

T. J. DALTON.
REVERSING MECHANISM.
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Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.

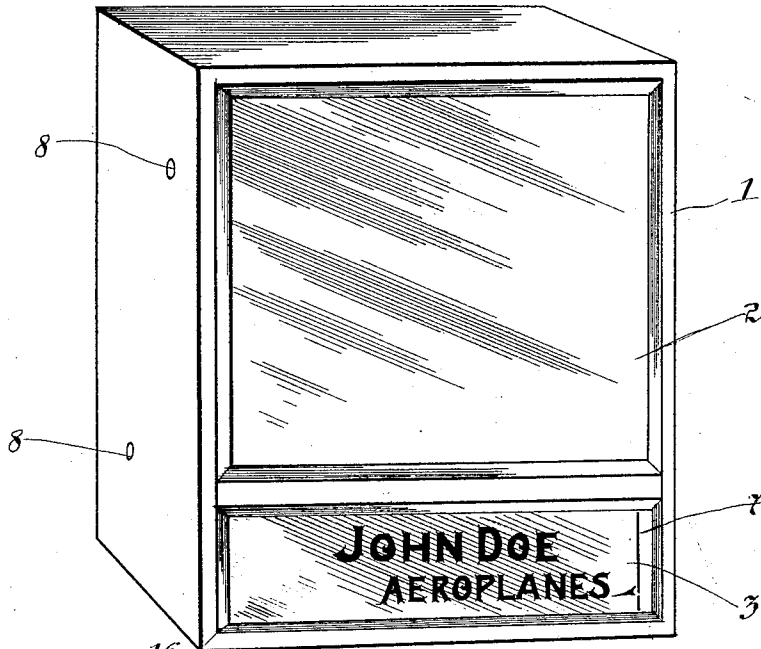


Fig. 1.

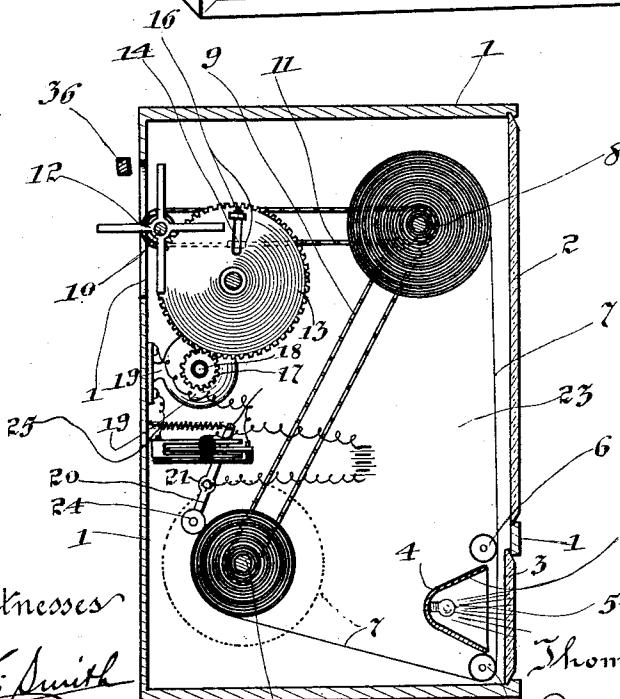


Fig. 2.

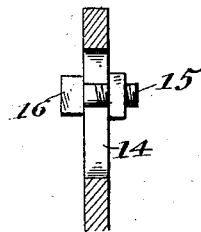


Fig. 3.

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1,020,193.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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REVERSING MECHANISM.

1,020,193.

Specification of Letters Patent.

Patented Mar. 12, 1912.

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To all whom it may concern:

Be it known that I, THOMAS J. DALTON, a citizen of the United States, and residing at the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Reversing Mechanism, of which the following is a specification.

My invention relates to improvements in reversing mechanism for advertising or display devices for use in street cars, show windows and other suitable places, the object being to provide a device of this character which shall be simple of construction and efficient in operation.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

My invention will be best understood by reference to the accompanying drawings forming a part of this specification and in which,

Figure 1 is a perspective view showing an advertising or display device embodying my invention, Fig. 2 is a vertical, transverse section of the device, Fig. 3 is a detail vertical section showing the construction of a gear wheel driving means employed in the device, Fig. 4 is a detail side elevation showing an electric reversing switch employed in the device, and embodying my invention. Fig. 5 is a top plan view of said switch.

The preferred form of construction as illustrated in the accompanying drawings comprises a case 1 which may be formed of wood or metal or other suitable material. Provided in the front wall of the case is a mirror 2 which serves the ordinary function of a mirror. In the lower part of the front wall of the case is inserted a glass or other transparent panel 3 in the rear of which is mounted a reflector 4 which is adapted to reflect rays of light through the panel 3, as clearly indicated in Fig. 2. One or more incandescent lights 5 are located within the reflector 4 in the line of the focus thereof. A pair of rollers 6 are journaled in the case 1 and arranged adjacent the longitudinal edges of the panel 3 and reflector 4, the disposition of said rollers being such that a ribbon 7 may traverse the same between the reflector 4 and panel 3. The web or ribbon 7 is made of transparent material, the characters or advertising matter carried thereby being opaque so that rays of light from the

lamp 5 shining through said ribbon will render the advertising matter clearly visible. The ends of the ribbon 7 are adapted to wind and unwind on a pair of ribbon shafts 8 which are spaced apart from each other and arranged in parallelism as will be readily understood by those skilled in the art. The shafts 8 are connected by means of a chain 9, the latter running over sprockets provided on the shafts 8 which are indicated by the dotted lines in Fig. 2. Helical springs in each roller (not shown) provide tightness and yieldability of the ribbon as the varying diameters of the two rollers may require. In order to drive the shafts 8 a star-wheel shaft 10 is operatively connected to one of said shafts by means of a chain 11, said star-wheel shaft carrying a star-wheel 12 as clearly shown in Fig. 2. This star wheel is arranged adjacent to the face of a driving spur gear 13 which is provided with a radial slot 14 which extends from the hub to adjacent the periphery thereof. Mounted in the slot 14 is a radially adjustable bolt 15 the head 16 of which is adapted to pass into the path of movement of the teeth of the star-wheel 12 and to mesh with and drive the same intermittently. The object of the radial slot 14 is to provide means whereby the head 16 may be adjusted so as to mesh with the star-wheel 12 in a proper manner. The slot 14 is of a sufficient length to permit the head 16 to be moved out of the path of the star-wheel 12 to prevent engagement therewith, the head 16 in such position being indicated by dotted lines in Fig. 2. The spur gear 13 is continuously driven at a uniform speed by means of a spur pinion 17 which is carried by a motor shaft 18 of a motor 19 which is provided on the interior of one of the walls of the case 1 as indicated in Fig. 2.

From the foregoing construction it is apparent that when the motor 19 runs in a certain direction that the ribbon 7 will have a corresponding movement by the panel 5, such movement of the ribbon however being intermittent, due to the effect of the star wheel 12. In this manner the display or advertising matter on the ribbon 7 will be displayed successively and at proper intervals, it being necessary that the spaces between the advertising matter on the ribbon be correctly timed with the movements of the star wheel 12. It becomes necessary

after the ribbon 7 has been wound on one of the ribbon shafts 8 to reverse the direction of movement of said ribbon, hence an automatic electric reversing switch is provided to change the direction of movement of the motor 19.

The automatic electric reversing switch comprises an oscillatory lever 20 which is fulcrumed as at 21 on the free extremity of a bracket 22 which is secured to the rear wall 23 of the case 1, as illustrated in Fig. 5. The oscillatory lever 20 is normally in a vertical position as illustrated in Fig. 4 and carried at the lower end thereof is a friction roller 24 which is adapted to traverse the ribbon 7 during the winding thereof on one of the ribbon shafts 8. The roller 24 is maintained in close contact with ribbon 7 by means of a tension helical spring 25 extending from the upper end of the lever 20 to one end of the case 1, this spring having considerable length in order to render the pressure of the roller 24 on the ribbon 7 substantially uniform. The roller 24 is mounted on the lever 20 to move through a radius of approximately 90 degrees, as indicated by the dotted lines in Fig. 4. Arranged adjacent the upper end of the lever 20 is an insulating bracket 26 which is screwed to the rear wall 23, as clearly shown in Fig. 5. This bracket is substantially U-shaped in form and secured thereto in the central portion thereof is a metallic block 27 for a purpose to be described hereinafter. Fulcrumed to the bracket 26 at points spaced apart thereon is a pair of bell-crank levers having short arms 28 and long arms 29, the latter being normally arranged in parallelism as shown in Fig. 4. The distance between the fulcrums of the bell-crank levers is slightly greater than the length of the long arms 29 thereof, which construction permits of the free and unobstructed movement of said long arms. While one of the arms 29 is shown to be double in Fig. 4, this construction is not necessary for the successful operation of the switch. The arms 29 are adapted to swing freely between the block or stop 27 and the lever 20, the latter serving also as a stop for the bell-crank levers when moving in one direction. In Fig. 5 of the drawings the distance between the stop 27 and the lever 20 is excessive, being so shown the better to illustrate the principle and mechanism employed. In actual practice this distance may be considerably less. The wiring of the switch is as follows. The fulcrums of the bell-crank levers are connected by means of wires 30 and 31 to the binding posts of the motor 19, the latter being indicated diagrammatically in Fig. 5. The fulcrum of the oscillatory lever 20 is connected by means of a wire 35 to a battery 33 from which extends a wire 34 to the stop block 27, the latter wiring being

shown only in Fig. 5. One edge of the long arms 29 is so formed as to permit of a continual electric contact with the lever 20 during the complete oscillation thereof, the friction of the fulcrums of the bell-crank levers being such that the same will remain in any position which they may assume until moved out of such position by a positive operating means.

The operation of the reversing electric switch is as follows: Assuming that the lever 20 is in a vertical position and oscillating as indicated by the arrow in Fig. 5. Then one arm 29 will be in electrical contact with the lever 20 and the other arm 29 will be insulated therefrom as will be clear by reference to Fig. 5. In this position of the parts an electrical circuit is established by the current passing from the battery 33, thence over the wires 34 to the block 27, thence along the long arm 29 to a bell-crank lever fulcrum, thence over the wire 30 to the motor 19, thence over the wire 31 to the other bell-crank lever fulcrum, thence over the long arm 29 to the point of contact of the lever 20 therewith, thence over a portion of the lever 20 to the fulcrum 21 thereof, and thence over the wire 35 to the battery, thus completing the circuit. This circuit will be maintained during the entire travel of the lever 20 in the direction indicated. When adjacent the limit of movement in this direction the lever 20 will contact with the short arm 28 of the right-hand bell-crank lever and effect an oscillation of the latter to such an extent that the long arm 29 thereof will come into contact with the lever 20. Simultaneously with this movement the long arm 29 of the left-hand bell-crank lever will be disengaged from the lever 20 due to the action of the insulating cord 36 connecting the free ends of the short arms 28. The long arm 29 of the left hand bell-crank lever will now be in electrical contact with the block 27 and the long arm 29 of the right-hand bell-crank lever will be in electrical contact with the lever 20 as aforesaid. In this manner the direction of flow of the current in the motor circuit is reversed, the flow now being from the battery 33, over the wire 35 to the lever fulcrum 21, thence over a portion of the lever 20 to the long arm 29 of the right-hand bell-crank lever, thence over the wire 30 to the motor 19, thence over the wire 31 to the left-hand bell-crank lever which is in contact with the block 27, and from said block back to the battery 33 over the wire 34. This action of the electric switch virtually produces a cross-over, which as is well known reverses the direction of flow of current in any electric circuit.

The operation of the complete device is as follows: Assuming that the parts of the device have a relative position as shown in

Fig. 2 and that it is desired to display successively advertising or other display matter on the ribbon 7, then it is only necessary to start the motor 19 in operation. The display or advertising matter if properly arranged and timed on the ribbon 7 will be displayed successively and be rendered visible by means of the reflector 4 and electric lamp 5. After the ribbon 7 has moved in one direction sufficiently to be unwound from one of the ribbon shafts 8 the direction of movement of said ribbon will be automatically reversed by means of the electric reversing switch hereinbefore described.

While I have illustrated and described the preferred construction for carrying my invention into effect, the same is capable of variation or modification without departing from the spirit of the invention. I therefore do not wish to be limited to the exact details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A reversing electric switch comprising an insulating frame, a pair of bell-crank levers fulcrumed to said frame, each bell-crank lever comprising a long and a short arm, the long arms of said levers being arranged substantially parallel and adjacent to each other, the fulcrums of said levers being spaced apart a distance slightly greater than the length of said long arms, an insulating cord connecting the free ends of said short arms, a stop for limiting the oscillation of said bell-crank levers in one direction, an oscillatory lever disposed in a plane at right angles to the plane of movement of said bell-crank levers, resilient means for moving said oscillatory lever in one direction, and a roller provided at the other end of said oscillatory lever and adapted to traverse an operating medium, said bell-crank levers being actuated by contact with said oscillatory lever at the limit of its stroke in either direction, substantially as described.

2. An electric reversing switch comprising a frame formed of insulating material, two bell-crank levers fulcrumed to said frame and adapted to oscillate in the same

plane, said bell-crank levers comprising short and long arms, the latter being arranged substantially in parallelism, the fulcrums of said bell crank levers being spaced apart a distance slightly greater than the length of said long arms, a stop for limiting the movement of said long arms in one direction, said stop being arranged on one side of said long arms, an oscillatory lever arranged on the other side of said long arms and disposed in a plane perpendicular to the plane of movement of said bell-crank levers, a traversing roller provided on one end of said oscillatory lever, a helical spring connected with the other end of said oscillatory lever and adapted to move the same in one direction, and a cord connecting the free ends of said bell-crank levers, the latter being actuated by contact with said oscillatory lever adjacent the limits of the strokes thereof, substantially as described.

3. An electric reversing switch comprising a substantially U-shaped insulating frame, a pair of bell-crank levers fulcrumed to said frame so as to move substantially in the same plane, said bell-crank levers comprising short and long arms, the latter being adapted to assume substantially parallel positions, the fulcrums of said levers being spaced apart a distance slightly greater than the length of said long arms, a stop arranged intermediate said fulcrums and on one side of said long arms, an oscillatory lever arranged on the other side of said long arms and adapted to have electric contact therewith, a traversing roller provided at one end of said oscillatory lever for oscillating the same in one direction, a tension helical spring provided at the other end of said oscillatory lever for oscillating the same in the other direction, and an insulating cord connecting the free ends of said short arms, said bell-crank levers being oscillated between said stop and said oscillatory lever by contact with the latter at the ends of its stroke in either direction, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS J. DALTON.

Witnesses:

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HELEN F. LILLIS.