Oct. 11, 1932. S. OLSON 1,881,898

RESTAURANT SERVICE CONVEYER SYSTEM

Filed Feb. 19, 1931 3 Sheets-Sheet 1

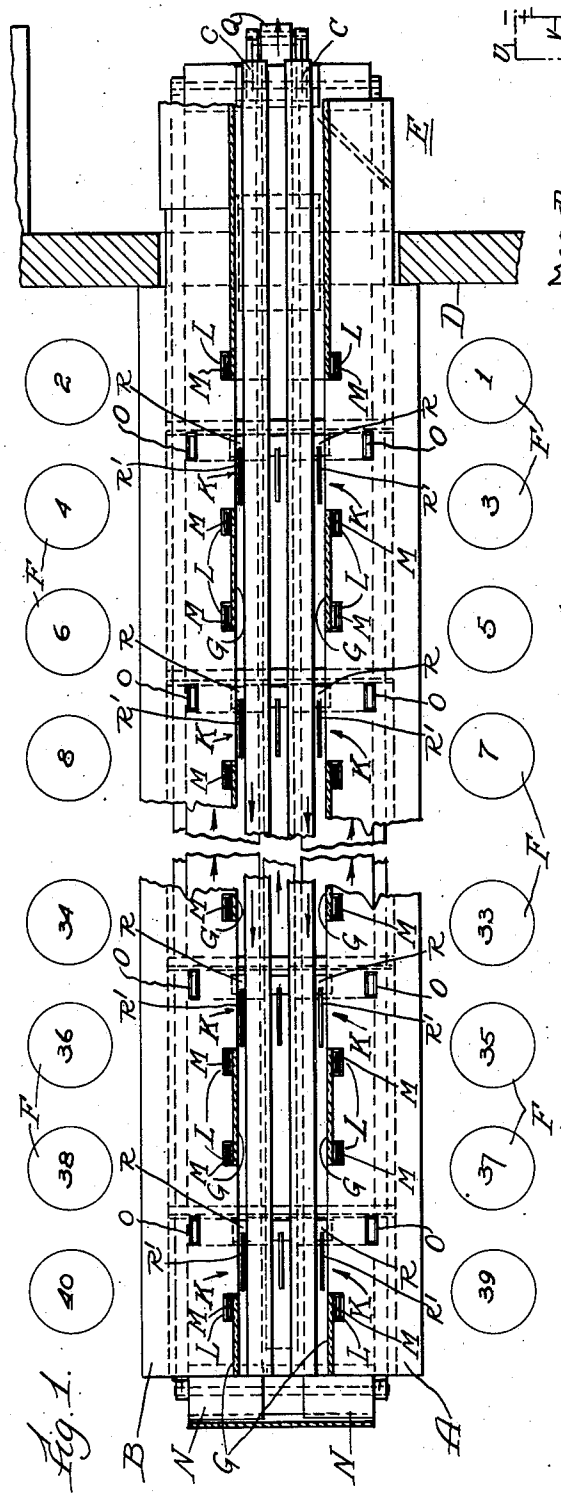


Fig. 1.

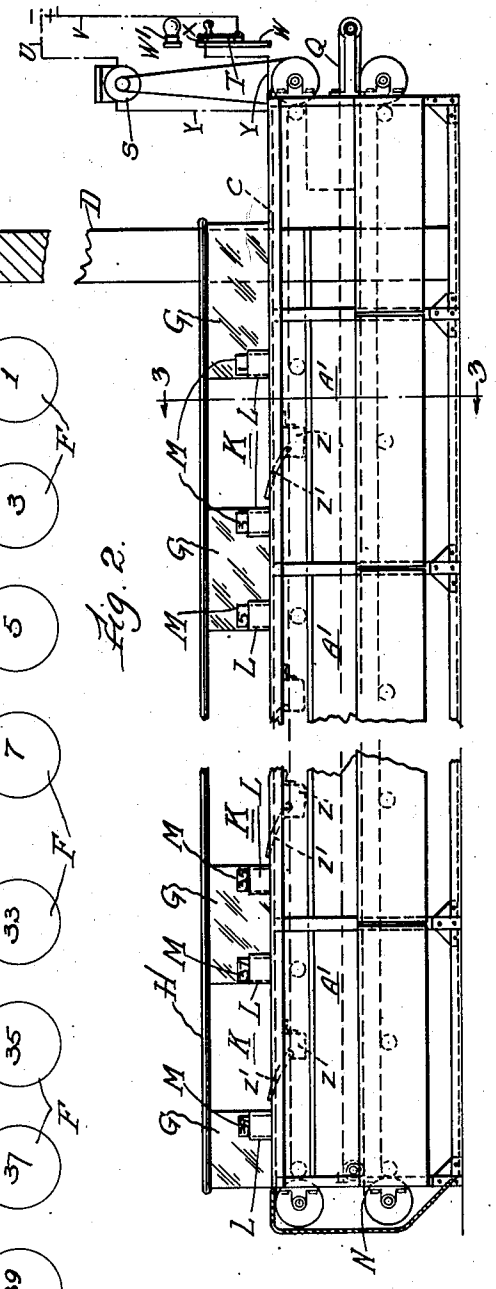


Fig. 2.

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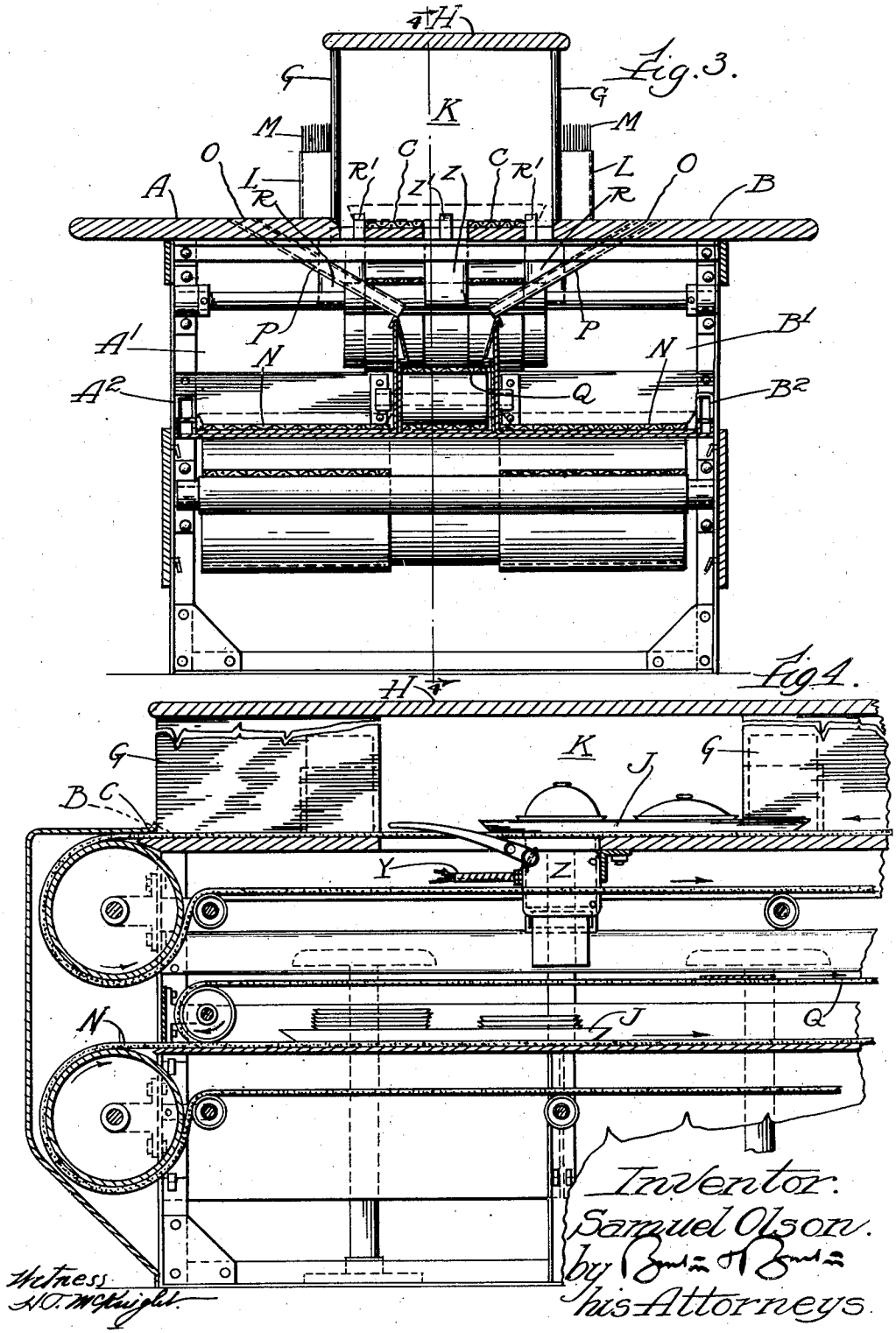


Fig. 3.

Fig 4.

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RESTAURANT SERVICE CONVEYER SYSTEM

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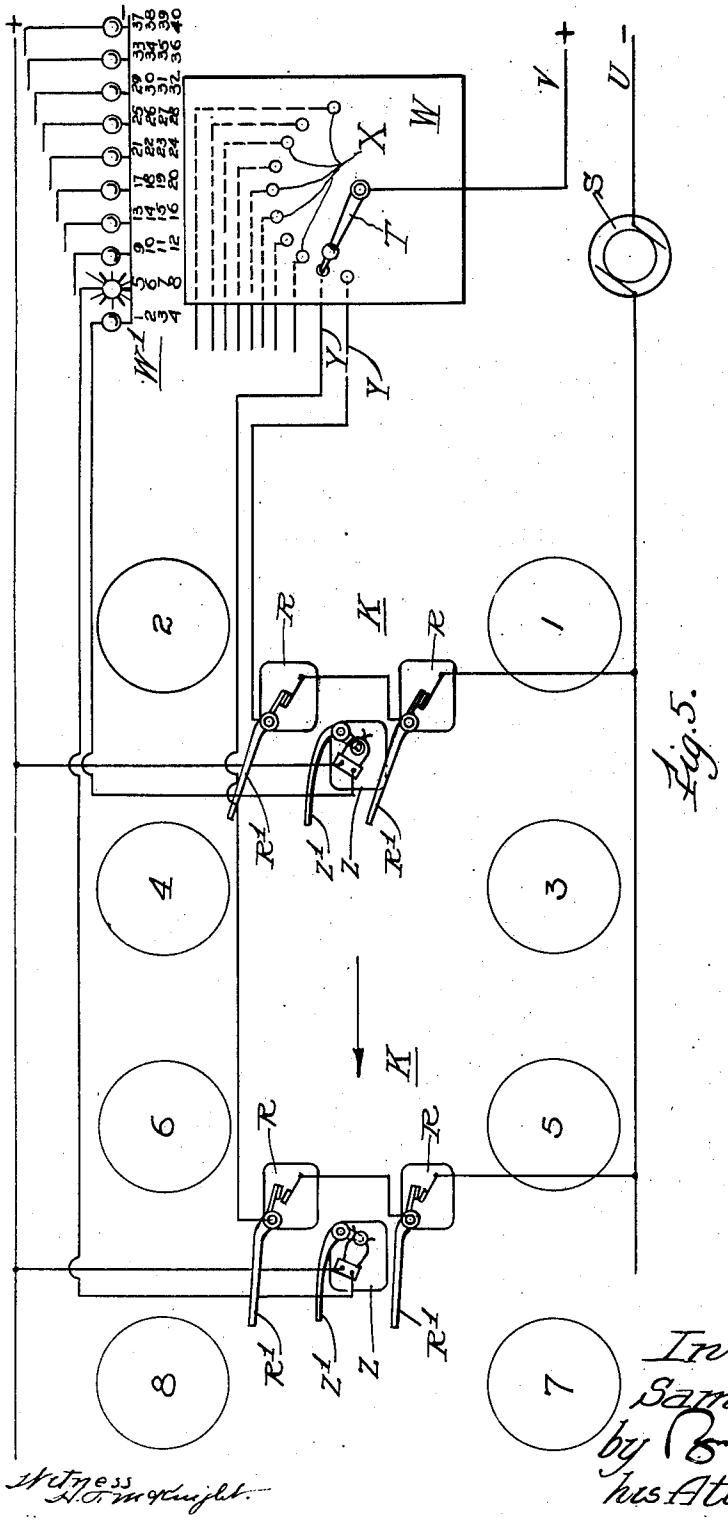


Fig. 5.

Witness
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Patented Oct. 11, 1932 1,881,898

UNITED STATES PATENT OFFICE

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RESTAURANT SERVICE CONVEYER SYSTEM

Application filed February 19, 1931. Serial No. 516,854.

This invention relates to automatic conveyer mechanism especially designed for use in restaurant service with a view to replacing, so far as possible, the employment of waiters in the dining room service. It consists of certain features and elements in combination as herein shown and described, and as indicated by the claims.

In the drawings:

Figure 1 is a top plan view partly broken away, showing the arrangement of counters and seats and the conveyer mechanism cooperating therewith in accordance with this invention.

Figure 2 is a side elevation of the structure illustrated in Figure 1.

Figure 3 is a transverse section on an enlarged scale taken through the service counter, as indicated at line 3—3 on Figure 2, and showing the relation of the various conveyers thereto.

Figure 4 is a vertical longitudinal section taken for convenience at the outer end of the counter, that is, the end which extends into the dining room, section being taken substantially as indicated at line 4—4 on Figure 3.

Figure 5 is a wiring diagram indicating the connections from the control board to the automatic limit switches arranged for operation by trays traveling on the delivery conveyer.

With a view to eliminating the necessity for the personal service of waiters in the dining room I have designed a restaurant serving counter equipped with power-driven conveyers so arranged that the customer on sitting down at the counter may take an order blank from a supply conveniently placed at the counter, and after writing his order may drop the blank into a slot or chute leading to a conveyer belt which carries the order to the kitchen; the various articles of food are assembled on a tray in the kitchen and the tray is placed on a conveyer running substantially at the level of the counter adjacent thereto. Then by means of automatic switch devices I have arranged that the conveyer may be caused to stop when the tray arrives opposite the customer who has given the particular order in question, whereupon the customer may remove the tray from the conveyer, leaving the latter free for the delivery of other orders in like manner. Various arrangements and modifications of mechanism for accomplishing this result may be made within the scope of my invention, but for the purpose of illustrating the same I have shown a specific embodiment which will now be described.

As shown in Figure 1, the counter consists of two parallel service areas, A and B, between which is mounted a belt conveyer consisting of two belts, C, C, disposed substantially at the level of the counters, A and B, and extending between them and thence through an opening in the partition, D, to the kitchen space, E. The several seats for accommodation of customers are indicated by circles, F, and for convenience in identifying the customers' orders each seat will have an individual number; in the example of Figure 1 these numbers are shown as running from 1 to 40. Preferably, the space occupied by the belts, C, C, is housed or enclosed by lateral walls, G, which may be of glass, and a roof or cover, H, which may be utilized as a shelf for displaying foods, if desired. The dishes and food are carried on trays such as those shown at J in Figure 4, and for delivery of the trays to the service areas, A and B, the side walls, G, of the housing are provided with openings, K, at intervals, each opening corresponding to two seats. Preferably, the openings in opposite side walls are arranged in registration, as shown, so that each pair of such registering openings constitutes a station at which a tray may be stopped for delivery to any one of four customers occupying the adjacent four seats, two at each side of the counter. In the example illustrated the first station will serve seats numbers 1, 3, 2 and 4.

Opposite each of the individual seats, F, there is provided on the counter, preferably against the wall, G, a pocket, L, designed to hold a number of order blanks or tickets, M, and the tickets, M, and the tickets opposite each seat will bear the identifying number of the seat. For each of the stations, K, the

counter contains a receiving slot, O, which leads to a chute, P, directed for discharge over a narrow belt conveyer, Q, which runs the length of the counter and back into the kitchen space, E, at a level somewhat below that of the tray-carrying belts, C, C. The customer takes from the pocket, L, one of the tickets, M, and by means of check marks or complete written instructions indicates his order thereon. He then drops the ticket, M, into the slot, O, and upon its arrival on the belt, Q, it is conveyed into the kitchen, E, and delivered from the end of the belt, Q, into any convenient receptacle, not shown. An attendant at this point may take the order ticket and proceed to collect the items, or may give suitable instructions for assembly of such items on a tray, J, and as soon as it is ready the tray is placed upon the belts, C, C, traveling away from the kitchen space, E, into the dining room space.

At each station, K, there are positioned a pair of "limit" switches, R, which are connected in series in the power circuit of the motor, S, which comprises the belts, C, C. As indicated in the wiring diagram the motor, S, may be connected directly to one of the lead wires, U, while the other wire, V, runs to a movable switch arm, T, on a control board, W, which is fitted with a plurality of terminal contacts, X, each corresponding to one of the stations, K, and from each of which a wire, Y, runs to one of the limit switches, R, at the station. The switches are normally closed with their operating arms, R^1, extending slightly above the plane of the belts, C, C, so that a tray traveling on the belts will depress said arms as it registers over them. The switch arm, T, can make contact with only one of the terminals, X, at any one time, thus including in the motor circuit only one pair of limit switches, R, R, corresponding to one of the stations, K; hence, the depression of the arms, R^1, will have no effect on the motor except when the tray registers at the station whose switches, R, R, have been included in the motor circuit by the setting of the switch arm, T. As soon as the loaded tray is ready, therefore, and is placed upon the belts, C, C, in the kitchen, E, the control switch arm, T, is set in contact with the proper terminal, X, and upon arrival of the tray at the corresponding station its depression of the arms, R^1, R^1, or either of them, will open the motor circuit and stop the movement of the belts, C, C. Preferably, the order ticket corresponding to the contents of the tray will be placed on the tray, perhaps in a vertical position, so that it can be easily read and the seat number thereon noted upon arrival of the tray at the station, thus indicating for which of the four customers served by that station the order is intended. The tray is then slid off horizontally from the belts, C, C, onto the counter area, A or B, thus releasing the switch arms, R^1, R^1, and restoring the motor circuit, so that the belts can again be operated by the motor, S. By providing the two limit switches, R, R, at each station I make it necessary for the tray to be completely withdrawn from the space between the counters, A and B, before the motor, S, can be started, because, as already noted, the opening of either of the switches, R, breaks the circuit. This tends to avoid collisions or other accidents which might result before complete removal of the tray.

Usually it will be desirable to have an attendant, who may be termed a "dispatcher", definitely assigned to the work of setting the control switch arm, T, for initiating the movement of trays and determining their destinations respectively; and for indicating the arrival of each tray, so that the dispatcher may know how soon the next tray may be launched, I provide a series of signal lamps shown associated with the control board, W, at W^1, and connecting each of said lamps with the limit switch, Z, whose actuating arm, Z^1, projects upwardly between the belts, C, C, for actuation simultaneously with the arms, R^1, R^1, of the limit switches, R, R. The depression of the arm, Z^1, instead of opening a circuit, operates as indicated in Figure 5 to close the circuit, which includes one of the signal lamps at W^1; and said lamps are appropriately marked as with the notations 1, 3, 2, 4,—corresponding to the first station, K,—5, 7, 6, 8,—corresponding to the second station, K,—and so on. Figure 5 indicates that with the position of the parts illustrated the lamp at W^1 for the second station is lighted, denoting arrival of a tray at said station. The lamp will remain lighted until the tray is removed by the customer, whereupon the release of the arm, Z^1, will open the switch, Z, and break the lamp circuit, informing the dispatcher that the line is clear for transportation of another tray. It will be obvious that instead of arranging the contacts, X, in an arc they might be distributed in straight line parallel to and directly opposite the respective signal lamps at W^1, or that the lamps themselves could be arranged in an arc concentric with that in which the contacts, X^1, are shown in Figure 5.

The return of the soiled dishes to the kitchen may be quite simply accomplished by providing a third conveyer consisting of one, or preferably two, wide belts, N, N, mounted under the counter spaces, A and B, and extending throughout the length thereof into the kitchen space, E. Openings, A^1 and B^1, in the counter-supporting structure provide access to these return belts, N, N, while guard rails, A^2 and B^2, tend to retain the trays and their contents in place thereon. After a customer is finished he can readily place his

tray with the used dishes on the return belt, N, or one or two attendants in the dining room may be employed for this purpose.

I claim:

1. In combination, a service counter including a series of stations, a power-driven conveyer mounted to travel parallel and adjacent thereto, trays adapted to ride on said conveyer, a motor for driving said conveyer and a controller for the motor adjustable for encounter and actuation by a tray carried by the conveyer for cutting off the power from the motor upon arrival of a tray at a chosen station.

2. In combination, a service counter including a series of stations, a conveyer mounted to travel parallel and adjacent thereto, trays adapted to ride on said conveyer, lateral guard walls associated with the conveyer and interrupted at each station for a space sufficient to permit removal of a tray laterally, a driving motor for the conveyer, and a switch device at each station positioned for actuation by the trays in their travel, together with a control circuit arranged for selectively placing the switch of any chosen station in circuit with the motor for stopping the latter by the arrival of a tray at such station.

3. In the combination defined in claim 1, a signal device associated with said controller, and means at each station positioned for actuation by a tray on the conveyer and connected to operate said signal device for indicating the progress of a tray along the conveyer.

4. A restaurant service system comprising in combination a service counter including a series of stations, a delivery conveyer mounted to travel parallel to the counter substantially at the plane of the counter surface, trays adapted to ride on said conveyer, control means at each station, an order conveyer operating in a direction opposite to that of the delivery conveyer and below the counter level, but accessible thereto for receiving order blanks, a dispatching station for the delivery conveyer, and to which the order conveyer delivers said blanks, and a controller at said station arranged for setting the control means at any chosen station for stopping a tray upon its arrival at such station.

5. In combination, a service counter, a delivery conveyer mounted to travel parallel thereto substantially at the level of the counter surface, trays adapted to ride on said conveyer, said counter including a series of stations, electric driving means for the conveyer, and a pair of limit switches disposed at each station adjacent the lateral margins of the conveyer, said switches being connected in series with each other, and a control board with conductors leading thereto from all of said switches, together with means for connecting any given pair of said switches in the circuit of the driving means, whereby actuation of either switch at the station by a tray on the conveyer will open said circuit and stop the conveyer until the tray is removed.

6. In the combination defined in claim 5, said conveyer comprising a pair of parallel belts spaced apart with said limit switches at each station disposed respectively adjacent the outer edges of the two belts, and a third switch at each station having an actuating member projecting upwardly between the two belts connected for operating a signal lamp associated with the control board for denoting the position of a tray on the conveyer.

7. In combination, a service counter having two parallel service areas, a delivery conveyer mounted to travel between them substantially at the plane of the counter surface, trays adapted to ride on said conveyer, a series of stations for the conveyer, a plurality of spaces for customers associated with each station at each of the two service counters, driving means for the conveyer and a controller therefor adjustable for stopping the conveyer, and a single order conveyer mounted below the delivery conveyer and arranged to operate in the opposite direction therefrom, and a pair of chutes leading to said order conveyer from the two service counters respectively at each station.

8. In combination, a service counter having two parallel service areas, a delivery conveyer mounted to travel between them substantially at the plane of the counter surface, trays adapted to ride on said conveyer, a series of stations for the conveyer, a plurality of spaces for customers associated with each station at each of the two service counters, driving means for the conveyer and a controller therefor adjustable for stopping the conveyer, and a vertical supporting structure for each of said service counters set back from the extreme outer edge thereof, and a pair of return conveyers each operating adjacent said vertical structure in a direction opposite to that of a delivery conveyer, said vertical structures including guard walls extending above the surfaces of the return conveyers but affording lateral openings through which said return conveyers may be loaded.

9. In combination, a service counter having two parallel service areas, a delivery conveyer mounted to travel between them substantially at the plane of the counter surface, trays adapted to ride on said conveyer, a series of stations for the conveyer, a plurality of spaces for customers associated with each station at each of the two service counters, driving means for the conveyer and a controller therefor adjustable for stopping the conveyer, said controller including a pair of trip members at each station located respectively at opposite margins of the delivery conveyer, the depression of either of said trip devices by the pres-

ence of a tray thereon being sufficient to arrest the conveyer if the controller is adjusted to render the given pair of trip devices effective, and the release of both trip devices by complete removal of the tray being adapted to render the conveyer operative.

10. In combination, a service counter including a series of stations, a conveyer mounted to travel parallel and adjacent thereto, trays adapted to ride on said conveyer, lateral guard walls associated with the conveyer and interrupted at each station for a space sufficient to permit removal of a tray laterally, a driving motor for the conveyer, and control means associated with each station positioned for being rendered operative by the trays in their travel, together with a control circuit arranged for selectively placing said control means of any chosen station in circuit with the motor for stopping the latter by arrival of a tray at such station.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 12th day of February, 1931.

SAMUEL OLSON.