March 9, 1943. L. J. LEVINE 2,313,560

VISIBLE BELL CALL DEVICE

Filed April 6, 1940 2 Sheets-Sheet 1

Fig. 1.

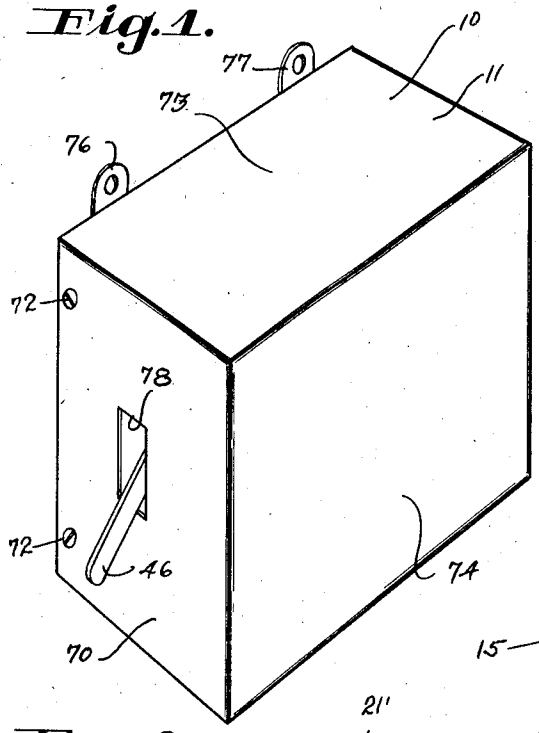


Fig. 2.

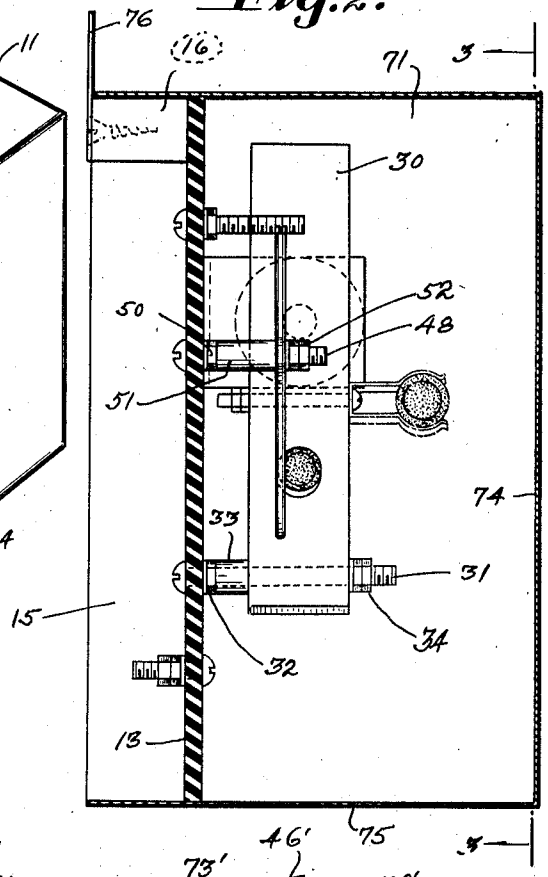
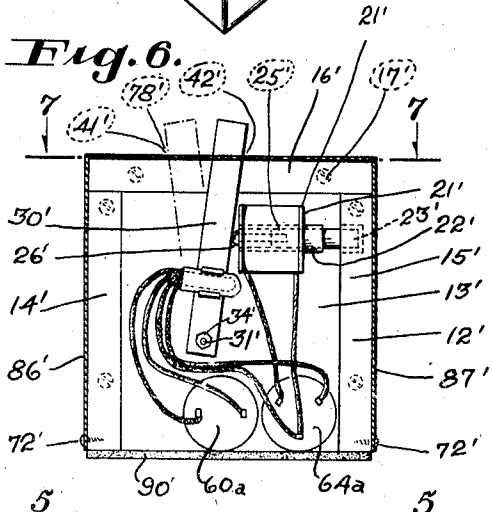


Fig. 6.



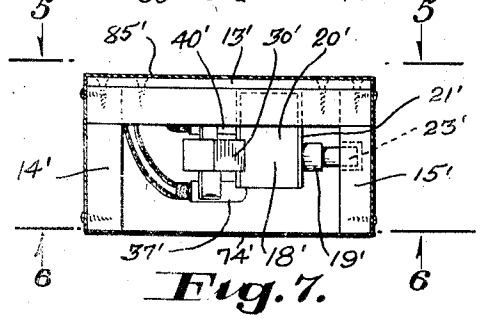


Fig. 7.

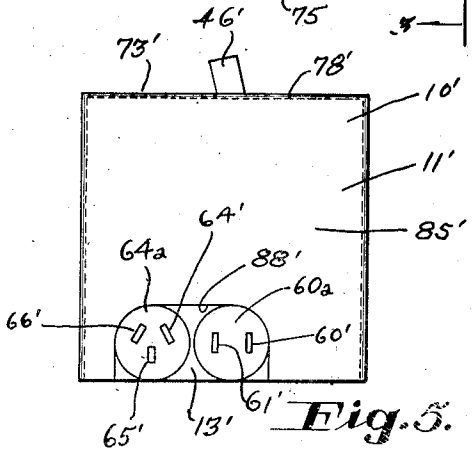


Fig. 5.

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Filed April 6, 1940 2 Sheets-Sheet 2

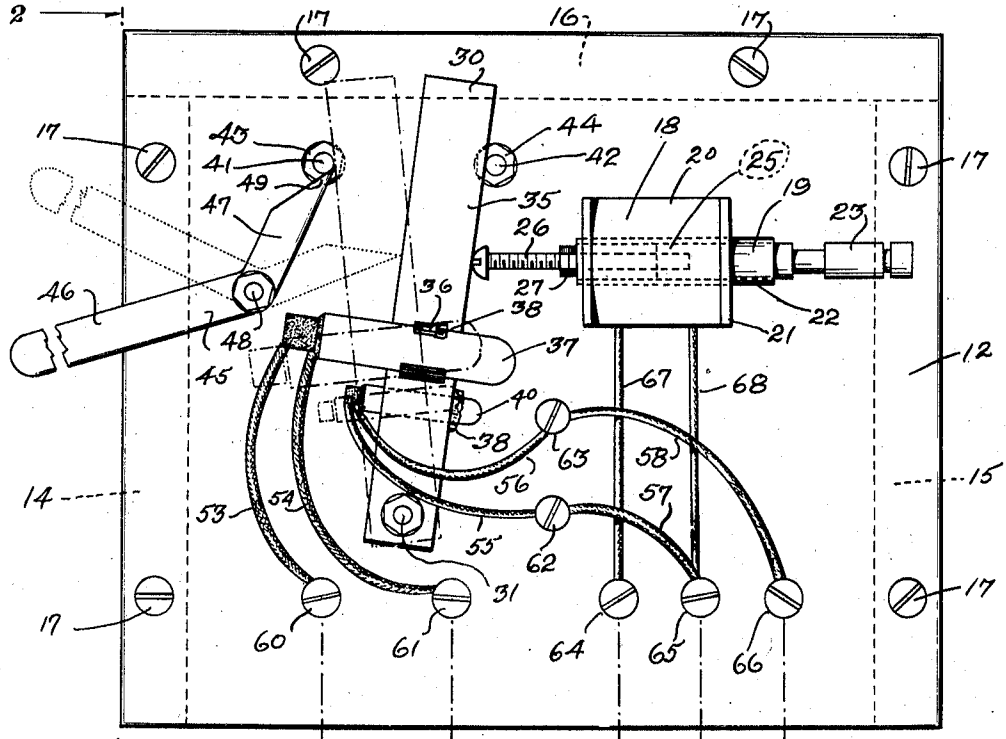


Fig. 5.

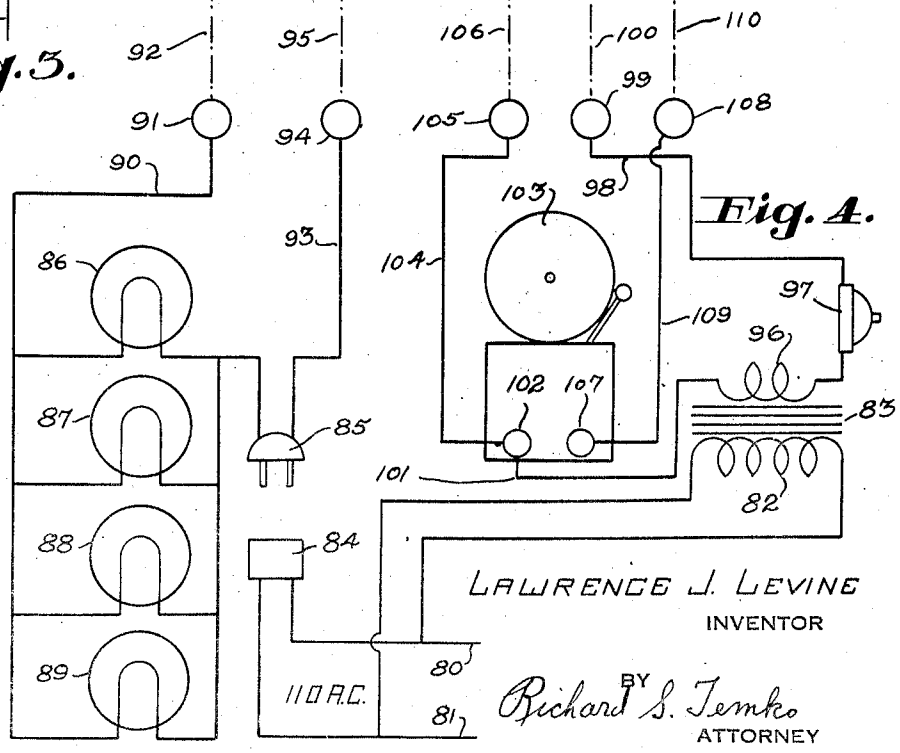


Fig. 4.

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2,313,560

VISIBLE BELL CALL DEVICE

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2 Claims. (Cl. 177—339)

This invention relates generally to electrical switching arrangements and more particularly to a visible bell call system.

Among the objects of the present invention is the provision of structure, the fundamental purpose of which is to aid those afflicted with defective hearing and are thus unable to hear the ringing of the bell or buzzer which is connected in the ordinary bell circuit in the home, office, or other building in which the deaf person is.

An object of this invention lies in the provision of structure which, when the usual bell push button is operated, in addition to the ringing of the bell or buzzer, a lighting circuit is completed and remains so until it has been manually released, thus insuring the attention of the deaf individual, and attracting him to the action of the bell circuit.

A further object herein lies in the provision of a control device which is an electrically operated switch used in conjunction with the normal bell ringing circuit, whose purpose is to close an illumination circuit, and to maintain circuit conditions until the control device is manually reset.

A device of the present class may of course be used as part of a completely new installation, in actual practice however, it is found that the device in order to be commercially acceptable and useful must be adapted for use with existing annunciator bell or buzzer circuits. These bell installations are usually inadequately supplied with electrical energy, either because the batteries are in poor condition, or because the bell ringing transformer is of insufficient capacity. The result of this situation is that if a control device has any sizable power requirements, its current drain on the bell ringing power source will be so great that with the consequent drop in voltage of said bell ringing power source, both the bell or buzzer and the switching mechanism for completing the circuit to the illumination medium will fail to function. This condition is particularly true in the case of the under-sized bell ringing transformers which are found in the usual bell ringing circuit.

One of the most important objects of the present invention lies in the provision of a novel control device for use in a visible bell call system which will have an extremely low power requirement, yet which will be so positive in action that there will be practically no chance that it will fail to close a good low resistance circuit to the lights.

Another feature of the present invention lies in the fact that the control device is extremely quick acting, so that only a momentary pressure on the push button will succeed in making a positive closure of the light circuit.

A still further feature lies in the provision of a device of the class described which will be very compact so that the same may be readily installed in cramped quarters, or if used as a table model will not take up too much space on the table surface.

A further advantage of the present construction lies in the fact that the manually resetting handle is easily accessible, and quickly shows the position in which it is, even if the lighting circuit should be inoperative by reason of current failure of the principal power source.

Another object herein lies in the provision of a control device having the above described properties and advantages yet which is low in cost and capable of large scale production so that the same may have a wide commercial distribution.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings constituting a material part hereof, similar reference characters designate corresponding parts throughout the several views in which:

Figure 1 is a view in perspective showing a first embodiment of the invention.

Figure 2 is vertical sectional view, showing the casing, and the chassis as might be seen from the plane 2—2 on Figure 3, with the frame member 14 removed for clarity.

Figure 3 is a front elevational view of the chassis as might be seen from the plane 3—3 on Figure 2.

Figure 4 is a schematic circuit diagram showing the electrical connections to be made to the control device and the auxiliary devices utilized in the circuit.

Figure 5 is a rear elevational view of a second embodiment of the invention.

Figure 6 is a vertical sectional view of the device shown in Figure 5, as might be seen from the plane 6—6 on Figure 7.

Figure 7 is a horizontal sectional view as seen from the plane 7—7 on Figure 6.

Turning now to the first embodiment of the invention illustrated in Figures 1 to 4 inclusive, the control device generally indicated by numeral 10 includes a casing 11 and a chassis 12.

The chassis 12 includes a base plate 13 prefer-

ably composed of any suitable insulating material having a dielectric constant adequate for the order of the voltages carried by the device. A material found suitable is wood pulp compressed sheeting, such as "Presdwood." The base plate 13 is secured to a plurality of frame members, including the vertical frame members 14 and 15 and the horizontal frame member 16. The said frame members may be composed in any suitable material such as wood and the securing of the base plate thereto may be accomplished by the known wood screws 17.

A solenoid generally indicated by numeral 18 is preferably composed of a high resistance winding 20 having a large number of turns wound about an insulating tube 19. The windings 20 and the tube 19 are mounted on the base plate 12 by means of a U shape bracket 21. The end 22 of the tube 19 extends outwardly of the bracket 21. A rod shaped armature is slidably disposed within the tube 19. The inner end 25 of the armature 23 has threadedly engaged therein a screw or pusher element 26. The screw 26 is provided with a known lock-nut 27 which serves as a stop and thereby regulates the movement of the screw in a right hand direction, as seen in Fig. 3. Movement of the screw in a left hand direction is regulated by other structure as will be more particularly described hereinbelow.

A lever element 30 is preferably of rectangular shape and composed of any suitable insulating material. Since the lever element does not actually carry any electric current it may if desired be composed of metal, but it is desirable that said lever element be of light weight, so that the same has a low inertia value. In actual practice dry wood has been found satisfactory. The lower end or lever element 30 is provided with a substantially horizontally disposed orifice and is rotatably mounted for movement in a vertical plane about a screw or pivot 31. The screw 31 is mounted upon the base plate 13 and secured thereto by means of a washer and nut 32. The lever element 30 is properly positoned with relation to the other structure by means of a spacing sleeve 33. The lock-nut 34 permits control of the frictional relation of the lever element 30 to the pivot 31, and the lock-nut 34 is adjusted to permit free rotation of the lever element 30 about the pivot 31. The surface 35 of the lever element 30 is provided with a mounting clip 36 which resiliently engages a high voltage mercury or first switch 37. The lever element 30 is provided with an orifice arranged above and disposed at right angles to the orifice within which is disposed the pivot 31. The said upper orifice has inserted therein a low voltage mercury or second switch 40. After any necessary adjustment of the position of the switches 37 and 40 with relation to the lever element 30 as will be particularly described below, any suitable binder such as for example cellulose acetate in amyl acetate may be used for securing the same. This binding material is indicated by numeral 38 on Fig. 3.

The lever element 30 is adapted for a limited reciprocal movement between the detents 41 and 42. Said detents are preferably formed by screws projecting from the base plate 13 and secured in position by means of nuts 43 and 44.

A manual resetting lever 45 is of irregular configuration best seen in Fig. 3, and includes a handle portion 46 and the trip portion 47. The handle portion 46 and the trip portion 47 are angularly disposed with relation to one another and the lever 45 is rotatably mounted on the base plate 13 by means of the pivot 48 which penetrates the lever 45 at the intersection of said angles. The trip portion 47 is pointed at the outer end thereof so that said pointed portion 49 may be disposed between the detent 41 and the lever element 30 when the latter is in the "on" position thereof. The handle 46 contains the center of gravity of lever 45 so that the lever 45 will normally rest in the position shown on Fig. 3 by the full lines. In this position coaction of detent 41 and the point portion 49 is such that the detent 41 acts as a stop for both the lever element 30 and the lever 45. The pivot 48 is preferably formed by a screw which is secured to the base plate 13 by means of the nut 50 and the lever 45 is maintained in operative position by means of the spacer sleeve 51 and the lock-nut 52. The lever 45 is loosely mounted upon the pivot 48.

Suitably mounted upon the base plate 13 are a plurality of binding posts 60, 61, 62, 63, 64, 65, and 66. The wiring of the control device is substantially as follows. The leads 53 and 54 of the mercury switch 37 are connected to the posts 60 and 61. The leads 55 and 56 of the switch 40 are connected to the posts 62 and 63, and thence by connecters 57 and 58 to the posts 65 and 66. The leads 67 and 68 of the solenoid 18 are connected to the posts 64 and 65.

The casing 11 is substantially rectangular in configuration and is preferably of thin sheet metal. The rear portions of the vertical side walls 70 and 71 are preferably secured by means of screws 72 to the vertical frame members 14 and 15. The casing 11 also includes a top wall 73 a front wall 74 and a bottom wall 75. Hanger elements 76 and 77 are secured to the horizontal frame member 16 and are useful in supporting the device 10 when same is used upon the wall. The vertical side wall 70 is provided with a cut out portion 78 through which projects the handle portion 46 of the lever 45.

As seen in Fig. 4 the electrical connections to be made to the control device 10 are schematically indicated. The high voltage lines 80 and 81 are connected to the primary 82 of a known bell ringing transformer 83 and also to a female outlet 84. The male plug 85 is in series with the parallel circuit arrangement of the lamps or visible indicating devices 86, 87, 88, and 89.

The conductor 90 from one side of the lamp circuits terminates in the post 91, and is connected by a bridge 92 to the post 60. The conductor 93 leading from the plug 85 terminates in the post 94 which is connected by the bridge 95 to the post 61.

The low voltage circuit is as follows. The secondary 96 of the tarnsformer 83 is connected to a push button switch 97 which is in turn connected by the condutor 98 to the post 99 and the bridge 100 completes the circuit to the post 65. The other end of the secondary is connected by conductor 101 to the post 102 of the bell 103. Post 102 is connected by conductor 104 to the post 105 and bridge 106 completes the circuit to post 64. The post 107 is connected to post 108 by the conductor 109 and the circuit is completed to post 66 by the bridge 110.

Turning now to the second embodiment of the invention illustrated in Figures 5 to 7 inclusive, the control device generally indicated by numeral 10' includes a casing 11' and a chassis 12'.

The chassis 12' includes a base plate 13' pref-

erably composed of compressed sheeting. Since the base plate 13' carries no electrical current said base plate may if desired be made of sheet metal. The base plate 13' is secured to a plurality of frame members including the vertical frame members 14' and 15' and the horizontal frame member 16'. The said frame members may be composed of any suitable material such as wood and the securing of the base plate thereto may be accomplished by the known wood screws 17'.

A solenoid generally indicated by numeral 18' is preferably composed of a high resistance winding 20' having a large number of turns wound about an insulating tube 19'. The windings 20' and the tube 19' are mounted on the base plate 13' by means of a U-shaped bracket 21'. The end 22' of the tube 19' extends outwardly of the bracket 21'. A rod shaped armature is slidably disposed within the tube 19'. The inner end 25' of the armature 23' has threadedly engaged therein a screw or pusher element 26'.

A lever element 30' is preferably of rectangular shape and composed of any suitable material since the lever 30' does not carry any electrical current. The lever element is preferably composed of a light weight material so that the same may have a low inertia value. The lower end of lever element 30' is provided with a substantially horizontally disposed orifice and is rotatably mounted for movement in a vertical plane about a screw or pivot 31'. The screw 31' is mounted upon the base plate 13' and suitably secured thereto. The lever element 30' is properly positioned with relation to the other structure by suitable spacer means. The nut 34' permits control of the frictional relation of the lever element 30' to the pivot 31' and is adjustable to permit free rotation of the lever element. The lever element 30' has mounted thereon a high voltage mercury switch 37' and a low voltage mercury switch 40'. The switches are secured in place by means of known mercury switch clips which are adjustably secured to the lever element 30'.

The lever element 30' is adapted for a limited reciprocal movement between the detents 41' and 42'. Said detents are preferably formed by the ends of a slot 78' in the top wall of the casing.

The base plate 13' is provided with a pair of female receptacles 60*a* and 64*a*. The receptacle 60*a* may be of a known two connector type including the contacts 60' and 61'. The receptacle 64*a* may be a three connector polarized type of receptacle and includes the contacts 64', 65', and 66'. Since all of the connections from the solenoid 18' and the switches 37' and 40' to the contacts 60', 61', 64', 65', and 66', are substantially similar to the connections described in the first embodiment, a repetition thereof is considered unnecessary. The connections made to the device 10' will of course be substantially the same as shown on Figure 4, because the contacts 60', 61', 64', 65', and 66' correspond with the binding posts 60, 61, 64, 65, and 66. The posts 91 and 94 may be included in a known male plug; and the posts 105, 99, and 108 may be included in a known polarized male plug. Since the receptacles 60*a* and 64*a* are of insulating material it may be seen that the base plate 13' carries no electrical current. Also note that in the second embodiment of the present invention posts corresponding to the posts 62 and 63 are eliminated.

The casing 11' is substantially rectangular in form and is preferably made of thin sheet material, though wood, plastic, or other suitable material may be used. The casing 11' includes the top wall 73', the front wall 74', a rear wall 85', and side walls 86' and 87'. The top wall 73' is provided with a slot 78' through which the upper handle portion 46' of the lever element 30' projects. The rear wall 85' has a cut away portion 88' which permits convenient access to the receptacles 60*a* and 64*a*. The casing 11' is secured in place by means of screws 72' which penetrate suitable orifices in the lower portion of side walls 86' and 87' on the lower or vertical frame members 14' and 15'. The base plate 90' may be of any suitable material such as plywood or felt. The base plate 90' may be secured in place in any suitable manner or may be cemented as shown, since the base plate remains permanently in place. Adequate access is gained to all of the working parts by a removal of the casing.

The operation of the first embodiment of the present invention is substantially as follows. Assuming the device 10 to be in the position shown in Figure 3, by the full lines therein, pressing the push button switch 97 will close the circuit from the transformer secondary 96 through the solenoid 18. The armature is immediately drawn within the tube 19, and the pusher 26 moves the lever element 30 to the position indicated by the dot dash lines, the first and second mercury switches become tipped or tilted to the "on" or closed position thereof. The circuit from the high voltage source is completed to the lamps through the first switch and after the solenoid has completed its function, the audible signalling device 103 is permitted to add its burden or drain to the low voltage supply, by the closing of the second switch. The circuit to the bell or audible signalling device 103 is completed through both the low voltage mercury switch and the push button switch. As soon as pressure on the push button 97 is released, the circuit to the bell 103 is broken and it stops ringing. The circuit to the lamps 86—89 still remains closed, and the lamps will continue to burn until the lever 30 is moved to its original position. This resetting is accomplished by moving the lever 45 to the position indicated by the dotted lines.

The operation of the second embodiment is similar to the operation of the first, except that the resetting is accomplished by moving the upper end of the lever 30'.

It may thus be seen that I have disclosed a novel and useful visible bell call device, of especial utility to persons who are hard of hearing. The lamps 86—89 and others in addition may be located in very many different places to suit the convenience of the user.

While as shown on the drawings the conductors 80 and 81 carry 110 volts alternating current, the voltage and type of current may be altered as desired. Similarly, the low voltage circuit may be powered by A. C. or D. C., of different voltage.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Obviously any suitable type of switch may be substituted for the push button switch 97, and the term "push button" as used in the specification and claims, is used for the purpose of clarity and no limitation is thereby intended.

I claim:

1. In a visible bell call system: a first circuit including a first source of electrical energy, a visible indicating device, and a first switch; a

second circuit including a second source of electrical energy, a push button switch and an electromagnetic means; a third circuit, including an audible signalling device and a second switch and running from one side of said second source of electrical energy through said audible signalling device and second switch, to the side of the push button switch away from said second source of electrical energy; and means to move the said first and second switches to closed position thereof when the electromagnetic means is energized by the closing of the push button switch; whereby the electromagnetic means is first connected to the second source of electrical energy and then after the means to move the first and second switches has been acted upon, the circuit to the audible signalling device is completed through the second switch and the push button switch.

2. In a visible bell call system: a first circuit including a first source of electrical energy, a visible indicating device, and a first switch; a second circuit including a second source of electrical energy, a push button switch and a solenoid; a third circuit, including an audible signalling device and a second switch and running from one side of said second source of electrical energy through said audible signalling device and second switch, to the side of the push button switch disposed away from said second source of electrical energy; said first and second switches being physically connected whereby they are closed or opened together; and means to move the said first and second switches to closed position thereof when the solenoid is energized by the closing of the push button switch; whereby the solenoid is first connected to the second source of electrical energy and then after the means to move the first and second switches has been acted upon, the circuit to the audible signalling device is completed through the second switch and the push button switch.

LAWRENCE J. LEVINE.