H. S. GREENBERG.

DINING SERVICE APPARATUS.

APPLICATION FILED SEPT. 14, 1920.

1,382,354.

Patented June 21, 1921.

4 SHEETS—SHEET 1.

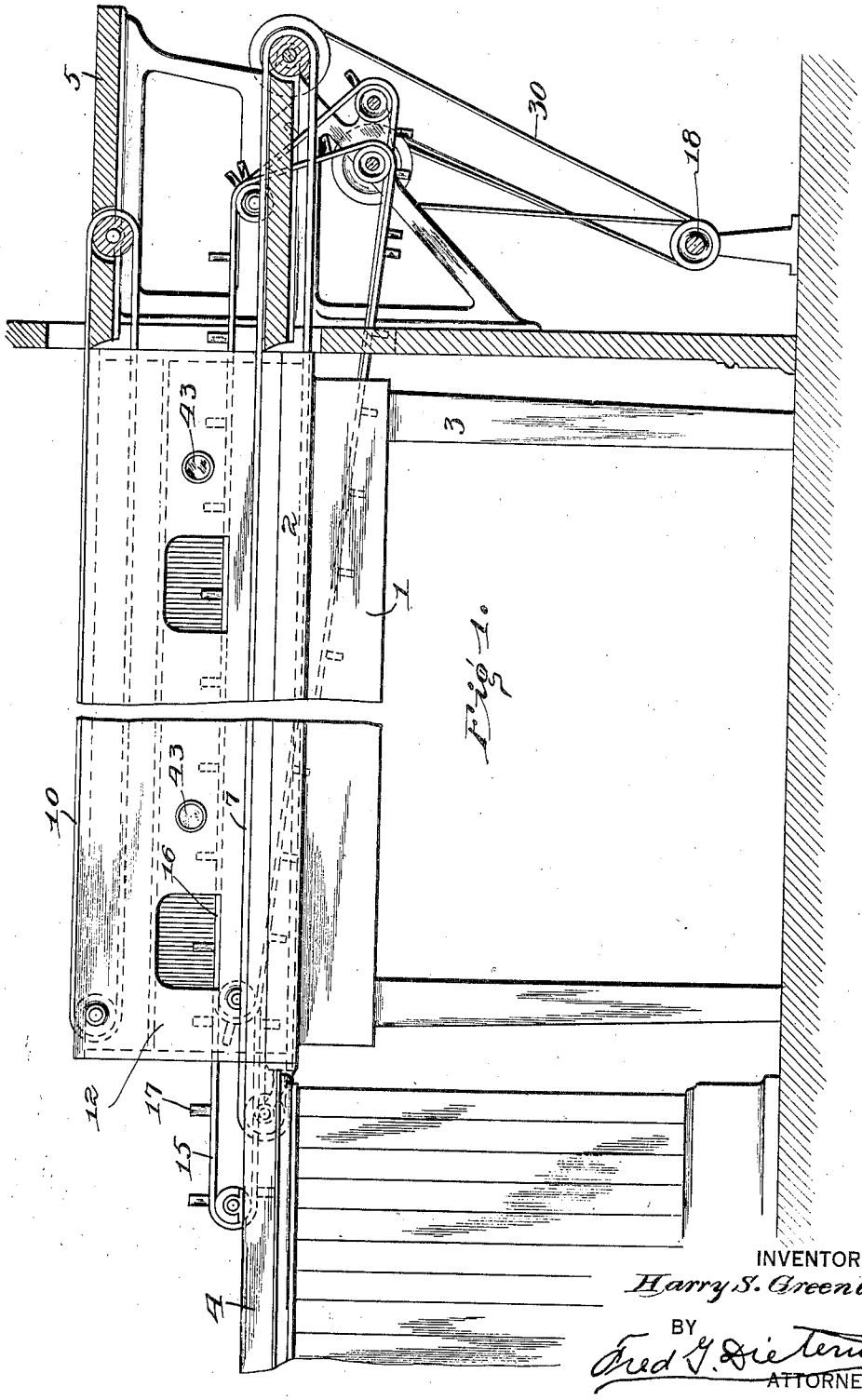


Fig. 1.

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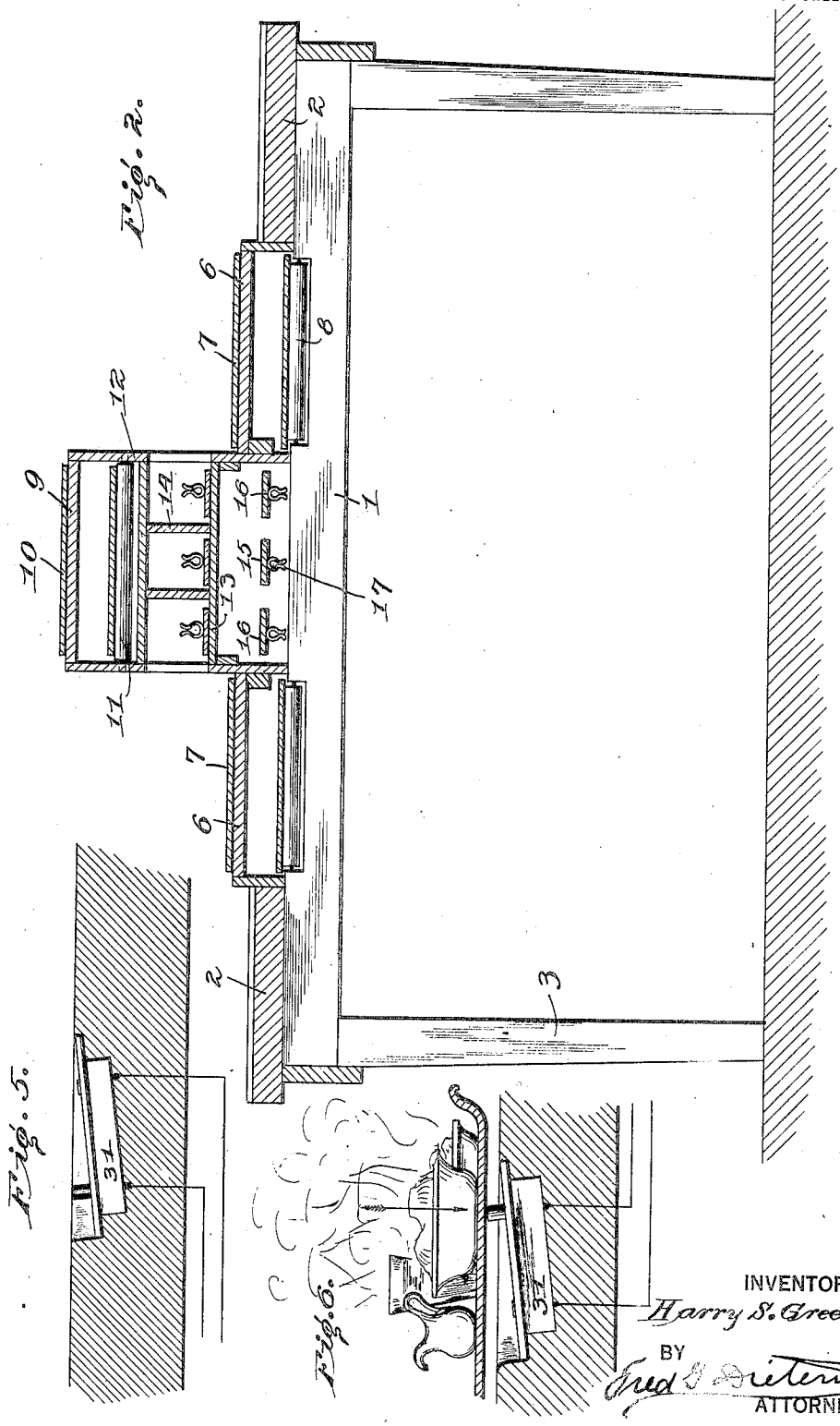
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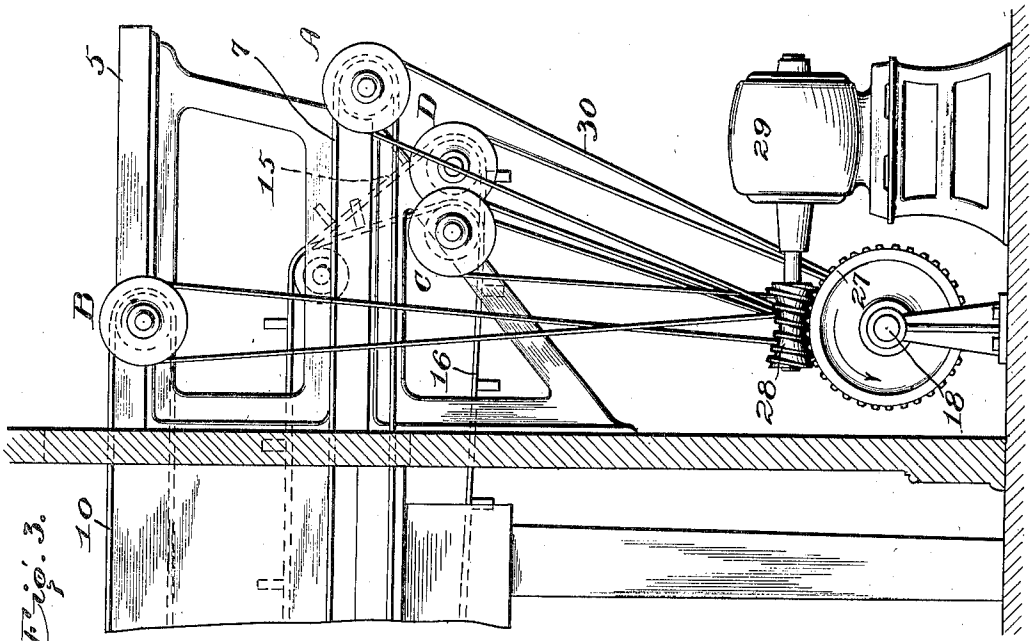


Fig. 3.

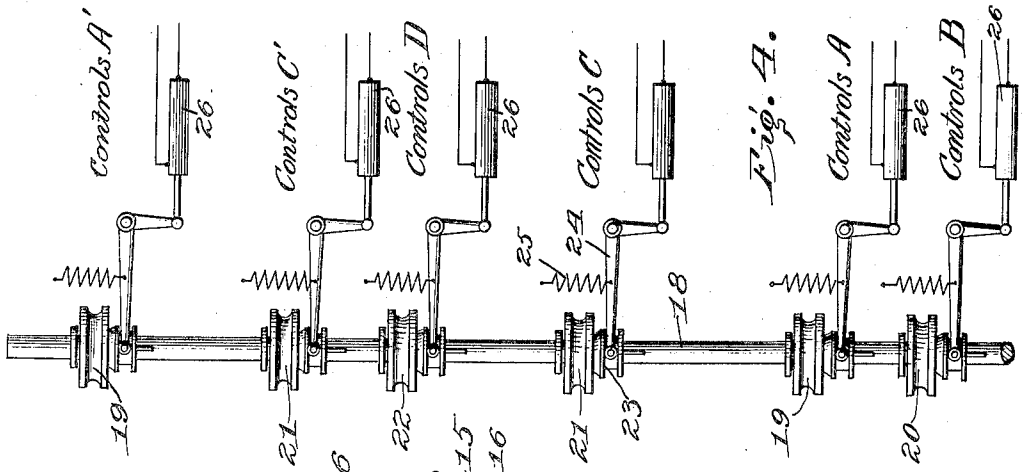


Fig. 4.

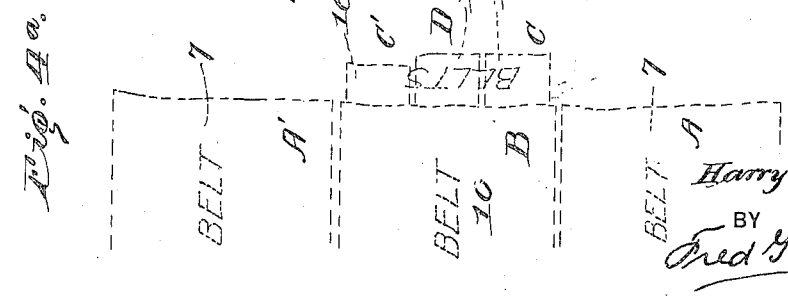


Fig. 4a.

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4 SHEETS—SHEET 4.

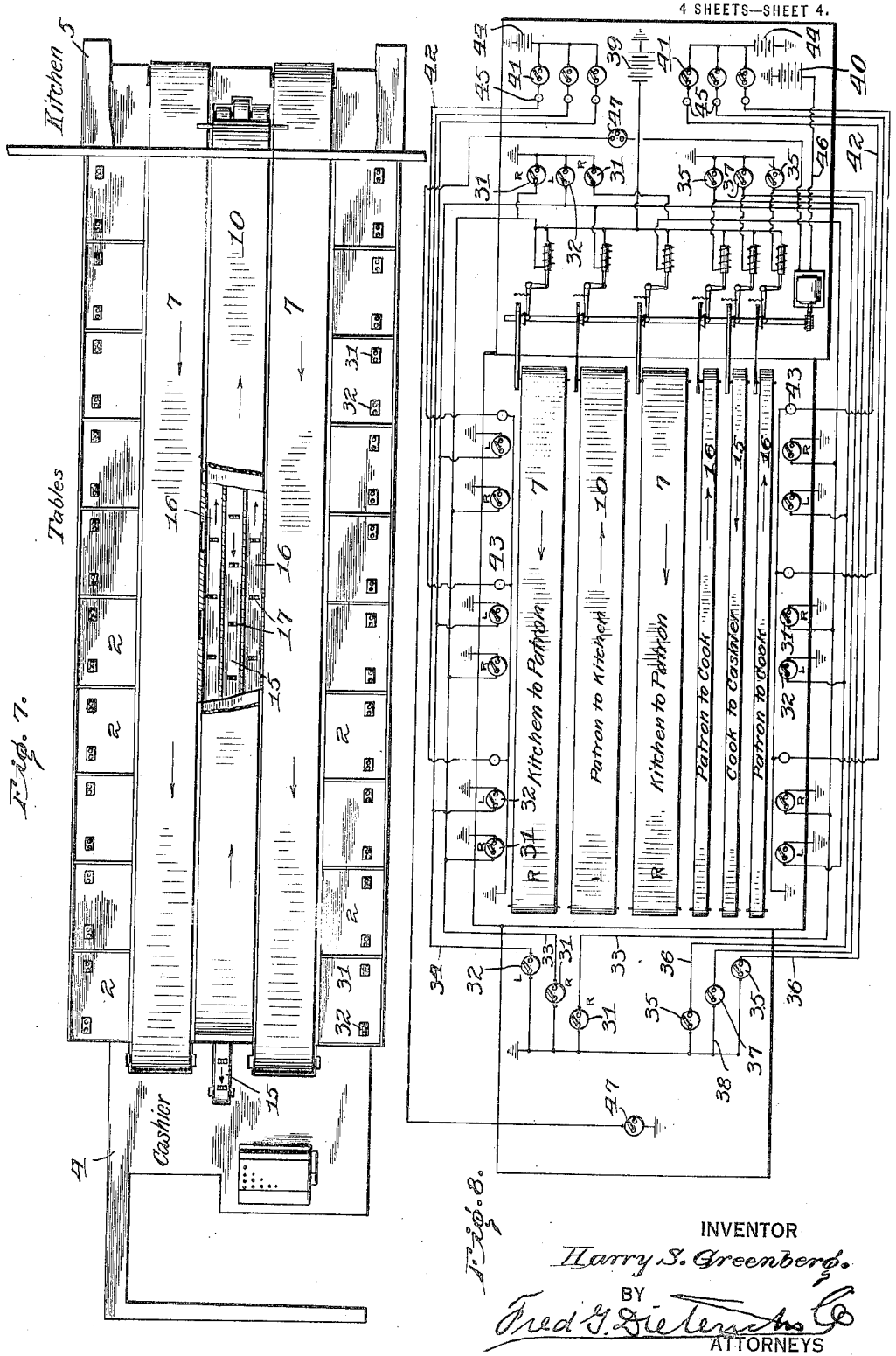


Fig. 7.

Fig. 8.

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DINING SERVICE APPARATUS.

1,382,354. Specification of Letters Patent. Patented June 21, 1921.

Application filed September 14, 1920. Serial No. 410,268.

To all whom it may concern:

Be it known that I, HARRY S. GREENBERG, a citizen of the United States, residing at Danville, in the county of Pittsylvania and State of Virginia, have invented certain new and useful Improvements in Dining-Service Apparatus, of which the following is a specification.

My invention has for its object to provide a compact, inexpensive, efficient and quiet apparatus by which the patrons of cafés, dining rooms, etc., may be served without employing waiters or servants or without requiring the patron to leave his seat at the table or counter; to provide means whereby the order card of the patron may be delivered to the kitchen, the order conveyed to him from the kitchen and the soiled dishes returned to the kitchen, the cook's duplicate check of the order delivered to the cashier's desk and all without the necessity of employing waiters or servants for the purpose.

Another object of the invention is to provide self-service apparatus wherein the conveyers of the food trays are under control of the patron, the cashier and the kitchen attendant or cook and whereby the order conveyers are under control at the cashier's desk and in the kitchen, the arrangement being such that the patron may stop and start the delivery conveyers serving his place so as to remove the tray of food conveniently from the delivery conveyer and place the tray of soiled dishes on the return conveyer.

Another object is to provide for the automatic restarting of the conveyers which are controlled by the patron in case he forgets or neglects to do so.

Again, it is an object to provide means whereby the cook or kitchen attendant may indicate to a patron, when his order is ready and placed on the service conveyer, thereby enabling the patron to watch for the arrival of his order.

In carrying out my invention, I provide a table or counter with places along the sides for the patrons and in the middle of the table or counter is located a return conveyer to the kitchen, which is placed at an elevation a definite distance above the table top, the same being flanked on the sides by the service or delivery conveyers which bring the trays of food from the kitchen to the patron, these conveyers being located below the return conveyer but preferably slightly elevated above the top of the table; beneath the return conveyer and boxed in are located the check conveyers that carry the patron's order to the kitchen and the cook's check back to the cashier's desk, the indicating signal from the kitchen being located in the side wall between the delivery and return conveyers opposite each patron's place where the signals may be easily visible, the side walls having openings through which the patron may introduce his order check to the check conveyer that takes it to the kitchen, the patron's control switch being placed on the table top (or at some other convenient location) whereby the trays, when set down on the top of the table, will operate the switch which starts the conveyers in motion in case the patron has failed to manipulate the switch for that purpose.

In its more detail nature, the invention includes those novel features of construction, combination and arrangement of parts, all of which will be first fully described and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which:

Figure 1 is a side elevation, parts being broken away and other parts being shown in section, illustrating one embodiment of the invention.

Fig. 2 is a cross section of the same.

Fig. 3 is a detail view of one form of driving mechanism that may be employed to actuate the several conveyers.

Figs. 4 and 4ª are diagrammatic views of the several control clutches and the conveyers which they control.

Figs. 5 and 6 are detail sections and part elevations showing how the control switches are automatically opened to restore the movement of the conveyers.

Fig. 7 is a top plan view of the invention, parts being broken away, showing the cashier's desk, the dining table or counter and the kitchen portion adjacent the dining room.

Fig. 8 is a diagrammatic view of the controlling circuits and their relation to the several conveyers and their clutches.

In the drawings in which like numerals and letters of reference indicate like parts in all the figures, I have illustrated one embodiment of the invention which, however,

may be modified in its arrangement and design to suit the exigencies of the particular place where the installation is made.

In the embodiment illustrated in the drawings, 1 designates the table or counter, the top 2 of which is partitioned into several sections or positions for the respective patrons. The table or counter includes the vertical supports 3 of any desired design.

4 represents the cashier's desk which is preferably placed at the end of the counter or table opposite the kitchen and 5 designates the shelf in the kitchen on which the trays are returned by the return conveyer.

Mounted to run from the kitchen along the table past the several positions or stations where the patrons are served, are delivery conveyers 7, the table being stepped up at 6 to raise the conveyer 7 slightly above the level of the service places of the table.

The return fold of the conveyer 7 is preferably guided on suitable rollers 8, as indicated in Fig. 2. The table is also raised in the center, as at 9, to form a support for the return conveyer 10, which carries the trays back to the kitchen, the conveyer 10 being also guided on the bottom side by rollers 11.

12 designates the side walls which project up from the table between the conveyers 7 and 10 and form an inclosure for the check conveyers 16 and 15, the check conveyers 16—16 being the ones which carry the checks from the patron's service places on the table to the kitchen, while the conveyer 15 carries the cook's check from the kitchen to the cashier's desk, suitable clips or other holding devices 17 being employed to insure the checks being moved with the conveyers and the central conveyer, the one which carries the cook's check to the cashier's desk, is preferably incased by walls 14 against access by the patron. The walls 12 have openings, as shown in Fig. 2, through which the patron's order check can be placed on the conveyers 16, the conveyers 15 and 16 running over a supporting surface 13, as indicated in Fig. 2.

18 designates a countershaft which is driven from a suitable motor 29, preferably through worm gearing 28—27 and on the shaft 18 is a series of loose pulleys 19—19, 20, 21—21, and 22 for the driving belts 30, which drive the several conveyers 7—7, 10, 16—16 and 15, respectively, see Figs. 4 and 4a.

The pulleys 19 to 22, inclusive, are adapted to be clutched to the shaft 18 by any suitable clutch devices 23 operated to normally hold the pulleys clutched to the shaft.

For convenience of illustration, I have indicated bell cranks 24 with springs 25 for the purpose.

The clutches are released from the shaft 18 against retention of the springs 25 by solenoid magnets 26 forming a part of the control system.

In order that each of the patrons, at his particular place, may stop and start the conveyer which passes before him and brings the food from the kitchen, I provide each patron's place with a suitable switch 31, preferably arranged in such manner that when the tray is set on the table, the switch will be manipulated to control the electric circuit in a manner to start the conveyers in operation again, an arrangement such as indicated in Figs. 5 and 6, for example, may be employed, though I wish it understood that other suitable arrangement may be employed, if desired.

Each patron's place is provided with a control switch 31 that is connected in the circuit 33, which governs the solenoid 26 of the service conveyer 7 adjacent to the patron.

Each patron's place is also provided with another switch 32 in the circuit 34 which controls the solenoid 26 of the clutch 20 which governs the operation of the return conveyer for carrying the dishes back to the kitchen.

At the cashier's desk, there are provided switches 31 and 32 in the respective control circuits 33—34 for controlling the same circuits as are controlled by the patron, so that the cashier may stop and start either of the conveyers 7 and 10 at will.

Similarly, a set of switches 31—31 and 32 are provided in the kitchen so that these conveyers may also be under control of the cook or kitchen attendant.

The conveyers 16 and 15 may have their control circuits 36 and 38 similarly controlled by switches 35 and 37 at either the cashier's desk or in the kitchen (see Fig. 8).

In order to indicate to the patron when his order is ready and placed on the delivery conveyer, a suitable signal 43 is placed where it can be viewed by the patron and connected into a circuit 42 in which is a pilot signal 45 and a control switch 41 in the kitchen.

This circuit 42 also includes the source of energy 44. The circuits which control the several sets of conveyers are also provided with a source of energy 39.

46 is the motor circuit which has a source of energy 40 and which is provided with a switch 47 at the cashier's desk and another switch 47 in the kitchen by which the circuit may be opened to stop the motor and thus stop the entire system.

From the foregoing, it will be seen that with my arrangement, a patron desiring to be served takes his position at one of the table or counter spaces or sections (which spaces or sections are, of course, provided with suitable identifying numbers, not shown) and writes his order on the usual

pad. Having written his order, the patron places it on the conveyer 16 by which it is taken to the kitchen, received by the kitchen attendant and when the order is filled, the tray of food is placed on the conveyer 7 and the required signal switch 41 is operated to signal the patron that his order has been placed upon the conveyer. As soon as the tray arrives opposite the patron's place, he manipulates the switch 31 to stop the conveyer until after he can take the tray off of the same. Having removed the tray from the conveyer, he operates the switch 31 again to start the conveyer or, if he fails to operate the switch, it will be automatically operated to start the conveyer when he lays the tray down on the table (see Fig. 6).

When he is ready to return the tray to the kitchen, he places it on the conveyer 10 which may be stopped by the switch 31 at the time and started again toward the kitchen where the tray of dishes is delivered onto the shelf 5 in the kitchen.

When the patron sends his order to the kitchen, the cook takes the cashier's duplicate check and places it on the conveyer 15 by which it is carried to the cashier's desk, so that the cashier will have a check on the patron who pays his bill at the cashier's desk on his way out.

Many modifications in the design and arrangement of parts and in the details of construction may be made to suit the apparatus to the requirements of the particular place where it is put and other electrical circuit arrangements may be employed, if desired, in lieu of the arrangement diagrammatically illustrated in Fig. 8, so long as the principle of the apparatus is maintained and comes within the terms recited in the appended claims.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of my invention will be readily understood by those skilled in the art.

What I claim is:

1. In an apparatus of the class described, a table having service places or stations, tray serving and returning conveyers running past said stations from and to the kitchen, and means under control of the patron or patrons for stopping and starting said conveyers.

2. In an apparatus of the class described wherein are provided a table with service places or stations, a kitchen and a cashier's desk; separate tray serving conveyers and tray returning conveyers passing said stations on the table for respectively bringing trays from and returning them to the kitchen.

3. In an apparatus of the class described wherein are provided a table with service places or stations, a kitchen and a cashier's desk; tray serving and returning conveyers passing said stations on the table for bringing trays from and returning them to the kitchen, and means under control of the patron for stopping and starting said conveyers.

4. In an apparatus of the class described wherein are provided a table with service places or stations, a kitchen and a cashier's desk; tray serving and returning conveyers passing said stations on the table for bringing trays from and returning them to the kitchen, and means under control of the patron, the cashier and the cook or kitchen attendant for stopping and starting said conveyers.

5. In an apparatus of the class described, a table having service places or stations, tray serving and returning conveyers running past said stations from and to the kitchen and means under control of the patron or patrons for stopping and starting said conveyers, said controlling means of the patron including means for automatically starting the conveyer after the tray has been set down at the service place.

6. In an apparatus of the class described wherein are provided a table with service places or stations, a kitchen and a cashier's desk; tray serving and returning conveyers passing said stations on the table for bringing trays from and returning them to the kitchen, and means under control of the patron for stopping and starting said conveyers, said controlling means of the patron including means for automatically starting the conveyer after the tray has been set down at the service place.

7. In an apparatus of the class described wherein are provided a table with service places or stations, a kitchen and a cashier's desk; tray serving and returning conveyers passing said stations on the table for bringing trays from and returning them to the kitchen, and means under control of the patron, the cashier and the cook or kitchen attendant for stopping and starting said conveyers, said controlling means of the patron including means for automatically starting the conveyer after the tray has been set down at the service place.

8. In an apparatus of the class described wherein are provided a dining room and a kitchen; a table in the dining room, conveyers for bringing the trays of food from the kitchen to the table and returning the trays from the table to the kitchen, and means under control of the patron and cook to stop and start said conveyers.

9. In an apparatus of the class described wherein are provided a dining room and a kitchen; a dining table having service places or stations, a conveyer for carrying trays of food from the kitchen to the table adjacent

to the service places, another conveyer for returning trays to the kitchen, controlling instrumentalities operable at each service place to stop and start the conveyers at the will of the patrons.

10. In an apparatus of the class described wherein are provided a dining room and a kitchen; a dining table having service places or stations, a conveyer for carrying trays of food from the kitchen to the table adjacent to the service places, another conveyer elevated above the first conveyer for returning trays to the kitchen, controlling instrumentalities operable at each service place to stop and start the conveyers at the will of the patrons.

11. In an apparatus of the class described wherein are provided a dining room and a kitchen; a dining table having service places or stations, a conveyer for carrying trays of food from the kitchen to the table adjacent to the service places, another conveyer for returning trays to the kitchen, controlling instrumentalities operable at each service place to stop and start the conveyers at the will of the patrons, other conveyers for carrying the patron's order check from the table to the kitchen.

12. In an apparatus of the class described wherein are provided a dining room and a kitchen; a dining table having service places or stations, a conveyer for carrying trays of food from the kitchen to the table adjacent to the service places, another conveyer for returning trays to the kitchen, controlling instrumentalities operable at each service place to stop and start the conveyers at the will of the patrons, other conveyers for carrying the patron's order check from the table to the kitchen, and means under control of the cook for stopping and starting all of said conveyers.

13. In an apparatus of the class described wherein are provided a dining room and a kitchen; a dining table having service places or stations, a conveyer for carrying trays of food from the kitchen to the table adjacent to the service places, another conveyer for returning trays to the kitchen, controlling instrumentalities operable at each service place to stop and start the conveyers at the will of the patrons, other conveyers for carrying the patron's order check from the table to the kitchen, and means under control of the cook for stopping and starting all of said conveyers, and signaling instrumentalities operable from the kitchen and associated with each service place on the table to indicate to the patron that his order has been filled.

14. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk.

15. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and means under control of the cashier for stopping and starting any of said conveyers at will.

16. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and means under control of the patron for stopping and starting the tray conveyers at will.

17. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and means under control of the cashier for stopping and starting all of said conveyers at will, and means under control of the patron for stopping and starting the tray conveyers at will.

18. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, means under control of the cashier for stopping and starting all of said conveyers at will, and means under control of the patron for stopping and starting the tray conveyers at will and including switch devices adapted to be actuated by the weight of the tray to set the conveyers in motion.

19. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's

desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and signals associated with each service place on the table and operated from the kitchen to indicate to the patron that his order has been filled and placed on the delivery conveyer.

20. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and means under control of the cashier for stopping and starting any of said conveyers at will, and signals associated with each service place on the table and operated from the kitchen to indicate to the patron that his order has been filled and placed on the delivery conveyer.

21. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, means under control of the patron for stopping and starting the tray conveyers at will, and signals associated with each service place on the table and operated from the kitchen to indicate to the patron that his order has been filled and placed on the delivery conveyer.

22. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, and means under control of the cashier for stopping and starting all of said conveyers at will, and means under control of the patron for stopping and starting the tray conveyers at will, and signals associated with each service place on the table and operated from the kitchen to indicate to the patron that his order has been filled and placed on the delivery conveyer.

23. In an apparatus of the class described wherein are provided a dining room and a kitchen and a dining table and a cashier's desk; conveyers connecting the dining table and kitchen and the cashier's desk for bringing trays of food from the kitchen to the patron, returning trays to the kitchen from the patron and for conveying the patron's order to the kitchen and the cook's check from the kitchen to the cashier's desk, means under control of the cashier for stopping and starting all of said conveyers at will, and means under control of the patron for stopping and starting the tray conveyers at will and including switch devices adapted to be actuated by the weight of the tray to set the conveyers in motion, and signals associated with each service place on the table and operated from the kitchen to indicate to the patron that his order has been filled and placed on the delivery conveyer.

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