May 7, 1940. J. R. AUFIERO 2,200,235

CONTROL DEVICE AND SYSTEM

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Fig. 1

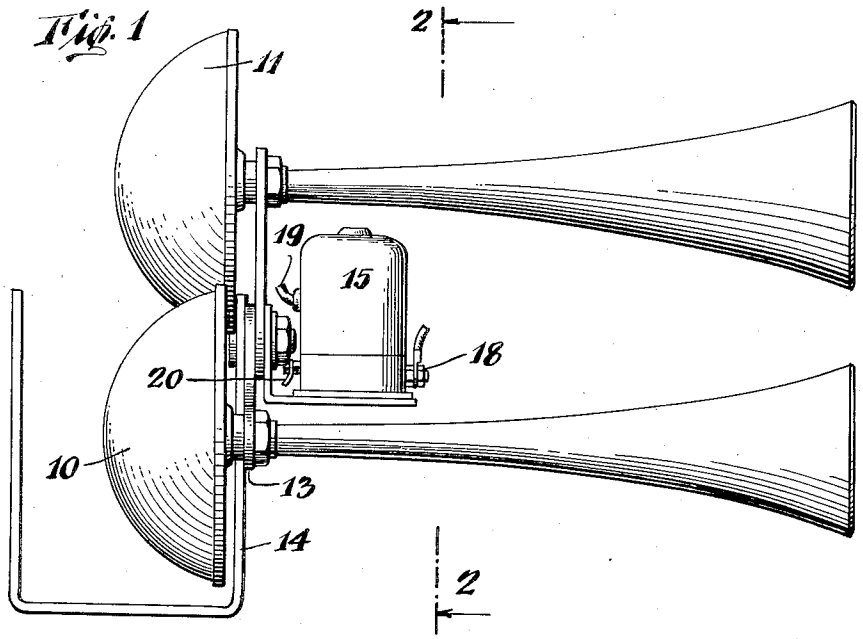
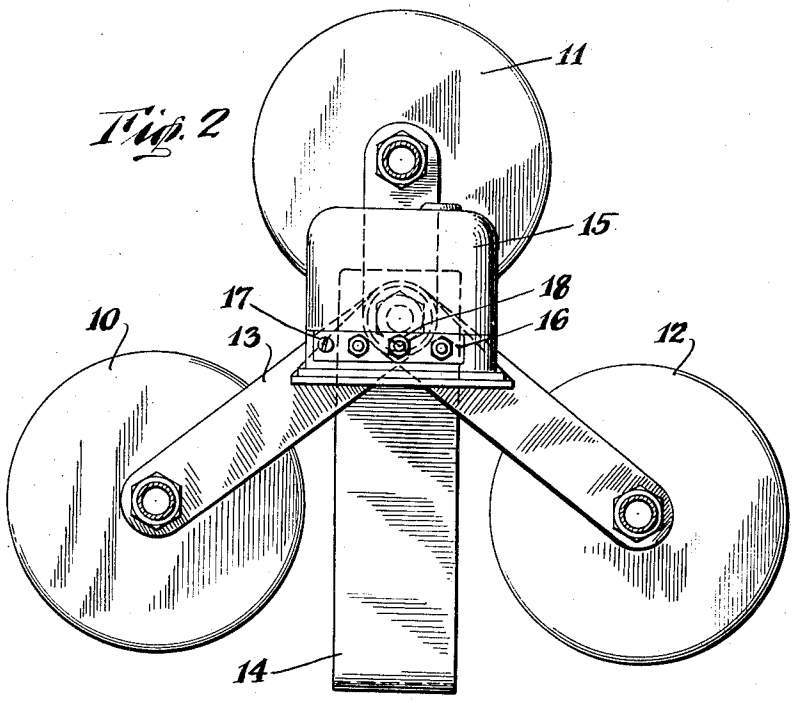


Fig. 2



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Fig. 3

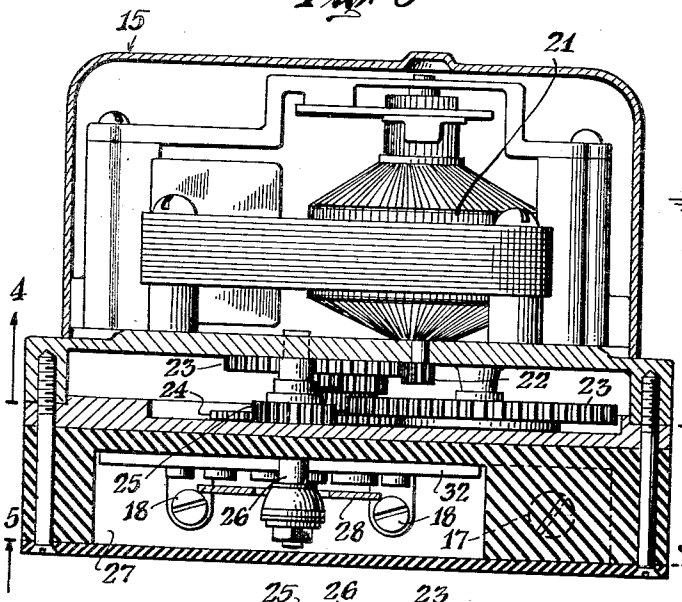


Fig. 4

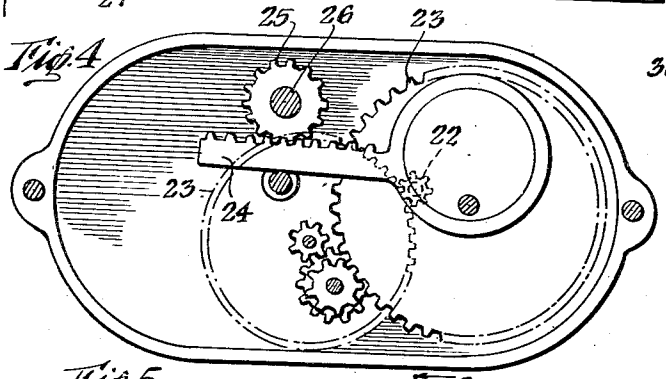


Fig. 5

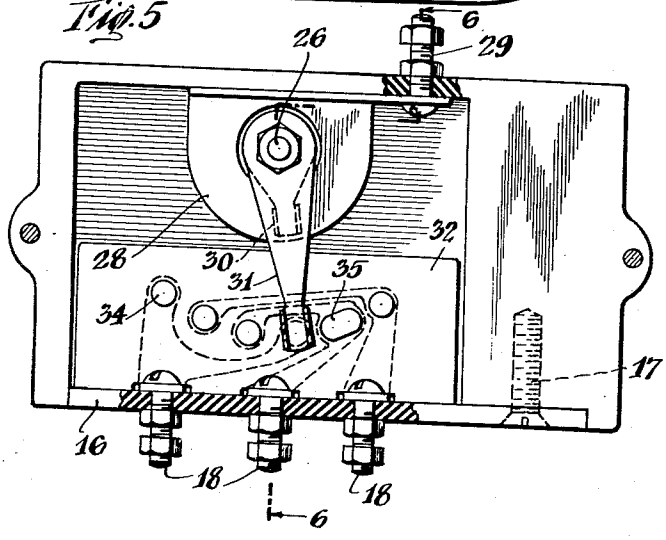


Fig. 7

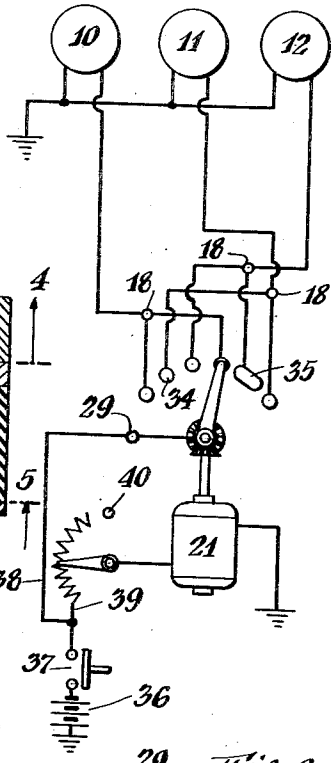
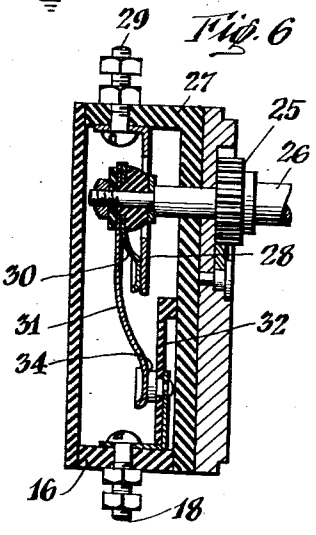


Fig. 6



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UNITED STATES PATENT OFFICE

2,200,235

CONTROL DEVICE AND SYSTEM

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Application February 21, 1940, Serial No. 319,999

9 Claims. (Cl. 177—7)

This invention relates to a structurally and functionally improved control device capable of use in connection with sounding units such as horns or musical instruments, and whereby a pleasing, definite, and novel effect may be achieved.

Viewed from another aspect, the present invention aims to provide in conjunction with a control device, a series of acoustical units combined therewith to furnish a system by means of which a definite series or sequence of tones may be produced to provide a melody or any other desired effect.

Viewed from a more specific aspect, it is an object of the invention to furnish an improved control device which may be coupled to a series of more or less conventional horns or sounding devices and by means of which an operator may produce a pleasing warning or recognition signal embracing a pre-determined sequence of notes and which may in turn furnish a definite melody.

A further object is that of furnishing a device of this type which may be operated as a simple warning signal if such result is desired.

A still further object is that of producing an apparatus, the speed of operation of which may be varied and in which, moreover, the individual tones may be given any desired pitch.

Another object is that of producing an apparatus of this type which may be embodied in a complete system and which will comprise relatively few parts, each individually simple and rugged in construction and operating over long periods of time with freedom from all difficulties.

With these and all objects in mind, reference is had to the attached sheets of drawings illustrating one practical embodiment of the invention, and in which;

Fig. 1 is a side elevation of a horn assembly embodying the complete system as herein contemplated;

Fig. 2 is a sectional front view thereof taken along the lines 2—2 and in the direction of the arrows as indicated in Fig. 1;

Fig. 3 is a sectional plan view of a control motor which may form a part of the main unit or device;

Fig. 4 is a partly sectional front view taken along the lines 4—4 and in the direction of the arrows as indicated in Fig. 3;

Fig. 5 is a similar sectional view taken along the lines 5—5 and in the direction of the arrows as indicated in Fig. 3;

Fig. 6 is a transverse sectional view taken along the lines 6—6 and in the direction of the arrows as indicated in Fig. 5, and

Fig. 7 is a somewhat diagrammatic view of the control device embraced in a complete system as shown in Figs. 1 and 2.

It is primarily to be understood that a unit embodying the present construction may be employed for numerous control purposes and particularly to operate musical instruments in a certain definite sequence. As such, the unit is ideally suited for inclusion within a system embracing any desired number of horns such as are commonly associated with a motor vehicle.

Accordingly, the present invention has been shown in this particular association. This, however, is to be taken in an illustrative rather than in a limiting sense except where otherwise indicated by the claims.

Thus, referring primarily to Figs. 1 and 2, the numerals 10, 11, and 12 indicate electrically operated horns of, for example, the magnetic type. A greater or lesser number of these horns may be employed, but they are all conveniently maintained in a single assembly by, for example, mounting them on brackets 13 radiating from a common support 14, which may in turn be coupled in any desired fashion by a mounting member.

In the embodiment under consideration, it is preferred to employ power operating means to control the sequential functioning of these horns, each of which is tuned to a different note. With this thought in mind, the bracket 14 may also support a casing 15 having a readily removable portion 16 for a purpose hereafter brought out, and which portion may normally be retained in position by, for example, a screw 17. Leads may extend from contact posts 18 asociated with the portion 16. These leads connect to and control the operation of the individual horns 10, 11, and 12. Of course, one side of the latter may be grounded in order to eliminate unnecessary wiring. Also, leads 19 and 20 may extend into the casing 15 through openings in the latter or else may be associated with binding posts coupled to the same.

Now, referring to the mechanism within casing 15, attention is directed primarily to Figs. 3, 4, and 6. In these views, the numeral 21 indicates an electric motor which may, for example, drive a gear 22, which through a train of reduction gearing 23 serves to effect a reciprocation of a rack 24. The teeth of the latter are engaged by a pinion 25 secured to a shaft 26. As a consequence of this construction it is apparent that when the motor functions, the rack will be reciprocated to oscillate shaft 26.

The latter extends into that compartment of the casing 15 of which section 16 forms a part. The walls of this compartment are conveniently formed of di-electric material as indicated at 27. A contact plate 28 is mounted by one of the walls on the casing and conveniently terminates in a post 29 to which lead 20 shown in Fig. 1 is secured. The shaft 26 is insulated from this plate but carries a contact arm 30 wiping against the

same. This arm is in turn coupled to a movable contact member or arm 31. The section 16 of the casing may be provided with a shelf portion 32 carrying a series of contacts generally indicated at 34. The end of arm 31 traverses these contacts as shaft 26 oscillates.

Next referring to Figs. 5 and 7 it will be seen there are three sounding devices or horns employed and, for example, utilizing six contacts. The first of these contacts may be coupled to horn 10, the second of the same to horn 11, the third to horn 12, the fourth again to horn 10, the fifth to horn 12, and the sixth to horn 11. By arranging the wiring in any manner desired, a definite sequence of tones will accordingly result as the arm 31 traverses the series of contacts.

As will be apparent to those skilled in the art, a great number of melodies or pleasing tone permutations may be achieved by merely using six contacts and three horns. However, the number of horns may be decreased or increased as desired, and likewise the number of contacts may be varied. It is preferred that both the number of contacts and horns be increased in that by, for example, employing a minimum of four horns or sounding devices, the range of selections or melodies which are achieved is increased to a tremendous extent.

Also, while for the sake of variety it is preferred to employ an oscillating shaft so that a definite sequence of tones will first be played and then a reverse sequence will occur, it will be appreciated that such a shaft need not necessarily be utilized. Moreover, as indicated at 35, one or more of the contacts may be made of greater length than others of the same. Consequently, with the contact arm traversing the contacts at a pre-determined speed, the duration of the corresponding tone will be increased to a commensurate extent.

In any event, it is preferred, however, that the contacts be associated with a removable or replaceable unit such as 16, in that by such an expedient, only a single connection for each one has to be employed and it is feasible to, in effect, furnish a record unit which is readily replaceable. In other words, by simply loosening screw 17 or its equivalent, and after detaching the leads from the binding posts 18, a new unit 16 with a different sequence of contact points may be substituted. This unit when secured in place and with the leads of the horns attached thereto, will produce an entirely different and novel sequence of tones.

Accordingly, an operator will not have to go through any involved procedure if the particular tone permutation employed in his horn no longer pleases him. Rather by simply purchasing a new contact unit and replacing the same for the old one, he may without any particular skill vary the results to please his own individual taste. Of course, in lieu of an electric power driven motor, any other form of manual or power motor might be employed to oscillate or rotate shaft 26. It is definitely preferred, however, that in the interest of furnishing an acceptable device that an electric motor be employed.

Again returning to a consideration of Fig. 7 in which such an electric motor has been shown in a circuit it will be seen that the numeral 36 indicates a source of current supply such as a battery, and to which there is coupled a circuit breaker 37 in the form of, for example, a push-button which may be mounted on the steering column of an automobile. Beyond this element, the lead 38 may be continued to connect to the binding post 28. Also, the lead may be provided with a branch extending to a variable rheostat 39 coupled to the motor 21. This rheostat may be conveniently located within the reach of the driver and may also be provided with dead contact 40 capable of being engaged by its arm.

As a consequence of the rheostat, the speed of operation of the motor 21 may be varied to thus accelerate or decrease the speed of movement of shaft 26. This will permit infinite variations in the effects which are produced. Likewise if desired, the arm of the rheostat may be shifted to position 40. In such position, the motor will not operate but if the contact arm is in engagement with one of the contacts 34 to which a desired horn or horns are coupled, it will be appreciated that thereafter an operation of the push-button 37 will result merely in a sounding of such horn or horns. With the parts adjusted to the position shown, the closing of the circuit breaker 37 results in a simultaneous operation of both the motor and the horns.

In any event, it will be understood that with the apparatus functioning as aforedescribed, a predetermined sequence of horn operation will occur, as the record and the contact arm are moved relative to one another, and in one direction. A reverse sequence of such predetermined rendition will result as the parts move in an opposite direction. Also, due to the provision of the crank, a simple harmonic motion occurs. In other words, adjacent its limits of movement, the rack will have relatively slow movements in a direction parallel to its axis, whereas intermediate such limits of movement, the rack 24 will have increased velocity of movement. This will result in the contact arm having relatively prolonged engagement with the contacts which are adjacent the ends of the series; while the contacts intermediate such ends will be relatively rapidly engaged and traversed by the contact arm. Consequently, the horns coupled to these several contacts will be accordingly operated.

Thus among others, the several objects of the invention as specifically afforded, are achieved. Obviously numerous changes in construction and re-arrangements of the parts may be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. In combination, a series of electrical horns, each of such horns being adapted to continuously produce a tone of a pitch different from other horns of said series and while continuously energized by the passage of current, a series of contacts of a number greater than the number of horns, means for connecting each of said contacts to at least one of said horns, a contact engaging member, motor means for causing relative movements between said contacts and contact engaging member, switch means for connecting said member and motor to a source of electric current supply and further means for interrupting the operation of said motor whereby said contact engaging member and said series of contacts will cease relative movement to cause energization solely of the contact with which said contact engaging member remains in engagement.

2. In combination, a series of electrical horns, each of such horns being adapted to continuously produce a tone of a pitch different from other horns of said series and while continuously energized by the passage of current, a record including a body, a series of contacts mounted by said body and of a number greater than the number

of said horns, a plurality of terminals also mounted by said body and corresponding in number to the number of said horns and connected one to each of the same, means for connecting each of said contacts to at least one of said terminals, a contact engaging member, motor means for causing relative movement between said contacts and contact engaging member, a casing for said motor means, said record body forming a part of said casing and readily releasable means for normally maintaining said record immovable with respect to said casing.

3. A control device for use in a system embracing a plurality of electric horns each adapted to continuously produce a tone of a pitch different from that of other horns in such system and in response to continuous electric energization, said control device including a casing, a record within said casing and including a body, an arcuate series of electrical contacts mounted by said body, means for securing said body within said casing, a contact engaging member, a motor for oscillating said member in engagement with said contacts and terminals mounted by said record body and corresponding in number and adapted to be connected one to each of the horns embraced within such system, the number of such contacts being greater than the number of such terminals and means connecting each of said contacts to at least one of said terminals whereby said contact engaging member in moving in one direction will, in predetermined sequence, engage the individual contacts of said series and moving in an opposite direction will successively engage said contacts in reverse sequence.

4. As an article of manufacture, a removable record comprising a body, a casing portion forming a part of said body, said portion presenting a surface to be engaged by means which normally locks said record against displacement with respect to a mounting member, a series of electrical contacts mounted by said body, terminal members extending from said casing portion and of a number less than the number of contacts and means connecting each of said contacts to at least one of said terminals.

5. As an article of manufacture, a removable record comprising a relatively thin body of insulating material, a casing portion forming a part of said body and disposed adjacent the edge of the latter and extending at right angles to the surface of such body, said portion having a heighth greater than the thickness of said body and presenting a surface to be engaged by means which normally locks said record against displacement with respect to a mounting member, a series of electrical contacts mounted by said body, terminal members extending from said casing portion and of a number less than the number of contacts and means connecting each of said contacts to at least one of said terminals.

6. In combination, a plurality of electrical horns each adapted to continuously emit a tone of different pitch in response to continuous energization by electrical current, a plurality of contacts connected to said horns, a contact member, an electrical motor connected to said member for reciprocating the same with respect to said contacts to cause said member to first move relative to the contacts in one direction and to successively engage and energize said contacts and the horns connected therewith, whereby a sequential and pre-determined operation of the different horns results, said motor thereupon causing a movement of said member in a reverse direction with respect to said contacts whereby a reverse rendition of such pre-determined sequence results and switch means for connecting said motor and member with a source of electric current.

7. In combination, a plurality of electrical horns each adapted to continuously emit a tone of different pitch in response to continuous energization by electrical current, a multiple switch means connected to said horns, a motor connected to operate said switch means to cause operation of the latter, such that said horns are successively energized whereby a sequential and pre-determined operation of the horns results, said motor thereupon causing a reverse operation of said switch means, whereby a reverse rendition of such pre-determined horn sequence results and further switch means for connecting said first named switch means with a source of electric current.

8. In combination, a plurality of electrical horns each adapted to continuously emit a tone of different pitch in response to continuous energization by electrical current, a plurality of contacts connected to said horns, a contact member, an electrical motor connected to said member for reciprocating the same with respect to said contacts to cause said member to first move relative to the contacts in one direction and to successively engage and energize said contacts and the horns connected therewith, whereby a sequential and pre-determined operation of the different horns results, said motor thereupon causing a movement of said member in a reverse direction with respect to said contacts whereby a reverse rendition of such pre-determined sequence results, switch means for connecting said motor and member with a source of electric current and a variable rheostat interposed between said switch means and motor whereby the speed of relative movement of said contacts and member may be varied and without variation in the supply of current to, and resultant pitch and volume of, the horns.

9. In combination, a plurality of electrical horns each adapted to continuously emit a tone of different pitch in response to continuous energization by electrical current, a plurality of contacts connected to said horns, a contact member, an electric motor, a crank for connecting said motor with said contact member for reciprocating the latter with respect to said contacts and whereby said contact member and contacts are, adjacent their limits of relative movement, move at a substantially reduced rate of speed, and intermediate such limits, such relative movement will occur at a higher rate of speed, said crank causing said member to first move relative to the contacts in one direction and to successively engage and energize said contacts and the horns connected therewith, whereby a sequential and pre-determined operation of the different horns results, said motor thereupon causing a movement of said member in a reverse direction with respect to said contacts whereby a reverse rendition of such pre-determined sequence results and switch means for connecting said motor and member with a source of electric current.

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