H. A. HALL.

AUTOMATIC RESTAURANT AND VENDING MECHANISM THEREFOR.

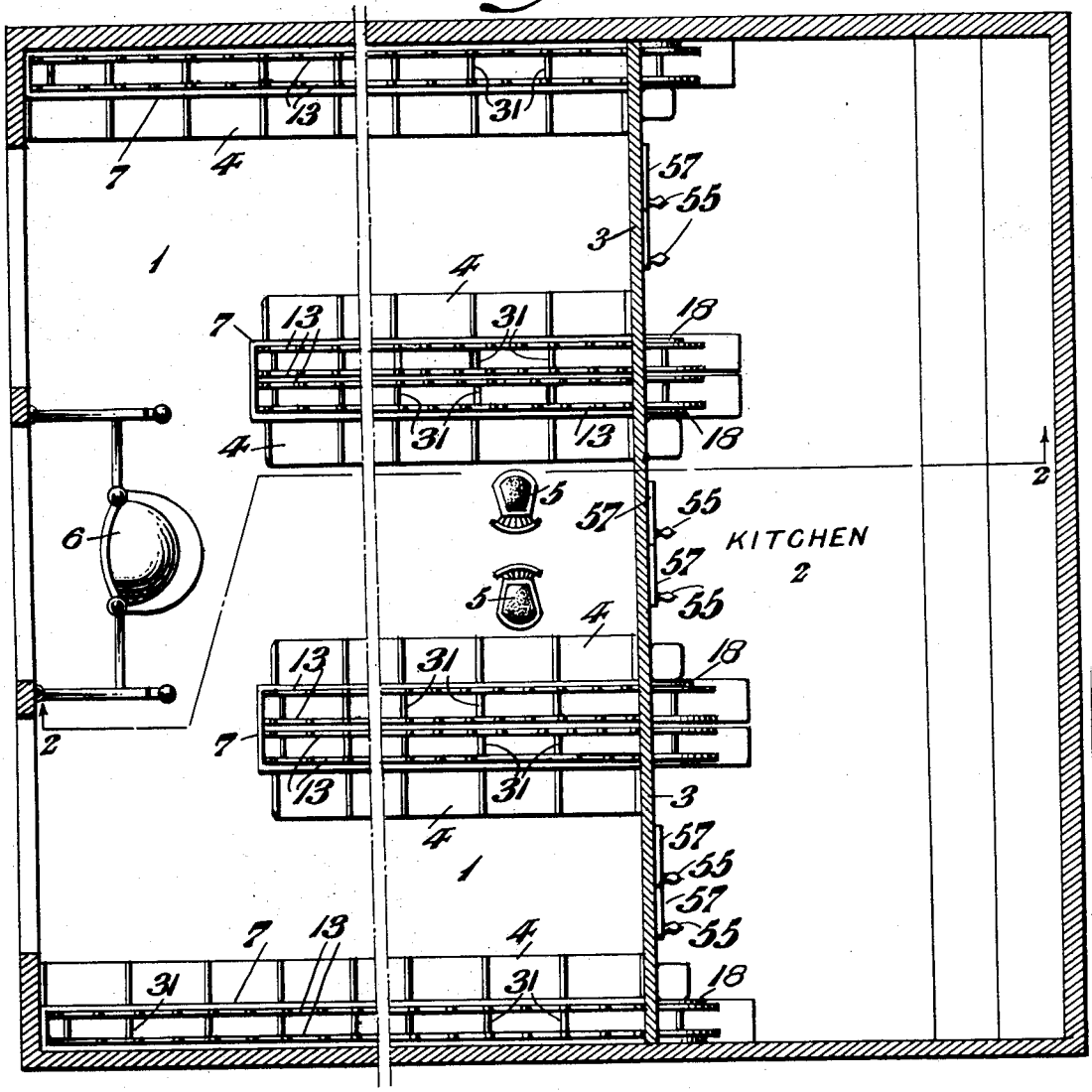
APPLICATION FILED MAR. 14, 1919.

1,353,996.

Patented Sept. 28, 1920.

4 SHEETS—SHEET 1.

Fig. 1.



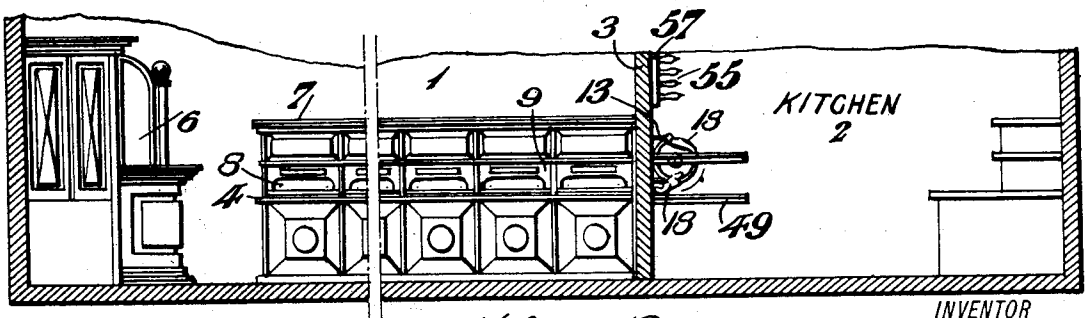


Fig. 2.

ON LINE 2-2. FIG. 1.

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4 SHEETS—SHEET 2.

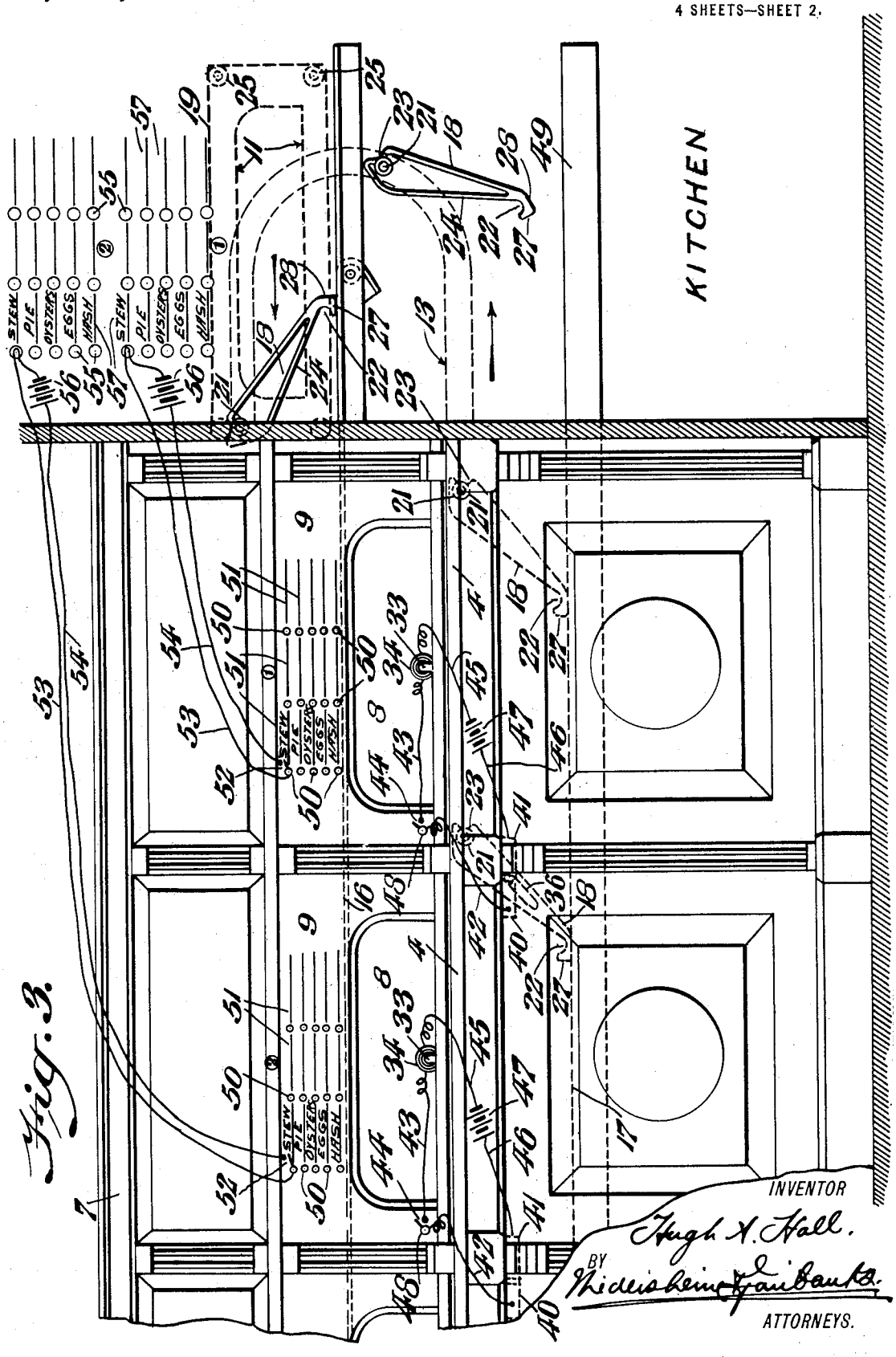


Fig. 3.

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4 SHEETS—SHEET 3.

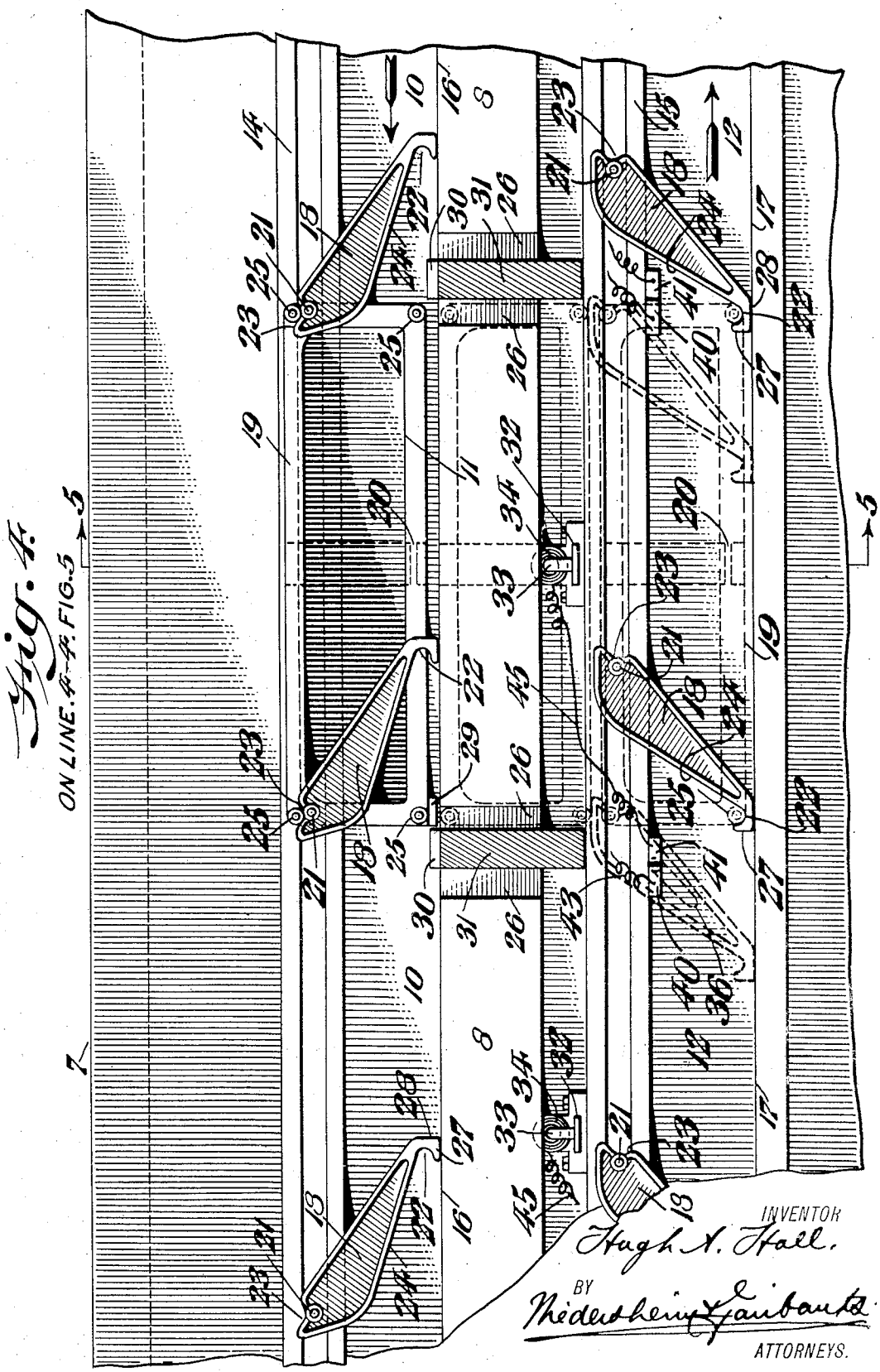


Fig. 4.

ON LINE 4-4, FIG. 5

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4 SHEETS—SHEET 4.

Fig. 5.

ON LINE 5-5, FIG. 4.

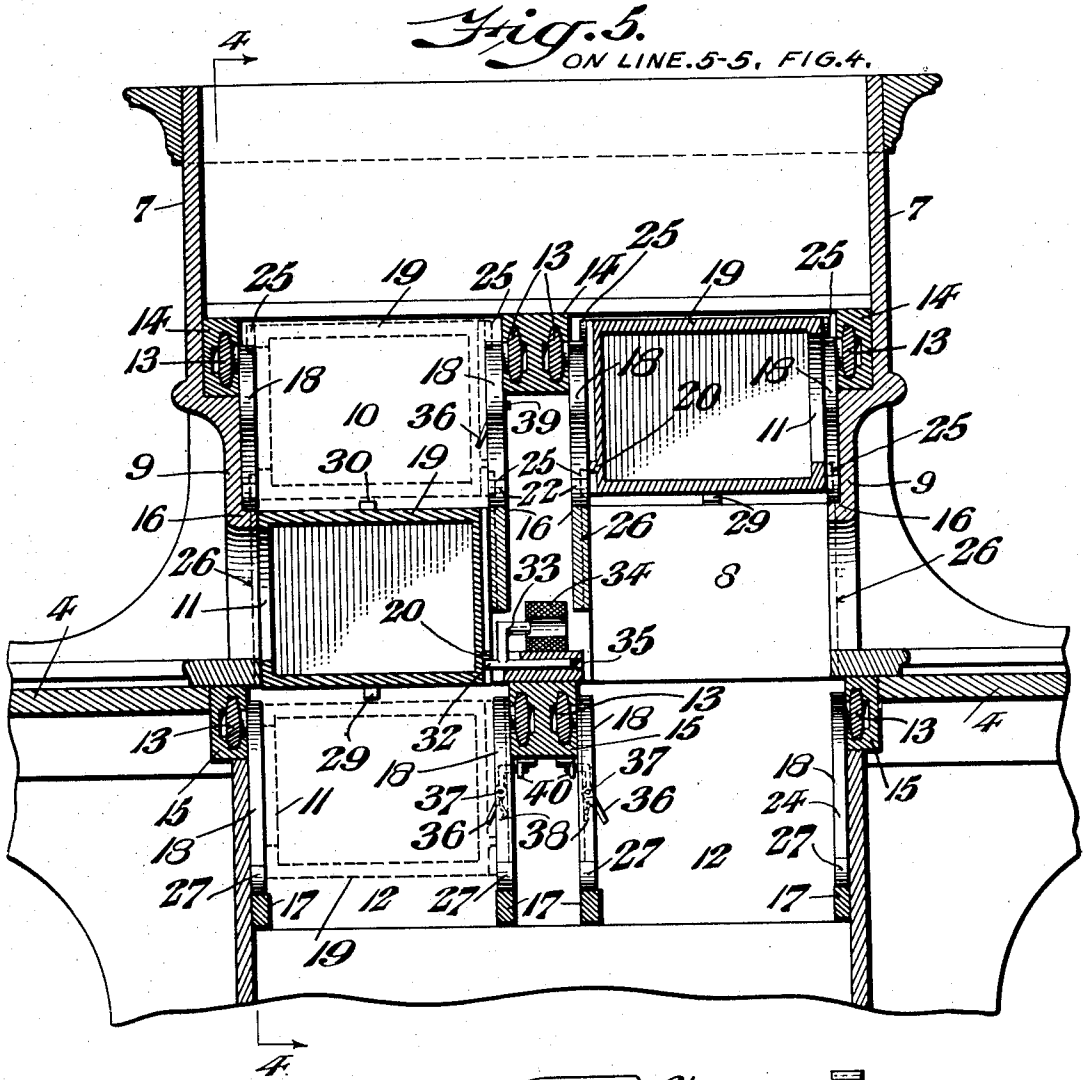


Fig. 6.

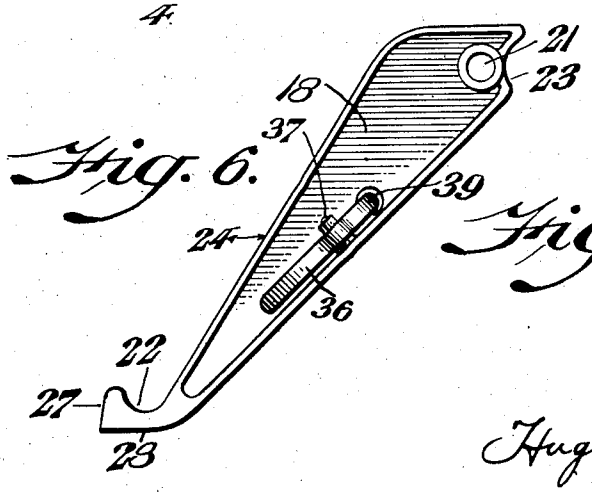
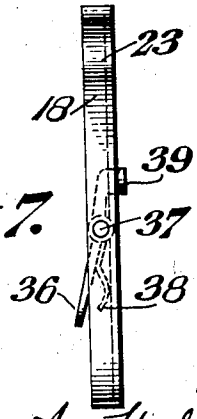


Fig. 7.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC RESTAURANT AND VENDING MECHANISM THEREFOR.

1,353,996. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed March 14, 1919. Serial No. 282,708.

To all whom it may concern:

Be it known that I, HUGH A. HALL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Automatic Restaurant and Vending Mechanism Therefor, of which the following is a specification.

In restaurants of the type wherein the different articles of food are vended in coin controlled vending machines, it is customary to have the vending machines placed along the sides of the room in which they are installed and it is necessary for each purchaser after he removes the articles he has purchased from the vending machines to carry them to a table or chair or else to stand up at a table or counter. This is objectionable to many people as they dislike the necessity of carrying food from the vending machine to the table or counter.

The object of my present invention is to devise an automatic restaurant wherein each individual will be provided with a seat at the table or counter to which the selected articles of food are mechanically carried in accordance with the selection which has been made by the purchaser.

In accordance with my invention in its broad and generic scope it comprehends a novel automatic restaurant wherein the articles selected are mechanically carried to the table or counter at which the intending purchaser is seated.

It further comprehends a novel construction and arrangement of carriers, a novel construction and arrangement of a signaling mechanism, novel means for causing tray carrying boxes to be removed from the conveyer when they reach their proper destination, novel means for causing the boxes or trays to be taken up by the conveyer and returned to the kitchen, novel locking mechanism for the trays and a novel construction and arrangement of seats and counters or tables arranged in proximity to the conveyers so that the intending purchaser can receive the articles purchased without leaving his seat.

It further consists of other novel features of construction and advantage all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings a typical embodiment which is at present preferred by me, since this embodiment will give in practice satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

In the drawings, Figure 1 represents a diagrammatic view of a typical automatic restaurant with its connected kitchen, embodying my invention.

Fig. 2 represents a vertical, longitudinal section on line 2—2 of Fig. 1.

Fig. 3 represents an enlarged, fragmentary, partly sectional and partly elevational, view of two counters and their adjunctive devices,—the view also typifying a menu in the kitchen being a counterpart of that above a table.

Fig. 4 represents a section on line 4—4 of Fig. 5, illustrating the runways for the endless carrier, the tracks, and the tray-carrying boxes, particularly illustrating one serving chamber.

Fig. 5 represents a transverse section on line 5—5 of Fig. 4,—the view illustrating a typical double cabinet with opposite counters or tables.

Fig. 6 represents an enlarged side elevation of one of the carrier arms.

Fig. 7 represents the carrier arm illustrated in Fig. 6 as viewed from the right-hand side of said Fig. 6.

Similar numerals of reference indicate corresponding parts in the drawings.

Having in view the purposes of my invention as already outlined, I will first describe the general arrangement of my restaurant and the elements generically considered which are assembled and coöperate to make it an automatic restaurant.

Referring now more particularly to Figs. 1 and 2,—1 designates a restaurant of any preferred dimensions and 2 a typical kitchen employed in conjunction with the restaurant but divided from it by a wall or partition 3.

4 designates a plurality of tables or counters assembled, as indicated in Fig. 1, each plurality in a long series against each of the outer walls of the restaurant apartment, so that my apparatus is placed wholly in each instance against the wall,—the view also illustrating two double assemblages of tables in separate groups, the series of tables

in each group being opposite to each other, so that the cabinets in which the automatic serving apparatus is contained are disposed between the opposite groups of tables, whereas in the wall assemblages of tables first mentioned, the cabinets are against the walls.

5 are seats for the customers arranged in practice one in front of each counter or table, although, for simplicity, I have illustrated but two. 6 designates a typical cashier's desk of any preferred character.

Each of the cabinets which are all designated 7, is a decorative structure of any preferred construction and material, which, in the double assemblage represented in Fig. 5 in which the tables extend outwardly from each side of it, is illustrated as a double cabinet whereas the two cabinets respectively shown as against a wall in Fig. 1, are single cabinets.

The general structure of a cabinet,—and for clearness, I will describe a single cabinet on only one side of which extends a counter or table is such that it may be said to consist of a front-apertured serving chamber 8, which faces a table 4 and within which a tray-carrying box 19 is, as called for by the customer, adapted to be deposited. A box delivering passage 10 runs lengthwise of and above the group of tables and the serving chambers of the cabinet and a box-returning passage 12 runs below the level of the chambers and tables, and similarly extends lengthwise of the cabinet as an entirety.

It will, therefore, be understood that in each cabinet are contained a group of serving chambers 8 corresponding to the group of tables 4 applied to the cabinet and one for each table, which chambers as a group extend longitudinally of the cabinet in the line of the tables and side by side,—that there are also two passages, one the box-delivering passage designated 10 above the assembled serving chambers and the other a box-returning passage 12, below the serving chambers.

The office of these passages is to permit of the delivery to a particular serving chamber in the restaurant through the instrumentality of an endless carrier 13, of a tray-carrying box 19 into which has, within the kitchen, been placed the article called for by the purchaser and to be delivered to the serving chamber at the table of which he is sitting.

The endless carrier 13 may be of any preferred construction, but conveniently consists of two parallel chains, and as typically represented in outline in Fig. 3, extends longitudinally of the cabinet and has imparted to it a continuous movement, by any preferred operating mechanism which it is not necessary to illustrate.

14 designates parallel delivering runways for the upper reaches of the endless carrier, and 15 the returning runways for the lower reaches, both of which are illustrative merely of a means for supporting and permitting of the longitudinal travel of the double-chain endless carrier.

Each chain or side member of the carrier as such is provided with a group or plurality of carrier arms 18, particularly illustrated as detached in Figs. 6 and 7, which with the carrier, serve, as will be later explained, to assist in the desired delivery from the kitchen of a given tray-carrying box 19 into a given serving chamber, and its return to the kitchen.

These carrier arms are in opposite pairs pivotally connected at 21 to the endless carrier which, as explained, carries the boxes.

Each carrier arm is at its outer end provided with a roller receiving socket, while at its upper end beyond the point of its pivotal attachment it is formed with an upper socket 23.

Each tray-carrying box 19 is a quadrangular container apertured in front as at 11, and made of such dimensions as to fit snugly within the box-delivering passage 10, and serving chamber 8, and the box-returning passage 12, and each box is at its parallel longitudinal sides provided with four guide rollers 25 which are spaced at the same distances apart and two at the upper and two at the lower ends of said sides.

Each box, therefore, is provided with eight rollers, four on each side, and, as will be observed by reference particularly to Fig. 4, each pair of the upper two pairs of rollers, is adapted in the forward traverse of the endless carrier 13 through the delivering passage 10 to rest in the top sockets 23 of four of the carrier arms 18, while each pair of the lower two pairs of rollers is adapted in the return traverse of the endless carrier through the returning passage 12 to rest in the bottom sockets 22 of said four carrier arms.

As the endless carrier 13 is always in motion in the direction of the arrows shown in Figs. 3 and 4, it will be obvious that the carrier arms in the advance travel of the carrier through the delivering passage 10 will drag with their heels 27, Fig. 6, with which their lower ends beneath the bottom sockets 22 are formed, along the upper track 16,—while in the return travel of the carrier through the return passage 12 the carrier arms which will be then in a reversed position, will travel in a reverse direction and with their bottom plate formations 28 resting upon and dragging along the lower track 17.

Assume the endless carrier in motion and a call to have been made for a particular

article desired by a purchaser, as hereinafter described, and such article to have been placed in a particular box,—the operator will, as indicated in dotted lines in Fig. 3, place said box upon the carrier in such position that its four upper side rollers 25 will rest within the four upper sockets 23 of the carrier arms and be supported thereby as indicated particularly in the upper part of Fig. 4.

Assume, further, that the box in question has reached a position over the desired serving chamber 8, and has come to a stop by the contact of a stop 29 on the bottom of the box with a stop lug 30 on a division 31 which separates the particular serving chamber at which it is desired that the box should stop from the serving chambers upon each side of said chamber,—the carrier will continue its traverse with the result that the carrier arms 18 which have been supporting and carrying the box in question will pass beyond said chamber so as to permit the box gravitatively to descend into the chamber and to come to a stop by the contact of a stop bar 20 on its side with the bolt 32 connected with the core 33 of a solenoid 34, see Fig. 5, which is disposed in the framework to the rear of the serving chamber under consideration, and which bolt travels in a bolt-way 35 beneath the solenoid. In the descent the rollers will travel through the vertical slots 26 in the cabinet.

It should be explained that to the rear of each serving chamber is mounted one of these bolt-provided solenoids and that in the normal position or that shown in Fig. 5, the core is withdrawn from the helix of the solenoid and the bolt similarly withdrawn to a given distance from without its bolt way.

Normally, therefore, when a particular box descends from the carrier into a particular serving chamber, it is stopped by the contact of its stop bar 20 with the bolt 32, and rests with its aperture 11 facing the apertured opening of said serving chamber and in reach, of course, of the customer, who withdraws the article from the box to the counter in front of said chamber at which he is sitting.

When either the customer or an employee of the restaurant desires to remove from a serving chamber a box then in place in said chamber so that it may be returned to the kitchen, the following electrical contrivance for energizing the solenoid and withdrawing the bolt from beneath the box, is conveniently resorted to, notwithstanding, of course, that other devices not of an electrical character would be the fair equivalent of the electrical box-releasing mechanism I have illustrated.

Referring to Figs. 5, 6 and 7, it will be observed that all of the carrier arms which are attached to the front chain of the endless carrier are plain arms of a desired width and flat upon each side, whereas all of the carrier arms which are attached to the rear chain of said carrier are provided with triggers 36, pivoted at 37 to the arms and normally controlled as to their lower extended internal faces to stand free of the carrier arms by springs 38 which normally retain them in the position particularly illustrated in Fig. 7. It will also be observed that the upper end of each trigger above its pivot is formed with a contact 39 which normally extends beyond the opposite or outer face of the carrier arm.

Reference to Fig. 4 will indicate that below the returning chain runway 15 and at a point intermediate of the serving chambers there are attached to it a pair of separated contact plates 40 and 41, which through electrical conductors, 42 and 43, connectible by a switch 44, lead to a solenoid 34, and that thence through conductors 45 and 46 leading from said solenoid to the contact plate 41, an electric circuit of the solenoid, under the influence of a battery 47, or other source of electric energy, is established,—with the result that when said switch which is of course controlled by a push button 48 is closed, the circuit will be closed and the solenoid energized to draw within it the core and with the core occasion the withdrawal of the bolt 32 into its bolt head 35 and from beneath the stop bar 20 on the side of the box, which is to be thereby freed to descend.

The carrier arms of the carrier which in the reverse travel of the carrier through the returning passage 12 are reversely disposed as shown in Fig. 4, will then through the dropping of the four lower guide rollers 25 of the box into four of the bottom sockets 22 of the carrier arms 18 then within range, carry the box along through the box returning passage 12 until it has been carried into the kitchen and left at rest upon, for instance, receiving arms 49 in the kitchen.

It should be explained that the stoppage of the boxes at particular serving chambers may be effected by any preferred stopping device, and that I, therefore, merely illustrate the stop 29 and the stop lug 30 as convenient devices for the purpose.

It will, of course, be also understood that the disposition of the stop lugs 30 within the delivering passage 10 and upon the divisions 31, and of the stops 29 on the bottoms of the boxes is to be varied with reference to each box, so that a particular box will stop at a particular serving chamber. This arrangement is of no peculiar novelty with me but is conveniently accomplished by a staggered relationship of the stop lugs and the box lugs, when transversely considered with regard to the delivering passage 10 and the divisions 31.

It having now been explained how a box

which has been supplied with an article desired by a particular customer, may be caused to travel from the kitchen to the serving chamber and table in front of which the customer is sitting,—how the box may be deposited into the given serving chamber,—and how after the removal of the article vended from the chamber to the table, the box may be deposited upon the carrier and returned empty, to the kitchen,—I will describe a convenient means to which I resort to enable a purchaser to indicate to an operator in the kitchen the particular article which he desires to purchase.

Referring to Fig. 3, upon the panel 9 above each of the two tables represented, and above the aperture of each of the serving chambers, are mounted menu boards comprising an assembled group of push buttons 50, relatively opposite assembled name slips 51 upon which latter are marked different kinds of articles to be vended as, for instance, those indicated in the drawings as "stew," — "pie," — "oysters," — "eggs," "hash," — and so forth,—and these push buttons are electrically connected each through conductors typified as 53 and 54, with a counterpart assemblage of flashlights 55, upon a corresponding menu board in the kitchen.

The operative result of this counterpart arrangement is that when a given switch 52 is, through its connected push button closed, a given circuit from a battery 56, conveniently in the kitchen, will be closed and a given flashlight corresponding to a given push button in the restaurant, and placed opposite name slips 57 on the menu board in the kitchen which corresponds to the name slips 51 on the panel opposite the customer in the restaurant will be flashed, with the further result that the operator in the kitchen will know what particular serving chamber is to be served with a certain article and will thereby be enabled to place such article in a box gaged to stop at the chamber in question and will place the box upon the carrier.

This entire system of electrical connection between a menu board above a particular table and a corresponding menu board within a kitchen, is of course, as explained, typical merely of a means for informing an operator in the kitchen of the particular desires of a particular customer, and, obviously, other than such an electric system of connection, for instance a mechanical coin-controlled connection, may be substituted therefor without departure from so much of my invention as relates to and comprehends a means of signaling between a particular table and the kitchen.

It will be understood from the foregoing that in accordance with my present invention I have devised a vending machine, the casing of which has a desired number of delivery openings, and a mechanical conveyer is provided to carry the trays to and from said openings. An individual signaling device is provided in proximity to each delivery opening so that the intending purchaser can signal to the attendant in the kitchen his order. The attendant then places the order in a tray numbered in accordance with the delivery opening to which it belongs, and places the tray on the conveyer, by which it is mechanically conveyed to the delivery opening from which the purchaser signaled his order. When the tray reaches the proper opening it is automatically removed from the conveyer and is locked in a position accessible to the purchaser so that the person, who ordered predetermined articles by signaling to the attendant in the kitchen, can remove the articles from the tray and without leaving his seat can place the articles which he has ordered on a table or bench in front of the delivery opening. When the attendant in the kitchen or the person who ordered presses the button which controls the locking plunger such locking plunger will be released and the tray will be automatically delivered to the lower stretch of the conveyer and returned to the kitchen, where the attendant removes the tray and the empty dishes which it contains from the conveyer.

It is of course within the broad scope of my invention to employ, in lieu of the push button I have described for signaling an order, a conventional coin controlled contact device so that an order will not be signaled unless a coin of proper dimension has been placed in its respective coin slot, so that the circuit of the signaling device will be closed and the proper signal given to the attendant in the kitchen.

By the employment of my present invention one is enabled to employ a minimum number of help with consequent reduction in the cost of operation, and the breakage of dishes is reduced to a minimum since the dishes are mechanically conveyed from the kitchen to the purchaser and from the purchaser back to the kitchen.

As illustrated, the cashier's desk is so located that, if desired, the customers pay their check when they pass by the cashier's desk when leaving the restaurant.

It will be seen that in accordance with my present invention each customer is provided with a seat and any order which he has signaled is mechanically conveyed to him thus eliminating the necessity of employing waiters to carry the different articles to the customers.

The conveyers are driven in any desired

manner and, as will be understood, during the operation of the restaurant the conveyers are continuously in motion.

It will now be apparent that I have devised a novel and useful construction of an automatic restaurant and vending machine therefor which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which will give in practice satisfactory and reliable results, it is to be understood that such embodiment is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a vending machine, means controlled by the intending purchaser to signal to an attendant an order, a tray conveyer to travel between the attendant and the intending purchasers, said tray being removable only at one point in the travel of the conveyer, and means to cause a tray on said conveyer to be automatically removed from the conveyer in a position accessible to the person who gave the order.

2. In a vending machine, means controlled by the intending purchaser to signal to an attendant an order, a tray conveyer to travel between the attendant and the intending purchaser, each tray being capable of removal from the conveyer at one predetermined point in its travel and different trays being capable of removal only at different points in the travel of the conveyer, means to cause a tray on said conveyer to be automatically removed from the conveyer in a position accessible to the person who gave the order, and means to lock the tray in such position.

3. In a vending machine, means controlled by the intending purchaser to signal to an attendant an order, a tray conveyer to travel between the attendant and the intending purchasers, each tray being capable of removal from the conveyer at one predetermined point in its travel and different trays being capable of removal only at different points in the travel of the conveyer, means to cause a tray on said conveyer to be automatically removed from the conveyer in a position accessible to the person who gave the order, and means to return said tray to said conveyer.

4. In a vending machine, means to signal to an attendant a selected order, a mechanical conveyer having tray-carrying arms to convey trays from said attendant to the purchaser, trays on said arms, each tray being capable of removal from the conveyer at one predetermined point in its travel and different trays being capable of removal only at different points in the travel of the conveyer, and means to cause a predetermined tray to be automatically delivered from said conveyer into a position accessible to the person who signaled the order.

5. In a vending machine, a casing having delivery openings, trays corresponding in number to such openings, a tray conveyer, each tray being capable of removal from the conveyer at one predetermined point in its travel and different trays being capable of removal only at different points in the travel of the conveyer, and means to cause a tray to be automatically discharged from said tray conveyer when it registers with its respective openings.

6. In a vending machine, a casing having delivery openings, trays corresponding in number to such openings, a tray conveyer, each tray being capable of removal from the conveyer at one predetermined point in its travel and different trays being capable of removal only at different points in the travel of the conveyer, means to cause a tray to be automatically discharged from said tray conveyer when it registers with its respective opening, and an individual ordering device in proximity to each delivery opening.

7. In a vending machine, an endless conveyer having an upper and a lower stretch, trays carried by said conveyer, means to automatically remove a tray from the upper stretch of said conveyer when it reaches a predetermined location, and means to return a tray to the lower stretch of said conveyer.

8. In a vending machine, an endless conveyer having an upper and a lower stretch, trays adapted to be carried by said conveyer, means to automatically remove a tray from the upper stretch of said conveyer when it reaches a predetermined location, and means to automatically return such tray to the lower stretch of said conveyer.

9. In a vending machine, an endless conveyer having an upper and a lower stretch, trays adapted to be carried by said conveyer, means to automatically remove a tray from the upper stretch of said conveyer when it reaches a predetermined location, locking means for a tray which has been removed in such manner, and means to release said locking mechanism to cause the tray removed from the upper stretch of the conveyer to pass to the lower stretch of said conveyer.

10. In a vending machine, an endless conveyer, tray carrying arms thereon, trays

supported on said arms, means to cause a tray to be automatically removed from said conveyer and to slide down said arms, locking plungers to support trays when removed from the conveyer, and means to release said locking plungers to permit the trays to engage with said arms and be carried thereby.

11. In a vending machine, a casing having delivery openings, a tray conveyer in proximity to said openings, means to automatically remove a predetermined tray from said conveyer when such tray registers with a predetermined delivery opening, means to automatically return a tray to said conveyer, and means to prevent the return of such tray to a conveyer when another tray is in the position on the conveyer which the return tray is to occupy.

HUGH A. HALL.

Witnesses:
ALBERT HALL,
WILLIAM OECHSLIN.