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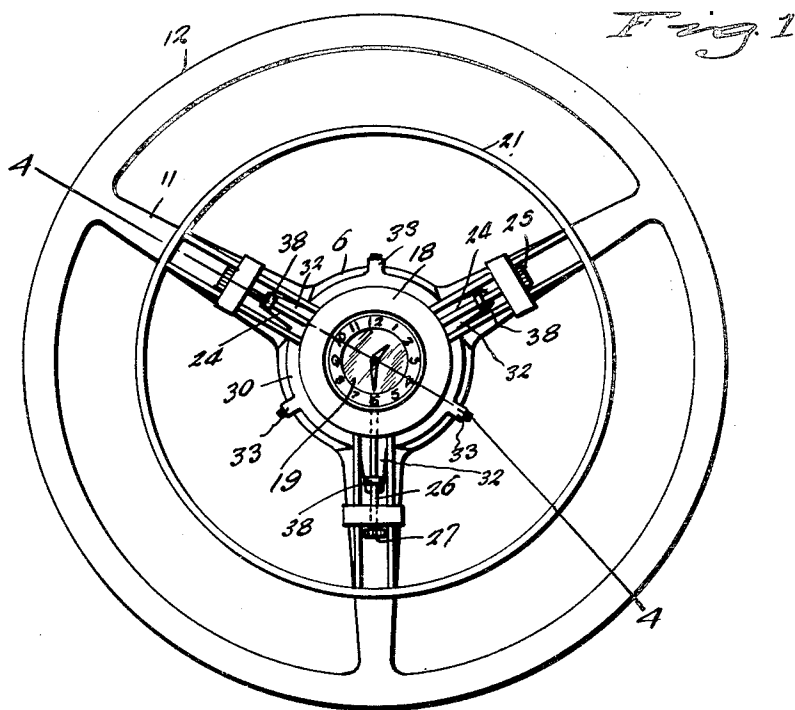
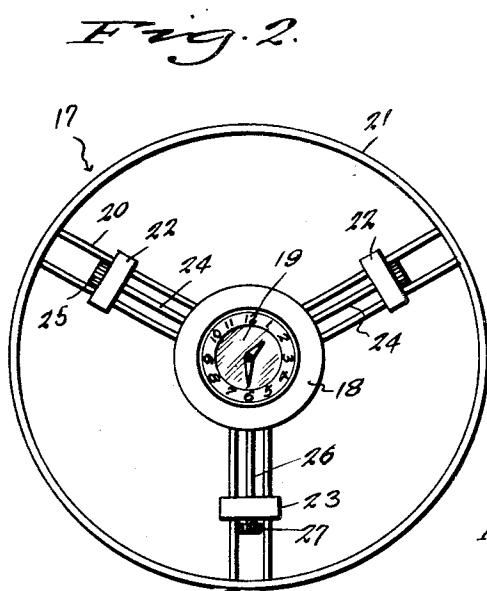
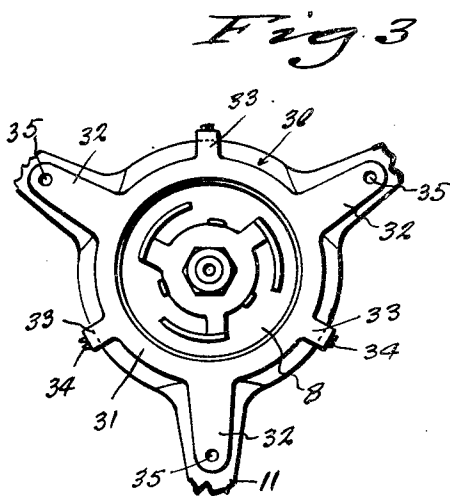
M. H. HOLLINGSWORTH

2,203,281

HORN BUTTON OPERATING DEVICE

Filed April 13, 1936

3 Sheets-Sheet 1



Inventor

Maurice H. Hollingsworth

By *Clarence A. O'Brien* and
Hyman Berman Attorney

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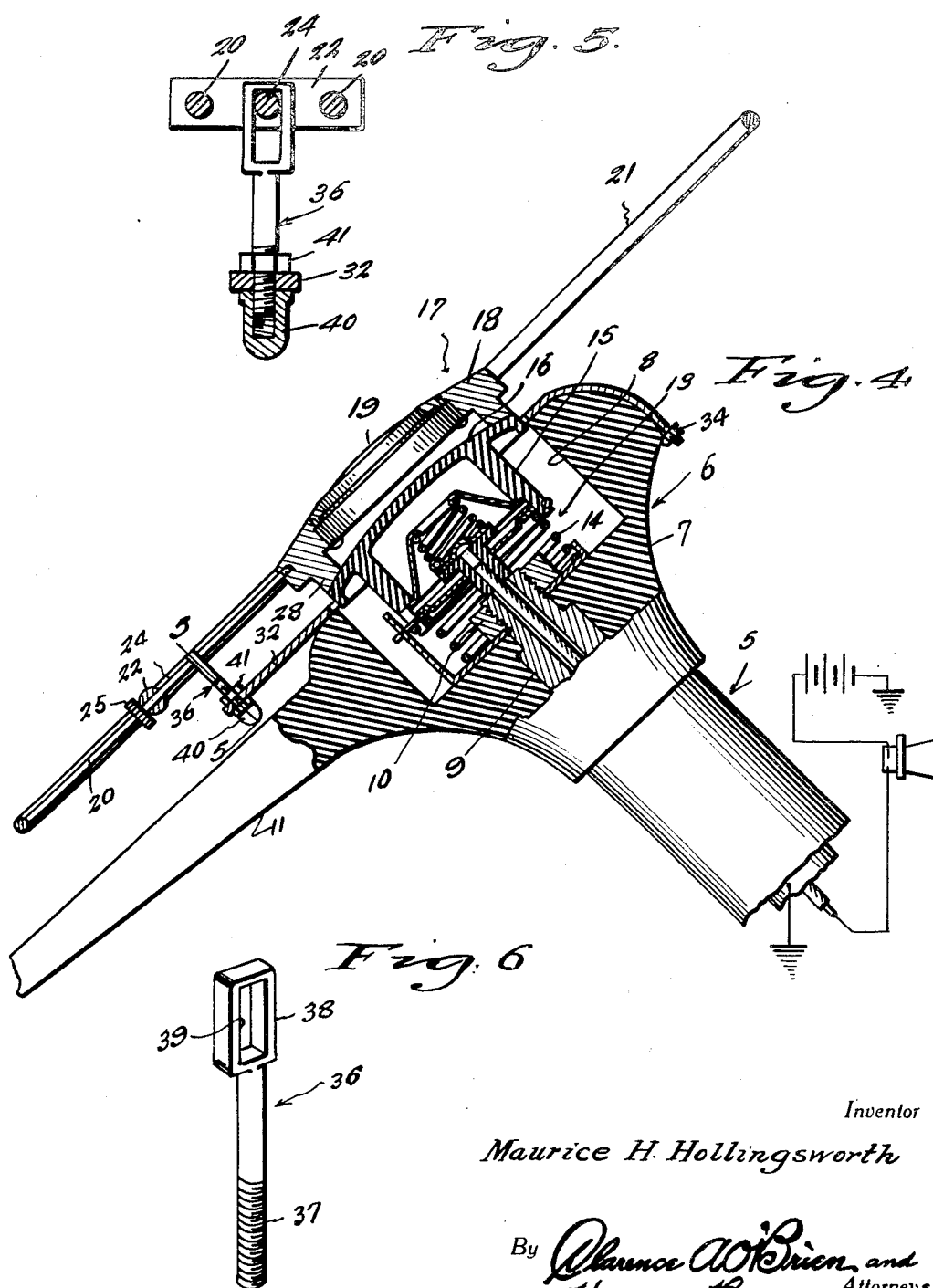
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3 Sheets-Sheet 2



Inventor

Maurice H. Hollingsworth

By *Alaunce W. O'Brien* and
Hyman Berman Attorneys

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3 Sheets-Sheet 3

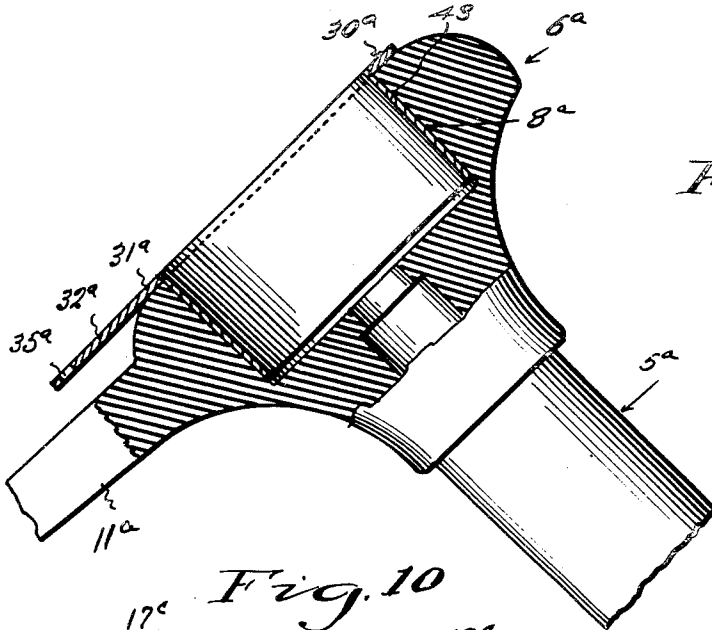


Fig. 7

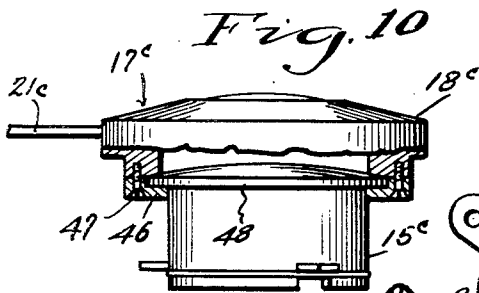


Fig. 10

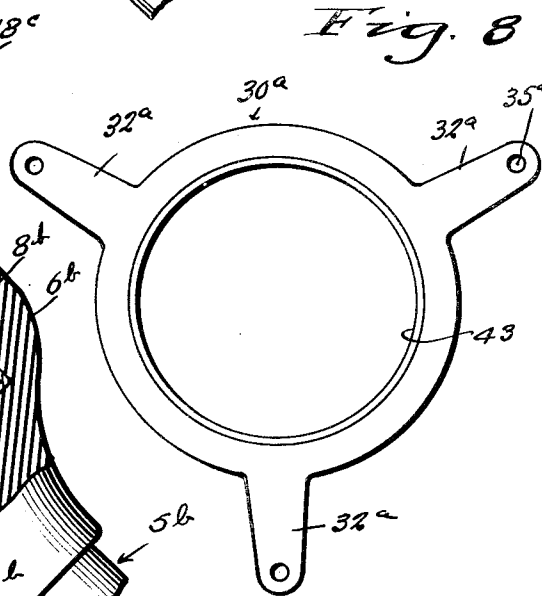


Fig. 8

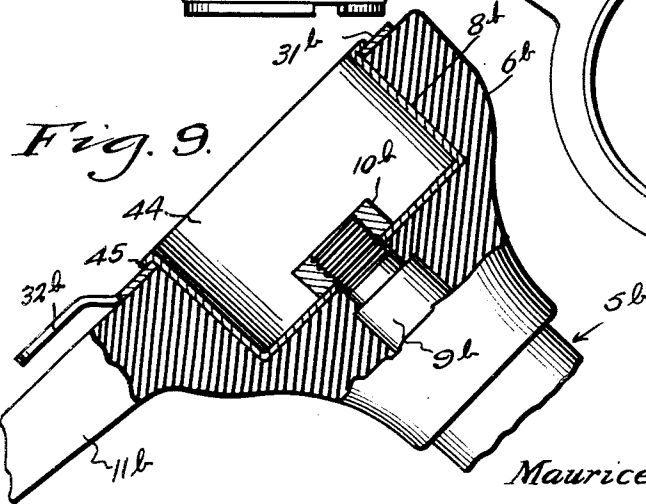


Fig. 9

Inventor

Maurice H. Hollingsworth

By *Clarence A. O'Brien* and
Hyman Berman Attorneys

UNITED STATES PATENT OFFICE

2,203,281

HORN BUTTON OPERATING DEVICE

Maurice H. Hollingsworth, Miami Beach, Fla.

Application April 13, 1936, Serial No. 74,192

8 Claims. (Cl. 200—59)

My invention relates generally to automobile steering wheel horn button and steering wheel construction, and particularly to a combined arrangement of steering wheel horn button operating device and an article of utility incorporated therein, such as a watch or clock, vanity cases, and the like, and an important object of my invention is to provide arrangements of this character which are extremely practical both from the standpoint of operation and from the standpoint of ease and efficiency of installation on different makes of automobiles.

Another important object of my invention is to provide arrangements of the character indicated above which render easier and more convenient the operation of the horn button for sounding the horn without removing the hand or hands from the rim of the steering wheel, and to remedy the defects heretofore inherent in devices of this general class.

Another important object of my invention is to provide arrangements of the character indicated above in which the article of utility is incorporated in a new, more useful and more efficient manner, so that the combination is mechanically practical and meets an insistent public demand.

Another important object of my invention is to provide in arrangements of the character indicated above a constructional and functional cooperation of horn button operating device and article of utility such as a clock, whereby the efficiency of the device is in no way impaired, and whereby the efficiency of the article such as a clock, is not only enhanced from a utility standpoint, but is enhanced from a winding and setting standpoint.

Other important objects of my invention will be apparent from a reading of the following description in connection with the drawings, wherein for purposes of illustration I have shown preferred embodiments of my invention.

In the drawings:

Figure 1 is a top plan view of one embodiment of the invention showing the same installed on a steering wheel.

Figure 2 is a top plan view showing the embodiment removed from the steering wheel.

Figure 3 is a top plan view showing the horn button operating device removed from the steering wheel and exposing the mounting means and the interior of the horn button mechanism well.

Figure 4 is a transverse vertical sectional view taken through Figure 1 approximately on the line 4—4.

Figure 5 is a transverse vertical sectional view

taken through Figure 4 approximately on the line 5—5.

Figure 6 is a perspective view of one of the eye bolts.

Figure 7 is a transverse vertical sectional view taken through another embodiment of the invention.

Figure 8 is a top plan view of the mounting means shown in Figure 7.

Figure 9 is a transverse vertical sectional view taken through another embodiment of the invention.

Figure 10 is a transverse vertical sectional and side elevational view taken through a still further embodiment of the invention showing a rigid connection of the horn button operating device with the horn button itself.

Referring in detail to the drawings, and first to the embodiment of the invention shown in Figures 1 through 4, the numeral 5 generally designates the steering column on which the steering wheel generally designated 6 is mounted in a conventional manner, the said steering wheel including the hub 7 which is formed with the cylindrical well 8 in its top through and above the bottom of which projects the steering post portion 9 which includes the nut 10 threaded on its upper end to engage the bottom of the well 8 or an intermediate member lying thereon to hold the steering wheel in place. The steering wheel has the usual spokes 11 and the rim 12 and is in these and in all other respects conventional, the constructions mentioned to be taken as generic in interpretation, since different makes of automobiles and different models have or may have differently formed steering wheels which, however, would essentially possess the features mentioned.

A conventional horn button operated switch mechanism which is generally designated 13 is mounted in the well 8 and includes the spring arrangement 14 which yieldably supports the horn button 15 in the elevated initial condition in which the switch is open. The horn button may assume any conventional form and be either flat or rounded on its upper side or top indicated by the numeral 16.

In accordance with the present invention the horn button operating device which is generally designated 17 comprises a central annular member 18 which acts as the supporting member for the article of utility such as the clock 19 which it embraces and to which it is attached, and the horn button engaging element, and includes the dual spokes 20 which may be in the form of square or round metal rods and which are at-

tached at their outer ends to the ring 21. The spokes 20 are long enough to bring the ring 21 sufficiently close to the rim 12 of the steering wheel to enable the driver to depress the ring 21 without taking his hand or hands from the rim 12 of the steering wheel, and close enough to the top of the steering wheel to prevent the horn button operating device from being at too great an elevation above the steering wheel, which condition would act as an inconvenience and obstruction. It is to be kept in mind that the horn button operating device is equally applicable in the form being described to flat or convex or concave steering wheels, simply by giving a conforming curvature to the spokes 20.

Straddling each pair of spokes 20 intermediate the ends thereof are the blocks 22 and 23, the blocks 22 being purely decorative in character and acting as supports for the dummy rods 24 and the dummy knurled knobs 25. The block 23 has mechanical significance besides that of bracing the spokes 20 because of its supporting function in connection with the rotatable rod 26 which is connected at its inner end to the stem 25 and set arrangement of the clock 19 and has at its outer end the knurled knob 27 which is grasped for the purpose of pulling out and pushing in the stem set, and for rotating the stem set in setting and winding the clock or watch 19.

The bottom of the supporting member 18 has an annular portion 28 whose lower edge is substantially conformed to the contour of the top of the horn button, so as to rest conformably thereon in a manner to prevent sliding as shown in Figure 4 of the drawings. This arrangement spaces the watch or clock 19 from the top of the horn button sufficiently to prevent any injurious contact between the clock and the horn button in any relative movement of the horn button and the supporting member 18.

Means for positively holding the horn button operating device 17 in position on the steering wheel and relative to the horn button comprises the bracket which is generally designated 30 and which includes the flat annular part 31 which lies around the top of the steering wheel hub immediately adjacent the well 8, and from which radiate the arms 32 and circumferentially spaced between these arms, the hooks 33.

The hooks 33 are shaped to conform in curvature to the contour of the upper part and side portions of the steering wheel hub and they have on their lower ends set screws 34 which are arranged to either hook under the expanded portion of the steering wheel hub as indicated in Figure 4, or to bite into the side of the steering wheel hub, so as to have in either case the effect of securely clamping the annular part 30 on the top of the hub.

The arms 32 have adjacent their outer ends the unthreaded openings 35 which lie directly over the corresponding spokes 11 of the steering wheel and which receive the threaded lower ends 37 of the respective eye bolts 36 which have at their upper ends the rectangular eyes 38 which include the substantially parallel-sided vertically elongated openings 39 of a width to slidably receive the respective rods 24, 24 and 26, whereby sidewise motion of these rods relative to the steering wheel is positively prevented, while a limited amount of vertical movement thereof is allowed.

An acorn nut 40 is conveniently threaded on the lower end of the threaded portion 37 of the eye bolts to engage the bottom of the respective

arm 32, while a plain nut 41 used as a lock nut, is threaded on the portion 37 and engages the top of the arm 32 whereby respective eye bolt 36 is supported at the proper elevation to perform the functions indicated.

By reason of the arrangements described, the horn button mechanism spring 14 by acting on the lower end of the horn button 15 will push the horn button operating device to the limit of its upper position in which the rods 24, 24 and 26 will rest against the upper end of the opening in the eye bolts and be positively prevented from disengaging the supporting member 18 from the horn button, no matter what the vibration of the vehicle may be, and even if the ring or any of the spokes should be struck accidentally by the operator in operating the steering wheel or other controls of the automobile. No other position or arrangement of the horn button operating device can be occupied by it except during the exertion of pressure by the driver upon the ring in an act of operating the horn of the automobile. During any of the tilted or depressed positions of the device, the eye bolts positively hold the device in proper alignment and in such a manner that should the operator suddenly or inadvertently release the pressure on the ring or other portion of the device, the spring 14 can restore the device to its elevated initial position without any damage or disarrangement thereof.

Referring now to the embodiment of the invention shown in Figure 7, it will be noticed that the same numerals as employed in describing the first mentioned embodiment are utilized with distinguishing small letter characters, so that the numeral 5a designates the steering column, the numeral 6a the hub of the steering wheel, the numeral 8a the well in the hub of the steering wheel, and the numeral 11a the spokes of the steering wheel. The embodiment of the invention shown in Figure 7 particularly applies to automobiles having steering wheels and horn button construction similar to that employed in certain current models, wherein the well 8 has a substantially cylindrical wall 43. This wall 43 is already present in the well 8a and I take advantage of this present structure to divest the bracket 30a of the clamping hooks 33, and to provide instead direct attachment to the upper end of the shell 43 of the annulus 31a, by welding or by some other suitable means of permanent attachment. The shell 43 being a pressed fit in the well 8a, gives adequate permanent mounting for the annulus 31 and its arms 32a.

All other arrangements and construction of the horn button operating device, including the spoke equipped ring 21 and the retaining eye bolts 36 are utilized and employed in conjunction with the present embodiment. Therefore, repetition of the description of these parts will not be made.

Referring now to the embodiment of the invention shown in Figure 9, which is particularly directed to steering wheel structures such as used conventionally on certain automobiles, which contain as original equipment a metallic cup 44 which is held in place by the steering post nut 10b which is threaded on the upper end of the steering post 9b. This cup has on its upper end a laterally outwardly extending radial flange 45. I take advantage of this conventional and present construction to eliminate from the bracket construction 30 shown in the first described embodiment the retaining hooks 33 and their clamping screws 34, while retaining the

radial arms 32b as done in the case of the embodiment shown in Figures 7 and 8, and arranging the annulus 31b to be retained in place on the top of the steering wheel hub by the aforementioned flange 45, the nut 10b being sufficiently tightened to procure the necessary rigid mounting of the annulus 31b on the top of the steering wheel hub, to support and maintain in the positions already mentioned, the horn button operating device 17, which is in all particulars like the horn button operating devices described in connection with the two foregoing embodiments.

Referring now to Figure 10 wherein a still further embodiment of the invention is shown, elimination of the retaining eye bolts 36 is effected by providing the supporting member 18c of the horn button operating device with removable inwardly projecting annular flanges 46 which are held in place by screws or the like 47 and which are formed to receive the laterally projecting annular edge 48 of the horn button 15c, and in a manner to securely mount the supporting member 18c and consequently the spokes and ring 21c bodily on the horn button. Of course, in this embodiment of the invention the retaining eye bolts 36 may also be used, but they can be eliminated if this is desired, since sufficient support in all directions is afforded by the immediately above described arrangement to securely and operatively mount the device 17c. In this embodiment the use of a particularly strong spring in the horn switch is deemed advisable to lend rigidity to the arrangement and to prevent wobbling of the horn button operating device in service.

Although I have shown and described herein preferred embodiments of my invention, it is to be definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in the materials, and in the structure and arrangement of the parts, within the spirit of the invention and the scope of the subjoined claims.

What is claimed is:

1. In combination with a steering wheel having a rim and a hub including a well adapted to accommodate horn switch mechanism including an actuator having radial spokes, a bracket having an annular part resting on the top of said hub around said well attaching means engaging the hub and holding said bracket in place thereon, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, said guiding and retaining members being adapted to be engaged with the spokes of the actuator in a manner to prevent circumferential movement but permit limited up and down movement of said spokes, said attaching means comprising a tube tight fitted in said well.

2. In combination with a steering wheel having a hub including a well adapted to accommodate horn switch mechanism including an actuator having radial spokes, a lateral extension on said hub, a bracket having an annular part stationarily resting on the top of said hub around said well and attaching means engaging the hub and holding said bracket in place thereon, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, said guiding and retaining members being adapted to be engaged with the spokes of the actuator in a manner to prevent circumferential movement but

permit limited up and down movement of said spokes, said attaching means comprising hooks engaging under said lateral extension of the hub.

3. In combination with a steering wheel having a hub including a well adapted to accommodate horn switch mechanism including an actuator having radial spokes, a bracket having an annular part resting on the top of said hub around said well and said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, said guiding and retaining members being adapted to be engaged with the spokes of the actuator in a manner to prevent circumferential movement but permit limited up and down movement of said spokes, said bracket further comprising a shell depending from said annular parts and fastened within said well, whereby said annular part is securely fastened in place on the hub.

4. In combination with a steering wheel having a hub including a well adapted to accommodate horn switch mechanism including an actuator having radial spokes, a bracket having an annular part resting on the top of said hub around said well and attaching means engaging the hub and holding said bracket in place, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, said guiding and retaining members being adapted to be engaged with the spokes of the actuator in a manner to prevent circumferential movement but permit limited up and down movement of said spokes, said attaching means comprising a cup fitting within said well, a lateral flange on the upper edge of said cup and overlying the top of the hub and a part of the top of said annular part and holding said bracket in place of the hub, and means securing said cup in place in said well.

5. A steering wheel having a hub including a well adapted to accommodate horn switch mechanism including an actuator having radial spokes, a bracket having an annular part engaged with the top of said hub around said well and attaching means engaging the hub and holding said bracket in place, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, said guiding and retaining members being adapted to be engaged with the spokes of the actuator in a manner to prevent circumferential movement but permit limited up and down movement of said spokes, each of said guiding and retaining members comprising a closed loop having a depending shank connected to the respective radial arm with each loop receiving the spoke of the actuator adjacent thereto.

6. In a steering wheel of the type having a hub including a well enclosing horn switch mechanism comprising a depressible spring-pressed horn button, a bracket having an annular part resting on the top of said hub around said horn button and well and attaching means engaging the hub and holding said bracket in place, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, an actuator comprising a member resting on top of said horn button and including radial spokes and having spaced elements engaging upper and lower sides of the horn button, said guiding and retaining members being engaged with said spokes in a manner to prevent circumferential movement but

permit limited up and down movement of said spokes.

7. In a steering wheel of the type having a hub including a well enclosing horn switch mechanism comprising a depressible spring pressed horn button, a bracket having an annular part resting on the top of said hub around said horn button and well and attaching means engaging the hub and holding said bracket in place, said bracket further comprising radial arms, guiding and retaining members projecting upwardly from said radial arms, an actuator including a central member including radial spokes, said guiding and retaining members being engaged with said spokes in a manner to prevent circumferential movement but permit limited up and down movement of said spokes, said central member having vertically spaced flanges engaging upper and lower surfaces of said horn

button and fixing said member to said horn button.

8. In combination, a steering wheel comprising a hub, said hub being formed with a well adapted to contain horn switch mechanism, said mechanism comprising an actuator having radial spokes, a mounting element comprising an annulus directly engaged with the top of said hub and surrounding said well, said mounting element having circumferentially spaced spokes guiding and retaining elements each formed with an opening receiving the adjacent spoke of the actuator in a manner preventing relative circumferential movement while permitting limited up and down movement of said actuator, and means securing said mounting element rigidly in place on said hub of the steering wheel.

MAURICE H. HOLLINGSWORTH.