.

MAKE-AND-BREAK ELECTRICAL SIGN CONTROL.

Application filed May 15, 1922. Serial No. 561,189.

To all whom it may concern:

Be it known that PERRY V. McCASH, a citizen of the United States of America, residing at Seattle, in the county of King and State of Washington, has invented certain new and useful Improvements in Make-and-Break Electrical Sign Controls, of which the following is a specification.

This invention relates to electric sign flashers, and has for its object the provision of a sign flasher of novel form wherein the lighting circuits including the sign lamps may be broken at stated intervals for the relative duration of time of light and darkness in the lamps of the respective circuits as may be predetermined.

Another object of the invention is to provide a circuit-breaking device for each said circuit which will be instantaneous in its mechanical action in breaking the circuit to reduce the sparking effect, consequent upon the separation of the circuit-breaking members.

A still further object of my invention is the provision of novel means of dampening and still further reducing the tendency of the circuit-breaking members of my device to produce sparks through the employment of an enveloping flow of magnetic energy about said members.

The present invention is particularly designed to obviate imperfections perceived in devices in the previous art as known to me wherein circuit-interrupters of the sign-flasher type have been subject to sparking and the formation of arcs considered dangerous by fire-prevention authorities where the volume of current carried exceeded certain limits which circumscribed the size of signs and confined the development of the art.

My invention is illustrated in connection with a plurality of lamp circuits having the lamps in each circuit in regular order of position as about an illuminated sign, in which the lamps are arranged about the border thereof in a design and wherein the lamps of each circuit may be extinguished momentarily in regular succession about the sign border to resemble a wave or a plurality of waves of light encircling the sign or "chasing" about the sign, as it may be termed.

With the above and other objects in view, the invention consists in the combination, adaption and arrangement of parts and devices in an illuminated sign and novel operative apparatus therefor, as will be fully described in the following specification, illustrated in the accompanying drawings, and finally set forth in the appended claims.

In the accompanying drawings:—

Fig. 1 is a view in front elevation of a circuit-breaker of the sign-flasher type embodying my invention.

Fig. 2 is a view in side elevation of the same.

Fig. 3 is a fragmentary view in rear elevation of Fig. 1.

Fig. 4 is a fragmentary perspective view of certain operative details of the invention.

Fig. 5 is a plan diagrammatic view of the electric wiring scheme followed out in my invention.

Fig. 6 is a detached view in longitudinal section of an element of the invention.

Referring to said drawings, wherein like numerals of reference indicate like parts in the several views, the reference numeral 10 indicates a base of non-conducting material mounted on soft-rubber cushions 11. Upright posts 12 are rigidly mounted on said base and rigidly support a panel 13 of electrically non-conducting material. Said panel is formed with two parallel plane faces 15 and 16 upon the former of which a shaft 17 is rotatably mounted in journal brackets 18. One end of said shaft is provided with a worm-wheel 20 driven by a worm 21 upon stud-shaft 22 upon whose opposite end a worm-wheel 23 is driven by worm 24 upon the armature shaft 25 of an electric motor 26 mounted on said base 10. 27 and 28 indicate, respectively, oil-tight casings in which said worms and worm-wheels are encased and in which the stub-shaft 22 is journaled.

Rigidly mounted on said shaft 17 are a plurality of cam-wheels 30, each formed with a circular portion 31 extending about the major portion of its circumference and a cut-out section consisting of an abrupt ledge 32 directed radially of the cam-wheel and a wiping face 33. A cylindrical rod 35 is supported in brackets 36 on said panel above and parallel to said shaft 17 upon which a plurality of brass bars 37 are pivotally mounted in vertical lines, respectively, with the cam-wheels 30 with which the lower ends of the bars are arranged to engage. Said bars are apertured between their ends through which aperture a screw-

threaded stud 38 extends and carries on the outer side of the bar a nut 40 and jam-nut 41 to limit the outward movements of said bar. A coil spring 42 is interposed between each bar 37 and the base 43 of said studs tending to urge the bar outwardly. 44 indicates a terminal contact member extending inwardly on the lower end of each bar.

49 indicates a cylindrical casing having a tubular core 45 of soft iron which is screw-threaded at one end 46 and protrudes through apertures in said panel and secured thereat by nut 47.

A brass plunger 48 is reciprocally mounted in the bore of said core 45 protruding at both ends, the forward end terminating in a contact member 50 and the rear end being screw threaded to receive wire-clamping nuts 51 through which circuit wire 54 is secured to the plunger and having a soft rubber collar 52 thereon to act as a seating cushion. Said plunger is maintained yieldingly in its forward position by means of spring 53 contained in chamber 55 of said core. The contact-points 44 and 50 are positioned oppositely of each other and in contact to admit of the passage of current therethrough except when the rotary position of the respective cams 30 is such as to cause their separation, as will be explained hereinafter.

Said cores 45 are each wound with a helix 56 of insulated wire, the wire being continuous in all the helices, as indicated in Fig. 3, through connecting portion, 57.

Referring to diagram Fig. 5, 58 indicates an electric battery or other source of electrical energy from which a circuit wire 60 conducts a current to a connection 61 of the electric motor 26 through which the motor is energized to actuate the motor shaft 25 and through intermediate transmission mechanism to actuate the cam-shaft 17. The current passing through said motor is conducted on wire 62 to a copper strip 63 secured at the top of said panel 15 by spaced screws 65 which extend through the panel and communicate through wires 66, respectively, with one of said bars 37. The current is conducted through said bars, except when momentarily interrupted, to the plungers 48 and thence distributed by wires 67, 68, 69 and 70 through binding posts 71 to the respective series of lamps 67′, 68′, 69′ and 70′, of an illuminated sign. 72 indicates a return wire common to all the lamps connected with the pole of the battery opposite to that with which wire 60 is connected.

Thus it will be seen that with the bars 37 pressed against the contact-members 50 of said plungers a circuit will be established including the motor 26 through which the entire current of the battery or other source of power supply runs and thence through said bars 37 where the current is divided and flows through plungers 48 and wires 67, 68, 69 or 70 and thence through all the lamps on each respective said circuit passing therethrough to common wire 72 to the source of energy.

Said cams 30 are positioned on the shaft 17 so that their circular position 31 will press the terminal 44 of the respective bar 37 against the opposing terminal 50 of the plungers which will yield against such pressure. In the rotation of the shaft 17 the bar will jump off said surface 31 as the abrupt ledge 32 presents itself and admits the bar to fly away from the plunger in response to the action of spring 42 and breaks the light circuit of the particular minor lamp circuit 67, 68, 69 or 70 fed through such plunger.

The further rotation of the cams 37 brings the wiping face 33 in contact with the bar 37 which forces the bar back into contact with the plunger through a relatively quick return movement. Said cams are positioned with said cut-out portions at equally spaced annular distances so that the stoppage of the current in said minor circuits will be equally divided as to time and in regular rotative order as predetermined in the scheme laid out for the particular sign. The sign lamps are arranged in groups such as A, B, and C, of four lamps each in the present illustrated example and the lamps of each said minor circuit 67, 68, 69 and 70 are arranged in the same order in each group. It will be understood that as many such groups of lamps may be included in said sign as desired and that they will usually be continuous.

The breaking of said circuits will be instantaneous to avoid sparking as far as possible and to further prevent the formation of a spark at the separated contact-points, the provision of the magnet 45 is made as a core surrounding said plunger 48 and from the end 46 of which a continuous magnetic flux sets towards its opposite end, as indicated in Fig. 6, and which serves to dampen and reduce the conductivity of the air-gap made between said contact-points and hence reduces the formation of an arc to very narrow limits, in a manner analogous to that described in my co-pending application Serial No. 438,946.

The invention is susceptible of adaptation to a great variety of applications and changes in design and style of signs and for other purposes. I do not, therefore, intend to confine the invention to the precise embodiment as illustrated and described herein but as the same may be modified and developed in practice within the spirit of the invention it may be brought within the scope of the protection afforded by the claims.

What I claim is:—

1. In a sign flasher, a panel having a plurality of tubular electro-magnets mounted

thereon, each said magnet being wound with a wire helix, a spring-pressed plunger reciprocatively mounted in each said magnet, a bar pivoted at one end and engagable with an end of each said plunger, and a plurality of cam-wheels mounted to rotate in unison and arranged to maintain said bars in contact with said plungers and at one stage of their rotation to abruptly release the same.

2. In a sign flasher, a panel, a shaft rotatably mounted on said panel, a plurality of cam-wheels fixedly secured on said shaft, a bar pivotally secured at one end and engageable at its opposite end by one of said cam-wheels, a tubular electro-magnet positioned opposite each said cam-wheel, a spring-pressed plunger reciprocatively mounted on each said magnet, said plungers and bars being urged in electrical contact by said cam-wheels except at one stage of the revolution of the cam-wheel, the contacting points of said plungers and bars being in the field of magnetic flux from said magnets.

3. A sign flasher, consisting in a panel having a rotatable shaft mounted thereon, a plurality of cam-wheels rigidly positioned on said shaft and each formed with a cut-out portion, a plurality of bars pivoted at one end and engaged at their opposite end by said cam-wheels, respectively, a spring pressed plunger reciprocatively mounted on said panel opposite each said bar and adapted to contact therewith, an electric circuit extending through each of said bars and plungers, and means to actuate said shaft to rotate said cam-wheels whereby said cut-out portions admit said bars to break contact with said plungers and open said circuits in rotation.

In testimony whereof I affix my signature.

PERRY V. McCASH.