Apr. 17, 1923. 1,452,178

E. L. BALLEW

ELECTRIC SIGN FLASHING APPARATUS

Filed Feb. 13, 1918 3 Sheets-Sheet 1

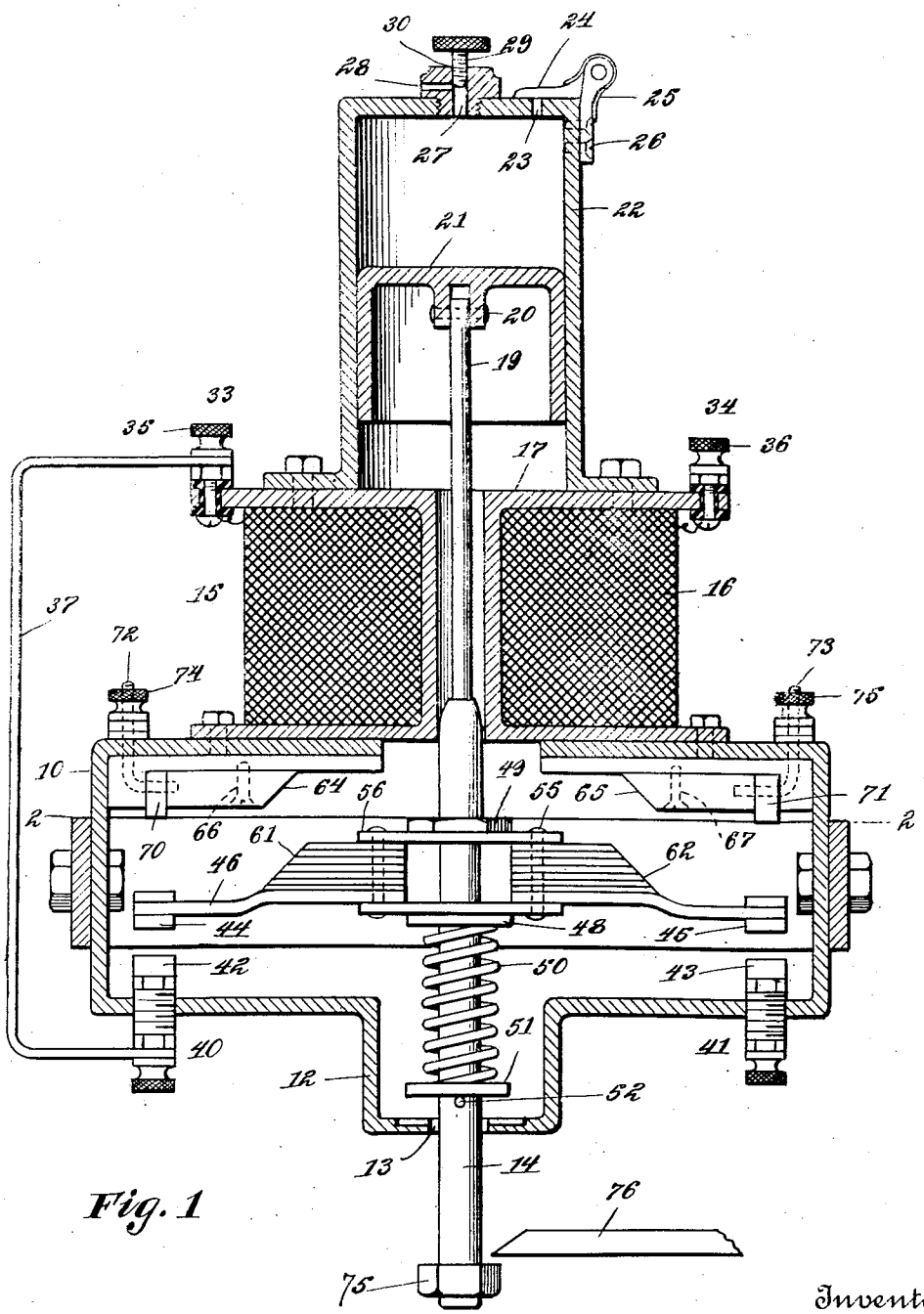


Fig. 1

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By Victor J. Evans

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Witnesses

C. F. Rudolph

E. M. Springer

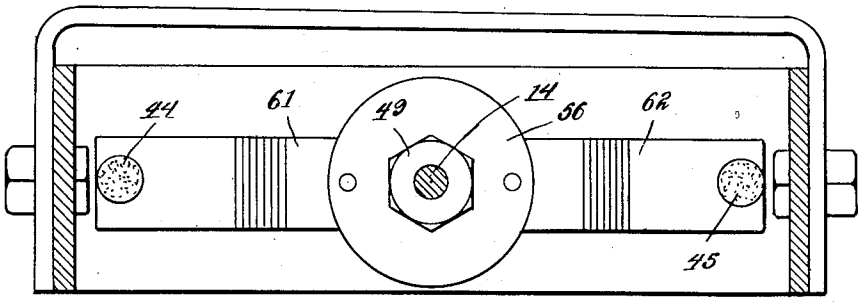
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Fig. 2



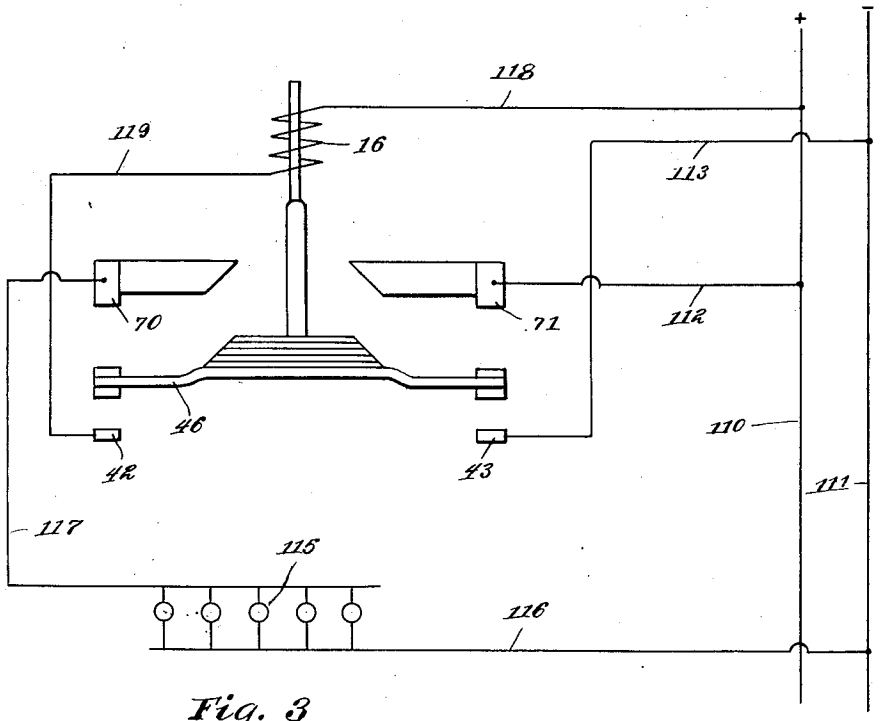


Fig. 3

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ELECTRIC SIGN FLASHING APPARATUS

Filed Feb. 13, 1918 3 Sheets-Sheet 3

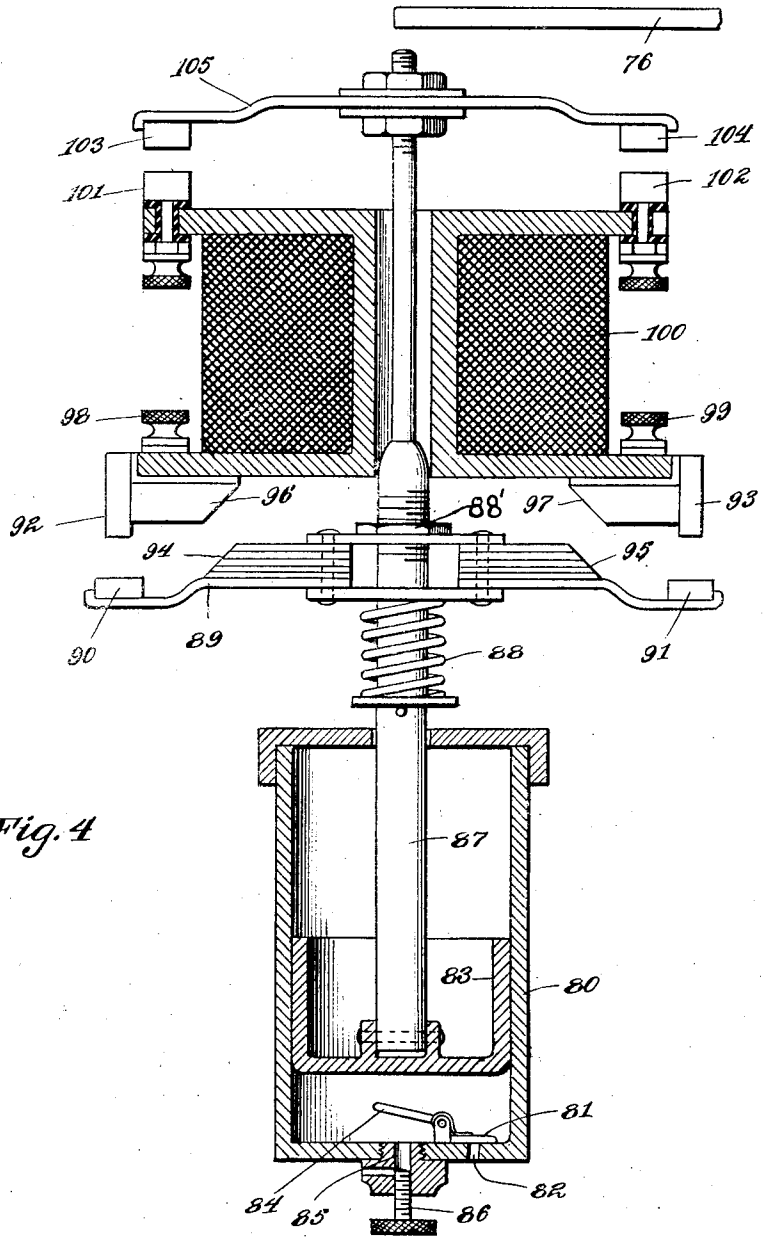


Fig. 4

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UNITED STATES PATENT OFFICE.

ELMER L. BALLEW, OF CHICAGO, ILLINOIS.

ELECTRIC-SIGN-FLASHING APPARATUS.

Application filed February 13, 1918. Serial No. 216,925.

To all whom it may concern:

Be it known that I, ELMER L. BALLEW, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Electric-Sign-Flashing Apparatus, of which the following is a specification.

This invention relates to an electric sign flashing apparatus and one object is to provide an improved construction whereby the lights are cut in and out for an equal period of time, and in which the consumption of current is reduced by a large percentage, as compared with certain other types of apparatus in use, for the purpose indicated.

A further object is to provide in a device of the type indicated, a contact or plurality of contacts controlled by a solenoid and dashpot, and certain novel construction by means of which arcing is prevented, and the period of illumination and the period during which the lights are cut out is regulated independently.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of elements hereinafter described and claimed.

In the drawings—

Figure 1 is a view in vertical section.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a diagrammatic view showing the circuits connecting the switch with the feed wires and lamps.

Figure 4 is a vertical section of a modified form.

The main frame or casing is designated 10 and may be of about the form shown in the drawings, in which it appears in Figure 1 in vertical section, the central portion being provided with a downwardly extending member shown at 12 and having an aperture 13 therein for the accommodation of the core member 14 of a solenoid 15 comprising a coil 16 wound upon any suitable structure, as for instance that shown at 17, in cross section. The core has connection with a rod 19 pivotally connected at 20 with a plunger 21. This plunger operates within a casing 22, the structure described constituting a dashpot and being provided with an outlet port 23 under the control of a spring mounted valve 24, which permits the passage of air from the cylinder or casing 22. This valve 24 is retained in position by a spring 25 and the valve is mounted in any suitable manner, the mounting means being designated 26. An inlet port 27 has a reduced outer portion 28 and is under the control of a valve member comprising a screw 29 threaded into a bore 30, said valve member controlling the port 27 and admitting air at a limited rate for the purpose of permitting the plunger 21 to return to its lower position gradually after having forced the air out of the casing 22 through the port 23. The plunger 21 drops to its lower position when current is cut off from the solenoid 15.

The coil 16 is supplied with current through insulated contact members 33 and 34 carrying nuts or taps 35 and 36. A connection is shown at 37 between certain of these terminals and the lower terminal 40, which terminal together with terminal 41 is in circuit when the coil is energized. Terminals 40 and 41 are suitably insulated and carry carbon contact members 42 and 43 cooperating with carbon contact members 44 and 45 carried by a transversely extending arm 46.

Contact arm 46 moves with the core 14 and is retained between a washer 48 and an adjusting nut 49, said nut permitting of the adjustment of the tension of spring 50 encircling the core, the lower end of the spring abutting washer 51 which is retained in position by a pin 52. Contact arm 46 is insulated from the core, bolts 55 passing through insulating washer 56 as shown, and washer 48 being also of insulating material.

When contact arm 46 is raised by the energization of the coil through contact members 42 and 43, the contact elements 61 and 62 formed of a plurality of metallic members or plates are brought into cooperation with contacts 64 and 65 in electrical communication with the elements of the sign. These contact elements 64 and 65 are retained in position by screws 66, 67 and are provided with carbon contacts 70 and 71 cooperating with the carbon contacts 44 and 45 previously mentioned. Terminal elements 72 and 73 are engaged by nuts 74, 75 for securing in position the wires leading to the sign. It will be understood that the terminals last named are insulated as shown. A nut 75 on the lower end of element 14 cooperates with an arm 76 of a time switch mechanism, not forming a part of this case,

but included in a feed circuit through terminals 42, 43 and coil 16. The coil having been energized, the core thereof moves upwardly, the initial impulse being sufficiently pronounced to bring contacts 44, 45 into engagement with contacts 70, 71 (Figures 1 and 3), contacts 61, 64 and 62, 65 being also engaged. The circuit through contacts 42, 43 is of course broken by this operation. The contacts now engaged are in the load circuit (Figure 3), the path of the current being traced below.

In the form shown in Figure 4 the dashpot is placed below the coil and is designated 80, the valve 81 controlling the port 82 being mounted within the casing of the dashpot and opened by contact between the plunger 83 and the pivoted arm 84. Port 85 is controlled by a valve member in the form of a screw 86, the operation being substantially the same as that before indicated.

The core 87 is encircled by a spring 88 and carries a contact arm 89, the latter supporting contacts 90 and 91 cooperating with contacts 92 and 93. The contacts 94 and 95 of laminated strips cooperate with contacts 96 and 97 in the manner before indicated, these contacts last named having communication with terminals 98 and 99 leading to the sign. The coil of the solenoid is designated 100 and is energized through contacts 101 and 102 and contacts 103 and 104 carried by arm 105 operated, or shifted vertically by the movement of core 87. The arm 76 of the time switch is controlled from above in this form of the device.

In both forms of the apparatus described, arcing is prevented between the contacts formed of laminated strips and cooperating contacts, in view of the fact that the carbon contacts designated 70 and 71 in the first form remain in engagement with contact 44 and 45 also of carbon slightly longer than do the contacts of laminated material and their complemental contact members. Arms 46 are resilient, and the resiliency is manifest in a maximum degree at the outer ends thereof, whereby the effect just described is secured.

In Figure 3 the feed wires are designated 110 and 111, the former being connected with contact 71, by means of wire 112, and feed wire 111 being connected with contact 43, by wire 113. The lamps of the sign are shown conventionally at 115, and have connection by means of wire 116 with feed wire 111, the circuit being through wire 110, wire 112, contact 71, contact arm 46, contact 70 and wire 117, lamps 115, wire 116 to wire 111.

The period during which the elements are illuminated is governed by the position of nut 49 in the form first described, a similar nut 88′ being shown in the modified form. This is true because arms 46 are resilient and at a given adjustment of nut 49 the core will continue to move upwardly after contact has been made at 70, 71. If nut 49 is screwed down, obviously the period of contact will be reduced, since engagement will take place later, than before this adjustment was made.

The circuit for the solenoid is through wire 110, wire 118, coil 16, wire 119, to contact 42, contact arm 46, contact 43, wire 113 to wire 111.

The period between successive illuminations is controlled by means of the position of adjustable terminal members 40 and 41.

What is claimed is:

In a device of the class described, a solenoid including a coil and a core therefor, means permitting the prompt and positive movement of the core in one direction and causing the gradual return thereof to a lower position when acted upon by gravity, adjustable resilient means carried by the core, a contact making device carried by the core and under the control of the resilient device, contact members carried by said contact making device, a set of contacts with which the contacts first named cooperate when the core is drawn upwardly by the energization of the coil, additional contacts maintaining the circuit completed by the others of said contacts after the said circuit has been broken by those contacts, means for connecting the contacts with feed wires and with a load circuit, and means for completing a circuit through the coil and the feed wires when the core and contact making device moves downwardly under the action of gravity.

In testimony whereof I affix my signature.

ELMER L. BALLEW.