

March 18, 1958

H. H. BUNZL  
DEVICES FOR THE AUTOMATIC OPENING  
AND CLOSING OF DOORS AND THE LIKE

2,827,284

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3 Sheets-Sheet 1

Fig. 1

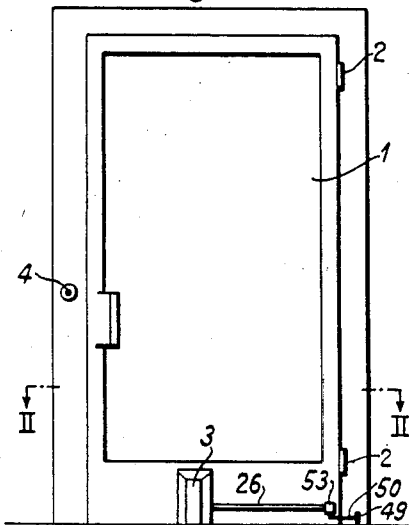


Fig. 4

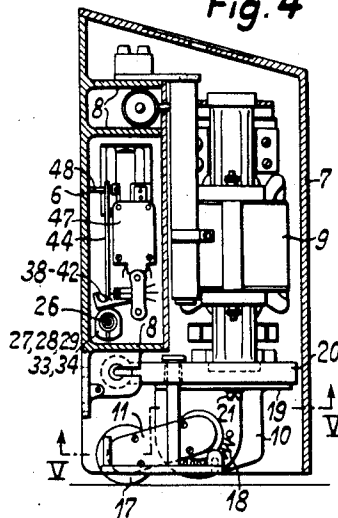


Fig. 2

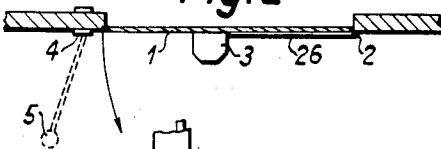


Fig. 3

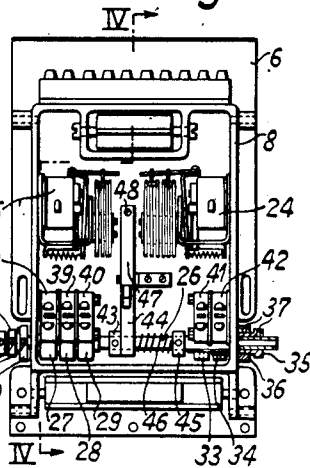
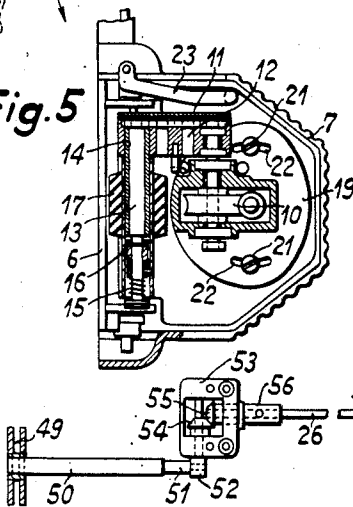


Fig. 5



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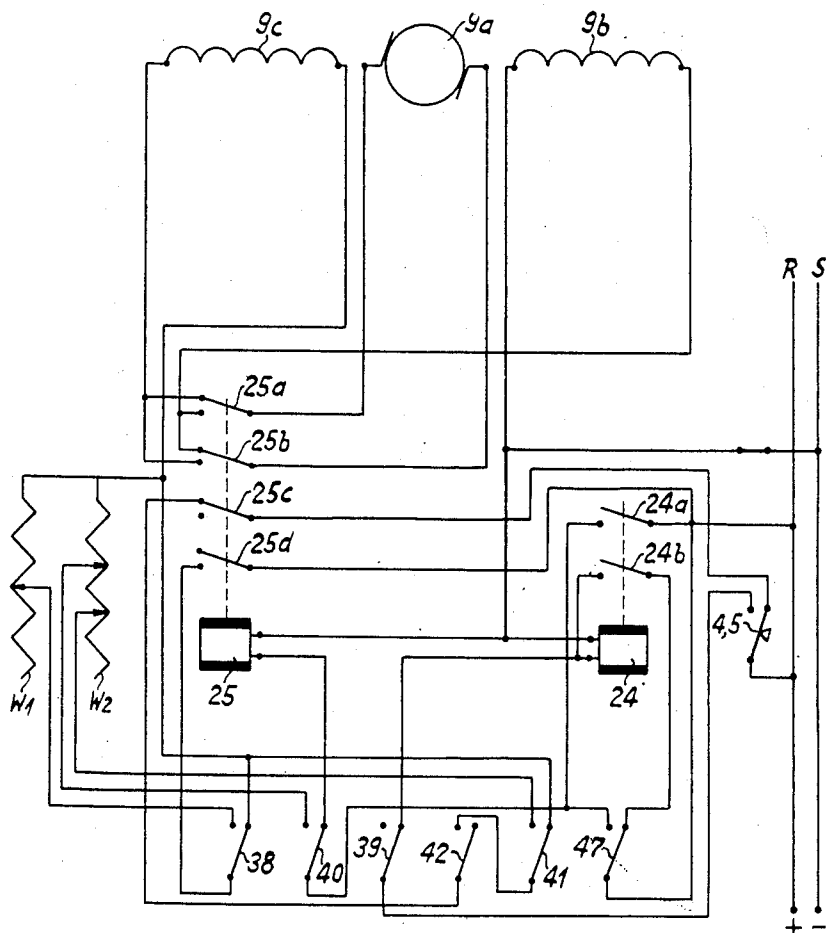
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**Fig. 6**



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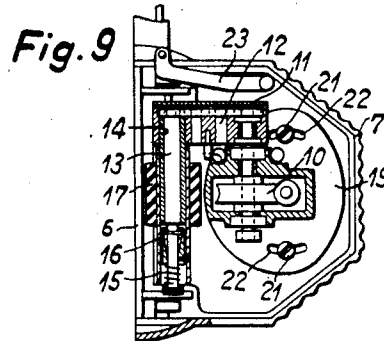
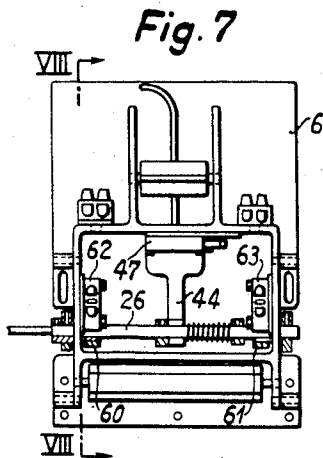
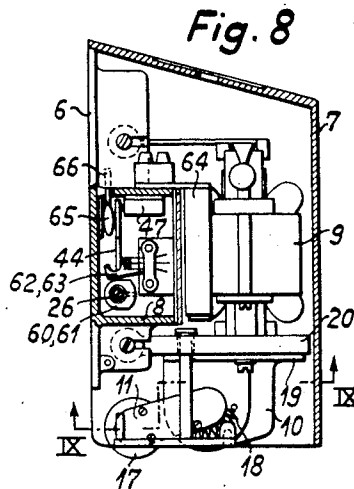
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## DEVICES FOR THE AUTOMATIC OPENING AND CLOSING OF DOORS AND THE LIKE

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Claims priority, application Switzerland March 13, 1953

14 Claims. (Cl. 268—65)

There are already known devices for the automatic opening and closing of doors and the like which are controlled by push-button switches, photoelectric cells or the like. These known devices as a rule, act on the hinges of the doors and must be fitted in the floor, the door frame or the lintel and they are consequently suitable only for doors that are to be newly made or, if they are to be fitted to existing doors, they render considerable fitting work necessary. In addition, these known devices for the automatic opening and closing of doors and the like are very expensive and require a relatively powerful motor. These disadvantages can be eliminated by the present invention.

The subject matter of the present invention is a device for the automatic opening and closing of doors and the like, in which there is fixed, on the wing of the door which is to be opened and closed, a casing in which there is mounted a reversible electric motor that drives, through a reduction gear, a roller which is pressed against a stationary track and effects the movement of the wing of the door which is to be opened and closed and which is provided with a lifting device, and in which door opening and closing device there are arranged in the said casing a device, to be operated by an actuating device, for switching in the electric motor in the direction of rotation which corresponds to the opening, and controlling members which are operated by transmission members in dependence upon the movement of the wing to be opened and closed, the said controlling members controlling the electric motor in accordance with the required course of movement of the wing to be opened and closed.

This device can readily be fitted to any existing door.

Two examples of embodiment of the subject matter of the invention and their arrangement, as well as a wiring diagram, are represented in the accompanying drawings, of which:

Fig. 1 is an elevation of a door with a device for its automatic opening and closing arranged thereon;

Fig. 2 is a section on the line II—II of Fig. 1;

Fig. 3 is an elevation of the first embodiment of the device for the automatic opening and closing of a door, with the lid of the casing taken off and the motor removed;

Fig. 4 is a section on the line IV—IV of Fig. 3;

Fig. 5 is a section on the line V—V of Fig. 4;

Fig. 6 is a wiring diagram of the device shown in Figs. 3 to 5;

Fig. 7 is an elevation of the second embodiment of the device for the automatic opening and closing of a door, with the lid of the casing taken off and the motor removed.

Fig. 8 is a section on the line VIII—VIII of Fig. 7; and

Fig. 9 is a section on the line IX—IX of Fig. 8.

In Figs. 1 and 2, 1 denotes the wing of a single-wing door which is rotatably mounted by means of the hinges 2. On the middle part of the bottom part of the frame of the wing 1 there is fixed a casing 3 which consists of a base plate and a lid and in which the driving

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mechanism (hereinafter described in two embodiments) of the device for the automatic opening and closing of the wing 1 of the door is accommodated. 4 denotes a push-button switch arranged on the frame of the door and 5 denotes a foot switch arranged outside the reach of the wing 1; both the push-button switch and the foot switch or only one of them may be provided. Instead of the push-button switch 4 or the foot switch 5, or in addition thereto, a photoelectric or other electronic switching device may be provided.

The casing 3 consists of a base plate 6, which is fixed on the bottom part of the door wing, and a lid 7, which is detachably fixed on the base plate 6. Mounted on a support 8 on the base plate 6 in vibration-absorbing bearing members is a reversible electric motor 9 which drives, through a worm gear 10 and a spur-wheel gear 12 arranged in a rocking arm 11 which is mounted on the shaft of the worm wheel of the worm gear 10, a shaft 13 which is mounted in the rocking arm 11 and is parallel to the floor. Mounted on this shaft 13 is a sleeve 14 which is coupled with the shaft 13 by a friction clutch 16 that is acted upon by a compression spring 15. Mounted on the sleeve 14 is an adhesion roller 17 made of profiled rubber or the like, which runs on the floor, a strip of carpet, a plate or a rail and effects the movement of the door wing. The rocking arm 11 is acted upon by a prestressed spring 18 which causes the adhesion roller to be pressed to its rolling surface. The friction clutch 16 renders it possible for the adhesion roller 17 to roll on its rolling surface also when the electric motor 9 is switched out and the door wing is opened or closed by hand. The connecting flange 19 of the casing of the worm gear 10 is fixed to the base plate 20 of the electric motor 9 by means of set screws 21 which are inserted in the base plate 20 and which lie in arcuate slots 22 in the connecting flange 19. These slots 22 in the connecting flange 19 render it possible to turn the connecting flange 19 within certain limits in relation to the base plate 20 and thus to set the adhesion roller 17 in the correct position, i. e. in such a position that its axis intersects the axis of the door hinges. A lifting device that is to be operated by a lever 23 renders it possible to lift the rocking arm 11, for the purpose of disengaging the device, in opposition to the action of the spring 18 and thus to lift the adhesion roller from its bearing surface.

Arranged on the base plate 6 of the casing 3 are a starting relay 24 and a switching relay 25 for forward and backward running of the electric motor 9. On the bottom part of the base plate 6 of the casing 3 there is mounted a shaft 26. On one side of the base plate 6 there are arranged on this shaft 26 two sleeves which lie one within the other and on one of which a cam disc 27 is mounted and on the other of which two cam discs 28 and 29 are mounted. The length of the said sleeves is stepped and they have on their ends that are outside the lid 7 of the casing adjusting heads 30 and 31 respectively. In the same way, there are arranged, on the other side of the base plate 6 on the shaft 26, two sleeves on which cam discs 33 and 34 respectively are mounted. These two sleeves also have on their ends that are outside the lid 7 of the casing adjusting heads 35 and 36 respectively. The adjusting heads 30 and 31 and 35 and 36 are each provided with a set screw 37 by means of which the sleeves can be clamped on the shaft 26 in any desired position in relation to one another. The cam discs 27, 28, 29, 33 and 34 operates switches 38, 39, 40, 41 and 42 respectively. On the shaft 26 there is also keyed, by means of a set screw, an adjusting ring 43 to which is pressed the hub of a lever 44, loosely mounted on the shaft 26, by a spring 46 which is arranged on the

shaft 26 and rests against another adjusting ring 45. In this way, the lever 44 is coupled with the shaft 26 by friction. The lever 44 operates a switch 47 and a set screw 48 limits its switching movement.

Fixed to the bottom part of the side part that carries the hinges 2 for the rotation of the door is a bearing member 49 on which a tubular arm 50 is mounted so as to be capable of being swung about a vertical axis. Carried displaceably in this tubular arm 50 is a rod 51, the end of which, that is outside the tubular arm 50, is connected with a vertical shaft 52 which is mounted in a casing 53 that is fixed on the door wing 1 near the axis of the hinges 2. The end of the shaft 52 that lies in the casing 53 carries a bevel wheel 54 with which a second bevel wheel 55 engages which is mounted on one end of a shaft 56 which is mounted in the casing 55 and the other end of which is coupled with the shaft 26. The two ends of the shaft 26 are formed for coupling with the shaft 56 in order that it should be possible to fit the device to door wings which open on the right or on the left.

From the wiring diagram shown in Fig. 6, the construction of the starting relay 24 and of the switching relay 25, as well as the arrangement of these relays and of the switches 38 to 42 in the circuit of the electric motor 9, can be seen, and the operation of the device described for the automatic opening and closing of the door will now be described with the aid of this wiring diagram.

In Fig. 6, R and S denote the conductors of current mains to which the device is connected. The starting relay 24 and the switching relay 25 as well as the switches 38-42 are represented in the position which corresponds to the condition of rest with the door closed. The starting relay 24 operates two switches, 24a and 25b, and the switching relay 25 operates four switches 25a, 25b, 25c and 25d. The collector of the electric motor 9 is denoted by 9a and its field windings are denoted by 9b and 9c. W1 and W2 are series resistances.

If the push-button switch 4, the foot switch 5 or the photoelectric or electronic switching device is operated, the starting relay 24 is energized through the switch 39 whereby switches 24a and 24b are closed. The switching relay 25 is energized through the switches 24a and 40, closes the switch 25d, reverses the switches 25a and 25b and opens the switch 25c. The circuit of the electric motor 9 is thus closed through the switches 25a and 25b, the switch 38 that is closed in this condition of operation, and the switch 25d, and the electric motor 9 starts to rotate vigorously in the direction which corresponds to the opening of the door, so that the door begins to open. The shaft 56 is rotated by the opening movement of the door and drives the shaft 26. The lever 44 is frictionally driven by the shaft 26 and operates the switch 47 which is reversed and thus breaks the circuit of the switch 24b which acts as holding contact for the starting relay 24, so that the starting relay 24 is de-energized. At the same time, however, the switch 47 takes over the supplying of current to the switching relay 25, so that the electric motor 9 continues to run and the door is opened further. After a definite opening movement of the door, which can be adjusted by corresponding adjustment of the cam disc 27, the switch 38 is reversed by the cam disc 27 that is rotating with the shaft 26, so that the regulatable series resistance W1 is switched out and the torque of the electric motor 9 is reduced. The door opens further, but more slowly. When the door reaches the maximum predetermined degree of opening, which is adjustable by a corresponding adjustment of the cam disc 29 on the shaft 26, the switch 40 is reversed by this cam disc 29, so that the switching relay 25 is de-energized. At the same time, the reversal of the switch 40 and the de-energization of the relay 25 effect a pole reversal on the electric motor 9, the circuit of which is now closed through this switch 40, the series

resistance W2 and the switches 25a and 25b which have returned to their initial position, so that it rotates in the reverse direction and closes the door. However, only a small portion of the series resistance W2 is switched out. Previously, the switch 39 had, after a definite distance of opening of the door, which can be adjusted by corresponding adjustment of the cam disc 28 on the shaft 26, been disconnected by this cam disc 28 which rotates with the shaft 26, so that the circuit, in which lie the push-button switch 4, the foot switch 5 or the photoelectric or electronic switching device, is broken, so that, in this stage of the operation, the starting relay 24 and, consequently, also the switching relay 25 will, in no circumstances, be energized through renewed operation of the push-button switch 4, the foot switch 5 or the photoelectric or electronic switching device and, consequently, cannot cause a disturbance owing to further opening of the door to beyond the desired extent. Quite at the beginning of the opening movement of the door, the switch 42 has been switched in by the cam disc 34 and, somewhat later, the switch 41 has been reversed by the cam disc 33. On the closing movement of the door, the shaft 26 rotates in the reversed direction, so that the cam discs 27, 28, 29, 33 and 34 also rotate in the reversed direction and return to their initial position and they now again, at the same opening angles of the door, at which they operated their switches during the opening of the door, operate these switches in the reversed direction. At the beginning of the closing of the door, the lever 44 is driven by the shaft 26 and thus returns the switch 47 to its initial position (Fig. 6). The effect of this is, with the ensuing return of the switch 40 into its initial position, that the supply of current remains interrupted, and the connection of a further portion of the regulatable series resistance W2, while the circuit of the electric motor 9 is now closed through the switches 41 and 42 and the switch 25c which has already returned to its initial position on the de-energization of the switching relay 25. The electric motor consequently runs more slowly and the closing movement of the door becomes correspondingly slower. When, on being closed, the door reaches the position into which, on being opened, the switch 41 was reversed, this switch 41 is again returned to its initial position by the cam disc 33. In this way, the series resistance W2 is entirely switched out, while the circuit of the electric motor 9 is closed directly through this switch 41 which is in the position shown in Fig. 6, the still closed switch 42 and the switch 25c, and the door closes with increased force. When, finally, on further closing, the door, immediately before reaching the position of closure, reaches the position in which, when being opened, the switch 42 was closed, this switch 42 is opened again by the cam disc 34, so that the circuit of the electric motor is broken. When the door has been closed, the shaft 26 and the cam discs 27, 28, 29, 33 and 34 will have again reached their initial position and the device is ready for a fresh operation.

It can be seen from the wiring diagram shown in Fig. 6 that the device can be operated not only by the push-button switch 4, the foot switch 5 or the photoelectric or electronic switching device, but also by a short opening movement carried out by hand. By means of such an opening movement of the door, the shaft 26 is rotated and thus takes the lever 44 with it. The lever 44 then reverses the switch 47, so that the switching relay 25 is energized. If, during its closing or opening movement, the door is stopped by hand and moved for a short distance in the direction of opening or closing, a reversal is likewise effected by means of the lever 44 and the switch 47 operated thereby.

When the push-button switch 4 or the foot switch 5 is fixed in the operated position, for example by a mechanical locking device not represented in the drawings, or when the electronic switching device remains in opera-

ation, the door opens as described but remains open since, after the pole reversal of the electric motor 9 which is effected by the de-energisation of the switching relay 25 and the reversal of the switch 40 into its initial position which takes place immediately after the commencement of the closing movement of the door, the circuit of the electric motor 9 is broken by the push-button switch 4 or the foot switch 5 or the photoelectric or electronic switching device.

The device for the automatic opening and shutting of a door shown in Figs. 7 to 9 is substantially like the embodiment hereinbefore described, but has a considerably simpler controlling means than the latter. The parts that are identical with the corresponding parts of the device represented in Figs. 3 to 5 are denoted in Figs. 7 to 9 with the same reference numerals and the foregoing description can be referred to with regard to these parts. In the case of the device shown in Figs. 7 to 9, the starting relay 24, the switching relay 25 and the series resistances W1 and W2 have been dispensed with. Instead of the five cam discs 27, 28, 29, 33 and 34, only two cam discs 60 and 61 are adjustably arranged on the shaft 26. The cam disc 60 operates a reversing switch 62 which starts the closing movement of the door, and the cam disc 61 operates a circuit-breaker 63 which puts the driving member out of operation after the door is closed. An adjustable resistance 64 renders it possible to adjust the speed of closing. The switching-in of this device is effected by means of the lever 44. For this purpose, a cushion of air or liquid 65 is arranged beneath this lever 44 which cushion communicates, through a pipe 66, with a pneumatic or hydraulic actuating device (not shown in the drawings) which is arranged at a suitable position on the door or its frame. By operating this actuating device, the cushion of air or liquid 65 is inflated and presses the lever 44 into such a position that it operates the reversing switch and thus sets the device into operation.

Instead of the adhesion roller 17, a toothed roller may be provided which engages with a toothed running rail.

The device described may be arranged at the bottom or the top of the door, or of the window and it may be constructed for opening and closing doors of any kind, for example revolving doors, sliding doors, swinging doors and the like, for example casement windows. In the case of revolving doors, in which the movement is always in the same direction, the device is advantageously constructed in such a manner that the rolling door performs half a revolution on every operation of the device. In the case of sliding doors, a toothed wheel, which engages with a stationary rack is provided instead of the parts 49—52.

The term "doors" used in the appended claims is to be understood as covering openable and closable members, for example, revolving doors, sliding doors, swinging doors and casement windows.

What I claim is:

1. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, means yieldably urging said roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, reduction gear means, said motor driving said roller through said reduction gear means, control circuit means including switching means for controlling said motor, actuating means for controlling said switching means to start said motor in the direction of rotation which corresponds to the opening of the closure member, and control means controlling said switching means and controlled by a limited manual movement of said closure

member controlling said motor in accordance with the required direction of movement of said closure member.

2. A device according to claim 1, comprising a shaft, a sleeve rotatable on said shaft, said roller being mounted on said sleeve, a rocking arm, said sleeve being mounted on said rocking arm, a spur-wheel gear for driving said shaft, a spring acting upon said rocking arm, and a friction clutch coupling said sleeve with said clutch.

3. A device according to claim 1, comprising a shaft, a sleeve rotatable on said shaft, said roller being adjustably mounted on said sleeve, a rocking arm, said sleeve being mounted on said rocking arm, a spur-wheel gear for driving said shaft, a spring acting upon said rocking arm, and a friction clutch coupling said sleeve with said clutch, the casing of said reduction gear means being fixed to said motor rotatably and fixably in relation to the axis of said motor so that said rocking arm can be brought back into a position in which said roller is adjusted corresponding to the direction of movement on the closing and opening of said closure member.

4. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means including switching means for controlling the motor disposed in said casing, actuating means controlling said switching means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled by a limited manual movement of said closure member and controlling said motor in accordance with the required direction of movement of said closure member, a gearing, said control means including a shaft driven by said gearing in dependence upon said manual movement of said closure member to operate said controlling means for the purpose aforesaid.

5. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, means yieldably urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling said motor disposed within the casing, actuating means for controlling said circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, a shaft, a gearing for driving said shaft in dependence upon a limited manual movement of said closure member, at least two cam discs adjustably mounted on said shaft, and switching means adapted to be operated by said cam discs and to control said motor in accordance with the required direction of movement of said closure member.

6. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, means yieldably urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor disposed within the casing, actuating means for controlling the circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled in dependence upon a

limited manual movement of said closure member and controlling said motor in accordance with the required direction of movement of said closure member, said control means including a gearing, a shaft driven by said gearing in dependence upon said manual movement of said closure member and actuating said control means, a lever mounted on said shaft, a friction clutch for coupling said lever with said shaft, and an electrical reversing switch operated by said lever, said lever being rockable between two limit positions.

7. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor disposed within the casing, actuating means for controlling the circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled in dependence upon a limited manual movement of said closure member and controlling said motor in accordance with the required direction of movement of said closure member, said control means including a gearing, and a shaft driven by said gearing in dependence upon said manual movement of said closure member and operating said control means, a bearing member adapted to be fixed to the closure member, an axle disposed parallel to the hinging axle of the closure member, a tubular arm mounted on said bearing member and rockably mounted on said first mentioned axle, a rod carried displaceably in said tubular arm, a shaft mounted in said casing, said rod having an end protruding from said tubular arm and connected with said secondly mentioned shaft, a third shaft coupled with said first mentioned shaft, and bevel wheels through which said secondly mentioned shaft drives said third shaft.

8. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member and, mounted in said casing, a reversible electric motor, a switching relay adapted to switch in and reverse said motor, and a starting relay adapted to control said switching relay, a roller which is adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging said roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor disposed in the casing, actuating means for controlling the circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled in dependence upon a limited manual movement of said closure member and controlling said motor in accordance with the required direction of movement of said closure member.

9. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging said roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor disposed in the casing, actuating means for controlling the circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled in dependence upon a limited manual movement of said closure member and

controlling said motor in accordance with the required direction of movement of said closure member, a gearing, a shaft driven by said gearing corresponding to said manual movement of said closure member and operating said control means, a lever mounted on said shaft, a friction clutch for coupling said lever with said shaft, an electrical reversing switch operated by said lever, said lever being pivotal between two limit positions, a switching relay adapted to connect and reverse said motor, a starting relay adapted to control said switching relay, a holding contact for said starting relay, said contact, when said actuating device is operated, maintaining said starting relay energized until said lever moves said reversing switch into a position in which the further supply of current to said switching relay is effected through said reversing switch.

10. A device for automatically closing and opening a closure member, comprising a casing adapted to be secured to the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor, at least one switch operable by the user of the closure member for controlling said circuit means to start said motor in the direction of rotation corresponding to the opening of the closure member, and control means operated by a limited manual movement of said closure member to control said motor in accordance with the required direction of movement of said closure member.

11. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, control circuit means for controlling the motor, at least one switch operable by the user of the closure member for controlling said circuit means to start said motor in the direction of rotation which corresponds to the opening of the closure member, control means controlled by an initial manual movement of said closure member controlling said motor in accordance with the required direction of movement of said closure member, said control means including a gearing and a shaft driven by said gearing in response to said initial movement of said closure member to operate said control means.

12. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, an electrical actuating device and, for operating said actuating device, a single-pole reversing switch and a fixing device for said reversing switch, and, in said casing, a control circuit means for the motor controllable by said actuating device, for starting said motor in the direction of rotation which corresponds to the opening of the closure member, and control means controllable in dependence upon an initial manual movement of said closure member to control said motor in accordance with the required direction of movement of said closure member.

13. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed

on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, an electrical actuating device and, for operating said actuating device, a single-pole reversing switch and a fixing device for said reversing switch, and, in said casing, a control circuit means for the motor controllable by said actuating device, for starting said motor in the direction of rotation which corresponds to the opening of the closure member, and control means operable in dependence upon an initial manual movement of said closure member to control said motor in accordance with the required direction of movement of said closure member, said control means including a gearing, and a shaft driven by said gearing in dependence upon said initial movement of said closure member to operate said control means.

14. A device for automatically closing and opening a closure member, comprising a casing adapted to be fixed on the closure member, a reversible electric motor mounted in said casing, a roller adapted to engage a floor surface to effect the movement of said closure member, yieldable means urging the roller into engagement with

said surface, lifting means for lifting said roller from its position of engagement with said surface, a reduction gear, said motor driving said roller through said reduction gear, an actuating device, and, in said casing, control circuit means for the motor controllable by said actuating device, for starting said motor in the direction of rotation which corresponds to the opening of the closure member, and control means operable in dependence upon an initial manual movement of said closure member to control said motor in accordance with the required direction of movement of said closure member, said control means including a gearing, a shaft driven by said gearing in dependence upon said initial movement of said closure member to operate said control means, a lever mounted on said shaft, a friction clutch for coupling said lever with said shaft, and an electrical reversing switch operable by said lever, said lever being rockable between two limit positions and said actuating device coacting with said lever to rock the same for actuating the said switch.

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