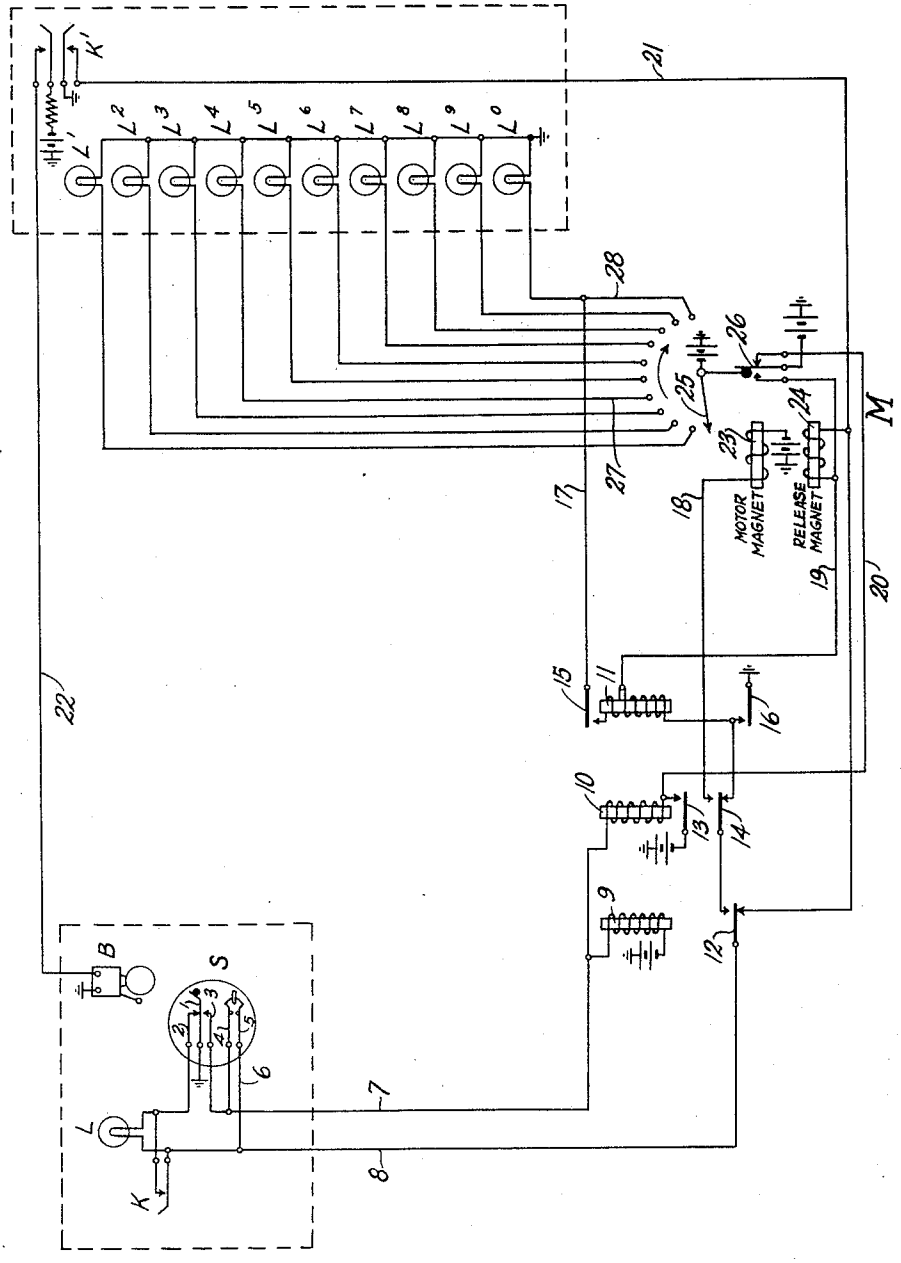
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SIGNALING SYSTEM

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SIGNALING SYSTEM

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This invention relates in general to signaling systems and in particular to such systems wherein signals are transmitted from remote sending stations to a central receiving station which has equipment to cause the transmitted signals to be displayed upon banks of lamps.

Signaling systems of that character are particularly useful in garages of the ramp type where it is a necessity that the door attendant be informed of the number of vacant stalls on each floor so that he may dispatch cars with the least possible delay and confusion.

I have taken for the principal object of my invention the provision of a system of the character above described which employs the minimum of equipment with a minimum of maintenance and installation costs.

Other objects and advantages of the invention will hereinafter appear.

This application is a continuation in part of my application Serial No. 289,192, filed June 29, 1928, now abandoned.

The accompanying single sheet of drawings diagrammatically shows the equipment necessary for each line of the system, there being one line for each floor of the garage.

The equipment included within the dotted rectangle towards the upper left-hand corner of the sheet is that located at the sending station and it comprises the impulse sender S, signal lamp L, bell B, and key K.

The equipment included within the dotted rectangle towards the right is that located at the receiving station, and it comprises the bank of lamps L_1 to L_0, inclusive, and the key K_1. The lamps are arranged behind a glass panel so that when each lamp lights it exhibits a numeral corresponding to that lamp on the face of the panel. There is one such panel with a key similar to K_1 for each line, which, in this case, represents each floor of the garage.

The equipment in the lower central part of the drawing is the equipment necessary to translate the signals from impulses to lighted lamps. This equipment comprises the relays 9, 10, and 11 and the switch M.

A complete and detailed description of the operation of the system will now be given so that the novelty and utility of my invention may be fully appreciated.

It will be assumed that on the third floor of the garage there is room to store four cars; that is, there are four vacant stalls. The floor attendant, desiring to apprise the dispatcher, who is on the main floor of the garage, of this fact, operates the impulse sender S located on that floor. The impulse sender S is of the well-known Strowger type consisting of a mechanism controlled by a finger-hole dial having ten finger holes located near the periphery of the dial, the holes being numbered 1 to 0, inclusive. To operate the impulse sender, the finger is inserted in the hole corresponding to the digit which it is desired to transmit, and the dial is rotated in a clockwise direction until the finger encounters a stop. The dial is then released and allowed to return to its starting position under the influence of a spring. In so doing, it operates a mechanism to transmit a number of impulses corresponding to the digit selected.

In accordance with the assumed number four, that being the number of vacant stalls, the floor attendant inserts his finger in #4 hole of the dial and rotates the dial in a clockwise direction. As the dial is turned from its position of rest, spring 1 which is held in contact with spring 2 under tension, disengages spring 2 and engages spring 3, thereby completing energizing circuits for relays 9 and 10 in multiple over conductor 7. The circuit for relay 10 extends to battery via conductor 20 and off-normal spring 26 and its right-hand contact, of switch M.

Relays 9 and 10, when energized, operate their armatures to move their springs into engagement with their working contacts. In the case of relay 9, the moving of spring 12 into engagement with its make contact extends the conductor 8 to spring 14. In the case of relay 10, the moving of spring 13 completes a locking circuit for itself partially independent of the original energizing circuit, and the moving of spring 14 connects conductor 8 with conductor 18 and the winding of the motor magnet 23 of switch M.

As the dial is returning to normal under the influence of the restoring spring (not shown), springs 4 and 5 will close momentarily four times, thus sending four current impulses over the following circuit: from ground on spring 1, spring 3, springs 4 and 5, conductor 6, conductor 8, spring 12 and its make contact, spring 14 and its make contact, conductor 18, winding of motor magnet 23, to grounded battery. Motor magnet 23 operates four times in accordance with the number of impulses received over conductor 18 and with each operation moves its wiper 25 one step.

As wiper 25 moves from rest, it allows off-normal spring 26 to disengage itself from its right-hand contact and engage its left-hand contact, thus opening the original energizing circuit of relay 10.

When wiper 25 comes to rest on the fourth contact of its bank, a circuit is completed for lamp L_4 which is traceable as follows: from ground, lamp L_4, conductor 27, wiper 25, to battery. Lamp L_4 lights in that circuit to exhibit the number "4" on the lamp panel.

When the finger dial reaches its position of rest, spring 1 disengages spring 3 and engages spring 2, thereby opening the circuits of relays 9 and 10 to permit them to deenergize to move their springs into engagement with their back contacts, and completing the circuit of lamp L in series with release magnet 24 to battery via off-normal spring 26 and its left-hand contact. Lamp L lights when its circuit is completed and remains lighted as long as the equipment is in use. Release magnet 24 is so adjusted that it will not operate in series with lamp L. Therefore, when it is desired at any other time to send a signal, the attendant will be able to tell by the condition of lamp L whether or not the equipment is in use.

If at any time it is desired to erase the number written upon the lamp panel, it may be accomplished by the operation of key K at the sending station or key K_1 at the receiving station. The operation of key K, or key K_1, short circuits lamp L, allowing the release magnet 24 to operate to return wiper 25 to its position of rest in the well-known manner.

In garages of the type described, it is not imperative that the dispatcher know the exact number of vacant stalls on a certain floor if that number is more than ten because it is unusual that cars seek storage so rapidly that, in order to dispatch them hurriedly, the dispatcher must send more than ten cars at once to one floor. Therefore, the system has been so arranged that if a number comprising two digits is dialled, the tens number next below it will be registered upon the single row of lamps. For example, if "48" were dialled, "40" would be registered; if "32" were dialled, "30" would be registered; and so on. The dialling of the second digit always multiplies the first digit by ten merely by lighting the "0" lamp.

Going back to the place in the sequence of operations where the number "4" is exhibited, the dial is in its normal position and relays 9 and 10 have deenergized, the operation of the system when a second digit is dialled will be described.

When the dial is turned from its position of rest the second time, the same circuit for relay 9 is completed and relay 9 operates. No circuit is completed this time for relay 10 because off-normal spring 26 is out of engagement with its right-hand contact. No matter what number is dialled, the first impulse transmitted by the engagement of springs 4 and 5 energizes relay 11, which relay operates, completing two locking circuits for itself. The path traveled by that first impulse is the same as that traveled by the first group of impulses until it gets to spring 14 of relay 10. Since relay 10 is not energized, the impulse path goes by way of spring 14 and its back contact, lower winding of relay 11, conductor 19, left-hand contact and off-normal spring 26 to grounded battery. One of the two locking circuits for relay 11 is completed by the engagement of spring 16 with its make contact. The other locking circuit includes the upper winding of relay 11, spring 15 and its make contact, conductor 17, and lamp L_0. Lamp L_0 lights in that circuit to exhibit the numeral "0" on the panel.

Thus it will be seen that the dialling of the second digit of a number lights the "0" lamp regardless of the digit dialled.

This arrangement enables less equipment to be used, for, to register the second digit exactly as dialled, it would be necessary to provide a second switch similar to switch M and a second row of lamps.

The operation of release key K_1 at the receiving station not only releases the equipment, but it also closes an operating circuit for the bell B at the sending station. By prearranged code, say two rings of bell B, the dispatcher may signal the attendant for a recount of the number of vacant stalls.

Although I have chosen the foregoing manner of illustrating my invention, it is not my intention to be limited to the exact disclosure, for there are modifications and adaptations which could be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, what I consider new and desire to have protected by Letters Patent shall be pointed out in the appended claims.

What is claimed is:

1. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of lamps, a selecting de-

vice operated responsive to the operation of the digit sender to light the lamp in said row corresponding to the digit sent, and a relay operated responsive to a subsequent operation of the digit sender to light one certain lamp in said row regardless of the digit sent.

2. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of ten lamps numbered 1 to 0, inclusive, a selecting device operated responsive to the operation of the digit sender to light the lamp in the row corresponding to the digit sent, and a relay operated responsive to a subsequent operation of the digit sender to light the "0" lamp regardless of the digit sent.

3. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of lamps, circuit connections for each lamp of the row, a switching device operated responsive to the operation of the digit sender to complete the circuit connection for the lamp of said row corresponding to the digit sent, an additional circuit connection for a certain one of the lamps, and a relay operated responsive to a subsequent operation of the digit sender to always complete said additional circuit connection for said certain lamp.

4. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of ten lamps, a ten point switch having each of its points in an energizing circuit for one of said lamps, said switch operated responsive to the initial operation of the digit sender to select the point corresponding to the digit sent and to complete the energizing circuit for the associated lamp, and a relay operated responsive to a second and subsequent operation of the digit sender to always complete the energizing circuit of a certain one of said lamps independently of said switch.

5. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of ten lamps numbered 1 to 0, inclusive, means operated responsive to the operation of the digit sender in sending numbers comprising one digit to light the lamp corresponding to that digit, and means operated responsive to the operation of the digit sender in sending numbers of two digits to light lamps corresponding to the nearest lower multiple of ten by lighting a lamp corresponding to the first digit and the 0 lamp.

6. In a signaling system, a sending station having a digit impulse sending device, a receiving station having a lamp panel comprising a single row of ten lamps numbered 1 to 0, inclusive, means operated responsive to the operation of the digit sender in sending numbers comprising one digit to light the lamp corresponding to that digit, and means operated responsive to the operation of the digit sender in sending numbers of any two digits to light lamps corresponding to the nearest lower multiple of ten by lighting a lamp corresponding to the first digit and the 0 lamp.

In witness whereof, I hereunto subscribe my name this 26th day of March, A. D. 1929.

ROY F. GOULD.