July 3, 1951 W. C. BRINTON 2,558,927

PARKING SYSTEM

Filed July 29, 1946 4 Sheets-Sheet 1

Fig. 1

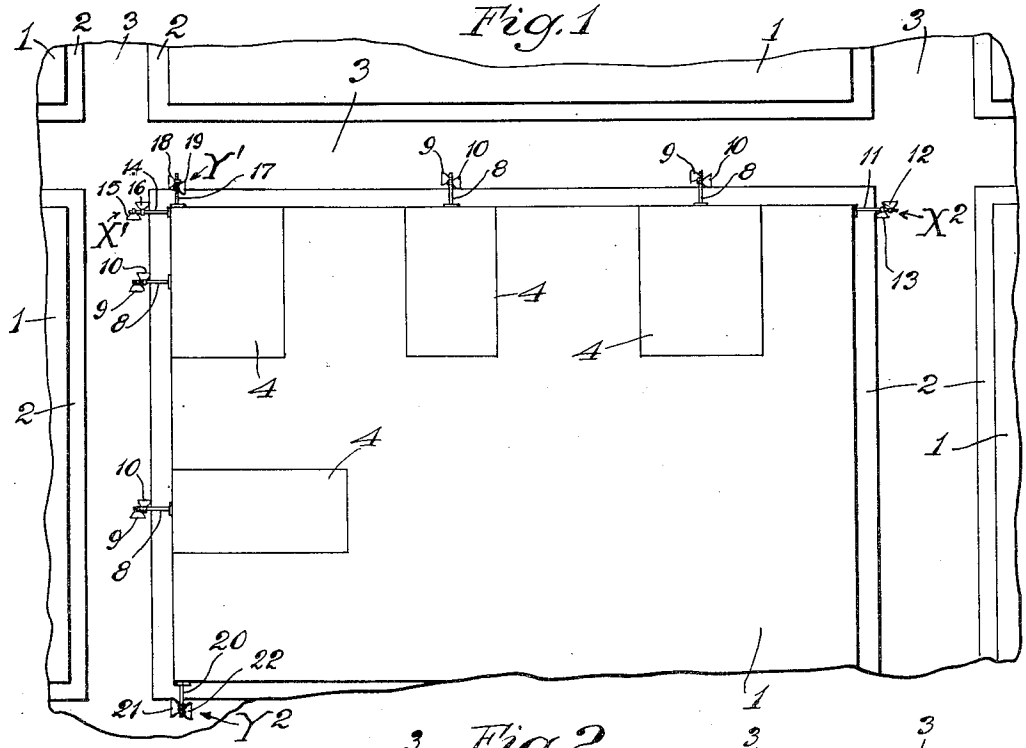
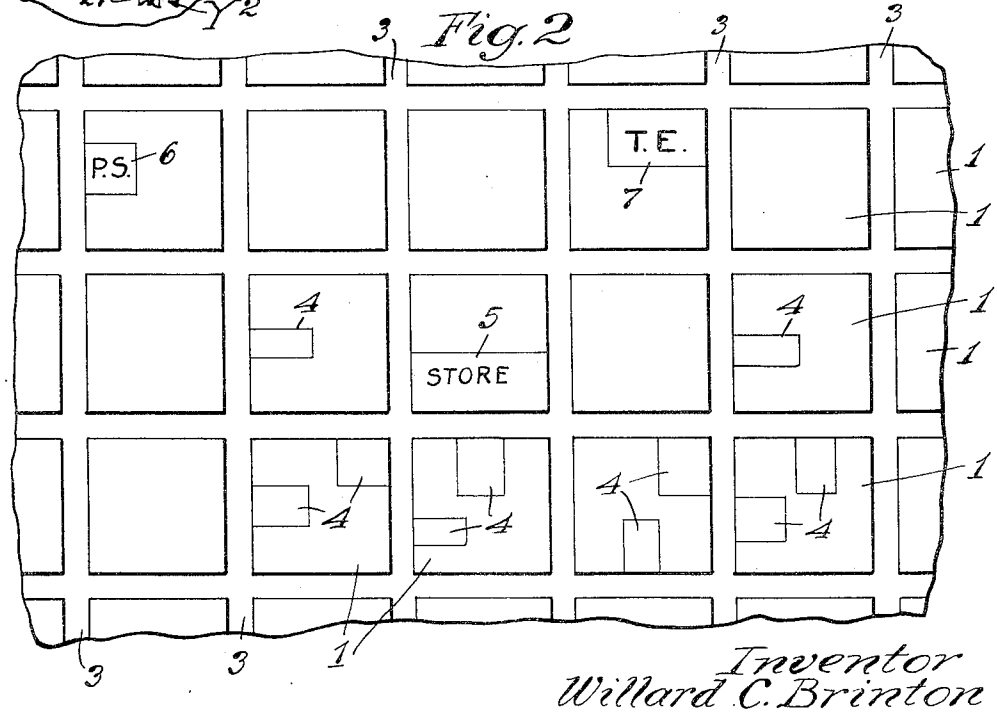



Fig. 2




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PARKING SYSTEM

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Fig. 3

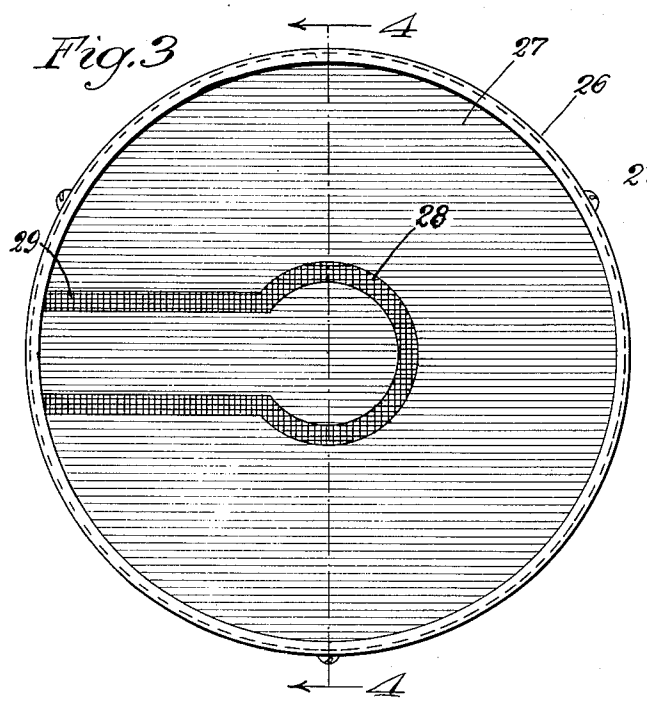



Fig. 4

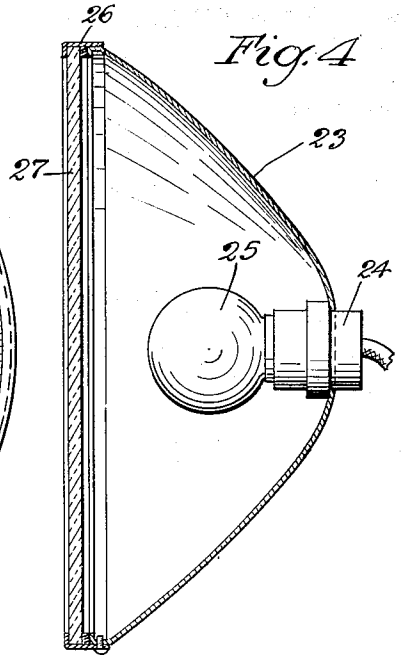
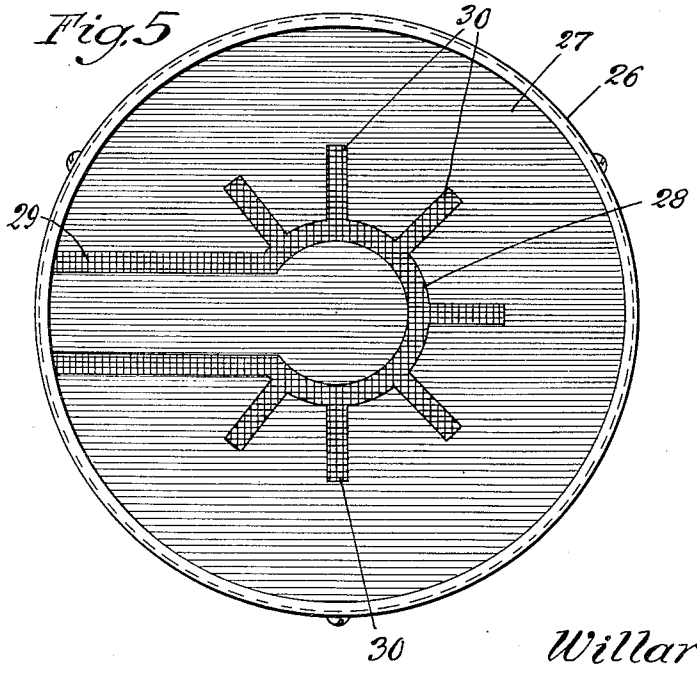



Fig. 5




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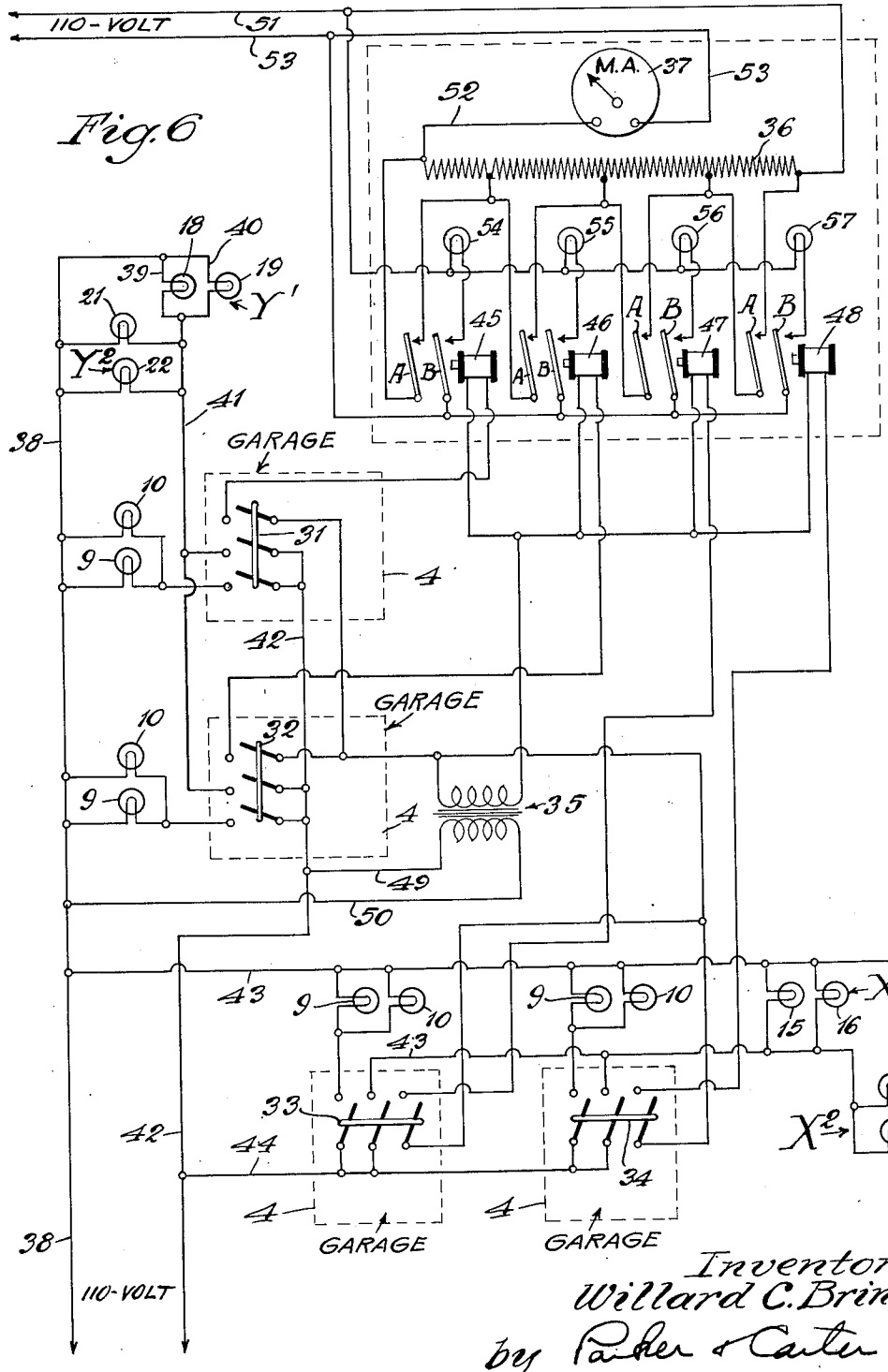



Fig. 6

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PARKING SYSTEM

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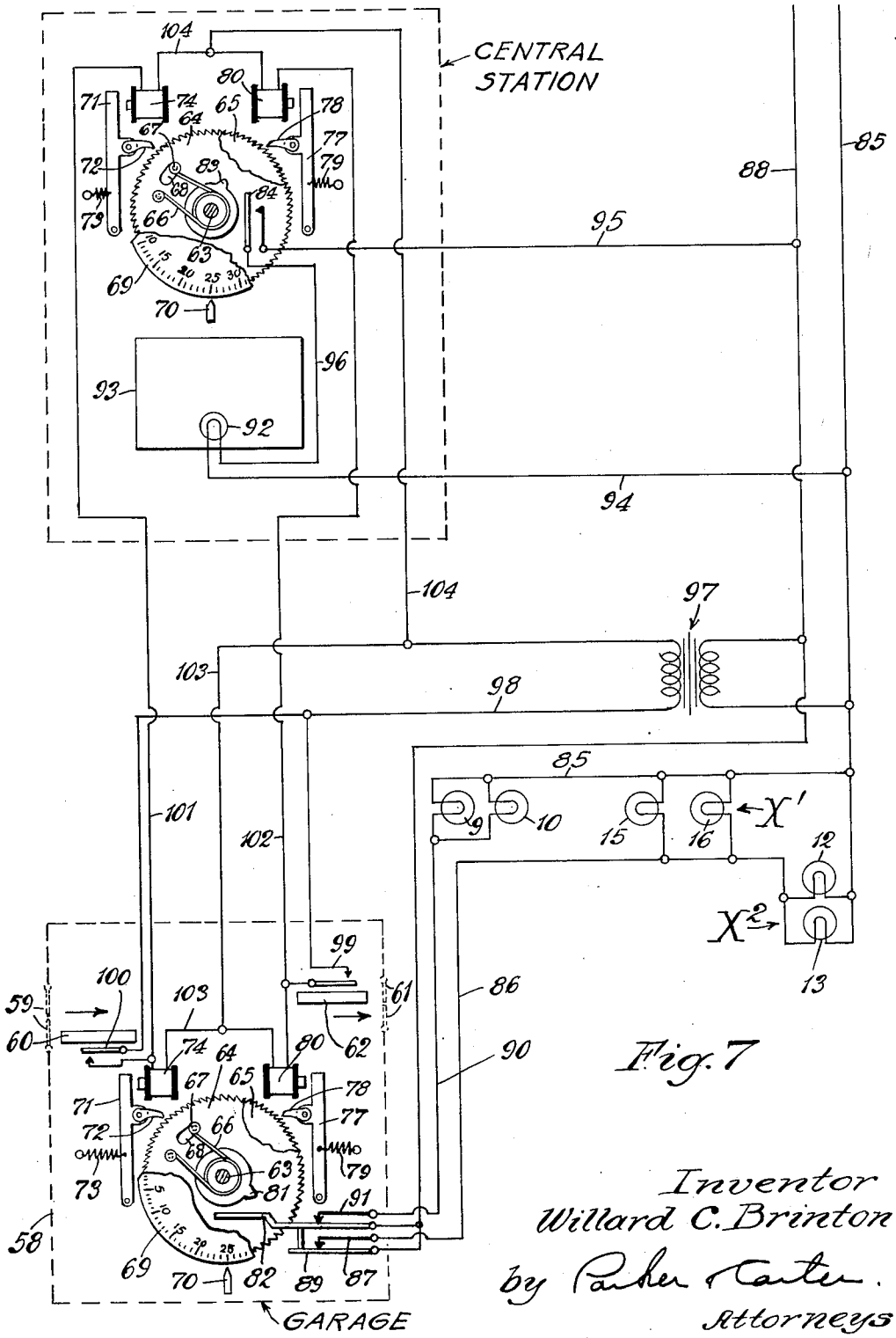



Fig. 7

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# UNITED STATES PATENT OFFICE

2,558,927

## PARKING SYSTEM

Willard C. Brinton, New York, N. Y.

Application July 29, 1946, Serial No. 687,031

6 Claims. (Cl. 177—311)

1

This invention relates to a parking system and has for one object to provide a parking system involving a number of garages and means for indicating at several points the availability of parking space.

Another object is to provide in connection with a plurality of garages means for indicating at a distance whether or not a garage has parking space available in it.

Another object is to provide an indicating system or board which may be installed at one or several places so that the condition of the garages throughout a city or an area may be readily ascertained.

Another object is to provide mechanism for accomplishing the results above indicated.

Other objects will appear from time to time throughout the specification and claims.

This invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a plan view of a portion of a city block or comparable area, showing garages;

Figure 2 is a plan view of a city area including several blocks;

Figure 3 is a front elevation of one form of light or beacon;

Figure 4 is a longitudinal section through the device of Figure 3, taken at line 4—4;

Figure 5 is a front elevation of a modified form of light or beacon;

Figure 6 is a schematic diagram illustrating the lighting system for several garages and for one central indicating board or station;

Figure 7 is a schematic diagram for automatically operating the lights of a garage in response to movement of vehicles into and from it.

Like parts are indicated by like characters throughout the specification and the drawings.

City blocks are designated by the numeral 1 throughout. As shown in Figure 1 each block is provided with sidewalks 2. 3 are intersecting streets. The showing of the sidewalks is omitted from Figure 2.

Garages or garage areas are distributed throughout the city and they are indicated by the numeral 4.

In general the problem of indicating the location of a garage and the degree of occupancy is the same whether the garage be an open parking lot or a closed garage building of any sort.

Throughout a city area it is convenient to provide central sources of information about the garage conditions. Thus a store 5 or a police station 6 might be provided with an indicating

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board upon which information as to the degree of occupancy of various garages or parking areas would be automatically available. Preferably the telephone wires already available in the city would be used as a part of the system and a telephone exchange is indicated at 7 in Figure 2.

Each garage or parking area is provided with lights which are visible up and down the street on which it is located. These lights may be of many different sorts. As shown in Figure 1 each of the garages 4 has a light standard or support 8 upon which lights 9 and 10 are positioned. In the case of the corner garage shown at the upper left corner of the block in Figure 1, lights are provided on each street to which the garage has access. By the use of two lights, oppositely directed, it is possible to tell the condition of occupancy of the garage in either direction up and down the street.

In addition to the lights on the individual garages or parking areas, lights are arranged at the corners of the blocks in which the garages appear, so that a motorist passing the street can tell whether or not there are garages in a given block or area and can also tell the condition of occupancy of such garages. Thus at one corner of the block 1 in Figure 1 a standard 11 supports lights 12 and 13. A motorist passing this street can look along it and will see from either direction one of the lights. That, because of a distinctive color or form as will be described below, will determine whether or not garages are in the adjacent block and will indicate whether a right or left turn is necessary to reach them.

A similar light arrangement is carried on the opposite corner of the block by a support 14, which displays lights 15 and 16. If, for example, the lights 9 and 10 carried by the two adjacent garages are out, because the garages are full, and if one of the other garages is not full, the lights 15 and 16 will give information to that effect and will direct a motorist to the garages which are not full.

Another light assembly is carried on a support 17 and carries and displays lights 18 and 19. At the opposite corner from that upon which the lights 18 and 19 are located is a standard 20 carrying lights 21 and 22. From the description and from the drawings it will be clear that each garage or parking area is provided with light means which indicate the location of the garage and also indicate its condition of occupancy. In addition to that each block or corresponding area is provided with additional indicating means. By these means a visual in-

dication is given of the location of the parking facilities in the block or general area and also the degree of occupancy of these facilities is indicated.

One suitable form of light means is indicated in Figures 3, 4 and 5. As shown, these are primarily indicating means and may be embodied in many different arrangements and supports. A conventional reflector 23 carries a light base 24 and a light source 25. A closing frame 26 may be of any desired form and carries a transparent member. As shown in Figures 3 and 4, this is the member 27 and it is provided with a design 28. This design is of a color different from the main area 27. The design is one which indicates that a garage is in the immediate neighborhood. It is therefore suitable for use on individual garages or parking areas and is also suitable for use on the corner indicators which merely show that a garage is nearby.

The design 28 is provided with an elongated portion 29 which indicates the direction in which the garage is to be found.

The transparent cover member of Figure 5 is generally the same as that of Figure 3 and corresponding parts are designated by the same numerals. The design is varied by adding the radial projecting members 30 to the rounded portion 28. This is done to indicate the presence of facilities such as gasoline supplies and any other supplies. By means of these and other distinctive designs on the cover members of the light devices, a motorist or anyone else passing can tell not only the location of a garage but can tell what types of facilities are available.

The arrangement shown in Figures 1, 3, 4 and 5 may be actuated manually or automatically and is not limited to any particular electrical circuit or mechanism. Each light on each garage is preferably provided with a cover member, such as the members 27 of Figures 3 and 5, and when they are illuminated they show the location of a particular garage and its type. They are illuminated only when the garage has parking space available.

The corner lights, whether positioned merely at the corner of a block, such as the lights 12, 13, 21 and 22 or positioned on a garage such as the lights 15, 16, 18, 19, serve an additional purpose. They will usually be connected to the garages in the block and if any garage has parking space available, the corner lights will be lighted. When all of the garages are full, the corner lights will be extinguished.

The system, therefore, whether operated mechanically or automatically, provides means for indicating to a passing motorist the location of garages in a general area, the location of particular garages and the availability of parking space in one or more garages.

The schematic diagram of Figure 6 shows the electric wiring for a system which may be used in connection with the garage layout of Figure 1 and includes a central indicating system which, for example, may be at the store 5, the police station 6 or the telephone exchange 7 of Figure 2.

The light assembly including the lights 16 and 15 is designated generally with the numeral $X^1$. It is a corner light assembly and its purpose is to show the conditions in a plurality of adjacent garages. Similarly, the light assembly, including the lights 12 and 13, is designated with the numeral $X^2$ as a whole. It is also a corner light assembly. Similarly, the assembly including the



lights 18 and 19 is designated at $Y^1$ and the assembly including the lights 21 and 22 is designated as $Y^2$. These designations occur on Figures 1 and 6.

Each side of each block is therefore provided with means for showing whether or not there are garages in that block and what is their condition.

In the schematic diagram of Figure 6 manual switches are shown, one being positioned at each garage. Obviously automatic devices might be shown or used instead of the manual switches. As shown, there is a manual switch 31 for the uppermost garage 4, a manual switch 32 for the lowermost garage 4, a manual switch 33 for the central upper garage 4 and a manual switch 34 for the upper right hand garage 4. 35 is a transformer. 36 is a resistance. 37 is a milliammeter.

The garage lights are preferably in connection with a city circuit or other suitable source of electrical power. A conductor 38 is connected by means of a conductor 39 to the light source 18 and by means of a conductor 40 to the light source 19. A conductor 41 is connected to the conductor 39 and to one pole of each of the switches 31, 32. A conductor 42 is connected to one pole of each of the switches 31 and 32 and to the main source of power.

The lights 21 and 22 are connected in parallel across the conductors 38 and 41. Each pair of lights 9 and 10 is connected to the conductor 38 and to one pole of the switches 31 and 32, respectively. The switches 31 and 32 are connected to the conductor 42. When closed they energize the light sources 9 and 10, as well as the light sources 18, 19, 21 and 22. Each switch in each garage controls the lights 9 and 10 of that garage independently from the corresponding lights 9 and 10 of another garage and each switch in each garage also controls the lights of two corner light assemblies: For example, the switch in the lower left-hand garage 4 controls the lights 9 and 10 in front of it and controls the lights in the light assemblies $Y^1$ and $Y^2$.

A conductor 43 is connected to the conductor 38 and to one pole of the switch 33 in the upper garage. Lights 12, 13, 15 and 16 are connected in parallel across this circuit. These are the corner light assemblies designated as $X^1$ and $X^2$.

A conductor 44 is connected to the conductor 42 and to one pole of each of the switches 33 and 34. Each switch 33 and 34 when closed energizes the lights 9 and 10 of its particular garage and also energizes the lights 12, 13, 15 and 16.

Each of the switches 31, 32, 33 and 34 is connected to a relay for actuating a system at a distance. This is the system indicated in the upper right-hand corner of Figure 6. Thus the switch 31 is connected to the magnet 45, the switch 32 is connected to the magnet 46, the switch 33 to the magnet 47 and the switch 34 to the magnet 48. Each of the magnets is connected to one side of the transformer 35 by the conductors shown. The same side of the transformer 35 is connected to the swtiches 31, 32, 33 and 34. The opposite side of the transformer 35 is connected through the conductor 49 to the conductor 42 and through the conductor 50 to the conductor 38.

The resistance 36 is connected through a line or conductor 51 to a source of power. The opposite side of the resistance 36 is connected through a conductor 52 to the milliammeter 37 which is connected by a conductor 53 to the source of current.

Each magnet 45, 46, 47 and 48 forms a part of a relay which includes two switches. In each relay one switch arm A short-circuits a portion of the resistance 36 and an arm B illuminates a light source 54, 55, 56 or 57.

I have stated above that each relay is connected to one of the main switches 31, 32, 33 and 34. When any of these switches is closed, it actuates the magnet of its relay to close the two switch arms A and B, thus lighting its respective light source and short-circuiting a portion of the resistance 36. When any light source is illuminated at the central station, it is an indication that the garage with which that light source is connected has space available. When any relay is actuated, in addition to energizing its light source, its switch arm A is also actuated and a portion of the resistance 36 is shorted out, thus changing the indication on the milliammeter.

As shown the switches at the garages are intended to be closed so long as any space is available at the garage, and thus if all switches 31 to 34, inclusive, were closed, each light source 54 to 57, inclusive, will be energized and each switch arm A will be closed, thus shorting out the entire resistance 36.

It is recognized that garages may be of different sizes and the portion of the resistance which is shorted out when the switch at each garage is closed is in proportion to the capacity of the garage. When all of the garage switches are closed, the indication at the central station is that a substantial amount of garage space is available. As each garage is filled, the operator at it opens its switch, thus extinguishing its light at the central station and bringing into circuit its proportional part of the resistance. The reading of the milliammeter, therefore, gives an indication of the proportion of garages in which parking space is available and the individual light sources for each garage at the central station indicate which particular garage has space available.

Although only four garages are shown in the system in Figure 6, it is to be understood that a large number of garages may be connected to a single central station. Ten garages are shown in Figure 2. They would all normally be connected to a single central station indicator. The proportional indication on the milliammeter will be more accurate where a substantial number of garages is in the system and connected to the central station indicator.

Where a more accurate indication of the exact space available in any garage is required, the system indicated in Figure 7 will give that information. As shown in the diagram only a single garage is connected to an indicator, but many such indicators could be installed at a single station and would give a specific and exact indication of the parking space available in each garage which is connected to the system.

The structure includes a garage 58, indicated diagrammatically in dotted lines. Entrance gates or doors 59 are provided and in the path of the entering car a switch operating mechanism 60 is installed. Exit gates 61 have associated with them switch operating means 62 over which a car leaving the garage must pass. Preferably the members 60 and 62 are long enough to hold one side of the entire car, and they cannot be operated by a single wheel or by a pedestrian.

Indicated also diagrammatically with parts broken away in Figure 7 is the indicating assembly at the garage. This includes a shaft 63 upon which a ratchet wheel 64 is fixed. A second ratchet wheel 65 is loosely mounted on the shaft 63 and is connected to the wheel 64 by a spring 66. One end of the spring is fastened to the member 64 and the other to a pin 67 which passes through a slot 68 in the member 64. Thus slight relative movement of the two ratchet wheels is possible. This may become necessary when a car leaves at exactly the moment at which another car enters. 69 is a calibrated or otherwise marked scale which moves with the shaft 63 and which may have a pointer 70 associated with it. It is preferably numbered to indicate the number of cars in the garage. Means are provided which will be described below for operating the indicating means.

In general when a car enters the indicator is advanced by one movement and when a car leaves it is returned by one movement, so that the indicator is progressively advanced and returned automatically by the entrance and exit of cars to and from the garage or the parking area.

The means for advancing the indicator as a car enters include a lever 71 provided with a pawl 72 adapted to engage the notches in the ratchet 64. A spring 73 normally holds it in the inoperative position. An electromagnet 74 is adapted to move it in the opposite direction to cause it to advance the ratchet wheel 64 by one step, which corresponds to the entrance of one car.

The means for returning the indicator include a lever 77 carrying a pawl 78. A spring 79 normally holds it in the inoperative position. An electromagnet 80 is adapted, when energized, to move the indicator by returning the ratchet wheel 65 one step in the opposite direction, which corresponds to the departure of one car.

Fixed in relation to the shaft 63 is a cam 81. It is so positioned that when the garage is full, it contacts a switch arm on a switch operating means 82 to control the lights.

The indicating means at the central station is preferably identical with the indicating means at the garage just described above and identical numerals have been applied to corresponding parts.

A cam 83 is positioned in relation to the shaft 63 of the central station indicator and closes the switch 84 which controls the light at the central station.

The garage lights shown in Figure 7 may be assumed to be the same as the lights for any garage illustrated in Figure 6 and thus two pairs of corner lights 12 and 13 and 15 and 16 appear. A pair of lights 9 and 10 is shown as in front of the garage. The switch which is operated by the member 82 in Figure 7 has the same purpose as any of the switches 31 to 34, inclusive, of Figure 6—namely, to turn off or on the street lights which indicate the availability of parking space and the corner lights. Since only a single garage indicator is shown in Figure 7, the circuit is such that when the lights 9 and 10 are turned out, the corner lights are also turned out. If several garages were associated in the general manner shown in Figure 6, the circuit would be such that the corner lights would only be turned out when all of the individual garage lights are turned out, and that connection in that case would be identical with the connection shown between the garage lights, the corner lights and the garage switches in Figure 6.

85 is the line connected with the source of power from which the lights 12, 13, 15 and 16 are connected in parallel to the line 86 which leads to the fixed switch contact 87. The other power line 88 leads to the movable switch members 82 and 89. The lights 9 and 10 are connected in parallel across the power line 85 and a line 90 which leads to the fixed switch contact 91.

I have referred above to a light at the central station. This is the light 92 and it is positioned preferably adjacent the indicating assembly at the central station, which may include a panel 93 upon which the name and location of the garage, as well as its capacity, will usually be indicated.

The light is actuated through current from the central source by means of a conductor 94 which is connected to the conductor 85 and the conductor 95 which is joined to the switch 84. A conductor 96 leads from the switch 84 to the light source 92. The magnet 74 at the garage is connected in parallel with the magnet 74 at the station. Correspondingly, the magnet 80 at the garage is connected in parallel with the magnet 80 at the station. Current is furnished to the four magnets from the main power line through a transformer 97. The secondary side of the transformer is connected by the conductor 98 to the switch 99 at the garage and to the switch 100, also at the garage.

A conductor 101 connects the garage magnet 74 to the central station magnet 74 and a conductor 102 connects the garage magnet 80 to the central station magnet 80. The other sides of the garage magnets 74 and 80 are joined by a conductor 103 and the corresponding sides of the central station magnets 74 and 80 are joined by a conductor 104. The conductors 103 and 104 are joined and connected to the secondary side of the transformer 97. The conductor 101 is connected to the fixed contact of the switch 100 and the conductor 102 is connected to the movable contact of the switch 99.

Although the form of the light or signal shown in Figures 3, 4 and 5 appears in those figures with a bulb 25 and a colored transparent member 27, it is to be understood that the color might be furnished by the bulb itself, and there is now available a gas filled bulb which produces on illumination a chemically blue light. Such a bulb might be used and in that case the member 27 need not be colored. Obviously other gas filled bulbs are available producing colors other than blue, and any suitable color producing bulb might be used.

The insignia or device 28, as shown in Figure 3, and the device 28 with the additions 30, as shown in Figure 5, may be made on the transparent member 27, or they may be made by means of a lens, colored or not. In general it is to be understood that this invention is not limited to any particular type of insignia or design, nor to the use of color, nor to the use of any particular color where color is used. The purpose of illuminating devices visible on the street is to indicate the location and direction and type of facility available. Where an insignia such as the member 28, 29 is used, the portion 29 will point toward the facility. Thus it will point in the direction of the closest garage. The member 27 or the design or insignia producing means will thus serve to point out the direction in which the facilities lie. The arrangement in which the light has an insignia to indicate the type of facilities available is thus more than a mere directional device.

The central indicating board of Figure 6 includes a plurality of lights—for example, the lights 54, 55, 56 and 57—and these may be of different types to indicate large or small garages, or they may be of different colors, or they might be associated with size indicating devices which would indicate size, by color or otherwise. One suitable means for indicating size is by the use of "lucite" rods. This material is available generally on the market and has the property of lighting up or transmitting light throughout its length. Thus a Lucite rod might be associated with each of the lights 54, 55, 56 and 57 and the length of the rod might be in scale to indicate the size or parking capacity of the garage.

Where a plurality of garages is indicated at a central station, as shown in Figure 6, the central station indicator might be associated with a map.

In general all of the lights of the system, and particularly those visible from the street, may be caused to flash in any way. It is of course well-known that flashing lights call attention to themselves generally better than do lights which do not flash or fluctuate. Thus the lights 25 in particular, or their equivalent members, would probably be caused to flash and would be provided with controls either to change their timing or to cause them to burn steadily when the garage is almost full. It will be preferable, where two speeds of flashing are provided, to have the more rapid flash condition at a time when the garage is fairly empty. The flash controlling means would probably be operated manually, although it need not be. Where flashing is provided, it might be either in the lights visible from the street or in the lights at a central switchboard, or both, and the lights 54, 55, 56 and 57 may be made to flash and their speed of flash would indicate to the observer at the central station whether or not they were largely empty or practically full. Where the Lucite rods or members mentioned above are applied at the central station, the flashing would be particularly effective.

The central station mechanism illustrated in Figure 7 amounts, of course, to a counting device, and the dial 69 indicates the degree of occupancy at any moment. Obviously a curved plotting or recording device might be associated with the dial 69 at the central station or with the dial 69 at the garage, and would give a permanent picture or record of the degree of occupancy of the garage throughout the time for which the record is made. A device of this sort is shown in my copending application Serial No. 672,127, filed May 24, 1946, now abandoned, and for that reason none is illustrated herewith.

Figure 7 shows diagrammatically only a single counter at the central station. Obviously any number of similar or equivalent counters might be assembled at a central station and a curve plotting device or recording device could be used with each. Similarly, if a plurality of curve plotting or recording devices is used at a station, an over-all totalizing recorder may be used.

Figure 6 comprises a schematic diagram showing the indicating and communicating system for a central station and a plurality of garages. It is to be understood that where the garages are sufficiently numerous to justify it, a main central station might be used which would be in communication with all of the garages in a large area

and that sub-central stations might be interposed ahead of the main central station, such sub-central stations being connected with all of the garages in an area smaller than the total area considered.

Figure 6, however, since it illustrates generally the combination of a central station with a plurality of garages, is to be taken as illustrative broadly of any combination of one or more central stations with a plurality of garages.

I claim:

1. A signal system for use with a group of garages for directing cars to said garages and indicating the availability of parking space therein, each of said garages having an entrance on a street, said system including a signal light located at the entrance to each garage so as to indicate the position thereof, each of said signal lights being of such character that it may be seen from the street at a greater distance from the entrance than that at which the condition of the garage for the reception of cars can be directly observed, a signal light located at a distance from the entrances to at least some of said garages and visible along a street different from the street on which the entrance to at least one of said garages is located, electrical connections from each garage to the signal light associated with the entrance to such garage, electrical connections from each garage to the distant signal light, and control means at each garage for changing the condition of the signal light at such garage and for changing the condition of the electrical connections between such control means and the distant signal light in accordance with the availability of parking space in such garage, whereby the distant signal light may be set from any garage to indicate availability of parking space in at least one member of the group of garages when there is such space available and will be set to indicate the absence of availability of parking space anywhere within the group of garages only if the control means at each of the garages of the group are all set to indicate absence of parking space in the responsive units.

2. A signal system for use with a group of garages for directing cars to said garages and indicating the availability of parking space therein, said system including a central control station for indicating conditions at said garages, each of said garages having an entrance on the street, said system including a signal light located at the entrance to such garage and visible for a substantial distance along the street upon which the entrance is located, a signal light located at a distance from said entrances and visible from locations at which at least some of the individual garage signals cannot be observed, a unitary control device at each garage, electrical connections from said control device to the signal light at the garage, electrical connections from the control device in each garage to the distant signal, a central station indicator, electrical connections from each control device to said central station indicator, each of said control devices and the electrical connections therefrom being constructed and arranged in such manner that manipulation of the control device at any garage will simultaneously change the condition of the electrical connections to each of the following, to the signal light at the entrance to the garage where the particular control device is located, to the distant signal light, and to the central station indicator whereby, when the control at any garage device is actuated to change the indication at such garage as to the availability of parking space therein, the condition of the electrical connections from such garage to the distant signal will be correspondingly changed, and the condition of the central station indicator will be changed to indicate the presence or absence of available parking space in said garage.

3. A signal system for use with a multiplicity of individual garage units for directing cars to individual units and for indicating the availability of parking space in said units, at least one of said units being of different capacity from others of said units, said system including a central control station for summarizing conditions at said units, each of said garage units having an entrance on a street, said system including a signal located at the entrance to each garage unit and visible for a substantial distance on the street upon which the entrance is located, a control device at each garage for changing the condition of said signal to indicate unavailability of parking space in each unit, a central station indicator at the central control station, electrical connections from the control device in each garage unit to the visible signal at the entrance to such unit, electrical connections from each control device to said central station indicator, each said control device and the electrical connections therefrom being constructed and arranged in such manner that manipulation of the control device at any garage will simultaneously change the condition of the signal at such garage and the condition of the central station indicator, said central station indicator having indicating means operable by said control devices to give a changed indication proportional to the rated capacity of garage units at which said control devices are manipulated.

4. A signal system as claimed in claim 3 in which said central station indicator includes a plurality of resistance elements, one of which is associated with the electrical connections from each of said control devices, the value of each of said resistance elements being proportioned to the capacity of the garage unit at which the corresponding control device is located, said central station indicator also having an indicating instrumentality, the indication of which is responsive to the combined value of all the unit resistances activated at any particular instant.

5. A signal system for use with a group of garages for directing cars to said garages and indicating the availability of parking space therein, each of said garages having an entrance on a street, said system including a signal located at the entrance to each garage and visible for a substantial distance along the street upon which the entrance is located, a signal located at a distance from said entrances, and visible from locations from which at least some of the individual garage signals cannot be observed, electrical connections from each garage to the signal associated with the entrance to such garage and to the distant signal, and control means at each garage for changing the condition of the signal at such garage in accordance with the availability of parking space in such garage, the electrical connections from the control means at each garage to the distant signal being interconnected so that the distant signal may be set from any garage to indicate the availability of parking space somewhere in the group of garages and may be set to indicate absence of available parking space in the group from the control means of the garage last to be filled.

6. A signal system for use with a garage having an entrance located upon the street of a city block for indicating parking accommodations therein, comprising a first signal located at said entrance and visible at a substantial distance longitudinally of the street and acting to indicate the position of said entrance, a second signal located at the corner of said street and visible at a substantial distance longitudinally along an intersecting street, at least one of said signals being provided with means indicating the direction of the turn to be followed in approaching the garage, and control means at the garage for changing the condition of both of said signals to enable them to indicate the presence or absence of available parking space in the garage.

WILLARD C. BRINTON.




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