Dec. 14, 1943. J. WHITE 2,336,762

HORN CONTROL SYSTEM

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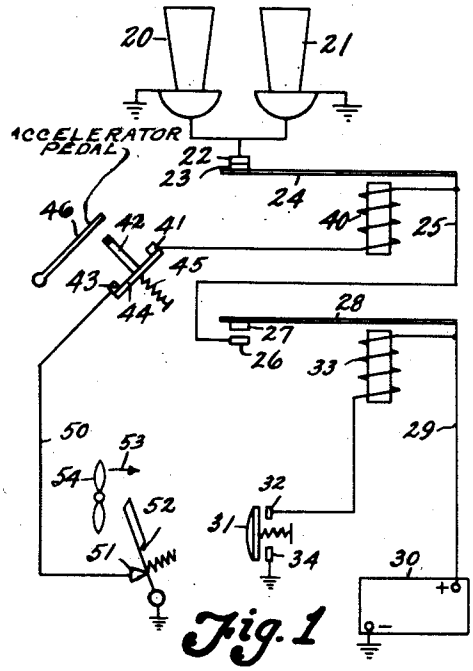


Fig. 1

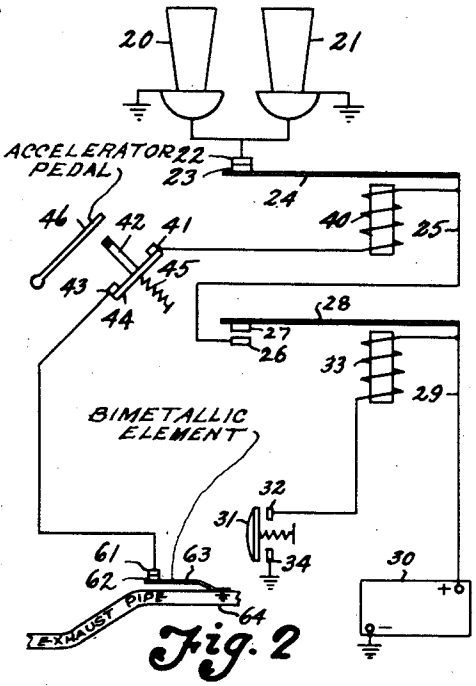


Fig. 2

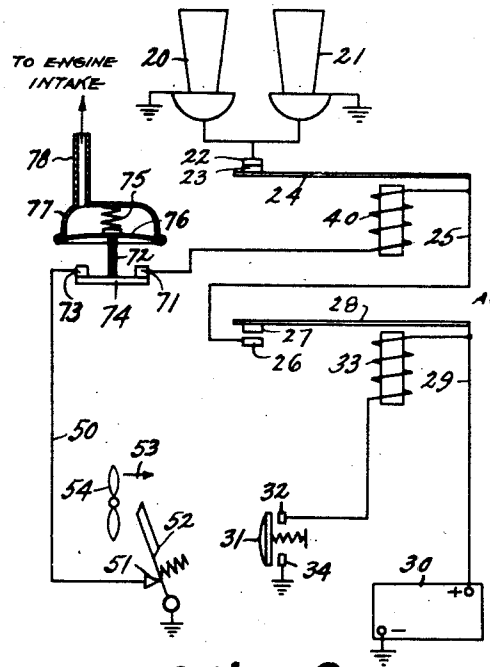


Fig. 3

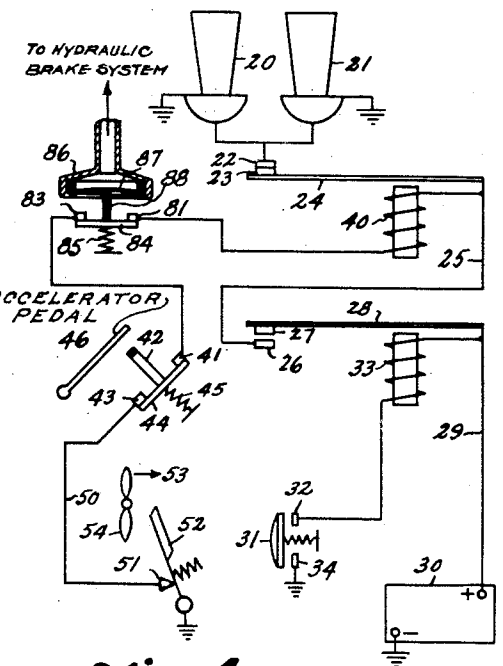


Fig. 4

INVENTOR
Joe White
BY
Spencer Hardman & Fehr
his ATTORNEYS

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HORN CONTROL SYSTEM

Joe White, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

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1 Claim. (Cl. 177—7)

This invention relates to systems of controlling automobile horns, and more particularly to a system which provides for the sounding of a relatively short, low blast in ordinary city driving and for sounding as long a blast as desired when driving above a certain speed usually attained when driving outside of the city limits.

It is the aim of the present invention to provide a system of control such that when accelerating the vehicle in order to pass another vehicle or for any other reason the horn may be sounded as long as desired regardless of whether the driving is done within or outside the limits of the city. In order to provide this control in some forms of my invention I take advantage of the fact that the accelerator pedal is depressed to an extent further than required for normal city driving and I use this additional movement of the accelerator pedal to operate a switch which disables the device which provides for a short blast only of the horn.

In another form of my invention I provide an engine suction responsive switch which is actuated by the momentary decrease in engine intake suction during acceleration to disable the device which provides for a short blast only.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein preferred embodiments of the present invention are clearly shown.

In the drawing:

Figures 1, 2, 3 and 4 are diagrams of various embodiments of my invention.

Referring to Figure 1, a pair of horns 20 and 21 which are grounded at one terminal are connected with a relay contact 22 normally engaged by movable contact 23 carried by armature 24 connected by wire 25 with a relay contact 26 normally out of engagement with a movable contact 27 attached to armature 28 connected by wire 29 with a storage battery 30 which is grounded. In order to effect the closing of contacts 26 and 27, the car driver presses the horn button 31 which bridges a contact 32, connected with wire 29 through relay magnet coil 33, and a contact 34 which is grounded. This energizes magnet coil 33 causing attraction of armature 28 and the closing of contacts 26 and 27, whereupon current may flow to the horns through wire 29, armature 28, contacts 27 and 26, wire 25, armature 24, contacts 23 and 22 through the horns 20 and 21 and back to the battery 30.

The horns 20 and 21 will sound so long as the horn button 31 is pressed and provided the contacts 22 and 23 remain closed. Contacts 22 and 23 will remain closed only a brief instant after the closing of contacts 26 and 27 for normal city driving. The opening of contacts 22 and 23 a brief instant after the pressing of the horn button 31 is effected by means of a circuit which includes a relay magnet winding 40 connected with wire 25, contacts 41 and 43 normally bridged by a movable contact 44 urged by a spring 45 against contacts 41 and 43. Movable contact 44 is actuated by a plunger 42, the insulated upper end of which is engaged by accelerator pedal 46 when moved sufficiently to accelerate the engine when driving in the city. Contact 43 is connected by wire 50 with a contact 51 normally engaged by an air vane contact 52 which is grounded. The air vane 52 is in the path of circulation of air indicated by arrow 53 which is impelled by the engine cooling fan 54. Therefore, when the accelerator switch is closed and the air vane switch is closed the pressing of the horn button results in only a short blast of the horns. When it is desired to blow the horn to give a long warning signal when passing in city traffic, the accelerator switch is opened due to the fact that the accelerator pedal must be pressed beyond normal city driving position, to a position which will produce rapid acceleration. The opening of the accelerator switch will disable the relay winding 40 so that the contacts 23 and 22 will remain closed and the horn may be sounded as long as the horn button 31 is pressed. When the vehicle speed exceeds a higher limit, for example 35 miles per hour, the air vane 52 will be moved out of contact with the contact 51 in order to interrupt the circuit of the relay magnet winding 40. Therefore, when driving above 35 miles per hour, for example, a long blast signal can be given whether or not the car is being accelerated.

Figure 2 shows a form of the invention in which a thermal switch responsive to engine temperature has been substituted for the air switch of Figure 1. This thermal switch comprises normally closed contacts 61 and 62 and a bimetallic element 63 carrying the contact 62. The blade 63 is in thermal relation with the engine exhaust pipe 64. I take advantage of the fact that engine exhaust temperatures increase generally as the engine speed increases. Therefore, at some predetermined speed such as 35 miles per hour, the thermostat blade 63 will bend sufficiently to separate contact 62 from contact 61 and the circuit through the relay magnet winding 40 will be interrupted as in the case of the use of an air switch.

This thermal switch is roughly responsive to vehicle speed. The operation of the switch will vary according to the engine load and engine operating temperature which vary according to the season of the year. There will be a variation due to the rise in temperature as the engine begins operating from a cold state. Generally speaking, the thermal switch will open the circuit at contacts 61 and 62 somewhere between a vehicle speed of 35 M. P. H. and 40 M. P. H., when the vehicle is driven on level ground. The thermal switch responsive to exhaust temperature finds its application on vehicles which are so constructed that it is impractical to install an air switch.

Figure 3 discloses the use of a switch responsive to engine intake suction instead of the accelerator switch. In Figure 3 the contacts 71, 74 and 73 replace contacts 41, 44 and 43 respectively of Figure 1. The bridging contact 74 is insulatingly supported by a diaphragm 76 through a non-conducting rod 72. Diaphragm 76 provides a flexible wall for a suction chamber box 77 connected by pipe 78 with the engine intake manifold. During normal driving in the city, the engine intake suction is sufficient to draw the diaphragm 76 upwardly against the action of spring 75, so as to maintain contact 74 in engagement with contacts 71 and 73 so long as the engine is operating. During the acceleration of the car engine intake suction will decrease to such extent that the spring 75 will cause the contact 74 to be separated from contacts 71 and 73 thereby interrupting the circuit of the relay magnet winding 40. In this way the short blast means is disabled during accelerating so that the horns may be sounded as long as the horn button 31 is pressed.

The form shown in Figure 4 differs from that shown in Figure 1 by the inclusion of a fluid pressure operated switch responsive to the application of brakes in a hydraulic brake system. This switch comprises a contact 81 connected with relay magnet winding 40, a contact 83 connected with accelerator switch contact 41 and a movable bridging contact 84 normally urged by spring 85 into engagement with the other contacts 81 and 83. A pressure fluid chamber is provided by housing 86 and a flexible diaphragm 87. This chamber is connected with the hydraulic brake system. When the brakes are applied the diaphragm 87 is flexed downwardly and its motion is transmitted to the non-conducting rod 88 through a contact 84 causing it to become separated from the contacts 81 and 83 thereby disabling the short blast means of the system. Therefore in the system shown in Figure 4 I have provided the combination of means responsive to the application of brakes, means responsive to engine acceleration and means responsive to the attaining of speeds above a certain city speed limit, for example 35 M. P. H. for disabling the short blast means, whereby the driver may sound the horn for as long a time as desired in case the brakes are applied or in case the engine is accelerated, or in case the speed of the vehicle has exceeded 35 miles per hour.

While I have shown a fluid pressure switch operating in response to the application of hydraulic brakes, it will be understood that the present invention contemplates the use of a switch actuated in response to the application of any kind of brake whether it be mechanical, electrical or fluid pressure actuated.

While the embodiments of the present invention as herein disclosed, constitute preferred forms, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

A horn control system for automobiles comprising an electric horn, a current source, a series circuit comprising only the source, the horn, a manually-controlled, normally-open switch and a pair of normally closed relay contacts, and a circuit parallelling the relay contacts and the horn and comprising, in series, a magnet coil for opening the relay contacts and a plurality of normally closed switches, one of which opens in response to the attainment of a certain vehicle speed and another of which opens in response to the opening of the engine throttle valve to a certain extent.

JOE WHITE.