

April 20, 1937.

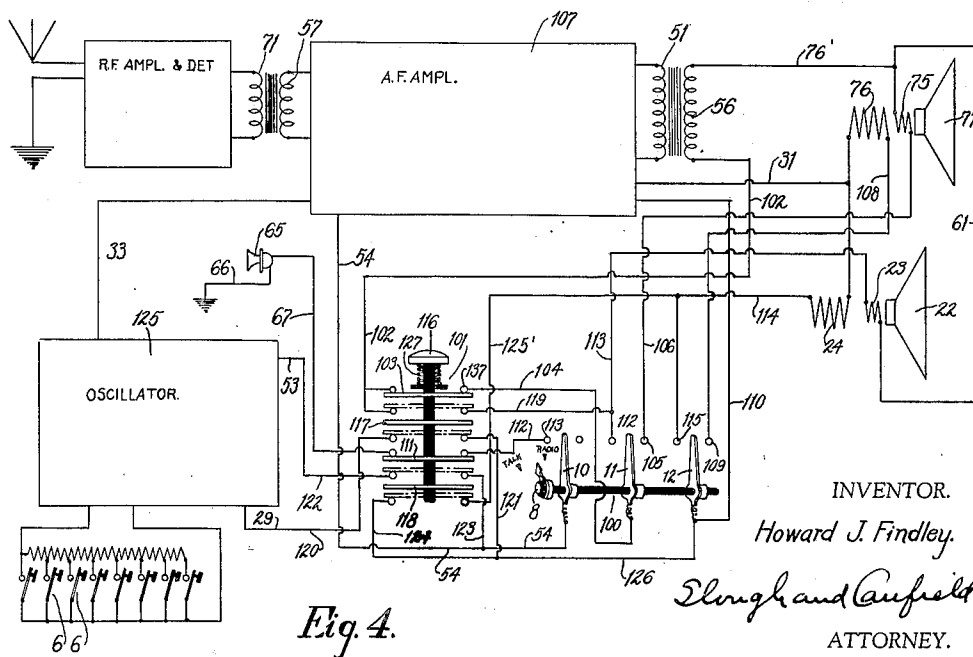
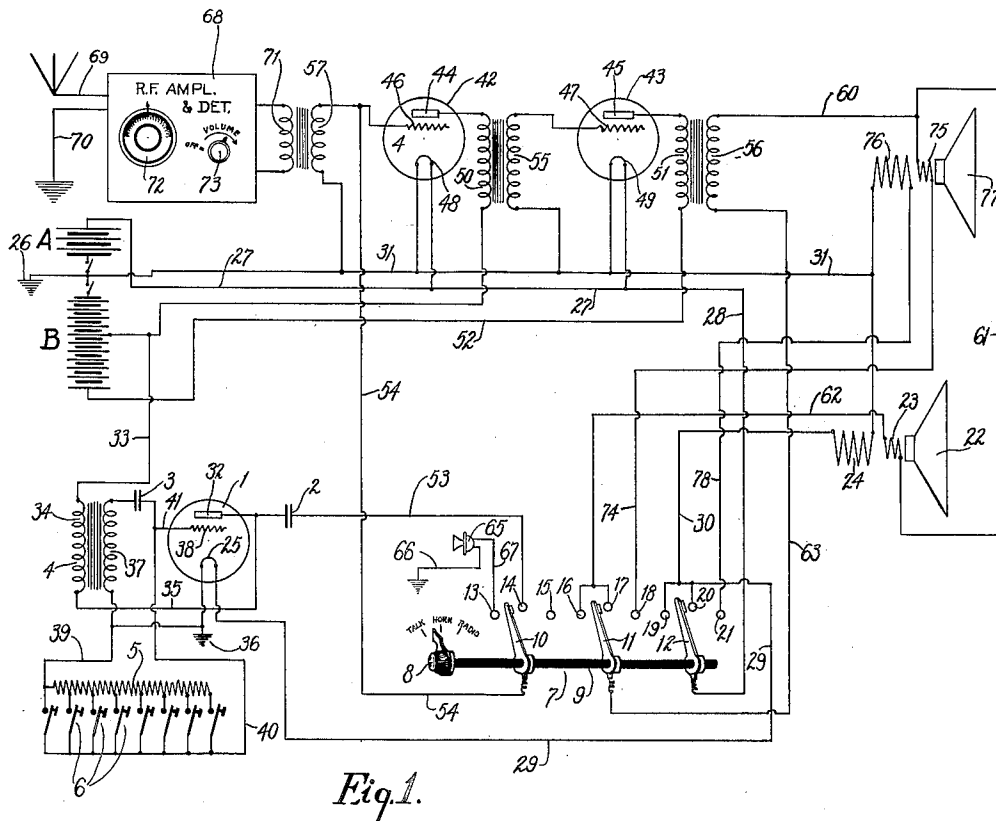
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2,077,552

RADIO SIGNALING SYSTEM AND APPARATUS

Filed Sept. 20, 1933

2 Sheets-Sheet 1



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RADIO SIGNALING SYSTEM AND APPARATUS

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2 Sheets-Sheet 2

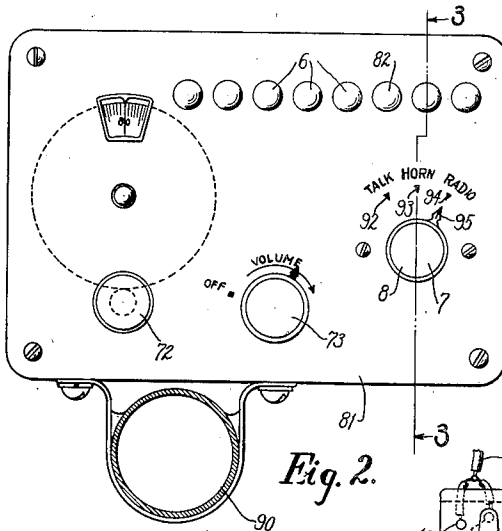


Fig. 2.

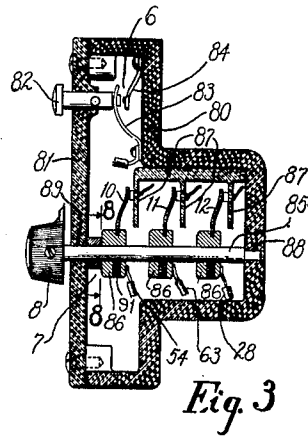


Fig. 3

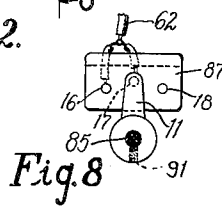


Fig. 8

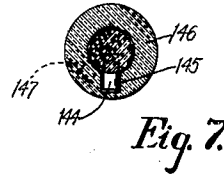


Fig. 7

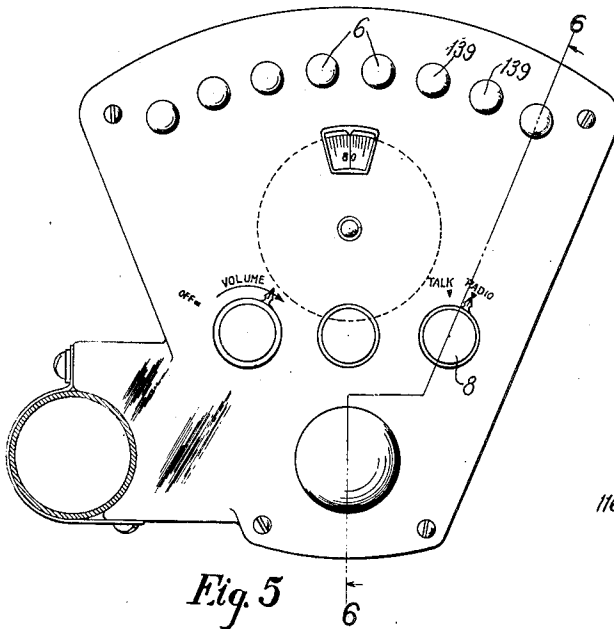


Fig. 5

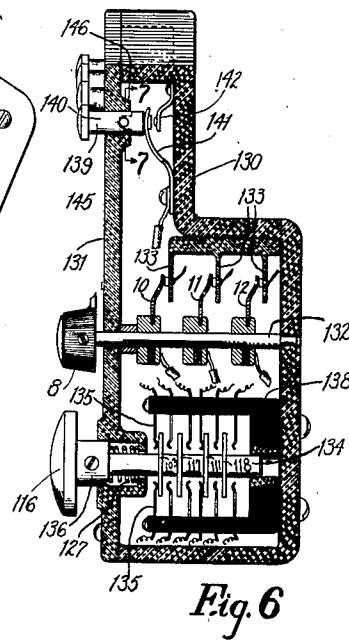


Fig. 6

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RADIO SIGNALING SYSTEM AND APPARATUS

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Application September 20, 1933, Serial No. 690,243

11 Claims. (Cl. 179—2)

This invention relates to signaling systems and apparatus and particularly to signaling systems and apparatus for vehicles such as automotive vehicles.

5 Certain aspects of my invention may be practiced with particular advantage in connection with a vehicle equipped with a radio receiver or so-called receiving set by which broadcasted signals, programs etc. may be received by the vehicle driver and passengers of the vehicle; but as will appear hereinafter, certain particular advantages of my invention may be enjoyed entirely apart from such radio reception.

10 It is an object of my invention to provide generally an improved signaling system and apparatus.

Another object is to provide a signaling system and apparatus employing the principles of radio reception and amplification in an improved manner.

20 Another object is to provide a signaling system and apparatus whereby electrical oscillations may be produced at will of predetermined frequency in an electric circuit and translated into amplified sound signals of predetermined musical tone frequency, in an improved manner.

Another object is to provide a signaling system and apparatus whereby electric oscillations may be produced at will in an electric circuit at any one of a plurality of frequencies selectively, singly or in sequence, and translated into amplified sound-signals of corresponding predetermined musical tone frequencies in an improved manner.

30 Another object is to provide, in a signaling system and apparatus in which oscillations in an electric circuit are translated into amplified sound signals, improved control means for selectively varying the frequency of the oscillations to effect the production of signals of selectively different tone pitch.

Another object is to provide, in a signaling system and apparatus in which oscillations in an electric circuit are translated into amplified sound signals of predetermined musical tone frequency, improved control means to selectively vary the frequency of the oscillations to effect the production of signals of a plurality of different musical tones, either singly or in sequence.

Another object is to provide a signaling system and apparatus employing a radio amplification circuit and apparatus and improved means for selectively employing the same to amplify and render audible selectively a plurality of different kinds of signals transmitted electrically thereto.

55 Another object is to provide, in a signaling system and apparatus of the class whereby a plurality of different kinds of audible signals may be produced electrically, improved control means for effecting selection and production of the signals.

Other objects will be apparent to those skilled in the art to which my invention appertains.

My invention is fully disclosed in the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a diagrammatic representation of electric circuits and apparatus whereby my invention may be practiced in one form;

Fig. 2 is a view illustrating a form of control apparatus which may be employed with the circuits of Fig. 1 and which is illustrated diagrammatically in Fig. 1;

Fig. 3 is a sectional view taken from the plane 3—3 of Fig. 2;

Fig. 4 is a view generally similar to Fig. 1 but illustrating a modification which I may employ;

Fig. 5 is a view similar to Fig. 2 but illustrating a controller which may be utilized with the modification of Fig. 4;

Fig. 6 is a sectional view taken from the plane 6—6 of Fig. 5;

Fig. 7 is a fragmentary sectional view taken from the plane 7—7 of Fig. 6;

Fig. 8 is a fragmentary sectional view taken from the plane 8—8 of Fig. 3.

Referring to the drawings, Fig. 1, I have shown at 1 a three-element electron tube, which may be of well known construction as commonly employed in radio apparatus. At 2 and 3 are condensers of selected capacitance. At 4 is an iron core transformer, and at 5 a rheostat or resistance unit associated with which is a plurality, such as eight, manually operable switches 6—8 by which the resistance of the rheostat 5 in the circuit to be described may be selectively varied.

The apparatus thus far referred to and suitable electric circuits which will be described constitute what may be called an oscillator inasmuch as electric oscillations may be set up therein, the frequency of which may be selectively varied by the switches 6—8.

At 7 is a manually operable switch having a knob or handle 8 and comprising a shaft 9 rotatable by the handle, and arms 10, 11 and 12 projecting radially from the shaft 9 engageable selectively with three corresponding groups of three contacts each indicated by the reference characters 13 to 21 inclusive.

At 22 is a sound amplifying horn or loud speaker of the dynamic type having an armature winding 23 and a field winding 24. The horn

22—23—24 may be of any known or suitable construction whereby current impulses transmitted to the armature winding 23 may react upon the magnetism generated by the field winding 24 and translate the current impulses into sound waves amplified by the horn 22.

The other elements of apparatus illustrated in the figure and employed in the preferred practice of my invention may be those well known in the art and will be described or identified in the following description of the mode of operation thereof.

According to this preferred mode of operation, the operator of the apparatus, for example the driver of a vehicle on which the apparatus is installed, may cause the horn 22 to emit musical tones as signals. Tones of any one of a plurality of different pitches such as eight different tones may be sounded, or these tones may be sounded in sequence having the character of musical tunes. The switch knob 8 may normally rest in the "horn" position indicated in Fig. 1 or may be upon occasion moved to that position whereupon the switch arms 10, 11 and 12 will respectively move into engagement with the contacts 14, 17 and 20. This will energize the filament 25 of the oscillator tube 1 along the following circuit, from ground 26 through battery A and by wires 27, 28, arm 12, contact 20, wire 29 to the filament and thence to ground. Current may also flow from the battery A and by wires 27 and 28, arm 12, contact 20 and wire 30 to the horn field winding 24 and thence by wire 31 back to the battery A, energizing the horn field. A high potential is established between the filament 25 and the tube plate 32 by a battery B, the circuit being traced from ground 36 to the filament 25, thence to the plate 32 and by wires 35 to the primary 34 of the transformer 4, and thence by wire 33 to the upper part of the battery B and thence to ground.

A local oscillation circuit is provided comprising the condenser 3, the transformer secondary 37, a wire 39, the resistance 5, through one or the other of the switches 6, and a wire 40, one side of this circuit being connected to the ground 36 and the other by a wire 41 to the tube grid 38.

Oscillations are set up in this circuit upon closing any one of the switches 6—6 due to the fact that the current in the plate circuit above described comprising the transformer primary 34 reacts upon the oscillating circuit through the secondary 37 of the transformer and the current in the oscillating circuit in turn reacts upon the plate circuit through the grid 38.

The frequency of oscillations in this circuit will be determined by the well known factors of resistance, capacitance and inductance of the circuit, and the elements of the resistance 5 are so proportioned that upon closing any one of the switches 6, the circuit will oscillate and oscillate at a musical tone frequency. Preferably the different frequencies thus effected will have the relative interval relation of the eight tones of a diatonic musical scale one octave in extent.

The oscillations thus produced are amplified in a two-tube amplifier, the three-element electron tubes of which are illustrated at 42 and 43. These tubes have plates 44 and 45, grids 46 and 47 and filaments 48 and 49. The filaments are energized by the battery A across the wires 31 and 27 above described. A plate circuit is energized by the battery B and the circuits therefor may be traced from the wire 31, to filament 48 and thence to the plate 44 and transformer primary

50 to a positive connection on the battery B and through the battery to negative. A similar circuit is provided for the plate 45 through a transformer primary 51 and by a wire 52 to a higher point on the battery B and thence to negative at the other end of the battery B.

The oscillations in the oscillator circuit are impressed upon the grid 46 of the tube 42 by a circuit which may be traced from the plate 32 of the tube 1, through the condenser 2 and by a wire 53 to contact 14, arm 10, and a wire 54 to the grid 46, the polarity of the plate 32 differing from that of the filament 48 and responding to voltage fluctuation effected by the oscillations.

The oscillations in the grid 46 are amplified in the circuit of the plate 44 in the well known manner and induce corresponding oscillations in the transformer secondary 55 and correspondingly in the circuit of the grid 47. The circuit of the plate 45 and primary 51 again amplify the oscillations and they are correspondingly induced in the transformer secondary 56.

It will be seen that the amplifying circuits of the filament, grid and plate of the tubes 42 and 43 are those of the well known audio frequency amplification of a broadcast radio receiving set except that the grid 46 of the first tube responds to the oscillations in the wire 54 instead of from the usual transformer secondary 57. This secondary 57 is illustrated in the drawings for a purpose to be described but does not function as a secondary of a transformer in the system being considered at this point.

The oscillations produced as above described and now greatly amplified in the transformer secondary 56, are impressed upon the armature winding 23 of the horn 22 by a circuit including the wires 60, 61, armature winding 23, wire 62, switch contact 17, arm 11, and wire 63, and are converted into sound of great magnitude in the horn 22 in the well known manner above referred to. And inasmuch as the sounds are produced from amplified oscillations of musical tone frequency, the horn will emit musical tones. As will now be clear, the musical tones emitted by the horn may be varied by closing selectively one or another of the switches 6—6 to vary the periodicity of the oscillations. Likewise, the signal emitted by the horn may be made to be in the nature of a musical tune by closing the switches one after another in the suitable sequence.

Thus signals of great variety as well as of great beauty may be produced by the horn 22.

By means of a very small addition to the system above described, the horn 22 may be made to emit voice signals amplified so as to be distinctly heard outside of the vehicle by the drivers of other vehicles or by persons generally. For this purpose, a transmitter 65 is provided disposed at a convenient place in the vehicle and connected by a wire 66 to ground and by a wire 67 to the contact point 13.

The transmitter 65 is of the type which will convert voice vibrations into electric current impulses. When it is desired to effect this type of signal, the switch 8 is rotated to the "talk" position. This cuts out the oscillator circuit wire 53 so that the horn 22 will no longer be responsive to musical tone signals and effects the circuit for the transmitter impulses, from the contact 13 above mentioned to arm 10, wire 54, whereby the impulses are impressed upon the grid 46 of the tube 42. It will be observed that although the switch arms 11 and 12 are moved over from con-

tact points 17 and 20 to 16 and 18 respectively, the circuits thereof are not changed so that now the voice impulses transmitted over the wire 54 will be amplified and converted into amplified sound by the horn 22.

The amplifying apparatus and circuit comprising the tubes 42 and 43 and the transformers 50—55 and 51—56 may be of a type commonly employed as an audio frequency amplifier to amplify signals, programs and the like commonly broadcasted from boardcasting stations. Therefore, when such an amplifying circuit is employed for the signaling means above described in connection with the horn 22, such amplifying circuit may conveniently be employed for the reception of broadcasted programs by the addition of a radio frequency amplifying circuit and apparatus. This is indicated in Fig. 1.

At 63 is indicated diagrammatically a panel behind which and not shown may be provided the usual or any suitable radio frequency amplifying and detector apparatus and circuit, adapted to be energized from an antenna 69 associated with the ground 70 and having a transformer primary 71 which may be associated with the above described transformer secondary winding 57.

A tuning dial 72 and a control switch 73 of usual or any suitable construction may be provided to close the circuit or circuits of the radio frequency amplification and to tune the same and the detector circuit to incoming signals and to adjust the volume thereof in a well known manner.

Such signals will be transmitted through the transformer 71—57 to the audio amplification circuit and apparatus above described; and such incoming signals or broadcast programs will be delivered to the circuit of the transformer secondary 56. When such signals are received by broadcast, the switch handle 8 may be turned to the "radio" position whereby the amplified current impulses in the secondary 56 may flow over a circuit including the secondary itself, the wire 63, arm 11, contact 18, a wire 74, through the armature winding 75 and by wire 60 back to the secondary of the transformer. The armature winding 75 may be that of a dynamic loud speaker having a field winding 76 and a sound amplifying horn or the like 77. The field 76 may have an energizing circuit, closed upon operation of the switch to the "radio" position, as follows, from positive of the battery A, by wire 27, arm 12 to contact 21, and thence by wire 78 to the field winding 76 and thence by wire 31 to the A battery negative.

Incoming programs will thus be amplified and given out on the horn 77 which may be located within the vehicle for the entertainment of passengers therein. At such time, as will be observed, the switch 8 throws out of the circuit the amplifying horn 22 and the oscillating circuit and circuit of the transmitter 65.

In Figs. 2, 3 and 8 is illustrated one form of a controller means for operating the signal system and apparatus of Figs. 1 and 2 and embodying switches 6—6, the switch 7, and, where it is desired also to receive broadcasted programs, embodying a switch 73 and a tuning dial 72.

The controller comprises a housing 80 having a cover 81. The switches indicated generally at 6 are preferably of the push button type comprising a push button element 82 reciprocable in a suitable bore in the housing cover 81. A resilient switch finger 83 is engaged by the button and upon depressing the button is bent downwardly to

engage another resilient switch finger 84 to close an electric and to perform the circuit functions of the switch 6 of Fig. 1. Suitable circuit connections may be made to the fingers 83 and 84 corresponding to those of Fig. 1 but not shown in Figs. 2 and 3.

The several switches 6 may be disposed in a line as shown in Fig. 2 convenient to the fingers and thumb of the vehicle driver. To this end, the housing in general may be secured to the steering column of the vehicle as shown generally at 90.

The switch 7 of Fig. 1, illustrated generally at 7 in Figs. 2 and 3, comprises a shaft 85 of insulating material rotatably mounted in suitable bearings 88 and 89 in the housing and housing cover, respectively, and may be rotated or oscillated by a knob 8 externally of the cover. Three switch arms 10, 11 and 12, secured to corresponding heads 86—86—86 are rigidly secured to the shaft 85 by set screws 91 in the heads 86. Three shelves 87 of insulating material carry each three contacts in an arc about the axis of the shaft 85 as shown in Fig. 8 for the switch arm 11. A circuit wire is soldered to each of the heads 86 and wires are connected to each of the contacts on the shelves 87, see Fig. 8, and by the construction thus described it will be apparent that the circuit wires of Fig. 1 brought to the diagrammatic switch 7 of that figure may be brought to the switch 7 of Figs. 2, 3 and 8 and controlled by the operation of the switch knob 8 as and for the purposes set forth in connection with Fig. 1.

The controller cover 81 may have position points 92, 93 and 94 cooperating with a single point 95 on the switch knob 8 to indicate externally the positions of the switch arms 10, 11 and 12 and legends such as "talk", "horn", "radio", may be associated with the switch points as more fully described in connection with Fig. 1.

The switch 73 may, as in common practice of the radio frequency amplifying circuits and apparatus, have an "off" position and a plurality of volume control positions as clearly indicated in Fig. 2.

In this connection it may be stated that whereas in Fig. 2 circuits from the batteries A and B, such for example as the filament circuits, are illustrated as constantly closed, this has been done to simplify the drawings but it will be understood that, as in common practice in circuits of this general class, the circuits may be controlled by switches such as 150—151 in a well known manner; and if desired, such switch contacts can be under the control of the switch 73 to be opened when it is in its "off" position.

Where the radio frequency amplifying circuit and apparatus are not employed for the reception of incoming programs, the control of the A and B battery circuits may be effected in any suitable manner which will be clearly understood by those skilled in this art, to effect opening of these circuits when the system and apparatus are not in use.

In the operation of the system and apparatus of Fig. 1 in connection with the controller of Figs. 2, 3 and 8, normally the switch 7 will be maintained in the "horn" position and whenever it is desirable to sound a signal, the operator will press one or another of the push buttons 82, thereby sounding a signal of a corresponding musical tone on the horn 22 disposed outside of the vehicle or in a position wherefrom its sound may clearly be heard by other vehicle drivers or pedestrians etc.

When it is desired to signal by means of the human voice, the driver will move the switch 7 to the "talk" position and thereby can communicate through the horn 22 vocally with people generally outside of his car. Occasionally the switch 7 may be moved to the "radio" position to receive incoming broadcast programs, particularly at times when the vehicle is parked or on the open road where there is little probability that the "talk" or "horn" signals may be needed.

It will thus be apparent that my invention may be practiced without the radio frequency amplifying circuits and apparatus but inasmuch as the signaling system and apparatus proper, including the oscillating circuit and the transmitter 65 and the horn 22, utilizes an amplifying circuit and apparatus comprising the tubes 42 and 43 suitable for amplifying broadcast programs, the latter may be enjoyed by the addition only of the radio frequency amplifying circuits and apparatus supplemental thereto, and at slight additional expense and complication.

In Fig. 4 I have illustrated a modification of the circuit of Fig. 1, and in Figs. 5 and 6 a corresponding modification of controller means therefor. In this form, a switch 100 is provided corresponding to the switch 7 of Fig. 1 but controlling only the "talk" and the "radio" functions thereof, and a switch 101 is provided having a convenient mode of operation whereby by a single movement on the part of the driver, the "talk" and "radio" functions of the system and apparatus may be cut off or stopped and the "horn" function initiated.

If the switch 100 is in, say, the "radio" position to receive broadcast programs, the secondary 56 of the transformer of the audio frequency amplifier which is energized by the received programs, will have a circuit by a wire 102 through a bar 103 of the switch 101 normally engaging suitable contacts at its opposite ends as illustrated, and thence by wire 104 to switch arm 11, contact 105 and wire 106 to the armature winding 75 of the horn 77, and by wire 76' to the transformer 56.

The field winding 76 for the horn 77 will be energized from the A battery forming part of the audio frequency amplifying circuit and apparatus indicated generally at 107 and comprising apparatus and circuits fully described in connection with Fig. 1, and the circuit may be traced from wire 31 leading to one side of the battery as will be understood, through the field winding 76, by wire 108 to the contact 109 and thence by switch arm 12 and by wire 110 back to the other side of the A battery.

Thus, upon moving the switch knob 8 to the "radio" position, programs may be received in the vehicle from the horn 77.

Again, if the knob 8 be turned to the "talk" position, the horn 22 may be utilized to amplify voice signals originating in the vehicle. The transmitter 65 will cause current to flow along the circuit 66-65-67 through a switch bar 111 engaging contacts at its opposite ends, and by wire 112 and contact 113 to the switch arm 10, and thence to wire 54 whereby the impulses will be impressed upon the audio frequency amplifying circuit as described in connection with Fig. 1. At the same time, the armature winding 23 of the horn 22 will be energized along a circuit from transformer 56 by wire 102, switch bar 103, wire 104, switch arm 11, contact 112, wire 113, to the armature winding

23 and thence by wire 61 to the transformer secondary 56. At the same time, the field 24 is energized from the A battery above referred to by wire 31 through the field winding 24 by wire 114, contact 115, switch arm 12 and wire 110 back to the other side of the A battery.

Thus upon turning the switch knob to the "talk" position, the reception of broadcast programs will be interrupted on the horn 77 and vocal voice signals may be emitted from the horn 22. For this purpose, and also for the corresponding purposes of Fig. 1, the transmitter 65 may be provided with extension wires 66 and 67 whereby it may be conveniently moved to the speaker's mouth, and when not in use may be disposed at any convenient point within reach.

Whether the switch knob 8 be in the "talk" or the "radio" position above referred to, if at any time the driver wishes to signal with musical tones from the horn 22, he may do this by operating the switch 101 and one or another of the switches 6-6. In operating the switch 101 as viewed in Fig. 4, a large push button 116 is depressed and the bars 103 and 111 thereof as well as bars 117 and 118 thereof are depressed to their dotted line positions illustrated. The bar 103 breaks the circuit therethrough above described and makes a circuit through suitable contacts from the wire 102 to a wire 119. The bar 117 makes a circuit from wire 120 to wire 121. The bar 111 breaks the above described circuit therethrough and makes a circuit from wire 122 to wire 123, and the bar 118 makes a new circuit from wire 124 to wire 125'.

As was described in connection with Fig. 1, a filament circuit for the oscillator tube 101 forming part of the "oscillator" apparatus 125 of Fig. 4 is made to the positive side of the battery A along a circuit including the wire 29, wire 120, contact bar 117, wire 121, wires 126 and 110 to the battery. The oscillating circuit 125, upon oscillating, impresses the oscillations, by way of wire 53, wire 122, contact bar 111, wire 123 and wire 54 upon the audio frequency amplifying circuit and apparatus as before. The armature winding 23 is energized from the transformer 56, by wire 102, through contact bar 103 and by wires 110 and 113, through the armature winding and by wire 61 back to the transformer. The field winding 24 is energized over a circuit including the wire 31 from the A battery, through the field winding 24, by wire 125', contact bar 118, wires 126 and 110 back to the A battery.

It will thus be seen that whether the knob 8 is in either the "talk" or the "radio" position or in a neutral position therebetween, upon pressing the switch button 116, the circuits will automatically thereby be changed to cut out the "talk" or "radio" circuits and start the oscillating circuit and energize the field and armature of the horn 22 and cause it to emit a musical tone depending upon which switch 6-6 is closed. By means of a spring 127, the switch button 116 will be retracted upon removing the operator's hand therefrom to restore the circuits to the "talk" or to the "radio" functions as they were before the button 116 was depressed.

In Figs. 5 and 6 I have illustrated a form of controller means by which the apparatus of Fig. 4 may be conveniently assembled into compact form. The controller of Figs. 5 and 6 comprises a housing 130 and a cover 131 therefor.

A switch having an operating switch knob 8 and adapted to oscillate a shaft 132 having bearings in

the housing 130 and cover 131, has switch arms 10 11 and 12 mounted thereon cooperating with contacts upon insulated shelves 133—133. The construction of switch 8—132 and of the arms 10, 11 and 12 and the contacts on the shelves 133 may be similar to or identical with the corresponding parts including the shaft 85 and arms 10, 11 and 12 and shelves 87 of Figs. 2 and 3, except that the shelf is provided only with two contacts, such as the contacts 115 and 109 or 112 and 105 of Fig. 4, instead of the three contacts of the other form.

The push button 116 and the bars 103, 117, 111 and 118 of Fig. 4 are reproduced in Fig. 6 mounted upon a longitudinally reciprocable shaft 134 and the bars are adapted to normally engage and connect corresponding pairs of resilient fingers 135—135. A spring 127 reacting at one end upon a portion of the cover 131 and at the other end upon a shank 136 of the button 116 normally holds the shaft 134 in an outer position in which pairs of resilient fingers 135 are connected by the bars 103 and 111. Upon depressing the button 116 to move the shaft 134 inwardly, the bars 103, 117, 111 and 118 all engage pairs of resilient fingers 135. The bars of Fig. 6 correspond to those of Fig. 1 and the resilient fingers 135 correspond to the pairs of small circular contacts such as 137 in Fig. 1, and it is therefore believed unnecessary herein to complicate the description by a further elaboration of the electrical connections made by reciprocatory movements of the switch button 116. The resilient fingers 135 may all be mounted upon an insulating support 138 secured to the housing 130, and, as will now be understood, upon depressing or releasing the button 116, circuits will be established in a diagram such as that of Fig. 4 corresponding to the circuit connections effected by depressing or releasing the button 116 of Fig. 4.

The switches 6—6 of Fig. 4 are, in the form of Figs. 5 and 6, of push button type comprising a plurality of push buttons 139—139 each having a shank 140 slidable in a suitable bore in the cover 131 of the housing, and inwardly of the housing adapted when depressed to bend a resilient switch finger 141 downwardly to engage a corresponding stationary resilient finger 142. The operation of each button in this respect may close an electric circuit such as that closable by the switches 6 of Fig. 4.

It is believed that the operation of the controller of Figs. 5 and 6 in connection with the circuit of Fig. 4 will now be clear in view of the more complete description hereinbefore of the first described form.

In operation, with the button 116 in its outer position, the switch knob 8 may be turned either to the "talk" or the "radio" positions illustrated in Fig. 5 and will effect the circuit connections described in connection with Fig. 4, either to receive broadcasted programs or to effect signals of amplified voice. In any position of the knob 8, if the operator desires to effect musical tone signals, he may first depress the button 116 as for example by the heel or palm of his hand, and with the fingers and thumb of his hand may depress one or another of the push buttons 139, each button corresponding to a different musical tone or signal. The push buttons 139 are preferably disposed in a circular arc around the push button 116 as a center to more conveniently dispose them under the fingers and thumb of the operator's hand.

Thus, it will be seen that with the form of Figs. 4, 5 and 6, the apparatus is always in condi-

tion for the immediate emission of loud musical tone signals without regard to the "talk" or "radio" functions, these latter being automatically eliminated upon pressing the button 116.

If preferred, the buttons 139 may be constructed so that any one of them may be depressed and retained in depressed position. This construction may comprise a pin 144 through the shank 140 of the button, slidable in a lateral groove 145 in a boss 146 in which the shank of the button slides. Upon depressing the button and engaging the contact fingers 141 and 142, the button may manually be rotated to bring the pin 145 under the face of the boss as illustrated in Fig. 7 where the pin is shown in the position 147, and upon releasing it the button will be retained depressed.

Thereafter, by merely depressing the button 116, the signal in this manner preselected, will be sounded. This provision makes possible a more immediate signal since only the button 116 needs to be operated to effect such signal.

Where the push buttons 139 are all left in their open circuit position, it will be apparent that after the push button 116 has been depressed, they may be operated in sequence to effect the emission of signals having the character of a musical tone.

I claim:

1. In a signal system for motor vehicles and the like, in combination with a passenger compartment of the vehicle having a compartment wall, a first electrically energizable sound-producing device disposed on one side of the wall in the passenger compartment in a position to be more readily audible internally than externally of the passenger compartment, a second electrically energizable sound-producing device disposed on the vehicle on the other side of the wall in a position to be more readily audible externally of the passenger compartment than internally thereof, an electronic tube type radio receiver, and electronic tube type oscillator, an electronic tube type amplifier, and a manually operable two-position switch all mounted on the vehicle, and with the switch within reach of a vehicle occupant, means causing the two-position switch to normally take up a first position and in that position closing by its contacts, circuit means effecting energization of the first sound-producing device by the radio receiver through the amplifier, and operable to the second position to open said closed contacts to effect interruption of said energization of the first sound-producing device and in said second position closing, by other contacts, circuit means to effect energization of the second sound-producing device from the oscillator through the same amplifier.

2. In a signaling system for motor vehicles and the like, in combination with a passenger compartment of the vehicle having a compartment wall, a first electrically energizable sound-producing device disposed on one side of the wall in the passenger compartment in a position to be more readily audible internally than externally of the passenger compartment, a second electrically energizable sound-producing device disposed on the vehicle on the other side of the wall in a position to be more readily audible externally of the passenger compartment than internally thereof an electronic tube type radio receiver, an electronic tube type oscillator, an electronic tube type amplifier and a manually operable two-position switch all mounted on the vehicle and with the switch within reach of a vehicle occupant, the

switch adapted, in a first position, closing by its contacts, circuit means effecting energization of the first sound-producing device by the radio receiver through the amplifier, and operable to the second position to open said closed contacts to effect interruption of said energization of the first sound-producing device and in said second position closing, by other contacts, circuit means to effect energization of the second sound-producing device from the oscillator through the same amplifier.

3. A signaling system and apparatus as described in claim 1 and in which the means causing said two-position switch to take up said first position is resilient means and after operation to the second position the resilient means may automatically return the switch to said first position.

4. A signaling system and apparatus as described in claim 1 and in which the said two-position switch is of the push button type and when in said first position the push button thereof is elevated and the switch is operable to said second position by depression of the button.

5. A signaling system as described in claim 1 and in which the oscillator is provided with a plurality of switches operable selectively, singly or in a group to change the periodicity of the oscillations produced by the oscillator.

6. A signaling system and apparatus as described in claim 1 and in which the oscillator is provided with a plurality of switches operable selectively, singly or in a group to correspondingly change the periodicity of the oscillations produced by the oscillator and means is provided to cause the said switches to be optionally automatically retained in operated position after being operated.

7. A system and apparatus as described in claim 1 and in which the said two-position switch is of the push button type and when in said first position the push button is elevated and the switch is operable to said second position by depressing the button, and in which the oscillator is provided with a plurality of push button switches disposed in a series generally concentric with respect to the said two-position switch push button and operable selectively, singly or in a group to correspondingly change the periodicity of the oscillations produced by the oscillator.

8. A system and apparatus as described in claim 1 and in which the said two-position switch is of the push button type and when in said first position the push button is elevated and the switch is operable to said second position by depressing the button, and in which the oscillator is provided with a plurality of push button switches disposed in a series generally concentric with respect to the said two-position switch push button and operable selectively, singly or in a group to correspondingly change the periodicity of the oscillations produced by the oscillator, and means is provided to cause the said selected ones of the plurality of switches to be optionally retained in operated position after being operated.

9. In a signal system for motor vehicles and the like, in combination with a passenger compartment of the vehicle having a compartment

wall, a first electrically energizable sound-producing device in the passenger compartment on one side of the compartment wall positioned to be more readily audible internally than externally of the passenger compartment, a second electrically energizable sound-producing device on the other side of the compartment wall disposed to be more readily audible externally than internally of the passenger compartment, an electronic tube type radio receiver, a source of sound wave produced current undulations, an electronic tube type amplifier, and a manually operable two-position switch mounted on the vehicle, and with the switch within reach of a vehicle occupant, means causing the two-position switch to normally take up a first position and in that position closing, by its contacts, circuit means effecting energization of the first sound-producing device by the radio receiver through the amplifier, and operable to a second position to open said closed contacts to effect interruption of said energization of the first sound-producing device and in said second position closing, by other contacts, circuit means to effect energization of the second sound-producing device from the said current undulation source.

10. In a signaling system for motor vehicles and the like, an electrically energizable sound producing device, an electronic tube type oscillator, an electronic tube type amplifier, and an electric switch construction all adapted to be mounted on the vehicle with the switch convenient to the vehicle driver, the switch construction comprising a plurality of switches operable collectively, singly or in a group to correspondingly change the periodicity of the oscillations produced by the oscillator and adapted to be optionally and automatically retained in operative position, switch means normally in a restored condition and operable to effect energization of the sound producing device from the oscillator, a second sound producing device operable through the amplifier, and movement of the switch means energizing the first sound producing device being adapted to de-energize the second sound producing device.

11. In a signaling system for motor vehicles and the like, an electrically energizable sound producing device, an electronic tube type oscillator, an electronic tube type amplifier, and an electric switch construction all adapted to be mounted on the vehicle with the switch convenient to the vehicle driver, the switch construction comprising a first switch of the push-button type normally restrained in restored position with the push-button elevated and operable by depressing the button to effect energization of the sound producing device from the oscillator to the amplifier, a plurality of push-button switches disposed in series generally concentric with respect to the first said switch and operable collectively, singly or in a group to correspondingly change the periodicity of the oscillations produced by the oscillator, a second sound producing device operable through the amplifier, and depressing movement of the first switch energizing the first sound producing device being adapted to deenergize the second sound producing device.

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