Sept. 14, 1965 O. T. GUSTUS ETAL 3,206,722

TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE

Filed Aug. 20, 1963 3 Sheets-Sheet 1

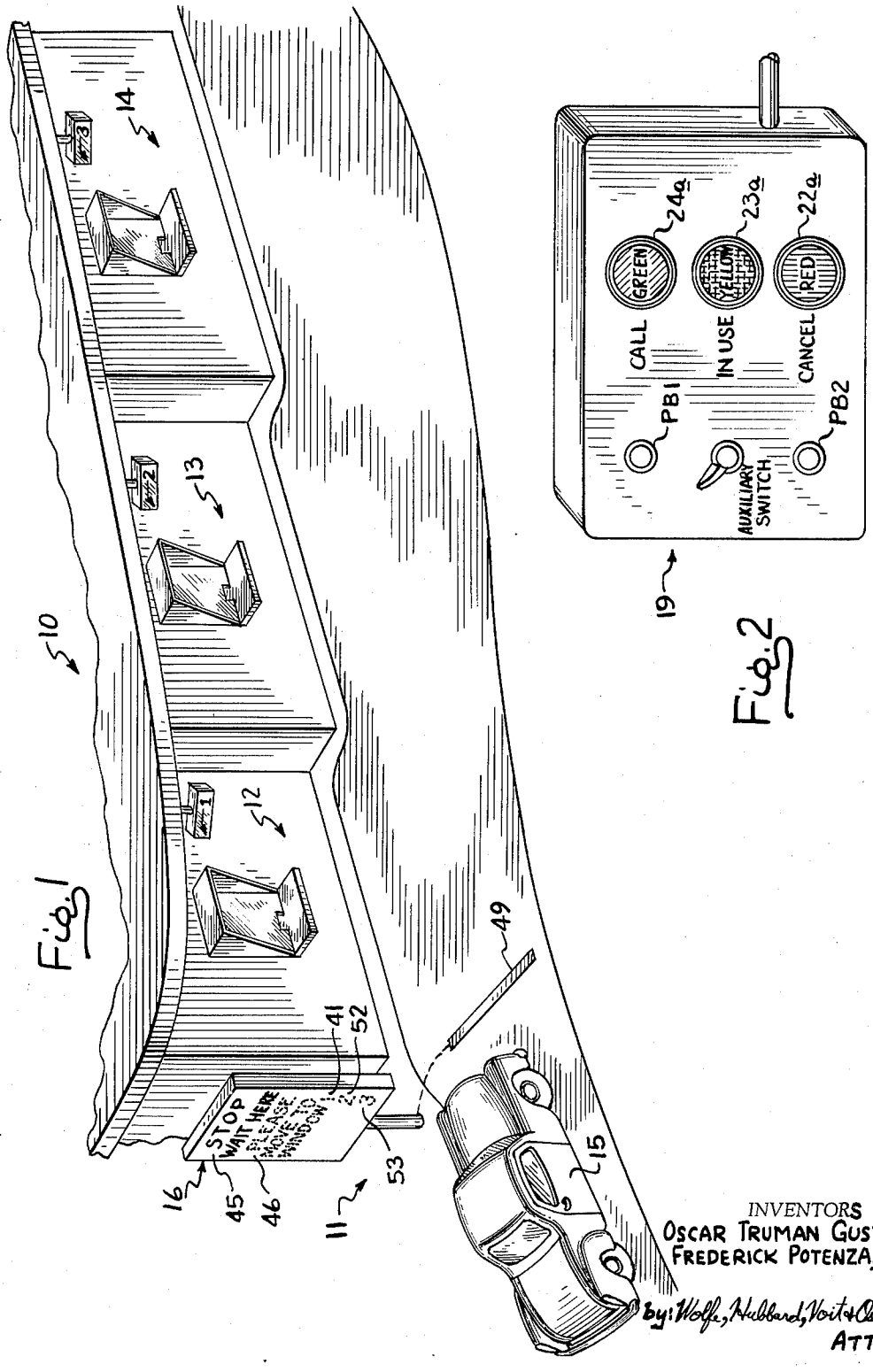

Fig. 1

Fig. 2

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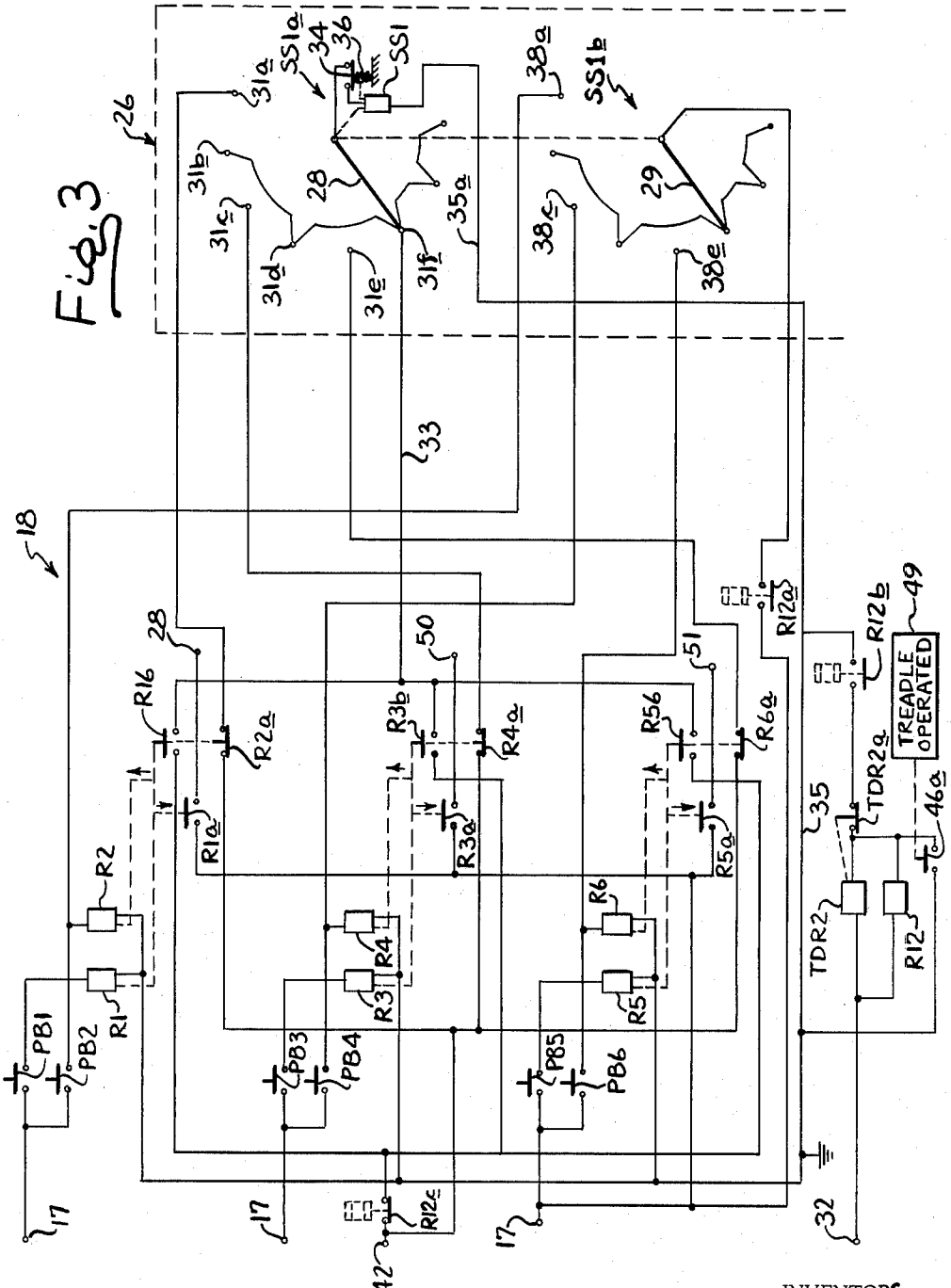
Filed Aug. 20, 1963 3 Sheets-Sheet 2

Fig. 3



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3 Sheets-Sheet 3

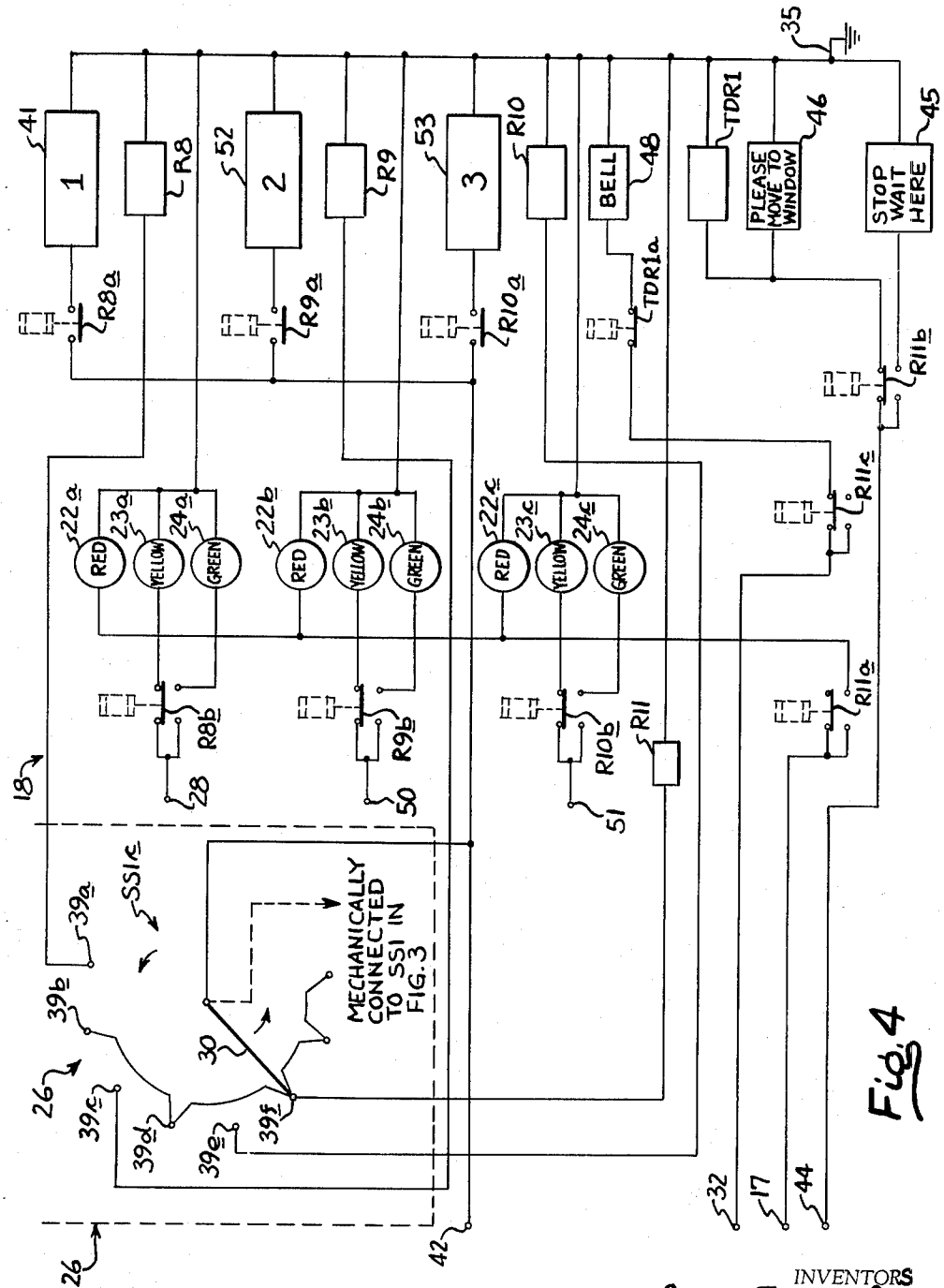

Fig. 4

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3,206,722

TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE

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Filed Aug. 20, 1963, Ser. No. 303,358
6 Claims. (Cl. 340—51)

The present invention relates to a system for controlling movement of traffic and more particularly to a system in which control is exercised over the movement of traffic to a plurality of serving stations such as drive-in bank installations or the like.

Among installations in which it is necessary to control the movement of vehicles, drive-in banks have created a need for an efficient and economical system to control movement of vehicles from a dispatching or entrance station to a plurality of receiving or serving stations. The simplest systems have used human traffic directors to motion and instruct the vehicle drivers. The latter system is undesirable for several reasons. First of all, only a limited number of windows can be utilized requiring a physical arrangement of the entrance station and serving stations so that the traffic director can keep both under observation. Furthermore, the system is inefficient because the bank guard is not the person who has the most timely knowledge of the service window transaction so that he can anticipate when one customer is about to leave and another one can be directed to the service station. In addition, exceptional vigilance is required on the part of the traffic director if vehicles are to be instructed in an efficient manner to proceed to specific ones of several service windows. Though the problems of controlling traffic movement from a dispatching station to receiving stations have been set forth in the environment of a drive-in bank, it will be clear from the objects and description that follow that the present system can be used in a variety of situations having the same basic traffic control problem.

It is a general aim of the present invention to provide a traffic control system wherein operators located at a plurality of receiving or service stations direct movement of traffic from a dispatching or entrance station to the several service stations. The present invention will find especially advantageous but by no means exclusive use in a drive-in bank installation wherein personnel at designated service stations or windows transmit signals to a central control unit which then operates a sign or other instructing means directing movement of customers to the respective service windows, the central control unit being capable of receiving more than one signal at a given time and then sequentially presenting instructions corresponding to these signals to the waiting patrons.

It is an ancillary object of the present invention to provide a system which is not confusing in giving instructions and presents only one message at a time. Contrariwise, it is an object of the present invention to provide a system which can accept signals from several receiving stations at the same time and subsequently feed out these signals to present messages at the dispatching station in a predetermined sequence. Also, it is an object of the present invention to provide a traffic control system which is not restricted to a limited number of receiving stations or to a particular location of the stations relative to the dispatching station.

It is a further object in accordance with the above to provide an efficient and economically manufacturable system for controlling movement of traffic at drive-in bank installations and the like which, however, is reliable and easy to maintain.

Other objects and advantages of the invention will become apparent upon reading the following description and upon reference to the drawings in which:

FIGURE 1 is a perspective of a drive-in bank having a plurality of service stations and embodying the present invention;

FIG. 2 is a perspective of a control panel used at each of the receiving or serving stations;

FIG. 3 is a schematic of a portion of the central control unit; and

FIG. 4 is a schematic of the remaining portion of the central control unit showing the coupling with the message presenting signs.

While the invention will be described in connection with a preferred embodiment and method, it will be understood that we do not intend to limit the invention to such an embodiment and method but on the contrary we intend to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Turning to FIG. 1 and the traffic control system **10** there shown embodying the present invention, the latter includes a dispatching or entrance station **11** and receiving or serving stations **12, 13, 14,** respectively. The serving stations have been designated as window **1**, window **2** and window **3** respectively in the environment of a drive-in bank installation. Shown approaching at the entrance station **11** is a vehicle **15**, though shown as a car it could be any mobile machine, to which instructions are communicated or presented by an instructing means, in the present instance a sign **16**. It is clear that other instructing means could be used besides visual, for example, audio or even radio signals for remote control. The initial instruction is one to hold the vehicle **15** in readiness and in the exemplary device reads: STOP WAIT HERE. The movement messages are shown in phantom on the sign **16** and include a message PLEASE MOVE TO WINDOW and also specific window identifying numbers: 1, 2 and 3 corresponding to the receiving stations or serving windows **1, 2** and **3** as identified in FIG. 1.

For coordinating the presentation of particular movement messages along with hold position messages on the sign **16**, a central control unit **18** is provided coupling an operator actuated panel **19** with the sign **16**. One panel is provided at each of the serving stations, an exemplary panel for window **1** is shown in FIG. 2. The latter has a pair of push buttons PB1, PB2 connected with a source **17**, and three indicator lights **22***a*, **23***a*, **24***a* explained subsequently. A master switch (not shown) controls energization of the complete system. When power is applied to the system in the light **22***a*, in the present instance red on panel **19**, would indicate to an operator that the sign **16** is presenting a hold position message: STOP WAIT HERE and the system is in condition for receiving his call.

Turning specifically to the exemplary construction of the central control unit **18**, three sets of actuators or push buttons PB1, PB2; PB3, PB4; and PB5, PB6 are provided, one set being present at each of the receiving windows. The push buttons are electrically connected to complete an energizing circuit for respective sets of relays R1, R2; R3, R4; and R5, R6. Associated with each of the sets of relays are contacts R1*a*, R1*b*, R2*a*; R3*a*, R3*b*, R4*a*; and R5*a*, R5*b*, R6*a*. In the exemplary circuit the relays are of a construction known as latching relays in the art. Explaining operation of an exemplary set of these relays, upon actuation of push button PB1 the relay R1 is energized and contacts R1*a*, R1*b* are actuated and latched in a closed position to complete the respective circuits in which these contacts are operative. At the same time contacts R2*a* are opened. Should relay R2 be energized, for example if push button PB2 were pressed, then the

contacts R2*a* would be actuated and they would latch in the closed position while at the same time the contacts R1*a* and R1*b* would be opened. The arrows in FIG. 3 indicate the direction in which contact movement is effected. Summarizing, the contacts are latched in one or the other of two positions depending upon which relay was last energized.

For placing a call instructing a customer to move to respective windows **1**, **2** and **3**, the control unit includes structure responsive to actuation of push buttons PB1, PB3 and PB5, respectively. As is explained subsequently, the remaining push buttons PB2, PB4 and PB6 at each of the respective stations are used to override or cancel signals submitted by the push buttons PB1, PB3 or PB5, respectively. Referring to the structure in control unit **18** responsive to actuation of PB1 at window **1** indicating a call for a vehicle to move to that window, source **17** is connected to relay R1 energizing the latter and actuating contacts R1*a*, R1*b*. The closing of contacts R1*a* provides electrical power at terminal **28** and, as shown in FIG. 4, completes a circuit through the light **23***a*, yellow in the present instance, to indicate on panel **19** to the operator at window **1** that his call has been received.

At the same time that contacts R1*a* are closed contacts R1*b* are also closed energizing a selector **26** which in turn effects presentation of the movement message at the entrance station **11**. The selector **26** in the exemplary structure includes a stepping switch relay SS1 and three sets of stepping switches SS1*a*, SS1*b* and SS1*c* (the latter is shown in FIG. 4). The switches include a set of respective wipers **28**, **29**, **30** coupled to rotate as a unit. Summarizing the functions of each of the stepping switches, SS1 and SS1*a* cooperate to effect rotation of the wipers, SS1*b* prepares the control unit **18** for sequential presentation of messages and SS1*c* controls energization of the specific messages on the sign **16**.

Turning to stepping switch SS1*a* and the structure for effecting counterclockwise rotation of the wipers, SS1*a* includes contacts **31***a*, **31***b*, **31***c*, **31***d*, **31***e* and **31***f* with alternate contacts connected together, i.e. **31***b*, **31***d*, **31***f*, to provide a desired stepping operation of the wipers. The remaining alternate contacts **31***a*, **31***c*, **31***e* are coupled to respective relay contacts R2*a*, R4*a* and R6*a* corresponding to windows **1**, **2** and **3**. To effect unison stepping of the wipers **28**, **29**, **30**, the wiper **28** is connected to source **42** through one of the respective relay contacts R2*a*, R4*a*, R6*a* or through the common conductor **33** and one of the contacts R1*b*, R3*b*, R5*b*. The energizing circuit for relay SS1 includes the wiper **28**, a set of relay contacts **34**, the relay SS1 and conductor **35***a* connected to a common ground terminal **35**. The relay SS1 operates as a self-interruption device effecting one-step movement of wiper **28**. Explaining the self-interruption operation of the energization circuit of relay SS1, each time relay SS1 is energized the contacts **34** are opened. The interruption stops the wiper for a moment at one of the contacts **31***a*–**31***f* whereupon a spring **36** biases the contacts **34** back to the closed position. If the contact at which the wiper **28** is stopped is energized, the relay SS1 will again step the wiper **28** around counterclockwise as viewed in FIG. 3. The operation continues until the wiper reaches a contact at which there is no electrical power, whereupon the relay SS1 is not energized after the circuit has been interrupted and stepping is stopped.

To effect positioning of the wiper **28** at a selected point, electrical energy is removed from selected ones of the contacts **31***a*–**31***f*. To stop the wiper at contact **31***a* the actuation of push button PB1 energizes relay R1 to actuate opening of contacts R2*a* and thereby open the circuit between contact **31***a* and source **42**.

Accordingly, the wiper **28** will step around counterclockwise making the jump from the contacts at the lower end as viewed in FIG. 3 up to contact **31***a* and, upon making connection with contact **31***a*, the wiper stops because there is no electrical energy to energize relay SS1. The stepping switches SS1*b* and SS1*c* are mechanically coupled with the stepping switch SS1*a* thus all wipers rotate counterclockwise and stop at correspondingly oriented wiper contacts. Stepping switch SS1*b* has a set of contacts **38***a*, **38***c*, and **38***e*. The wiper **29** will stop at contact **38***a*. The remaining stepping switch SS1*c* has a set of contacts **39***a*–**39***f* and the wiper **30** will stop at contact **39***a*.

Turning first to stepping switch SS1*c* which controls energization of specific messages on sign **16**, as best shown in FIG. 4, it has alternate contacts **39***a*, **39***c* and **39***e*, respectively connected to relays R8, R9 and R10 to effect energization of respective numerals on sign **16**, i.e. 1, 2 and 3. The remaining contacts **39***b*, **39***d*, **39***f*, respectively are connected together and to relay R11. For providing electrical energy at each of the contacts, the wiper arm **30** is connected to an electrical source **42**. Accordingly, when the wiper **30** is connected with the commonly connected contacts, electrical energy is transmitted to the relay R11, and as a result associated contacts R11*a*, R11*b*, R11*c* are actuated. Otherwise relay R11 is deenergized and the contacts are in a rest position. The contacts are shown in their rest positions. As is clear from FIG. 4, upon actuation contacts R11*b* complete an energization circuit from a source **44** to an initial hold position message **45**: STOP WAIT HERE. At the same time the contacts R11*a* complete an energizing circuit through the respective red lights **22***a*, **22***b*, **22***c* indicating to the operators or tellers that the hold message STOP WAIT HERE is displayed on the instructing means. Contacts R11*c* are inoperative in their actuated state.

The movement message is effected on sign **16** by the wiper **30** stopping at contact **39***a*. Reviewing the effect of the person at station **1** placing a call, the push button PB1 was actuated and as a result wiper **28** of stepping switch SS1*a* steps to contact **31***a*. Simultaneously, at stepping switch SS1*c* the wiper **30** stepped to contact **39***a*. In this position of wiper **30**, relay R11 is deenergized because the wiper no longer connects the relay to source **42**. Accordingly, the contacts R11*a*, R11*b*, R11*c*, respectively take their rest positions. When contacts R11*b* drop to their rest position a message **46** PLEASE MOVE TO WINDOW is energized on sign **16**. At the same time contacts R11*a* assume a rest position in which the red lights **22***a*, **22***b*, **22***c* at each of the windows are extinguished indicating that the STOP WAIT HERE message has been blocked out. Also contacts R11*c* assume a rest position in which a bell **48** is energized from source **32** audibly indicating that a movement message is to be obeyed. In order to turn off the bell after a predetermined period of time, a time delay relay TDR1 and its associated contacts TDR1*a* are provided. The time delay relay TDR1 is connected in parallel with the message means **46** and accordingly, after the message PLEASE MOVE TO WINDOW has been on for a predetermined period of time the bell **48** is deenergized.

To display the numeral indicating which window the vehicle **15** is to move to, in the exemplary operation when wiper **30** makes electrical connection with contact **30***a*, a relay R8 is energized and its associated contacts R8*a*, R8*b* are actuated. The closing of contacts R8*a* completes an energizing circuit from source **42** to a numeral sign **41**, reading: 1. The closing of contacts R8*b* energizes green light **24***a* to indicate to the teller that the sign **16** reads: PLEASE MOVE TO WINDOW 1.

To prepare the control unit **18** for presenting the next message, movement of vehicles at entrance station **11** is detected, in the present instance detection is by a treadle **49** which effects energization of a relay R12. It is, of course, clear that detectors other than the pressure type can be used including among others infrared and induction detectors. Relay R12 has associated contacts R12*a*, R12*b*, R12*c* with contacts R12*a* controlling energization of stepping switch SS1*b*'s wiper **29**. Stepping switch SS1*b*

includes contacts 38*a*, 38*c*, 38*e* connected respectively to relays R2, R4, R6 associated with the various receiving stations. Accordingly, when relay R12 is energized and contact R12*a* is actuated to close the circuit connecting the wiper 29 with the source 17, electrical energy is transmitted to relay R2 through stepping switch contact 38*a*. Operation of relay R2 closes contacts R2*a* and opens contacts R1*a*, R1*b*, the latching relay assembly having been explained previously.

The closing of contacts R2*a* completes a circuit from the source 42 to wiper contact 31*a*. Accordingly, the wiper 28 of stepping switch SS1*a* is energized and as a result self-interruption relay SS1 is energized. Upon energization of the relay SS1 the wiper arm is moved one step to contact 31*b*. The contacts R1*b* are open because the relay R2 was energized, accordingly the alternate, commonly connected terminals of stepping switch SS1*a* are no longer connected to source 42. As a result there is no electrical energy to effect operation of stepping relay SS1, and the wiper will stop at 31*b*. To prevent the wiper 29 from being stepped as the rear wheels of vehicle 15 pass over treadle 49, time delay relay TDR2 and contacts TDR2*a* are provided. Contacts R12*b*, R12*c* cooperate with relay TDR2 to assure proper operation.

In accordance with the present invention the control unit 18 can accept signals from each receiving station at the same time and store these signals to effect sequential presentation of messages at the instructing means 16 corresponding to the signals received so as to provide controlled movement of traffic to the various stations. In the present instance, the control unit includes a signal receiving and retaining device in the form of the latching relays associated with each of the receiving stations, in the present instance there being three stations and thus three sets of latching relays R1, R2; R3, R4; and R5, R6. To explain the signal receiving and storing structure in control unit 18, it is assumed that push buttons PB1, PB3 and PB5 at each of the respective windows are actuated at the same time requesting that traffic move to these windows. Besides relay R1 relays R3 and R5 are also operated and thus contacts R3*a*, R3*b* and R5*a*, R5*b* are closed while contacts R4*a*, R6*a* are opened. Because the relays are of the latching type the contacts would hold their position. While the call from window 1 is processed, the closing of contacts R3*a* and R5*a* provides electrical power from terminal 17 to respective terminals 50, 51. Turning to FIG. 4, the providing of energy at terminals 50, 51 energizes respective yellow lights 23*b*, 23*c*. The yellow lights at each of the control panels indicate to the respective tellers that their signals have been received and stored.

At a later time after the message PLEASE MOVE TO WINDOW 1 has been displayed and a vehicle moving to the latter window actuates the detector 49, relay R2 is energized thereby effecting closing of contacts R2*a*. As a result, contact 31*a* of stepping switch SS1*a* is energized and wiper 28 is stepped by relay SS1 to contact 31*b*. Contact 31*b* is also energized because the contacts R3*b* are closed, this is because the teller at window 2 has actuated PB3 thus energizing all of the commonly connected contacts of stepping switch SS1*a*. Accordingly, the wiper 28 will step once more to terminal 31*c*. Contact 31*c* is not energized because contacts R4*a* are open since, as has been assumed, PB3 is actuated. Thus, the wiper arm 28 will stop at contact 31*c*. In step with wiper 28 are the wipers 29 and 30 of respective stepping switches SS1*b*, SS1*c*. In stepping switch SS1*c* the wiper 30 will stop at contact 39*c*. As a result the relay R11 is deenergized because the wiper 30 is not connecting the source 42 to any of the respective commonly connected terminals 39*b*, 39*d*, 39*f* that are themselves connected to relay R11. Therefore contacts R11*b* will move to their rest position to connect source 44 to the message means 46: PLEASE MOVE TO WINDOW. At the same time relay R9 is energized actuating contacts R9*a*, R9*b*. Actuation of contacts R9*a* energizes message means 52 illuminating the numeral 2. The closing of contacts R9*b* energizes green light 24*b* to indicate to the operator at station 2 that the message PLEASE MOVE TO WINDOW 2 is displayed on sign 16. Meanwhile the contacts R11*a* assume a rest position in which the red lights 22*a*, 22*b*, 22*c* at each of the control panels are extinguished. Also the contacts R11*c* are deenergized connecting the bell 48 to source 32 and audibly indicating to the vehicle operator that he should take note of the message that is displayed. The bell rings until the time delay relay TDR1 operates to actuate contacts TDR1*a* and thereby deenergize the bell 48.

As another vehicle passes over treadle 49 the selector 26 is prepared to present the next message. The contacts 46*a* are closed by actuation of treadle 49 to energize relay R12 and effect closing of contacts R12*a*, R12*b* and R12*c*. The closing of contacts R12*a* couples electrical energy from the source 17 to the wiper 29 which has stepped to contact 38*c* to thereby energize relay R4 and return the latching relay contacts to their rest position. In their rest position contacts R4*a* are closed and provide electrical energy at contact 31*c* to effect stepping of the wiper 28 because electrical energy is coupled into the stepping switch relay SS1. As a consequence wiper 28 moves to contact 31*d* which is also energized because the teller at window 3 operated push button PB5 to energize relay R5 and latch contacts R5*a*, R5*b* in the closed position. Contacts R5*b* in their closed position complete an energization circuit through conductor 33 to the commonly connected contacts of stepping switch SS1*a*. The wiper 28 will therefore couple electrical energy into stepping relay SS1 and effect further step movement of the wiper 28. The wiper 28 moves only one step to terminal 31*e* because the contacts R6*a* are open as a result of actuation of PB5 thereby removing electrical energy from the terminal 31*e*.

Meanwhile in stepping switch SS1*c* the wiper 30 has stepped to terminal 39*e*. As a result relay R11 is deenergized because contact 39*e* is not one of the commonly connected terminals to which relay R11 is connected and accordingly the message 45: STOP WAIT HERE is removed and the message 46: PLEASE MOVE TO WINDOW is presented on the sign 16. Because relay R10 is connected to terminal 39*e*, the stepping of wiper 30 to contact 39*e* couples electrical source 42 to relay R10 thereby energizing the latter and actuating contacts R10*a*, R10*b*. The actuation of contacts R10*a* effects energization of a numeral illuminating means 53 thereby displaying the number 3. The closing of contacts R10*b* completes the circuit for the green light 24*c* on the panel at station 3 indicating to the teller that the message at the enrance station reads: PLEASE MOVE TO WINDOW 3.

For removing a signal or call after it has been placed and is either in storage or is displayed on the sign, the respective push buttons PB2, PB4 and PB6 are provided, one for each receiving station. Explaining the operation of one of the push buttons as an example, if the operator at receiving station 2 has signalled a call which has either been placed on the sign 16 or is awaiting presentation, cancellation of the call can be effected by operating push button PB4. Upon actuation of the latter relay R4 is connected to source 17 which energizes the relay R4 and effects return of relay contacts R3*a*, R3*b* and R4*a* to their rest position. The effect on the control unit 18 is the same as that explained previously when the detector 49 was actuated by a car passing over it to energize relay R4. The stepping relay SS1 is energized when contacts R4*a* close because the latter connect electrical source 42 to the contact 31*c* at which wiper 28 has stopped in response to the person at station 2 actuating push button PB3. The wiper 29 takes one step and stops at contact 31*d* unless an operator at station 3 has placed a call whereupon the relay SS1*a* operates to effect the message PLEASE MOVE TO WINDOW 3.

As an example of usable voltages at the different sources herein enumerated, it has been found in a practical installation that the following voltages are usable: at terminal 17, 24 volts A.C.; at terminal 32, 24 volts D.C.; at terminal 42, 155 volts D.C.; and at terminal 44, 115 volts A.C.

In the foregoing description it has been assumed that the actuators PB1, PB3 and PB5 at respective serving stations 1, 2 and 3 are actuated at the same time. The system 11 then operates so as to sequentially present instructions at the sign 16 to direct vehicles at the entrance station 11 first to serving station 1, then to serving station 2 and finally serving station 3. It is a feature of the present invention that any one or more of the stations can be by-passed while the other stations are operated. To explain the operation of the system when one of the serving stations is inoperative, it is assumed that serving station 2 is not operated but only stations 1 and 3. Accordingly, actuators PB1 and PB5 at respective stations 1 and 3 are operated, in the present instance simultaneously.

Turning to FIG. 3 and the selector 26 of control unit 18 there shown, the stepping switch SS1*a* is operated so it first stops at contact 31*a* and then stops at contact 31*e*. The wiper 30 of stepping switch SS1*c* steps in unison with switch SS1*a* and stops first at contact 39*a* to effect an instruction on the sign 16 directing a vehicle to serving station 1, and then stops at contact 39*e* to effect an instruction on the sign 16 directing a subsequent vehicle to serving station 3. The operation of the push buttons or actuators to transmit signals to the control unit 18 thereby effecting signals at the entrance station 11 has been explained. At this point the structure allowing specific stations to be unused while the remainder of the stations are utilized is emphasized. To this end, the selector 26 steps the wiper 28 about from contact 31*a* to 31*e*. As has already been explained, the wiper 28 will be stepped counterclockwise as viewed in FIG. 3 from contact 31*a* to 31*b* after a movement message instructing a vehicle to move to station 1 has been displayed and the vehicle has actuated the detector 49 in proceeding to the station. Upon reaching contact 31*b* the wiper 28 takes another step because the commonly connected terminals 31*b*, 31*d* and 31*f* are connected to source 42 through closed contacts R5*b* and conductor 33. The latter is operated when relay R5 is energized by actuation of push button PB5. Thus wiper 28 steps to contact 31*c*. The wiper 28 steps once again upon reaching contact 31*c* because when the serving station 2 is not being operated the relay R3 is deenergized and the contacts R3*a*, R3*b* and R4*a* are in their rest positions. In the latter position contacts R4*a* are closed thereby completing a circuit from the source 42 to wiper terminal 31*c*. Thus when the wiper 28 makes contact with the terminal 31*e* electrical energy will be coupled into stepping switch SS1 to effect stepping of wiper 28 to contact 31*d*. The wiper will step once more to contact 31*e* upon reaching contact 31*d* because the latter is coupled to the source 42 through common conductor 33 and the closed contacts R5*b*. Contacts R5*b* are actuated when push button PB5 is operated to energize relay R5. Because contacts R6*a* have been open upon energization of relay R5, contact 31*e* is deenergized and thus wiper 28 stops at this contact. As was explained, the wiper 30 of stepping switch SS1*c* steps in unison with wiper 28 and thus will stop at contact 39*e* thereby effecting an instruction on sign 16: PLEASE MOVE TO WINDOW 3. Thereafter, upon the detector 46 operating in response to vehicle 15 moving to station 3 the wipers 28, 29, 30 are stepped once and because power is removed from the commonly connected contacts of SS1*a*, the wiper comes to rest on contact 31*f*.

From the foregoing description, it is clear that the dispatching system 10 provides an efficient control over dispatching of moving units from a dispatching station 11 to a plurality of receiving stations 12, 13 and 14. Signals are sent from the respective receiving stations to a control unit 18 by operation of actuators, herein described as push buttons. The signals are stored in the unit 18, in the exemplary unit latch relays are used to store signals from the actuators. The storage signals are then utilized in the selector 26 sequentially and one at a time to effect an instruction at the dispatching station 11, in the present instance on a sign 16, to either instruct units to hold position or move to a particular station. In the environment of a bank installation, the exemplary unit takes the form of a vehicle 15. The present system, however, finds utility in other installations than drive-in banks. A few examples of other installations are conveyor systems where units are to be conveyed to remote receiving stations, warehouses where fork lift trucks are dispatched to receiving stations and so forth. The present dispatching system finds a broad scope of utility where instructions are presented at a dispatching station in response to specific signals from a plurality of receiving stations, including the particularly advantageous ability to store signals received at the same time from the various receiving stations and then sequentially presenting these signals one at a time so as not to confuse the movement of vehicles or units from the dispatching station.

Though stepping switches and relays have been specifically described in the foregoing exemplary embodiment, it is within the skill of those in the art to follow the teachings of the present invention in adopting other commercially available structures of electronic and mechanical nature to perform the selection, signaling and memory functions in the present system. Also, though the system is provided with three sets of actuators: PB1, PB2; PB3, PB4 and PB5, PB6 for the three receiving station installation, the system is fully adapted for more or less receiving stations.

In summary, an economical and easy to maintain system for controlling dispatching of vehicles and the like has been provided. The system provides a versatility not possessed by systems now known or available.

We claim as our invention:

1. In a system for controlling movement of vehicles in a dispatching installation, the combination comprising a dispatching station, a plurality of designated receiving stations beyond said dispatching station each having an operator, means at said dispatching station for instructing the vehicles, said instructing means including an initial hold position message and selectively presentable movement messages, a central control unit having a selector for energizing said instructing means, an actuator at each of said serving stations coupled to said central control unit for transmitting signals to said control unit, relays in said control unit coupled to said actuators for receiving and storing signals from each of said operators at the same time, said actuator operated relays effecting positioning of said selector to complete an energizing circuit for said hold position message to maintain said vehicles in readiness and subsequently completing an energizing circuit for one of said movement messages designating one of said stations to which the awaiting vehicle is to move, said selector responsive to said relays to sequentially present said stored signals as movement messages at said instructing means, and a vehicle detector at said dispatching station for returning said instructing means to their initial state upon passage of individual mobile machines beyond said dispatching station.

2. In a system for controlling movement of vehicles in a dispatching installation, the combination comprising a dispatching station, a plurality of designated receiving stations beyond said dispatching station each having an operator, means at said dispatching station for instructing the vehicles, said instructing means including an initial hold position message and selectively presentable movement messages, a central control unit having a selector for energizing said instructing means, an actuator at each of said

serving stations coupled to said central control unit for transmitting signals to said control unit, signal retainers coupled to each of said actuators for reception and storage of signals from each of said operators at the same time, said selector responsive to actuation of said serving station actuators by said respective operators to present a movement message on said instructing means designating which station the vehicles should move to, said selector responsive to said signal retainers to sequentially present movement messages, and a traffic movement detector at said dispatching station for effecting return of said instructing means to said initial state upon passage of individual vehicles beyond said dispatching station.

3. In a system for controlling movement of traffic at a drive-in bank installation or the like, the combination comprising an entrance station, means at said entrance station for instructing entering traffic, a plurality of designated serving stations beyond said entrance station, a central control unit having a selector operable to energize said instructing means, and selectively operable actuating means at each of said serving stations coupled to said central control unit for operating said selector, said central control unit capable of receiving instructions from each of said selectively operable actuating means at the same time and sequentially feeding instructions to said selector so that only one message is presented at said entrance station to assure non-contradictory instruction of the traffic.

4. In a system for controlling movement of traffic at a drive-in bank installation or the like, the combination comprising an entrance station, means at said entrance station for instructing entering traffic, a plurality of designated serving stations beyond said entrance station having operators, a central control unit, actuators at each of said serving stations coupled to said control unit for transmitting signals from said operators, a selector in said control unit operable to energize said instructing means, signal storage means in said control unit for coupling said actuators to said selector for receiving signals from each of said actuators at the same time and sequentially feeding signals to said selector so as to present only one message at a time on said entrance station instructing means.

5. In a system for controlling movement of vehicles in a drive-in bank installation or the like, the combination comprising a dispatching station, a plurality of designated

receiving stations beyond said dispatching station each having a teller or the like, means at said dispatching station for instructing the vehicles, said instructing means including an initial hold position message and selectively presentable movement messages, an actuator at each of said serving stations, a central control unit having a set of stepping switches stepping in unison, relays coupled to each of said actuators for reception and storage of signals so that all of said actuators can be operated at the same time, a second one of said stepping switches energizing said instructing means to effect controlled movement of the vehicles to said respective designated receiving stations in response to operation of said actuators by said tellers, said second stepping switch coupled to sequentially energize said instructing means in response to reception of stored signals in said relays to selectively present instructions to said vehicles, a vehicle detector at said dispatching station, a first one of said set of switches coupled to said relays to control the positioning of said set of switches in response to operation of said relays, and a third one of said set of stepping switches responsive to actuation of said detector to signal said second stepping switch to operate said instructing means to present said initial message and return said relays to their un-actuated position.

6. In a system for controlling the dispatching of vehicles, the combination comprising a dispatching station, a plurality of receiving stations spaced away from said dispatching station, actuating means at each of said receiving stations for sending signals from the receiving stations, signal storage means operatively associated with said actuating means for storing said signals, means at said dispatching station for instructing the vehicles to be controlled, and a control unit operatively associated with said storage means and said instructing means for utilizing the storage signals one at a time for energizing said instructing means to effect an instruction at the dispatching station to direct a vehicle when to move and to which receiving station movement is to be made.

References Cited by the Examiner

UNITED STATES PATENTS

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NEIL C. READ, *Primary Examiner.*

THOMAS B. HABECKER, *Examiner.*