

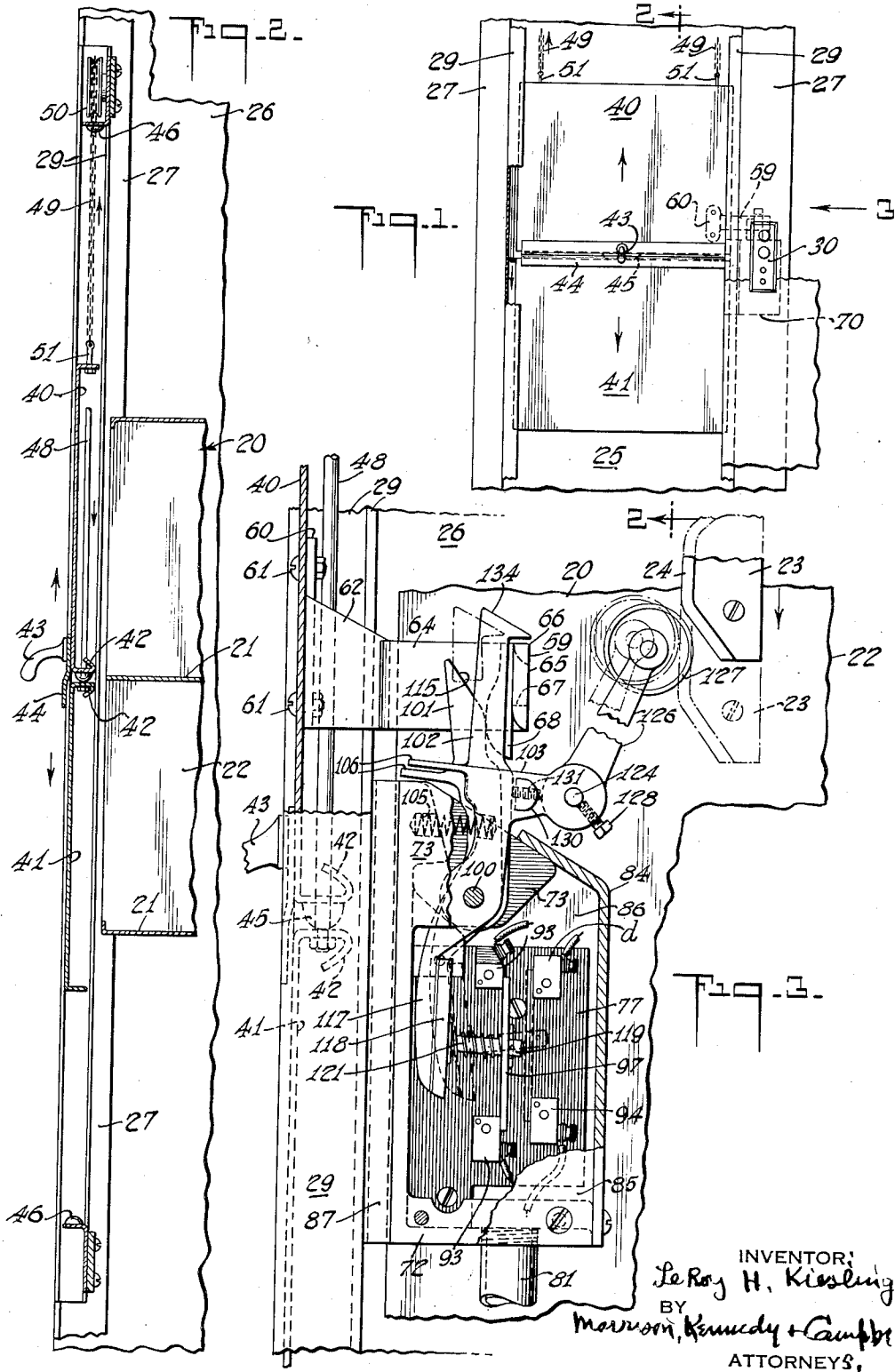
Jan. 30, 1940.

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DUMB WAITER CONTROL SYSTEM

2,188,357

Filed Nov. 11, 1937

3 Sheets-Sheet 1



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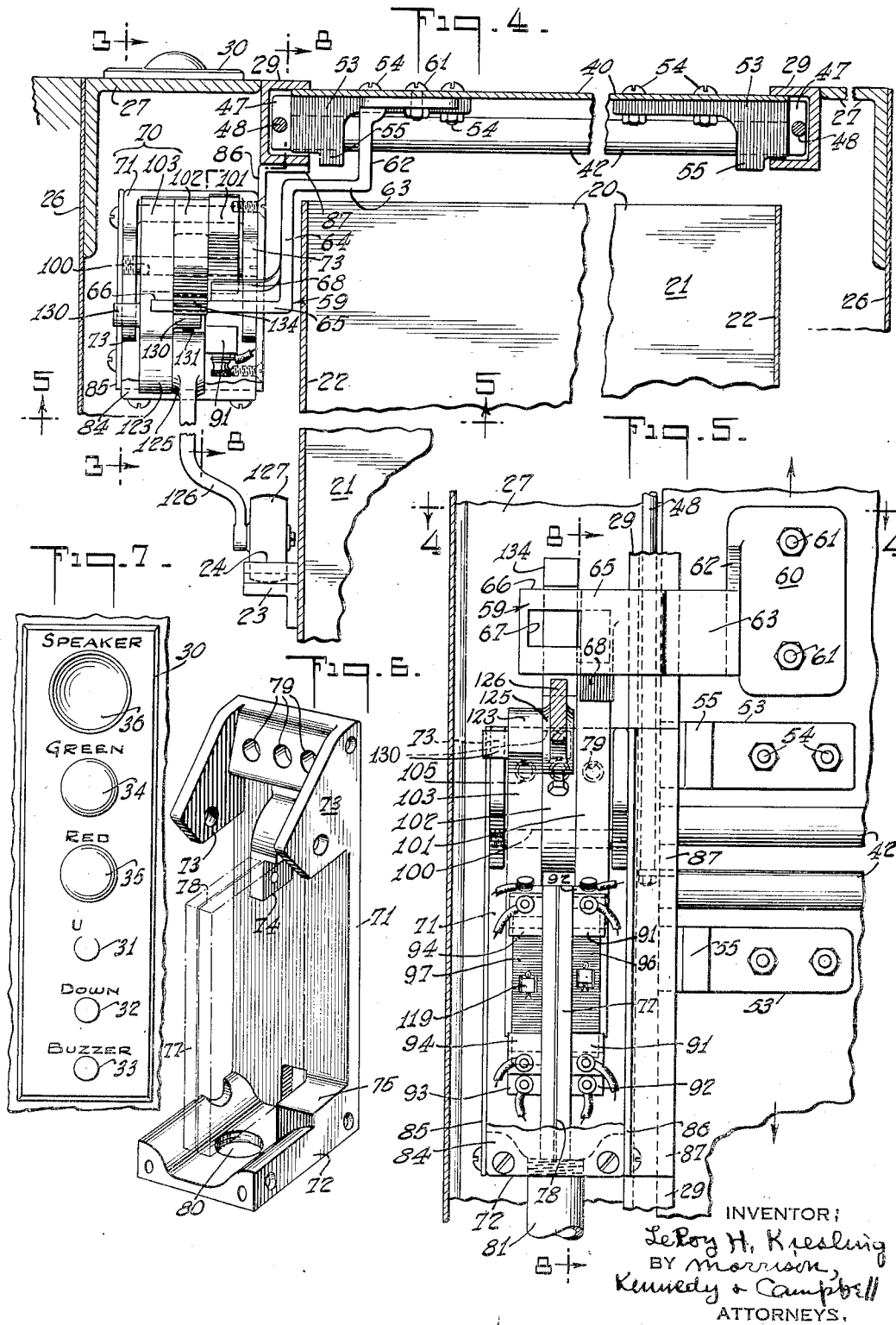
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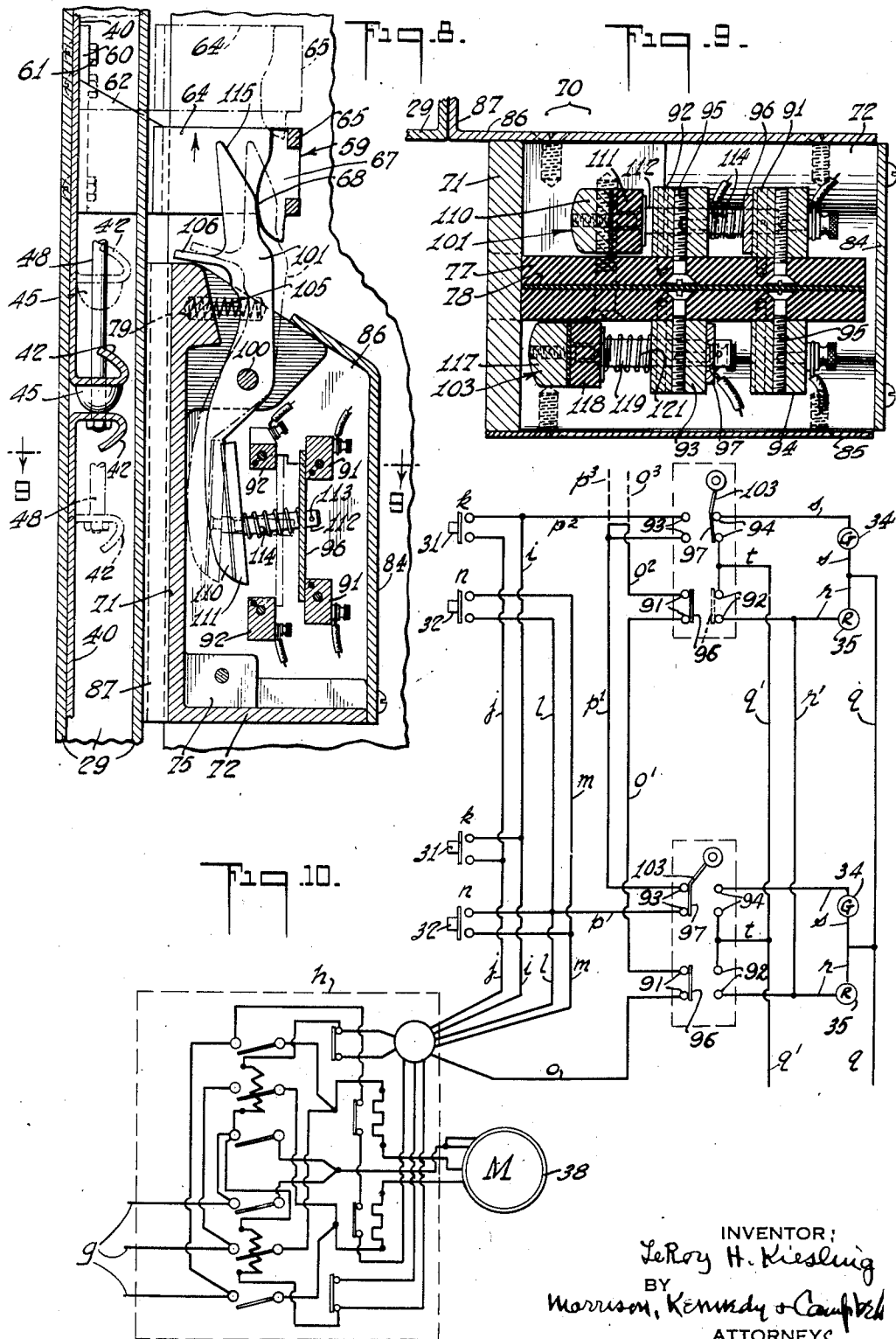
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3 Sheets-Sheet 3



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2,188,357

DUMB-WAITER CONTROL SYSTEM

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Application November 11, 1937, Serial No. 173,983

10 Claims. (Cl. 187—3)

This invention is a novel dumb-waiter control system, being intended more especially for use with any elevators having vertically slidable doors, particularly for dumb-waiters. The invention is shown applied to a dumb-waiter system having the biparting type of door, wherein a pair of doors, upper and lower, at each floor, have movements of separation and approach with self-balancing action.

The general object of the present invention is to provide an efficient and safe system of control for the operation of doors of dumb-waiters or other elevators, including the necessary indication at each floor of the movements of the car and other conditions. Another object is to afford completeness of control and indication by a means or mechanism which is readily and conveniently installed and operated. A further object is to afford a system of the kind mentioned in which the control mechanism or device is small and compact, simple in structure and inexpensive of manufacture, and which contains means adapted to provide all essential functions for the control, operation and indication of the movements of the car and doors. Other and further objects and advantages will be explained in the hereinafter following description of an illustrative embodiment of the invention or will be manifest to those conversant with the subject. To the attainment of such objects and advantages the present invention consists in the novel elevator door control system and the novel features of operation, mechanism, combination, arrangement and construction herein illustrated or described.

In the accompanying drawings:

Fig. 1 is a small scale front elevation of a door construction for dumb-waiters and the like embodying the present invention, the dumb-waiter not being shown.

Fig. 2, on a scale about $1\frac{1}{2}$ times larger than Fig. 1, is a vertical section taken on the line 2—2 of Fig. 1 and looking from the right hand side thereof, this figure being extended vertically to show the disposition of the flexible or chain connection between the upper and lower doors.

Fig. 3, on a larger scale, about six times that of Fig. 1, is a right elevation of the control mechanism, a side cover plate being broken away to show better the interior parts; this view may be considered as taken substantially on the line 3—3 of Fig. 4.

Fig. 4 is a top plan view partly in section on the horizontal section line 4—4 of Fig. 5; this and

Figs. 5, 6 and 8 being on the same scale as Fig. 3.

Fig. 5 is a rear elevation taken partly on the section line 5—5 of Fig. 4, the dumb-waiter being omitted.

Fig. 6 is a perspective view of the supporting body or frame casting of the control mechanism, with all working parts removed, but the position of the supporting insulation or wall being indicated in dotted lines.

Fig. 7 is a face view of the flushplate or fixture as provided at each floor, with buttons, lamps, etc.

Fig. 8 is a right elevation and vertical section view, similar to Fig. 3, but taken on the vertical section line 8—8 of Fig. 4.

Fig. 9, on a scale $1\frac{1}{2}$ times larger than that of Fig. 3, or nine times that of Fig. 1, is a horizontal section view taken on the section line 9—9 of Fig. 8, looking from above.

Fig. 10 is a wiring diagram of electric connections such as may be used with the apparatus of the other figures.

Among the controls effectively provided by the means to be described are the following. The door at each floor or landing is locked in its closed position, except when unlocked by the presence of the car at the floor. The wiring diagram indicates only two floors, but the system is readily extensible to three or more. Whenever the car is at a given floor this not only unlocks the door but indicates this condition by putting on or illuminating the green light. The door itself, or pair of biparting doors, is opened and closed manually. Whenever the door at any floor is open this puts on the red light not only at that floor but at all other floors, thus indicating that the car is in use. By a button-controlled switch a circuit may be set manually to cause the lifting or lowering of the car, the circuit however being otherwise open and preventing operation when any door is open.

The drawings indicate an elevator or dumb-waiter 20 which may be of usual type having one or more shelves 21 and side walls 22, the dumb-waiter being open in front facing the wall opening at each floor. As best shown in Figs. 3 and 4 the dumb-waiter is provided with an actuator or projecting cam member 23 shown as an outstanding lug having a cam incline at both its lower and upper ends, with a vertical surface or dwell 24 between, and cooperating with a stud or roller 127 to actuate a lever 103 as will be later described.

The dumb-waiter slides vertically in the usual shaft indicated by its rear wall 25 and its side walls 26. As part of the building construction

there may be provided at each floor a vertical angle piece 27 constituting part of the front wall of the shaft or way. Mounted on or adjacent to the vertical angles 27, as by conventional fixtures, at each side, are shown the door guides 29 in the form of vertical channels, provided at each floor or extended through the building from floor to floor. On the front face of one of the angle irons 27 is shown a panel plate 30, being of usual character and provided with control buttons 31 and 32 for causing upward and downward travel of the dumb-waiter, and a button 33 for operating buzzers at other floors, and green and red lamps 34 and 35 to indicate respectively the presence of the dumb-waiter and the position of the doors; also a mouthpiece or speaker 36, of tube form or otherwise, for vocal communication from floor to floor.

The car is to be understood as being lifted and lowered by cables, pulleys and drums of usual kinds, not shown, preferably by an electric motor 38, shown only in Fig. 10, controlled through the circuits indicated or any conventional means.

Referring next to the dumb-waiter doors, these preferably comprise an upper door 40 and a lower door 41 both running in the channel guides 29 and operating reversely in the manner of so-called biparting doors. Each door has a backwardly curled flange or bead 42 adjacent to the other door, and a simple flange at its opposite edge. The upper door has a frontwardly projecting handle or lever 43 for opening the doors, and this may be attached on top of a cross plate 44 extending below the upper door and overlapping the lower door to seal the gap in a fireproof manner. Between the doors may be provided one or more cushions or bumpers 45 to prevent impact and noise, and each door may have a bumper 46 at a suitable place to break the shock of impact when the doors are opened.

As usual the biparting doors hereof are suspended and interconnected in a manner to afford mutual counterbalance. The upper flange or bead 42 of the lower door is extended somewhat laterally at 47, see Fig. 4, this extension at each side having secured to it a vertical rod or hanger 48 which extends upwardly and is connected, in usual manner, to a flexible element or chain 49 which runs over a high pulley 50 and thence down to a fitting 51 connecting the chain to the top flange of the upper door. When the upper door is closed down the lower door rises to it and when the upper door is there locked this locks also the lower door against opening. For the easy running of the doors 40 and 41 in the vertical guides 29 each door may have two or more loosely fitting shoes 53, shown in Figs. 4 and 5, engaging the guides, and attached to the doors at both vertical edges by bolts 54. To restrict lateral play each shoe has a rear flange 55 projecting beyond the rear flange of the guide channel.

Just as the dumb-waiter has an actuator, projection or cam member 23 cooperating with the control means, so the doors have an actuator 59 for control purposes, applied for convenience to the rear side of the upper door, shown in Figs. 1 to 5 and Fig. 8. It cooperates with and actuates a control lever 101 to be described, while lever 102 engages it for locking the door.

This actuating member, or cam 59 is in the form of a bracket having its base or foot 60 secured by bolts 61 to the door. The bracket has a conformation to bring its operating end near the levers, being shown with a web 62 extending rearwardly from the foot and then a web 63 ex-

tending outwardly, to the right, thus clearing the guide 29 at the right side of the doorway. A second rearward web 64 carries at its extremity the operating end or head 65 of the actuator or bracket 59. The head 65 extends horizontally to the right or outwardly, and has a top edge 66 constituting a shoulder cooperating with the hook 134 of lever 102, and an aperture or window 67 below this edge providing a secondary edge or shoulder for cooperation with the hook. Further, the head 65 at its front side has an enlargement 68 in the form of a vertical cam or lug adapted to swing the lever 101.

The actuator or bracket 59 with its active portion or head 65 moves up and down with the opening and closing of door 40, and when the door is down or closed this positions the head to cooperate with the levers as will be further described. Manifestly, the lower door might be omitted and the controls hereof applied to a single door 40 moved down and up to close and open it, or vice versa.

Having described the dumb-waiter car 20 and the doors 40 and 41 at the several floors, the remainder of the description refers first to what will be called the control mechanism or device 70, of a mechanical nature, cooperating with the actuators 23 and 59 of the dumb-waiter and the doors, and then the electrical arrangements and circuits cooperating therewith to afford the desired operations, controls and indications in the running of the dumb-waiter.

The control mechanism or device 70 is indicated in Fig. 1 as to its preferred location, within the shaft at one side, and is shown in detail in Figs. 3 to 6 and 8 and 9, the switches thereof being also shown diagrammatically in the wiring diagram Fig. 10. The control device is compact and unitary in character in that its various parts are all mounted on the same support or frame 71, this being shown separately in Fig. 6 as a frame casting or body suitably supported in the dumb-waiter shaft and carrying the switches, levers and other parts to be described. This main casting 71 comprises a lower wall or base 72, and near the top a pair of opposite side ears or flanges 73. At the interior is an upper lug 74 and a lower lug 75, these serving for the rigid mounting of a central insulating wall or block 77, indicated by dot-and-dash lines in Fig. 6 and being built up of two insulating plates and a separating sheet 78, see Fig. 9. The main casting has also, near the top, a set of sockets or holes 79 to receive springs for the operating levers. The bottom or base has a hole 80 to which is attached a pipe or connection 81 through which the conducting wires are carried out of the mechanism and to the various points explained on the wiring diagram. This frame or body carries compactly the assembly of levers and contacts to be described.

The control mechanism or unit 70 is preferably enclosed, and the main casting 71 has attached to it a bent rear cover plate 84, a left cover or plate 85 and a right cover 86, the last mentioned having a bent extension 87 welded or bolted to the right hand guide channel 29, for the mounting of the control device, as best seen in Figs. 3, 4 and 9.

Mounted on the central insulating wall or partition 77 are several pairs of electric contacts, two pairs at each side, affording two double-pole double-acting switches. Thus at the left side of the insulating partition is a front contact pair 92 and a rear contact pair 91 best seen in Figs. 5,

8 and 9. At the right side is a front contact pair 93 and a rear contact pair 94, see Figs. 3, 5 and 9. These several contact pairs 91 to 94 bear the same designations as Fig. 10. The several contacts are in the form of brass blocks fixedly mounted by means of screws 95, the heads of which are insulated from the opposite screws by the supplemental insulating sheet 78 between the two halves of the wall as Fig. 9 shows. The first and second contact pairs 91 and 92 of one switch are adapted to be contacted by a movable contact in the form of a blade or bridge 96, while the two contact pairs 93 and 94 at the right side have a corresponding movable switch blade 97. The respective switch blades 96 and 97 also bear the diagram designations 96 and 97. There are thus really four switches which are later designated 91, 96 and 93, 97 for operation control and 92, 96 and 94, 97 for the signal lamps.

Coming now to the operation of the switch members or blades 96 and 97, these are mounted upon so as to be moved by certain levers of a lever set. Thus pivoted on an axle 100, which is mounted in the side flanges or ears 73, are a left hand lever 101 actuated by the movements of the door, a middle lever or finger 102 having a hook to lock or anchor the door, and a right hand lever 103 actuated by the movements of the dumb-waiter or car. The levers 101 and 103 respectively operate the switch blades 96 and 97, lever 103 also controlling finger 102 for locking the door. Each of the three levers has a spring 105 pressing it rearwardly, and each has a thin frontward extension or guard 106, best seen in Fig. 3, to exclude foreign matter that might block the lever movements. The spring 105 pressing lever 101 rearwardly may be supplemented by a positive means in the form of a front complementary lug or cam on the head 65 opposite to the lug 68 so that when the upper door opens upwardly the front lug will positively engage and throw rearwardly the lever 101 to open the circuit in case the spring may have failed or be unable to throw the lever, thus assuring safe operation.

The switch blade 96 may be operated from the left lever 101 as follows: The lever has a downward extension 110 carrying at its rear side a thick insulation strip or piece 111. On this insulation is mounted a rearwardly extending post 112, the rear extremity of which carries the contact blade 96. The post is preferably flat sided or square in section and the blade is fitted loosely thereon so that it may rock and adapt itself to its frontward and rearward contacting positions. In effect the post is the shank of the blade, the blade being tiltable upon its shank. The extremity of the post or shank has a stop 113 in the form of a cotter pin, and in front of the blade the post is surrounded by a compression spring 114 holding the blade yieldingly against its stop. In Fig. 8 the blade is shown in its normal or rearward position, the door being closed and the lever swung; its forward position being shown in dotted lines. This figure shows that in the rearward swinging of the lever the post has slid somewhat through the blade, compressing the spring, and that this action causes a slight upward movement of the blade, by which it is wiped along the rear contact blocks, tending to keep clean the surfaces. The top end of the lever 101 has an incline or cam surface 115 contacted and operated by the front cam 68 of the door-operated actuator 59, so that when the door is in closed position the lever is

swung and the contact blade shifted rearward from contacts 92 to contacts 91.

The connection from the right lever 103 to blade 97 is similar, Figs. 3 and 5. The lever downward extension 117 carries insulation 118 supporting a post 119 having an end stop or cotter pin 120, the post or shank surrounded by spring 121 pressing the blade 97 toward the stop. At its upper end the right lever 103 has a rearwardly extending arm 123 in which is a transverse stud 124 supporting the hub 125 of an extension or arm 126, shown in Fig. 3 set at an upward rearward slant, and carrying a follower or roller 127 at its extremity cooperating with the car-operated actuator or cam lug 23. By a set screw 128 securing the parts 123 and 125 to the stud 124 the extension 126 and roller 127 can be adjusted into correct relation to the operating lug.

The right lever 103 has cooperative relation to the middle lever 102, afforded as follows: At the inner or left side of lever 103 is a projecting lug 130, which thus stands behind lever 102, so that the rearward swinging thereof is limited by said lug. Preferably the lever 103 has such a lug 130 at each side, so that for certain installations the right and left hand levers may be reversed if desired. For adjustment purposes the lug 130 carries a set screw 131 which may be turned so as to set the proper initial position of the middle lever or hooked finger.

As already explained the middle lever is a hooked lever, having a rearwardly facing hook 134 at its top, for engaging the top edge 66 of the door-operated actuator 59 mounted on the upper door 40. The relation is such that when the hook is at its rear or normal position it overlies the actuator and thus locks down the door, which serves to hold the two doors locked in closed position. The aperture 67 below the top edge of the door member is for safety purposes, presenting a second edge adapted to lock the doors if for any reason the hook should miss engagement with the top edge.

Referring next to the wiring diagram Fig. 10, this shows a simple installation with only two landings or stories. The car is assumed to be at the upper or second story, and the door there closed; but in dotted lines the position is shown when the door is open. At each floor the elements 91 to 97, already mentioned, are illustrated as follows: The contact pair 91 is shown, normally connected or closed by blade 96 when the door is closed, and the opposite contact pair 92, which is normally open but is closed by blade 96 when the pair 91 is opened. The contact pair 93 is shown, normally closed by blade 97 when the car is absent, and the opposite contact pair 94, which is normally open but is closed when the car is present at the floor. The diagram therefore shows that at the lower floor the door is closed and the car is absent, while at the upper floor the car is present but the door is closed, the blade 96 to become shifted across from 91—91 to its dotted line position at 92—92 when the door is opened.

Much of the wiring may be conventional. Assuming the 3-phase system there are shown three line wires *g* leading into a control enclosure or box *h* in which conventional arrangements are shown, but need not be described, the control serving to feed the line wire energy to the motor 38, which is reversible for lifting and lowering the car.

Extending from the control box *h* are shown 5 wires, three of which *i*, *j* and *o* cooperate, under the 3-phase system, in operating the motor to lift the car, and three of which, *l*, *m* and the mutual wire *o* cooperate for lowering the car. Wires *i* and *j* thus constitute part of a circuit, and can be connected by a switch *k* by means of the up push button 31 at either landing thereby to cause motor operation to raise the car. Similarly, wires *l* and *m* leading from the box *h* are adapted to be interconnected by a switch *n* by means of the down button 32 at either floor to cause control operations to lower the car. Cooperating with each of these circuits, is the third or common conductor *o* extending from the box *h* to one of the contacts 91 at a certain floor, for example the lower. From the other of these contacts 91 the circuit *o* is continued by a wire *o'* extending to one of the contacts 91 of the upper floor, and from the other contact 91 extends a wire *o*² connecting with the wire *p'* to be mentioned and thereby with one of the contacts 93 at each floor. All the contact pairs 91—91 are thus connected in series in the circuit *o*, *o'* *o*².

Further control circuits are as follows. A wire *p* is shown extending from the wire *l* to one of the contacts 93 at the lower floor; and from the other contact 93 extends a wire *p'* to a contact 93 at the upper floor; with a further wire *p*² from the other contact 93 to the wire *i*. These described circuits sufficiently afford control of the movements of the car. As stated, conductors *i*, *j* and *o* cooperate under the 3-phase system, when properly connected, to cause motor operation to raise the car, and similarly conductors *l*, *m* and *o* to lower it.

The diagram shows at each floor a safety or green light 34 and a danger or red light 35 indicating, respectively, that the car is at hand so that it is safe to open the door, and that some door is open and the car is in use. A source of current for the lamps is indicated as comprising line wires *q* and *q'*. Each red lamp is in a local circuit *r* extending from one of the contacts 92 to the line *q*; and there is a connecting wire *r'* connecting the two circuits *r*, so that when one red light is on, all are on. Each green lamp is in a local circuit *s* extending from one of the contacts 94 to the line wire *q*, but with no wire connecting *s* with *s*. In each case the other contact 92 and other contact 94 are connected to line *q'*, for example by a common wire *t*. This completes the description of the circuits shown as illustrative.

A typical mode of operation of the described control mechanisms and circuits may be as follows. As shown on the diagram Fig. 10 the following are the existing conditions. At floor one there is no car; the door is closed and is locked by the hooked lever 102; the switch blade 96 rests on the contacts 91—91, as in Fig. 8, thus connecting wires *o* and *o'*; the blade 97 rests on contacts 93—93 as on Fig. 3, thus connecting wires *p* and *p'*; the green lamp is off, showing the absence of the car, and the red light is off showing that no door is open and that therefore the car can be shifted. At floor two the car is present and has shifted lever 103; the door is closed, but unlocked by lever 102; the switch blade is on contacts 91—91 as at floor one, closing the circuit *o'* and *o*²; however the blade 97 has shifted across from contacts 93—93 to 94—94, thus lighting the green lamp and showing that the door is free to be opened; the green

light is on but the red light is off. Under these conditions the car may be used at floor two by opening the door, or it may be moved to floor one by button 32 and switch *n*.

If at floor two the door be opened this reverses the blade 96, moving it from 91—91 to 92—92, as shown in dotted lines; the bridging of 92—92 puts on the red light, and wire *r'* causes the red lights to go on at all floors; by leaving contacts 91—91 the blade 96 has broken the circuit *o*, *o'*, and as this circuit is essential to the energizing of the motor 38, this adjustment prevents any operation of the car while the door is open. Again closing the door at floor two restores the conditions as first recited.

While the car is at floor two, and the door closed, the car may be caused to descend by operating button 32 and switch *n* at either floor, this bringing into operation the wires *l* and *m* in connection with the third wire *o*; the circuit *o*, *o'* being now closed the conditions are such that the closing of switch *n* operates through the control box *h* to energize the motor 38 in a direction to lower the car. As soon as the car starts down this releases lever 103 and blade 97 or 97 which blade therefore shifts back from contacts 94—94 to 93—93, closing the circuit *p'*, *p*²; at the same time the circuit *s* is broken turning off the green safety light 34. When the car reaches floor one the blade 97 at that floor is thrown across from 93—93 to 94—94, and conditions are set which are just the reverse, floor for floor, of those shown in the diagram. It is to be understood that there is an over-travel device below the lowest point of car travel and above its highest point, to change suitably the controls and stop the car; this being well known is not herein shown or further described. The described system is applicable to an installation of more than two floors, and in Fig. 10 are indicated extension wires *o*³ and *p*³ which, with other rearrangements, may adapt the system to additional floors.

The switches at each floor, other than the panel or button switches *k* and *n*, may be designated as comprising four switches operated by levers 101 and 103, as follows: door-actuated switches, 91, 96 to control the operating circuits, and 92, 96 to control the red light; car-actuated switches, 93, 97 to control the operating circuits, and 94, 97 to control the green light.

When the car is at the top floor, the top switch 93, 97 is open, as shown, which prevents wires *o*, *o'*, *o*² being linked to wires *p*², *i* and *j*, so that the panel up-switches *k* are inoperative to cause further up-travel. Similarly if the car is at the bottom floor the switch 93, 97 there is open and prevents operation by panel down switches *n* to cause further down travel. These openings of switches 93, 97 to prevent improper operation could be dispensed with if limit switches serve the same purpose. If there be three floors the switch 93, 97 at the middle floor should not be so rendered inoperative and the contacts 93, 93 there may be permanently connected.

I claim:

1. For a dumb-waiter system of the kind having an electrically operated car, a vertically openable door at each floor, a car operating circuit with up and down manual switches at the several floors, a door-indicating circuit, and a car-indicating circuit, with indicators at the several floors showing the locations of the door and car respectively; a unitary control mechanism

adapted for use at each floor, comprising in combination, a frame 71 adapted to be attached in the dumb-waiter shaft adjacent to the car path and door, and the following elements mounted on said frame, a door-actuated spring-restored first control lever 101 cooperating with a projection of the door, a car-actuated spring-restored second control lever 103 cooperating with an actuator on the car, and a separate spring-restored door-locking third lever 102 cooperating with said door projection, said levers being compactly mounted on said frame in generally upright positions in a manner for shifting in adjacent parallel planes, a first operation-controlling switch 96, 91 closed by the first lever when the door is closed, a second operation-controlling switch 97, 93 opened by the second lever when the car is present, a door-indicating switch 98, 92 opened by the first lever when the door is closed, and a car-indicating switch 97, 94 closed by the second lever when the car is present, and said second lever having a connection to the third lever whereby it may shift the third lever against its spring to door-unlocking position when the car is present.

2. For a dumb-waiter system of the kind having an openable door at each floor, a car operation controlling circuit with up and down manual switches at the several floors, a door-indicating circuit and a car-indicating circuit, for showing at each floor the locations of the door and car respectively; a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated spring-restored first control lever, a car-actuated spring-restored second control lever, and a separate spring-restored door-locking third lever, said levers being adjacently mounted on said frame in a manner for shifting in substantially parallel planes, and said second lever having a connection to thrust the third lever against its spring to door-unlocking position when the car is present; a first operation-controlling switch reversed in condition by the first lever when the door is closed or opened, a second operation-controlling switch reversed by the second lever when the car arrives or departs, a door-indicating switch reversed by the first lever when the door is closed or opened, and a car-indicating switch reversed by the second lever when the car arrives or departs.

3. For a dumb-waiter system of the kind having a vertically sliding, downwardly closable door at each floor, and a car operation controlling circuit with manual switches at the several floors, a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated first control lever swung into normal operative position by the downward closing movement of the door and returned back to inoperative position by the opening of the door, a car-actuated second control lever swung out of normal operative position by the presence of the car, and a separate door-locking third lever swung out of normal locking position by the presence of the car, said three levers being arranged upright and adjacently mounted on said frame in a manner for separate shifting in substantially parallel planes, the first lever having an arm extending upwardly for its actuation into normal position by the closing descent of the door and means for restoring it to inoperative position by the opening movement of the

door, the second lever having an arm extending upwardly and laterally for its actuation by an actuator on the car upon the arrival of the car, and there being a connection between said separate second and third levers whereby the second lever thrusts the third lever out of its normal door-locking position when the car arrives; a first operation-controlling switch reversed into closed condition by the first lever when the closing of the door causes the first lever to swing into operative position and back into open condition when the opening of the door causes the first lever to swing into inoperative position, and a second operation-controlling switch reversed into open condition by the second lever when the presence of the car swings the second lever out of operative position.

4. For a dumb-waiter system of the kind having a vertically openable and closable door at each floor, and a car operation controlling circuit with manual switches at the several floors, the improvement consisting in a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated first control lever adapted to be swung into normal operative position by the vertical closing movement of the door and returned back to inoperative position by the opening movement of the door, a car-actuated second control lever adapted to be swung out of normal operative position by the arrival of the car at the floor, and a separate door-locking third lever adapted to be swung out of normal locking position by the arrival of the car, said three levers being arranged upright and adjacently mounted on said frame in a manner for separate swinging movements in substantially parallel adjacent planes, the first lever having a vertical extension for its actuation into normal position by the closing movement of the door and there being means for restoring the first lever to inoperative position by the opening movement of the door, the second lever having a vertical and lateral extension for its actuation by an actuator on the car upon the arrival of the car, and there being a connection between said separate second and third levers whereby the second lever thrusts the third lever out of its normal door-locking position when the car arrives; a first operation-controlling switch reversed into closed condition by the first lever when the closing of the door causes the first lever to swing into operative position and shifted back into open condition when the opening of the door causes the first lever to swing into inoperative position, and a second operation-controlling switch reversed into open condition by the second lever when the arrival of the car swings the second lever out of operative position.

5. For a dumb-waiter system of the kind having an openable door at each floor, a car operation controlling circuit with manual switches at the several floors, a door-indicating circuit and a car-indicating circuit, for showing at each floor the locations of the door and car respectively; a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated spring-restored first control lever, and a car-actuated spring-restored second control lever, said levers being adjacently mounted on said frame in a manner for shifting in substantially parallel planes, a door-locking member operated by said second lever to shift to door-unlocking position when the car is present; a first

operation-controlling switch reversed in condition by the first lever when the door is closed or opened, a second operation-controlling switch reversed by the second lever when the car arrives or departs, a door-indicating switch reversed by the first lever when the door is closed or opened, and a car-indicating switch reversed by the second lever when the car arrives or departs.

6. For a dumb-waiter system of the kind having an openable door at each floor, a car operation controlling circuit with manual switches at the several floors, and an indicating circuit, for showing an indication at each floor; a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated spring-restored first control lever, and a car-actuated spring-restored second control lever, said levers being adjacently mounted on said frame in a manner for shifting in substantially parallel planes, a door-locking member operated by said second lever to shift to door-unlocking position when the car is present; a first operation-controlling switch reversed in condition by the first lever when the door is closed or opened, a second operation-controlling switch reversed by the second lever when the car arrives or departs, and an indicating switch reversed by shift of one of said levers.

7. A mechanism as in claim 6 and wherein the indicating switch is reversed by the first lever when the door is closed.

8. A mechanism as in claim 6 and wherein the indicating switch is reversed by the second lever when the car is present.

9. For a dumb-waiter system of the kind having an openable door at each floor, a car operation controlling circuit with manual switches at the several floors, a door-indicating circuit and a car-indicating circuit, for showing at each floor the locations of the door and car respectively; a unitary control mechanism adapted for use at each floor, comprising in combination, a frame

attachable adjacent to the car path and door, a door-actuated spring-restored first control lever, and a car-actuated spring-restored second control lever, said levers being adjacently mounted on said frame in a manner for shifting in substantially parallel planes, a door-locking member operated by said second lever to shift to door-unlocking position when the car is present; an operation-controlling switch reversed in condition by the first lever when the door is closed or opened, a door-indicating switch reversed by the first lever when the door is closed or opened, and a car-indicating switch reversed by the second lever when the car arrives or departs.

10. For a dumb-waiter system of the kind having an openable door at each floor, a car operation controlling circuit with manual switches at the several floors, a door-indicating circuit and a car-indicating circuit, for showing at each floor the locations of the door and car respectively; a unitary control mechanism adapted for use at each floor, comprising in combination, a frame attachable adjacent to the car path and door, a door-actuated spring-restored first control lever, and a car-actuated spring-restored second control lever, said levers being adjacently mounted on said frame in a manner for shifting in substantially parallel planes, a door-locking member operated by said second lever to shift to door-unlocking position when the car is present; a first double-pole double-throw switch reversed in position by the first lever when the door is closed or opened, and a second double-pole double-throw switch reversed in position by the second lever when the car arrives or departs; said first switch in one position closing the operating circuit when the door is closed and in its other position closing the door-indicating circuit when the door is open, and said second switch in one position closing the operating circuit when the car is absent and in its other position closing the car-indicating circuit when the car is present.

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