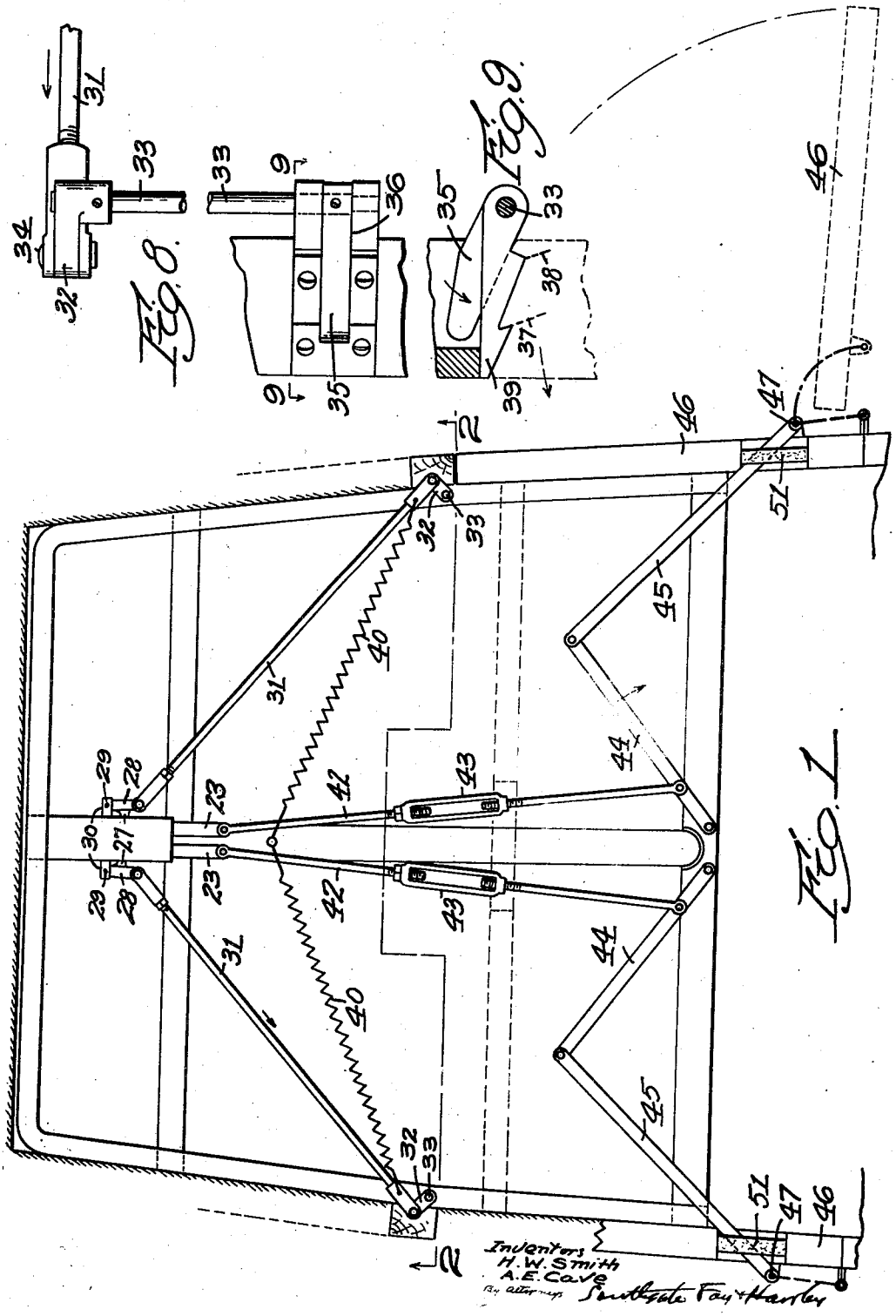
Oct. 29, 1940. H. W. SMITH ET AL 2,219,340

VEHICLE DOOR CONTROL

Filed Sept. 27, 1935 3 Sheets-Sheet 1



Oct. 29, 1940. H. W. SMITH ET AL 2,219,340

VEHICLE DOOR CONTROL

Filed Sept. 27, 1935 3 Sheets-Sheet 2

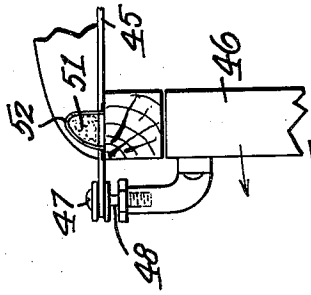


Fig. 10.

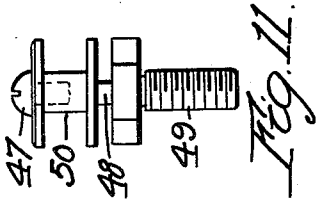


Fig. 11.

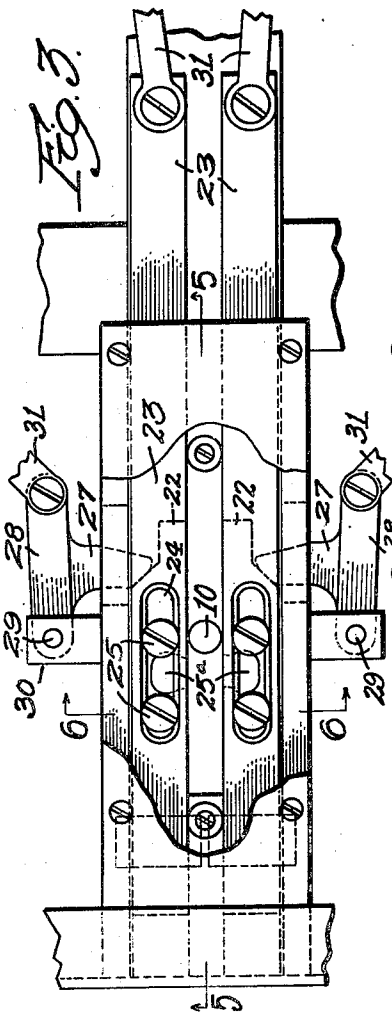
Fig. 2.

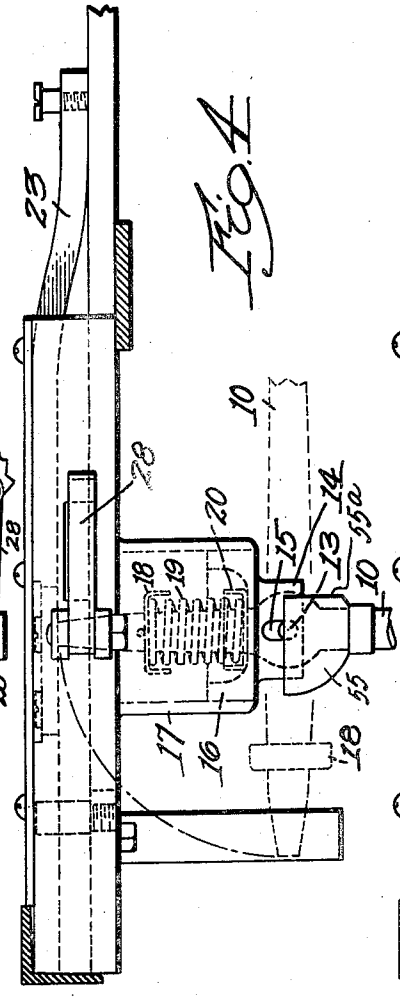
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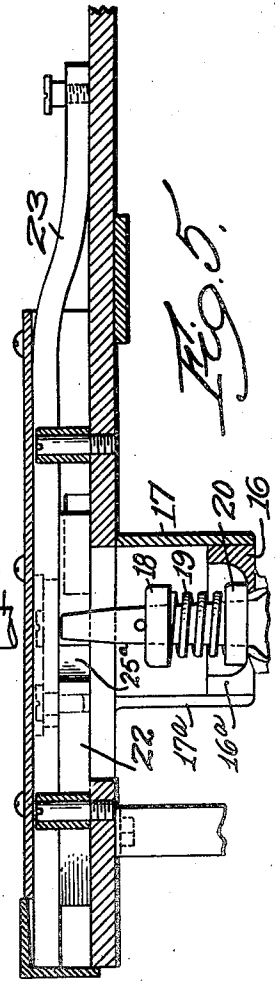
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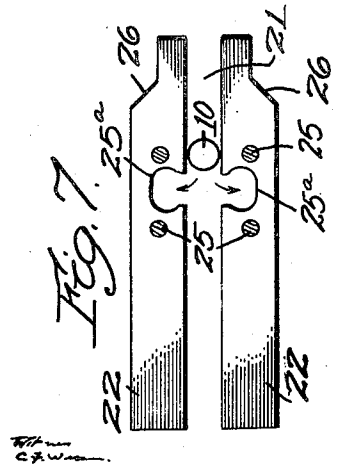
VEHICLE DOOR CONTROL

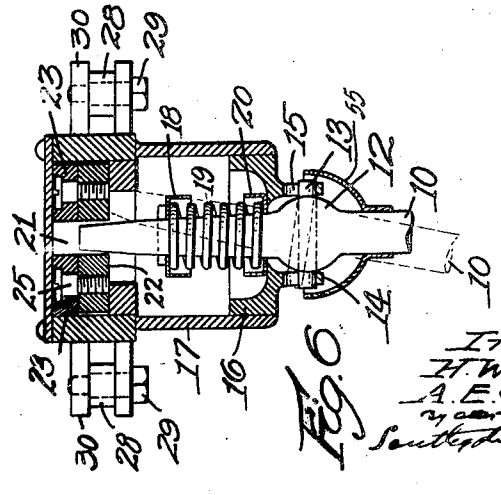
Filed Sept. 27, 1935 3 Sheets-Sheet 3











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UNITED STATES PATENT OFFICE

2,219,340

VEHICLE DOOR CONTROL

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Application September 27, 1935, Serial No. 42,384

8 Claims. (Cl. 268—3)

This invention relates to a door controlling device for vehicles, particularly adapted for controlling the rear doors of taxicabs but capable of general use.

The principal objects of the invention are to provide means located at the top of the vehicle where they are practically entirely out of sight for manipulating a lever in different directions to unlatch and open or close either of the two rear doors at will; to provide a construction by which the driver can so manipulate the doors without leaving his seat, and to provide a construction in which the doors can be opened or closed without slamming.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a plan of the roof of a taxicab provided with a preferred embodiment of this invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1 looking forward;

Fig. 3 is a plan of a portion of the parts shown at the extreme front of the vehicle in Fig. 1 but with the covering parts removed and shown on a larger scale;

Fig. 4 is a side view of the same;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a transverse sectional view on the line 6—6 of Fig. 3;

Fig. 7 is another plan of parts shown in Fig. 3 but with the covering parts removed to show the path of the top of the operating lever;

Fig. 8 is a view similar to the left hand part of Fig. 2 on enlarged scale;

Fig. 9 is a sectional view on the line 9—9 of Fig. 8 showing the latch construction in plan;

Fig. 10 is a top view of part of the car door in closed position showing the connection of the means for operating it, and

Fig. 11 is an enlarged elevation of the connecting parts shown in Fig. 10.

The operating mechanism for unlatching and opening the door as well as closing it is operated by a lever 10 having a handle 11 located at about the center of the car and in the front where it is convenient for the chauffeur to reach up and manipulate it. This lever 10 is provided with a spherical enlargement 12 through which passes a horizontal pivot pin 13 supported in a pair of lugs 14 which are provided with vertical slots 15 for holding this pin. This pin can be tilted in its slots in either direction as indicated in dotted lines in Fig. 6. The lever is provided with a collar 18 fixed to it by a pin and spring 19 below it, which rests on a collar 20 carried by a cup 16 which constitutes the bottom of a casing 17 in which some of these parts are located. As appears better from Figures 4, 5 and 6, the spring 19 presses the collar 20 against the upper face of the cup 16, and thus yieldingly tends to hold the lever 10 in vertical position, while permitting tilting of the lever about the axis of the pivot pin 13 as well as also about an axis transverse thereto, due to the above-described relation between the pin 13 and the slots 15, one direction of this latter tilting being shown in dotted lines in Figure 6. The arrangement however, is also such that the lever 10 may be swung, about the axis of the pin 13, throughout substantially 90° and hence from the full-line position shown in Figure 4 to the dotted-line position shown in that figure. The lever projects upwardly past its pivot and has an operating end which enters a space 21 between two slides 22. The slides 22 are provided each with two screws 25 extending through a slot 24 in a slide 23 to cause the motion of the slide 23 after the slide 22 has moved a short distance.

In the first place it will be obvious that by swinging the lever first backwardly from the position shown in Fig. 7 to a position in registration with two notches 25a in the two slides 22 and then swinging it either to the right or left, the end of the lever will be brought into one of these notches. Then the lever can be swung forward from the position shown in Fig. 3. The first effect of this is to cause a cam 26 on the slide to engage a projection 27 on a pivoted lever 28 and force that lever outwardly about its pivot 29. This action can take place on either side, one side for opening one door and the other for opening the other. The pivot 29 is on a projection 30 carried by the casing 17. The motion of this lever 28 will move an adjustable rod 31 which will turn a link 32 fixed on a vertical pivot rod 33. The link 32 is pivoted to the rod 31 by a pivot 34 which is free to move. The pivot rod 33 extends downwardly and has on its bottom a cam 35. This cam, therefore, is operated in the direction of the arrow in Fig. 9 and, moving through a slot 36 in a striker 39, it engages the spring pressed tongue 37 on the door which catches the door to the fixed striker 39. The striker 39 has a safety catch or tooth and a tight catch to receive the tongue. The action, therefore, is to move the tongue 37 beyond these teeth and unlock the door and then unlatch it

by a single motion of the operating lever 10. Springs 40 tend to hold the two rods 31 in the position shown in Fig. 1 and return them to that position. When not in use the operating lever can be swung up parallel with the car roof, as shown in dotted lines in Fig. 4.

Accordingly, referring to Figure 4, the swinging of the lever 10 into the dotted-line position moves the extreme operating end thereof downwardly and out from in between the two spaced slides 22, while the collar 18, spring 19, and collar 20 are moved out of the casing 17—16, along respective arcs in counterclockwise direction, as viewed in Figure 4, and with the pin 13 as an axis; for these purposes the casing part 17 has a vertical slot 17a, as is better shown in Figure 5, and the bottom-forming cup 16 also has a slot 16a, both slots positioned to the left of the vertical plane through the axis pin 13 to permit the collar 18 and related parts that extend about the upper end of the lever 10 to pass out of the casing, while a hollow, half-spherical shell 55 (Figures 2 and 6) suitably secured to the lever, as shown in Figures 6 and 4, has a portion thereof cut away as at 55a (see Figures 4 and 2) so that it will not collide with the casing structure 16—17 when the lever 10 is swung into the dotted-line horizontal position of Figure 4. In this latter position, the collar 20, carried out of the cup-shaped bottom 16 with the movement of the lever 10, is now no longer pressed by the spring 19 against the upper face of the cup 16 but is brought into position to bear against the left-hand vertical edges of the lugs 14, as seen in Figure 4, thus yieldingly holding the lever 10 in horizontal position. While the collar 18 is fixed to the lever as by a pin, collar 20 is loosely mounted on the lever, the spring 19 being between the two collars and the spring, as a result, pressing the loosely mounted collar 20 against whatever surface or surfaces it is brought into contact with according to whether the lever is in full-line position, as in Figures 4, 5 and 6, whence the collar is pressed by the spring to rest on the cup 16, or is swung into the dotted-line position of Figure 4 to bring the loosely mounted collar 20 out through the slot 16a and to press it against the left-hand vertical edges of the lugs 14.

The slides 22 are, as stated, mounted to move on two other slides 23 and when the screws 25 are moved far enough they will transmit to the slides 23 their own sliding motion. This occurs after the door is unlatched. Now the further motion of one of either of these slides 23 operates to move a rod 42 having a turn buckle 43, or other adjustment means, and therefore swings a lever 44 in the direction of the arrow in Fig. 1. This lever, of course, is located in the roof of the car and ordinarily concealed like most of the mechanism described above. The lever 44 is pivotally connected with a link 45 which is pivoted to the door 46 at a point 47. The complete operation of the lever 10 will first unlatch and then open the door, as indicated in dotted lines in Fig. 1.

The connection of the pivot member 47 with the link 45 is made through a breaking pin 48 mounted on a screw 49 and entering a spool 50 which receives the pivot 47 passing through the link 45. Therefore, if the door is pushed accidentally the break will occur at the point 48 and can be repaired easily. Also a soft sponge rubber cushion 51 is shown mounted on the frame of the car in a casing 52 in the roof. This link 45 passes through an opening in the cushion which cushions it and also keeps the rain out.

It will be seen, therefore, that the parts are located above the passengers and in the roof where they are concealed by the usual lining in the roof. Also the driver has full control of both doors by one handle located conveniently within his reach and he can open the doors individually, first unlatching them, and close them gently but firmly without slamming them. This relieves him of the necessity of reaching through the window and opening the door if the space there is free and also relieves him of getting out and walking around the car to open the door. The passangers are released instantaneously which is a feature of importance in a crowded city. The construction is simple and comparatively inexpensive.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:

1. In a door operating device for a vehicle, the combination of a handle pivoted near the roof of the car and depending therefrom, said handle being capable of turning about a longitudinal and transverse horizontal axis, a slide on each side of the handle, means whereby the handle is adapted to move either slide, said slides having cam surfaces, a lever having a part engaging the cam surface of one slide, whereby the motion of the slide will turn the lever on its axis, a vertical rod connected with said lever to be turned by it when the lever is operated by the cam, and an arm on the rod located in position to engage a door latch and throw it out of operative position.

2. In a door opening device for a vehicle, the combination of a slide, means for moving said slide, said slide having a cam and connections between the latter and said door for unlatching the door and also having a pair of screws mounted thereon, a second slide having a slot for receiving said screws longer than the distance between them, whereby, after the slide is moved a predetermined distance, the second slide will be moved by one of the screws, and means connected with the second slide for opening the door.

3. A door and latch operating device for a vehicle body having a roof structure, a front operator's seat, and two doors to the rear of the latter, each of said doors having latch means and the vehicle body having keeper means with which said latch means respectively coact, said device comprising a frame structure underneath said roof structure having related to it operating mechanism comprising two slides and which, with said frame, are of relatively small vertical dimension, two vertical rods having means respectively related to said keepers and adapted upon actuation to disengage the latch bolt therefrom, means including cam means and lever means forming operative connections between said rods and the said slides of said operating mechanism, operating connections including lost-motion means, respectively, between said doors and said slides of said frame adapted upon actuation thereof to move the door to which it is connected, a lever depending from said frame at the forward portion of the latter and within reach of the operator in said seat, said lever being capable of turning about longitudinal and transverse horizontal axes, and selective operating connections between said lever and said slides effective in accordance with the direction in which said lever is tilted about said longitudinal, whereby said lever may be made selectively to actuate

either of said slides to effect actuation, through said cam means and lever means of the corresponding latch-disengaging means and then after said lost-motion means has acted, to effect actuation of the corresponding door-moving operating connections, respectively to first unlatch and then open the door corresponding to the selected slide, in response to turning said lever about said transverse axis.

4. A construction as claimed in claim 3 in which said operating connections include means capable of giving way when said operating connections are stressed beyond a certain limit thereby to prevent breakage of said operating mechanism under abnormal conditions of operation.

5. A construction as claimed in claim 3 in which said selective operating connections between said lever and said slides include also a disconnectable connection between said selectively operable slides and said lever, whereby said lever may be disengaged therefrom and is made free to be swung about one of said axes and into a substantially horizontal position under and substantially parallel to said roof structure, and releasable means for holding said lever in horizontal position.

6. A door opening device for a vehicle having a door and a latch bolt and keeper therefor and means for releasing said bolt from said keeper, comprising a guideway having a slide member slidably guided therein, said slide member having operating connections with said latch bolt releasing means whereby the latter is actuated in one direction in response to a moving stroke of said slide member in one direction along said guideway and is actuated in the reversed direction when said slide member is given a retrograde stroke of movement along said guideway, and operating connections between said slide member and said door for moving the latter, said operating connections including means forming a lost-motion connection whereby said door-moving operating connections actuate the door only after a certain portion of either stroke of said slide member along its guideway has been completed, said striker having two catches, a safety catch and a locking catch with either of which the latch bolt on the door may engage, said bolt-releasing mechanism comprising a member having a range of actuation to include the regions of both of said catches for thereby disengaging the bolt from either of said catches during door-opening operation of the mechanism and for permitting the bolt to engage either of said catches during door-closing operation.

7. A door and latch operating device for a vehicle having two doors, each having a latch bolt and keeper therefor, comprising a handle pivoted near the roof of the vehicle and depending therefrom, said handle having an operating end and being capable of turning about a longitudinal and transverse horizontal axis, two slides, means comprising a guideway slidably mounting said two slides in operative relation to said operating end, said slides having spaced means with either of which said operating end of said handle is engageable, according to the direction of tilting of said handle about one of said axes and thereby to permit the operating end of the handle to move the corresponding slide upon turning of the handle about the other of said axes, each latch bolt and keeper having means for releasing the bolt from the keeper and each bolt-releasing means having a vertical rod which, upon turning about its axis, actuates said releasing means, means including lever means, one for each bolt-releasing means, forming operating connections respectively between said vertical rods and said two slides for effecting turning movement of either of said rods according to which of said slides is engaged, and during an initial portion of its stroke, by said handle-operating end, and operating connections respectively between said slides and said two doors, each including a lost-motion connection, for communicating movement of the engaged slide to the corresponding door only after said initial portion of the stroke of the selected slide has been traversed.

8. A door and latch operating device for a vehicle having two side doors, each having a latch bolt, comprising a handle having means pivoting it near the roof of the car and in depending relation for turning about longitudinal and transverse horizontal axes, two slide bars respectively allocated to said two doors, means whereby the handle, according to the direction in which it is tilted about one of said axes and then turned about the other of said axes, is adapted to move either slide bar, said slide bars having cam surfaces, two vertical rods, one for each of said two doors, and each having an arm located in position to engage a latch bolt and, upon turning of its rod, to throw the latch bolt out of operative position, two lever means, each including a lost-motion connection, operatively connecting said two slide bars and said two doors, respectively, whereby motion of either slide bar, in response to turning of said handle, moves its allocated door in opening direction but only after the time interval interposed by said lost-motion connection, and two lever means respectively connected to said vertical rods and respectively engaging the cam surfaces on said slide bars, whereby the motion of the slide bar resulting from turning of said handle effects turning of its corresponding vertical rod to throw the latch bolt out of operative position during said time interval.

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