March 19, 1935. E. B. NEWILL 1,995,129

FLASH SIGN

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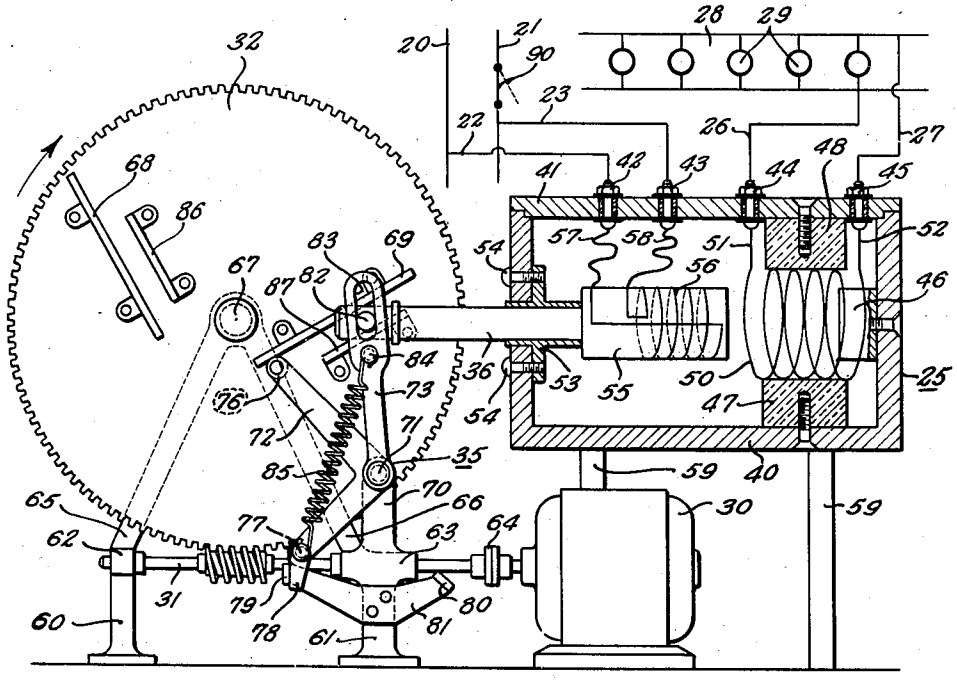


Fig. 1.

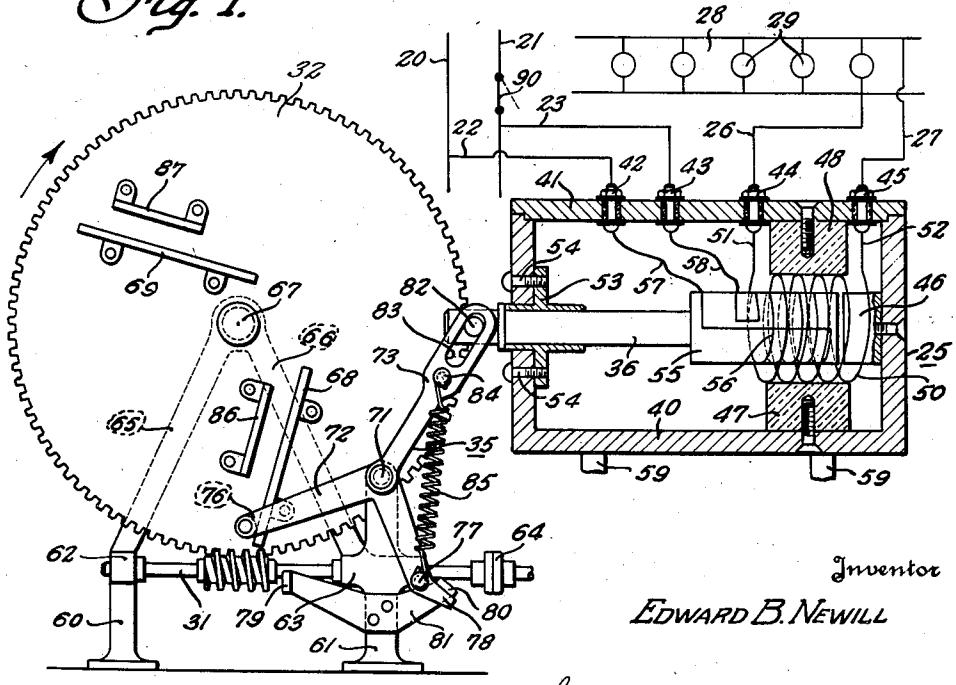


Fig. 2.

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FLASH SIGN

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9 Claims. (Cl. 177—346)

This invention relates to flashing signs and has to do particularly with a device for controlling the sign so as to eliminate interference with radio receiving apparatus of the most sensitive type.

Radio receivers of modern day development are extremely sensitive to electric disturbances of one kind or another, especially in their immediate vicinity. The principal elements of electrical structures that are responsible for much of the interference of the radio apparatus, can be traced to electrical flashing signs and other equipment where there is frequent interruption of circuits. Electrical flashing signs, especially those which demand high voltages, or are responsible for their flashing due to opening and closing of power lines, are one of the greatest sources of trouble.

It is therefore one of the objects of the instant invention to provide a system and means for operating flashing signs in a manner that will eliminate interference with radio apparatus.

A further object of the invention is to provide a coupling unit between a power source and a flashing sign, whereby the illuminants of the sign may be caused to flash successively without interruption of circuit.

A further object is to provide a coupling means for flashing signs of the class described wherein a quick transition of the sign from the illuminated to the darkened state may be accomplished.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a view in elevation, with a part shown in section, of the improved sign flashing mechanism as it is inserted in circuit with the sign and power source, the illuminants being illustrated in their darkened state.

Fig. 2 is a similar view, but with portions of the mechanism shifted in accordance with the illuminants as illustrated in the glowing state.

With particular reference to the drawing, 20 and 21, indicate the lines of a power source that are connected by leads 22 and 23 with a flash sign coupler 25 from which leads 26 and 27 supply energy to a lamp bank 28 for the various illuminants 29. The coupling unit 25 is of particular form as will presently be described, and it is mechanically operable by means of a motor 30 through the agency of a drive shaft 31 driving a cam wheel 32, periodically operable upon snap or quick-shift mechanism 35 connected with a movable part 36 forming a part of the coupler 25.

The coupler 25 embraces a housing 40 of magnetic material, open at the top and fitted with a panel or lid 41 insulatingly supporting terminals 42, 43, 44 and 45. At one end of the housing 40, a pole piece 46 is provided that is rather centrally disposed thereof and presented between the faces of dielectric blocks 47 and 48 carried by the bottom wall of the housing 40 and the lid 41 respectively. A fixed coil 50, forming a secondary winding, terminates in leads 51 and 52 that have connections with the terminals 44 and 45 supported by the lid 41, and thence by means of the lines 26 and 27 are connected with the illuminants 29 of the sign, the coil 50 being supported between the blocks 47 and 48 and one end thereof substantially embracing the end of the pole piece 46. In the opposite end wall of the housing 40, and substantially in alignment with the pole piece 46, a non-magnetic bushing 53 is secured as by the screws 54, that supports the member 36 for sliding movement therein. Within the housing 40 the member 36 provides an enlargement or core 55, that supports a movable or primary winding 56 that has its terminals connected by leads 57 and 58 respectively, with the terminal member 42 and 43 carried by the panel 41, which terminals are in turn connected with the source of power by means of the conductors 22 and 23.

The coupling unit 25 may be supported from a common base as is the motor and operating mechanism, by frame members 59, but in all events is so associated with the quick shift mechanism 35 that the movable member 36 will be operated upon to move the winding 56 into and out of the field of the winding 50. The extremes of these positions are illustrated in Fig. 1 and Fig. 2, wherein the windings are without and within inductive relation respectively. For the most successful operation it has been found that it is necessary to immerse the winding 56 within, and to withdraw from, the field of the winding 50 in a rather sudden or snap like movement, in the present instance this is accomplished as will now be described.

The snap mechanism 35 is supported from a common base by standards 60 and 61 providing bearings 62, and 63, for the worm shaft 31 hereinbefore referred to, and that is driven by the motor 30 through any desirable coupling union 64. These standards 60 and 61 have joining branches 65 and 66 that support a journal pin 67 forming the axis of the cam wheel 32, that carries the camming blades 68 and 69. The standard

61 carries an extension 70 that provides a journal pin 71 about which is pivoted a bell crank lever 72 and a link 73, the latter being loosely connected by pin and slot means with the shaft 36 of the coupling unit. On one end of the bell crank lever 72 there is provided a cam roller 76 that alternately engages the cam blades 68 and 69, while the other end thereof provides an anchor or tie-pin 77 beyond which there is provided a stop lug 78 designed to cooperate with abutments 79 and 80 of a limiting arm 81 also secured to the standard 61.

The link 73 pivoted about the pin 71 as earlier stated, has pin and slot engagement with the member 36 of the coupling unit, the shaft 36 carrying a pin 82 received by a slot 83 of the link 73. The link 73 is operably connected so as to respond to the snap action or quick shift movement of the lever 72, in that it is provided with an anchor pin 84 to which is secured one end of a spring 85 that is secured at its other end to the anchor pin 77 carried by the lever 72, thus providing a toggle like coupling between the lever 72 and the link 73.

In the operation of this flashing sign the motor 30 receiving its energy from the power line will drive the shaft 31, and through a worm gear will rotate the cam wheel 32, in the illustrated embodiment in a clockwise direction as indicated by the arrow, and through rotation of the cam wheel 32 will cause the cam blades 68 and 69 to alternately engage the cam roller 76 of the bell crank 72. This alternate engagement of the blades with the roller will cause the lever to pivot in accordance therewith about its support 71, carrying with it the anchor pin 77 until the same has passed in its arc of rotation beyond the center line passing through the pivot 71 and the anchcor 84, whereupon the force stored up in the spring 85 will cause the link 73 to take up the movement and thereby shift the movable part 36 and in consequence thereof the coil 56 within the coupling unit. To insure that the force of the spring 85 will be exerted only in movement of the coil 56, baffles 86 and 87, or secondary cam blades that cooperate with the cam blades 68 and 69, respectively, are provided so as to keep the bell crank lever 72 from snapping to the opposite extreme of its path of movement, at least until after the spring 85 has caused the shift of the member 36 and the coil it supports.

As illustrated in Fig. 1 the parts of the mechanism are shown in a position attendant upon darkening of the light bank 28, though the cam blade 69 has just engaged the cam roller 76, and its movement will cause the lever 72 to oscillate about its pivot 71 until the tie-pin 77 has passed the center line passing through the pin 84 and the pivot 71, during which time the tie-pin 77 will have moved over substantially half the extent of the arm 81 and the roll 76 will be positioned between the cam blades 69 and 87. As soon as the tie-pin 77 passes the said center line the spring 85 then exerts its force to cause the link 73 to rotate in a clockwise direction so as to decrease the angle of inclination between it and the leg of the lever 72 carrying the pin 77. Since the lever 72 is restrained against rotation by the engagement of the roller 76 between the cam blades 69 and 87, the entire force of the spring will be applied to this clockwise movement of the link 73, manifesting in the quick shift of the coil 56 toward the right, immersing it in the field of the coil 50. Continued rotation of the cam wheel 32 carries the cam roller 76 from between the blades 69 and 87 whereupon the arm 72 may snap to the other extreme of its limit plate 81, the lug 78 engaging the limit 80 substantially as illustrated in Fig. 2, where it remains until the cam blade 68 engages the roller for withdrawing the movable coil.

The cooperation of the parts on the withdrawing movement is substantially the same as that just described, the blade 68 initially moving the arm 72 until the tie-pin 77 has been carried past the indicated center line, whereupon the spring 85 exerts itself to cause the counterclockwise movement of the link 73 that manifests in the withdrawing of the coil 56, the blade 86 in this instance retaining the lever 72 against snapping to the other limit 79, at least until after the force of the spring 85 has been applied to withdrawing the primary winding. Thereby, a quick shift of the mechanism is accomplished and the lighting and extinguishing of the sign, or the flashing of the light bank is accomplished without interruption of the circuits, since the secondary coil is energized and deenergized by the immersion and withdrawing, respectively, of the primary winding 56 relative to the fixed coil 50.

When the movable coil is moved to the position illustrated in Fig. 2 the energy impressed thereon will induce a current in the secondary winding 50 which flowing through the conductors 26 and 27 cause the illumination of the light bank 28. Withdrawal of the movable coil to the position illustrated in Fig. 1 will so reduce the induced current of the coil 50 that the light bank will be substantially deenergized or extinguished. Thus the flashing of the sign is accomplished without actual interruption of the circuit. A single switch 90 inserted in the power line may operate to control both the motor 30 and the energy supply of the movable coil 56, in that way eliminating stopping of the mechanism as illustrated in Fig. 2, in which the light might continue to burn, since opening of the switch 90 will not only deenergize the motor but will also open the circuit to the movable coil 56.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. An electric flashing sign comprising in combination; a light bank, a power supply for said bank and coupling means for impressing the energy of said power supply upon said bank, said means comprising a fixed secondary coil and a movable primary coil, a snap action mechanism arranged for periodically inserting the primary within the field of the secondary coil at a high velocity and means for withdrawing the primary from said field.

2. In an electric flashing sign operated from a power source, comprising in combination; a casing of magnetic material, a plurality of terminals mounted upon one panel of said casing, a fixed coil supported within the enclosure and in electrical communication with a pair of said terminals, a movable coil mounted for immersion in the field of said fixed coil and having electrical communication with others of said terminals, and a snap action device exterior of the casing for actuating said movable coil and rapidly immersing it in the field of said fixed coil, the terminals of said fixed and movable coils being connected respectively with the flashing sign to be operated and a power source and means for withdrawing

said movable coil from the field of said fixed coil.

3. In an electric flashing sign, having an illuminating circuit energized from a power source, in combination; an inductive coupler including a magnetic housing, a fixed secondary in circuit with illuminants of said sign, and a movable primary in circuit with a power source, means for periodically immersing the primary in the field of the secondary for flashing of said illuminants, said immersing means including snap action mechanism whereby a quick shift of the primary coil as it enters the field of the secondary is accomplished, and the illuminants may be flashed without actual circuit interruption and means for withdrawing said primary coil from the field of the secondary.

4. An electric flash sign comprising in combination, a pair of normally closed circuits, a light source in one of said circuits, a power supply of variable voltage connected to said other circuit, inductive elements for coupling said circuits and a snap action device arranged for moving one of said elements out of the field of the other at a velocity which is rapidly accelerated in one direction and which remains substantially constant during the remainder of its motion in said direction whereby the voltage supplied to said light source is rapidly reduced during the initial portion of the motion of said element.

5. In combination, a pair of normally closed circuits, a light source in one of said circuits, a source of variable voltage connected to said other circuit, inductive elements for coupling said circuits, a snap action mechanism for moving one of said inductive elements into the electrical field of the other and rotary means for operating said snap action mechanism intermittently.

6. In an illuminating device the combination of a source of illumination, a coil in closed circuit with said source, a second coil connected to a source of power and a snap action mechanism connected to actuate one of said coils and to rapidly move it into the field of said other coil whereby the voltage impressed on said source of illumination is rapidly increased.

7. In combination in a device for flashing a source of illumination, a housing, two coils in said housing, means for connecting one coil to said source of illumination, means for connecting the other coil to a source of power, means connected to one of said coils and extending exterior of said housing, a snap action mechanism for actuating said last named means and arranged to move its connected coil rapidly into the field of said other coil and rotary means for intermittently operating said snap mechanism and for withdrawing the movable coil from the field of said other coil.

8. In combination, a load circuit to be energized, a secondary coil connected to said circuit, a source of alternating current energy, a primary coil connected to said energy source, and means for moving said primary coil into the field of said secondary at a high velocity comprising, a link connected to said primary, an oscillatory two arm lever, a pivotal mounting for said link and lever a tension spring connecting said link and lever and movable across the axis of said pivot, a rotatable wheel carrying cam blocks arranged to alternately engage a projecting portion of said lever and means for rotating said wheel.

9. The device described in the preceding claim in combination with a pair of spaced apart stop blocks arranged to engage a projecting portion of said lever and limit the extent of its oscillation.

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