

June 9, 1959

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2,890,299

SELECTOR AND INDICATOR DEVICE

Original Filed Dec. 3, 1956

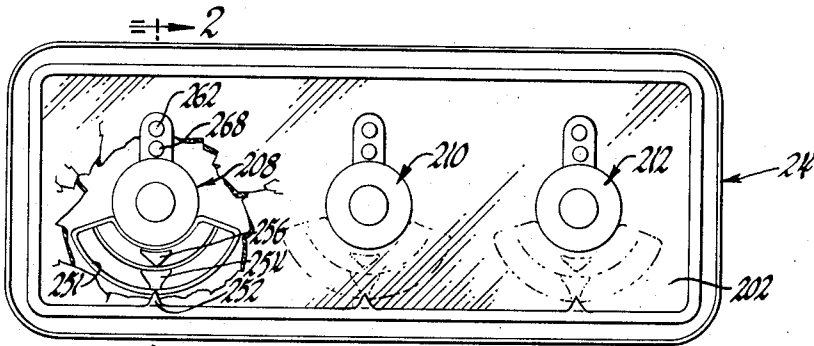


Fig. 1

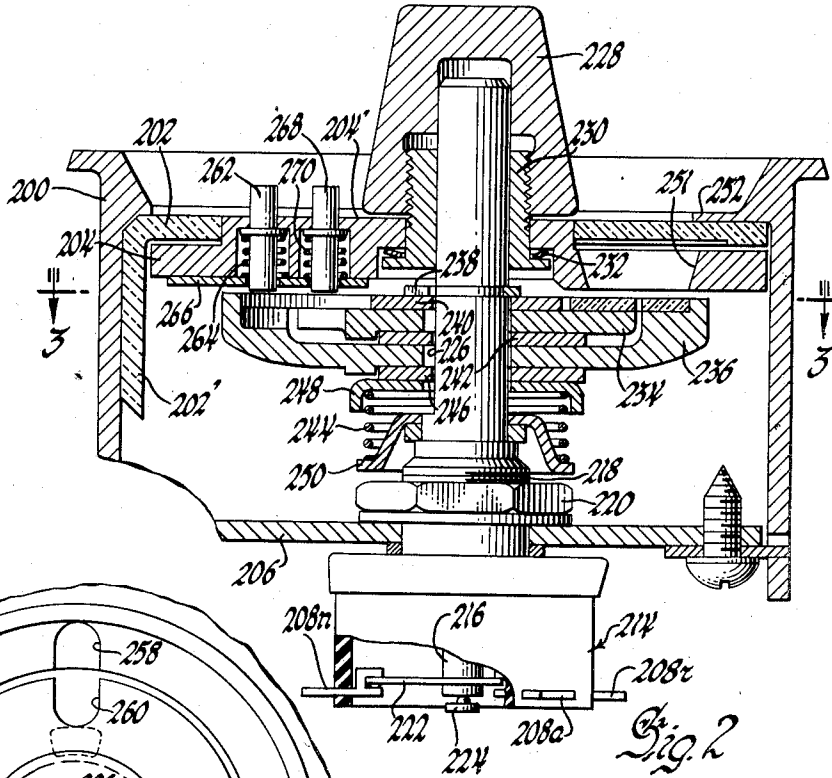


Fig. 2

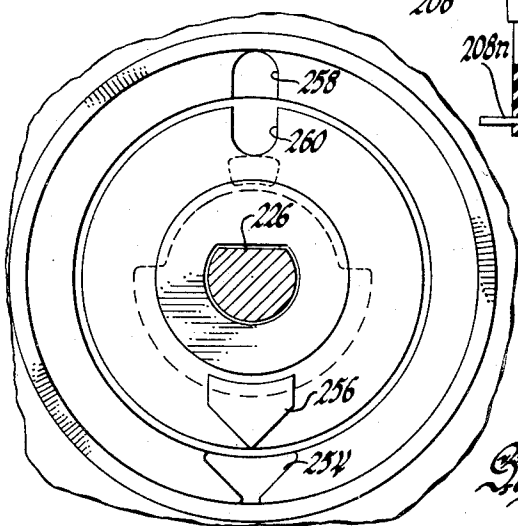


Fig. 3

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SELECTOR AND INDICATOR DEVICE

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Original application December 3, 1956, Serial No. 625,716. Divided and this application November 25, 1957, Serial No. 698,686

3 Claims. (Cl. 200—18)

This invention relates to positional control systems and more particularly to automatically controlled vehicle seat positioning apparatus of the power actuated type. This patent application is a division of our copending application Serial No. 625,716, filed December 3, 1956, for "Seat Positioning Apparatus."

This invention is adaptable to seat positioning mechanisms of the power actuated type affording any desired degree of freedom or planes of adjustment. It is especially adapted for seat mechanisms of the so-called six-way type seat adjustment which afford three planes of adjustment; namely fore and aft, front edge elevation and rear edge elevation. In accordance with the invention set forth in the aforementioned copending application the adjustment of seat position is afforded by a separate control channel including a position selector device corresponding to each plane of adjustment. A different power actuator may be employed for each plane of adjustment or an actuator common to two or more planes of adjustment may be utilized. The control channels are interlocked in such a manner that simultaneous position selection in the different planes is permitted even though a common power actuator is used.

For the purpose of accommodating plural operators of the same vehicle, each of whom may have a different favorite seat position, this invention affords plural favorite position information storage by providing a separate position indicator for each individual operator. Thus an individual operator is relieved of the burden of remembering a position code or digit for each plane of adjustment corresponding to his favorite position. This is accomplished by providing each selector device with a single fixed index mark and a plurality of movable index marks each of which corresponds to the pre-selected position of a given individual operator.

A more complete understanding of this invention may be had from the detailed description which follows taken with the accompanying drawings in which:

Figure 1 is a plan view partially in section of the position selector means;

Figure 2 is a sectional view taken on line 2—2 of Figure 1; and

Figure 3 is a sectional view taken on lines 3—3 of Figure 2.

In order to provide for automatic selection of the seat position there is provided a position selector mechanism 24 as shown in detail in Figures 1, 2, and 3. The selector mechanism comprises a body or casing 200 which is generally rectangular in configuration. The casing 200 is closed at the top by a transparent plate 202 which is seated against an internal shoulder on the casing 200. The transparent plate 202 is suitably formed with a depending flange 202' to permit illumination of the visible portion of the selector mechanism by edge lighting. A backing plate 204 of opaque material is disposed adjacent the transparent plate 202 and has a boss portion 204' extending therethrough. The bottom of the casing 200 is closed by a plate 206 which is secured thereto by any

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suitable means. The casing 200 accommodates a plurality of selector devices 208, 210, and 212 for independent position selection of the front elevation, fore and aft, and rear elevation respectively.

The selector switches 208, 210, and 212 are identical in construction and accordingly the description which will be given with respect to device 208 will be equally applicable to the others. The selector device 208 comprises a multiple contact switch having an axially extending operating shaft 216 which is generally cylindrical. The body or stator 214 of the switch includes a threaded bushing 218 coaxial with the shaft which extends through the bottom plate 206 and is secured in position by a lock nut 220. The switch is provided with multiple fixed contacts which may be identified as contacts *r*, *a*, *b*, *c*, . . . and *n*, and which are circumferentially disposed upon the body or stator of the switch. A switch rotor contact 222 is mounted upon the operating shaft 216 for rotation therewith and is adapted in a conventional manner to selectively engage the fixed contacts. A centrally disposed fixed contact 224 is maintained in continuous engagement with the rotor contact 222 whereby the rotor contact is effective to bridge the fixed contact 224 and any one of the fixed contacts *r*, *a*, . . . and *n*.

Manual operation of the selector switch is effected by an extension of the operating shaft 216 through the plates 204 and 202 to an operating knob 228. The operating knob is non-rotatably secured to the shaft by providing this extension of the shaft with an axially extending flat surface 226 which projects into a recess of corresponding configuration in the knob. The knob 228 is secured against axial displacement by a threaded bushing 230 disposed coaxially of the shaft and extending through the central portion 204' of the opaque plate against which it reacts through an interposed spring washer 232.

To provide a visual indication of the position of the selector device operating shaft there are provided a plurality of indicator rotors 234 and 236. The indicator rotors are preferably disposed in nested relation and thus may be of cup-shape configuration with progressively increasing diameters. The indicator rotors are disposed coaxially of the shaft 216 and are provided with a central circular opening to permit relative rotation of the shaft and rotors. To impart rotative effort to the indicator rotors, there is provided a yieldable coupling or clutch between the operating shaft and rotors. A plurality of clutch elements or friction disks 240, 242, and 246 are keyed by corresponding configuration to the shaft 216 and are disposed in engagement with the axial faces of the indicator rotors 234 and 236. The friction disk 240 is prevented from axial movement on the shaft 216 by a stop ring 238. The friction disk 246 is seated against an actuator plate 248 for transmitting axial pressure to the stack of clutch elements and indicator rotors. A clutch spring 244 is interposed between the actuator plate 248 and a reaction plate 250 to apply the clutch engaging pressure and thus the indicator rotors 234 and 236 are normally driven synchronously with the shaft rotation.

In order to provide a visual indication of the shaft position as indicated by rotors 234 and 236 the opaque plate 204 is provided with an arcuate window 251 in alignment with the periphery of the rotors. A fixed reference index mark 252 is disposed on the plate 204 at the midpoint of the window in a position corresponding to that of the fixed switch contact 208*r*. For cooperation with the fixed index mark 252 the indicator rotor 236 is provided with an index mark 254 and in a similar manner the rotor 234 is provided with an index mark 256. With the operating shaft 216 angularly positioned so that the switch rotor contact 222 is in engagement with the

fixed contact 208r and the indicator rotors 234 and 236 angularly positioned so that the index marks 254 and 256 are opposite the fixed index mark 252, it may be said that the indicator rotors are in a primary reference position with respect to the operating shaft. Upon rotation of the shaft, the angular displacement of either index mark 254 or 256 from the fixed index mark 252 represents the angular position of the switch rotor contact 222.

In accordance with this invention, provision is made for establishing the indicator rotors in selectable secondary reference positions with respect to the operating shaft so that the selector device serves as an information storage means. This feature is especially desirable where two or more persons have different favorite seat positions. For the purpose of establishing such a favorite position, the selector device is provided with an indicator rotor stop mechanism corresponding to each indicator rotor. The stop mechanism for the indicator rotor 236 comprises a stop pin 262 extending through the boss 204' of the plate 204. The pin 262 is slidable in the plate 204 and maintained in a normally retracted position by a bias spring 264 which extends between a shouldered portion on the pin and a reaction plate 266. Similarly, a stop pin 268 corresponding to the indicator rotor 234 is slidable in the plate 204 and is retained in a retracted position by a bias spring 270.

The secondary reference position for the indicator rotor 234 is established by displacing the stop pin 268 into a corresponding recess 260, which is disposed in the rotor 234 opposite the index mark 256, and simultaneously operating the knob 228 to displace the switch rotor contact 222 to a selected position. The stop pin 268 is effective to prevent rotation of the indicator rotor 234 and consequently the clutch elements 240 and 242 slip relative to the rotor 234 resulting in relative angular displacement between the rotor index mark 256 and the switch rotor contact 222. When the stop pin 268 is released the rotor 234 is freely movable and may be displaced by the knob 228 by rotational effort imparted through the clutch disks 240 and 242. Accordingly, the favorite position thus selected may be re-established by merely rotating the knob 228 to a position in which the rotor index mark 256 is aligned with the fixed index mark 252. The secondary reference position may be established for the indicator rotor 236 in the same manner, by operation of stop pin 262 into recess 258, to represent the favorite position of another person.

In accordance with this invention one or more persons may establish, in the selector switches, positional information which defines his favorite position and facilitates restoring the seat adjustment to this position from any displaced position. As shown in Figures 1, 2, and 3, this favorite position information storage is accomplished simultaneously with the selection and adjustment of the seat to the favorite position as described previously. The operator who wishes to store such information in the selector switches appropriates to his use one of the movable index marks 254 or 256, for example, mark 256. Prior to manipulation of control knob 228 for displacement of the selector switch rotor contact 222 the operator depresses the stop plunger 268 causing engagement thereof with the indicator rotor 234 in the recess 260. The indicator rotor 234 is thereby held in fixed position with the index mark 256 opposite the fixed reference index mark 252. In this condition, the selector knob 228 is rotated in either direction to any desired position until the desired seat position has been established. This movement of the selector knob 228 and operating shaft 216 relative to the indicator rotor 234 is permitted by slippage thereof with respect to the clutch disks 240 and 242. When the stop plunger 268 is released and withdrawn from the recess 260, the position information for the corresponding plane of adjustment is established in the selector switch. The knob 228 and operating shaft

216 may be displaced to any position without disturbing the information storage because the indicator rotor 234 is driven synchronously with the shaft 216 so long as the stop plunger 268 is withdrawn. Therefore, the operator who has utilized the position storage feature of indicator rotor 234 may re-establish his favorite seat position merely by manipulating the selector knob until the index mark 256 is positioned opposite the fixed reference index mark 252. This same procedure is, of course, followed to store position information in each of the selector switches 208, 210, and 212 corresponding to each plane of seat adjustment. In a similar manner, another person may appropriate to his use the index mark 254 by operation of stop plunger 262 of each selector switch for information storage relative to his favorite position.

Although the description of this invention has been given with respect to a particular embodiment, it is not to be construed in a limiting sense. Many variations and modifications within the spirit and scope of this invention will now occur to those skilled in the art. For a definition of the invention, reference is made to the appended claims.

We claim:

1. A selector device comprising a stator, an operating member mounted on the stator for movement relative thereto, a reference index on said stator, an indicator element mounted on the operating member and bearing a movable index, said indicator element being connected with the operating member by yieldable clutch means, and coacting stop means on the indicator element and stator and disposed oppositely when the reference index and movable index are disposed in a given positional arrangement, whereby a given position of the operating member may be established corresponding to said positional arrangement.

2. A selector device comprising a stator, an operating shaft rotatably mounted on the stator, an operating motor mounted on the shaft for rotation therewith, a reference index on said stator, an indicator rotor on the shaft and bearing a rotor index, said indicator rotor being connected with said shaft by yieldable clutch means, and means operable at the will of the operator for holding the indicator rotor fixed relative to the stator during rotation of the shaft whereby a given position of the operating rotor may be established corresponding to a given positional arrangement of reference index and the rotor index.

3. A selector switch comprising a stator and a rotor, a plurality of fixed contacts disposed on said stator, an operating shaft rotatably mounted on the stator, a movable contact mounted on the shaft for rotation therewith for successive engagement with the fixed contacts, a reference index on the stator, a plurality of indicator rotors disposed coaxially in nested relation each mounted on the shaft and each bearing a movable index, each indicator rotor being connected with the shaft by a slip clutch, a different stop element corresponding to each of the indicator rotors and disposed on said stator, coacting stop means on each of said indicator rotors and disposed opposite the corresponding stop element when the movable index is aligned with the reference index, said stop element and stop means being operative to hold the indicator rotor fixed relative to the stator during rotation of said operating shaft.

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