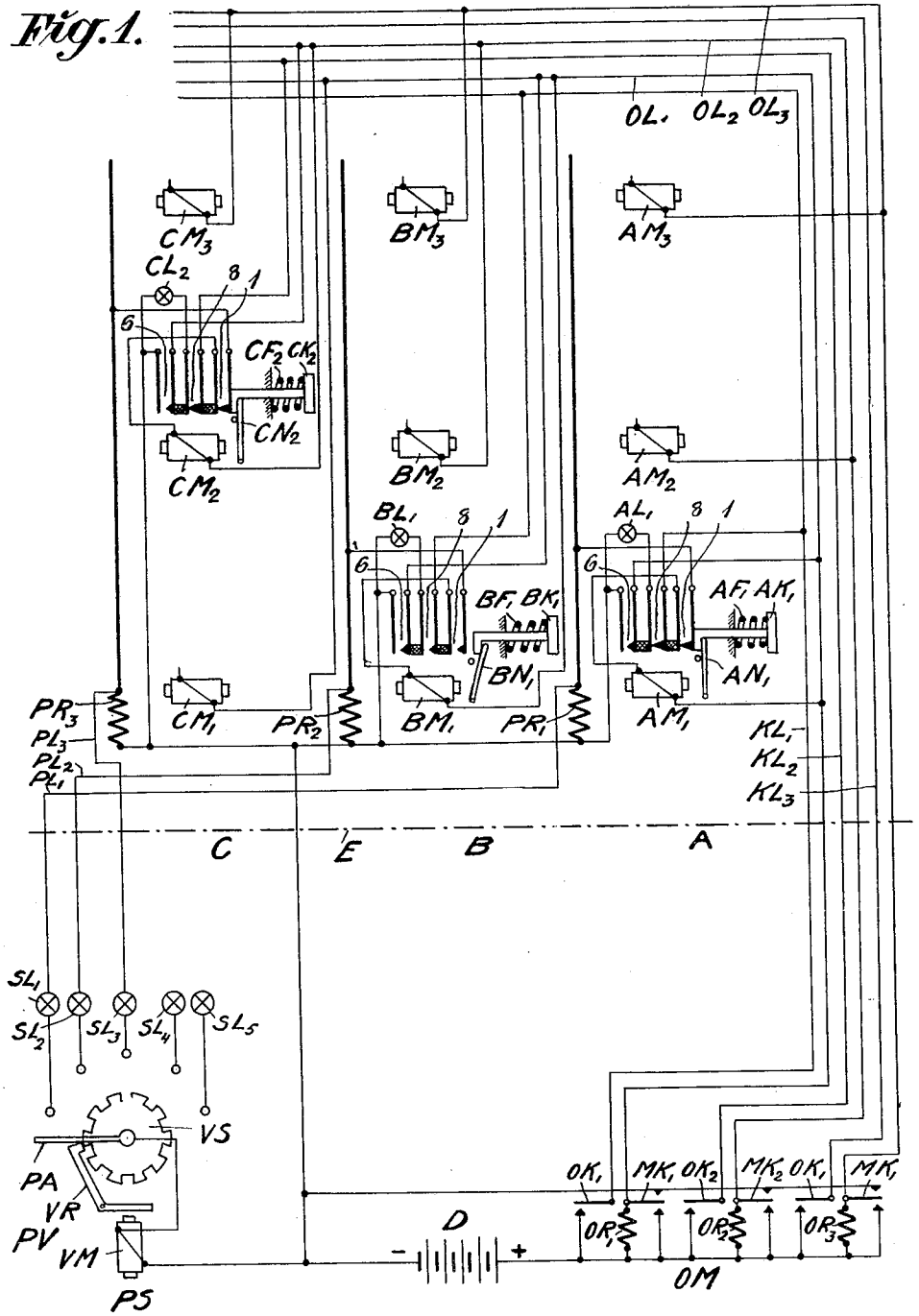
Sept. 19, 1933. O. I. H. EKMAN 1,927,362

SIGNALING SYSTEM

Filed Oct. 24, 1929 2 Sheets-Sheet 1

Fig. 1.



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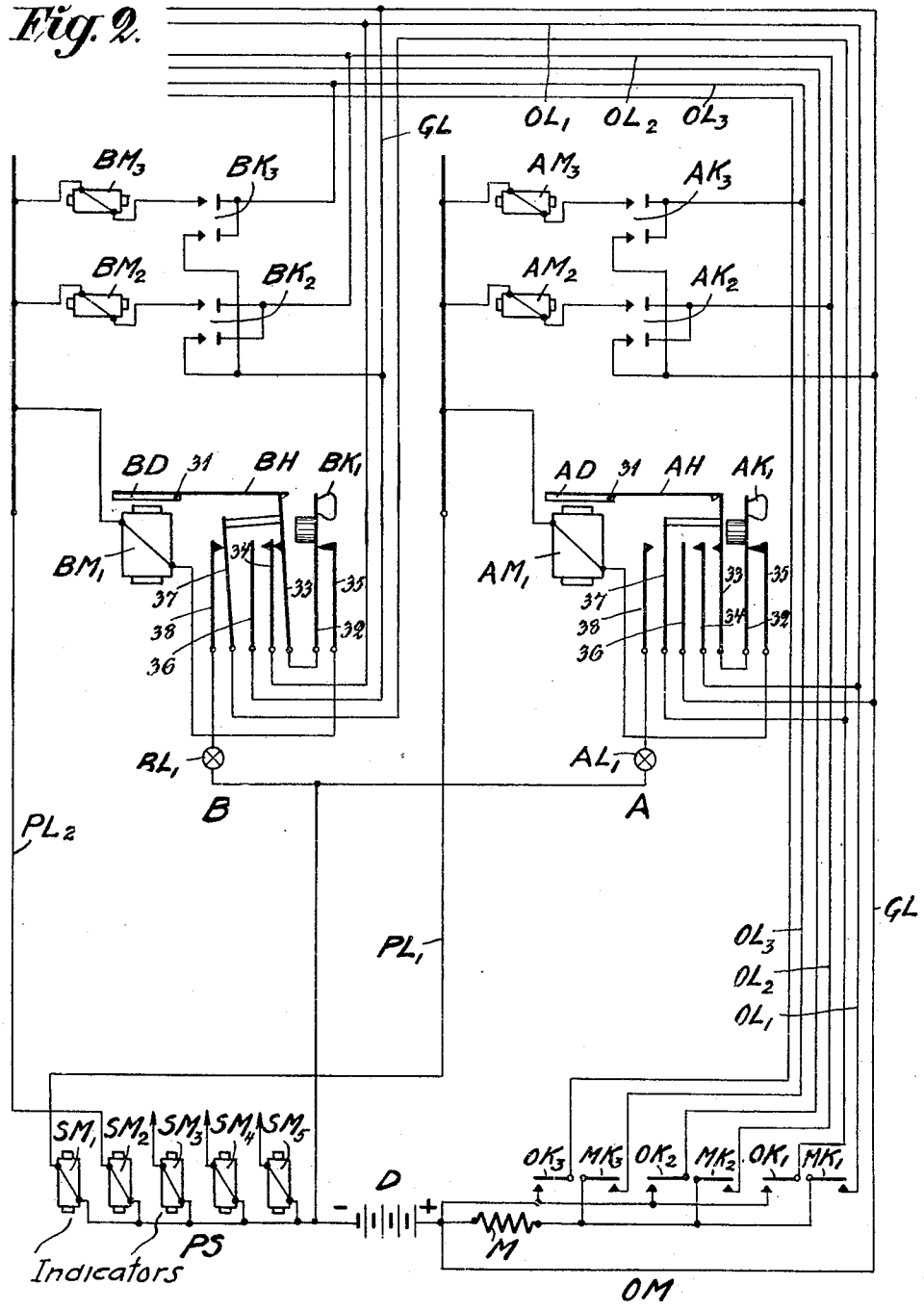
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SIGNALING SYSTEM

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Fig. 2.



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UNITED STATES PATENT OFFICE

1,927,362

SIGNALING SYSTEM

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Application October 24, 1929, Serial No. 402,215, and in Sweden October 30, 1928

3 Claims. (Cl. 177—353)

The present invention has for its object a signaling system which is especially intended for so called searching plants to search persons in large warehouses, business premises, factories, hospitals or the like. In hitherto known plants of this kind the signaling devices usually consist of a number of lamp signs allotted to the different localities and consisting of a number of lamps of different colours said lamp signs being then controlled from a special supervisory position, preferably from the telephone operator's position in the warehouse or the like where the signaling system is installed. The operator is for this purpose provided with a switch for the different lamp circuits whereby the call signal of the wanted person may be made visible in all the localities. This system has, however, the inconvenience that the number of call signals will be comparatively limited and that the wanted persons themselves always must direct their attention to the signs. The present signaling system avoids these inconveniences and has besides the advantage that the operator at the supervisory position at any time may ascertain the where-about of the wanted person. The invention is based upon a co-operation of the persons to be searched for as they have to mark themselves on those places where they are present for the time being in such a manner that the operator at the supervisory position in any moment may ascertain the where-about of the wanted person. The invention is not limited to such searching plants but it may also find a wide application in other kinds of signaling systems. It may, by way of example, be advantageously applied in hotels for sending signals to the staff of attendants from the different hotel rooms as will be more closely explained in the following.

The invention is illustrated on the accompanying drawings showing circuit diagrams of different embodiments.

Figure 1 is a circuit diagram of one embodiment of the signal system. Figure 2 is a circuit diagram of another embodiment.

Figure 1 is a simplified circuit diagram in which A, B and C designate three different marking places. Each such place is provided with a number of contact members AK, BK and CK respectively whereby a number of marking lines PL entering from the different marking places to a central supervisory position may be electrically marked in certain manner to control a place indicating device PS disposed at the supervisory position which device in the example shown in Figure 1, consists of a rotary switch PV the contact arm PA of which is connected to the battery D and by means of which the battery may be successively connected to the different place marking lines PL. The switch PV is preferably designed as a selector provided with a stop or locking magnet VM whereby the selector arm PA may be stopped and locked in different positions. At the supervisory position there are also disposed a number of marking members MK in the form of switches, push-buttons, or the like which in view of the various applications of the invention will hereinafter be called object marking members. They constitute in combination an object marking device OM. Extending from said marking device to the different marking places there is a number of marking lines OL which correspond to the different marking objects and which may be connected at each of the different marking places to the place marking line PL belonging to the marking place over the appertaining contact members AK, BK or CK respectively.

The object marking lines OL may be connected over the corresponding marking members MK to the one terminal of a current source D the other terminal of which may be connected to the place marking lines PL by means of the selector PV. The parts of the plant appertaining to the supervisory position and those appertaining to the marking places are on the drawings separated from each other by means of a dashed and dotted line E.

By means of such a switching arrangement different objects may be marked at different places A, B, C in such a manner that the place at which an arbitrary object is being marked for the time being may be ascertained at any time at the central position. The arrangement will be described in the following as applied to a searching plant for finding persons in a large warehouse or the like. The different objects are then represented by different persons to be searched for. To said persons a marking member AK, BK or CK respectively is allotted at each marking place besides which a marking member MK is disposed at the central position for each person. If one of said persons by way of example, is present at the place C he marks his presence by operating his marking member CK_2 to close a corresponding contact 1 in the way which will be described more closely hereinafter. If the operator at the central supervisory position wishes to know where said person is to be found for the time being this may be ascertained in the following manner. Initially, that marking member MK_2 is actuated which corresponds to the want-

ed person. Thereupon the contact arm PA of the selector PV is set, by way of example, manually and successively into different positions. When the arm reaches connection with the marking line PL for the marking place where the person in question is marked a circuit is closed over the marking member MK_1, the line OL_1, contact 1 of the marking member CK_2, the line PL_3, and the locking magnet VM of the selector whereby the selector arm PA is locked in the corresponding position which position thus directly denotes the place at which the person in question is present for the time being. The stopping and locking of the selector is effected by a pawl VR operated by the armature of the magnet VM engaging a toothed wheel VS secured to the shaft of the selector arm. As soon as the marking member MK is restored to the normal position the selector PV is released and may be restored to its starting position.

The indicating device is preferably associated with the operator's position in such a manner that it may be controlled by the operator. After the operator in the described manner has ascertained where the wanted person is present she may by telephone calls put herself into communication with the place in question and thus also enter into direct communication with said person.

A searching plant of the present kind may, of course, be designed for an arbitrary number of persons. The system allows also a simultaneous marking of several persons at the same marking place as is readily understood.

It is desirable in a system of the kind described that a place marking effected by operating a member AK, BK, CK should be automatically removed upon a new marking being effected at another place. For said purpose the place marking members AK, BK, CK are designed as magnetically lockable push-buttons the locking magnet AM, BM, CM respectively of which is short-circuited by pressing a button at another marking place so that the button at the former marking place is released and the marking at that place removed.

To establish the necessary holding circuits the different place marking lines PL are connected to the negative terminal of the battery over resistances PR. In similar manner the object marking lines are connected to the positive terminal of the battery over resistances OR. When a push-button is pressed as shown at A and C as regards the push-buttons AK_1 and CK_2 a corresponding holding circuit is closed over the resistances OR_1 and OR_2 respectively and the resistance PR_1 or PR_2 respectively including the locking magnet AM_1 and CM_2 respectively. When searching the place where the wanted person is marked, initially, the marking member MK of the wanted person, for instance MK_2, is actuated, the appertaining resistance OR_2 being then short-circuited. Thereupon the selector PV is successively set on the different place marking lines the system being then arranged in such a manner that the locking magnet VM is energized only at the setting on the marking line corresponding to the place where the person in question is marked. In the assumed example the selector is thus locked in the third position. Also in the first position a circuit is closed through the locking magnet over contact 1 of the push button AK_1 but on account of the high resistance OR_1 included in said circuit the locking magnet cannot operate. In the circuit established in the third position of the selector the resistance OR_2 is, on the other hand, short-circuited the selector magnet thus obtaining an adequate current to be energized.

In the embodiment according to Figure 1 optic marking devices SL are connected into the different place marking lines to mark directly the place. Said marking devices may, by way of example, consist of lamps or shutter indicators so adjusted that they are rendered operative only when the resistance OR is short-circuited in the corresponding circuit. In certain cases the place marking lines may instead contain relays which in turn control local circuits for the optic indications.

The push-buttons are actuated by a spring AF_1, BF_1 and CF_2 respectively whereby the button is normally held in that position which the buttons AK_1 and CK_2 take up on the drawings. When pressing down a button, for instance AK_1, the appertaining object marking line OL_1 is connected over the locking magnet AM_1 and the contact 1 actuated by the push-button, to the place marking line PL_1 and over the resistance PR_1 to the negative terminal of the battery. When the button is released it is retained by the armature AM_1 of the locking magnet in pressed down position as the magnet AM_1 remains energized over the contact 1. If the person in question desires to mark himself at another place, for instance the place B, he has only to press his button BK_1 at the place B, the marking on the place A being then automatically removed in the following manner. When pressing the button BK_1 the contact 1 is initially closed, the locking magnet BM_1 being then connected in parallel with the locking magnet AM_1. Upon further depressing the button BK also a contact 6 is closed whereby the negative terminal of the battery is connected to the object marking line OL_1. As a consequence, both the locking magnets AM_1 and BM_1 are short-circuited the button AK_1 being then released and returned to the normal position. When the button BK_1 thereupon is released, the contact 6 is first opened said short-circuit being then eliminated whereupon the button remains locked in an intermediate position in which the contact 1 is closed.

In large business premises or the like such a magnetically lockable push-button is preferably disposed also in the office room of the person in question so as to render possible the removal of a marking effected on a marking place situated outside his office room by pushing down the marking button in said room. For the purpose of calling the wanted person indicating devices are provided at the different marking places consisting of lamps AL, BL and CL respectively the circuits of which include switches OK disposed at the supervisory position. By means of these switches the corresponding lamps may be lighted after the operator at the central position in above described manner has ascertained that the wanted person is marked at a marking place. The lamp circuits extend over special lines KL to the same number as the lines OL and extending in the same manner as the latter lines from the central position to the different marking places. Each lamp circuit contains a contact 8 controlled by the appertaining push-button which contact is closed when the button is pressed and which remains closed in the locked intermediate position of the button. As soon as a certain person has marked himself at the marking place, for

instance A, the appertaining marking lamp, for instance AL_1, is lighted by closing the lamp circuit by means of the appertaining switch OK_1. Hereby the attention of the staff at said marking place is called to the fact that the person in question is wanted. If the signal should not be observed at once it will be noticed in any case when the person in question marks himself at another place or in his office as the lamp BL_1 in case a new marking is effected, for instance at the place B, immediately is lighted when pressing the button at said place. At the same time the call signal ceases at the place A by that the button is released and the lamp circuit interrupted at the contact 8.

Figure 2 shows a modification of the arrangement according to Figure 1 which renders possible a saving in current consumption as the marking members AK, BK at the different marking places AB are locked in marking position by the magnetic locking device in de-energized condition and are released by an impulse generated when actuating a corresponding switching member in another device. The figure shows a circuit diagram for an indicating plant with an object marking device OM and a place signaling device PS and a number of marking places of which only two, namely A and B are shown. At each marking place there is disposed a number of switching members in the form of push buttons AK and BK respectively for object marking, by way of example, for marking the presence of different persons at the place in question. Only one of said switching members AK_1 and BK_1 is shown in detail on the drawings the other switching members AK_2, AK_3 and BK_2, BK_3 respectively being only diagrammatically indicated on the drawings. Each push-button is provided with a magnetically releasable locking device in the form of a detent AH and BH respectively which is united with the armature AD and BD respectively pivoted at a point 31 and controlled by a release magnet AM_1 and BM_1 respectively. Each push button is adapted to actuate the contact springs 32, 33, 34, the springs 32 and 34 of which co-operate with two fixed contact pieces 35 and 36 respectively whereas the intermediate contact spring 33 co-operates with the detent AH and BH respectively in such a manner that it is locked in the position shown at the button BK_1 when the button is pressed and released. In this position the spring 33 at the same time makes contact with the spring 34.

The different marking members may, as described above, consist of push-buttons MK by means of which the positive terminal of the battery D can be connected to the different object marking lines OL. The place indicating device PS may be of any arbitrary kind. It may, by way of example, as shown on the drawing consist of shutter relays or lamp relays SM connected into circuit between the negative terminal of the battery and the place marking lines PL.

Each push button AK_1 and BK_1 respectively is provided with a calling lamp AL_1 and BL_1 respectively arranged to be connected up over contact springs 37, 38 in the operated position of the push button as shown in Figure 2 and as described with reference to Figure 1.

When a person intends to mark his presence at a certain place, by way of example, the place B he presses his button BK_1 the contact springs then taking up the position shown on the drawings. Thereby the appertaining place marking line PL_2 has been connected to the corresponding object marking line OL_1 over the winding of the release magnet BM_1 and the contact members 35, 32, 33, 34. In order to ascertain where the person in question is present for the time being the corresponding marking member MK_1 at the central position is actuated, a current being then closed from the positive terminal of the battery through a resistance M, the marking member MK_1, the object marking line OL_1, the contact members 34, 33, 32, 35 at BK_1, the release magnet BM_1, and the signal relay SM_2 to the negative terminal of the battery. This current is on account of the resistance M insufficient to actuate the release magnet BM_1. On the other hand, the signal relay SM_2 is actuated and indicates thus the place at which the person in question is present.

When said person moves to another place, for instance the place A, he marks his presence at the latter place by pressing the corresponding button AK_1. In the innermost position of the button the spring 34 makes contact with the contact member 36 a circuit being then closed from the positive terminal of the battery over a line GL, the contacts 36, 34, the object marking line OL_1, the contacts 34, 33, 32, 35 at the button BK_1, the release magnet BM_1, the place marking line PL_2 and the signal relay SM_2 to the negative terminal of the battery. In said circuit which does not contain the resistance M the release magnet BM_1 is energized, the contact spring 33 at the button BK_1 being then released and restored to its normal position so as to remove the marking at the place B. When the button AK_1 is released the contact spring 33 is locked at the latter button by the detent AH in an intermediate position in the same manner as shown at the button BK_1, whereby the person in question is marked at the place A. When actuating the marking member MK_1 to ascertain at which place the person is present for the time being a circuit is closed in this case through the indicating relay SM_1 which thus indicates that the person is present at the place A.

When pressing the button the contact 32, 35 is opened whereby is prevented that the release magnet appertaining to the same push button is actuated. The contact springs 32 and 33 may, if desired, be mutually interconnected in such a manner that the push -button is held in pushed-down position by the detent AH and BH respectively when the button is released.

A marking effected at an arbitrary place AB may at any time be removed from the central supervisory position by short-circuiting the resistance M and actuating a marking member MK whereby the locking magnet receives a release impulse over the appertaining line OL.

I claim:

1. In an annunciator system a supervisory station, a plurality of local stations, a plurality of station marking switches at each local station, each station marking switch being provided with two operative positions, a catching device for mechanically holding the switch in one of said operative positions and a release magnet for unlocking the switch, circuits controlled by said switches and including indicating means at the supervisory station for indicating the local station, where a station marking switch has been operated, circuits for said release magnets including contacts adapted to be operated in the other of said operative positions of the station marking switches so as to release one marking switch upon a corresponding marking switch at another local station being operated.

2. In an annunciator system a supervisory station, a plurality of local stations, a plurality of station marking switches at each local station, each station marking switch being provided with a normal position, a locking position and a release position and a magnetic locking device for holding the switch in the locking position, a number of object marking wires extending from the supervisory station through all of the local stations, a number of station marking wires extending from the supervisory station to the various local stations, contacts associated with the station marking switches for connecting the corresponding object marking wire with the station marking wire of the appertaining local station, station indicating means at the supervisory station associated with the station marking wires, a battery at the supervisory station, object marking switches at the supervisory station associated with the object marking wires and adapted, upon being operated, to establish an indicating circuit through said battery over the corresponding object marking wire, contacts of an operated station marking switch, a station marking wire and the station indicating means, for ascertaining the local station where a certain object has been marked, circuits for said locking devices extending over the object marking wires and including contacts adapted to be operated in the release position of the station marking switches so as to release one marking switch upon a corresponding marking switch at another local station being operated.

3. In an annunciator system a plurality of local stations each comprising a plurality of station marking switches corresponding to different objects to be marked, a supervisory station, a number of object marking wires extending from the supervisory station through all of the local stations, a number of station marking wires extending from the supervisory station to the various local stations, contacts associated with the station marking switches for connecting the corresponding object marking wire with the station marking wire of the appertaining local station, station indicating means at the supervisory station associated with the station marking wires, a battery at the supervisory station, object marking switches at the supervisory station associated with the object marking wires and adapted, upon being operated, to establish an indicating circuit through said battery over the corresponding object marking wire, contacts of an operated station marking switch, a station marking wire and the station indicating means, for ascertaining the local station where a certain object has been marked, calling means individually associated with the station marking switches, circuits for said calling means controlled by the appertaining station marking switches, and switches at the supervisory station for operating the calling means.

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