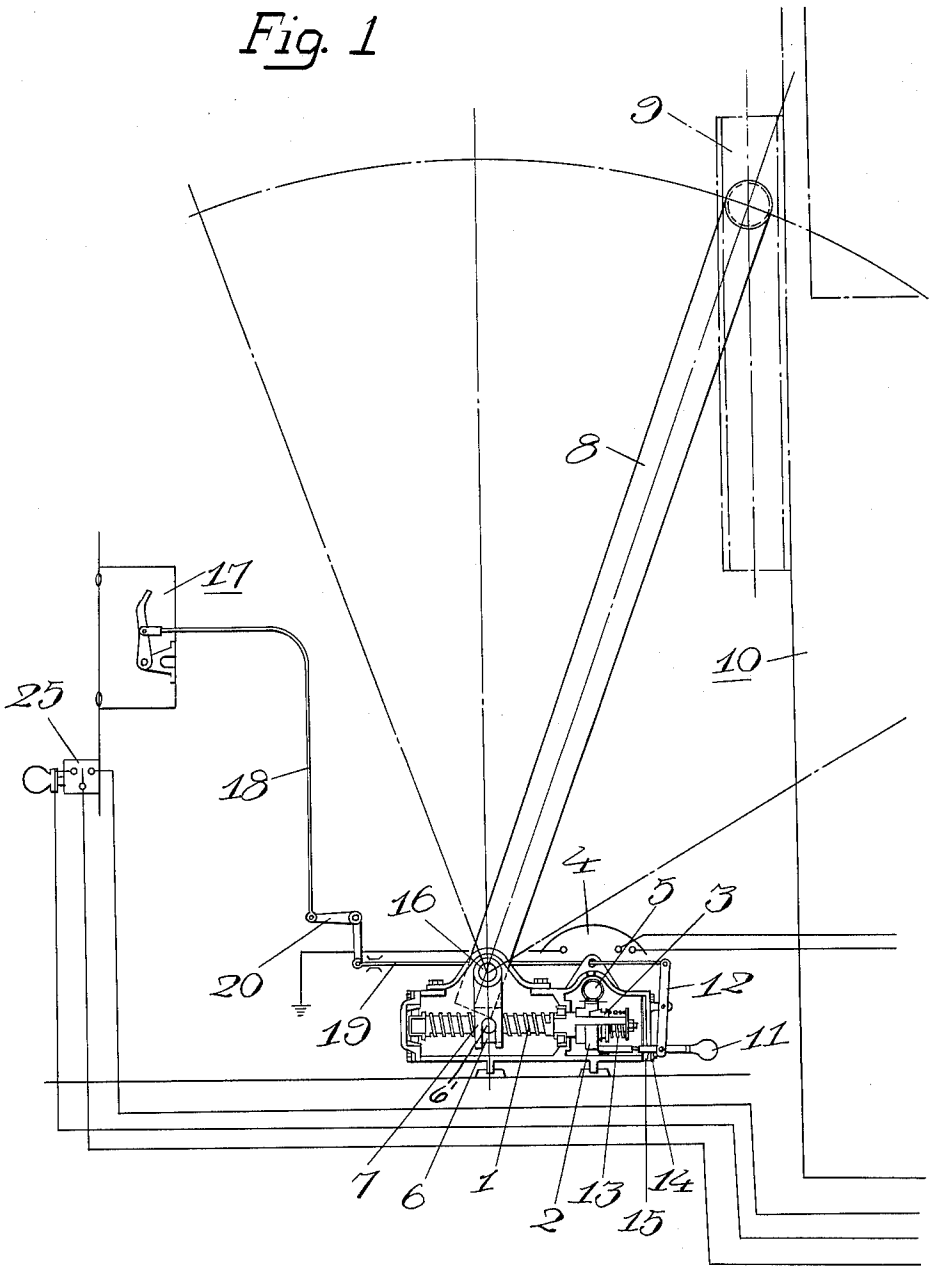
July 26, 1966 MITSUO MIURA 3,262,514

AUTOMATIC DOOR SWITCH DEVICE FOR A VEHICLE, A BUILDING OR THE LIKE

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Fig. 1



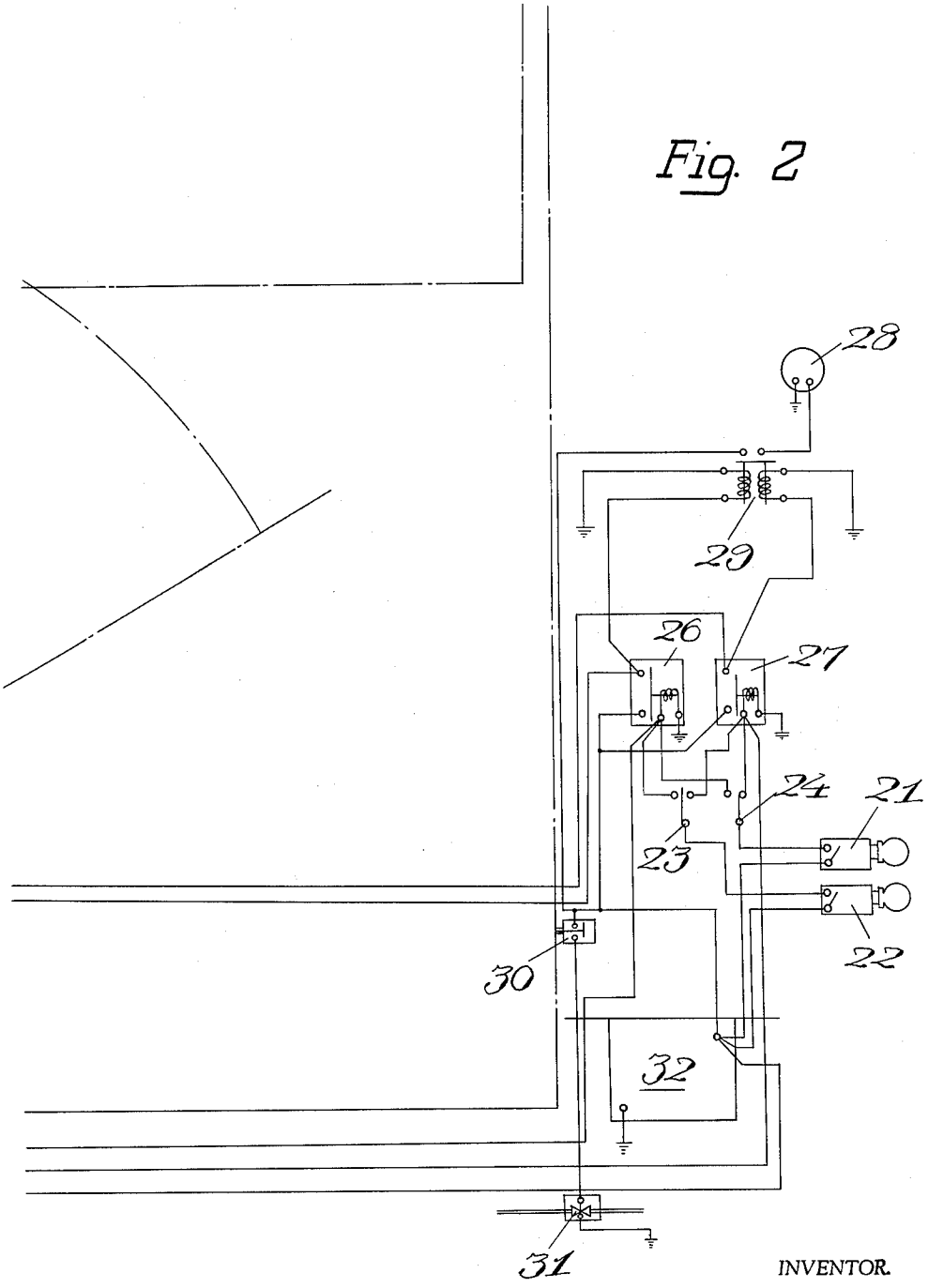
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Fig. 2



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3,262,514

AUTOMATIC DOOR SWITCH DEVICE FOR A VEHICLE, A BUILDING OR THE LIKE

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6 Claims. (Cl. 180—82)

The present invention relates to an automatic door switch device for a vehicle, a building or the like.

The principal object of the present invention is to provide an automatic door switch, electrically operated, easily handled, reliable and low in cost, of the type which comprises an automatic door switch mechanism, an alarm mechanism, a manual door change and switch mechanism, a start check mechanism and a transmitting mechanism.

It is usual for an automatic door device to be operated by the action of compressed air used as the power source.

However, this has brought forth two faults; the installation of the device is costly, the limitation on the position where it is fixed or employed is limited, and the operational difficulty of the device by freezing in the cold northern districts is not unusual.

Taking consideration of the faults on the conventional automatic door device, as above said, the present invention is to a uniquely developed and most reliable automatic door switch device.

The present invention will be hereafter described in detail with reference to an embodiment illustrated in the accompanying drawings in which;

FIG. 1 is an illustration showing one portion of the main mechanism of the present automatic door switch device, and FIG. 2 is an illustration of another portion of the main mechanism.

Used as the driving source for the opening or the closing of the door, is an electromotor **4**, a series motor possessed of large electrotorque.

A worm **5** is fixed to the rotary shaft of said electromotor **4**, which is engaged with a worm wheel **2**. The worm wheel **2** is also connected with a worm screw shaft **1** through a clutch **3**, which is of a well known construction having cooperating conical faces on the driving and driven elements. A worm nut **6** is screwed to engage with the worm screw shaft **1**, which makes a straight movement in accordance with the rotation of the latter shaft **1**. Projected from said worm nut **6** is a pin **6'** which is engaged with one end of a forked lever **7**. The other side of the forked lever **7** is freely movable, and connected to a shaft **16**, to which is connected one end of an arm **8**. Also the other end of the arm **8** is connected to a door **10** through a guide plate **9**. Said clutch **3** is connected with a rod **11** through a spring **13**, a locking spring **14**, and locking ball **15**.

Further, the rod **11** is connected with an emergency lever **17** through a lever **12**, a release wire **19**, a lever **20** and a release wire **18**.

The input terminal of said electromotor **4** is connected to the power source through a keyed switch **21**, a control switch **24** and a relay **26** or **27**, or another keyed main switch **22**, a control switch **23** and the relay **26** or **27**, and further through still another main switch **25** and the relay **26** or **27**. By the use of the forward and reverse relays **26** or **27**, the electromotor **4** is rotated clockwise and counterclockwise.

A warning relay **29** is connected with the contact points of the relays **26** and **27**, through which an alarm **28** is being connected to the power source **32**. Also connected to the power source **32** in series with electromagnetic fuel throttle valve **31**, is a switch **30** which is operated in accordance with the opening or the closing of the door.

Now, for instance, supposing said main switch **21** is keyed to close the contact point thereof, and then said control switch **24** is operated, said relay **26** or **27** is energized to close the contact point to connect the power source **32** with the electromotor **4**.

As a result, the electromotor is rotated to rotate the worm **5** and the worm wheel **2** engaged with the former. The rotation is further transmitted to said worm screw shaft **1** through said clutch **3**, which gives linear movement to said worm nut **6**, as it is screwed with the screw shaft **1**.

Further, the movement of the worm nut **6** causes the rotation of said lever **7** on shaft **16**, and thus causes said arm **8** to pivot on the shaft **16**. Through these steps, the door is opened or closed through said guide plate **9**.

The switches **21** and **22** together with the control switches **23** and **24** power the relays **26** and **27**.

The number of said keyed main switches herein employed, may be suitably increased or decreased as occasion demands.

As said switches **26** and **27** are closed at their contact points, the warning relay **29** is powered to close its contact point by which the alarm **28** is connected to the power source, sounding necessary alarm.

The alarm is arranged to fulfil its duty during the opening or closing operation of the door. In an emergency, said emergency lever **17** is pulled, to operate rod **11**, through said release wire **18**, lever **20**, release wire **19** and lever **12** in that order. Then, the rod **11** is pulled against said spring **13**, which releases the clutch **3**, further disconnecting said worm wheel **2** from said worm screw shaft **1**.

Through these steps, the opening or the closing of the door becomes ready for any manual operation.

The clutch **3** may be released by only giving a direct pull to the rod **11**.

Further, when applied to a vehicle, the present door switch device operates during the opening or closing operation of the door to operate switch **30** which operates electromagnetic fuel throttle valve **31** in series relation with the switch **30**.

Valve **31** checks the flow of fuel, which is fed to the engine, during the opening of the door thus preventing the vehicle from starting carelessly or accidentally.

What is claimed:

1. A door operator comprising a motor and means for rotating said motor in forward and reverse directions, gearing connected to a door and the motor for moving said door in opening and closing directions, a clutch in said gearing, and manual means at a point remote from the door for operating the clutch to engage and disengage the motor drive from the door.

2. A device as defined in claim **1** wherein the means for rotating the motor comprises forward and reverse relays, and a plurality of switches for selectively energizing the relays.

3. A device as defined in claim **2** wherein the manual means comprises a lever adjacent one of the switches and linkage means connecting the lever with the clutch.

4. A device as defined in claim **2** further including an alarm and relay means operable by said forward and reverse relays for energizing the alarm.

5. A device as defined in claim **1** further including a fuel conduit, an electromagnetic valve in said conduit, and switch means operable by said door to energize and deenergize said valve for controlling the flow of fuel through the conduit.

6. A device as defined in claim **1** wherein said gearing comprises a worm screw shaft connected to the motor, a worm nut threadedly mounted on the screw shaft, a lever pivotally connected to the nut and fixedly secured

to a pivot shaft, and an arm fixedly secured to said pivot shaft and slidably connected to the door.

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