Sept. 4, 1923.

1,466,890

E. DELOATCH

MOTOR CONTROL SYSTEM FOR SELF SERVING TABLES

Filed Nov. 26, 1919 3 Sheets-Sheet 1

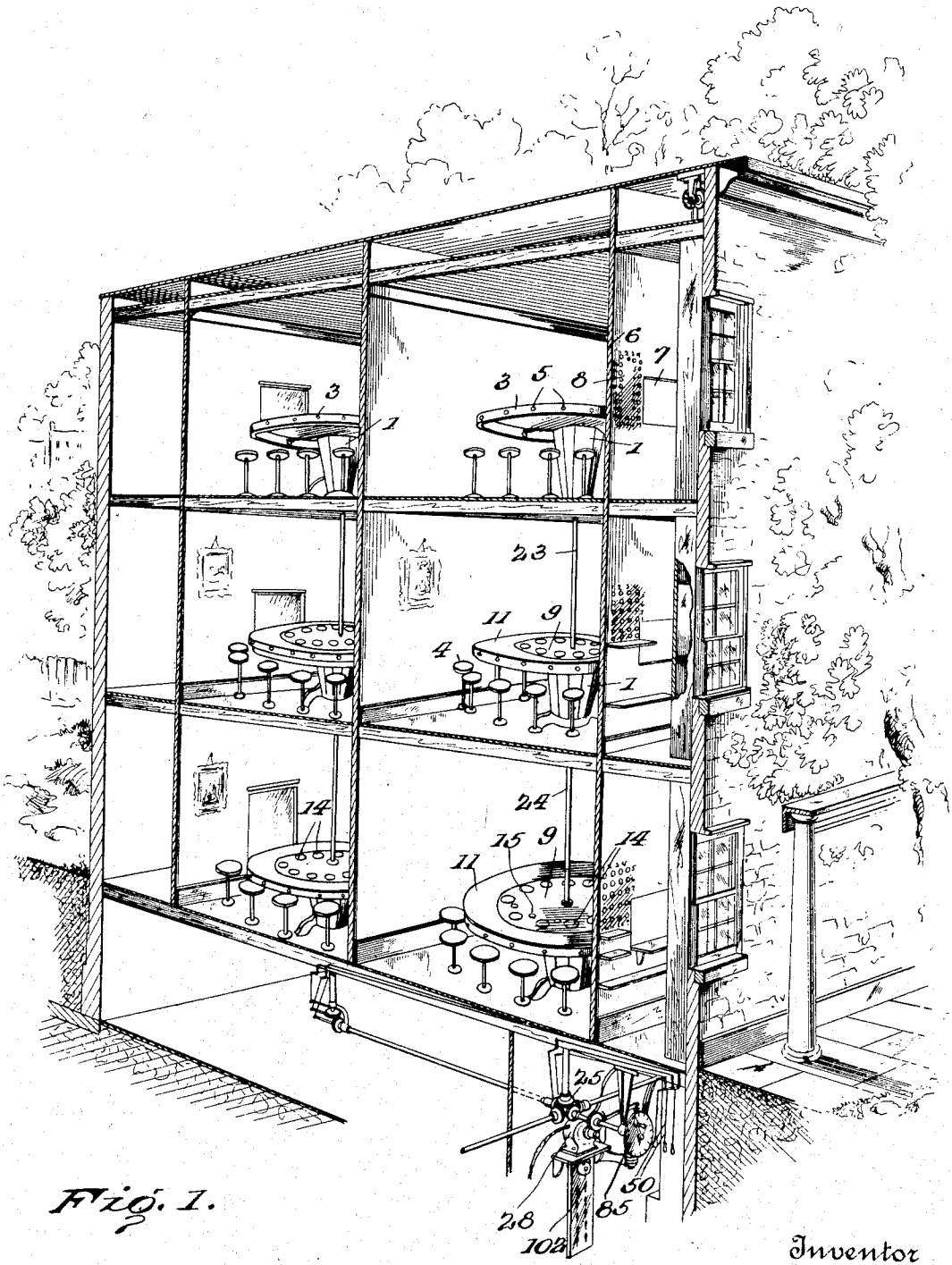


Fig. 1.

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By Lacey & Lacey. His Attorneys.

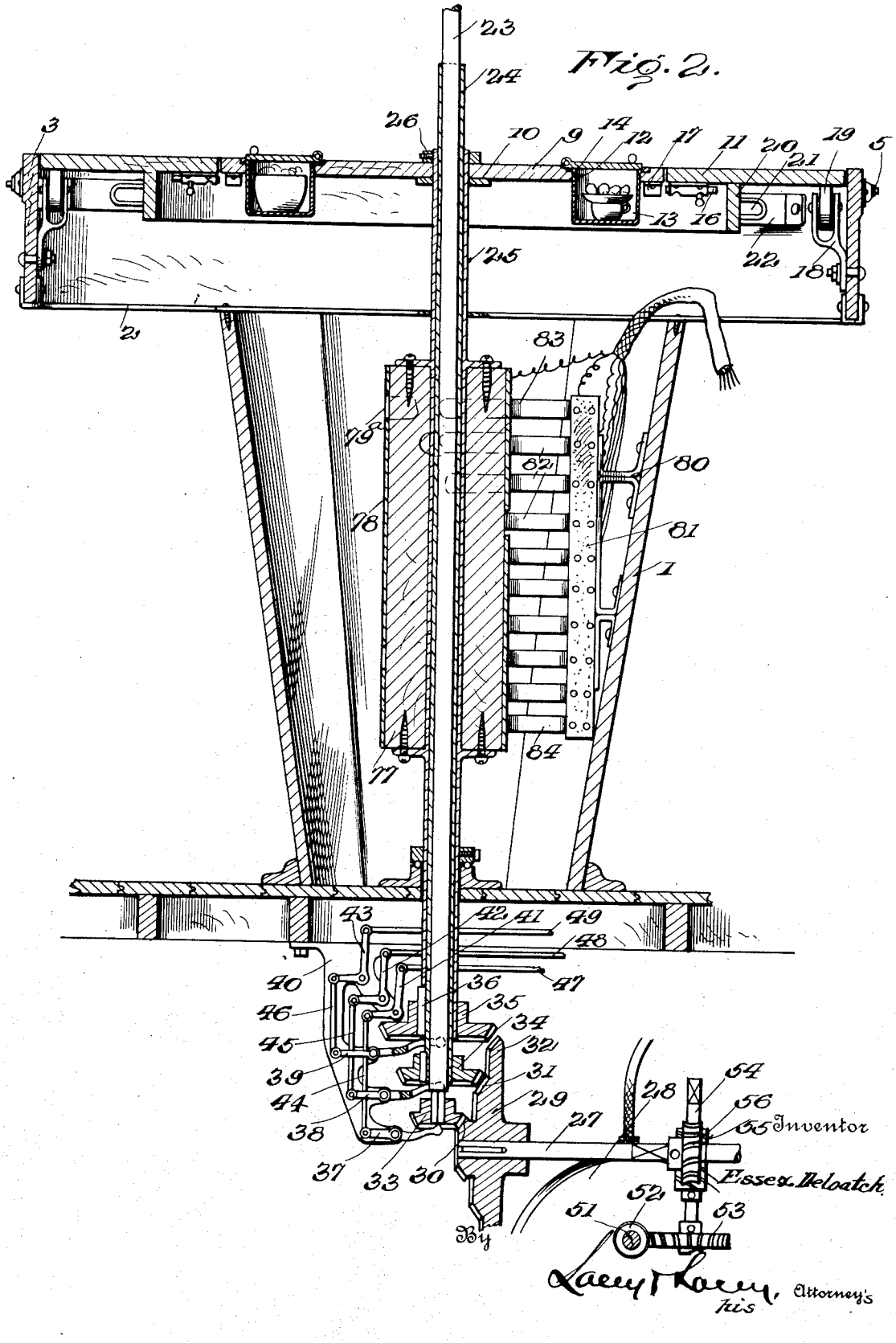
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MOTOR CONTROL SYSTEM FOR SELF SERVING TABLES

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Fig. 2.



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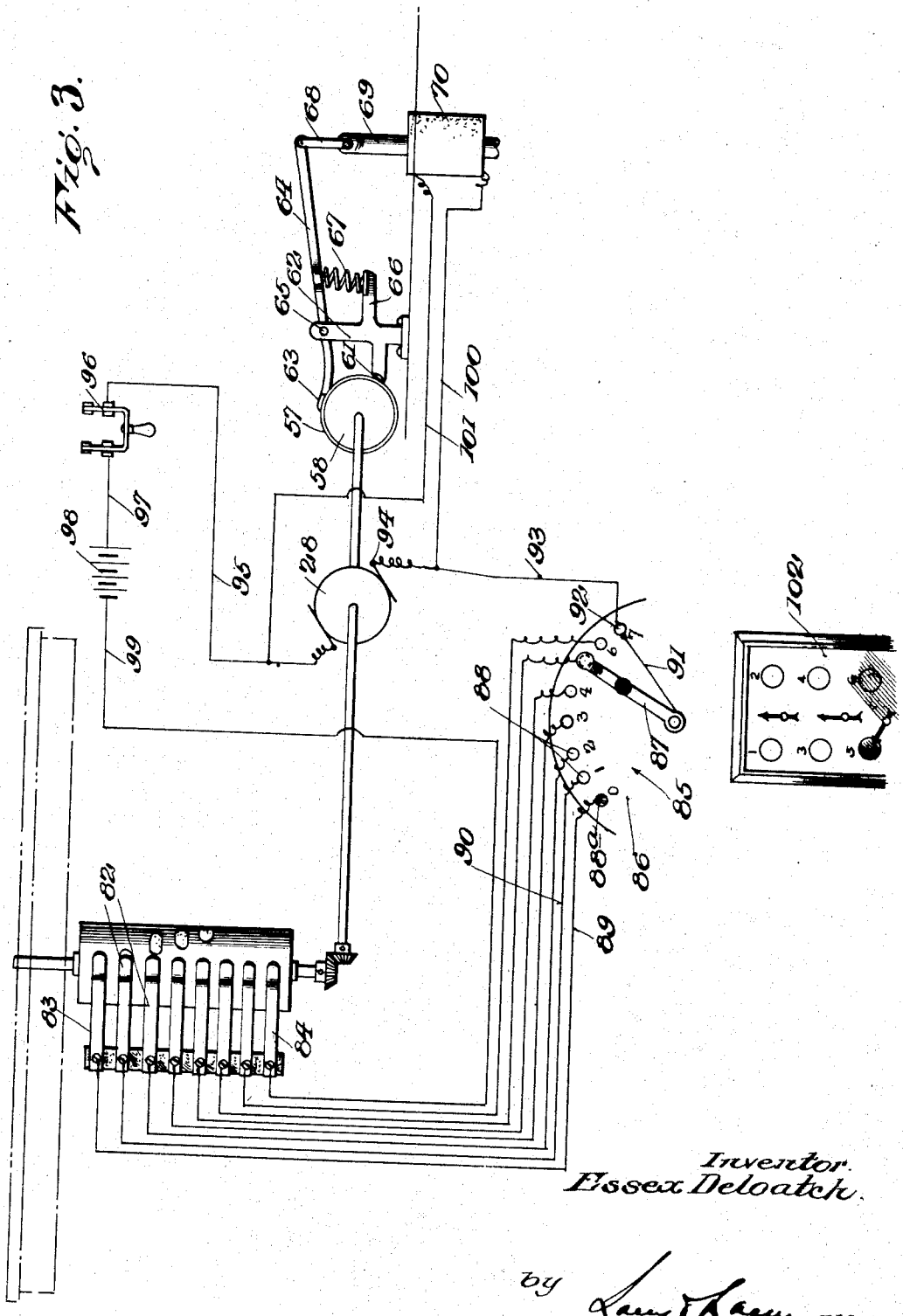
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MOTOR CONTROL SYSTEM FOR SELF SERVING TABLES

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3 Sheets-Sheet 3

Fig. 3.



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UNITED STATES PATENT OFFICE.

ESSEX DELOATCH, OF PHILADELPHIA, PENNSYLVANIA.

MOTOR-CONTROL SYSTEM FOR SELF-SERVING TABLES.

Application filed November 26, 1919. Serial No. 340,791.

To all whom it may concern:

Be it known that I, ESSEX DELOATCH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Motor-Control Systems for Self-Serving Tables, of which the following is a specification.

This invention relates to dining room, lunch room, or out-of-doors serving tables and has as its principal object to provide a table of such construction and capable of operation in such a manner that a large number of patrons may be expeditiously served without the employment of waiters or any considerable number of attendants.

Another object of the invention is to so construct the table and the operating means therefor that a large number of guests may be individually served from a serving station, means being provided whereby the food ordered by any guest may be delivered to that guest's place at the serving table, from the serving station, by a means passing in front of the guest thus obviating the annoyance caused by waiters reaching past the guests seated at the table.

Another object of the invention is to so construct the operating means that any desired number of tables may be attended to by a single operator of the mechanism.

The invention further has as its object to provide means whereby a number of persons may be served individually, severally, or all at the same time so that the invention is applicable for use where guests are constantly arriving at and leaving the table or tables or where a party of guests is to be served in courses, or where a banquet is to be served.

A still further object of the invention is to provide means whereby the used dishes may be readily collected from the table after a meal without the necessity of the attendant or attendants entering the dining room or walking around the table.

In the accompanying drawings:

Figure 1 is a perspective view illustrating in a general way the manner in which a number of tables constructed in accordance with the present invention may be arranged within a house and illustrating also in a general way the operating mechanism for controlling the several tables;

Fig. 2 is a vertical diametrical sectional view through one of the tables;

Fig. 3 is a semi-diagrammatic view illustrating the circuits controlling the movements of the table.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Inasmuch as all of the tables embodying the invention are of the same general structure, a specific description of one of the tables will suffice, and after having so described the single table, it will be pointed out in what manner the tables are to be arranged and operated where a number of them are employed, as for example upon the different floors of a building.

The table comprises a supporting pedestal which is indicated in general by the numeral 1 and which is preferably of the hollow or drum-like construction shown in the drawings, this pedestal being secured rigidly and permanently in any suitable manner to the floor of the room in which the table is arranged and being adapted to house certain circuit closing devices which are employed in controlling the movements of the movable parts of the table top, as will be presently explained.

Suitable supporting arms 2 radiate from the top of the pedestal 1 and at their outer ends are secured to and support an annular rim 3 within the bounds of which the table top proper is arranged, it being understood that this rim is rigidly supported and is immovable. In practice a number of seats 4 are arranged in an annular series about the table and suitably spaced from the rim 3 so that patrons may be comfortably seated at the table, and upon the rim 3 in front of each seat there is preferably arranged an electric push button 5 which may be pressed by the occupant of the respective seat to announce to the attendant that he is ready to be served and has written and placed his order in a manner which will be presently explained. Whether the invention is embodied in a single table or in a number of tables arranged in different rooms or in different portions of the same room upon the same floor of a building or in a number of tables arranged in rooms in different floors of the building, it is preferable that the table be arranged with one of its sides adjacent a partition wall which is indicated in Fig. 1 of the drawings by the numeral 6 and in which there is provided a window 7 through

which the attendant may pass the food to be served and otherwise superintend the serving of the guests. This window will hereinafter be referred to as the serving station, as a matter of convenience in describing the invention, and the several push buttons 5 will be in electric circuit with an annunciator board 8 preferably arranged upon the partition 6 beside the window 7. Thus when any one of the guests presses the push button at his respective station or place at the table, the indicator of the annunciator 8 corresponding to this particular station or place will be caused to register on the annunciator board to indicate to the attendant which of the guests requires service.

The table top is indicated in general by the numeral 9 and the same comprises a central section 10 and an annular section 11 which surrounds the said section 10, both sections, however, preferably occupying the same horizontal plane and the upper surfaces of both sections being substantially flush with the upper edge of the rim 3 so that the table top will as a whole present a substantially smooth and unbroken surface. The section 10 is designed to be rotated through the medium of a revolvable shaft as will be presently more specificially pointed out and this section is formed with an annular series of openings 12 in each of which is disposed a receptacle 13 preferably provided with a hinged lid 14 closing substantially flush with the surface of the said section 10. These receptacles 13 are designed to receive the dishes of food ordered by the guests, which dishes are placed in the receptacles when the receptacles are brought, through rotation of the section 10 of the table top, to position opposite the serving station 7, and of course when the section 10 is rotated to properly position its several receptacles 13 with relation to the various guests stations about the table, the dishes containing the articles of food may be removed by the guests after which removal they are placed upon the section 11. The section 10 is further preferably provided with a number of pockets 15 each arranged adjacent a respective one of the receptacles 13 and in these pockets the guests may place slips of paper upon which they have written their orders, and they may also place in these pockets the money to pay for the food ordered, the pocket serving the further purpose of containers for any change which may be due the guests and which is of course placed therein by the attendant at the serving station after he has taken out the amount of the order.

The section 11 of the table top is designed to be normally stationary and it may be so held by any suitable means but as the invention contemplates collection of the used dishes or other utensils by the attendant at the serving station, either before or after the guests have left the table, and these utensils would be left to remain by the guests upon the section 11, it is desirable that means be provided whereby this section may be connected for rotation with the section 10 when the collection of dishes or utensils is to be made. In order that this may be accomplished, any suitable means may be provided, such for example as one or more sliding bolts 16 mounted upon the under side of the section 11 and engageable in keepers 17 upon the underside of the section 10.

In order that the section 11 may be supported and guided for rotary movement whenever it is connected with the section 10, brackets 18 are secured upon the inner side of the rim 3 and anti-friction wheels 19 are mounted in these brackets and support the peripheral portion of the section 11, as clearly shown in Fig. 2. The section 11 is also provided upon its under side with a depending annular rail 20, and anti-friction wheels 21 which are mounted in brackets 22 in the rim 3, contact the outer surface of this rail and serve to center and guide the section 11. Of course when the bolts 16 are withdrawn from their keepers 17, the section 10 may be rotated independently of the section 11, the latter section remaining stationary and being held relatively fixed as above pointed out, but when it is desired to bring the used dishes or other utensils past the serving station or window 7 where they may be collected from the table, any one or several of the bolts 16 may be slid into engagement with the respective keepers and the section 10 then set in motion so as to impart corresponding rotary motion to the section 11, for the purpose stated.

The invention may find embodiment in an arrangement wherein several tables are arranged one above another or more specifically upon different floors of a building, as shown in Fig. 1, in which event means may be provided for independently rotating the sections 10 of the several tables and one such means is illustrated in Fig. 2 of the drawings.

In the arrangement illustrated in Figs. 1 and 2, provision is made for the independent operation of three tables, each table of course having its individual row of seats and its individual serving station and each being located upon a different floor of the building but all in axial alinement. To provide for the successful operation of these three tables, it is necessary to employ three operating shafts one of which is indicated by the numeral 23, another by the numeral 24, and the third by the numeral 25, the shafts 24 and 25 being sleeve shafts and the shaft 24 fitting upon and rotating about the shaft 23, and the shaft 25 fitting upon and rotating about the shaft 24. As illustrated the section

10 of the table top 9 of the table shown is secured in any suitable manner, as indicated by the numeral 26, to the upper end of the shaft 25. This table would be the lowermost one of the three tables, and the section 10 of the table on the floor next above it would be secured to the shaft 24, and the section 10 of the uppermost table would be secured to the shaft 23. The numeral 27 indicates a shaft which is preferably driven from an electric motor indicated in general by the numeral 28 and this shaft carries a master gear 29 having three sets of gear teeth one indicated by the numeral 30, another by the numeral 31, and the third by the numeral 32. The shafts 23, 24 and 25 are provided at their lower ends with bevel gears or pinions indicated respectively by the numerals 33, 34 and 35, these pinions or gears being held for rotation with the respective shafts by means of keys 36 which are so arranged, however, as to permit of sliding movement of the several gears upon their respective shafts. The shafts 23, 24 and 25 are counter to the shaft 27 and normally the gears 33, 34 and 35 tend to seat by gravity with their teeth in mesh with the gear teeth 30, 31 and 32 respectively of the master gear 29. Of course when any one of the gears 33, 34 and 35 is in mesh with the master gear and the master gear is rotated through the medium of the shaft 27 and motor 28, the corresponding shaft 23, 24 or 25 as the case may be, will be rotated thus rotating the section 10 of the corresponding table top. In order, however, that the sections 10 of the several table tops may be selectively rotated, it is necessary that some means be provided for elevating the gears 33, 34 and 35 out of mesh with the master gear 29 and controllable to permit any one or more of these gears to lower into mesh with the master gear. This means is preferably embodied in a system of levers illustrated in Figs. 1 and 2. Thus a plurality of rocking arms 37, 38 and 39 are mounted upon a suitable bracket 40 upon any suitable support in, for example, the basement of the house in which the tables are arranged, and these rocker arms are arranged to coact respectively with the gears 33, 34 and 35 so that when the outer ends of the arms are rocked downwardly, their inner ends will be swung upwardly to elevate the corresponding gears. In order that the arms may be so rocked, angle levers 41, 42 and 43 are mounted for rocking movement upon the bracket 40 and are connected by means of rods 44, 45 and 46 with the outer ends of the rocker arms 37, 38 and 39 respectively. Rods 47, 48 and 49 are connected to the other arms of the angle levers 41, 42 and 43 and may be manipulated through the medium of suitable pull ropes or cables 50 which hang within the basement of the house in convenient reach of an operator who is stationed in this portion of the house and who attends to the operation of the various tables. Of course the arrangement shown in Fig. 1 may be duplicated any required number of times by a suitable arrangement of shafting as illustrated in Fig. 1 so that more than one table upon each floor of the house may be operated from the common source or operating station when desired.

As above stated, the shaft 27 is driven from an electric motor 28 and preferably by the gear arrangement shown in Fig. 2 in which figure the numeral 51 indicates the motor shaft and 52 a worm which is fixed upon this shaft and which meshes with a worm gear 53 fixed upon a counter shaft 54. The shaft 54 carries a worm 55 which in turn meshes with a worm gear 56 upon the shaft 27. Thus while the motor shaft rotates relatively rapid, the motion imparted to the table sections 10 would be relatively slow so as not to spill the food contained within the compartments 13.

In order that the motor may be automatically stopped when the section 10 of any of the tables has been rotated to the desired position, a brake such as shown in Fig. 3 of the drawings is employed. This brake comprises a brake band 57 which surrounds a brake drum 58 fixed upon one end of the motor shaft 51. One end of the brake band is connected at 61 to an arm of a bracket 62 mounted upon any suitable fixed support adjacent the brake drum, and the other end of the band is connected as at 63 with one end of a lever arm 64 which is pivotally mounted as at 65 upon the said bracket. The bracket 62 is provided with an arm 66, and a compression spring 67 is disposed between the said arm 66 and the under side of the lever arm 64. Thus the spring 67 normally holds the arm 64 swung to such a position as to tighten the brake band about the brake drum. The other end of the lever arm 64 is pivotally connected to a link 68 which in turn is connected to the core 69 of a solenoid 70. At this point it will be evident that normally the brake is applied so as to prevent rotation of the motor shaft but that when the solenoid 70 is energized the lever arm 64 will be swung against the tension of the spring 67 so as to slacken the brake band 57 and thus permit rotation of the motor shaft until current again ceases to flow through the solenoid winding.

In order that the rotative movement of the table sections 10 may be controlled, electric circuit closing devices are provided as illustrated in Figs. 2 and 3 of the drawings. In these figures the numeral 76 indicates in general a contact drum which comprises a core 77 of insulating material fixed upon

the shaft for the respective table, and a sheathing or covering 78 of copper or other metal which is a good conductor of electricity. At predetermined points the contact sheathing 78 is cut away as indicated by the numeral 79 so as to expose the insulation 77. This contact drum is of course housed within the pedestal of the table, and supported within the pedestal upon suitable brackets 80 is a bar 81 of insulating material which carries a plurality of contact fingers certain of which are indicated by the numeral 82, these fingers touching the periphery of the drum 76 and being located each in the path of one of the openings or cut-away portions 79 so that the fingers or brushes 82 will be in electric contact with the sheathing 78 in the rotation of the drum except when one of the openings 79 is in position under the engaging extremity of the respective brush or finger. One of these fingers is indicated specifically by the numeral 83 and another by the numeral 84, the opening in the sheathing which is related to the contact finger or brush 83 being designated specifically by the numeral 79^a in Fig. 2 of the drawings. The sheathing is, however, not provided with one of the openings 79 moving in the path of the brush 84 so that this brush is continuously in electric contact with the sheathing of the drum. A controlling switch is illustrated in the drawings and is indicated in general by the numeral 85 and this switch comprises a switch board 86 upon which is mounted for swinging movement a switch lever 87 designed to be swung by hand so as to be thrown selectively into contact with any one of a series of contacts 88 upon the face of the board. One of these contacts, indicated specifically by the numeral 88^a, has connected to it a wire 89 which leads to the contact finger 83 and this contact will be referred to as the zero contact of the board. Other wires 90 are connected to the contacts 88 and to respective fingers 82. A wire 91 is electrically connected with the switch lever 87 and to a binding post 92 upon the switch board to which binding post is also connected a wire 93 leading to one of the brushes of the motor, as shown in Fig. 3, and indicated by the numeral 94. A wire 95 is connected with the other brush of the motor and leads to one pole of a knife switch 96. A wire 97 is connected with the other pole of this switch and to one terminal of the source of electric current supply illustrated diagrammatically in Fig. 3 and indicated by the numeral 98. A wire 99 is connected to the other terminal of the source of supply and to the contact finger 84. Wires 100 and 101 are connected to the terminals of the winding of the solenoid 70 and in shunt with the motor 28.

An annunciator board 102 is provided in the basement of the house or in any other room provided for the operator of the mechanism in which room the switch board 85 and its associated parts are likewise located.

As an example of the operation of the table, let it be assumed that the table is in zero position or, more specifically, that the section 10 thereof is in the position which it would assume when the switch lever 87 is turned to the contact 88^a. At this time there will be no current passing through the motor 28 for the reason that the contact finger 83 will be in engagement through the opening 79^a and in contact with the insulation 77. If now a person occupying number 5 position at the table wishes to be served he will write out his order and place the slip of paper containing the same within his respective receptacle 13 and will then press the push button 5 at his place at the table. The attendant at the serving station will note the corresponding registration upon the annunciator board 8 and will then notify the operator in the basement either by pressing a button (not shown) to actuate the corresponding indicator upon the annunciator board 102, or otherwise, whereupon the operator will throw the switch lever 87 into engagement with No. 5 contact, as shown in Fig. 3 of the drawings, thus closing the circuit through the motor and setting the motor in operation. The motor will continue to rotate and through its rotation the section 10 of the table will be rotated, until the receptacle 13 corresponding to No. 5 position and in which the patron has placed his order, is brought opposite the serving station 7, at which time that one of the contact fingers 82 which corresponds to the No. 5 position and which is electrically connected with the No. 5 contact on the switch board 85, will engage through its respective opening 79 in the sheathing 78 and rest in contact with the insulation 77. Of course in this manner the circuit through the motor will be broken and the motor will cease to rotate, it being furthermore arrested in its rotative movement because of the coaction of the brake with the brake drum 58 due to deenergization of the solenoid 70. It will be understood of course that the solenoid 70 is energized at the time the circuit is closed through the motor so that the brake is released at this moment and remains released until the circuit is broken, whereupon the brake becomes effective. The attendant at the serving station will now take from the receptacle 13 the order slip and will see that the order is filled and when filled will place the order in the corresponding one of the receptacles 13 which is of course at that time opposite the serving station. The lid 14 of the receptacle 13 will then be closed and

the attendant will notify the operator that the order is ready to be served whereupon the operator will throw the switch lever 87 to zero position and the circuit will thus again be closed through the motor and the motor will operate until the contact finger 83 engages through the opening 79ª and with the insulation 77, whereupon the circuit will be broken and the brake will be applied so as to stop the section 10 of the table in its zero position in which position all of the receptacles 13 will be opposite their respective places at the table.

Having thus described the invention, what is claimed as new is:

In a device of the class described, the combination of a table top section, a shaft carrying said table top section, an electric motor geared to said shaft to rotate the same in one direction only, a cylindrical core of insulation on said shaft, a sheathing of conducting material enclosing said core and having a series of circumferentially extending openings arranged in stepped relation longitudinally of the sheathing, a plurality of contact fingers supported at one side of said sheathing and bearing thereon in the planes of the respective openings, a finger bearing upon said sheathing axially beyond the series of openings, and means for closing a motor circuit through said last-mentioned finger and selectively through the first-mentioned fingers.

In testimony whereof I affix my signature.

ESSEX DELOATCH. [L. S.]