

Oct. 22, 1935.

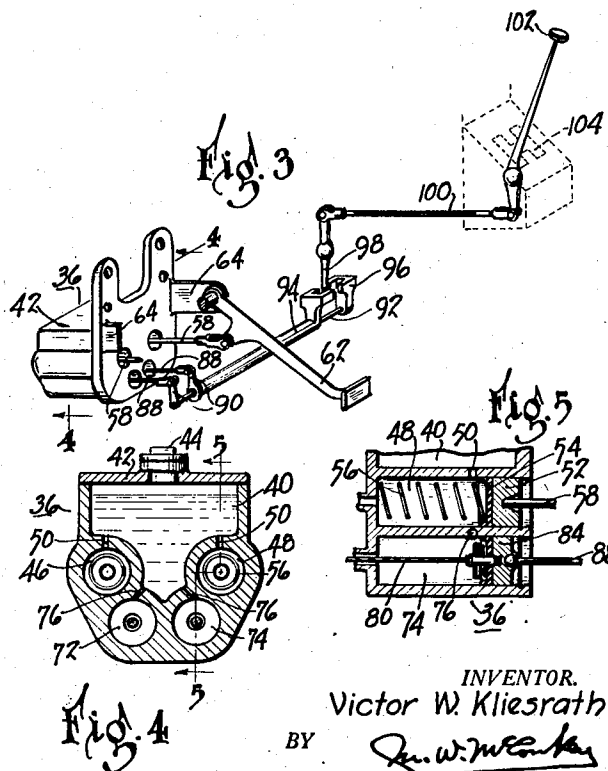
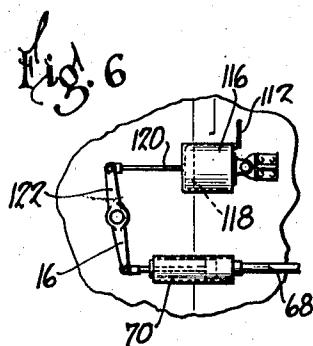
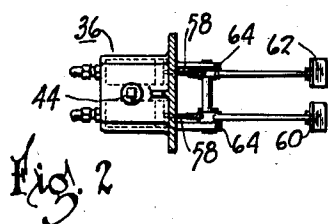
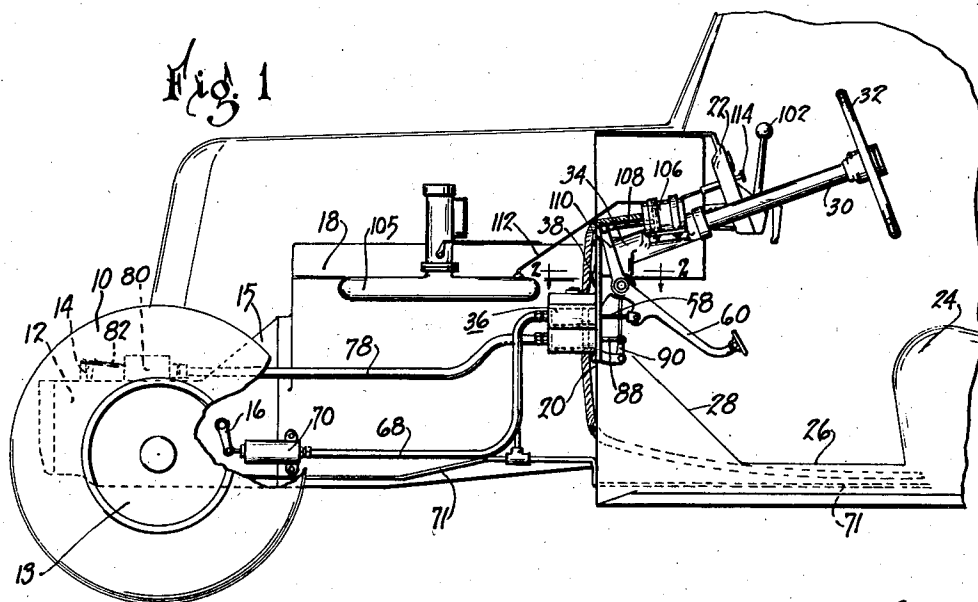
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2,018,023

CONTROL

Filed May 15, 1933

3 Sheets-Sheet 1



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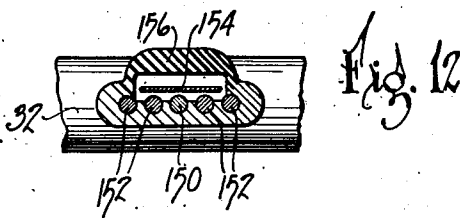
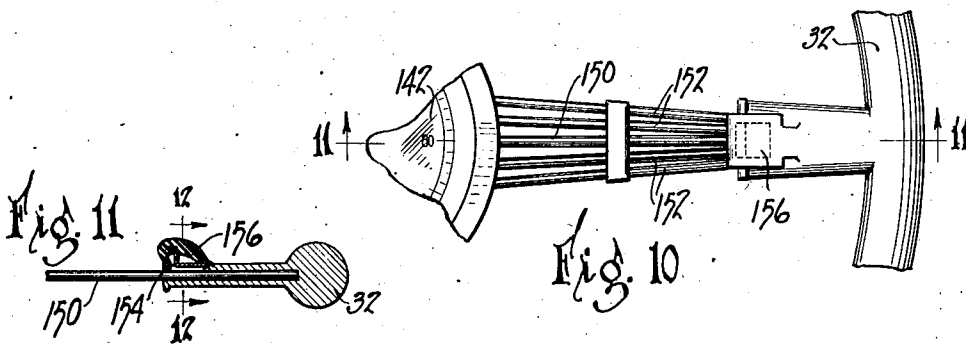
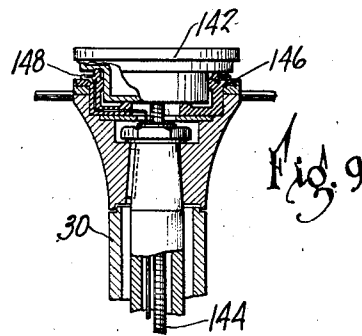
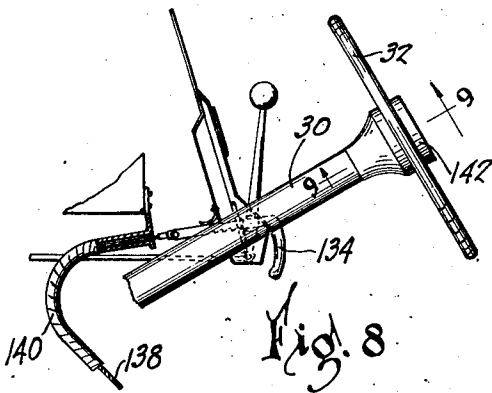
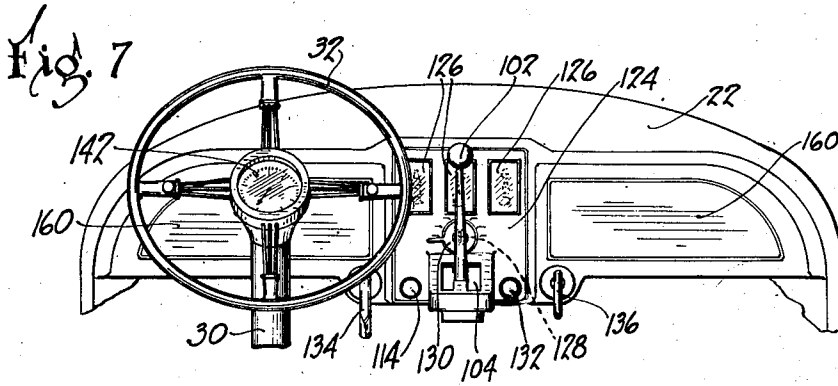
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CONTROL

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3 Sheets-Sheet 2



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CONTROL

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3 Sheets-Sheet 3

Fig. 13

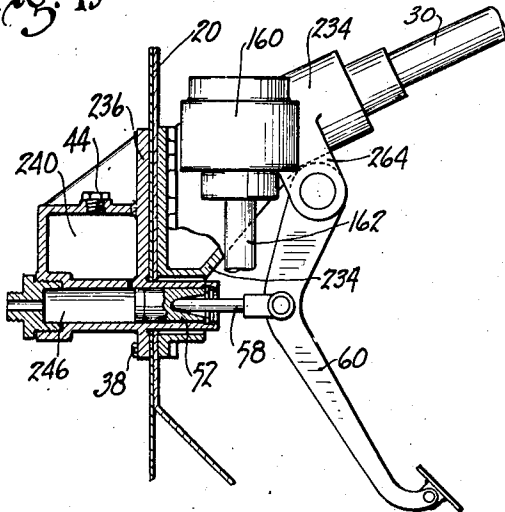


Fig. 14

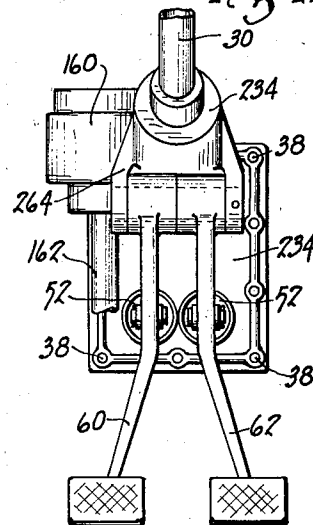


Fig. 15

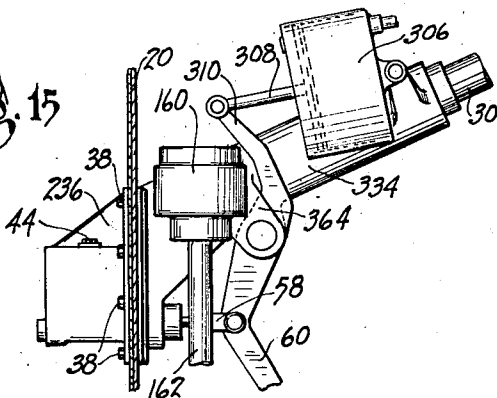


Fig. 16

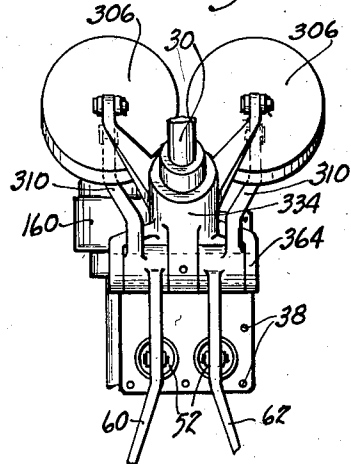
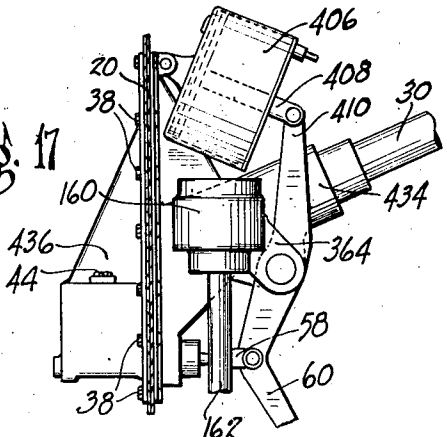


Fig. 17



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UNITED STATES PATENT OFFICE

2,018,023

CONTROL

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Application May 15, 1933, Serial No. 671,049

14 Claims. (Cl. 180-77)

This invention relates to controls, and is illustrated as embodied in a novel arrangement and mounting of the controls of an automobile.

An important object of the invention is to arrange a system of automobile controls which will clear up the floorboard of the automobile, by mounting the controls, or at least the important controls, on the dash or its equivalent. I also consider it important to do this in a manner which strengthens the dash and makes it more rigid, and preferably in a manner facilitating assembling the various controls in place, or removing them from the assembly for repair or replacement.

In one very desirable arrangement, the controls include a steering column having a supporting bracket engaging one face of the dash, and another bracket carrying hydraulic and other operating devices for the controls is arranged in engagement with the opposite face of the dash, registering with the first bracket. The two brackets are bolted or otherwise secured together, and to the dash, giving a readily assembled support for the various controls which support also serves to strengthen and rigidify the dash.

Other features of novelty relate to the use of a novel hydraulic means, for example a novel plural-cylinder master cylinder for operating the brakes and the clutch (and if desired also the gear-shift means), which is preferably carried by the above-described bracket. This hydraulic means is shown actuated in a novel manner by downwardly-extending pedals or the like pivoted at their upper ends on one of the supporting brackets.

I prefer to provide a simplified arrangement of vacuum or other auxiliary power means for actuating one or both of these pedals or their equivalents, and in the preferred arrangements I mount this power means on one of the above-described supporting brackets so that it virtually forms part of the novel control unit which is carried by, and which at the same time serves to reinforce and strengthen, the dash of the vehicle.

The above and other objects and features of the invention, including novel and improved constructions and arrangements embodied in the several controls independently of their combination in an improved assembly unit, and other desirable structures and relationships of parts, will be apparent from the following description of the illustrative embodiments shown in the accompanying drawings, in which:

Figure 1 is a diagrammatic longitudinal section through the front part of an automobile

embodying my invention, and showing most of the controls in side elevation;

Figure 2 is a partial section on the line 2-2 of Figure 1 and showing the hydraulic brake and clutch operating means;

Figure 3 is a perspective view of an arrangement in which the gear shifting means is also operated hydraulically;

Figure 4 is a section through the combination master cylinder of Figure 3 on the line 4-4 of that figure;

Figure 5 is a section on the line 5-5 of Figure 4;

Figure 6 is a view of an alternative arrangement in which a vacuum power device for the clutch is arranged adjacent the clutch;

Figure 7 is a rear elevation showing the steering wheel and instrument board of the vehicle;

Figure 8 is a longitudinal section through the assembly shown in Figure 7;

Figure 9 is a partial section through the upper end of the steering column on the line 9-9 of Figure 8;

Figure 10 is a top plan view of a modified arrangement of one of the spokes of the steering wheel;

Figure 11 is a partial section on the line 11-11 of Figure 10 and showing the means of closing one of the electric circuits, as for example the horn circuit;

Figure 12 is a section through the circuit closer on the line 12-12 of Figure 11;

Figure 13 is a partial vertical longitudinal section, corresponding to part of Figure 1, but showing a modified arrangement;

Figure 14 is a rear elevation of the parts shown in Figure 13;

Figure 15 is a section corresponding to Figure 13, but showing another modification;

Figure 16 is a rear elevation of the parts shown in Figure 15; and

Figure 17 is a section corresponding to Figures 13 and 15, but showing still another modification.

The automobile selected for illustration is of the general type more fully described in my co-pending application No. 651,821 filed January 14, 1933, and includes front road wheels 10 which may be provided with hydraulic brakes 13, and which are driven through a suitable differential (not shown) which is operated by a transmission or change-speed gear 12 of any desired character, the gears of which are shifted by suitable means such as levers 14. The transmission, which may be of the progressive type illustrated in the above-mentioned application, or which may if desired be of

the conventional three-speed-and-reverse sliding gear type, is operated through a suitable clutch arranged in a clutch housing 15 and operated by a clutch lever 16.

6 The engine 18 is preferably mounted as described in the above-referred to application No. 651,821, filed January 14, 1933, just forwardly of a transversely-extending dash 20 which carries an instrument board 22 arranged just in front
10 of the driver's seat 24. As is also more fully described in the said application, the automobile has a base 26 which carries the dash 20 and which also carries an inclined foot board 28.

As explained above, the present application relates to the controls of the automobile, and more particularly to their assembly upon the dash 20 or its equivalent. These controls are shown as including a steering column 30 carrying a steering wheel 32 and which is mounted in a novel supporting bracket 34, the front face of which engages the rear face of the dash 20. The front face of the dash is engaged by another supporting bracket which is shown as having formed integrally thereof a combination hydraulic master
20 cylinder 36, more fully described below.

The supporting brackets 34 and 36 are secured to each other and to the dash 20 by means such as a series of bolts or the like 38, thereby forming a rigid unit with the dash which adds greatly to the strength of the dash, the strengthened dash forming a reinforced transverse bridge or truss in which the various stresses and strains of the entire vehicle are centered as more fully explained in my co-pending application No. 677,610, filed
30 June 26, 1933.

The novel master cylinder 36 is shown as including a reservoir 40 for hydraulic fluid such as the usual mixture of alcohol and castor oil, the reservoir being closed by a tight-fitting cover 42 having a removable filler cap 44. Just below the reservoir 40, and at opposite sides of the combination master cylinder 36, are arranged respectively a clutch-operating cylinder 46 and a brake-operating cylinder 48, each communicating with the
40 reservoir 40 when in released position through a port 50 which allows for expansion and contraction of the operating liquid to compensate for heat and cold.

In each of these cylinders there is arranged an operating piston 52 shown faced by a rubber sealing cup 54, which may be held in place by a spring 56. Each piston 52 is operated by a piston rod 58, the two piston rods 58 being pivoted to and operated respectively by novel clutch and
55 brake pedals 60 and 62. The pedals 60 and 62 are pivoted at their upper ends on brackets 64 carried by or integral with one of the above-described supporting brackets, and which are shown as being integral with the one on the front side of the dash which is extended to form the novel master cylinder 36 with the brackets 64 extending through suitable slots or openings in the dash 20.

The cylinder 46, containing the piston operated by the clutch pedal 60, is connected by a suitable conduit 68 with an operating cylinder 70 containing a piston having a piston rod which is pivotally connected to the clutch arm 16. Thus the depression of the novel downwardly-extending pedal 60 rocks the lever 16 to throw out the clutch, while the release of the pedal 60 permits the clutch spring to return the parts to the positions shown in the drawings. The cylinder 48, containing the piston 52 which is operated by the
70 brake pedal 62, is connected to the usual pipe

lines 71 forming the hydraulic system which operates the four brakes 12 on the wheels.

The corresponding port 50 in this case serves to permit compensation or changes in temperature and the like by providing communication
5 between the cylinder and the reservoir 40 when the brakes are released.

I preferably provide, just below the cylinders 46 and 48, two additional cylinders 72 and 74 having compensating ports 76 for connecting the cylinders with the reservoir 40, and which are connected by pipe lines 78 with operating cylinders 80 having pistons connected by piston rods 82 to the gear shifting levers 14. As best appears in Figure 5 I prefer to provide an operating piston 84 in each of these cylinders 72 and 74 which compresses the liquid ahead of it to apply a thrust to the corresponding lever 14 when the piston is pushed forwardly, and which has attached thereto a flexible cable or other
15 tension element 86 which at its forward end is connected to the corresponding piston which is connected through its piston rod 82 to one of the levers 14. Thus, retraction of the piston 84 serves to pull the corresponding lever 14 rearwardly, while pushing the piston 84 forward serves to thrust the lever 14 forwardly.

Each of the pistons 84 is connected by a piston rod 88 to one of two operating arms 90 arranged respectively on the ends of two coaxial shafts 92 and 94. At their opposite ends the shafts 92 and 94 are provided with arms 96 having slots facing toward each other and one or the other of which is adapted to receive, when in its central or neutral position, and to embrace operatively
35 an auxiliary gear shift lever 98 operatively connected by a sliding and rocking lever 100 to a universally-mounted hand gear shift lever 102 which may have an H guide slot 104 formed in the instrument board 22. Thus the shifting
40 backward and forward of the lever 102 when in its right hand position rocks one of the levers 14 back and forth, while the corresponding shifting of the lever 102 when in its left hand position rocks the other lever 14 back and forth.
45 The master cylinder and hydraulic controls are more particularly described and claimed in my copending application Serial No. 9,224 filed March 4, 1935, which is a division of this application.

If desired one or both of the pedals 60 and 62 may be arranged to be operated by power, as for example by the suction of the intake manifold 105 of the engine. This is accomplished by the use of a power cylinder 106, preferably mounted
55 on the bracket 34 which carries the steering column, and which contains a suitable piston connected by a piston rod 108 to an extension 110 formed on the upper end of the corresponding pedal. The cylinder 106 is connected by a suitable conduit 112 with the intake manifold and is controlled by a suitable valve (not shown), the valve being opened by the release of the accelerator pedal in the case of the clutch operating device and by the depression of the brake pedal 62
65 in the case of power operation of the brakes, in a manner which is well known in the art. The power actuator 106 for the clutch pedal may also be provided in the usual manner with a suitable cut-out valve controlled by a button 114 or the like on the instrument board. If preferred, and as shown in Figure 6, the clutch operating power cylinder may be in the form of a cylinder 116, mounted on the engine housing instead of on the steering wheel bracket, and containing a piston 75

118 having a piston rod 120 connected to an upper extension 122 of the clutch shifting lever 16.

One manner of arranging the control parts on the instrument board is shown in Figure 7.

5 There is shown in that figure a panel 124 across the top of which are arranged three instruments 126 such as the ammeter and the oil gage and the gasoline gage. Immediately below this is the ignition lock 128, which may if desired be of one of the well known co-incidental types and serve also to lock the gear shift lever 102 in a neutral position. Preferably the light switch 130 is arranged to surround the ignition switch 128. Control members such as the vacuum cut-out button 114 and the spark-controlling button 132 are arranged at opposite sides of the gear shifting lever 102 at the bottom of the panel 124, and I prefer to arrange on opposite sides of the lower portion of the panel an emergency brake operating lever 134 and a choke-operating handle or the like 136. As shown in Figure 8, the emergency brake handle is connected to the upper end of a cable 138 passing through a flexible "Bowden" type housing 140, the cable 138 extending in any desired manner to the emergency brake.

I prefer to mount the speedometer 142 in the center of the steering wheel 32, with its flexible operating shaft 144 extending down through the center of the steering column 30. If desired the speedometer 142 may be supported by a soft rubber bushing 146 which can readily be distorted to permit a slight tilting of the speedometer casing to ground it against some part of an annular contact 148 which is connected to the usual horn or other danger signal. If preferred, the horn circuit may be provided by insulating the center wire 150 forming the right spoke of the steering wheel 32 and which is adapted to be grounded to one of the outside spokes 152 by depressing a contact 154 carried by a resilient extension 156 which may be mounted integrally with the rim of the wheel 32. A dimmer switch may be similarly provided on the opposite spoke 45 of the steering wheel.

It will be observed that all of the controls are compactly mounted on the instrument board in a manner which leaves the floor board of the car entirely clear and in a manner which at the same time strengthens and reinforces the transversely-extending dash which forms a very important structural element of the car as more fully set forth and claimed in my co-pending application No. 677,610 filed June 26, 1933. Suitable compartments may be provided at opposite sides of the instrument board, with removable covers 160 of any desired form.

The arrangement shown in Figures 13 and 14 differs from that described above in several respects. The steering column bracket 234 for the steering column 30 is arranged to form a housing 160 containing intermeshing gears connecting the steering shaft in column 30 with a vertical shaft in an auxiliary vertical column 162. This vertical column continues below the floor-board, and operates the steering connections to the front wheels, preferably in the manner fully described in my copending application No. 677,611, filed June 26, 1933.

70 The steering column bracket 234 is shown in the form of a casting, and engages the rear face of the dash 20 opposite a complementary casting or the like 236, forming a bracket engaging the front face of the dash, and formed to provide a hydraulic reservoir 240 for the control cylin-

ders 246 or their equivalents. As in Figure 1, the two brackets and the dash are rigidly connected, by means such as the bolts 38, to form a reinforced and strengthened composite structure.

The cylinders 246 of the controls, extend through registering openings in the dash 20 and in the bracket 234, so that the piston connecting rods 58 may be directly connected to the pedals 60 and 62. The pedals are in this arrangement, 10 however, pivoted on a boss 264 on the steering column bracket 234.

In the arrangement of Figures 15 and 16, vacuum power cylinders 306, which may form parts of standard vacuum clutch control and vacuum booster brake systems, are shown pivoted or otherwise mounted on arms integral with the steering column bracket 334. The power pistons therein are connected by means such as connecting rods 308 to extensions 310 on the upper ends 20 of the pedals 60 and 62, the supporting boss 364 for the pedals having a portion spacing the pedals apart to facilitate the connection to the power pistons, as shown in Figure 16.

In the arrangement of Figure 17, intended for 25 use when power is supplied by compressed air instead of by engine manifold suction, the cylinders 406 are pivoted or otherwise mounted on an upwardly extending part of that portion of the steering column bracket 434 which engages 30 the dash 20. The piston connecting rods 408 in this arrangement thrust against upward extensions 410 of the pedals. The brackets 434 and 436 are suitably modified to facilitate this cylinder mounting. 35

While several illustrative constructions have been described in detail, it is not my intention to limit the scope of the invention by that description, or otherwise than by the terms of the appended claims. 40

I claim:

1. An automobile control assembly comprising, in combination with a dash, a steering column having a supporting bracket engaging one face of the dash, another supporting bracket engaging 45 the other face of the dash opposite the first bracket, means for securing the two brackets together and to the dash, operating hydraulic devices carried by the said other bracket, pedals mounted on the first bracket and arranged to actuate certain of said hydraulic devices, a vacuum booster device carried by said first bracket and arranged to actuate one of said pedals, and a gear-shift lever mounted on the dash and arranged selectively to operate certain of said devices for shifting gears. 55

2. An automobile control assembly comprising, in combination with a dash, a steering column having a supporting bracket engaging one face of the dash, another supporting bracket engaging 60 the other face of the dash opposite the first bracket, means for securing the two brackets together and to the dash, operating hydraulic devices carried by the said other bracket, and means carried by the first bracket for actuating 65 said devices selectively.

3. An automobile control assembly comprising in combination with a dash, a steering column having a supporting bracket engaging one face of the dash, another bracket carrying a plurality of hydraulic operating devices and engaging the other face of the dash opposite the first bracket, means for securing the two brackets together and to the dash, and actuating means for selectively operating said devices and including 75

downwardly-extending pedals pivoted on said assembly and arranged at their lower ends for operative engagement by the driver's foot.

4. An automobile control assembly comprising, in combination with a dash, a steering column having a supporting bracket engaging one face of the dash, another bracket carrying a plurality of hydraulic operating devices and engaging the other face of the dash opposite the first bracket, means for securing the two brackets together and to the dash, actuating means for selectively operating said devices and including downwardly-extending pedals pivoted on said assembly and arranged at their lower ends for operative engagement by the driver's foot, and power means arranged also to act on one of said pedals.

5. An automobile control assembly comprising, in combination with a dash, a steering column having a supporting bracket engaging one face of the dash, another bracket carrying a plurality of hydraulic operating devices and engaging the other face of the dash opposite the first bracket, means for securing the two brackets together and to the dash, actuating means for selectively operating said device and including downwardly-extending pedals pivoted on said assembly and arranged at their lower ends for operative engagement by the driver's foot, and a vacuum power device carried by the dash and connected to the upper end of one of said pedals.

6. An automobile control assembly comprising, in combination with a dash, a plurality of hydraulic devices formed as a unit mounted on said dash and having one side of the unit engaging one face of the dash, actuating means for selectively operating said devices formed as a second unit having one side engaging the other face of the dash opposite the first unit and including downwardly-extending pedals pivoted on said assembly and arranged at their lower ends for operative engagement by the driver's foot and fastening means engaging the two units and securing them to each other and to the dash as one rigid assembly.

7. An automobile control assembly comprising, in combination with a dash, a hydraulic device formed as a unit mounted on said dash and having one side engaging one face of the dash, a second unit engaging the other face of the dash opposite the first unit and including a downwardly-extending pedal pivoted at its upper end and connected through the dash to operate the hydraulic device and arranged at its lower end for operative engagement by the driver's foot, and fastening means securing said units and dash together in one rigid assembly.

8. An automobile control assembly comprising, in combination with a dash having an instrument board carried thereby and spaced rearwardly thereof, a hydraulic device formed as a unit mounted on said dash, a downwardly-extending pedal connected to operate said device and pivoted on said assembly and arranged at its lower end for operative engagement by the driver's foot, and a power device mounted in said assembly in the space between the dash and the instrument board and connected to the upper end of said pedal.

9. An automobile control system comprising, in combination with a dash, a hydraulic device form-

ing a unit mounted on the dash and having one side engaging the dash, a second unit engaging the other face of the dash opposite the first unit and including a downwardly-extending pedal connected to operate the hydraulic device and pivoted on said second unit and arranged at its lower end for operative engagement by the driver's foot, a power operator mounted on one of said units adjacent the upper end of and operatively connected to said pedal, and means for securing said units and said dash together in a rigid composite reinforced structure.

10. An automobile control system comprising, in combination with a dash having an instrument board carried thereby and spaced therefrom, a hydraulic device adjacent the dash, a downwardly-extending pedal operating the hydraulic device and pivoted on said dash and arranged at its lower end for operative engagement by the driver's foot and a power device arranged in the space between the dash and the instrument board and operatively connected to the upper end of said pedal.

11. A hydraulic power unit comprising a reservoir member having below and in communication therewith at times cylinders each having a piston, one for a brake system, and one for a clutch, a steering column, means for jointly supporting said steering column and said unit, and driver-operated devices supported by said supporting means and arranged for selective actuation of said pistons.

12. Control means comprising a steering column having a power cylinder mounted thereon, hydraulic master cylinder means, a common mounting for said steering column and said means, and means whereby the power cylinder acts on said master cylinder.

13. Control means comprising, in combination with a dash, a bracket engaging the front face of the dash and having hydraulic operating means provided therein, another bracket engaging the rear face of the dash and having supported thereon an inclined driver-operated steering column and a vertical column operated by the inclined column and extending downwardly toward the bottom of the dash, driver operated means at the rear of the dash and supported by one of said brackets and arranged to operate said hydraulic means, and means for fastening the two brackets and the dash together in one rigid composite reinforced structure.

14. Control means comprising, in combination with a dash, a bracket engaging the front face of the dash and having hydraulic operating means provided therein, another bracket engaging the rear face of the dash and having supported thereon an inclined driver-operated steering column and a vertical column operated by the inclined column and extending downwardly toward the bottom of the dash, driver-operated means at the rear of the dash and supported by one of said brackets and arranged to operate said hydraulic means, means for fastening the two brackets and the dash together in one rigid composite reinforced structure, and power means mounted on the steering column bracket and connected to said driver-operated means.