United States Patent [19]

Ratner

[11] **3,921,160**

[45] **Nov. 18, 1975**

[54] **SERVICE SYSTEM**

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[22] Filed: **May 3, 1974**

[21] Appl. No.: **466,813**

[52] **U.S. Cl.** **340/286;** 340/332; 340/279

[51] **Int. Cl.²** **G08B 5/00**

[58] **Field of Search** 340/286, 51

[56] **References Cited**

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[57] **ABSTRACT**

The present development consists of an automatic system for controlling the flow of persons to a plurality of service stations. The persons wait their turn in a waiting area, and when a service station is vacant a director sign in front of the waiting area lights and directs the person in the direction of the vacant service area. A beacon light at the vacant service area is on at this time and directs the person to this station. When the person reaches the service station, automatic sensing means such as a mat switch or photocell arrangement extinguishes the beacon light and terminates input to the director sign. This system is particularly useful in banks, airports, train and bus stations or other places where persons must wait on lines which move at widely varying rates.

5 Claims, 6 Drawing Figures

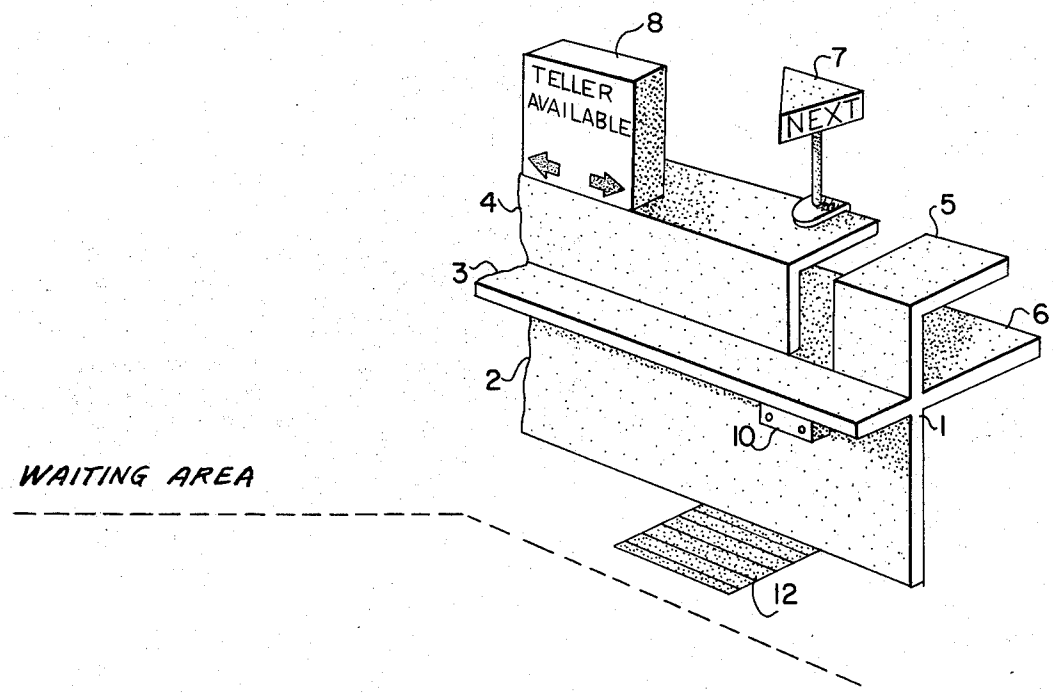
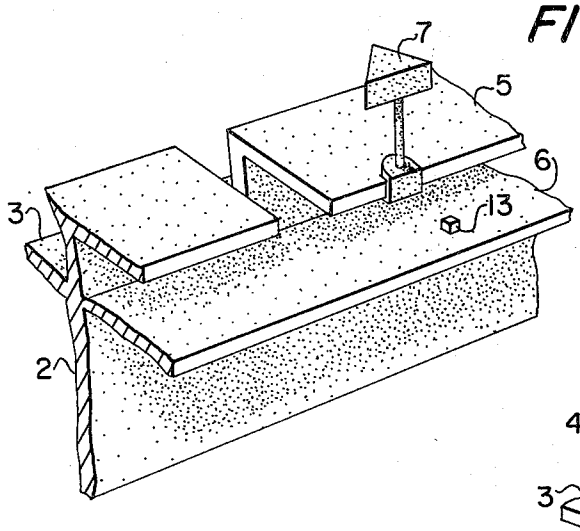
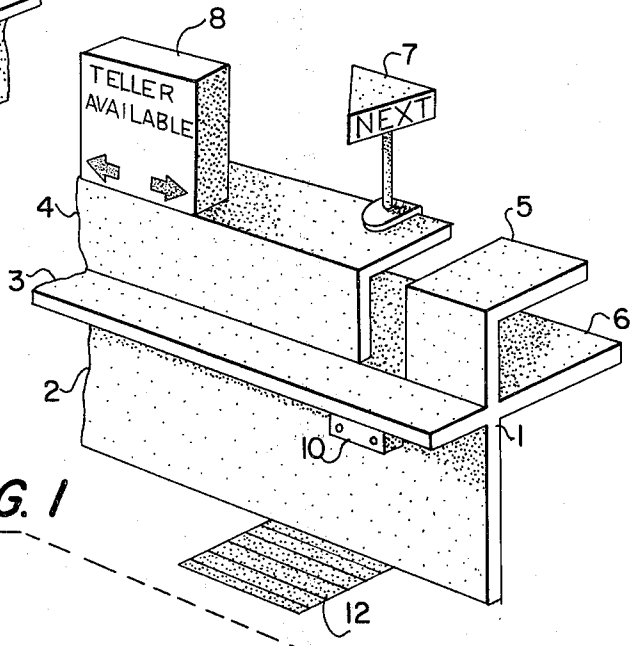


FIG. 2





WAITING AREA

FIG. 1

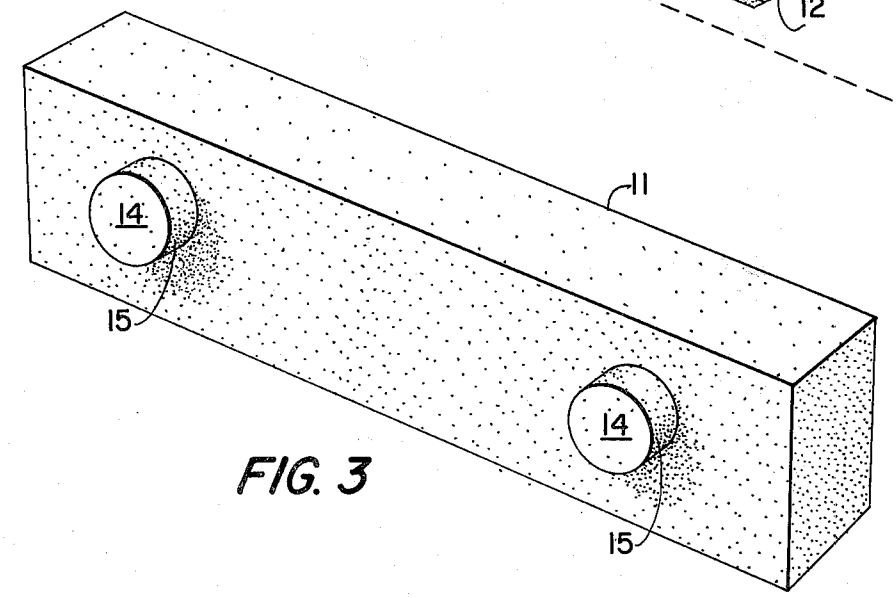
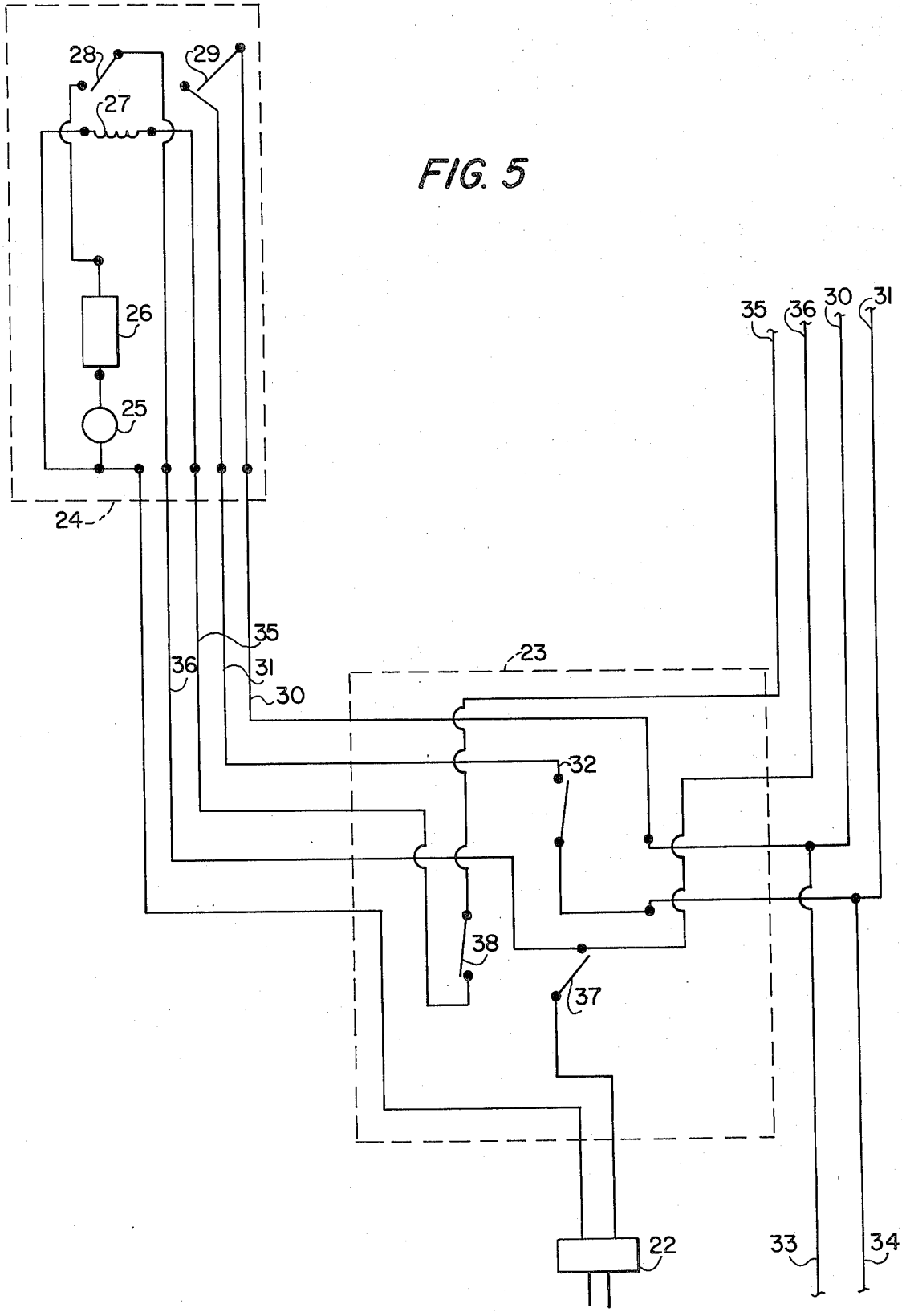


FIG. 3

FIG. 5



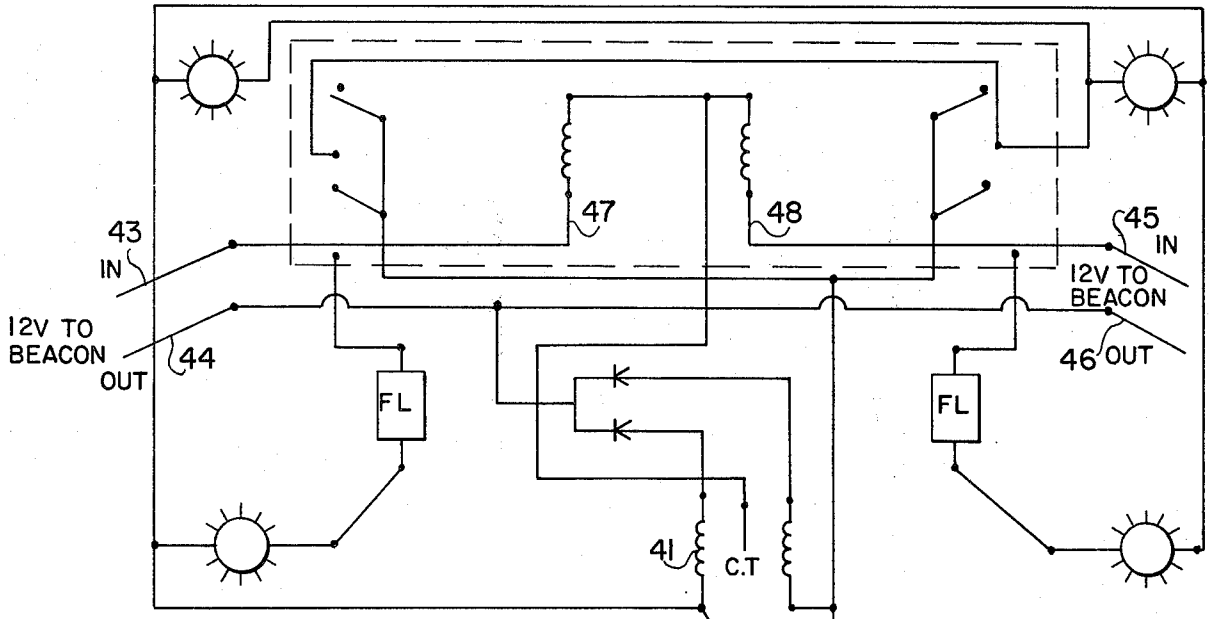

43
IN
12V TO
BEACON
OUT
44
47
48
45
IN
12V TO
BEACON
46
OUT
FL
FL
41
C.T

FIG. 6

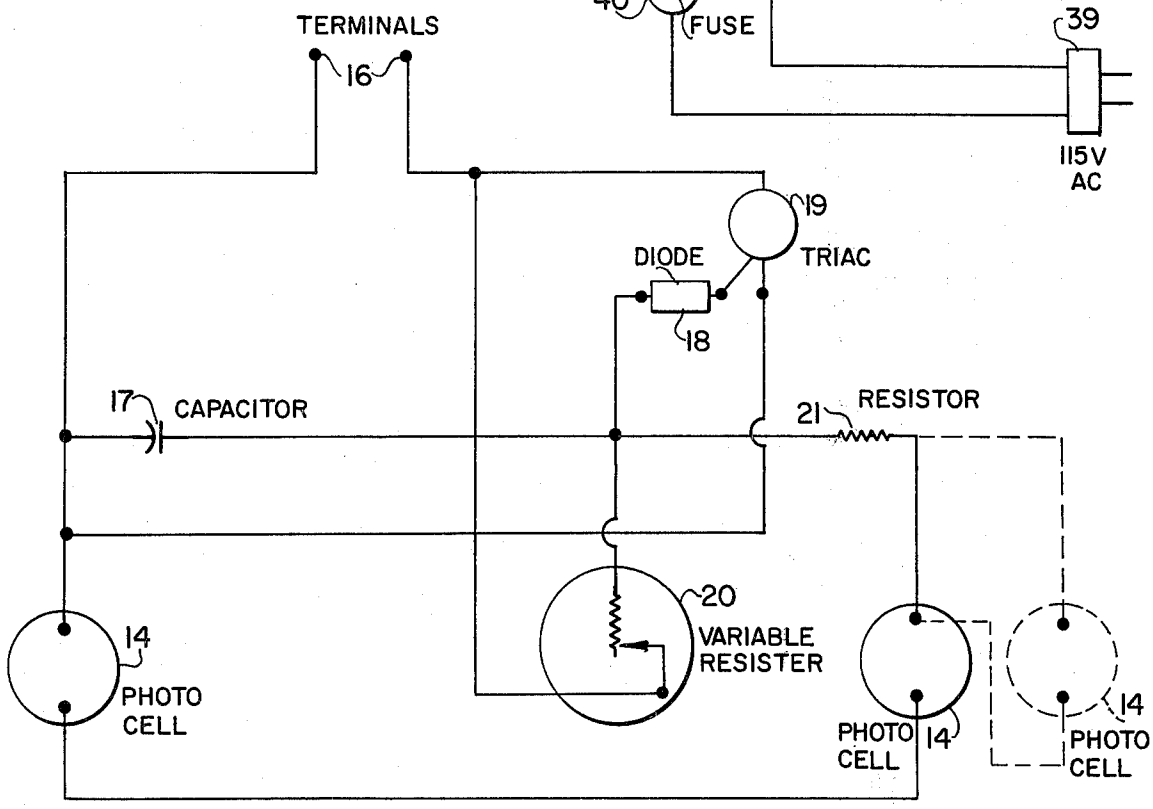

40
FUSE
39
115V
AC
TERMINALS
16
19
TRIAC
DIODE
18
17
CAPACITOR
21
RESISTOR
20
VARIABLE
RESISTER
14
PHOTO
CELL
PHOTO
CELL
14
14
PHOTO
CELL

FIG. 4

SERVICE SYSTEM

This invention relates to a system for controlling the flow of persons to a service area. More particularly this invention relates to a system wherein the presence of a person at the service station automatically controls a director means and a beacon means which notify persons of the availability of service at a service station.

As businesses gear to serve a mass market they are confronted with the most equitable way to serve their customers. In order to be profitable there must be some backlog of waiting customers. This is acceptable by customers, but they do want to be waited on in a fair and equitable manner. The present technique of having a separate individual line at each service counter or station yields many inequities. One line may move very fast, and another rather slow. A person arriving later than those waiting may be served earlier. Further when various service stations and counters are opened or closed there is an inequitable treatment of customers. In general, customers do not mind waiting a reasonable time for service as long as they are treated equitably.

The present invention comprises a means for providing equitable treatment to customers waiting for service at a number of stations or counters. This system is very useful in banking institutions, supermarkets, ticket counters such as airline, bus or train ticket counters and any other place where customers wait and are provided service at a number of stations. The present system also has the advantage that transactions at a counter or station can be made in privacy without those waiting behind in line overhearing the discussion of the transaction or seeing any of the documents which are a part of the transaction.

In brief summary, the system consists of a waiting area wherein persons wait for a vacancy at one of a plurality of service stations; a director sign in front of the waiting area which alerts a waiting person to a vacancy at any of the service stations and directs the person in the direction of the vacant service station; a beacon sign at each service station which is in a lighted mode when there is a vacancy and is automatically extinguished when a person is receiving service at that service station; and further, automatic control means to extinguish the director sign when all of the service stations are in use. The automatic control means is preferably either a switch mat or a photocell arrangement. When the automatic control means is a photocell arrangement, a customer at the service station restricts the amount of light to a photocell which then extinguishes the beacon sign and the input to the director sign from that station.

It is therefore a prime object of this invention to provide a means for automatically handling large numbers of persons by a small number of service personnel.

It is also an object to provide a means for the equitable treatment of a large number of customers at a small number of service stations.

It is further an object to provide a means whereby customers can transact their business in relative privacy.

It is additionally an object to provide a customer regulated system of service so that the service personnel cannot cause delays in calling the next customer as is possible in systems controlled solely by the service personnel.

It is another object to maximize the efficient use of both space and personnel for the effective service of the customers.

These and further objects are provided by the present system. Further objects, and the many advantages of this system will become apparent from the following detailed description and claims in conjunction with the drawings.

FIG. **1** is a front elevational view of the service counter, including the director beacon and a photocell automatic means.

FIG. **2** is a rear elevational view of the service counter of FIG. **1.**

FIG. **3** is the photocell automatic control means.

FIG. **4** is the circuit diagram of the photocell switch means located at each service station.

FIG. **5** is the circuit diagram of the beacon unit.

FIG. **6** is the circuit diagram of the director unit.

In more detail, the system consists of a waiting area wherein all of the customers await their turn to proceed to a service station. This waiting area can consist of a standing line or a row of seats wherein the people waiting keep moving along in turn. The operation of the system for a bank use will be explained in greater detail with reference to FIG. **1.** The counter **1** consists of vertical section **2** which supports the front horizontal shelf **3** and the rear horizontal shelf **6.** Above the horizontal shelves is vertical section **4** which supports counter shelf **5.** Attached to the counter shelf **5** is beacon sign **7** and in this embodiment director sign **8.** Rectangular enclosure **10** below horizontal shelf **3** is the automatic photocell means which regulates the servicing of customers. Switch mat **12** can be used when it is not desired to use photocell unit **10.**

In this embodiment the director sign **8** is in the area of the service stations. This director sign can, however, be located at essentially any location as long as it is in full view of persons in the waiting area. Since this director sign is connected to the remainder of the system by conduit wire, it can be secured to any stand or fixture. The director exhibited in FIG. **1** has printed thereon TELLER AVAILABLE and arrows set out below to direct the person in the waiting area to the available teller. This instruction is only clearly visible to a person in the waiting area when the sign is lighted, and when not lighted appears blank. This can be accomplished by placing a dark glass plate over a template which has the above message cut out. The lights within the director can consist of one or more light units either of an incandescent or fluorescent type. When multiple light units are used there are preferably a series of baffles within the director.

FIG. **2** is a rear view of the counter of FIG. **1.** The switch **13** in this embodiment is to provide for temporary manual operation of the system, if such is desired, and to remove the station from service.

FIG. **3** illustrates the photocell switch for control of the beacon and input to the director. This switch unit consists of rectangular shaped enclosure **11.**

The front section carries photocells **14** and visors **15.** The visors shield the amount of light which can be incident on the photocells. FIG. **4** illustrates the preferred circuit for the photocell switch. The terminals **16** connect thru switch **13** to the beacon light circuit. The photocells **14** are used as variable resistors. The dashed circuit lines illustrate the circuitry if it is desired to use three photocells. In operation, when light impinges on the photocells the resistance of the photocells **14** de-

creases and prevents the voltage on the capacitor **17** to increase enough to operate diode **18** and no current flows through the circuit. When one or more of the photocells becomes darkened, the resistance in the circuit increases with the consequent increase in voltage on the capacitor **17** to cause diode **18** to actuate. This causes the triac **19** to conduct and operate the circuit. The circuit in this condition provides an output to a relay which causes an open circuit in the beacon input. The variable resistor **20** allows adjustment of the circuit for the amount of total resistance necessary to actuate diode **18.** Resistor **21** has a set resistance and is used to balance the resistance of the circuit.

When a mat switch is used in place of the photocell switch, the weight of a person standing on the mat closes the contacts and provides an input to the beacon relay. An input to the relay causes the beacon to remain extinguished and interrupts any input from the beacon to the director.

FIG. **5** illustrates the circuit of a beacon at a service station. The beacon circuit consists of a switch section **23** and a light section **24.** Power to the beacon circuit is supplied at **22.** The light section consists of the light **25** and flasher **26** which are operated by means of relay switch **27.** Relay **27** controls contacts **28** and **29.** Conduits **30** and **31** are part of the low voltage director circuit. When the relay **27** turns on light **25** it also closes the circuit formed by these conduits. Contacts **32** and **37** are for manually putting this service station in use. Switch **37** provides power, and switch **32** provides for connection of this service station to the director. Conduits **33** and **34** provide for connecting other service stations into the director circuit. The input for the automatic control of the beacon is by means of conduits **35** and **36** from a photocell switch or from a mat switch. This input controls relay **27.** The relay can also be controlled manually by means of switch **38.** Switch **38** is a momentary switch and is closed when the system is being operated automatically. When the system is temporarily being operated manually, this momentary switch **38** is manually operated thereby controlling the relay.

FIG. **6** sets out a preferred director circuit. Power is supplied to the circuit at **39.** Fuse **40** is a safety device. Transformer **41** reduces the voltage, and rectifier **42** converts the reduced voltage from AC to DC. Conduits **43** and **44** go to beacons located in one direction, and conduits **45** and **46** to beacons located in the other direction. The conduits **43** and **44** control relay **47,** and conduits **45** and **46** control relay **48.** Relays **47** and **48** each control lights **49** and **50.** Relay **47** further controls flasher **51** and light **52.** Relay **48** further controls flasher **53** and light **54.** This circuit is the preferred circuit for controlling the director **8** set out in FIG. **1.** The director **8** contains four lights, lights **49** and **50,** providing illumination for TELLER AVAILABLE and lights **51** and **52** providing illumination for the direction arrows.

In operation, a customer waits in the waiting area and watches the director. When it illuminates TELLER AVAILABLE and a direction arrow lights up, the person walks in that direction until he comes to the teller whose beacon is on. When the person steps in front of the teller to transact business, the beacon and the director automatically extinguish by means of a mat switch, photocell switch or equivalent switch arrangement. When the person has finished transacting his business and leaves the area, the beacon and director automatically switch on and page another customer. If a customer is slow in leaving the area, the beacon and director can be manually controlled.

The present system can be modified in various ways to adopt it to various uses. Such modifications are, however, within the present system.

What is claimed is:

1. A system for controlling the flow of persons to service stations comprising:

a. a waiting area wherein persons wait for a vacancy at a service station;

b. a plurality of service stations;

c. director means in front of said waiting area which alerts a waiting person to a vacancy at any service station and directs said person toward a vacant service station;

d. beacon means at each service station which is in a lighted mode when there is a vacancy at said service station; and

e. beacon actuating means at each service station activated by the person at that station attaining service, consisting of (1) at least one photocell which receives at least a set amount of ambient light when the service station is vacant and thereby controls said beacon actuating means to be in a lighted mode and said director to alert said waiting person, and receives less than said set amount of ambient light when the service station is in use by a previously waiting person, resulting in said beacon means being in an unlit mode and said director in a non-alerting mode and (2) variable resistance means in the photocell circuit for adjusting the photocell signal relative to the intensity of ambient light contacting said photocell so that variations in ambient light intensity do not disrupt said system.

2. A system as in claim **1** wherein said automatic means interrupts an input to said director means when said photocell receives less than said set amount of ambient light.

3. A system as in claim **1** wherein the person providing service at said service station has switch means to manually control said beacon means and said director means.

4. A system as in claim **3** wherein said service station is a bank teller station.

5. A system as in claim **3** wherein said service station is an airline ticket station.

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