Jan. 10, 1939. J. B. PALERMO 2,143,206

ROTO FLASH NEON SIGN

Filed Feb. 15, 1937 3 Sheets-Sheet 1

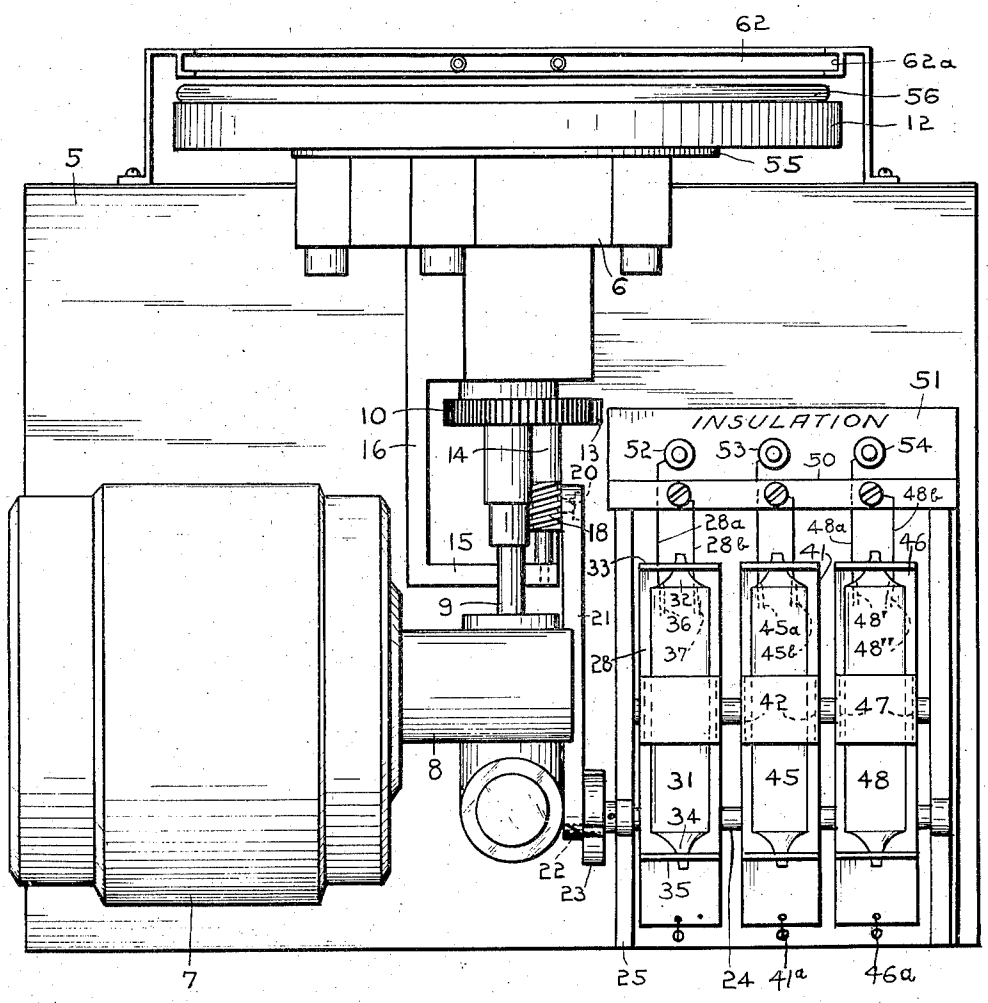


Fig. 1.

Inventor

JOHN B. PALERMO

By Herman Seid

Attorney

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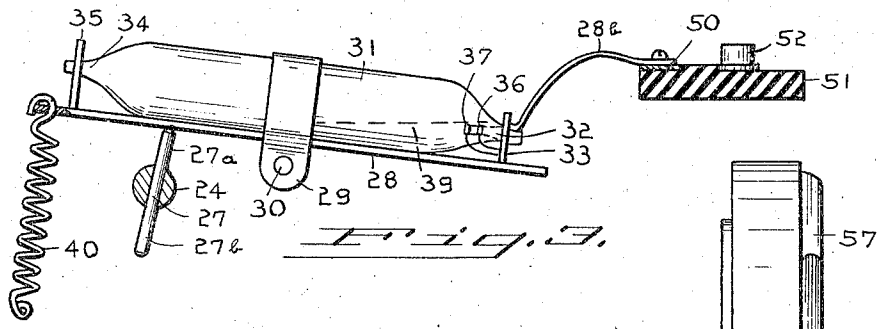


Fig. 3.

Fig. 2.

Fig. 4.

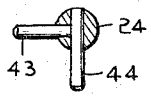
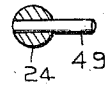


Fig. 5.



Inventor
JOHN B. PALERMO

By

Attorney

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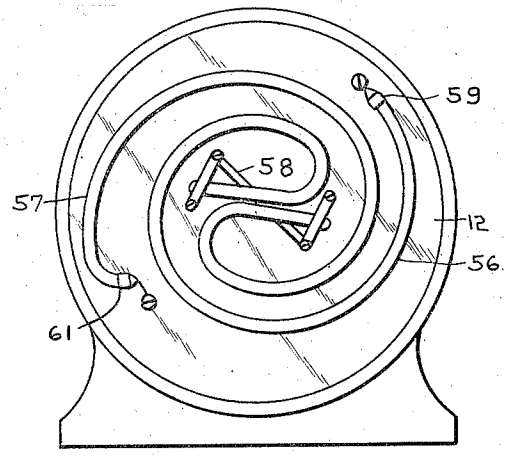


Fig. 6.

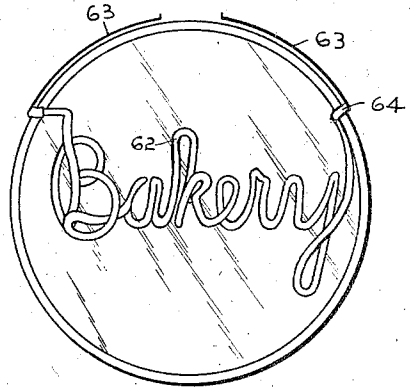


Fig. 7.



Fig. 9.

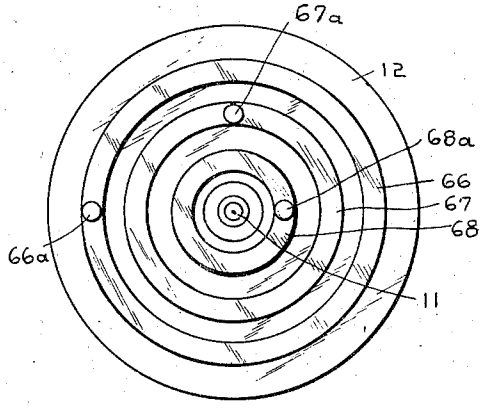
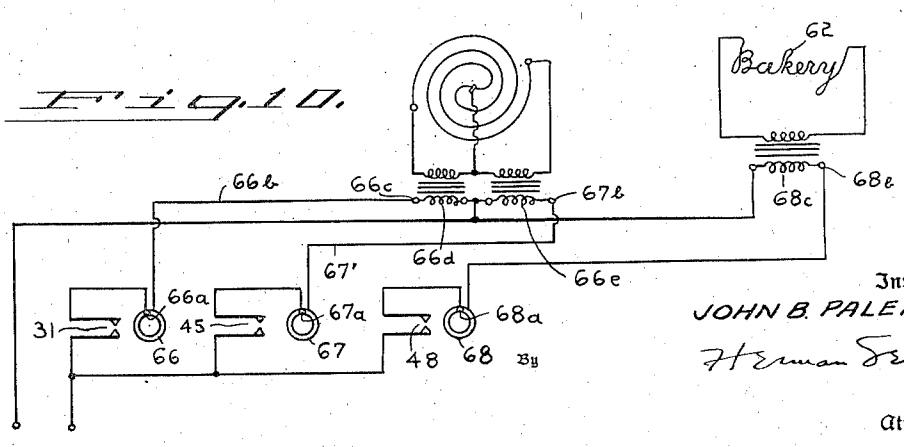


Fig. 8.

Fig. 10.



Inventor
JOHN B. PALERMO
Herman Seid

Attorney

Patented Jan. 10, 1939

2,143,206

UNITED STATES PATENT OFFICE

2,143,206

ROTO FLASH NEON SIGN

John B. Palermo, Brooklyn, N. Y.

Application February 15, 1937, Serial No. 125,750

5 Claims. (Cl. 200—32)

This invention relates to an improved display sign, and one of its objects is to provide means for producing an attention arresting intermittent illumination, in successive stages, and to provide non-arcing means for controlling this intermittent illumination.

A further object of the invention is to provide a main advertising sign consisting of a luminous tube and an independent motion device consisting of separate luminous tubes of different color characteristics when energized arranged behind each other, and non-arcing means for controlling the flow of electrical current to each of the luminous tubes, so that single illumination, then duplex illumination, and finally illumination of the sign tube is obtained in succession, and the effect produced upon a passerby is captivating and attention holding.

A further object of the invention is to provide an automatic circuit controller for the different luminous tubes, consisting of tiltable mercury contacts and a motor rotated shaft having radial arms so arranged that the contacts are successively rocked in different timing orders, and a silent operation obtained, without dangerous arcing, and with mechanism of relatively low cost and relatively high efficiency.

With the above and other objects in view the invention consists in certain new and useful constructions and arrangements of parts, clearly described in the following specification and fully illustrated in the drawings, in which:—

Fig. 1 is a plan view.

Fig. 2 is a side view of the motor and disc, showing the rocker shaft in section.

Fig. 3 is a detail side view, partly in section, of one of the mercury switches.

Fig. 4 is a detail cross sectional view of a rocker shaft.

Fig. 5 is another similar view thereof.

Fig. 6 is a front view of the luminous rotating tubings.

Fig. 7 is a front view of an extra luminous sign.

Fig. 8 is a rear view of the collector rings.

Fig. 9 is a front view of a sign, having transparent letters.

Fig. 10 is a diagrammatic view of the complete sign tubing circuit.

Referring to the accompanying drawings 5 designates a base, which is equipped with a standard 6 and an electrical motor 7, spaced from the standard. The electrical motor is provided with a reduction gearing contained in the housing 8, which is preferably of the worm type, and a secondary shaft 9 extends from this housing and is coupled to the shaft of the spur gear 10, which is arranged to rotate close to the upper end of the standard 6. The shaft 11 of the spur gear 10 extends through the upper end of the standard and carries the circular disc 12, which is constructed of fibre or other suitable insulating material, or made of metal, with its outer surface well insulated.

The spur gear 10 engages another spur gear 13, which is mounted on the shaft 14, one end of which has a bearing in the standard and the other end of which has a bearing in the arm 15 of the frame 16, which is mounted on the base. This shaft is provided with a gear worm 17 which engages the worm gear 18, mounted on the stub shaft 19 carried by the frame 16. This worm gear 18 is provided with an eccentric bearing pin or screw 20, which is engaged by the end of the pawl bar or rod 21. This pawl bar or arm is provided on its opposite end with a lateral pawl pin 22, which is designed to successively engage the radial curved arms of the ratchet wheel 23, which is mounted on the end of the horizontal shaft 24, which works in the frame 25. This ratchet wheel is provided, as shown, with four radial arms 23*a*, each one of which is formed with a concave face to receive the pawl pin, as shown, the reverse edge or face of the pawl engaged ratchet arm or tooth being rounded to permit the pawl to slide readily thereon.

A disc 26 is carried by the shaft 24 and serves to prevent lateral displacement of the pawl pin 22 from the working edge surfaces of the ratchet wheel. The shaft 24 is provided with a single pin 27, which extends on opposite sides of the shaft to provide radial arms 27*a* and 27*b* of equal length. These arms are arranged to engage the carrier plate 28, which is pivoted at 29 on a cross shaft 30, mounted on the frame 25. The carrier plate is provided with a mercury electrical switch 31, which is in the form of a glass tube or other container, having a pointed terminal 32 which extends through a bracket arm 33 on the end of the plate 28, and having a similar terminal 34 which engages the bracket arm 35 of the other end of the carrier plate 28. This switch also includes the electrical terminals 36 and 37, which are sealed in the container 31*a* of the switch, and insulated from each other. Electrical contact is made and broken between these terminals by means of the charge 39 of liquid metal mercury. When the shaft 24 is rotated the arms 27*a* and 27*b* of the cross pin 27 will successively engage the underside of the

carrier plate 28 and rock this plate against the tensional pull of the coil spring 40, which is connected to the end of the plate 28 at its upper end and to the base at its lower end. When the engaged end of the carrier plate is lifted by the action of the pin arms 27a and 27b, the opposite end of the plate, on which the terminals 36 and 37 are supported will be lowered and the mercury will flow against these contacts, thus establishing electrical contact between the same.

On the cross shaft 30 another carrier plate 41 is mounted by the bearing lugs 42, and this plate is engaged by pins 43 and 44 of the shaft 24, and these pins are disposed at right angles to each other. The pin 44 is disposed in the same radial relation to the shaft 24 as the pins 27a and 27b. The carrier plate 41 is equipped with a mercury switch 45, which is of the same construction as the mercury switch 31, and which is mounted in a similar manner on the plate 41. On the cross shaft 30 a third carrier plate 46 is supported for rocking action by its bearing lugs 47, and on this plate the mercury switch 48 is mounted, being retained in place thereon in the manner described with reference to the mercury switch 31. The plate 46 is engaged by the single pin arm 49, mounted on the shaft 24, and disposed at right angles to the pins 27a and 27b, and projecting in an opposite direction from the shaft from that of the pin 43.

When the shaft 24 is rotated by the action of the pawl arm, in a step-by-step manner, the carrier plate 28 is first rocked by the action of the pin 27a against the same: the next action is to rock the second carrier plate 41 and to close the circuit through its enclosed switch terminals and this develops as a result of the engagement of the plate 41 by the pin 43. The shaft 24 is advanced a quarter of a revolution, as shown, each time the pawl pin makes a complete stroke, during the turning of the operating worm gear which actuates the pawl bar by means of its eccentric pin. After the second carrier plate and its mercury switch is rocked by the second quarter turning movement of the shaft 24, under the pawl action, then both carrier plates 28 and 41 will be rocked and the circuits through the mercury switches on these plates will be closed. After these two plates and their mercury switches have been rocked simultaneously, the third carrier plate 46 is rocked by the action of the cross pin 49 against the same, so that the circuit through the enclosed terminals of its mercury switch 48 will be closed. The carrier plate 41 is returned to its initial inclined position by the action of the coil spring 41a, which is connected at its upper end to the short end of the carrier plate and at its lower end to the base; and the carrier plate 46 is engaged by a similar coil spring 46a, which is connected to the short end of the same at its upper end and to the base at its lower end. In each case the mercury switch returns to its initial position, so as to cause the mercury to flow away from the switch terminals it cooperates with to make and break the circuit.

Circuit is established through the mercury switch of the carrier plate 28 by means of the wires 28a and 28b, which are connected to the conductor strip 50, which is mounted on the block 51 of insulating material, and to the binding post 52, also secured to this block. Circuit is established through the mercury switch 45 by means of the wires 45a and 45b, which are wired to the conductor strip 50 and to the binding post 53, also fixed to the block 51. The mercury switch 48 is provided with circuit wires 48a and 48b, which are connected to the strip 50 and to the binding post 54 on the block 51.

The circular disc is provided with a metal plate 55 on which is mounted the luminous tubing 56, which is C-shaped. On this metal disc or plate 55 another C-shaped luminous tubing 57 is mounted. The inner ends of these C-shaped tubes are connected to each other by means of the conductor strip 58, and the outer end of the tubing 56 is provided with a terminal 60, and the outer end of the tubing 57 is provided with a terminal 61, both terminals being secured to the metal plate or disc 55, and insulated therefrom. In front of the rotating disc a third luminous tubing 62 is supported by the carrier wires or frame 63, and this tubing has its ends provided with terminals 64 and 65.

The disc 12 is equipped with three concentrically arranged metal conductor or collecting rings 66, 67 and 68. The ring 66 is engaged by the brush 66a, the ring 67 is engaged by the brush 67a, and the ring 68 is engaged by the brush 68a. All these brushes are insulated from each other and carried by the standard 6. The conductor strip 58 is connected in circuit with the ring 67; the terminal 60 is connected in circuit with the ring 68; and the terminal 61 of the tubing 57 is electrically connected to the ring 66.

The brush 66a is connected to one terminal of the secondary coil of the transformer 66d, and the other terminal of this secondary coil is connected with the secondary coil of the transformer 66e. The brush 67a is connected in circuit with the secondary coil of the transformer 66d and with the transformer secondary coil of the transformer 66e. The brush 68a is connected in circuit with the secondary coil of the transformer 66e. The secondary coils of the two transformers are connected in series. The wire 70' is connected with the primary coils of the transformers 66d and 66e, and the terminal 66c of the primary coil of the transformer 66d is connected to the wire 66b, which is in circuit with the mercury switch 31. The terminal 67b is connected in circuit with the wire 67' to the mercury switch 45, and the terminal 68b of the transformer 68c is connected in circuit with the mercury switch 48. The other terminal of this primary coil is connected with the wire 70', which is in circuit with the primary coils of the transformers 66d and 66e.

The stationary luminous tubing 62 may be omitted or cut-out and a plate 69 arranged in front of the rotating disc 12. This plate is provided with transparent letters 70, arranged to read across the C-shaped rotating luminous tubings 56 and 57. When these tubings are rotated and illuminated there will be produced a constantly changing illuminating effect, which is observable through the transparent letters, which will thus appear to be alive with changing luminous effects, and this action will be increased by the alternate illumination of these tubings, and simultaneous illumination thereof, in the different order of energization given.

Having described my invention I claim as new and patentable:—

1. In an apparatus of the character described, a plurality of movably mounted members, a fluid

switch carried on each of said members and operative responsive to changes in the position thereof, a shaft, means for rotating said shaft, and a plurality of pins received within cavities or apertures formed in said shaft and extending from said shaft and adapted to control the positions of said movable members, the relative positions of said pins with respect to each other controlling the selective operation of said fluid switches.

2. In an apparatus of the character described, a plurality of movably mounted members, a fluid switch carried on each of said members and operative responsive to changes in the position thereof, a shaft, means for rotating said shaft step-by-step through approximately one-quarter of a complete revolution at each impulse, a plurality of pins mounted in cavities or apertures formed in said shaft and extending from said shaft and being rotated therewith and adapted to control the positions of said movable members, the relative positions of said pins with respect to each other controlling the selective operation of said fluid switches, and means for restoring said movable members to a predetermined normal position during intervals when the movable members are not subject to the action of said pins.

3. In an apparatus of the character described, a plurality of movably mounted members, a fluid switch carried on each of said members and operative responsive to changes in the position thereof, a shaft, means for rotating said shaft step-by-step through a relatively large angle at each impulse, a plurality of pins mounted in cavities or apertures formed in said shaft and extending from said shaft and being rotated therewith and adapted to control the positions of said movable members, the relative angular positions of said pins around the axis of rotation of said shaft predeterminately controlling the selective operation of said fluid switches, and means for restoring said movable members to a predetermined normal position during intervals when the movable members are not subject to the action of said pins.

4. In an apparatus according to claim 3 in which said means for rotating said shaft step-by-step through a relatively large angle at each impulse includes a ratchet wheel carried upon and adapted to drive said shaft, said ratchet wheel having a maximum of four teeth, said teeth being uniformly spaced peripherally of said wheel and being formed so that at least the hooking side of each tooth is recessed, whereby to receive and retain a pawl adapted to actuate said ratchet despite the relatively large angle through which said wheel is actuated at each impulse.

5. An apparatus according to claim 3 in which said means for rotating said shaft step-by-step through a relatively large angle at each impulse includes a ratchet wheel carried upon and adapted to drive said shaft, said ratchet wheel having a maximum of four teeth, said teeth being uniformly spaced peripherally of said wheel and being formed so that at least the hooking side of each of the teeth is concave, and means for actuating said shaft through said ratchet wheel, said last-mentioned means including an element adapted to be moved in a plane parallel to the plane of rotation of said ratchet wheel and a pin laterally extending from said movable element and adapted to successively engage the concave side of successive teeth of said ratchet, the concave formation of said ratchet teeth permitting the rotation of said ratchet through a relatively large angle without permitting said pin to become disengaged from said ratchet teeth.

JOHN B. PALERMO.

CERTIFICATE OF CORRECTION.

Patent No. 2,143,206. January 10, 1939.

JOHN B. PALERMO.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 29, for "ring 67" read ring 66; line 31, for "ring 68" read ring 67; line 32, for "ring 66" read ring 68; line 43, for "wire 70'" read wire 66b; line 54, for "wire 70'" read wire 70; line 60, for "letters 70" read letters 71; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of May, A. D. 1939.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.