

- [54] ELEVATOR RECALL CONTROL WITH INTERFLOOR TRAFFIC CONTROL
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- [22] Filed: **June 10, 1971**
- [21] Appl. No.: **151,697**
- [52] U.S. Cl. **187/29 R**
- [51] Int. Cl. **B66b 1/20**
- [58] Field of Search **187/29**

[56] **References Cited**

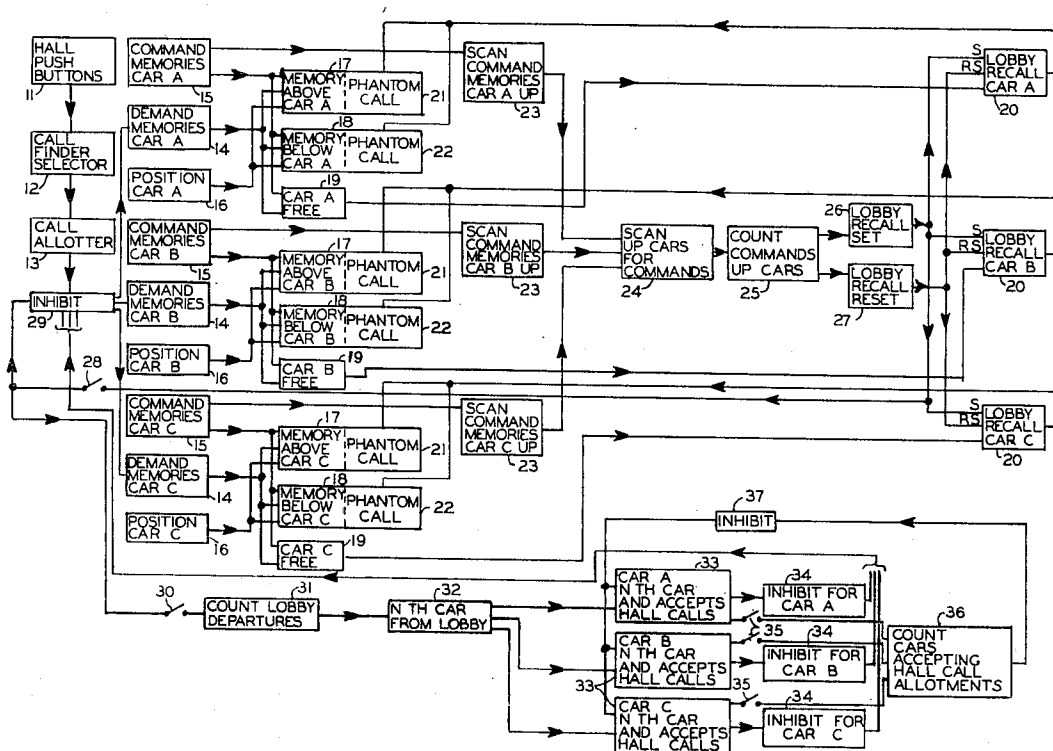
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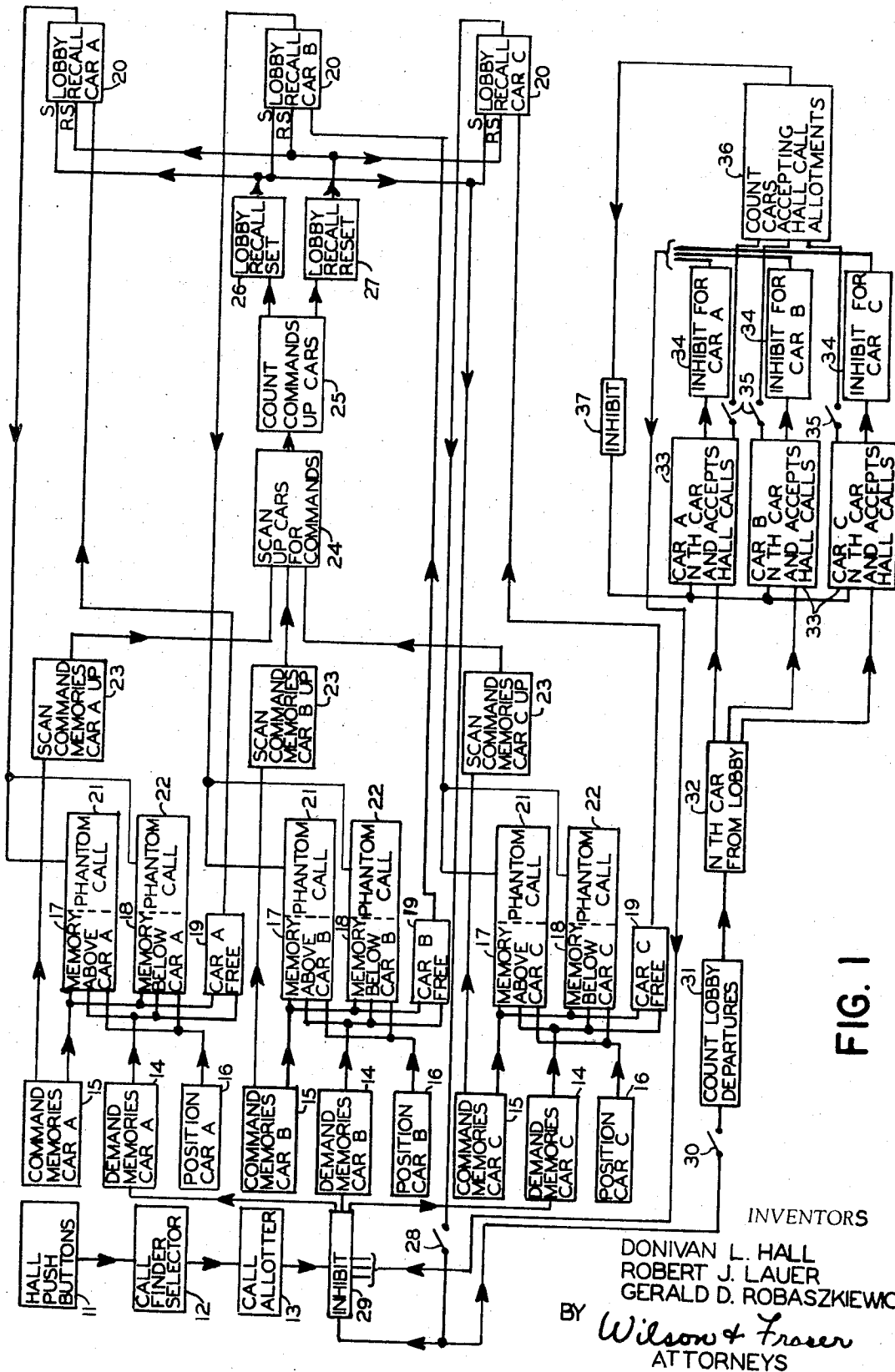
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[57] **ABSTRACT**

An elevator control for systems in which cars ordinarily run only to those hall calls specifically assigned to the individual cars wherein cars are automatically recalled to a primary service floor at which there is a high rate of passenger entries. The service from the primary service floor is enhanced by restricting response of the cars to hall calls. One restriction level is to eliminate service to all hall calls, another to eliminate service to certain hall calls, a third to permit only a limited number of cars departing from the primary service floor to serve hall calls in either the entire range or the restricted range. Where there are special floors served by less than all cars in the group, the cars permitted to serve hall calls can be made to include cars capable of serving those special floors. Cars are recalled only when they have concluded their service in traveling from the primary service floor. Recall service can be established by manual or clock controlled switch or by sensing a condition indicative of a need for such service. One such condition is a count of car calls in ascending cars where recall is to a lower main floor.

28 Claims, 4 Drawing Figures





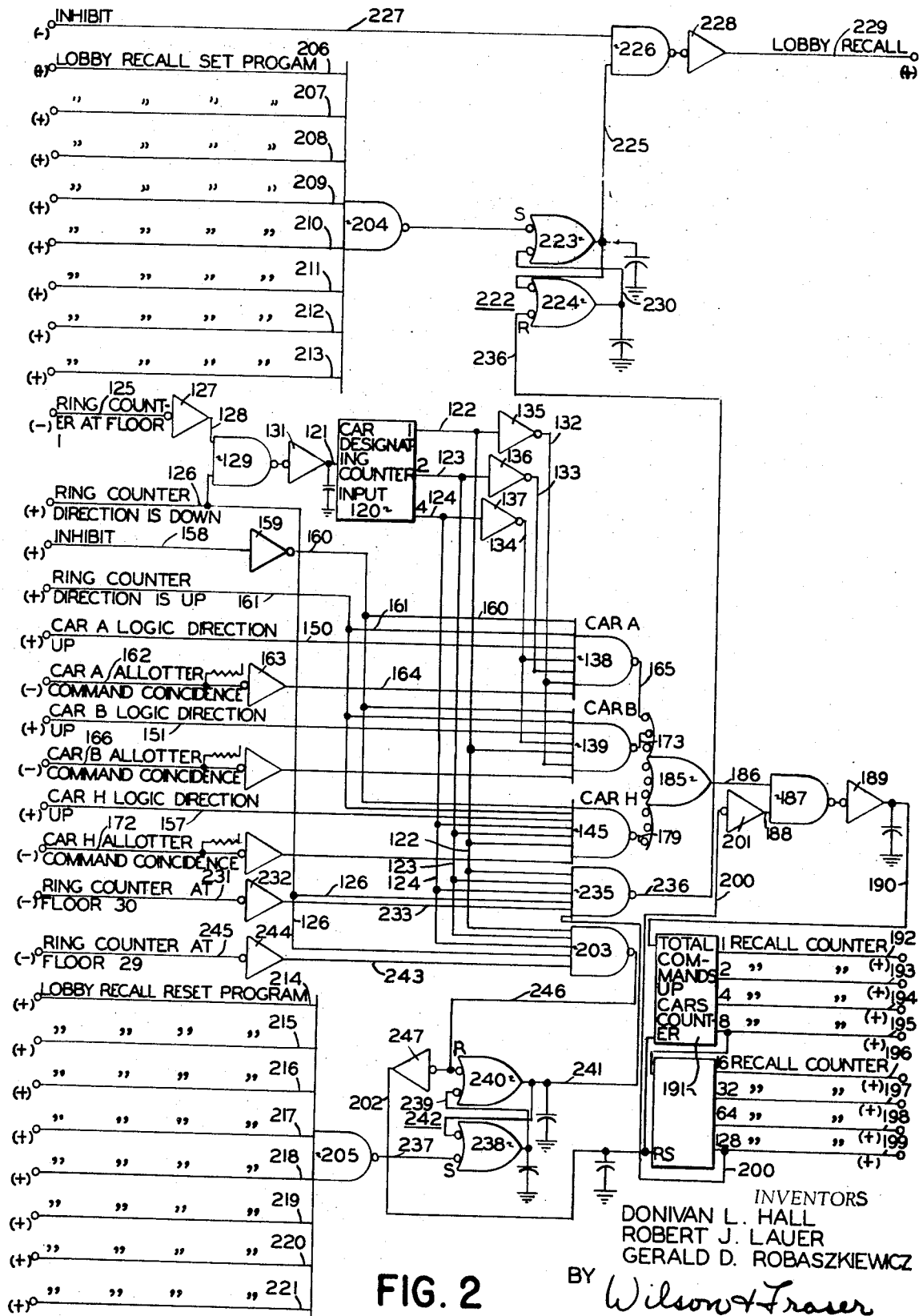
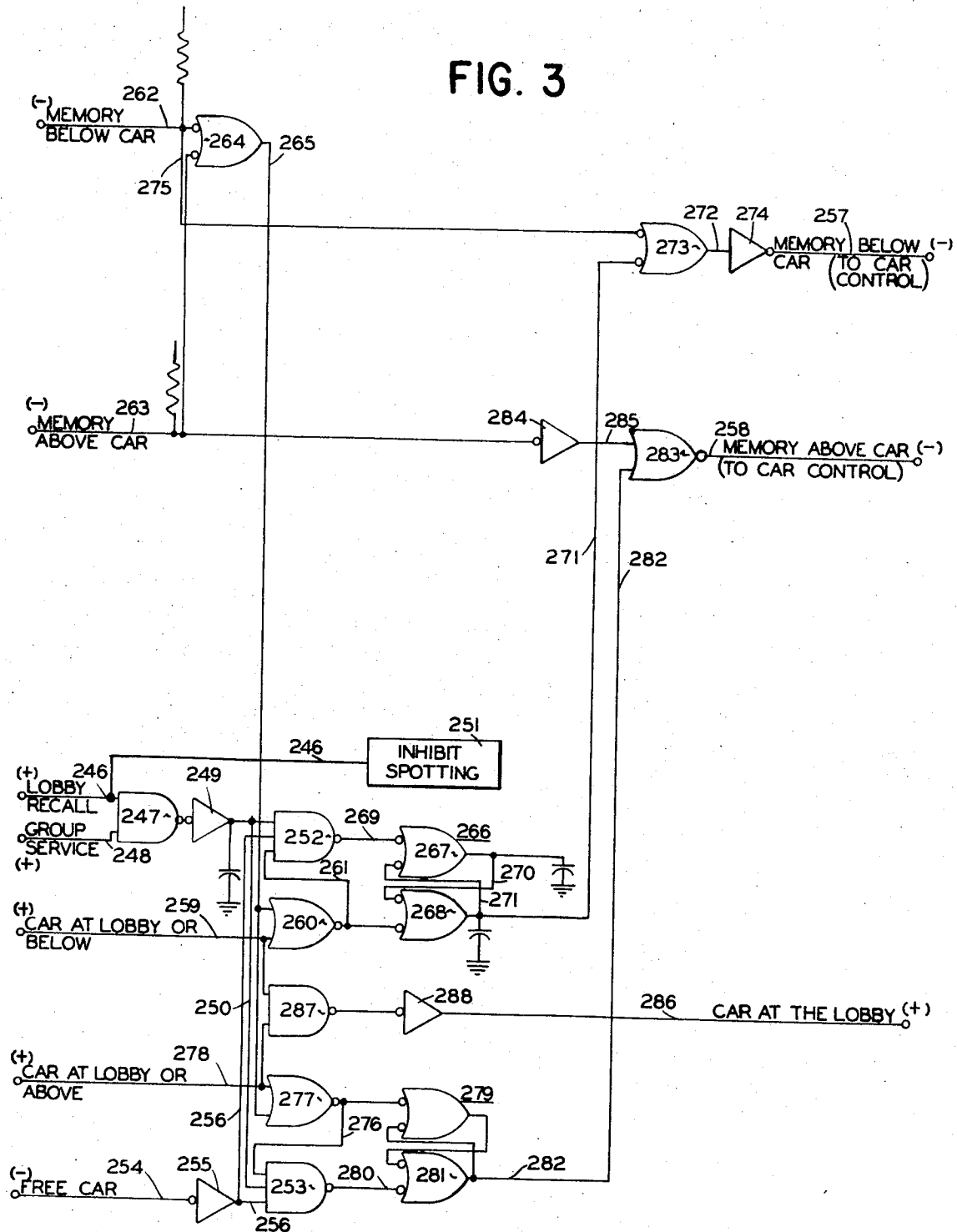
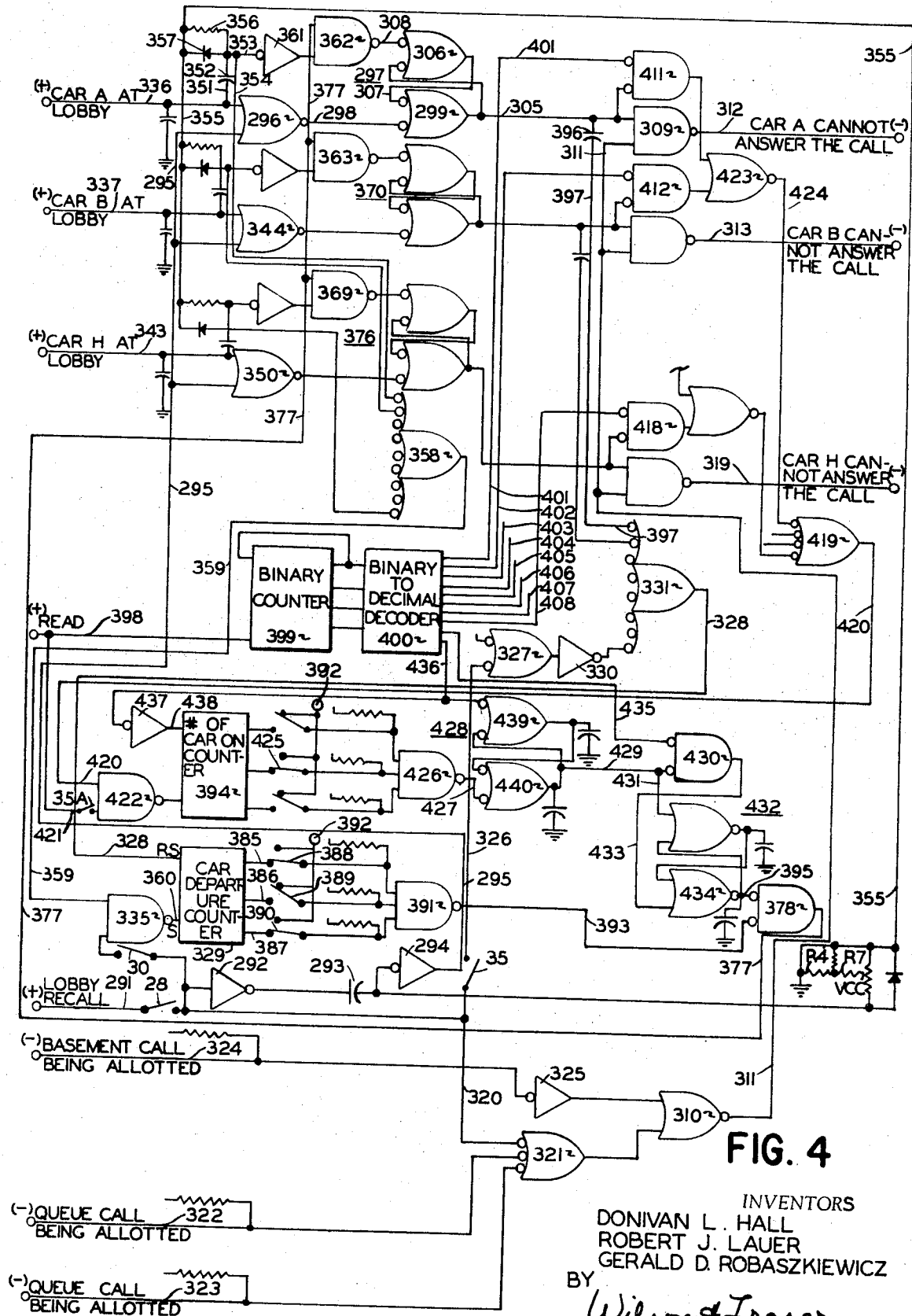


FIG. 2

FIG. 3



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ELEVATOR RECALL CONTROL WITH INTERFLOOR TRAFFIC CONTROL

CROSS-REFERENCE TO RELATED APPLICATION

This application relates to an application by Gerald D. Robaszekiewicz for "Elevator Control for Optimizing Allotment of Individual Hall Calls to Individual Cars" - Ser. No. 151,778 filed herewith.

BACKGROUND OF THE INVENTION

The recall of elevator cars to a floor of high intensity traffic according to this invention can be applied to systems of the type disclosed in U.S. Pat. No. 3,443,668 for "Plural Car Elevator System for Developing Hall Call Assignments Between Individual Cars and Registered Hall Calls" by Donovan L. Hall and William C. Susor, issued May 13, 1969, as augmented by U.S. Pat. No. 3,474,885 for "Queueing Controls For A Group Of Elevators" by Donovan L. Hall, Gerald D. Robaszekiewicz and Orval J. Martin issued Oct. 28, 1969, wherein the assignment mechanism selects a car to serve a call automatically inserted for a special service floor.

It has been found that where surges of traffic are experienced, as the morning in-rush as employees arrive to begin their working day, in prior elevator systems which permit cars to park at the floor at which they complete their service, the cars tend to stand idle in the upper portion of the building. When this occurs during an up peak of traffic, service tends to be delayed by the rapid filling of the car or cars at the floor of intense incoming traffic while cars are parked. The use of an artificial call, frequently termed a "home station call" or a "lobby call" ordinarily is applied to one or more but less than all of the cars as they become idle to alleviate this tendency toward service delay. The above mentioned queueing controls are effective in this manner to tend to maintain a car at a floor of high intensity traffic at all times and to replace that car as soon as it is indicated that it will depart.

Home station types of controls tend to negate the advantages of the distributed placement of idle cars and thus are normally constrained to a minor portion of the cars such as one in a bank of four or six. Further, where home calls are serialized in the process of assignment to individual cars, only a single car is conditioned to serve the home station conveniently.

The present invention provides means to establish a recall condition for all idle cars in an elevator system whereby no time is lost in parking idle cars to await their reaction to an automatic home station call. It enables the application of recall to all idle cars in a system which normally confines the allotment of individual calls to individual cars. It avoids disruptive interfloor traffic during peak traffic conditions or restricts such traffic to a metered amount whereby it is subordinated to the predominant traffic. The operation can be introduced and terminated by switch either automatically as by clock or a service condition sensing means indicating a peak traffic or manually.

In the specific example as applied to a system of the type disclosed in U.S. Pat. No. 3,443,668, the system is disclosed for accommodating up peak traffic from a lower main floor or lobby by causing all cars which are free of service requirements to be set to run toward the lobby until they reach the lobby. Cars stopped at the lobby are thereafter subject to the queue controls of U.S. Pat. No. 3,474,885, in that a car has its doors open

and up hall lantern lighted as the next preceding open car receives a car call by entering passengers, and is thereby committed to depart within a short interval provided to avoid unsafe door closing operation. The opening of the car door at the lobby and the illumination of the up hall lantern is maintained until a car call is registered.

A car running from the lobby satisfies all car calls registered on suitable call means in the car for floors served by the car. It can also be allotted hall calls on the basis taught in U.S. Pat. No. 3,443,668. When free of all car and hall calls, it is set to run downward by an artificial call below car signal which persists until it reaches the lobby. While returning to the lobby, the car can be allotted hall calls and thus diverted from its recall to the lobby. Where the intensity of the up peak traffic warrants, this diversion can be curtailed or eliminated. It is eliminated by preventing the allotment of all hall calls during the lobby recall operation. Thus, no hall calls are allotted while the car travels from the lobby serving its car calls, and no hall calls can interrupt its return.

Restriction of interfloor travel by barring hall call allotment is unacceptable in some instances since building occupants at other than the lobby are afforded no elevator service. This restriction can be tempered by permitting a selected car departing from the lobby to be allotted hall calls and to respond to such allotments until it again returns to the lobby. One means of establishing this permissive allotment is by enabling response for one car departing the lobby in every given number of such departures as every fifth car to depart. Even this limited interfloor service can be limited so that only a given number of cars can be maintained responsive to hall call allotments and once such a number is responding, as two cars in an eight car bank, no further departing cars can receive hall call allotments.

In some banks of elevators certain floors have openings only for certain cars. Thus a portion of the cars can travel one or a group of floors non-stop as to more expeditiously serve a high zone of floors. In other instances, only certain cars will serve a tower or other extension floors unavailable to the remaining cars in the system. Where the service capability of certain cars is thus curtailed, the permissive allotment can be made to cars providing the full range of service or those cars can be excluded from the control of the allotment inhibiting means.

Lobby recall in the various degrees outlined is brought into and taken out of operation automatically. In the example, it is controlled by counting the number of calls in ascending cars. Counters are provided for a count of calls for lobby recall introduction, and for a count of calls for lobby recall release. Count is by sequentially scanning the car calls in individual cars set for up travel at a high rate of scan. Upon completion of a scan of car calls for all cars, the accumulated car call count is reset. Latches hold lobby recall when the threshold count is achieved until it drops below a hold level.

An object of the invention is to improve elevator service.

Another object is to concentrate service in a given travel direction.

A third object is to restrict the concentration of service to afford continued service other than of the type concentrated upon.

A fourth object is to count total car calls in a system for a given direction of service with a minimum of equipment.

In accordance with the above, a feature of this invention resides in controls for setting all free cars in a system to run toward a given floor until they reach that floor.

A second feature involves preventing allotment of hall calls to cars under certain operating conditions without disrupting the allotment thereto under other operating conditions.

A third feature resides in counting the number of car departures from a given floor and at regular intervals in the car departure count permitting hall call allotment to the then departing car.

A fourth feature resides in constraining the allotment permission to a predetermined number of cars at any one time.

A fifth feature comprises a scan of car calls on a calls per car basis and successive scan of cars basis to establish a total count for a given car condition, such as for ascending cars.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a functional block diagram of a system embodying this invention and illustrating features thereof for typical cars only;

FIG. 2 is a logic diagram common to the cars of a bank for automatically issuing a recall signal in response to a given intensity of traffic from the floor to which the cars are recalled showing portions for cars A and H typical of an eight car bank;

FIG. 3 is a logic diagram of a portion of the controls individual to each car for setting the car to run to a phantom call for the lobby as dictated by the circuit of FIG. 2; and

FIG. 4 is a logic diagram of the interfloor traffic control common to the cars and showing typical circuits for cars A and H arranged to inhibit response of cars to hall calls, to admit cars to queue service or basement service by means of the allotter, to release cars to such response on a metered basis, and to constrain the number of cars so released.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is illustrated as applied to a bank of eight elevators, cars A through H, serving up to thirty floors. The cars are arranged to serve only car calls registered on suitable call registering means by passengers within the cars, designated "commands," and hall calls which are allotted the cars individually and are designated "demands." Allocation of demands to particular cars can be made on a number of bases including proximity of the floor of the hall call to the car; service direction of the hall call and the car; loading of the car; number of commands on the car; number of demands on the car; spatial relationship of the hall call to be allotted, the demands on the car, the commands on the car, and the car; and status of the car as m-g set shut down, queue status according to U.S. Pat. No. 3,474,885, and taxi service according to U.S. patent application Ser. No. 610,576 filed Jan. 20, 1967, entitled "Elevator Control Providing Preferred Service to Hall Calls Registered for a Long Time" by Donovan L. Hall, James H. Kuzara, and Orval J. Martin. Allotment according to disclosures of U.S. Pat. No. 3,443,668 is

according to an attributes evaluation in which a car has at least a predicted service capability, considering the above factors, with respect to the hall call to be allotted, or according to an optimization in which the car having the best service capability with respect to the call receives the hall call as a demand.

This disclosure is concerned with providing an operation to return cars to a floor of high traffic intensity without effectively imposing a call on the car for such floor. In the above noted queueing control, an artificial hall call is imposed on the system and allotted by the allotter to a car. That car runs to the floor of the queue call, termed a "queue floor" and upon arriving at the queue floor, opens its doors. In effect, a queue call is treated in much the same manner as a command or demand since the car is made available to the floor of the call by opening its doors. The present recall operation effectively imposes a "phantom" call on free cars so that any free cars have a signal "call memory below the car" or "call memory above the car" depending upon the relative positions of the car and the recall floor. The car runs to the recall floor at which point it ceases to have the signal requisite for running and stops. However, it does not open its doors since no demand or command for the floor is present.

When a queue car vacancy occurs, a queue call is imposed, the allotter allots it to the car best situated to provide queue service (presumably a car returned to the lobby by recall and having its doors closed in the example), and the new queue car when at the lobby opens its doors and lights its up hall lantern. Thus, recalled cars are immediately available to accommodate incoming passengers.

FIG. 1 is a block diagram representing the portions of a system associated with the present invention. The hall call means at the several landings and common to the cars is represented by the rectangle 11 bearing the label "Hall Push Buttons." A "call finder selector" 12 serializes the hall calls and queue calls for evaluation and allotment to cars by allotter 13. Allotted hall calls are maintained in the demand memory 14 for the floor, service direction, and car to which they are allotted.

Car calls result in the direct setting of command memories 15 for the cars. The cars, in normal operation, run to the calls in their demand and command memories 14 and 15. Running direction is established by the relationship of car position 16 to the floors of command memories and demand memories as memory above the car 17 for floors above or memory below the car 18 for floors below. If neither demands nor commands are imposed upon a car, it is designated a free car at 19 so that under recall conditions the car is individually subjected to lobby recall at 20. This imposes a phantom memory above car 21 or phantom memory below car 22 is set by a combination of the recall signal and car position for a free car to cause the car to run until the phantom memory is neither above nor below the car, and thus is at the location of the car.

Lobby recall is considered in the example although it is to be appreciated that recall operation is appropriate for any floor. It is assumed the lobby is in the lower portion of the travel of the elevators and thus that the preponderant recall operation is downward. Further, the assumed lobby recall is appropriate when a high intensity of traffic from the lobby exists. This will occur when tenants arrive in high concentration and require travel upward. These requirements are sensed for auto-

matic introduction of lobby recall operation as a count of commands in ascending cars.

A count of commands in each car is made by scanning the command memories floor by floor as at 23 and the total number of commands in up cars in the system is accumulated by scanning the cars, thereby successively counting commands for each car at 24 to be accumulated at 25. Lobby recall is established when a certain number of commands is counted in a scan of the cars to actuate a lobby recall set control 26, and is terminated when two successive scans of the command count in all up cars result in less than a lesser certain number to actuate a lobby recall reset control 27.

In addition to establishing a phantom call or memory for free cars by the individual car lobby recall response means 20, lobby recall signals can be applied optionally to interfloor traffic control by closing switch 28 to render an allotment inhibit 29 effective to prevent the allotter 13 from allotting hall calls as demands to the cars. As will be understood from the detailed discussion of FIG. 4, the allotter is enabled during the operation of inhibit 29 to allot queue calls to the cars.

A second phase of interfloor traffic control meters the release of cars departing from the lobby. With switch 30 closed to introduce this phase, a counter 31 counts the departures of cars from the lobby and actuates means 32 to identify the Nth car to depart. The value of N can be adjusted according to the proportion of cars departing from the recall floor which is desired to be released from inhibit 29. Thus, each car identified as Nth car departing from the recall floor is enabled to accept allotment of hall calls as demands on its demand memories. The enabling means 33, in practice, can be an inhibit 34 on inhibit means 29 which is effective as the Nth car departs from the recall floor and remains effective for that car until it returns to the recall floor either in response to a manually registered call or when a free car to a phantom recall call.

An overlapping of cars enabled by 33 is possible, particularly since the allotter can allot calls causing the cars to reverse before returning to the lobby. In order to avoid an accumulation of cars metered to interfloor traffic while recall control is imposed, another option can be introduced by closing switches 35 to a counter 36 which counts the metered cars serving interfloor traffic. This counter 36 can be set to any desired level. When that level is attained, it actuates inhibit 37 to inhibit the admission of cars to interfloor traffic service by control 33 even though those cars are Nth cars departing from the recall floor.

Typically, in an eight car installation whereby the lobby is the recall floor, the value N can be set at five so that every fifth car departing from the lobby can accept hall call allotments until it returns to the lobby. The count set in counter 36 can be three so that no more than three cars can accept hall call allotments during lobby recall operation. In the event there are floors served by less than all the cars, one car serving all calls can be excluded from the allotment inhibit 29 and thus will maintain itself available for allotment. In such an arrangement, the limit for counter 36 is reduced to account for the continuously available car.

In the remaining disclosure, logic diagrams are employed utilizing conventional symbols. Input signals, usually from sources not shown, are applied at the left of the diagrams, and outputs are on the right. Functional designations for the signals are noted adjacent

the input and output terminals. The true signal signifying the logic of the information to be processed is shown parenthetically as (-) or (+). Corresponding reference to negative signals will be "logical 0" and to positive signals will be "logical 1" below.

NOR and NAND logic is represented. Amplifiers appear as 127 in FIG. 2 and their inversion function is indicated by the placement of a circle on an input for a response from a "0" to an output "1" as for 127, or with a circle on the output for a response from a "1" to an output "0" as for 159 of FIG. 2. NANDs, inverting ANDs, are exemplified by 129 of FIG. 2 which responds to a coincidence of "1" inputs with a "0" output. NAND 378 of FIG. 4 typifies the opposite inversion of a coincidence of "0" inputs to issue a "1" output. NOR 185 of FIG. 2 responds to any "0" input by gating a "1" output as indicated by the circles on its several inputs. Reverse polarity is illustrated for a NOR by 277 of FIG. 3 where any "1" on an input results in a "0" output designated by the circle at the output. Binary counters of conventional form are represented by rectangles as at 191 of FIG. 2 and include an "input," outputs "one," "two," "four" and so forth where binary counting requires, and a "reset" where required. These counters may be commercially available integrated circuits, as can the binary to decimal decoder 400 of FIG. 4.

DESCRIPTION OF FIG. 2

Recall operation is initiated and terminated according to the count of commands, car calls, in the cars set for up travel. The commands are sequentially counted for each car. A master ring counter (not shown) arranged to count upward for an arbitrary count, at least equal to the number of landings served, and then reverse and count downward, continuously operates to scan the commands for each car in succession. In the example, the master ring counter scans commands for up cars when its count is ascending by gating a signal when the count corresponds to the landing for which a command is registered. A car designating counter 120 advances from one car to the next car when the master ring counter count is one, and the counter direction is down.

Car scan is controlled through binary counter 120 having the characteristic of advancing its count as its input 121 is transferred from a low, negative, or "0" logic signal to a high, positive, or "1" logic signal. Three stages are employed in the example to accommodate up to eight discrete conditions and thus the eight car system illustrated. If the stages of the counter are all in the "on" or "1" condition at outputs 122, 123 and 124, when the ring counter is set to one for a down count, it applies a "0" at 125 and a "1" at 126 and its next count will be a one in the up direction and apply a "0" at 125 and a "0" at 126. The first one count advances binary counter 120 since inverter 127 applies a "1" at 128 in coincidence with the "1" at 126 to gate NAND 129 to a "0" to inverter 131. This imposes an advancing "1" on 121 to counter 120 and sets the next count, a zero in the example, by placing a "0" on leads 122, 123 and 124.

A combination of enabling and disabling signals are derived from counter 120 as the direct signals on leads 122, 123 and 124 and inversions of those signals on leads 132, 133 and 134 from inverters 135, 136 and 137, respectively.

NAND gates 138 through 145 gate command counts for cars A through H when set for up travel, when selected by counter 120 and when their floor is coincident with master ring counter count. With car A selected by a zero count in counter 120, gate 138 is partially enabled since "1" signals are applied to its three-car designating inputs. At this time, all other NANDs of the group are inhibited by at least one inhibiting "0" signal on their car designating inputs as on lead 122 for NAND 139 of car B.

If car A is set for up travel, by means not shown, it issues a "1" signal "car A logic direction is up" on lead 150 to further enable NAND 138. Similar signals are available for cars B through H on leads 151 through 157 respectively to enable the respective NAND. The "1" inhibit signal on lead 158 must be absent to cause inverter 159 to issue an enabling "1" to lead 160 for all NANDs 138 to 145 if the command counting is to be accomplished. Master ring counter is effective in command counting only while it is operating in an up count sequence to place a "1" on lead 161 to all of NANDs 138 to 145.

With all enabling prerequisites, all "1" signals on the upper six inputs of any NAND of the group 138 to 145, the NAND is gated for each coincidence of a count of the master ring counter with a floor for which the car has a set command memory set. In the case of car A, as designated by counter 120 and during the up count of the master ring counter, each coincidence of count and floor having a command imposes (by means not shown) a "0" signal on lead 162 which is inverted to a "1" by inverter 163 to lead 164 and gates NAND 138 to issue a "0" on lead 165. Similar count and command coincidence signals are produced for cars B through H at leads 166 through 172 on each scan of master ring counter and those signals are effective to gate one of NANDs 139 to 145 for the car then designated by counter 120 to issue "0" signals on one of leads 173 through 179.

NOR 185 gates the trains of the command signal "0" pulses as "1" signals to lead 186 and NAND 187 which, assuming no inhibiting "0" signal on lead 188, issues a "0" inverted to a "1" by inverter 189 to input 190 of "total commands count for all up cars" counter 191. Counter 191 is illustrated as an 8 bit binary counter having a capacity to count to 256 as signal combinations on leads 192 through 199 set to "1" signals for respective counts of one, two, four, eight, 16, 32, 64 and 128. The capacity of counter 191 is limited since once a count of 128 is indicated by a "1" on lead 200, inverter 201 applies an inhibiting "0" to NAND 187.

A scan of one to 30 upward and 30 to one downward is performed in the master ring counter for eight scan cycles to complete a count of total commands in up cars and reset the total commands count sensing means of FIG. 2. Count of commands is accumulated between the one up count pulse of the master ring counter while car designating binary counter 120 is set to a zero count and the thirty up count pulse of the master ring counter while counter 120 is set to a seven count inclusive. Following that accumulation, the lobby recall signal is reset, if a sustaining count of commands was not achieved in the current evaluation cycle, at the time the master ring counter has a thirty down count and car designating counter 120 has a seven count. A first evaluation cycle is required following the reduction of the command count below the sustaining level in order to

release the sustaining latch prior to releasing the lobby recall signal latch in the next cycle. The signal for resetting the sustaining latch and counter 191 is issued only after the signal for resetting lobby recall signal latch in a given master ring counter cycle. This sequencing is by the master ring counter which releases the sustaining latch in its 29th down count during the seven count of car designating counter 120, and thus one master ring counter pulse following the release of the lobby recall signal latch at its 30th down count.

Command count reset is by a "1" on lead 202, the reset input of counter 191, as derived from gating NAND 203. Lobby recall is instituted by gating NAND 204 and is terminated by not gating NAND 235 as determined by not achieving a preselected total commands count required to gate NAND 205 and set its flip flop 242. Flip flop 242 can be reset only during the twenty-ninth down count of master ring counter during the seven count of car designating counter 120 to gate NAND 203. NAND 235 is gated only when flip flop 242 is reset and during the thirtieth down count of master ring counter during the seven count of counter 120. The outputs 192 through 199 of counter 191 are selectively connected as by means of switches (not shown) to the inputs 206 through 213 for NAND 204 and to the inputs 214 through 221 for NAND 205. Each switch has two positions. One position connects the input to a positive bias providing a continuous "1" logic signal on the input. The other position connects to the respective count output of counter 191 whereby the achievement of the count selected as the lower limit for setting up or maintaining lobby recall applies a "1" signal to the lead. Thus, if a count of 56 commands is required to set up lobby recall, leads 195, 196 and 197 are connected to lead 209, 210 and 211 respectively for the eight, 16 and 32 signals of "1" while all other leads are connected directly to a "1" signal source. When NAND 204 is gated, its signal is latched by the flip flop 222 comprising the cross connected NANDs 223 and 224.

NAND 204 issues a "0" to NAND 223 causing it to issue a "1" on lead 225. That "1" is applied to NAND 226 to institute lobby recall, provided no inhibit "0" signal is present on lead 227. The gated lobby recall NAND 226 has its output inverted to a "1" by inverter 228 at lead 229. Flip flop 222 is latched by NAND 224 which issues a latching "0" to lead 230 of NOR 223 until the "1" on lead 236 is replaced by a "0." NAND 235 issues a resetting "0" to lead 236.

NAND 235 is inhibited from issuing a resetting "0" if the threshold count for maintaining lobby recall is established. Such maintaining threshold is indicated when NAND 205 is gated. The count of total commands for up cars in counter 191 for maintaining an established lobby recall operation is fixed by selector switch interconnections between counter outputs 192 and 199 and NAND inputs 214 and 221 corresponding to those to NAND 204. The sustaining count is ordinarily less than that required to gate NAND 204, and establish lobby recall. For example, a count of 40 commands in up cars could sustain lobby recall if outputs 195 and 197 for counts of eight and 32 were connected to inputs 217 and 219 and the remainder of inputs 214 to 221 were connected to a positive signal source providing a continuous logical "1." As a command count is accumulated in counter 191, it gates NAND 205 at a count of 40 in the example. The "0" on lead 237 to

NAND 238 gates to a "1" to lead 239 causing NAND 240 to issue a latching "0" on lead 241 to NAND 238 and an inhibiting "0" to NAND 235. Thus, if the lobby recall sustaining count of commands in up cars is achieved in the scan of all the cars, NAND 235 cannot be gated and the lobby recall flip flop 222 cannot be reset.

The master ring counter is operated at a frequency such that the command count of counter 191 and the lobby recall controls are updated virtually instantaneously. A clock frequency of ten kilocycles per second has been utilized such that the scan up and down is completed in about 6 milliseconds for each car and an eight car scan is thus made every 48 milliseconds. When a scan of the eight car command gates has been completed and less than a sustaining count of commands accumulated in counter 191, NAND 205 is not gated and the signal LOBBY RECALL is cancelled.

A seven count of counter 120 places "1" signals on leads 122, 123 and 124 and a RING COUNTER DIRECTION IS DOWN signal on lead 126 is represented as a "1" signal to enable NANDs 203 and 235 for the 29th and 30th counts of master ring counter respectively. An attempt to reset lobby recall reset memory 242 therefore precedes by one master ring counter count the attempt to reset the lobby recall set memory 222 at the termination of every eighth master ring counter scan. If the count in total commands in up cars counter 191 is insufficient to gate NAND 205, the set signal, a "0," is absent from lead 237 when at the 29th scan position the reset signal, a "0" from NAND 203 is imposed on lead 246. As a result, the lobby recall reset memory 242 is reset to issue an enabling "1" to NAND 235 on lead 241 if NAND 205 is not gated and is held set if NAND 205 is gated. When the 30th scan position signal, a "1" on lead 233 is applied, NAND 235 gates a resetting "0" to lead 236 and memory 222 if memory 242 is reset by the absence of a gating count for 205 to cancel LOBBY RECALL by a "0" on lead 229. If 205 held memory 242 gated, the thirtieth scan has no effect on memory 222 and LOBBY RECALL is retained.

In the remainder of the disclosure it will be assumed that the lobby recall conditions prevail by virtue of the sensing of a threshold count of commands for up cars from counter 191 to gate NAND 204 and thereafter a sustaining count from counter 191 to gate NAND 205 at the conclusion of the scan of all cars. This results in a logical "1" at terminal 229. It is to be understood that alternative sources of a logical "1" for terminal 229 might be established by other traffic conditions indicating intense traffic from the lobby, by a clock controlled signal programmed for the time of day and week in which intense traffic from the lobby is anticipated, or by a manually controlled switch.

DESCRIPTION OF FIG. 3

A primary recall function is to return all free cars to the recall floor as expeditiously as possible and to avoid opening their doors until they are allotted queue status for the recall floor and are stopped at the recall floor. In the present system applied to lobby recall, the logic controls of each car are indicated to have a call memory in the direction of the lobby when the car concludes its service to currently registered calls. The cars thus run toward the lobby when they are in free car status until they reach the lobby, at which time they stop. During

their travel toward the lobby, hall calls can be allotted to the cars and the cars will be subjected to allotment while standing at the lobby with their doors closed until they are introduced into queue status by the release of a car from queue status in the manner disclosed in U.S. Pat. No. 3,474,885.

In response to a lobby recall condition, a "1" signal from lead 229 of FIG. 2 is passed on lead 246 to NAND 247. If the car is in group service a "1" on lead 248 in coincidence with the lobby recall signal gates a "0" to inverter 249 to apply a lobby recall for the car at lead 250 as a "1." Lobby recall "1" on 246 operates to inhibit car spotting whereby free cars are spaced over the range of floors by an "inhibit spotting" control 251. The "1" on 250 gates NANDs 252 or 253 if the car is a free car to provide a "0" "free car" signal. "Free car" signal is present on lead 254 so that inverter 255 issues as a "1" to lead 256. NAND 252 is gated if the free car is not at or below the lobby to set a "memory below car" signal on lead 257 while NAND 253 is gated if the free car is not at or above the lobby to set a "memory above car" signal on lead 258. The signals on lead 257 and 258 set the car in motion toward the memory indicated (by means not shown).

NAND 252 is inhibited if a "car at lobby or below" signal is present on lead 259 as a logical "1" to gate NOR 260 to issue a "0" to lead 261. NOR 260 is also gated if a call is present either as a command in the car or as an allotted hall call or demand in the car since these calls result in either a "memory below car" "0" signal at lead 262 or a "memory above car" "0" signal at lead 263 to NAND 264 issuing a "1" signal on lead 265.

Flip flop 266, comprising NANDs 267 and 268, maintain a "memory below car" until a resetting "0" is issued by NOR 260. When NAND 252 is gated, the "0" on lead 269 sets the flip flop 266 by gating NAND 267 which issues a "1" to lead 270 to coincide with the "1" on lead 261 from NOR 260 and cause NAND 268 to issue a "0" on lead 271. The "0" on lead 271 is gated as a "1" to lead 272 by NAND 273. Inverter 274 passes the "1" as a "0" to lead 257 indicating "memory below car" to the car control and causing the car to run downward. A true memory below car resulting from a manually registered call will also apply a "0" at lead 257 since the "0" on lead 262 is passed to NAND 273 by lead 275 to gate the NAND and activate inverter 274.

When the down traveling car responding to its "memory below car" signal effectively reaches the lobby, a "1" is imposed (by means not shown) on lead 259 for a "car at lobby or below" signal. This gates NOR 260 to inhibit NAND 252 and reset flip flop 266 whereby the "0" "memory below car" signal on lead 257 is cancelled.

If the car were below the lobby when it became free, and the system was on lobby recall operation, NAND 253 would be gated by a coincidence of "1" signals on leads 256, 250 and 276 while NAND 252 would be inhibited by the "0" signal on lead 259 for "car at lobby or below" signal. Lead 276 derives its "1" signal from NOR 277 in response to a coincidence of a "0" indicative of no "car at lobby or above" signal on lead 278 for the car below the lobby and a "0" on lead 265 indicative of no memory on the car. When NAND 253 is gated, it sets flip flop 279 by the "0" on lead 280 gating NAND 281. NAND 281 issues a "1" to lead 282 and NOR 283 to impose a "0" on lead 258 indicating to the

car control (not shown) a "memory above car" signal and setting the car to travel upward. This signal can also be produced by a true memory above the car resulting from a manually registered call which imposes a "0" on lead 263 (from means not shown) to inverter 284 and thence apply a "1" to input 285 for NOR 283.

When the up running car reaches the lobby, it inverts the "car at lobby or above" signal on lead 278 from a "0" to a "1" to gate NOR 277 thereby inhibiting NAND 253 and resetting flip flop 279 so that the memory above car signal at 258 is cancelled.

"Car at the lobby" signals, as employed in other portions of the system, are developed at lead 286 as a "1" when both of the signals "car at lobby or below" at 259 and "car at lobby or above" at 278 are present as a "1" to gate NAND 287. The resultant "0" is inverted to a "1" on lead 286 by inverter 288.

DESCRIPTION OF FIG. 4

Cars returned to the lobby during lobby recall operation stand at the floor with their doors closed until the car currently in queue status is released from that status. When the vacancy in queue status occurs, a car at the lobby, set for up travel, and in a free car status is admitted to queue status. It opens its doors, lights its up hall lantern and stands available for entry of passengers. It remains in that condition until a car call is registered in it or the allotter allots a hall call to it. As pointed out in U.S. Pat. No. 3,474,885, a bias is imposed against allotment of hall calls to queue cars unless the remaining available cars are subject to greater than a predetermined service assignment.

Under lobby recall operation, the allotment of hall calls, both to queue cars and to cars available for regular group service can be curtailed. This curtailment, termed "interfloor traffic control," can exclude allotment of all hall calls as demands to the cars by issuing a signal for each car to the allotter that the car cannot answer the call sought to be allotted.

A tempering of curtailed service to hall calls can also be provided on lobby recall operation by preventing hall call allotments to a given number of cars departing from the lobby and then permitting the next car departing from the lobby to receive allotments if any hall calls are registered. For example, every fifth car departing the lobby can be permitted to receive allotment. The intervening four departing cars can be conditioned to maintain a "car cannot answer the call" signal. This operation is termed "metered interfloor traffic."

Metered interfloor traffic can be limited so that only a predetermined number of cars are able to receive allotments at any time the system is on interfloor traffic control. This is accomplished by counting the number of cars on metered interfloor traffic operation and inhibiting the admission of additional cars to that operation when the count reaches a predetermined level. It is to be appreciated that a car on metered interfloor traffic operation retains that status until it returns to the lobby either in response to a manually registered call or a lobby recall while it was free of other calls. It can be reversed any number of times while away from the lobby and therefore could remain on metered interfloor traffic for a substantial interval of time if hall calls were registered requiring its service. It is this type of service requirement which can accumulate cars on metered interfloor traffic operation and which is restricted by the counter inhibiting functions.

Consideration will first be given to the interfloor traffic control wherein no car is permitted to receive manually registered hall call allotments while lobby recall operation is effective. Closure of switch 28 corresponds to that switch in FIG. 1 offers this type control. This control is isolated from the adjuncts of metered interfloor traffic and count of cars serving interfloor traffic by opening switches 30, 35 and 35A generally corresponding to similarly numbered switches in FIG. 1.

A lobby recall signal from lead 229 of FIG. 2 is applied to the interfloor traffic controls of FIG. 4 at a "1" signal on input 291 it is inverted at 292 to a "0" with the initial negative going pulse passed by capacitance 293 to inverter 294 which issues a "1" momentarily on lead 295. The pulse "1" on lead 295 is to initially set all cars to a state in which they can accept no call allotments. For car A, the set pulse gates NOR 296 to set flip flop 297 by the "0" on lead 298 to NAND 299. Flip flop 297 is latched by the "1" signal on lead 305 to gate NAND 306 and maintain a "0" on lead 307 until a reset pulse is applied as a "1" on lead 308. The "1" on 305 gates NAND 309 assuming that NOR 310 is not gated and a "1" is therefore present on lead 311. NAND 309 therefore issues a "0" on lead 312 signifying "car A cannot answer the call" to the allotter. Each of cars B through H are similarly provided with a "car cannot answer the call" signal at leads 313 through 319 respectively.

When the lobby recall operation is terminated a "0" signal is imposed on input lead 291 to lead 320 to gate NAND 321. NAND 321 issues a "1" to NOR 310 which issues a "0" to leads 311 whereby each of the NANDs to leads 312 through 319 are inhibited to remove the "car cannot answer the call" signals for all cars.

While lobby recall operation is in effect, the returned cars are made available to passengers at the lobby through the lobby queue controls. This entails operation of the allotter to allot a lobby queue call to a free car. The allotter serializes call allotments and thus during a queue call allotment, will allot only that call to one car. Accordingly, the "car cannot answer the call" signals can be inhibited for all cars during a queue call allotment, be it lobby or other queue floor, and only one car will be given the allotment. Each queue floor of the system has an input to the interfloor traffic control for a "queue call being allotted" signal. Two such inputs are shown in FIG. 4 with lead 322 receiving an "0" signal when a lobby queue call is being allotted and lead 323 receiving such a signal for allotment of a second queue call. Any such signal gates NAND 321 in the same manner as would occur with removal of the "lobby recall" signal. NAND 321 gates NOR 310 to place an inhibiting "0" on lead 311 to all of the NANDs from which the individual "car cannot answer the call" signals for the several cars are derived. Thus, during allotment of the queue call, all cars are available to the allotter and it allots the queue call to that most advantageously conditioned. In the normal functioning of the allotter, this means a free car at the lobby would be the best situated and receive the allotment in preference to a free car elsewhere while a car serving commands would have the lowest priority for assignment.

In systems where the recall floor has one or more floors beyond it in a direction opposite the primary service therefrom, as basement below a lobby in the lower floors of a building or a floor above an auditorium at

one of the upper floors, the extension floor service can be allotted on a limited basis. For example, a periodic permissive allotment of manually registered basement calls (by means not shown) can impose a "basement call being allotted" signal as a "0" on lead 324 and inverter 325 can gate NOR 310 with a "1" to place an inhibiting "0" on lead 311 and permit the basement call allotment then being processed in the allotter by eliminating for all cars the "car cannot answer the call" signal at leads 312 through 319.

A next phase of lobby recall with limited interfloor traffic is to permit every Nth car to leave the lobby to receive allotments until it returns to the lobby. This is accomplished with switches 30 and 35 closed. Switch 35 passes the lobby recall signal on lead 326 to terminate the gating of NAND 327 which prevails during an absence of a lobby recall signal. NAND 327, when gated, maintains a reset signal "1" on lead 328 to car lobby departure counter 329 since it applies to "1" to inverter 330 which holds a "0" on the NAND 331. In discussing this phase of lobby recall operation, NAND 327 will be considered to be unaffected by lead 326 since the lobby recall signal will be assumed.

The lobby recall signal "1" passed by switch 30 enables NAND 335 so that count signals "0" can be gated to car lobby departure counter 329. A car's presence at the lobby imposes a "1" on its "car at lobby" input as at 336 through 343 for cars A through H. This gates NOR 296, in the case of car A, and NORs 344 through 350, in the case of cars B through H, to issue a "0" on lead 298 and set flip flop 297 so that NAND 309 issues a "car A cannot answer the call" "0" signal at 312 and so that similar circuits for cars B through H establish signals "car cannot answer the call" when the respective cars arrive at the lobby. When each car departs the lobby, its signal at its "car at lobby" input shifts from a "1" to a "0." This transient signal actuates the car departure counter 329 and in the case of the Nth departing car resets its flip flop which holds its NAND gated to issue its "car cannot answer the call" signal at 312 to 319.

The transient signal for car A is passed on lead 351 through capacitance 352, providing the pulse signal coupling for the "0," to leads 353 and 354. A bias is maintained on lead 353 by source VCC and voltage divider R7 and R4 to bias lead 355, in the example at a positive 2.5 volts d.c., so that the resistance 356 and parallel diode 357 restrict the logic response to the "0" signal transition from "1" to "0" and prevent response to the signal transition from "0" to "1" when a car arrives at the lobby.

The "0" on lead 354 gates NAND 358 thereby imposing through lead 359 a gating signal to NAND 335 and a counting signal as a "0" to count input 360 of a car departure counter 329. Each car has a similar lobby departure signal circuit which is applicable to NAND 358 and will cause counter 329 to receive a count impulse on lead 360 when the respective car departs from the lobby.

The transient "0" signal for a car departure on lead 353 also can reset flip flop 297 since it is inverted to a "1" by inverter 361 and applied to NAND 362 which when gated issues a flip flop resetting "0" on lead 308. With the reset of flip flop 297, the car loses its "car A cannot answer the call" "0" signal to the hall call allotter until it returns to the lobby and again gates NOR 296. Therefore, until the car returns it can receive al-

lotment of hall calls. NAND 362 and corresponding NANDs 363 through 369 for resetting "car cannot answer call" flip flops 370 through 376 respectively for cars B through H are enabled by a "1" on lead 377 derived by gating NAND 378 when the Nth car departs from the lobby.

Counter 329 is a three bit binary counter with outputs for a one, two and four count at 385, 386 and 387, each signified by a logical "1" signal. Each output can be selectively connected by a switch 388, 389 and 390 to NAND 391. The circuit is shown for $N = 5$, that is to permit hall call allotment to every fifth car leaving the lobby, as established by closure of switches 388 and 390 to the one and four outputs 385 and 387. Switch 389 is coupled to a positive source at terminal 392 to maintain an enabling "1" on NAND 391. When the counter counts the fifth departure NAND 391 has a coincidence of "1" inputs and issues a "0" to lead 393 and NOR 378. With interfloor serving car counter 394 ineffective, switch 35A is open, input lead 395 to NOR 378 applies an enabling "0" so that the signal "0" on 393 gates NOR 378 to issue a "1" on lead 377 and enable all NANDs 362 to 369. The car causing this count will at this time have applied a gating pulse to the other input of its enabled NAND of the group 362 to 369 and therefor will reset its "car cannot answer the call" flip flop.

Reset of the "car cannot answer the call flip flop" resets car lobby departure counter 329 by gating NAND 331 to issue a resetting "1" on lead 328 to the reset input of counter 329. For car A, for example, as the flip flop 297 is reset by counter 329 attaining the predetermined count the signal on its output lead 305 shifts from a logical "1" to a "0." The transient signal is pulse coupled by capacitance 396 to lead 397 and thence to NAND 331 to apply a "0" gating that NAND. Each of the other cars has a similar input to NAND 331 for resetting counter 329. Thus counter 329 is reset each time the metering system releases a car departing from the lobby for allotment of hall calls. The next four departing cars will therefore be blocked from allotments and the fifth car will be permitted to receive allotments.

A further phase of lobby recall operation with limited interfloor traffic is applicable to the metering control to place a limit on the number of cars permitted to receive allotments at any one time. Counter 394 counts such cars and maintains the NOR gate 378 inhibited when the predetermined limit of such cars is present. The count of cars which have their "car cannot answer the call" signals inhibits is accomplished by scanning those cars with control by clocking signals from the master ring counter at ten kilocycles per second. Thus, an eight car system is scanned every millisecond with eight pulses for scanning and the final two employed for sequencing the counter and is associated elements.

Clocking pulses as logical "1" signals are applied by "read" lead 398 to the input of a four bit binary counter 399 suitably internally connected to produce a binary count of zero through nine and then recycle. This count is decoded by binary to decimal decoder 400 which issues "0" signals sequentially on its output leads. When car A is interrogated as to its allotment status a "0" is imposed on lead 401 to gate NOR 411 if it is enabled by the "0" on lead 305 indicative of the reset state of flip flop 297 and the inhibited state of NAND 309 to establish no "car A cannot answer the call" to the allotter and thus permit the allotter to allot

calls to car A. If, on the other hand, car A is inhibited from allotment by the set flip flop 297 the "1" on lead 305 inhibits NOR 411.

If NOR 411 or its counterparts 412 through 418 for cars B through H are gated, NAND 419 is gated to issue a "1" signal to lead 420 during the interrogation interval of the individual car. Coincidence of this gated signal on 420 with the clock pulse from read lead 398 to lead 421 and the now closed switch 35A to NAND 422 gates a "0" count pulse to counter 394. Such a pulse results when NOR 411 applies a "1" to NOR 423 which gates a "0" to lead 424 and then NAND 419.

Counter 394 is selectively connected to a desired limit of cars simultaneously available for hall call allotments in the manner the critical count of counter 329 is set. Assume a limit of two cars will be permitted to be available for hall call allotments. This is set by closing the switch 425 in the two count lead from counter 394 to NAND 426 while the one and four leads to NAND 426 are connected to a positive bias source. When a count of two is reached, NAND 426 is gated to lead 427 to set flip flop 428 to issue an inhibiting "1" on lead 429 to NOR 430 and a set signal on lead 431 to flip flop 432. NOR 430, when inhibited issues a "0" to reset lead 433 of flip flop 432 gating NOR 434 to issue a "1" on lead 395 and thereby inhibit NOR 378. With NOR 378 inhibited all of NANDs 362 through 369 are inhibited and reset of additional "car cannot answer the call" flip flops 297 and 370 through 376 is inhibited so that all other cars maintain their "car cannot answer the call" signal at 312 through 319.

As in the case of counter 191 the count of counter 394 is reset at the end of each scan of the cars A through H, but only following an attempt to gate NOR 430 and reset flip flop 432. Thus, the interrogation of counter 329 is permitted by gating NOR 378 only after a count of cars available for allotting is below the limit for one preceding scan. The interrogation reset is made by the ninth signal from decoder 400 (the signal following completion of the scan of cars) in response to a "0" on lead 435. This signal will gate NOR 430 to issue a reset "1" on lead 433 to flip flop 432 provided a "0" is present on lead 429 to indicate the car count is below the present limit.

The tenth count from the decoder 400, a "0" on lead 436 resets counter 394 by causing inverter 437 to issue a "1" to reset input 438 of the counter. It also resets flip flop 428 by applying its "0" to an input of NAND 439 whereby it gates a "1" to NOR 440. Since reset of counter 394 inhibited NAND 426 to issue a "1" to the other input of NAND 440, NAND 440 issues a "0" at this time to NOR 430 with no effect at this time. If, however, on the next cycle of decoder 400 the critical count to gate NAND 426 and set flip flop 428 is not achieved in counter 394, the "0" at count nine from decoder 400 gates NOR 430 to issue a reset signal on lead 433 to flip flop 432. The "1" on 433 and "0" on 431 produces an inhibiting "1" on 395 to NOR 378 so that the inhibit for metered interfloor traffic is removed by the presence of "0" on lead 377. The car departure counter is thereafter effective so that the Nth car to leave the lobby will have its "car cannot answer the call" signal inhibited and will be available for allotment of hall calls.

Metering of the cars to basement or other extension floors in a direction opposite that of the primary traffic from the recall floor can be arranged in a manner simi-

lar to that of the above system in conjunction with the signal "basement call being allotted" at 324. In such a system, the counter corresponding to car departure counter 329 might be set at a higher limit as every 20 car departure (using a counter having 5 binary bits) and only one car permitted to enter extension floor service. In the latter case, the counter corresponding to counter 394 would be set to one or a direct inhibit could be set up from the admission of the car to extension service.

From the above, it is evident that a number of variations and extensions of the system disclosed can be made as to the means of establishing recall operation, and the functions performed while on the recall operation. This control for ascertaining the total number of service functions for a plurality of cars, can be applied to elevator systems other than those described in U.S. Pat. No. 3,443,668 as can part or all of the service operations introduced as a result to the count of service function. Thus, in a peak traffic condition, many forms of elevator controls can be improved by curtailing the response of the cars to all or certain hall calls. The curtailment can be metered where every Nth car departing from the recall floor is permitted to respond to hall calls. Limits on the number of cars metered to respond to hall calls provide advantages in operation. The techniques and apparatus for achieving the recall operations can differ from that disclosed. The operations can be performed by electromagnetic switches and relay type logic although at much slower speeds. Accordingly, it is to be understood that the above disclosure is to be read as illustrative of the invention and not in a limiting sense.

I claim:

1. An elevator control comprising a plurality of cars serving a plurality of floors wherein each car has a plurality of car call means for registering calls for floor stops desired by passengers therein comprising first means for scanning a plurality of said cars individually for interrogation; second means for scanning each car call means for each of a plurality of said cars during the interval said first scanning means is interrogating said car; and count means for accumulating a count of registered car calls for a plurality of said cars from said second means for scanning each car call means.

2. An elevator control according to claim 1 including means rendering said count of car calls effective only for cars having a predetermined service condition.

3. An elevator control according to claim 2 wherein said service condition is the setting of said cars for travel upward.

4. An elevator control according to claim 1 including a master clocking means issuing clocking signals first sequencing controls for said first scanning means responsive to said master clocking means to advance from one car to another car in response to a predetermined clocking signal; second sequencing controls for said second scanning means responsive to said master clocking means intermediate advances by said first sequencing control to advance from one car call means to another car call means for a given car in response to said clocking signals; and means responsive to a coincidence of said clocking signal means with a car call means for a registered call to actuate said count means.

5. An elevator control according to claim 1 comprising means responsive to a given count by said count means to alter operation of the elevator cars.

6. An elevator control according to claim 5 including means for latching a signal to alter operation of the elevator cars in response to said given count.

7. An elevator control according to claim 5 including means responsive to a second given count less than said first mentioned given count to maintain the altered operation of the elevator cars.

8. An elevator control according to claim 6 including means responsive to a second given count less than said first mentioned given count to sustain said latching means; means responsive at a first scan position near the end of a scan of said plurality of cars by said first scanning means with less than said given count for enabling the reset of said latching means; and means responsive at a second scan position subsequent to said first scan position at the end of a scan of said plurality of cars by said first scanning means and coincident with the enabling of the reset of said latching means for resetting said latching means.

9. In an elevator system having a plurality of cars, means for counting service functions for said plurality of cars which can occur a multiplicity of times for each car comprising first means for sequentially interrogating a car to detect said service functions for said car; second means for sequentially enabling said interrogating means for each of a plurality of said cars; and a service function counter to accumulate a count of said detected service functions for a plurality of cars during the interrogation of said plurality of cars.

10. In an elevator system according to claim 9 a ring counter having a number of activatable states in its cycle at least equal to the number of service functions per car to be counted; said first means having a plurality of elements each transferable between a first and a second condition in response to respective ones of said service functions and a means for reading the state of each element responsive to the activation of a corresponding state of said ring counter; said second means having a gating means for each car for coupling said reading means of each car to said service function counter; and means to individually enable said gating means in response to a scanning sequence of said ring counter.

11. In an elevator system according to claim 10, a third counter to count a predetermined number of the scan cycles of said ring counter at least equal to the number of cars in said plurality and means to reset said service function counter in response to said third counter counting said predetermined number of scan cycles.

12. In an elevator system according to claim 9 a latch means responsive to a predetermined number of service function counts from said service function counter; and means to reset said latch means in response to a predetermined condition in said elevator system.

13. In an elevator system according to claim 12 including a second latch means responsive to a second predetermined number of service function counts from said service function counter which is less than said first mentioned predetermined number of counts; reset means for said second latch means responsive to a predetermined condition in said elevator system; and wherein said first mentioned reset means is enabled by the reset of said second latch means.

14. In an elevator system according to claim 13 a ring counter having a number of activatable states in its

cycle at least equal to the number of service functions per car to be counted; means for each car responsive to the activation of a service function and corresponding state of said ring counter to issue a count to said service function counter; wherein said predetermined condition to reset said second latch means is the activation of a first predetermined state in said ring counter and a service function count less than said predetermined number; and wherein said first mentioned reset means is actuated by said ring counter subsequent to the reset of said second latch means.

15. An elevator system having a plurality of floors including a given floor subjected to intense entering traffic comprising means to register calls for floors; means to assign individual calls to individual cars while said cars are spaced from the floors of said calls; means to park each car at any of a plurality of floors when no calls for service are imposed thereon; means selectively operable to inhibit the assignment of calls by said assigning means to a plurality of cars; means conditioning a car to load passengers at said given floor; means for registering a call for said given floor automatically in response to absence of a car conditioned to load passengers at said floor; and means responsive when said assigning means processes said automatically registered call for enabling said inhibited assigning means to assign said call to a car.

16. An elevator system having a plurality of floors including a given floor subjected to intense entering traffic comprising means to register calls for floors; means to assign individual calls to individual cars while said cars are spaced from the floors of said calls; means to park each car at any of a plurality of floors when no calls for service are imposed thereon; means selectively operable to inhibit the assignment of calls by said assigning means to a plurality of cars; means to count the departure of cars from said given floor; and means responsive to each successive departure of a predetermined number of cars from said given floor to enable the next car departing therefrom to accept assignment of an individual call from said assigning means.

17. A system according to claim 16 wherein said assignment enabling means is maintained effective for said enabled car until said car is returned to said given floor.

18. A system according to claim 17 including means limiting the number of cars enabled to receive assignment of calls at any given instant of time to a number less than all cars in the system.

19. An elevator system having a plurality of cars serving a plurality of floors including a given floor subjected to intense entering traffic comprising means to register calls for floors, assignment means for assigning individual registered calls to individual cars while said cars are spaced from the floors of said calls; and means selectively operable to inhibit assignment of calls by said assigning means to a plurality of said cars throughout a trip from and return to said given floor.

20. A system according to claim 19 including means responsive to a predetermined traffic condition indicative of a given level of traffic seeking service from said given floor; and wherein said selectively operable means is operated in response to said predetermined traffic condition.

21. A system according to claim 19 including means conditioning a car to load passengers at said given floor; means for registering a call for said given floor

automatically in response to absence of a car conditioned to load passengers at said floor; means responsive when said assigning means processes said automatically registered call for disabling said assignment inhibiting means whereby said assigning means is enabled to assign said call to a car.

22. A system according to claim 19 including means to count the departure of cars from said given floor; and means responsive to each successive departure of a predetermined number of cars from said given floor to enable the next car departing therefrom to accept assignment of an individual call from said assigning means.

23. A system according to claim 22 wherein said assignment enabling means is maintained effective for said enabled car until said car is returned to said given floor.

24. A system according to claim 23 including means limiting the number of cars enabled to receive assignment of calls at any given instant of time to a number less than all cars in the system.

25. An elevator system having a plurality of cars serving a plurality of floors including a given floor, comprising means to register calls for floors, said calls being answerable by each of a plurality of said cars; means selectively operable to inhibit the response of cars to said registered calls; means responsive to each successive departure of a predetermined number of cars from said given floor to enable the next car departing therefrom to respond to said registered calls.

26. A system according to claim 25 wherein said predetermined number of cars is greater than one.

27. A system according to claim 25 wherein said enabling means is effective for said next car departing from said given floor until said car returns to said given floor.

28. A system according to claim 25 including means limiting the number of cars enabled to respond to said registered calls at any given instant of time to a number less than all cars in the system.

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