July 29, 1952 D. J. MUNROE 2,605,336

VISUAL SIGNAL TYPE ANNUNCIATOR

Filed Jan. 5, 1950

Fig. 1.

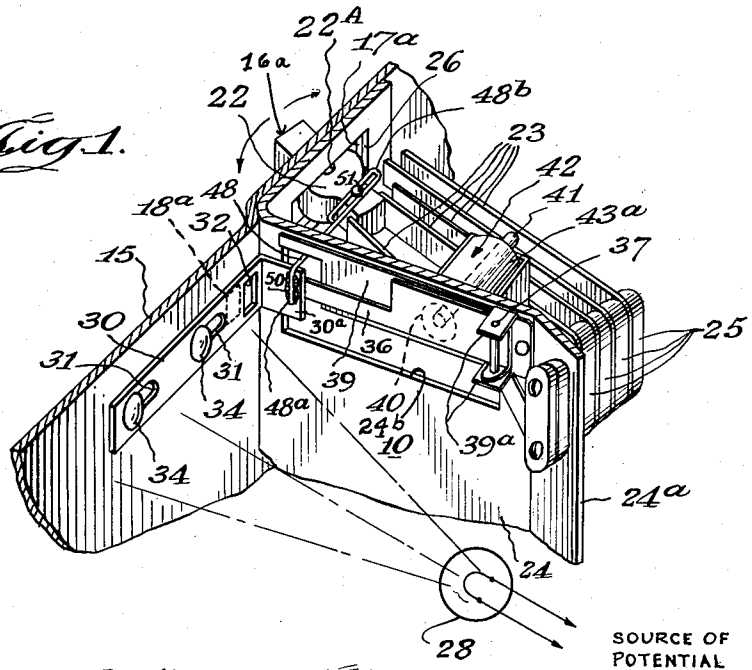


Fig. 2.

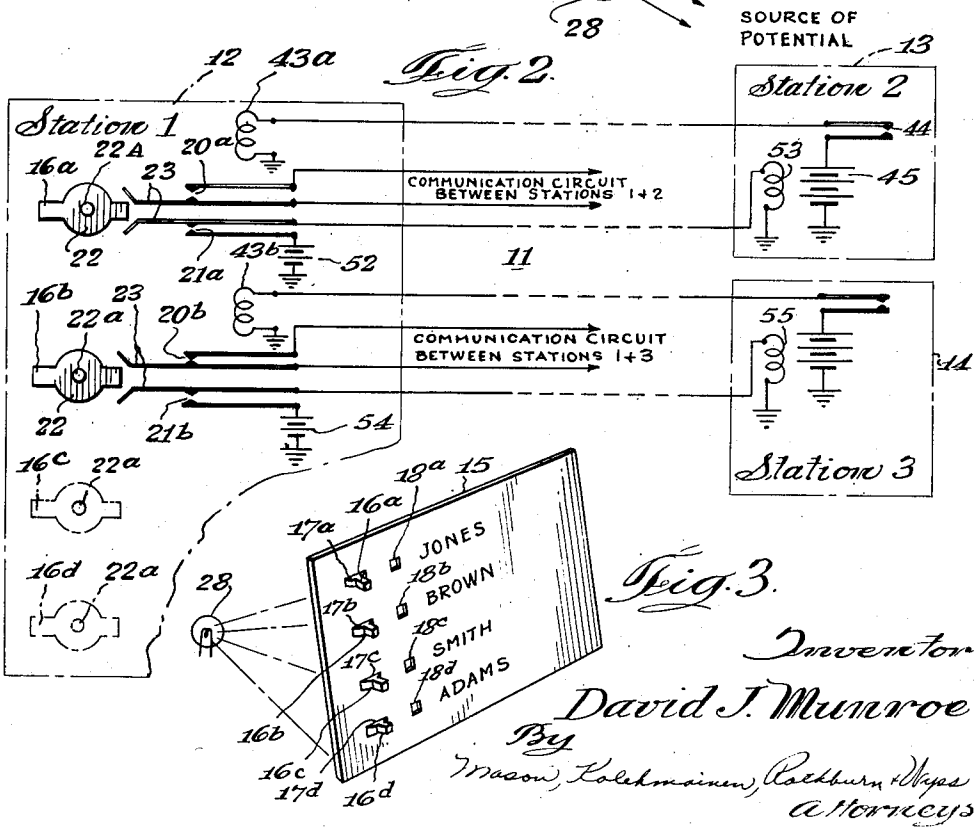


Fig. 3.

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VISUAL SIGNAL TYPE ANNUNCIATOR

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5 Claims. (Cl. 177—329)

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The present invention relates to annunciators and more particularly to annunciators of the visual signal type which are particularly well adapted for use with intercommunication apparatus. It is an improvement on a copending application of Richard H. Campbell, Serial No. 136,956, filed concurrently with the present application and assigned to the same assignee as the present application.

As will be understood by those skilled in the art, annunciators have numerous applications. They are, for example, extensively employed in connection with intercommunication apparatus to indicate by visual and/or audible means to the called party, not only that such party, for example, is being called, but also designating the calling party. Preferably, the signal produced by such annunciators should remain effective until the calling party has taken some positive steps to answer the called party. It has been customary, for example, in connection with such intercommunication apparatus, to provide selective switching means, such as station selector switches, whereby the called party may select and complete the communication circuit with the calling party. It would be desirable to terminate the signaling operation of the annunciator concurrently with or following such positive action. Numerous types of annunciators have been suggested heretofore. All of these prior arrangements, however, have been complicated and have not lent themselves favorably to certainty of operation and low cost, as well as high speed production from a manufacturing standpoint. It would be desirable to provide an annunciator particularly well adapted for use with intercommunication apparatus which will not only give long and satisfactory service, but which may be manufactured at low cost and readily assembled.

Accordingly, it is an object of the present invention to provide a new and improved annunciator system.

Still another object of the present invention resides in the provision of an improved annunciator of the visual signal type particularly well adapted for use with intercommunication equipment.

It is a further object of the present invention to provide an improved low cost annunciator for use in connection with intercommunicating apparatus of simple construction so as to be well adapted for use in substantial numbers in intercommunication systems comprising a large number of stations.

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Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention reference may be had to the accompanying drawing in which:

Fig. 1 is a fragmentary perspective view of an embodiment of the annunciator of the present invention shown associated with a portion of an intercommunication system;

Fig. 2 is a schematic circuit diagram illustrating an application of the annunciator of Fig. 1; and

Fig. 3 is a somewhat perspective view of a portion of a station illustrating how a plurality of annunciators of the present invention may be associated therewith in a small compact arrangement.

The present invention is generally concerned with the details of a visual signal type annunciator for use with intercommunication apparatus in which, for example, the annunciator is rendered effective by a party located at a point remote from the annunciator wishing to communicate with the party located adjacent the annunciator. The annunciator includes a suitable signal light which is preferably continually energized whenever the unit of the intercommunication apparatus is rendered operative as by supplying power thereto. The annunciator further includes an aperture through which light rays from the signal may be directed. In addition, a sliding gate for effectively closing said aperture is provided. By means of a suitable electromagnet energized through action of the calling party, the sliding gate may be moved to permit light rays from said signal light to pass through said aperture with the result that the visual signal produced by the annunciator is effective to indicate to the called party that he is being or has been called by a particular calling party. This signal remains effective until some action is taken on the part of the called party to complete an intercommunicating circuit between the called and calling stations.

For a better understanding of the present invention, reference may be had to the accompanying drawings in which the annunciator of the present invention is generally designated by the reference numeral 10 in Fig. 1 of the drawing. It will be understood that the annunciator of the present invention has numerous applications. In

order to aid in understanding the operation of the annunciator of the present invention, it has been illustrated in connection with an intercommunication system generally designated at 11 in Fig. 2 of the drawing. Intercommunicating apparatus such as might be employed for interoffice communication or the like, comprises a plurality of stations designated in Fig. 2 by the reference numerals 12, 13, 14, etc. Appropriate nomenclature, such as station 1, station 2, station 3, etc., has been applied to the individual units as a further aid in understanding the operation of the annunciator per se with which the present invention is particularly concerned. Conventionally, each station of an intercommunicating system may include, in addition to the annunciators, a loud speaker, selectively operable communication controlling means, station selector means and the like. Generally, each station includes a unit or device, which is usually disposed in a position where it may readily be seen, comprising a suitable cabinet or housing 15 on the front panel of which may be located a plurality of manually operable station selector control means designated as 16*a*, 16*b*, 16*c* and 16*d* respectively, each of which preferably has an operative portion extending within the cabinet 15, as through suitable apertures 17*a*, 17*b*, 17*c* and 17*d*, respectively. By way of example only, the unit illustrated in Fig. 3 of the drawing is shown capable of being used with four additional stations to provide a five station system. Each station has as many annunicators as there are stations which can call a particular station in the system, i. e., one less annunciator than the number of stations in the system. This indicates the need for compact annunciators when used in a multiple station intercommunication system, if it is desirable as usually is the case, to maintain the cabinet or housing 15 at each station as small as possible.

As illustrated, each of the selector means 16 has associated therewith an annunciator 10 forming the basis of the present invention which exteriorly of the cabinet 15 appears only as an aperture 18. As illustrated in Fig. 3 of the drawing, four apertures 18*a*, 18*b*, 18*c* and 18*d* are provided, one associated with each selector means 16 marked with the corresponding subscript. These apertures are capable of being illuminated by a visual signal means in a predetermined manner described hereinafter so as to indicate which station is calling. If desired, suitable indicia shown in Fig. 3 of the drawing, such as the names of the parties at the different stations, may appropriately be associated with the apertures 18, so that when the annunciator associated with a particular aperture 18 is rendered effective, the called party will known at a glance who is calling or has called him.

The selector means 16 are preferably station selector switches designated by the same reference numerals in Fig. 2 as in Fig. 3. As illustrated, these switches comprise a manually actuable member which may be moved either to the right or to the left as viewed in Fig. 3 and in either position being capable of operating certain control circuits. In Fig. 2 of the drawing some of the circuits for the selector switches 16*a* and 16*b* are indicated. As illustrated, each of the switches has associated therewith two sets of switches each having normally open contacts designated as 20*a* and 21*a* respectively for the selective control means 16*a*. The contacts 20*a* are illustrated as controlling a communication circuit between stations 1 and 2. The contacts 21*a*, on the other hand, are capable of completing a calling circuit whereby station 1 may call station 2. Similarly, selective control means 16*b* includes switches comprising contacts 20*b* and 21*b* for completing the communication circuit between stations 1 and 3 and calling station 3, respectively.

Considering now the improved annunicator system of the present invention, reference may be had to Fig. 1 where the aperture 18*a* is shown and the selector switch 16*a* may be seen to comprise a manually movable member 22 pivoted to means associated with the cabinet 15 as indicated at 22A, so that a portion thereof extends through the aperture 17*a* for manual actuation from outside the cabinet. The contacts 20*a* and 21*a* are not visible in Fig. 1 of the drawing, but the resilient supporting arms for these contacts are generally designated by the reference numeral 23. These arms 23 are mounted in spaced insulated relationship through means comprising a plurality of insulators 25 which in turn are supported on an angularly disposed flange 24*a* of an L-shaped bracket 24 having one arm of the L attached to the inside front panel of the cabinet 15. As illustrated, said one arm of the bracket 24 has an aperture 26 therein which is aligned with the aperture 17*a*. Preferably the member 22 is pivoted to the bracket 24 whereby the selector switch may comprise a subassembly of parts mounted on the bracket 24. The end of member 22 disposed within the cabinet 15 is effective to move the resilient contact arms 23 selectively to close the contacts 20*a* or 21*a* or, if desired, others not shown in the drawing.

In accordance with the present invention, a suitable light source 28 connected to a source of electrical energy is disposed so that rays of light therefrom are directed towards each of the apertures 18*a*, 18*b*, 18*c* and 18*d*. These apertures may, if desired, be covered with a suitable translucent window. The signal light 28 is preferably energized whenever the power supply unit for the particular station of the intercommunicating apparatus is energized.

For the purpose of producing a controlled visual signal at the front of the cabinet 15 indicative of the particular annunciator operated and thus of the calling station, there is provided, in accordance with the present invention, an L-shaped slide or gate 30 having defined in one arm of the L a pair of elongated guide defining openings or slots 31 and a light controlling aperture 32. As illustrated, slide 30 is mounted for limited reciprocal movement to the inside of cabinet 15 by fastening means such as 34 extending through the slots 31. Slide 30 is preferably formed of an opaque material and is adapted to move between the extreme position shown in Fig. 1 of the drawing, where the apertures 18*a* and 32 are misaligned and another extreme position where the apertures 18*a* and 32 are aligned, the former being the annunciator off position and the latter the annunciator on or operated position. It will be obvious that only in the operated position will light from the source 28 be visible at the aperture 18*a*. Also, the slide or gate 30 is so arranged that it will remain in the position to which it is moved.

For the purpose of moving the slide 30 into its operated position when, for example, a party at station 2 calls station 1, there is provided a pivotally mounted elongated slide operating members 36 having its free end engageable with the

arm 30a of the slide 30 and extending laterally from the wall of cabinet 15. The other end of the member 36 is pivoted as indicated at 37 to arms 39a of a support 39 to provide a subassembly suitably attached either removably or permanently to the bracket 24. The support 39 is furthermore provided with an opening 40 through which a plunger 41 of an electromagnet 42 may extend to engage the pivotal member 36. The electromagnet is suitably secured to the back of support 39 and projects through an opening 24b in bracket 24 to above the arms 23. The winding of the electromagnet is schematically designated in Fig. 2 of the drawing by the reference numeral 43a and, correspondingly, the winding of the electromagnet associated with the selective control means 16b is designated as 43b. As illustrated, winding 43a is connected in an electrical circuit with the contacts 44 of a selector switch at station 2 and in series with a source of power schematically indicated as a battery 45. It will be apparent that momentary closure of the contacts 44 by operation of a selector switch, similar to switch 16a at station 1, will cause winding 43a to be energized with the consequent movement of the plunger 41 in a direction pivotally to rotate member 36, in a counterclockwise direction as viewed in Fig. 1 of the drawing, with the result that the slide 30 is moved to the left until the apertures 18a and 31 are aligned.

With the annunciator employed in an intercommunicating system, its operation as just described will indicate to the party at station 1 that he is being or has been called by the party at station 2. By manipulating the selector switch 16a to close the contacts 20a, which requires rotation of member 22 in a counterclockwise direction as viewed in either Figs. 1 or 2, there is completed a communicating circuit between stations 1 and 2. Under these conditions it will be understood that it is desirable to restore the annunciator to its non-operated position and, in accordance with the present invention, the slide 30 is connected with the selector switch 16a by a suitable link 48 extending through opening 24b as indicated in Fig. 1 of the drawing. If desired, two smaller openings instead of opening 24b could be used for the link and electromagnet. The link 48 is illustrated as having a lateral projection 48a at one end hooked over the lateral projection 30a of the slide 30 and, if desired, soldered or otherwise secured thereto as indicated at 50. The other end of the link 48 is illustrated as a loop 48b engageable with a pin 51 attached to member 22. The loop 48b and pin 51 provide a lost motion connection whereby link 48 does not interefere with free operation of the side 30 in response to energization of the electromagnet 42. The connection also enables member 22 to be operated to close the signaling circuit without operating or affecting the position of the slide.

In order that the party at station 1 may call the party at station 2, the contacts 21a are connected in circuit with a source of potential 52 and a winding 53 of an electromagnet forming part of an annunciator located at station 2 and preferably identical with the annunciator 10. Similarly, the contacts 21b are connected in circuit with a source of potential 54 and a winding 55 of an electromagnet forming part of an annunciator located at station 3.

In view of the detailed description included above, the operation of the annunciator of the present invention will readily be understood by those skilled in the art. Under normal conditions when the intercommunicating apparatus, with which the present invention has been illustrated, is not being used, the slide 30 is in the predetermined position shown in Fig. 1 which has been designated as the annunciator off or non-operated position. Upon the energization of the electromagnet 42, the slide 30 is moved to a position where the apertures 18a and 32 are in alignment, whereby rays of light from the source 28 may pass through these aligned apertures to give a clear indication of annunciator operation. The annunciator is restored to its normal operation upon actuation of the selector switch 16a to complete a communication circuit.

While there has been illustrated and described a specific embodiment of the present invention which is especially adapted for use in intercommunication systems, it will be understood by those skilled in the art that numerous changes and modifications may be made, and it is aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In an annunciator of the visual signal type comprising a housing having an aperture, a slidable signal member normally disposed in a predetermined position and movable relative to said aperture into an operated position, means including an electromagnet capable of being energized to operate said annunciator, means operatively interconnecting said electromagnet and signal member whereby energization of said electromagnet effectively slides said member from its predetermined to its operated position, and means including a manually actuable control element and a lost motion linkage element operatively connected to said control element and said slidable signal member operable after operation of said annunciator for sliding said signal member to its predetermined position.

2. In an annunciator of the visual signal type comprising a housing, a light source associated with said housing, means defining a first aperture in said housing toward which light rays from said source may be directed, an L-shaped slide having one arm thereof attached to said housing for limited reciprocal movement relative to said first aperture, means defining a second aperture in said one arm adapted selectively to be aligned and misaligned with said first aperture depending upon the position of said slide, an electromagnet, a pivotally mounted member operatively interposed between said electromagnet and the other arm of said L-shaped slide whereby energization of said electromagnet causes movement of the slide and alignment of said apertures, a manually actuable control element carried by said housing, and means interconnecting said other arm of said L-shaped member and said control element for misaligning said apertures in response to a predetermined operation of said control element.

3. In an annunciator of the visual signal type comprising a housing, a source of light rays associated with said housing, means defining a first aperture in said housing toward which light rays from said source may be directed, a horizontally disposed L-shaped slide, means including a pair of elongated slots in one arm of said slide and fastening means attached to said housing and extending into said slots for mounting said slide

for limited reciprocal movement relative to said housing and said first aperture, means defining a second aperture in said one arm adapted to be aligned and misaligned with said first aperture depending upon the position of said slide, an electromagnet, and a pivotally mounted member operatively interposed between said electromagnet and the other arm of said L-shaped slide whereby energization of said electromagnet causes movement of said slide and alignment of said apertures.

4. In an annunciator of the visual signal type comprising a housing, a source of light rays associated with said housing, means defining a first aperture in said support toward which light rays from said source may be directed, a horizontally disposed L-shaped slide, means including a pair of elongated slots in one arm of said slide and fastening means attached to said housing and extending into said slots for mounting said slide for limited reciprocal movement relative to said housing and said first aperture, means defining a second aperture in said one arm adapted to be aligned and misaligned with said first aperture depending upon the position of said slide, an electromagnet, a pivotally mounted member operatively interposed between said electromagnet and the other arm of said L-shaped slide whereby energization of said electromagnet causes movement of said slide and alignment of said apertures, a manually actuable control element carried by said housing, and means interconnecting said other arm of said L-shaped member and

said control element for misaligning said apertures in response to a predetermined operation of said control element.

5. A station selector switch and annunciator means including a housing support mounted to the rear of said housing and having an apertured wall rearwardly extending, a station selector switch at one side of said wall and secured thereto, switch operating means located at said one side of said wall and having a portion extending outside said housing for operating the station selector switch, an electromagnet mounted at said one side of said wall and having a movable armature projecting through the wall, visual signal means including a slide mounted on said housing adjacent said wall and movable by said armature, and visual signal restoring means extending through the said wall operatively interconnecting said visual means and said switch operating means.

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