

June 7, 1955

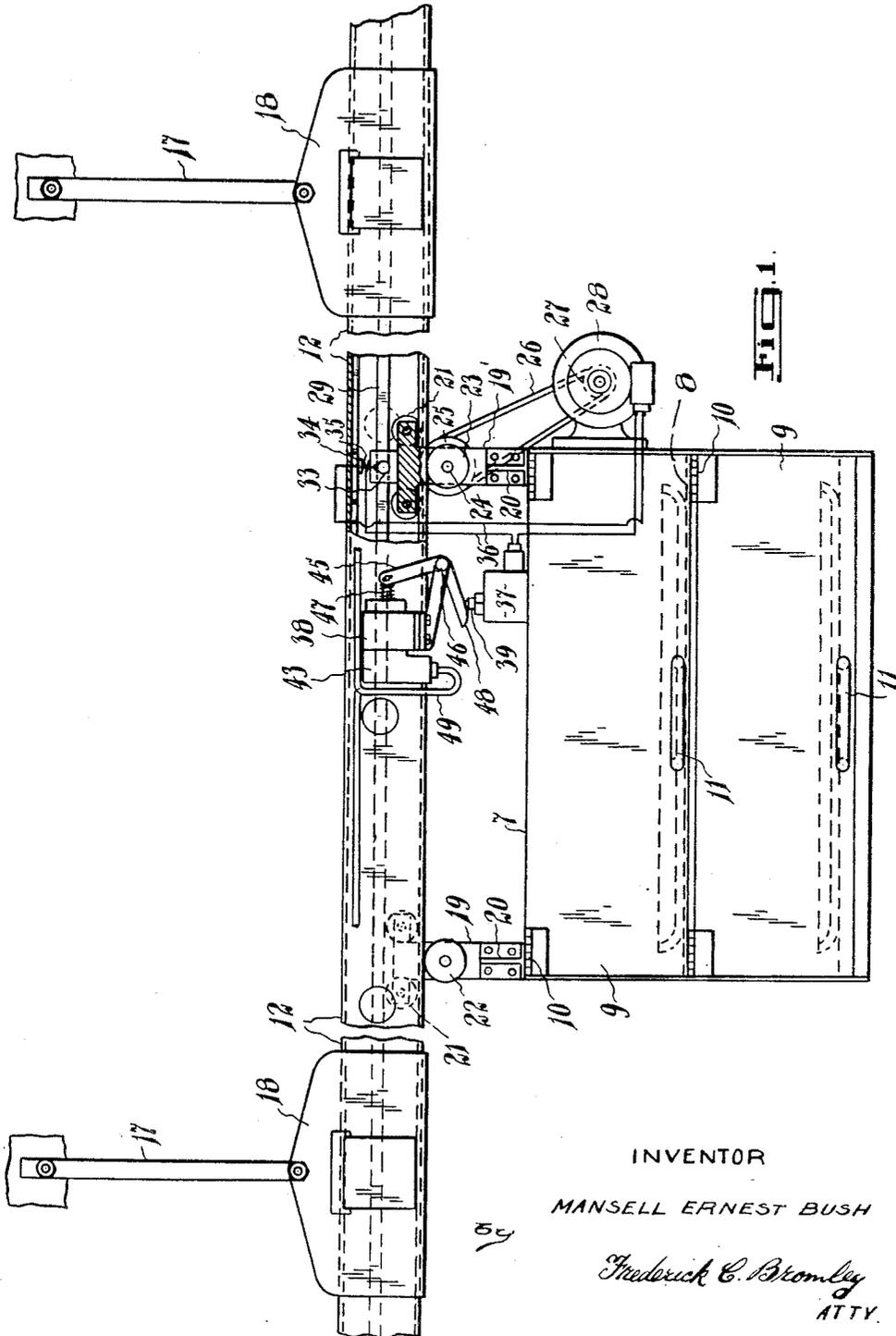
M. E. BUSH

2,710,319

ELECTRO-MECHANICAL TRAVERSE OPERATED SWITCH

Filed Feb. 8, 1951

3 Sheets-Sheet 1



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ELECTRO-MECHANICAL TRAVERSE OPERATED SWITCH

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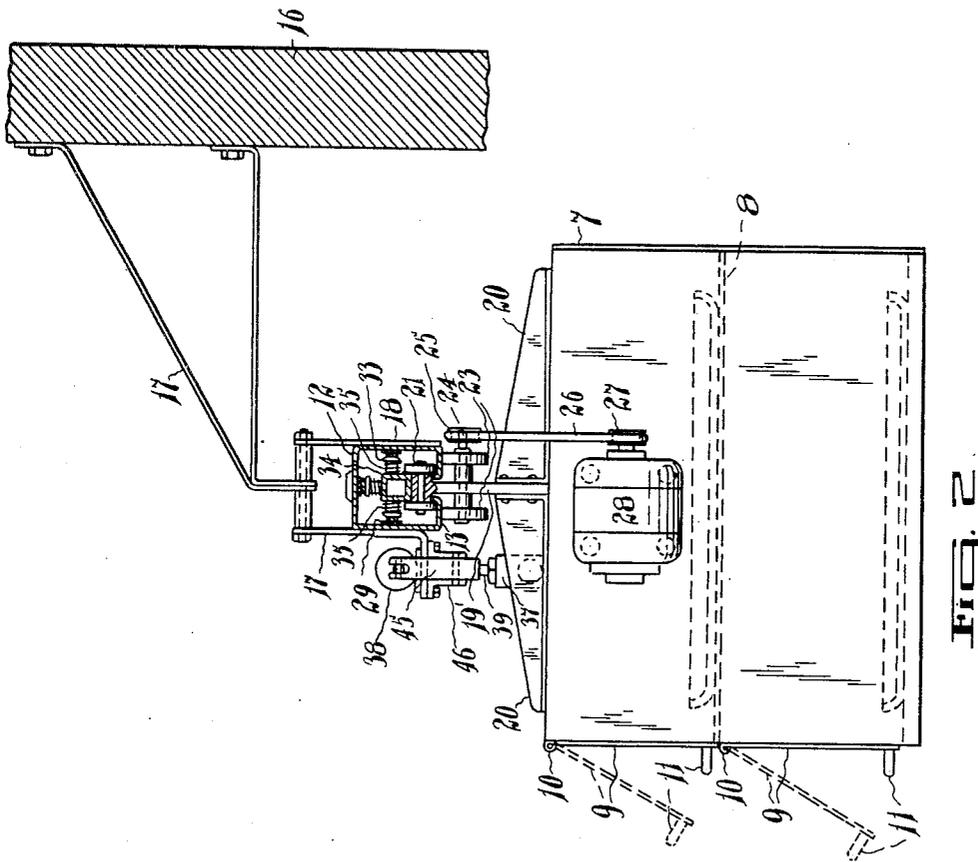


FIG. 2

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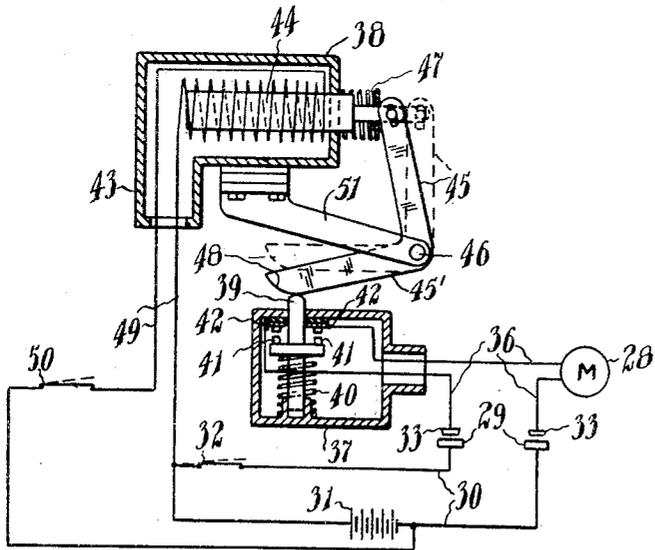
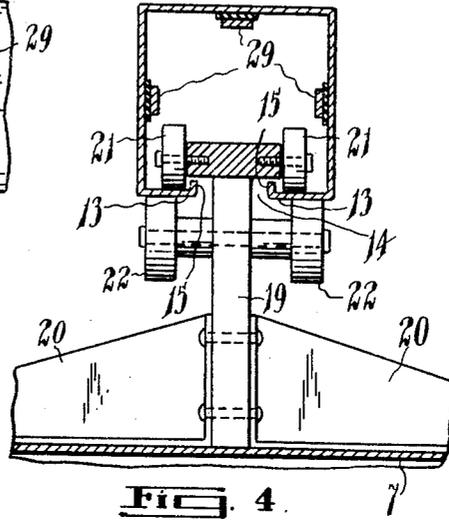
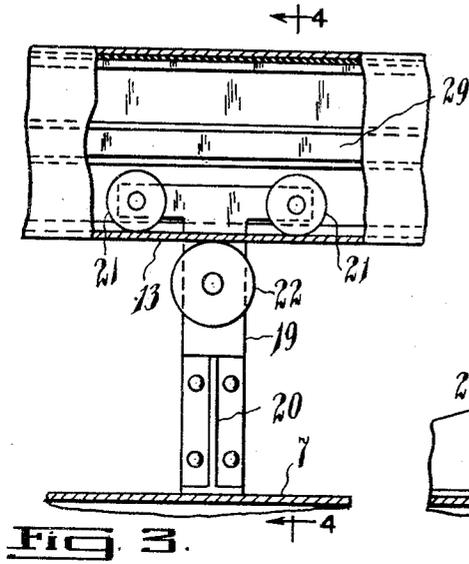


FIG. 5

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ELECTRO-MECHANICAL TRAVERSE OPERATED SWITCH

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1 Claim. (Cl. 200—61.44)

My invention pertains to carriers of the conveyor type and more particularly to dumb waiters for household and restaurant use.

The primary aim of the invention is to provide a carrier apparatus in the nature of a dumb waiter for carrying food from a kitchen to a dining room and for carrying empty dishes, et cetera from the dining room to the kitchen.

A further object is to provide an electro-mechanical waiter for transporting trays of dishes from place to place in order to obviate having to carry them by hand as is commonly done in a restaurant. The apparatus comprises a carrier basket suspended from a rail and movable therealong by means of a friction drive having an electric motor with a push button control.

The invention consists in the novel construction and arrangement of parts as described in the ensuing specification and shown in the accompanying drawings.

In the drawings,

Fig. 1 is a side elevation of a carrier apparatus embodying the invention.

Fig. 2 is an end view thereof.

Fig. 3 is an enlarged detail in side elevation of the rail and a support for the carrier basket.

Fig. 4 is a cross section on line 4—4 of Fig. 3, and

Fig. 5 is a schematic layout of the driving motor switch and the electro-magnetic trip for actuating the same.

The apparatus of my invention comprises a carrier basket generally denoted at 7 and of a box-like structure for containing a tray of dishes for transportation of food from a kitchen to a dining room. The basket also serves for the return of dishes to the kitchen and it may be supplied with one or more shelves, as at 8, for trays in order that a plurality of trays may be carried simultaneously. The interior of the basket may be accessible by doors 9 hinged as at 10 and supplied with individual handles as at 11.

A rail 12 suspends the basket for operational movements and is of a suitable length for extending from a kitchen to a dining room. Said rail is of a known tubular type having bottom walls 13 separated by an opening 14, Fig. 4, and supplied with guide flanges 15 which are upturned.

In the present instance the rail is shown as supported on a wall 16 by means of hangers 17. The hangers are attached to the rail by means of plates 18 which are rigidly fastened to the side walls of the rail in an approved manner. Instead of employing wall brackets the rail may be supported on the floor of a room by means of stands of a suitable construction. The rail provides a definite track for the carrier basket and it may be bent or curved through its length to suit a particular installation in accordance with requirements.

The carrier basket is supported to hang from the rail by means of the hangers 19 and 19', which hangers are located at the front and the rear of the basket and each comprises a member rigidly fastened to the top of the basket and braced as at 20. The members 19 and

19' extend upwardly through the opening 14 in the rail and are provided with wheels 21 which rest and move on the bottom walls 13 of the rail.

The front end of the basket is desirably held against upward displacement by means of idler wheels 22 journaled on the hanger 19 for engaging the exterior faces of the bottom walls 13. The rear end of the basket is provided with friction wheels 23 mounted on the hanger 19' below the rail and engaged with the exterior faces of the bottom walls 13. The friction wheels are rigid with a shaft 24 journaled on the hanger 19' and provided with a pulley 25. A belt 26 connects the pulley 25 to a pulley 27 carried by an electric motor 28. The motor is mounted on the basket and its operation drives the friction wheels for causing the basket to travel along the rail.

The motor 28 is reversible and its electric circuit is formed in part by buss bars 29 mounted within the rail to extend along the same. The buss bars are strips of conducting material fastened on the walls of the rail and insulated therefrom. The buss bars are electrically connected by means of a circuit 30 to a source of electric energy 31 as is diagrammatically illustrated in Fig. 5. The power source 31 is the ordinary commercial supply of A. C. current. The circuit 30 is switch controlled as indicated at 32 in Fig. 5. The switch 32 will be located on a control panel within the kitchen. The control panel is not shown since it is conventional in character and will be well understood by those schooled in the art of electrical controls.

Current from the buss bars 29 is picked up by an accumulator of a conventional character comprising the collectors 33 mounted on the hanger 19' by an element 34 and held in engagement with the buss bars by means of the springs 35. Conductors, as at 36, extend from the collectors 33 to the motor 28 in order to complete the circuit to the same. A switch 37 is interposed in one of the conductors 36 for stopping the motor when actuated by an electro-magnetic trip 38.

Switch 37 is mounted on the basket 7 at the top thereof and is of a standard type in which depressional movement of a member, indicated at 39, opens the circuit 36. An example of such a switch is shown in detail in Fig. 5, in which the member 39 is a plunger pressed to a projecting position by a spring 40 and carrying contacts 41 which are engaged with mating contacts 42 to close the circuit 36 when the plunger is in its projecting position. From this it will be understood that switch 37 is normally closed. Switch 32 is normally open and is conventional, being an ordinary manually operable switch of the "on and off" button type, for instance. Accordingly the motor 28 is set in motion by closing switch 32. The friction drive propels the basket along the rail until the motor is stopped by opening switch 37, which is automatically actuated by the electro-magnetic trip 38.

Trip 38 comprises a case 43 housing a solenoid 44 whose core is pivoted to one arm of a bell crank trip lever 45 fulcrumed at 46 to swing on a bracket attached to the case 43. Said case is attached to the rail 12. The trip lever 45 is disposed with its other arm 45' thereof arranged to swing downwardly into the path of travel of the plunger 39 when the trip lever is held in an effective position by energization of the solenoid 44. The solenoid is normally de-energized and its core is retained in an outer position by a spring 47. In this way the trip lever is held in a raised position, as shown in dash lines in Fig. 5, in which the arm 45' is clear of the plunger 39. The arm 45' has a cam face 48 which is capable of depressing the plunger when the trip lever is swung downwardly to its effective position by operation of the solenoid 44.

An electric circuit 49 connects the source of energy 31 to the solenoid, as is represented in Fig. 5. In Fig. 1 it will be noted that the circuit 49 is a cable extending along the outside of the rail. In the circuit 49 there is a control switch 50 (Fig. 5) which is normally open and is of the button type. When the switch 50 is closed the trip arm 45' is held in an effective position for opening the switch 37 to stop the motor. A plurality of the trips 38 will be used. One will be located in the kitchen and another in the dining room. As a matter of fact there may be a number of the trips 38 in the dining room so that the basket may be stopped at different places or stations as may be required for a restaurant.

The control panel in the kitchen may be equipped with a set of buttons for selectively stopping the basket at different stations within the dining room. Further button switches will be used in the dining room to return the basket to the kitchen according to the stopping stations that may be employed in the system. Such electric control equipment is well known in the art and does not require further comment.

From the preceding description it will be manifest that the invention provides a novel and serviceable carrier for carrying trays of dishes from a kitchen to a dining room as required in serving meals, and that the apparatus functions to return trays of dishes to the kitchen. The apparatus is designed to be employed in conjunction with a system of electric control buttons of a standard type. The invention presents a time and labour saving apparatus having distinctive features of construction as come within the scope of the appended claim.

What I claim is:

An electric control system for remotely supervising the stop and go action of a rail guided motor driven vehicle comprising a contact housing fixed on said vehicle and having a top enclosing wall portion provided with an aperture, a plunger vertically mounted in said housing for reciprocal movement and having an upper end occupying said aperture, a compression spring encircling said plunger within said housing and seated under compressive stress against shoulders to press the plunger upwardly so that the upper end thereof will normally project from said housing, a bridging contact member, means attaching said bridging contact member transversely upon said plunger and in insulated relation thereto at a point along the length thereof, a

pair of stationary contacts mounted in insulated spaced relation upon said top enclosing wall portion so as to be bridged by said bridging contact member in the normally projected position of said plunger, and a magnetically operating tripping device for said plunger including an apertured casing mounted on said rail at a selected point along the length thereof, a magnetically permeable plunger projecting freely through said apertured casing, spring means pressing this plunger outwardly of said casing to a predetermined limit of travel, a bellcrank pivoted on said casing and having a linked arm pivotally connected to the outer end of said plunger, said bellcrank also having an operating lever arm disposed to be swung downwardly into the path of travel of said upper end of said plunger when the said linked arm of the bellcrank is pulled by an inward movement of said magnetically permeable plunger, a solenoid electro-magnet mounted within said casing and having a winding which utilizes said magnetically permeable plunger as a core and urges the plunger inwardly when energized whereby to downwardly swing said operating lever arm for effecting a tripping action on the part of the first said plunger, and circuit means for selectively energizing said solenoid electro-magnet.

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