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HORN CONTROL SYSTEM

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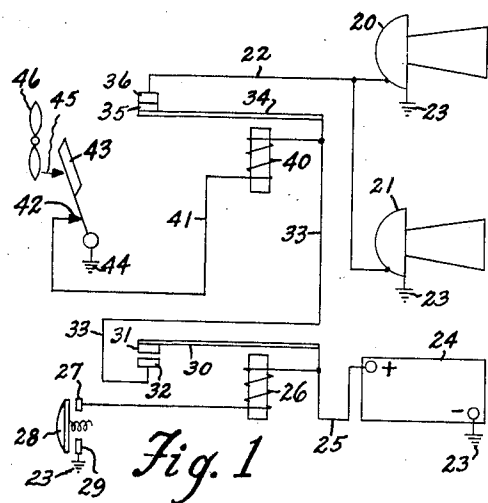


Fig. 1

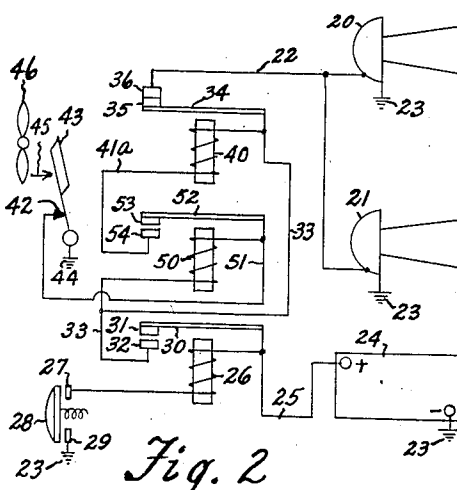


Fig. 2

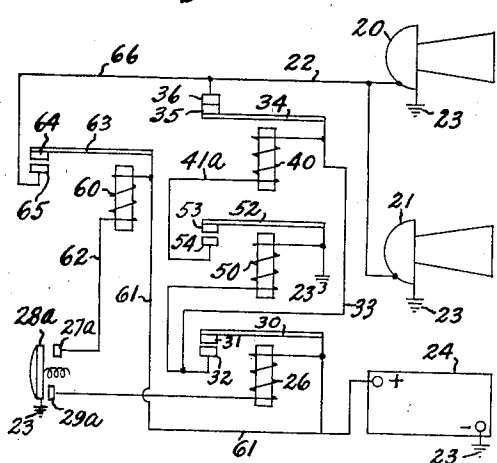


Fig. 3

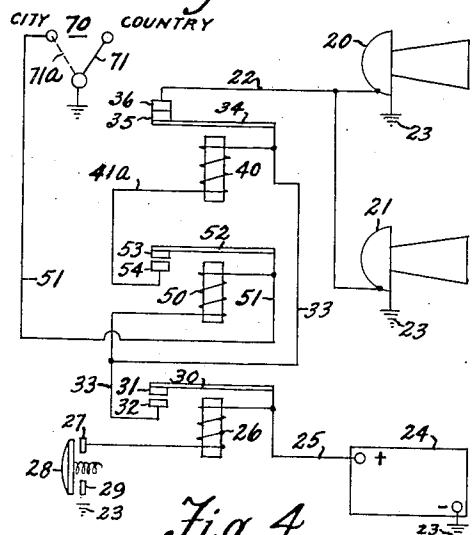


Fig. 4

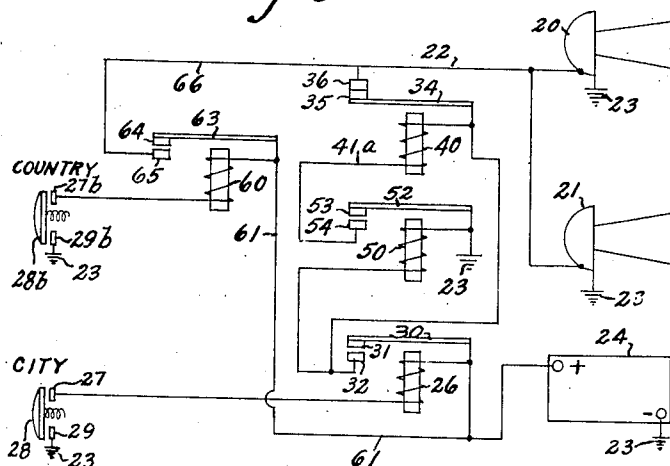


Fig. 5

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HORN CONTROL SYSTEM

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4 Claims. (Cl. 177-7)

This invention relates to horn signalling systems for automobiles. In the conventional horn control system the operation of the horn is controlled by the car driver who presses a push button generally known as the "horn button." The duration of the operation of the horn depends on how long the driver presses the horn button. Generally when driving in the country it is desirable, when passing a car, to give the driver of the car to be passed considerable warning. Therefore, a long blast of the horn is frequently necessary. However, when driving in the city or in any relatively populous district long blasts of the horn are not necessary and are frequently very irritating, particularly to pedestrians. It is, therefore, an aim and object of the present invention to provide a system of horn control by which the horn may be operated in driving in the country to give as long a blast as is desired, but when driving in the city or at relatively slow speeds which would be encountered in any relatively populous area, the horn can be sounded only to give a short blast which will give a warning for slow speed driving and will not be objectionable. In connection with my novel short blast and long blast control system I provide means for automatically selecting circuits which will give a short blast when the horn button is pressed for city driving or when driving at speeds at or below the prescribed legal limits for driving in relatively populous areas and which will permit the operator to obtain a continuous blast of as long a duration as he pleases when driving at speeds such as are legal for country driving. Also I provide means under the direct control of the operator for manually selecting which sort of signal, short blast or long blast, the driver desires to give.

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

In the drawing:

Figure 1 is a wiring diagram of a horn control system in which the selection of a short or long blast is under the control of an air switch operated by the air blast of the engine cooling fan;

Figure 2 is similar to Figure 1, but includes an additional relay for increasing the length of the short blast;

Figure 3 is a diagram similar to Figure 2, in which the control of the short or long blast is

obtained by a horn button having two circuit-closing positions;

Figure 4 is a diagram of a control system in which the control of the short or long blast is obtained by an auxiliary switch which may be mounted on the automobile instrument board; and

Figure 5 is a diagram of a short or long blast control circuit in which the short blast is obtained by one horn button and the long blast by another.

Referring to Figure 1, the warning signal may be given by a single horn or by a pair of horns 20 and 21, which are connected together in parallel by wire 22 and ground connections 23 leading to the negative terminal of grounded battery 24. The positive terminal of battery 24 is connected by a wire 25 leading to a relay coil 26 connected with horn button contact 27 capable of being bridged by movable contact 28 with a grounded contact 29. When the button 28 is pressed against the contacts 27 and 29 a circuit is completed through the relay magnet coil 26, thereby effecting attraction of an armature 30 which moves a contact 31 into engagement with a contact 32. Then the battery 24 is connected with the horns 20 and 21 through the following circuit: battery 24, wire 25, armature 30, contacts 31 and 32, wire 33, relay armature 34, normally closed contacts 35 and 36, wire 22, horns 20 and 21 and ground 23. When the circuit is in the condition shown in Fig. 1, the horns will give only a short blast because current is being supplied through the wire 33 to relay magnet coil 40 which is connected by wire 41 with air switch contact 42 normally engaged by air switch vane 43 grounded at 44. The relay 40 is constructed to give an appreciable time lag between the closing of the contacts 31 and 32 of the lower relay and opening of contacts 35 and 36 of the upper relay. This lag may be only a fraction of a second but will be sufficient to permit the horns 20 and 21 to give a short blast. However, as soon as current builds up in the winding 40 sufficiently to cause the armature 34 to be attracted, the contact 35 will be separated from contact 36 and the sound of the horns will cease, and these contacts will remain separated so long as the operator keeps the horn button contact 28 in engagement with contacts 27 and 29. To obtain a second short blast of the horn the driver must release the horn button 28 and then press again. As long as the air switch remains closed only a short blast signal can be given. Assuming that the legal speed limit for residential sectional

driving is 35 miles an hour, the air switch can be constructed so that its contacts 42 and 43 can remain closed at speeds of 35 miles an hour or below, and open at speeds above 35 miles an hour. The air vane 43 is located so as to be impinged upon by an air current represented by an arrow 45 created by the engine cooling fan 46. Above 35 miles an hour this air current will be sufficiently strong to cause the air switch vane 43 to swing away from contact 42, thereby interrupting the ground connection of the coil 40. Thereafter, when the button 28 is pressed against the contacts 27 and 29, only the relay magnet 26 will be energized and the horns 20 and 21 will give a signal enduring so long as the horn button 28 is closed.

Figure 2 is very similar to Figure 1, except that it includes an additional relay comprising a magnet coil 50 one end of which is connected with wire 33 and the other end of which is connected with wire 51 which connects air switch contact 42 with relay armature 52 normally supporting contact 53 out of engagement with contact 54. A wire 41a connects contact 54 with the relay magnet 40. When the air switch contacts 42 and 43 are closed and the driver presses the horn button 28 to bridge the switch contacts 27 and 29, relay contacts 31 and 32 close to make connection between the battery and horn through the circuit which includes wire 25, armature 30, contacts 31 and 32, wire 33, armature 34, contacts 35 and 36 and wire 22. At the same time relay winding 50 is being excited and current therein builds up after an appreciable time lag to effect closing of contacts 53 and 54 whereupon relay magnet coil 40 becomes excited and current therein builds up after an appreciable time lag to a point where armature 34 is attracted to move contact 35 out of engagement with contact 36. Then the operation of horns 20 and 21 ceases and they can not be operated again until the driver releases the horn button 28 and presses it again. The principle of the operation of Figure 2 is the same as in Figure 1 with the exception that two time relays are used instead of one, thereby increasing the duration of the short blast. Above a predetermined speed the air switch vane 43 opens circuit at 42 thereby rendering relay magnet coil 50 ineffective and, consequently, relay magnet coil 40. Then the horns can be sounded as long as the driver presses the button 28 against the contacts 27 and 29.

The control system shown in Figure 3 employs the three relays having magnet coils 26, 50 and 40 respectively, as in Figure 2. Instead of employing an air switch to determine whether or not the relay magnets 50 and 40 shall be excited to give the short blast signal, Figure 3 includes a horn button having a grounded movable bridging contact button 28a engaging stationary contacts 27a and 29a located at different distances from the movable contact button 28a. When the button 28a is pressed only sufficiently to engage contact 29a the three relays 26, 50 and 40, will operate in succession as has been described with reference to Figure 2. This will give the short blast signal. If the button 28a is pressed still further to engage the contact 27a the three relay coils 26, 50 and 40 may be excited, but their effect is nullified due to the fact that the connection of the horn button switch contact 27a with ground 23 connects a fourth relay winding 60 directly with the battery through a wire 61 and a wire 62 connected with contact 27a. This

excited relay winding 60 causes the attraction of an armature 63 which causes a contact 64 to be moved into engagement with a contact 65 thereby connecting the horns 20 and 21 directly with the battery 24 through the following circuit: battery 24, wire 61, armature 63, contact 64, contact 65, wire 66, wire 22, horns 20 and 21 and ground connections 23.

The signal-control system shown in Figure 4 is similar to that shown in Figure 2, with the exception that the air switch shown in Figure 2 has been replaced by a manually operated selector switch 70 having a grounded blade 71 which can be moved to country driving position rendering relay coils 50 and 40 inoperative, or to a city driving position, indicated by the dash line 71a, thereby establishing a grounded circuit for the windings 40 and 50. When the switch is in position 71a only a short blast signal will be produced; and, when it is in the position 71, the duration of the blast will be as long as the horn button 28 is maintained closed.

The signal control system shown in Figure 5 is substantially like that shown in Figure 3 with the exception that the single horn switch having two "on" positions has been replaced by two horn switches; one of these is the horn switch 28 which controls the three relays included respectively in the magnet windings 26, 50 and 40, just as it did in Figure 2, in order to obtain the short blast signal. This switch 28 may be labeled "City" to indicate that it is to be used for city driving. A separate switch having parts 28b, 27b and 29b, and labeled "Country" performs the same function with respect to the relay having a magnet coil 60 as is performed by the closing of horn contacts 28a and 27a in Figure 3.

From the foregoing description of the various signalling systems embodying my invention it is apparent that I have provided a horn button for closing a circuit between the current source and a horn or pair of horns, a relay switch which becomes operative a short time after closing of the horn button to interrupt the horn circuit in order to obtain a short blast from the horn, and means for rendering the interrupting means ineffective. In Figures 1 and 2 the means which renders the interrupting means ineffective is the air switch 42, 43. In Figure 4, the interrupting means is rendered inoperative by a dash switch 70 which can be set either for city or for country driving. In Figures 3 and 5, the interrupting means is circumvented by a relay 60, 63, 64, 65, controlled and made operative by the moving of the horn button into a second circuit closing position in Figure 3, or by the use of a second horn button as in Figure 5.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A horn control system for automobiles comprising an electric horn, a current source, a series circuit comprising only the source, and a manually controlled, normally open switch, a pair of normally closed relay contacts and the horn and a circuit paralleling the relay contacts and the horn and comprising in series, a magnet coil for opening the relay contacts and a circuit making device for making a connection between the source and the magnet coil.

2. A horn control system for automobiles comprising an electric horn, a current source, a series

circuit comprising only the source, and a manually controlled, normally open switch, a pair of normally closed relay contacts and the horn, a circuit paralleling the relay contacts and the horn and comprising in series, a magnet coil for opening the relay contacts and a pair of normally open relay contacts and a circuit paralleling the said magnet coil and said normally open relay contacts and comprising a magnet coil for closing said normally open relay contacts.

3. A horn control system for automobiles comprising an electric horn, a current source, a series circuit comprising only the source, and a manually controlled, normally open switch, a pair of normally closed relay contacts and the horn, a circuit paralleling the relay contacts and the horn and comprising in series, a magnet coil for opening the relay contacts and a pair of normally open relay contacts, a circuit paralleling the said magnet coil and said normally open relay contacts and comprising a magnet coil for closing said normally open relay contacts.

relay contacts and comprising a magnet coil for closing said normally open relay contacts, and a switch for making a connection between the source and both of said paralleling circuits.

5 4. A horn control system for automobiles comprising an electric horn, a current source, a series circuit comprising only the source, and a manually controlled, normally open switch, a pair of normally closed relay contacts and the horn, a circuit paralleling the relay contacts and the horn and comprising in series, a magnet coil for opening the relay contacts and a pair of normally open relay contacts, a circuit paralleling the said magnet coil and said normally open relay contacts and comprising a magnet coil for closing said normally open relay contacts, and a switch for making a connection between the source and the horn independently of the switch and relay contacts of the first circuit.

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