

K. W. KURTZ.

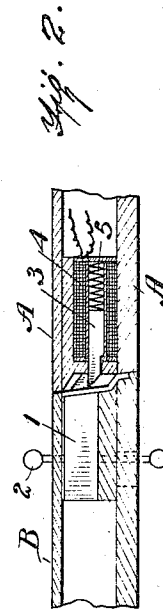
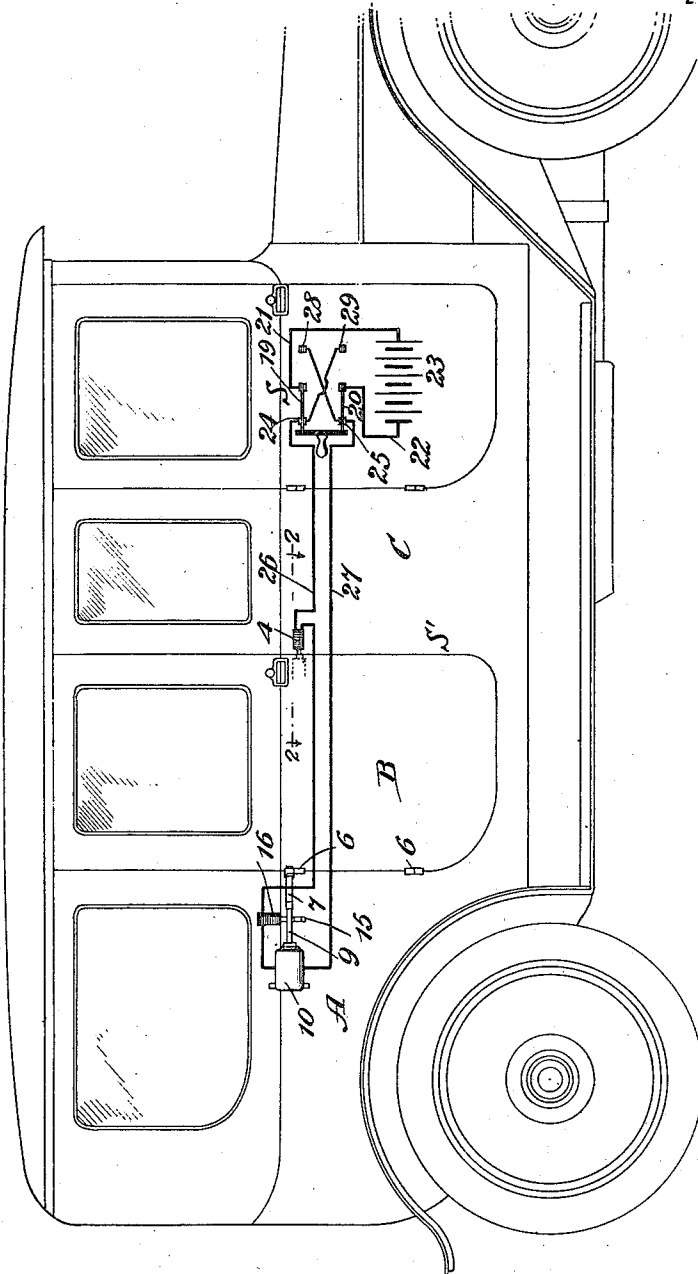
ELECTRIC DOOR UNLOCKING AND OPENING AND CLOSING MEANS FOR AUTOMOBILES.

APPLICATION FILED MAY 5, 1914.

1,151,479.

Patented Aug. 24, 1915.

2 SHEETS—SHEET 1.



WITNESSES

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Fig. 1.

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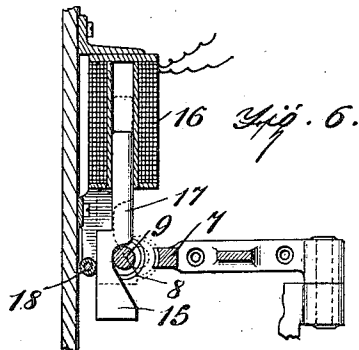
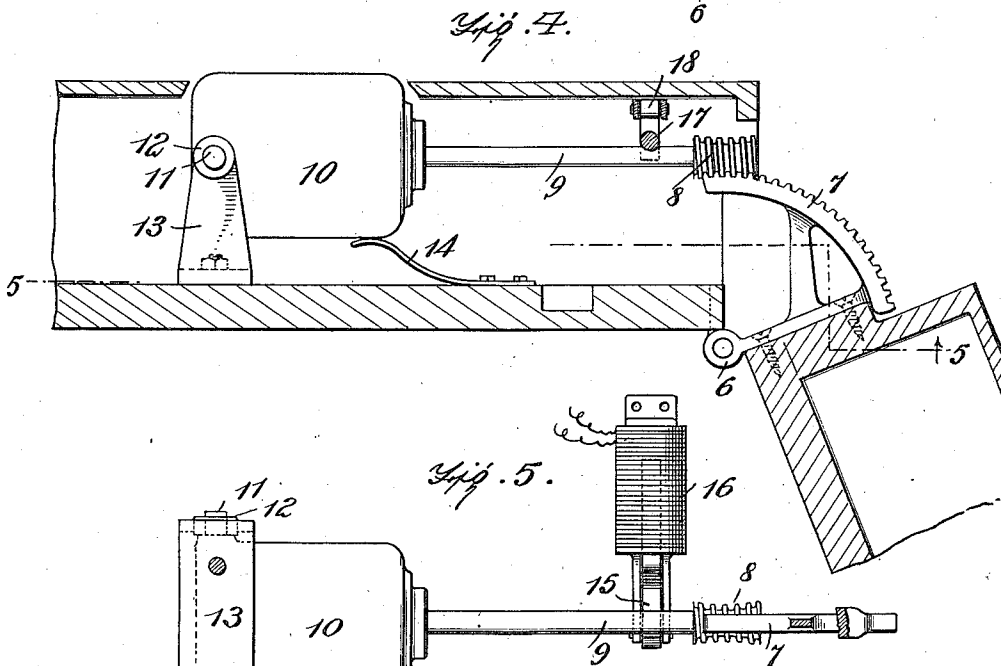
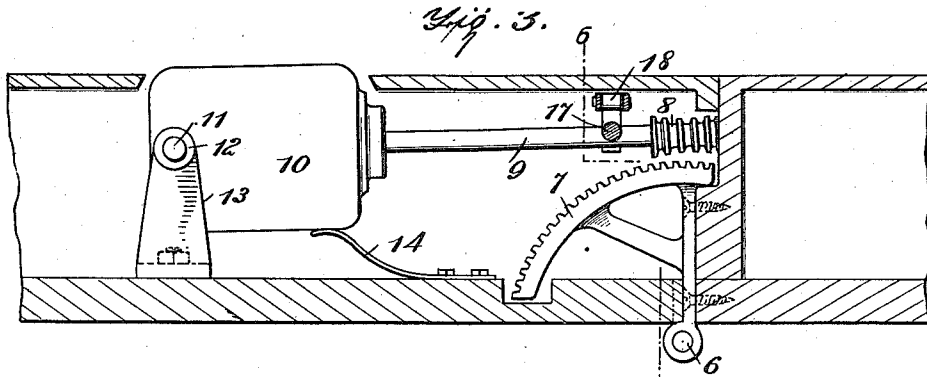
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WITNESSES

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ELECTRIC DOOR UNLOCKING AND OPENING AND CLOSING MEANS FOR AUTOMOBILES.

1,151,479.

Specification of Letters Patent.

Patented Aug. 24, 1915.

Application filed May 5, 1914. Serial No. 836,456.

To all whom it may concern:

Be it known that I, KARL W. KURTZ, a citizen of the United States, and a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and Improved Electric Door Unlocking and Opening and Closing Means for Automobiles, of which the following is a full, clear, and exact description.

This invention relates to door opening and closing means especially adapted for automobiles or other vehicles, whereby the driver can, by the mere closing of a circuit switch, cause the door or doors to be opened or closed without the necessity of the driver leaving his seat.

The invention has for its general objects to improve and simplify the construction and operation of door actuating means of the character referred to so as to be reliable and efficient in use, comparatively simple and inexpensive to manufacture and install and easily controlled.

Another object of the invention is the provision of a door-operating means of the electrical type, in combination with an electrically released latch or lock whereby the door is first unlocked before the operating means is brought into play.

Still another object of the invention is the employment of an electric motor operating through a worm gearing to open and close the gate, the worm of the gearing being normally disengaged from the worm segment or gear so that the door can be opened manually if desired, there being electrically operated means for throwing the worm into gear with the segment at the beginning of the operation of the motor.

With such objects in view, and others which will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts which will be set forth with particularity in the following description and claims appended hereto.

In the accompanying drawings, which illustrate certain embodiments of the invention and wherein similar characters of reference indicate corresponding parts in all the views, Figure 1 is a side view of an automobile showing diagrammatically the electric door unlocking and operating means applied thereto; Fig. 2 is an enlarged sectional view on the line 2—2, Fig. 1 of the combined manually and electrically operated latch;

Fig. 3 is a horizontal section through a portion of the car body adjacent the door and showing the operating means in normal position, as when the door is closed; Fig. 4 is a similar view showing the door in the act of opening; Fig. 5 is a sectional view on the line 5—5, Fig. 4; Fig. 6 is a detail sectional view on the line 6—6, Fig. 3.

Referring to the drawing, A designates an automobile, the body of which is shown with an electrically operated door B. This door, as shown in Fig. 2, is provided with a latch 1 which can be manually operated by a knob or handle 2 to disengage the catch 3 mounted in the body A of the automobile. This catch 3 is the core of a solenoid 4 which, when energized, will retract the catch from engagement with the latch so that the door can be electrically opened by the motor mechanism. When the solenoid is deenergized, a spring 5 will act on the core 4 so as to project the same to latch-engaging position, as shown in Fig. 2.

The door B is mounted to swing on hinges 6 and one of the hinges is provided with a worm segmental gear 7, although this gear may be fastened to any other suitable part of the door. Arranged to mesh with this gear 7 is a worm 8 mounted on the rotary shaft 9 of an electric motor 10. By rotation of the shaft in one direction or the other the door can be opened or closed. Normally the worm is disengaged from the gear 7 so that the door can be manually opened and closed. A simple method whereby the worm can be engaged or disengaged with the gear consists in pivotally mounting the motor 10 on a vertical axis so as to swing, and for this purpose the motor is provided with pivots 11 which engage in bearings 12 of a bracket 13, and pressing on the motor is a spring 14 or equivalent means whereby the worm will be held normally in the position shown in Fig. 3 to permit the door to be opened and closed independently of the door-operating means. To render the worm gear 8 effective a device is employed for throwing such worm into engagement with the gear 7. This device comprises a cam 15 which engages the shaft 9 and moves the same laterally, and to operate this cam a solenoid 16 is employed, the core 17 of which carries the cam 15. This cam 15 runs on a roller or other anti-friction device 18, and when the core 17 is drawn upwardly the cam 15 comes into play and swings the motor 10

on its pivots 11 in a direction to engage the worm with the gear 7. When the solenoid is deenergized the core drops and the spring 14 throws open the gearing or restores the motor to the position shown in Fig. 3 from that shown in Fig. 4.

The door locking and operating means is controlled from the driver's seat so that it will be unnecessary to leave the car to open or close the doors. Within convenient reach of the driver is a suitable switch or circuit closer S that is capable of changing the direction of the flow of current through the motor 10. The pole-changing switch S comprises blades 19 and 20 which have their pivot posts connected by wires 21 and 22 with the source of current 23. The contacts 24 and 25 for the blades 19 and 20 respectively are connected by wires 26 and 27 with the motor 10, and the solenoids 4 and 16 may be included in either one of these wires. The switch includes contacts 28 and 29 which are cross-connected with the contacts 25 and 24 respectively, so that when the blades are in engagement with the contacts 24 and 25 the flow of current through the circuit will be in such direction as to rotate the motor for opening the door, and when the switch blades are in engagement with the contacts 28 and 29 the flow of current will be in a direction to cause the motor to close the door.

It will be obvious that the latch solenoid 4 will release the latch 3 while the solenoid 16 is throwing the worm of the motor shaft into engagement with the gear segment 7. Normally the switch blades are in open circuit position and the switch will be manipulated only when the doors are to be opened and closed.

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

1. The combination of a door, a toothed gear element connected with the door, another gear element normally disengaged from the first, electrical operating means for actuating the last-mentioned element to open and close the door, electrically actuated means for moving the second element into

engagement with the first, and a circuit including both of the said electrical means and controlled by the operator for opening and closing the door.

2. The combination of a door, a gear connected therewith, a swinging motor having a shaft extending therefrom at right-angles to the axis on which the motor swings, a gear element on the outer end of the shaft and movable into and out of engagement with the first-mentioned gear element, a circuit for the motor, means in the motor circuit for moving the motor to engage the gear elements, and a switch for controlling the motor circuit.

3. The combination of a door, a gearing for opening and closing the door, a movably mounted electric motor on the shaft of which one of the gear elements of the gearing is mounted, means for moving the motor in a direction to disengage the elements of the gear, whereby the door can be opened and closed independently of the gearing, a circuit for the motor, a switch for controlling the circuit to reverse the flow of current therethrough, and means operating independently of the rotation of the motor shaft for moving the motor in a direction to engage the elements of the gear.

4. The combination of a door, a gearing for opening and closing the door, a movably mounted electric motor on the shaft of which one of the gear elements of the gearing is mounted, means for moving the motor in a direction to disengage the elements of the gear, whereby the door can be opened and closed independently of the gearing, a circuit for the motor, a switch for controlling the circuit to reverse the flow of current therethrough, a cam device for moving the motor for engaging the elements of the gearing, and electrical means in the circuit for the motor for actuating the cam device.

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

KARL WM. KURTZ.

Witnesses:

WM. F. WIDMAYER,
AUGUST GUMMLER.