Sept. 9, 1924. 1,508,270

C. A. CONNELLY

DOOR OPERATING DEVICE

Filed Feb. 18, 1921 3 Sheets-Sheet 1

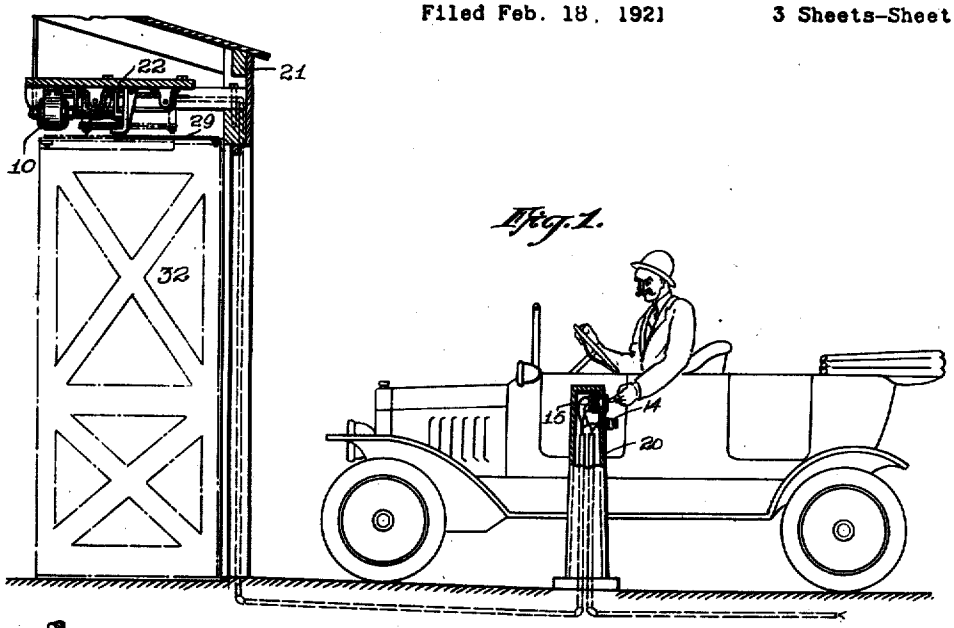


Fig. 1.

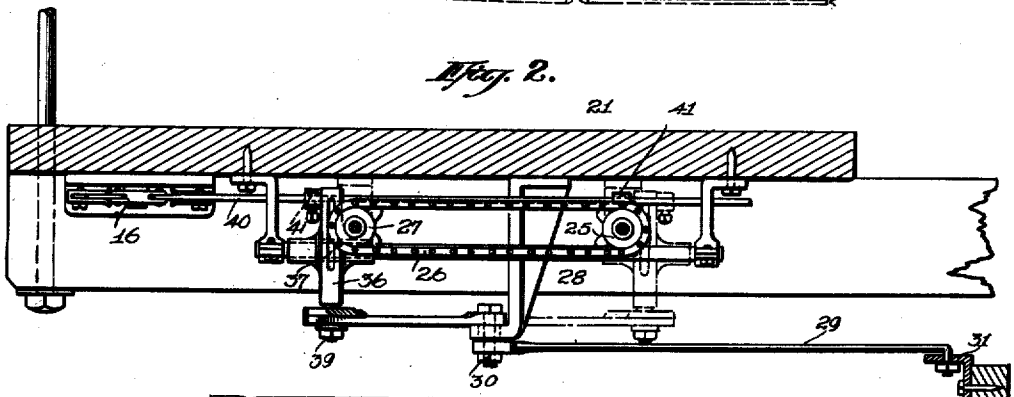


Fig. 2.

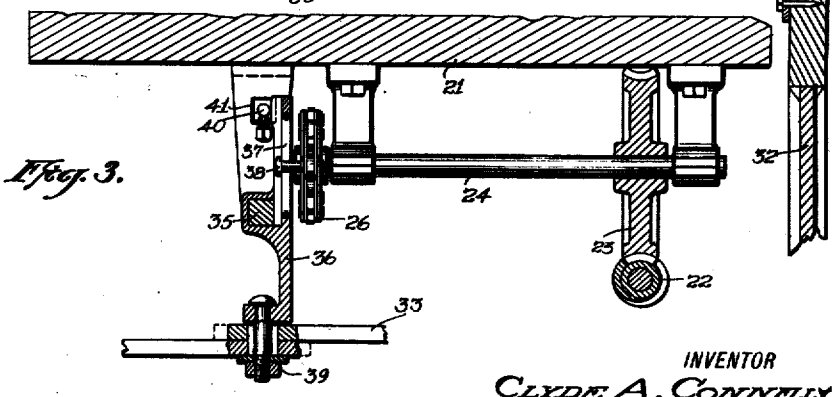


Fig. 3.

WITNESSES

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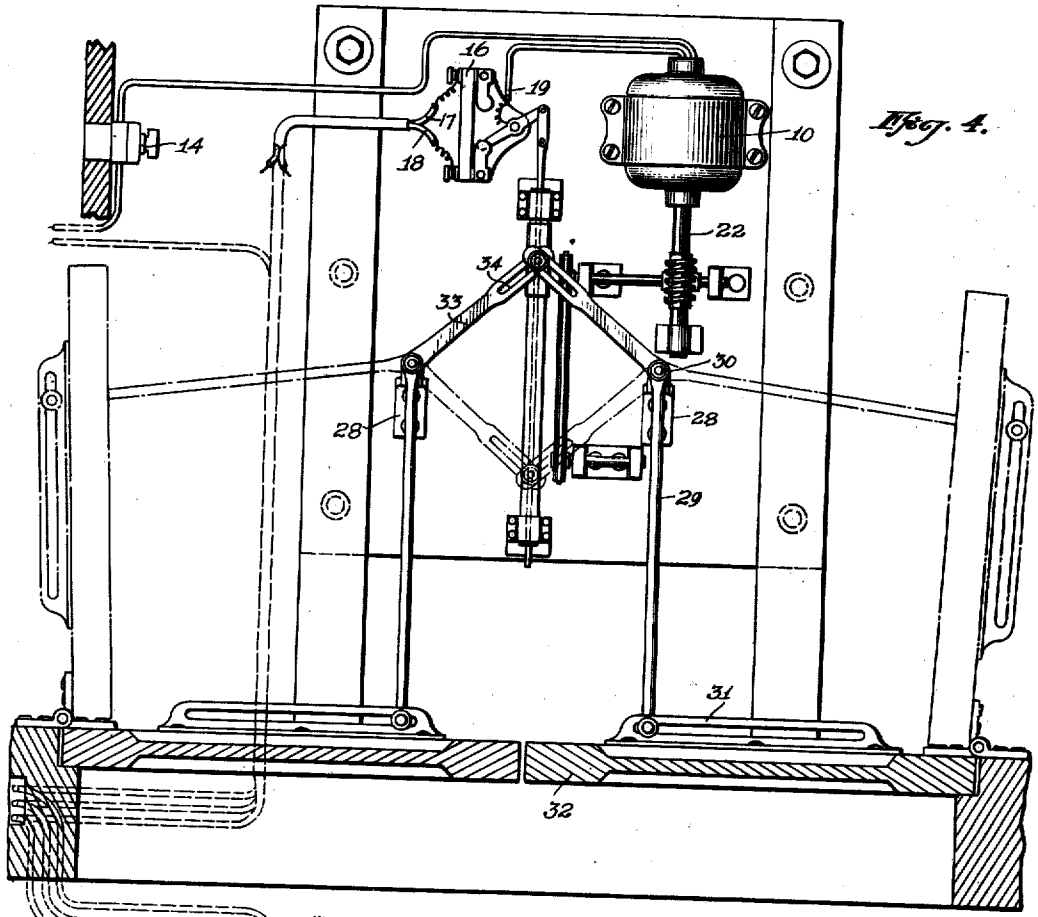
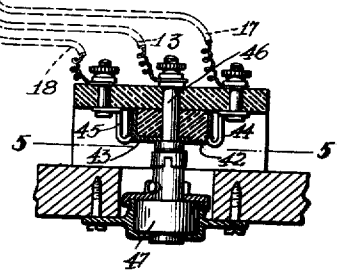


Fig. 4.



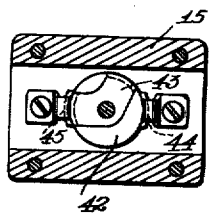


Fig. 5.

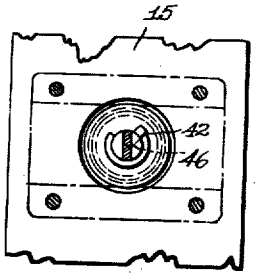


Fig. 6.

WITNESSES.

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Fig. 8.

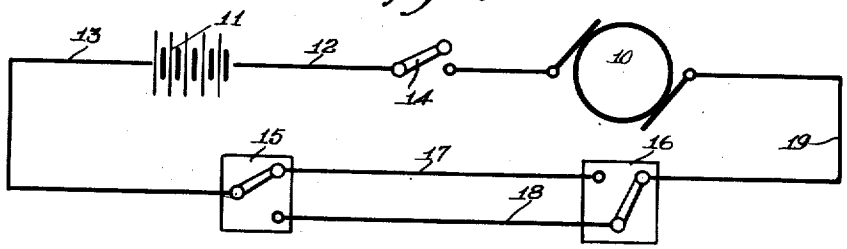
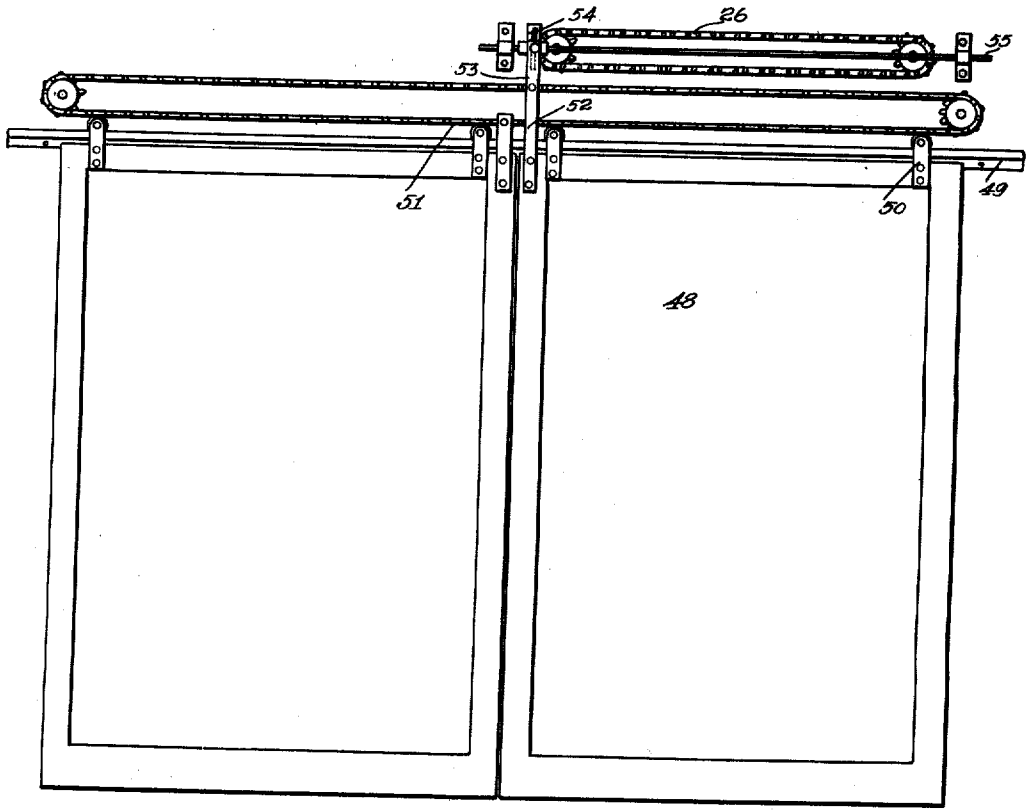


Fig. 7.



WITNESSES

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Patented Sept. 9, 1924. 1,508,270

UNITED STATES PATENT OFFICE.

CLYDE A. CONNELLY, OF SHELBY, OHIO.

DOOR-OPERATING DEVICE.

Application filed February 18, 1921. Serial No. 446,012.

To all whom it may concern:

Be it known that I, CLYDE A. CONNELLY, a citizen of the United States, and a resident of Shelby, in the county of Richland and State of Ohio, have invented a new and Improved Door-Operating Device, of which the following is a full, clear, and exact description.

My invention relates to a door operator, and aims to provide certain new and useful improvements in connection with a device of this character.

It is a well appreciated fact that it has been quite customary to utilize an operating element for closures which would permit of a person effecting an opening or closing of this element at a point relatively remote from the same. A device of this character is particularly adapted for use in connection with the operation of gates, doors, etc. and provides a means whereby the same may be opened or closed without alighting from a vehicle in which the operator might be riding.

These devices have all offered objections in that it has been necessary, in any instance, to manually operate the closure so that virtually no benefit is derived except from the fact that the same may be actuated without alighting from the vehicle.

Further, these devices have offered objections in that the parts have been more or less cumbersome and complicated, so that aside from the fact that the friction rendered the same somewhat difficult to operate, the liability of the entire device becoming in-operative has always existed.

Having this in mind, I have constructed a device for operating doors or other forms of closures, and at a point relatively remote from the same, whereby it will not be incumbent upon an operator to exert any force to effect an operation of the closure.

A further object of my invention is the provision of a device of the character stated, in which the working parts will be reduced to a minimum, thus avoiding complications, and difficulty incident to complication, aside from the fact that the expense of the primary installation will be reduced to an extremely small figure.

Further objects of my invention will appear in the annexed specification and drawings, which latter present practical embodiments of my invention, and in which;

Figure 1 is a sectional side view of a door operating device constructed in accordance with my invention and illustrating the same in use.

Figure 2 is an enlarged sectional view taken through a building and door to which the same is applied, and showing the same in position.

Figure 3 is a sectional rear view.

Figure 4 is a sectional plan view.

Figure 5 is a sectional front view of one of the elements forming a part of my improved construction, and taken along the line 5—5 of Figure 4.

Figure 6 is a partly sectional front view of the element illustrated in Figure 5.

Figure 7 illustrates my invention as applied to a slightly different form of closure than that illustrated in preceding figures, and

Figure 8 is a diagrammatic view of the circuit as utilized for accomplishing the working of the parts.

It is primarily to be understood that my invention has been shown in the accompanying drawing in association with closures of both swinging and sliding doors, but it will readily be appreciated that the same might be utilized to advantage in connection with any desired type of closure.

With this in view, reference being had to Figure 8, it will be seen that, in a diagrammatic manner the elements utilized for accomplishing a non-manual operation of the closure, and in which the reference numeral 10 indicates any suitable type of motor which is supplied with current by a desirable source of energy 11, having leads 12 and 13. It is to be noted that a switch 14 may be provided in association with the lead 12 for effecting an interruption of the circuit, if this is desired, and it will also be seen that the lead 13 is coupled with two way switches 15 and 16, having leads 17 and 18 extending between their respective points, the switch 16 being in turn arranged in series with the motor 10 by a lead 19.

It will thus be seen, assuming that the switch 14 is closed, that a closing of both of the switches 15 and 16 through either of the leads 17 and 18 will permit of the motor 10 being operated, but it will also be noted that a movement of the switch arm of either of the last named switches to the contact point associated with the opposite lead, will effect an interruption of the circuit, resulting in the stopping of the motor, and with

this in view, reference being had to Figure 1, I arrange switch 15 within a post 20, or other suitable element located at a point remote from the building 21, it being noted that the switch 14 may also be associated with the element 20.

Referring to the construction embodied in Figures 1 to 6 it will be noted that the motor 10 serves to drive a worm shaft 22, or other suitable provision, serving to effect a rotation of the gear 23, which in turn, by means of a shaft 24 and sprocket gear 25, serves to cause a movement on the part of a sprocket chain 26, suitably mounted by the gear 25 and secondary sprocket gear 27.

A pair of brackets 28 serve as supports for a pair of levers 29, these latter being pivotally associated with the brackets, as has been indicated by the reference numeral 30. Also it will be noted that each of the levers 29 slidably engage, adjacent their outer ends, with guide ways 31 affixed one to each of the doors 32 of the building 21. Further, the opposite ends of each of the levers 29, i. e. that portion of the same extending beyond the point of pivotal connection 30, is preferably off-set, as has been indicated by the reference numeral 33, and each of these off-set portions provide, adjacent their outer ends, slots 34 for a purpose hereinafter stated.

Arranged adjacent to the sprocket chain 26 and extending parallel to the same is a guide bar 35 serving as a track for a traveler 36 slidably arranged upon the same. This traveler includes, in the embodiment illustrated, a vertically extending slot 37 through which the pin 38 attached to the sprocket chain 26 extends. Thus it will be appreciated that a movement of the sprocket chain in one direction will result in a projection on the part of the traveler 36, and upon the pin 38 passing around either of the gears 25 or 27, and consequently moving in an opposite direction, the projection of the traveler 36 will be changed to a retraction of the same.

It will further be noted that the traveler 36 carries a pin 39, or any other suitable element capable of effecting a sliding engagement with the slots 34 of the off-set portions 33, and it will thus be obvious that a reversing of the traveler, as aforestated, will result in a swinging of the off-set portions 33 of the levers, and a consequential swinging of their opposite ends, which engage the doors 32, thus moving the latter, as has been indicated in dotted lines in Figure 4 to a fully open position.

This action occurs only upon a projection of the traveler 36, it being obvious that a retraction of the same, effected in the manner aforedescribed by the sprocket chain 26 will result in the doors being moved to the position indicated in full lines in the Figure referred to.

Now with a view of providing means serving to at all times cause a cessation of operation on the part of the device, upon the doors reaching either their fully closed, or open position, and at the same time, to set the apparatus so that upon its being operated it will swing the doors to the opposite position in which they rest, it will be noted that I position the secondary reversing switch, 16, preferably adjacent the motor 10. The automatic operation desired is conveniently effected by utilizing a slidably mounted switch operating bar 40, having one of its ends connected with the two-way switch referred to. This bar lies adjacent the path of movement of the traveler 36, and is preferably provided with stops 41 secured adjacent the limits of motion of this traveler. Thus upon this latter member reaching either end of its stroke, it will be obvious that the body of the same, reference being had to Figures 2 and 3, will contact with one of the stops 41, resulting in a movement of the switch blade of the switch 16, and consequential opening of the circuit. The parts will then be in the position illustrated diagrammatically in Figure 8, in which one of the switches is in electrical circuit with the lead 17, the second two-way switch being in circuit with the lead 18.

The doors 32, being now in either closed or open position, and it being desired to move them to their opposite position, it will be seen that this may be effected by closing the circuit through the switch 15, in that the blade or bridging element of the same is moved to a position at which it will contact with the lead now contacted with by the bridging element of the switch 16. This will obviously result in an operation of the motor 10, again swinging the doors to their opposite limit of motion, at which point the traveler 36, again moving the switch operating bar 40, will break the circuit.

Referring now more particularly to the specific construction of the switch 15, illustrated in Figures 4, 5 and 6 it will be appreciated that this member preferably includes a body portion 42, which is rotatably mounted, and carries a bridging element 43 adapted to co-act with either of the contact points 44 or 45 connected with the leads 17 and 18, respectively, it being noted that the center post 46 of the switch is in continuous electrical association with the lead 13.

Thus it will be obvious that an efficient form of two-way switch is provided, which may be operated by a key (not shown) adapted to co-operate with a lock 47 connected to the body 42. By providing this construction it will be seen that any unauthorized person would be unable to effect an

operation of the entire device, as it would be impossible for such a person to effect a closing of the circuit through the motor 10.

Referring now more particularly to Figure 7 in which I have shown my invention as applied to doors slidably mounted upon rails 49 by means of hangers 50, it will be seen that these doors, in the usual manner, are synchronized in movement by an endless movable member, such as for instance a sprocket chain 51, by being coupled thereto through arms 52.

It will be noted that one of these arms is conveniently formed with an extended portion 53 connected to a traveler 54 slidably mounted upon a bar 55, and moved as in Figures 1 to 6 by a sprocket chain 26, the balance of the structure not being illustrated. Thus it will be seen that the doors 48 move in opposite directions in the usual manner and that the traveler 54 co-operates with the arm 53 to produce an opening and closing of each of the panels of the doors.

From the foregoing it will be appreciated that I have constructed a door operating device which will at all times effectually serve to actuate any desired type of closure to either completely open or close the same. Upon its limit of motion having been effected the parts will cease to function, it being noted, however, that by virtue of the two-way switches employed the parts will be set to a position at which an actuation of the switch positioned at a point remote from the closure to be operated will result in a movement of the parts of the closure to its opposite limit.

Further it will be seen that my device is extremely simple in construction and efficient in operation, and it will be obvious that numerous modifications of structure might readily be resorted to without in the least departing from the spirit of my invention which I claim as:

1. A closure operating device, including in combination with swinging doors, of pivotally mounted levers having one of their ends slidably secured to said doors, said levers extending beyond the points of pivotal mounting, and being formed with longitudinally extending slots, a slidably mounted traveler, means extending through said slots and being connected to said traveler, a motor, an endless member operated by said motor, and means engaging said traveler to said endless member.

2. A closure operating device, including in combination with swinging doors, of pivotally mounted levers having one of their ends slidably secured to said doors, said levers extending beyond the points of pivotal mounting, and being formed with longitudinally extending slots, a slidably mounted traveler. means extending through said slots and being connected to said traveler, a motor, an endless member operated by said motor, means engaging said traveler to said endless member, and means operated by said traveler for causing a cessation of operation on the part of said motor upon said doors being moved to either of their extreme positions.

3. A closure operating device, including in combination with swinging doors, of pivotally mounted levers having one of their ends slidably secured to said doors, said levers extending beyond the points of pivotal mounting, and being formed with longitudinally extending slots, a slidably mounted traveler, means extending through said slots and being connected to said traveler, a motor, an endless member operated by said motor, means engaging said traveler to said endless member, means operated by said traveler for causing a cessation of operation on the part of said motor upon said doors being moved to either of their extreme positions, and also effecting a re-setting of the parts to permit of said doors being swung to their second extreme position.

4. A door operating device including in combination with the door, a reciprocable structure, means operated thereby to open and close said door, a motor, means operated by the motor to operate said structure, means operated at each limit of reciprocating movement of said structure to open the motor circuit, and means for manually closing the motor circuit after previously automatically opened as aforesaid, the means operated by the motor to operate said structure including a traveler, a guiding means therefor, an endless flexible member operable in a plane parallel to said guiding means, said traveler having an elongated recess extending at an angle to said guiding means, and a projection on said member engaging said recess.

CLYDE A. CONNELLY.