

- [54] **CUSTOMER SERVICE DISPLAY**
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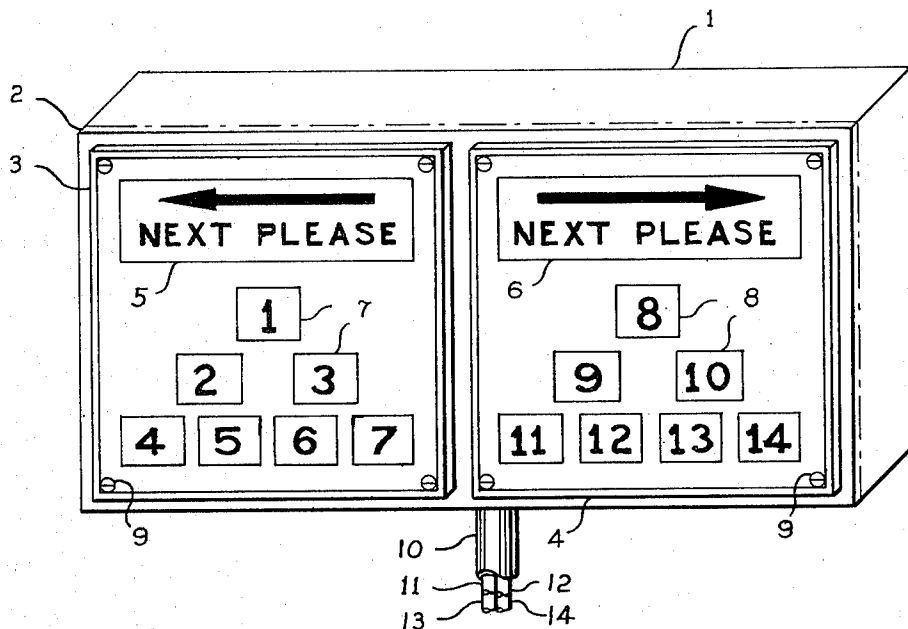
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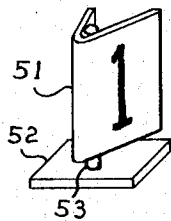
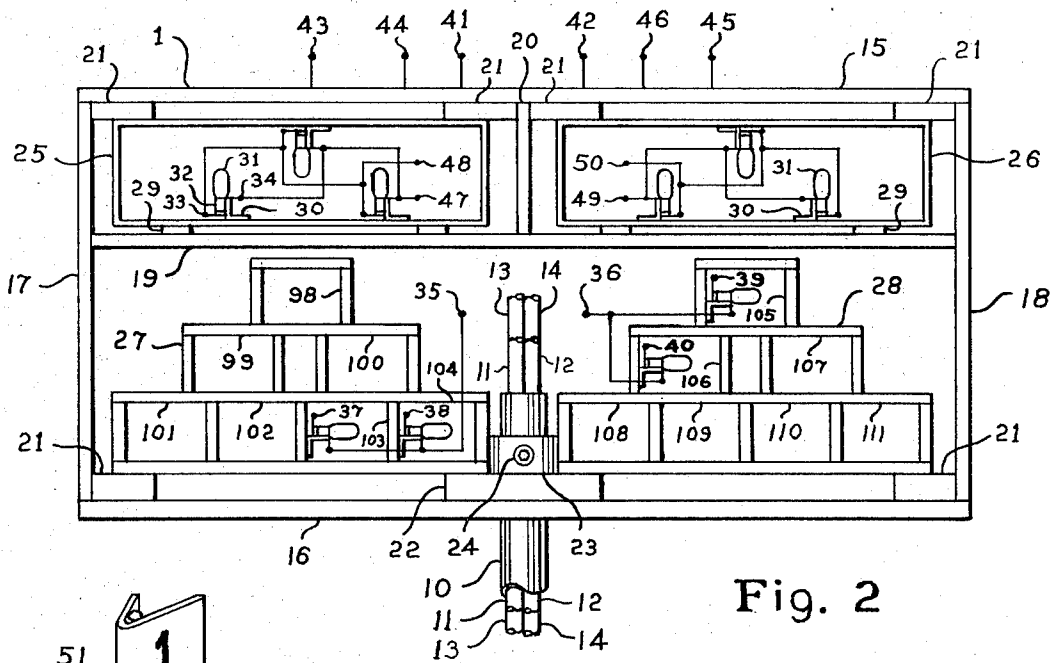
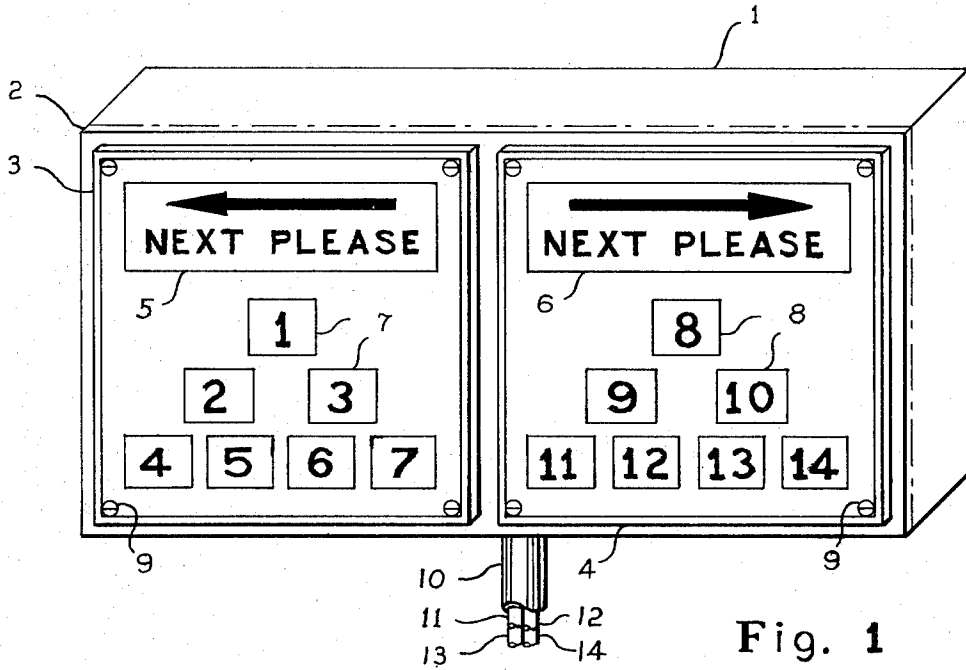
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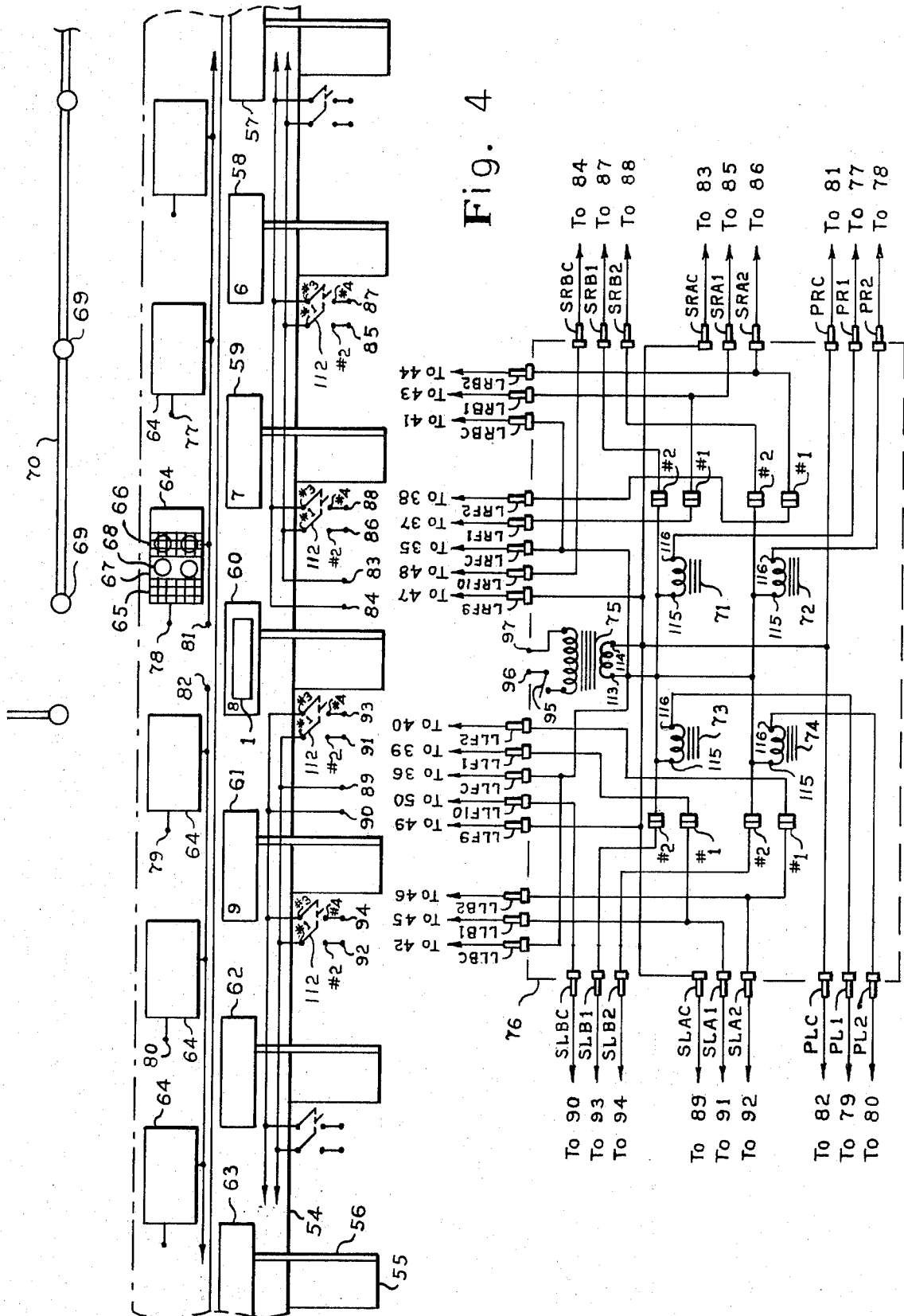
[57] **ABSTRACT**

A remote controlled or customer activated service display indicator for use in businesses serving large numbers of customers, particularly where a group of customers are maintained in a designated area to await their turn for services by one of several clerks, the service display indicating which clerk is available for service whenever a clerk has completed business with a previous customer.

5 Claims, 4 Drawing Figures







CUSTOMER SERVICE DISPLAY

The specification and drawings of the present invention are a continuation-in-part of the earlier application Ser. No. 337,762, filed Mar. 2, 1973 and now abandoned.

In businesses, such as banks, post offices, and similar businesses serving the public, a designated waiting area is sometimes maintained for customers to improve the efficiency of clerk service, the customers remaining in the designated area until some clerk is available for service, thus also providing each customer with more private service. To further improve the efficiency and convenience of such service, it is helpful to have some kind of indicator, remotely controlled by the individual clerks, or automatically activated whenever there is no customer at any individual clerk's service counter or area.

In the present invention, an improved electrically lighted display panel with clerk numbers (or other designations) is provided, the display panel flashing on the individual clerk's number (or other designation) which is available for service to the public. The display panel is located at a central location of the service counter or area, in conspicuous view of the awaiting public, the display panel being divided into a right and left section to indicate clerk numbers available for service to the right of the display panel and clerk numbers available for service to the left of the display panel. An electrically lighted sign stating "NEXT PLEASE" and an electrically lighted arrow indicating the direction of clerks available for service is also provided in each right and left section of the display panel, the arrow in the left section indicating that clerks to the left of the panel are available for service, and the arrow in the right section indicating that clerks to the right of the panel are available for service. The clerk numbers on the display panel are further arranged in a unique pyramid fashion, providing a large number of clerk designations on an attractive, compact display panel.

Individual switching means are provided at each clerk station, so the individual clerks may turn their respective signals on or off manually in the display panel. Customer activated switching pads are also provided individually at each clerk's service counter or area, which automatically turn off the individual clerk's number on the display panel whenever a customer is at the clerk's service counter, the clerk's number flashing on automatically whenever the customer leaves the clerk's service counter, so there is no delay in signalling the next customer. The manually operated individual switching means at the clerk's service counter enables the clerk to turn his signal light off temporarily if he must temporarily leave his service counter.

A unique circuit is provided to operate the "NEXT PLEASE" and arrow signals, such that the appropriate signals in either the left or right section of the display panel flash on automatically whenever a clerk is available for service. For example, if there are seven clerk stations to the left of the display panel, and one clerk is absent from duty, the left "NEXT PLEASE" and arrow signals would remain off until there was no customer at one or more of the remaining six clerks on duty. If two clerks were absent from duty, the "NEXT PLEASE" and arrow signals would remain off until there was no customer at one of the remaining five clerks on duty, etc. That is, the "NEXT PLEASE" and

arrow signals remain on until there is a customer at every station where there is a clerk on duty.

The relays, power supply, and master switch for operation of the display panel are mounted in a rectangular metal chassis box, located near the display panel, the chassis box being uniquely provided with plug-in connectors for convenient electrical connection of the various electrical cables operating the display panel from the customer switch pads and clerk switches, the plug-in connectors also providing convenient removal of the chassis box for servicing.

Another unique feature of the customer service display panel provides electrically lighted clerk numbers (or other designations) on the back side of the display panel (not visible to the public) operated only by the individual clerk switches, such that each individual clerk's number on the back side is lighted when he is on duty, regardless of whether or not a customer is at his station. Thus the Operations Officer conveniently knows which clerk is on duty by the lighted numbers on the back side of the display panel.

It is accordingly one of the objects of the present invention to provide a customer service display indicator, which indicates the availability of any of a series of clerks for service to the public.

Another object of the present invention is to provide a customer service display indicator with two sections, one section indicating the availability of clerks for service in one direction from the display indicator, and the other section indicating the availability of clerks for service in the other direction from the display indicator.

A further object is to provide a customer service display indicator in two sections with directional indicating means on each section to indicate the direction from the display panel of clerks that are available for service.

Another object is to provide a customer service display indicator in two sections with a "NEXT PLEASE" sign in each section which signals the awaiting customers whenever any of a series of clerks that are on duty is available for service.

A further object is to provide a customer service display indicator in two sections with clerk designations arranged in a unique pyramid fashion in each section to provide a large number of clerk designations on a compact, attractive display panel.

Another object is to provide means for clerks to manually operate the customer service display indicator, such that each clerk may indicate whether or not he is available for service.

A further object is to provide customer activated means to operate the customer service display indicator, such that the display indicator automatically indicates that a clerk is available for service when there is no customer at the clerk's service counter.

Another object is to provide both customer activated and manually operated means to operate the service display indicator, such that the display indicator automatically indicates that the clerk is available for service whenever there is no customer at the clerk's service counter, the manually operated means allowing the clerk to turn his individual service display indicator off if he must temporarily leave his service counter.

A further object is to provide unique circuit means to operate attention and directional signals in addition to clerk designations on a display panel automatically

whenever any of a series of clerks on duty is available for service.

Another object is to provide a chassis equipment box for operation of the customer service display indicator, the chassis equipment box providing means for mounting of components and plug-in connectors for electrical cables operating the display panel.

A further object is to provide indicating means on the back side of the customer service display panel indicator to clearly indicate whether or not each individual clerk is on duty.

Another object is to provide master switching means to turn the entire service display indicator off or on.

Other desirable features and advantages of the invention will appear more fully hereinafter from the following detailed description when taken in connection with the accompanying drawings illustrating one form of the invention. It is to be expressly understood, however, that the drawings are utilized for purposes of illustration only and are not to be taken as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, wherein similar reference characters refer to like parts throughout the several views:

FIG. 1 is a front perspective view of the customer service display panel.

FIG. 2 is a front view of the customer service display panel with the front cover panel removed to illustrate construction details and electrical connections of the interior.

FIG. 3 is a front perspective view of a unique clerk insignia device to be placed at each individual clerk station to clearly indicate the clerk's number (or other designation).

FIG. 4 is a plan layout of the clerk stations in a typical bank and schematic diagram illustrating components and electrical connections for operation of the Customer Service Display.

While the description herein considers the instant invention as applied to the problem of customer service display, it is to be understood that the present invention also relates to the novel features or principle of the instrumentalities described herein, whether or not such are used for the stated objects, or in the stated fields or combinations. In the following description and drawings, the symbol is sometimes utilized to distinguish certain classes of components from other similarly numbered components.

In customer service oriented businesses, particularly such as banks, a designated area is often set aside for customers awaiting service, as indicated in FIG. 4, where customers await in line within aisles of ropes 70 suspended between supporting posts 69. A primary element of the present invention is the customer service display indicator panel illustrated in FIG. 1, display panel 1 having similar clerk number designations on the back side, however there are no "NEXT PLEASE" or arrow signals on the back side. Display panel 1 is centrally located on the service counter 60 at clerk station 8 in FIG. 4, the front side (as illustrated in FIG. 4) being in conspicuous view of the customers awaiting at the exit of the rope aisles for dispatch to an appropriate clerk.

In FIG. 4, double-pole, single-throw switches 112 at each clerk station provide each clerk with manual operation of his individual clerk number on display panel 1. When the switches 112 at each clerk station are

turned on, the double-pole single-throw normally closed contacts of relays 71, 72, 73, and 74 are electrically connected to turn on each clerk number in the front of display panel 1, turn on each clerk number in the back of display panel 1, and turn on the "NEXT PLEASE" signs and arrows in the front of display panel 1 when there are no customers at the clerk stations. When a customer is at a clerk station, the relays turn off that respective clerk's number in the front of display panel 1 but leave on that respective clerk's number in the back of display panel 1. When there is a customer at every station only where there is a clerk on duty with his switch 112 turned on, the "NEXT PLEASE" and arrows turn off in the front of display panel 1, the left arrow and "NEXT PLEASE" being operated by stations 1 through 7, and the right arrow and "NEXT PLEASE" being operated by stations 8 through 14.

For purposes of illustration it is assumed that there are 14 clerk stations, display panel 1 being centrally located at station 8 on top of equipment box 60. Equipment boxes 57 through 63 on top of service counter 54 are as customarily arranged in banks, the back of the equipment boxes being open for placement of each individual clerk's equipment and needs, equipment boxes 58 through 61 representing respective clerk stations 6 through 9 as indicated. Customer switch pads 64 are placed individually in front of each clerk station, so that a customer being serviced must stand on the switch pad. A cutaway view of switch pad 64 in front of station 7 illustrates the principle of the switch pads. The switch pads are composed of a lower aluminum screen 65, an upper aluminum screen 66, and a resilient insulating material 67 with appropriately spaced holes 68 being sandwiched between screens 65 and 66, such that a person standing on the switch pads causes screen 66 to make electrical contact with screen 65 through holes 68. (Only two rows of holes 68 are shown for purposes of illustration, although several rows are actually provided.) When the person steps off the switch pad, resilient material 67 separates screen 66 from screen 65 to break the electrical contact. Cover material 64 merely binds and covers the screens 65 and 66, and a carpet runner preferably with rubber backing is placed over the switch pads to protect them, maintain their proper position relative to the clerk station, and conceal them from view. The switch pads are similar to those used to automatically open doors at the entrance to supermarkets.

In FIG. 1, the display panel is housed in a rectangular case 1, having a removable front panel 2 covering the entire front, and two smaller panels 3 and 4 covering respectively the left and right half sections of the front as illustrated. The case and panels may be constructed of any desired materials, such as metal, wood, plastic, etc., although plastic would probably be preferred for ease of construction and better appearance. Case 1 and front panel 2 are made of colored opaque plastic through which light cannot be transmitted. Panels 3 and 4 are made of translucent plastic admitting passage of light but diffusing it so that objects beyond cannot be clearly distinguished. Rectangular windows 5 and 6 (for "NEXT PLEASE" and arrow) respectively in panels 3 and 4 are left translucent so that light may be transmitted through to clearly disclose the colored opaque letting "NEXT PLEASE" and colored opaque left and right arrows. Nearly square windows 7 and 8 (for clerk numerals 1 through 14) respectively in pan-

els 3 and 4 are left translucent so that light may be transmitted through to clearly disclose the colored opaque numerals 1 through 7 in panel 3, and the colored opaque numerals 8 through 14 in panel 4. all the area of panels 3 and 4 outside of the described windows 5, 6, 7, and 8 is made any desired opaque color except for a narrow translucent border around the outside edge approximately one-eighth or three-sixteenths inch wide as illustrated, the translucent border providing a neater appearance. The arrows in windows 5 and 6 may be placed immediately below the lettering "NEXT PLEASE" rather than above, if desired. It is preferred that panels 3 and 4 be made as described, however the lettering "NEXT PLEASE", arrows, and numerals (or other clerk designations) could be left translucent and the remainder of panels 3 and 4 made an opaque color. Screws 9 at each corner of panels 3 and 4 provide for attaching panels 2, 3, and 4 to case 1. Panels identical to panels 2, 3, and 4 are similarly provided on the back side of case 1, except that the lettering "NEXT PLEASE" and arrows are eliminated from the back panels, leaving only the clerk numerals (or other clerk designation) on the back panels. Windows 7 and 8 for the clerk numbers on the front and back panels are arranged in horizontal rows in pyramid fashion as illustrated in FIG. 1 to provide a compact, attractive panel.

The interior of service display panel 1 is illustrated in FIG. 2 where front panels 2, 3, and 4 are removed. Horizontal plastic members 15, 16 and vertical plastic members 17, 18 form the external rectangular casing or frame, the plastic members being bonded together at the corners with conventional plastic cement. Horizontal member 19 is appropriately spaced parallel to and below member 15 to form a support for rectangular metal boxes 25 and 26 in which 3 candlepower, 24 Volt A.C. light bulbs 31 are positioned to light up the "NEXT PLEASE" and arrow windows 5 and 6, metal boxes 25 and 26 being open only at the front to transmit light. Vertical plastic member 20 is cemented midway between vertical members 17 and 18 to join horizontal members 15 and 16 at the center for additional bracing. Plastic blocks 21 are cemented at the four interior corners of the plastic casing 1, as illustrated, into which screws 9 are threaded for attachment of the front and back panels 2, 3, and 4 as illustrated in FIG. 1. In FIG. 2, plastic block 22 is cemented at the middle of bottom horizontal member 16 into which screws 9 are similarly threaded, block 22 also being provided with a center round opening through which supporting pipe or tubing 10 is passed. Collar 23 slips over tubing 10, allen nut 24 securely fastening collar 23 to tubing 10. Electrical cables 11, 12, 13, and 14 pass through tubing 10 to provide for operation of the various light bulbs in the display panel. Small plastic blocks 29 near each end of rectangular metal boxes 25 and 26 provide proper spacing and support of metal boxes 25 and 26 from horizontal member 19, metal boxes 25 and 26 being attached to horizontal member 19 and plastic blocks 29 with screws, bolts, or plastic cement. Spacing between metal boxes 25 and 26 and horizontal member 19 is desirable to allow the heat from the numerous electric bulbs in metal boxes 25 and 26 to be more readily dissipated without transferring the heat directly to plastic member 19.

For purposes of illustration, only three light bulbs 31 are indicated in boxes 25 and 26, however actually about seven are used, four lower bulbs being placed be-

hind the lettering "NEXT PLEASE" and three upper bulbs being placed behind the arrows intermediately between the four lower bulbs. Thus all seven bulbs actually provide well balanced lighting for both the lettering "NEXT PLEASE" and the arrows. If the arrows are placed below the lettering "NEXT PLEASE", four upper bulbs 31 and three lower bulbs 31 would be provided. Light bulb receptacle 32 is fixed to mounting bracket 30 and bracket 30 cemented, bolted, or screwed in proper position in metal boxes 25 and 26 as indicated. Terminals 33 and 34 provide for electrical connection to the light bulb 31, such light bulb assemblies being readily available in stores. All the light bulbs 31 in box 25 are electrically connected in parallel so that they may all be operated simultaneously from electrical terminals 47 and 48 for purposes of illustration. All the light bulbs 31 in box 26 are similarly electrically connected in parallel so that they may all be operated simultaneously from electrical terminals 49 and 50 for purposes of illustration.

Light frame assemblies 27 and 28 in display panel 1 are similarly constructed from horizontal and vertical opaque plastic members cemented together as illustrated in FIG. 2 to respectively form cubicles 98 through 104 on the left side and cubicles 105 through 111 on the right side, the cubicles being arranged in three horizontal rows arranged in pyramid fashion as illustrated, the back of the cubicles being closed off by an opaque plastic partition. A single 3 candlepower, 24 Volt A.C. light bulb is mounted in each described cubicle, similarly as previously described, to provide an individual light source behind each clerk number on front panels 3 and 4 in FIG. 1. For purposes of illustration, light bulbs are only illustrated in cubicles 103 and 104 on the left side to light clerk numbers 6 and 7, and in cubicles 105 and 106 on the right side to light clerk numbers 8 and 9, it being understood that the other cubicles would be similarly provided with a single light bulb each in a similar manner. Terminal 35 is electrically connected to one terminal of each light bulb in cubicles 98 through 104, and terminal 36 is electrically connected to one terminal of each light bulb in cubicles 105 through 111. The other terminal of the light bulb in cubicle 103 is terminal 37, and the other terminal of the light bulb in cubicle 104 is terminal 38. Thus electrical connection of a power source to common terminal 35 and terminal 37 lights the bulb in cubicle 103, and electrical connection of a power source to common terminal 35 and terminal 38 lights the bulb in cubicle 104. Similarly electrical connection of a power source to common terminal 36 and terminal 39 lights the bulb in cubicle 105, and electrical connection of a power source to common terminal 36 and terminal 40 lights the bulb in cubicle 106.

A light frame assembly identical to assembly 27 is similarly provided with an electric light bulb in each cubicle for the back side of display panel 1, an opaque partition being provided between the front assembly 27 and the back assembly 27 so that light from the back cubicles will not be transmitted to the front cubicles. Thus the clerk numbers 1 through 7 on the back side of display panel 1 may be respectively lighted by each individual clerk switch, while the clerk numbers 1 through 7 on the front side of display panel 1 may be turned off by the respective customer activated switch pads when a customer is at a clerk's station. For purposes of illustration, terminal 41 is the common termi-

nal for the back lights 1 through 7 (similarly as terminal 35 is the common terminal for the front lights 1 through 7). Terminal 43 in conjunction with common terminal 41 then provides for the lighting of back clerk number 6 (similarly as front clerk number 6), and terminal 44 in conjunction with common terminal 41 then provides for the lighting of back clerk number 7 (similarly as front clerk number 7).

A light frame assembly identical to assembly 28 is similarly provided with an electric light bulb in each cubicle for the back side of display panel 1, an opaque partition being provided between the front assembly 28 and the back assembly 28 so that light from the back cubicles will not be transmitted to the front cubicles. Thus the clerk numbers 8 through 14 on the back side of display panel 1 may be similarly respectively lighted by each individual clerk switch, while the clerk numbers 8 through 14 on the front side of display panel 1 may be turned off by the respective customer activated switch pads when a customer is at a clerk's station. For purposes of illustration, terminal 42 is the common terminal for the back lights 8 through 14 (similarly as terminal 36 is the common terminal for the front lights 8 through 14). Terminal 45 in conjunction with common terminal 42 then provides for the lighting of back clerk number 8 (similarly as front clerk number 8), and terminal 46 in conjunction with common terminal 42 then provides for the lighting of back clerk number 9 (similarly as front clerk number 9). The back clerk numbers may be either placed opposite corresponding front clerk numbers to read from right to left, or may read from left to right, and could actually be arranged in any manner or form desired.

If there are a smaller number of clerk stations, for example eight, cubicles 98 through 100 on the left side of display panel 1 in FIG. 2 and cubicles 105 through 107 on the right side would be eliminated, leaving clerk numbers 1 through 4 in a single row on the left and clerk numbers 5 through 8 in a single row on the right. The two single rows of clerk numbers thus provided might be placed one above the other in a single section of display panel 1, the arrow for the top row then pointing to the left, and the arrow for the bottom row then pointing to the right. That is, an upper and lower section would be created rather than a left and right section in panel 1.

A single common "NEXT PLEASE" sign may also be placed between an upper and lower row of clerk station numbers on the front side of display panel 1, with an upper arrow pointing to the left and a lower arrow pointing to the right, however due to circuitry it is preferred that one set of light bulbs be provided in the "NEXT PLEASE" sign operated from the clerk stations to the left, and another set of light bulbs be provided in the "NEXT PLEASE" sign operated from the clerk stations to the right. The two sets of light bulbs in a single common "NEXT PLEASE" sign then create excessive heating difficulties when a clerk is available for service both to the right and left of the display panel 1 which causes both sets of light bulbs to be operated simultaneously in the single common "NEXT PLEASE" sign. Thus it is preferred that a separate "NEXT PLEASE" sign and arrow be provided for the clerk stations to the right and left of display panel 1 as previously described.

The circuitry for operation of display panel 1 is illustrated in FIG. 4. A double-pole, single-throw switch

112 is provided at each individual clerk station, mounted in a position where it may be conveniently operated by each individual clerk. For purposes of illustration, the circuitry for only clerk stations 6 and 7 to the right of display panel 1 (to the left of the awaiting public) and the circuitry for only clerk stations 8 and 9 to the left of display panel 1 (to the right of the awaiting public) is sufficient to demonstrate the principle of operation, the circuitry for additional stations being similar.

Terminal 83 is electrically connected to terminal 1 of a first pole of double-pole, single-throw switch 112 at each clerk station to the right of display panel 1 in FIG. 4 as illustrated. Terminal 84 is electrically connected to terminal 3 of the second pole of double-pole, single-throw switch 112 at each clerk station to the right of display panel 1 in FIG. 4 as illustrated. Terminal 85 is electrically connected to terminal 2 of the first pole of switch 112 at clerk station 6, and terminal 87 is electrically connected to terminal 4 of the second pole of switch 112 at clerk station 6 as illustrated. Thus when switch 112 at clerk station 6 is turned on, terminal 85 becomes electrically connected to common terminal 83, and terminal 87 becomes electrically connected to common terminal 84. Terminal 86 is electrically connected to terminal 2 of a first pole of switch 112 at clerk station 7, and terminal 88 is electrically connected to terminal 4 of the second pole of switch 112 at clerk station 7 as illustrated. Thus when switch 112 at clerk station 7 is turned on, terminal 86 becomes electrically connected to common terminal 83, and terminal 88 becomes electrically connected to common terminal 84. Turning switches 112 off at stations 6 and 7 disconnects the described electrical connections to common terminals 83 and 84 as illustrated.

Terminal 89 is electrically connected to terminal 1 of a first pole of double-pole, single-throw switch 112 at each clerk station to the left of display panel 1 in FIG. 4 as illustrated. Terminal 90 is electrically connected to terminal 3 of the second pole of double-pole, single-throw switch 112 at each clerk station to the left of display panel 1 in FIG. 4 as illustrated. Terminal 91 is electrically connected to terminal 2 of a first pole of switch 112 at clerk station 8, and terminal 93 is electrically connected to terminal 4 of the second pole of switch 112 at clerk station 8 as illustrated. Thus when switch 112 at clerk station 8 is turned on, terminal 91 becomes electrically connected to common terminal 89, and terminal 93 becomes electrically connected to common terminal 90. Terminal 92 is electrically connected to terminal 2 of a first pole of switch 112 at clerk station 9, and terminal 94 is electrically connected to terminal 4 of the second pole of switch 112 at clerk station 9 as illustrated. Thus when switch 112 at clerk station 9 is turned on, terminal 92 becomes electrically connected to common terminal 89, and terminal 94 becomes electrically connected to common terminal 90. Turning switches 112 off at stations 8 and 9 disconnects the described electrical connections to common terminals 89 and 90 as illustrated.

Terminal 81 is electrically connected to a first screen in customer switch pads 64 at each clerk station to the right of display panel 1 in FIG. 4 (to the left of the awaiting public). Terminal 82 is electrically connected to a first screen in customer switch pads 64 at each clerk station to the left of display panel 1 in FIG. 4 as

illustrated (to the right of the awaiting public). Terminal 78 is electrically connected to a second screen in switch pad 64 at clerk station 7, and terminal 77 is electrically connected to a second screen in switch pad 64 at clerk station 6. Thus when a customer stands on switch pad 64 at clerk station 6, terminal 77 is electrically connected to common terminal 81, and when a customer stands on switch pad 64 at clerk station 7, terminal 78 is electrically connected to common terminal 81. When a customer steps off switch pads 64 at clerk stations 6 and 7, terminals 77 and 78 are respectively electrically disconnected from common terminal 81, due to the nature of switch pads 64 as previously described.

Similarly terminal 79 is electrically connected to a second screen in switch pad 64 at clerk station 8, and terminal 80 is electrically connected to a second screen in switch pad 64 at clerk station 9. Thus when a customer stands on switch pad 64 at clerk station 8, terminal 79 is electrically connected to common terminal 82, and when a customer stands on switch pad 64 at clerk station 9, terminal 80 is electrically connected to common terminal 82. When a customer steps off switch pads 64 at clerk stations 8 and 9, terminals 79 and 80 are respectively electrically disconnected from common terminal 82.

In FIG. 4, outline 76 represents a rectangular metal chassis box in which various components may be mounted for operation of display panel 1, such as power transformer 75, single-pole, single-throw master switch 95, double-pole, single-throw relays 71, 72, 73, and 74 with normally closed contacts 1 and 2, and various multi-pin electrical plug-in connectors to be described for convenient connection and disconnection of various electrical cables for operation of display panel 1. Power transformer 75 may be mounted in the bottom of box 76, relays 71, 72, 73, and 74 attached to a metal baseboard (not illustrated) mounted above transformer 75 in box 76, master switch 95 mounted in one end of box 76, and the various multi-pin electrical connectors mounted in the sides or ends of box 76 above the relay baseboard where convenient electrical connection may be made to the relays. Any type box may be used, a conventional fuse box available in stores being equipped with a convenient metal baseboard for the mounting of the relays and also a removable cover.

For operation of the light bulbs for clerk numbers 1 through 7 in display panel 1, the PR pin electrical connectors in FIG. 4 represent a right pad multi-pin electrical connector (mounted in the right side of chassis box 76) for electrical connection to customer switch pads 64 for clerk stations 1 through 7, the SRA pin connectors represent a first right switch multi-pin electrical connector for the first pole of double-pole switches 112 at clerk stations 1 through 7, the SRB pin connectors represent a second right switch multi-pin electrical connector for the second pole of double-pole switches 112 at clerk stations 1 through 7, the LRF pin connectors represent a right front light multi-pin electrical connector for the light bulbs in the front clerk numbers 1 through 7 and the "NEXT PLEASE" sign and arrow for the front clerk numbers 1 through 7 in display panel 1, and the LRB pin connectors represent a right back light multi-pin electrical connector for the light bulbs in the back clerk numbers 1 through 7 in display panel 1.

For operation of the light bulbs for clerk numbers 8 through 14 in display panel 1, the PL pin connectors in FIG. 4 represent a left pad multi-pin electrical connector (mounted in the left side of box 76) for electrical connection to customer switch pads 64 for clerk stations 8 through 14, the SLA pin connectors represent a first left switch multi-pin electrical connector for the first pole of double-pole switches 112 at clerk stations 8 through 14, the SLB pins represent a second left switch multi-pin electrical connector for the second pole of double-pole switches 112 at clerk stations 8 through 14, the LLF pins represent a left front light multi-pin electrical connector for the light bulbs in front clerk numbers 8 through 14 and the "NEXT PLEASE" sign and arrow for front clerk numbers 8 through 14 in display panel 1, and the LLB pin connectors represent a left back light multi-pin electrical connector for the light bulbs in back clerk numbers 8 through 14 in display panel 1. The multi-pin electrical connectors may be either of the conventional round or rectangular type for plug-in electrical connection to chassis components.

Power transformer 75 has a 110 Volt A.C. primary input through terminals 96 and 97, and a 24 Volt A.C. secondary output, all components for operation of display panel 1 being operated at 24 Volts A.C. A power transformer is selected having the appropriate Volt-Ampere capacity for the required number of clerk stations. A 110 Volt A.C. line cord may be either connected directly or through a conventional multi-pin electrical connector to input terminals 96 and 97 of power transformer 75. A battery or 24 Volt D.C. power source might replace power transformer 75, however the 24 Volt A.C. power transformer would likely be preferred.

To operate the various relays, in FIG. 4, relay 71 is assigned to clerk station 6, relay 72 is assigned to clerk station 7, relay 73 is assigned to clerk station 8, and relay 74 is assigned to clerk station 9 for purposes of illustration. An additional relay would be assigned to each additional clerk station in a similar manner. Terminal 113 of the secondary winding of power transformer 75 is electrically connected to terminal 115 of relays 71, 72, 73, and 74 as illustrated. Terminal 116 of relay 71 is electrically connected to the female terminal of pin PR1, the male pin PR1 being electrically connected to terminal 77 of switch pad 64 in front of clerk station 6 through an appropriate electrical cable. Terminal 116 of relay 72 is electrically connected to the female terminal of pin PR2, the male pin PR2 being electrically connected to terminal 78 of switch pad 64 in front of clerk station 7 through an appropriate electrical cable. Terminal 114 of the secondary winding of transformer 75 is electrically connected to the female terminal of pin PRC, the male pin PRC being electrically connected to common terminal 81 for switch pads 64 to the right of display panel 1, as illustrated in FIG. 4.

Terminal 116 of relay 73 is electrically connected to the female terminal of pin PL1, the male pin PL1 being electrically connected to terminal 79 of switch pad 64 in front of clerk station 8. Terminal 116 of relay 74 is electrically connected to the female terminal of pin PL2, the male pin PL2 being electrically connected to terminal 80 of switch pad 64 in front of clerk station 9. Terminal 114 of the secondary winding of transformer 75 is electrically connected to the female terminal of

pin PLC, the male pin PLC being electrically connected to common terminal 82 for switch pads 64 to the left of display panel 1, as illustrated in FIG. 4. Thus when a customer is at clerk stations 6, 7, 8, or 9, relays 71, 72, 73, or 74 are correspondingly energized. Additional relays in chassis box 76 are similarly energized by the customer switch pads at the other clerk stations through additional pins in the right and left pad multi-pin electrical connectors.

To operate the clerk numbers on the front side of display panel 1, in FIG. 4, terminal 113 of the secondary winding of transformer 75 is electrically connected to the female terminal of pin LRFC, male pin LRFC being electrically connected (through an appropriate cable such as cable 11 of FIG. 2) to common terminal 35 of light bulbs 31 in cubicles 98 through 104 for front clerk numbers 1 through 7 in display panel 1 of FIGS. 1 and 2 as illustrated. In FIG. 4, the movable contact of contact #1 in relay 71 is electrically connected to the female terminal of pin LRF1, male pin LRF1 being electrically connected to terminal 37 of the light bulb for clerk number 6 of display panel 1 in FIG. 2 as illustrated. In FIG. 4, the stationary contact of contact 1 in relay 71 is electrically connected to the female terminal of pin SRA1, male pin SRA1 being electrically connected to terminal 85 of switch 112 for clerk station 6. When switch 112 at clerk station 6 is closed, terminal 85 is electrically connected to common terminal 83 as previously described. Common terminal 83 is electrically connected (through an appropriate cable) to male pin SRAC, the female terminal of pin SRAC being electrically connected to terminal 114 of the secondary winding of transformer 75. Thus when switch 112 at station 6 is turned on, the electrical circuit from the secondary winding of power transformer 75 is completed to light the bulb in the front clerk number 6 on display panel 1 until a customer steps on switch pad 64 in front of station 6 to energize relay 71 to break the electrical circuit through contact #1 of relay 71.

In FIG. 4, the movable contact of contact #1 in relay 72 is electrically connected to the female terminal of pin LRF2, male pin LRF2 being electrically connected to terminal 38 of the light bulb for front clerk number 7 of display panel 1 in FIG. 2 as illustrated. In FIG. 4, the stationary contact of contact #1 in relay 72 is electrically connected to the female terminal of pin SRA2, male pin SRA2 being electrically connected to terminal 86 of switch 112 for clerk station 7. When switch 112 at clerk station 7 is closed, terminal 86 is electrically connected to common terminal 83 as previously described, common terminal 83 being electrically connected to pin SRAC and from there to terminal 114 of the secondary winding of transformer 75 as previously described. Thus when switch 112 at station 7 is turned on, the electrical circuit from the secondary winding of transformer 75 is completed to light the bulb in the front clerk number 7 on display panel 1 until a customer steps on switch pad 64 in front of station 7 to energize relay 72 to break the electrical circuit through contact #1 of relay 72.

When switches 112 for clerk stations 8 and 9 are turned on, the light bulbs for the front clerk numbers 8 and 9 in display panel 1 are similarly turned on respectively through the #1 contacts of relays 73 and 74 and the corresponding left multi-pin electrical connectors, PL, SLA, and LLF, similarly as described for front clerk numbers 6 and 7, until a customer steps on switch

pad 64 in front of station 7 or 8 to energize relay 73 or 74 to break the electrical circuit through contact 1 of relay 73 or 74.

To operate the "NEXT PLEASE" sign and arrow in the front side of display panel 1, in FIG. 4, terminal 113 of the secondary winding of transformer 75 is electrically connected to the movable contact #2 in relays 71, 72, 73, and 74. The stationary contact of contact #2 in relay 71 is electrically connected to the female terminal of pin SRB1, the male pin SRB1 being electrically connected to terminal 87 of the second pole of switch 112 at clerk station 6. When switch 112 at clerk station 6 is closed, terminal 87 is electrically connected to common terminal 84 as previously described. Common terminal 84 is electrically connected to the male pin SRBC, the female terminal of pin SRBC being electrically connected to the female terminal of pin LRF10. The male pin LRF10 is electrically connected to terminal 48 of the light bulbs for the "NEXT PLEASE" sign and arrow for clerk stations 1 through 7. Terminal 47 of the light bulbs for the "NEXT PLEASE" sign and arrow for clerk stations 1 through 7 is electrically connected to the male pin LRF9, the female terminal of pin LRF9 being electrically connected to terminal 114 of the secondary winding of power transformer 75. Thus when switch 112 at station 6 is turned on, the electrical circuit from the secondary winding of transformer 75 is completed to light the bulbs in the "NEXT PLEASE" sign and arrow for clerk numbers 1 through 7 until a customer steps on switch pad 64 in front of station 6 to energize relay 71 to break the electrical circuit through contact #2 of relay 71.

To further operate the "NEXT PLEASE" sign and arrow in the front side of display panel 1, in FIG. 4, the stationary contact of contact #2 in relay 72 is electrically connected to the female terminal of pin SRB2, the male pin SRB2 being electrically connected to terminal 88 of the second pole of switch 112 at clerk station 7. When switch 112 at clerk station 7 is closed, terminal 88 is electrically connected to common terminal 84 as previously described. The electrical circuit from common terminal 84 is completed through the SRBC pin, the LRF10 pin, and the LRF9 pin back to terminal 114 of the secondary winding of transformer 75 as previously described to further operate the "NEXT PLEASE" sign and arrow for clerk numbers 1 through 7 until a customer steps on switch pad 64 in front of station 7 to energize relay 72 to break the electrical circuit through contact #2 of relay 72. Thus the "NEXT PLEASE" sign and arrow for clerk stations 1 through 7 in the front of display panel 1 remains on until there is a customer at both stations 6 and 7 to energize both relays 71 and 72, provided switches 112 at stations 6 and 7 are both turned on. Relays for clerk stations 1 through 5 are electrically connected similarly as relays 71 and 72 such that the "NEXT PLEASE" sign and arrow for stations 1 through 7 remains on until there is a customer at every station where there is a clerk on duty to turn his individual switch 112 on. If any clerk is absent, so that his individual switch 112 is turned off, the electrical circuit from that station to light the "NEXT PLEASE" sign and arrow is turned off such that the "NEXT PLEASE" sign and arrow will remain on until there is a customer at each of the remaining clerks on duty at stations 1 through 7.

In FIG. 4, the #2 contacts of relays 73, 74, and similar relays for clerk stations 8 through 14 are similarly

electrically connected through the SLB and LLF multi-pin electrical connectors and switches 112 at stations 8 through 14 to operate the "NEXT PLEASE" sign and arrow for clerk numbers 8 through 14 in the front of display panel 1, as illustrated and previously described for clerk stations 1 through 7.

To operate the clerk numbers on the back side of display panel 1, in FIG. 4, terminal 113 of the secondary winding of transformer 75 is electrically connected to the female terminal of pin LRBC and to the female terminal of pin LLBC, the male pin LRBC being electrically connected to the common terminal 41 for the light bulbs in the clerk numbers 1 through 7 on the back side of display panel 1, and the male pin LLBC being electrically connected to the common terminal 42 for the light bulbs in the clerk numbers 8 through 14 on the back side of display panel 1, as indicated in FIG. 2 and previously described. In FIG. 2, terminal 43 of the light bulb for clerk number 6 on the back side of display panel 1 (as previously described) is electrically connected to the male pin LRB1 in FIG. 4, the female terminal of pin LRB1 being electrically connected to the female terminal of pin SRA1. The electrical circuit from the male pin SRA1 passes through terminal 85 of switch 112 at station 6, common terminal 83 when switch 112 at station 6 is closed, pin SRAC to terminal 114 of the secondary winding of transformer 75, as previously described. Thus when switch 112 at station 6 is turned on, clerk number 6 on the back side of display panel 1 lights up, regardless of whether or not a customer is at station 6 to energize relay 71.

In FIG. 2, terminal 44 of the light bulb for clerk number 7 on the back side of display panel 1 (as previously described) is electrically connected to the male pin LRB2 in FIG. 4, the female terminal of pin LRB2 being electrically connected to the female terminal of pin SRA2. The electrical circuit from the male pin SRA2 passes through terminal 86 of switch 112 at station 7, common terminal 83 when switch 112 at station 7 is closed, pin SRAC to terminal 114 of the secondary winding of transformer 75, as previously described. Thus when switch 112 at station 7 is turned on, clerk number 7 on the back side of display panel lights up, regardless of whether or not a customer is at station 7 to energize relay 72.

In FIG. 2, terminal 45 of the light bulb for clerk number 8 on the back side of display panel 1 (as previously described) is electrically connected to the male pin LLB1 in FIG. 4, the female terminal of pin LLB1 being electrically connected to the female terminal of pin SLA1. The electrical circuit from the male pin SLA1 passes through terminal 91 of switch 112 at station 8, common terminal 89 when switch 112 at station 8 is closed, pin SLAC to terminal 114 of the secondary winding of transformer 75. Thus when switch 112 at station 8 is turned on, clerk number 8 on the back side of display panel 1 lights up, regardless of whether or not a customer is at station 8 to energize relay 73.

In FIG. 2, terminal 46 of the light bulb for clerk number 9 on the back side of display panel 1 (as previously described) is electrically connected to the male pin LLB2 in FIG. 4, the female terminal of pin LLB2 being electrically connected to the female terminal of pin SLA2. The electrical circuit from the male pin SLA2 passes through terminal 92 of switch 112 at station 9, common terminal 89 when switch 112 at station 9 is closed, pin SLAC to terminal 114 of the secondary

winding of transformer 75. Thus when switch 112 at station 9 is turned on, clerk number 9 on the back side of display panel 1 lights up, regardless of whether or not a customer is at station 9 to energize relay 74. When any clerk is not at his individual station, turning switch 112 off at his station turns his clerk number off in the front side and back side of display panel 1.

In FIG. 2, cable 11 may be utilized for electrical connection of the LRF pins in FIG. 4 to operate the front clerk numbers 1 through 7 and the "NEXT PLEASE" sign and arrow for clerk numbers 1 through 7, cable 12 may be utilized for electrical connection of LLF pins to operate the front clerk numbers 8 through 14 and the "NEXT PLEASE" sign and arrow for clerk numbers 8 through 14, cable 13 may be utilized for electrical connection of the LRB pins to operate the back clerk numbers 1 through 7, and cable 14 may be utilized for electrical connection of the LLB pins to operate the back clerk numbers 8 through 14. Cables 11, 12, 13, and 14 would of course have an appropriate number of wires in each cable of appropriate wire gauge for the number and candlepower of light bulbs utilized in display panel 1. An appropriate amperage fuse may be placed in series (not illustrated) with the output of terminal 113 or 114 of the secondary winding of power transformer 75 to guard against possible inadvertent short circuits in the customer display system.

To mount display panel 1 in FIG. 2 on top of the service counter in conspicuous view of the awaiting public, a hole is drilled in the counter tops 60 and 54 in FIG. 4 through which metal tubing 10 is passed. Another collar (not illustrated) similar to collar 23 is slipped on tubing 10 beneath counter 60 or 54 and securely fastened by means of the allen nut, similarly as allen nut or screw 24 in collar 23. If it is desired to raise the display panel 1 above the counter top, a plastic tubing or collar may be slipped over tubing 10 between the bottom of display panel 1 and the counter top 60 to support display panel 1 at the desired height, preferably at eye level of the awaiting public. Chassis equipment box 76 is mounted on the counter wall beneath the counter top 54 at clerk station 7 or 8.

The insignia device in FIG. 3 is made from a plastic base 52, a plastic dowel rod 53 cemented in a drilled hole in base 52, and plastic member 51 made in a V shape as illustrated is cemented to dowel rod 53, the appropriate clerk numbers (or other designation) being appropriately inscribed on both sides of V shaped member 51. The described insignia devices may be placed on top of the counter at each clerk station to clearly designate the clerk station to the awaiting public through a wide angle in front of the insignia device.

Since many changes could be made in the aforesaid construction and many apparently widely different embodiments of this invention could be made without departure from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A customer service display apparatus for use with a series of customer service stations, comprising, in combination:

a. a public display panel including a series of station indicating means for respectively indicating, when operating, the availability of each of the customer service stations for service to the awaiting public,

said public display panel being placed in convenient view of the awaiting public;

- b. an operation personnel display panel including a series of on-duty indicating means respectively indicating, when operated, whether or not each of said customer service stations has a clerk on duty, said operation personnel display panel being placed in convenient view of operation personnel only;
- c. customer sensing switch means at each of said customer service stations connected to said public display panel for operating a corresponding station indicating means in response to a customer leaving a customer service station to thereby indicate on said public display panel the particular customer service station that is available to serve the next customer, the customer sensing switch means rendering inoperative the corresponding station indicating means in response to a customer arriving at the customer service station to thereby indicate that said station is no longer available for service to a next customer while the customer is still present at the station; and,
- d. clerk operated switch means at each customer service station connected to said public display panel and to said operation personnel display panel for overriding the customer sensing switch means at the respective customer sensing station whereby operation of said clerk operated switch means renders the corresponding station indicating means inoperative and simultaneously renders the corresponding on-duty indicating means inoperative to thereby advise operation personnel that the clerk at the particular customer service station has left or is not available for service.

2. An apparatus according to claim 1, in which said customer service stations are identified by numerals,

said station indicating means on said public display panel comprising corresponding numerals which are electrically lighted when operated, and in which said on-duty indicating means on said operation personnel display panel similarly comprises numerals corresponding to the numerals identifying the customer service stations and which are electrically lighted when operated, whereby a lighted numeral on the public display panel designates that the corresponding numbered customer service station is available for service and a lighted numeral on said operation personnel display panel indicates that the clerk for the corresponding numbered customer service station is on duty.

3. An apparatus according to claim 2, in which said operation personnel display panel comprises the back of said public display panel and in which the customer sensing switch means comprises switch pads on the floor area in front of the customer service stations, the switch means being operated by a customer's presence and absence from in front of the customer service stations.

4. An apparatus according to claim 1, in which said series of customer service stations are divided into first and second sections, said public display panel including direction indicating means connected to be operated whenever one of the station indicating means is operated to indicate the direction of the section containing the customer service station corresponding to said one of the station indicating means.

5. An apparatus according to claim 1, in which said public display panel includes attention getting means connected to be operated whenever one of the station indicating means is operated to further bring to the attention of the awaiting public whenever a customer service station is available for service.

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