Oct. 2, 1962 T. C. SODDY 3,056,176

WALL AND SLIDING DOOR STRUCTURE

Filed Dec. 23, 1959 4 Sheets-Sheet 1

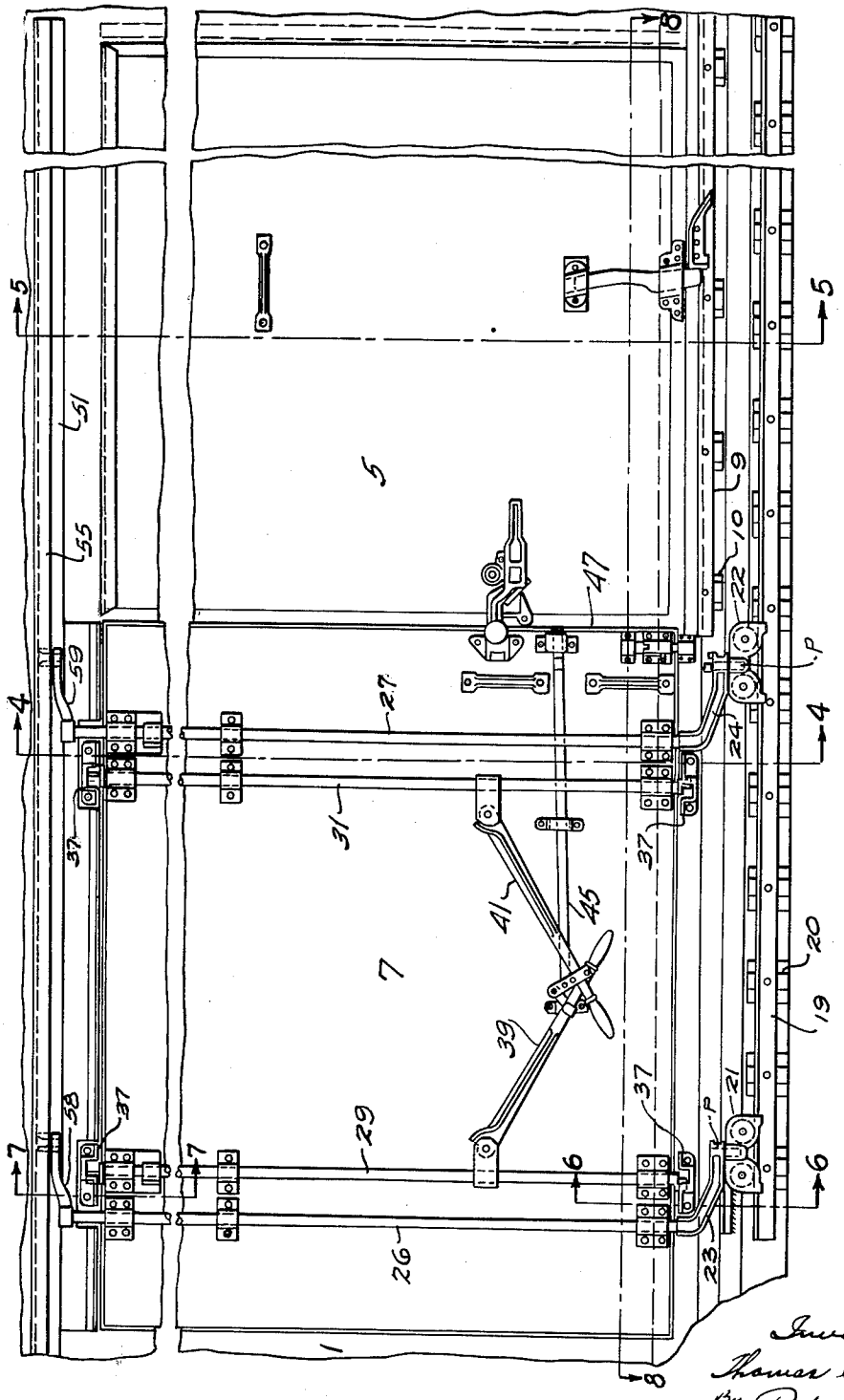


FIG. 1.

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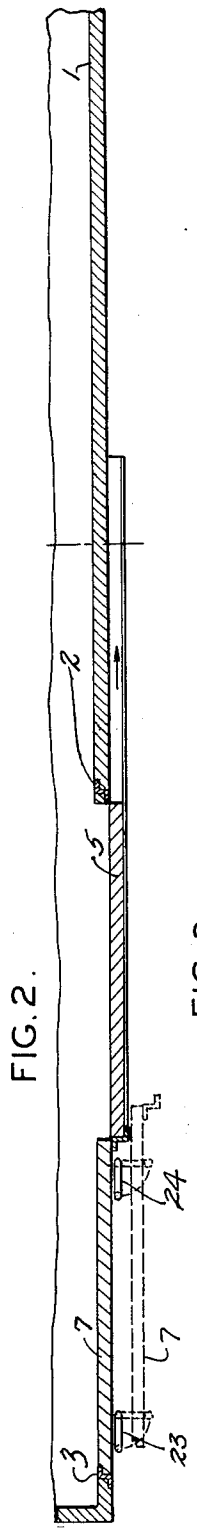


FIG. 2.

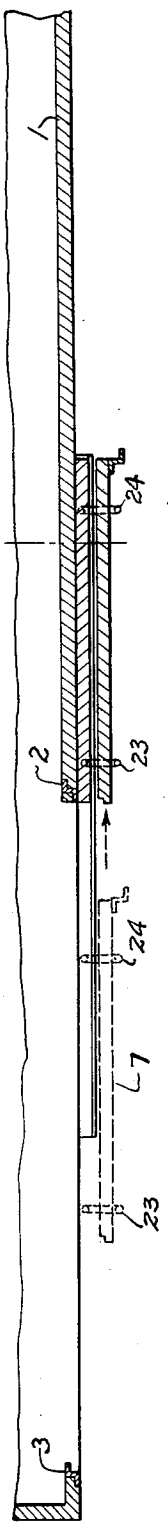


FIG. 3.

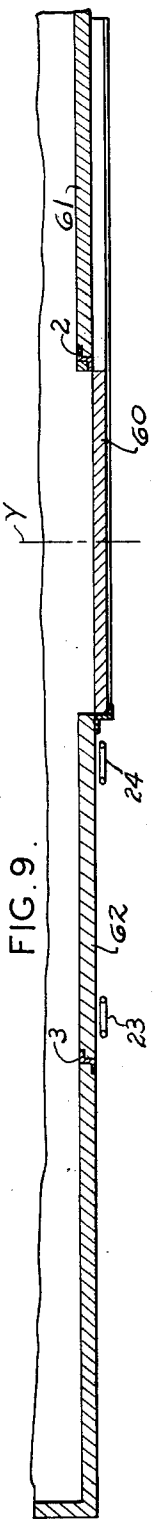


FIG. 9.

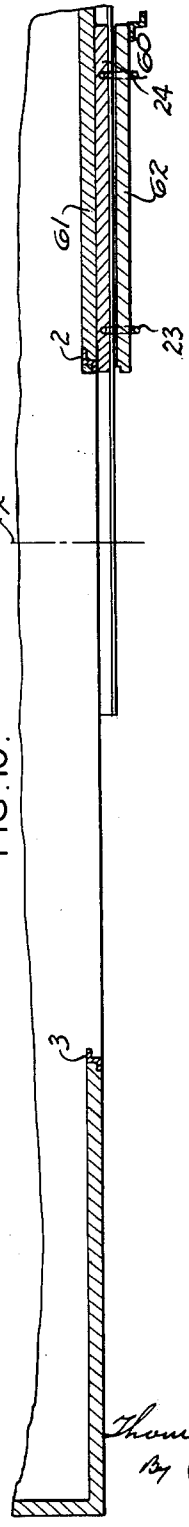


FIG. 10.

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FIG. 4.

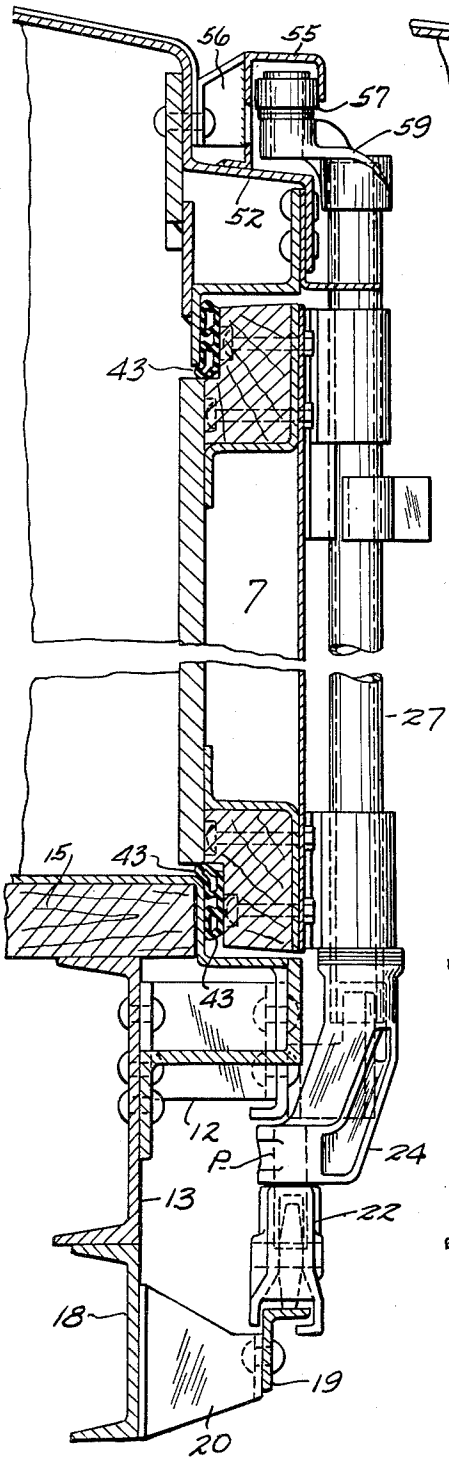
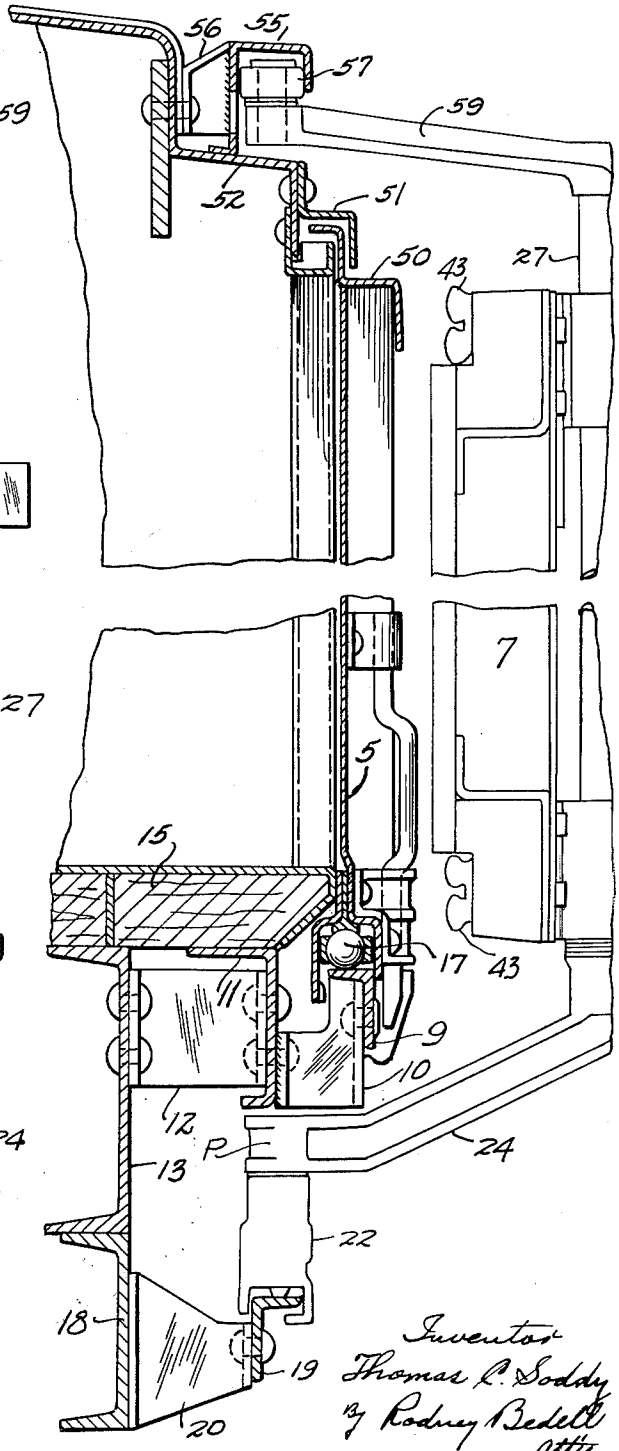


FIG. 5.



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WALL AND SLIDING DOOR STRUCTURE

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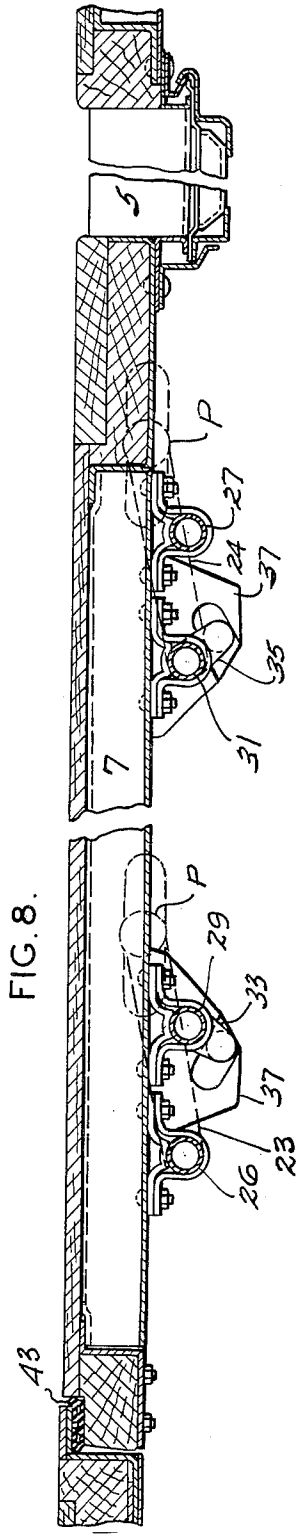


FIG. 8.

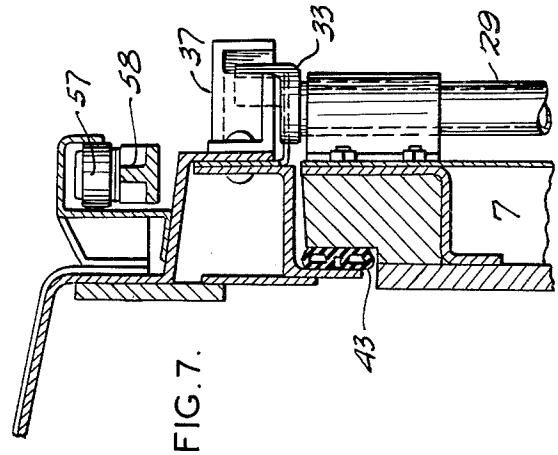


FIG. 7.

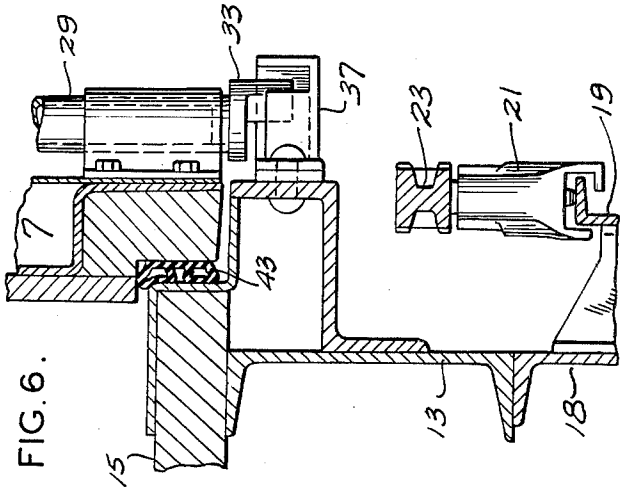


FIG. 6.

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3,056,176

WALL AND SLIDING DOOR STRUCTURE

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Filed Dec. 23, 1959, Ser. No. 861,615
8 Claims. (Cl. 20—23)

The invention relates to wall and door structure in which a pair of doors, which may be designated a main door and an auxiliary door, slide past each other alongside a wall opening, into and out of opening and closing positions. The invention is particularly adapted for, but not limited to, use in a railway house car where the width of the car is restricted by right-of-way clearances which limit the projection of door tracks and fittings transversely of the car.

Among the objects of the invention are to minimize the area required outwardly of the wall for mounting the pair of doors for movement as described and avoid undue projection from the wall to insure that the doors are clear of each other as they are moved to open and closed positions; to make the inside width of a railway car, if the structure is to be used on a railway car, as great as possible; and to arrange the openings in the spaced walls opposite to each other to facilitate loading and unloading of the car. These and other detail objects as will appear from the following description are attained by the structure in the accompanying drawings, in which

FIGURE 1 is a side view of a portion of a railway car side wall to which a pair of sliding doors are applied.

FIGURE 2 is a horizontal section, substantially diagrammatic, through the doors and side wall, showing the doors in closed position.

FIGURE 3 is a similar section showing the doors in full open position.

FIGURE 4 is a vertical transverse section on line 4—4 of FIGURE 1 through the auxiliary door when the door is closed.

FIGURE 5 is a vertical transverse section on line 5—5 of FIGURE 1, showing the main door in closed position and also indicating in broken lines the position of the auxiliary door as it is moved outwardly from the side wall to a position outside of the main door.

FIGURE 6 is a detail vertical transverse section on line 6—6 of FIGURE 1.

FIGURE 7 is a detail vertical transverse section on line 7—7 of FIGURE 1.

FIGURE 8 is a horizontal section on line 8—8 of FIGURE 1, parts being broken away.

FIGURES 9 and 10 correspond to FIGURES 2 and 3 but show a different arrangement of the doors relative to the end of the wall.

The structure wall is indicated at 1 and has an elongated opening from side post 2 to a corner post 3. The main door is shown at 5 and an auxiliary door is shown at 7. The main door is mounted on a track 9 carried by brackets 10 on a threshold support 11 carried by brackets 12 on a side sill channel 13. The floor 15 is carried on sill 13 and support 11. Balls 17 support the door for movement along track 9 which extends in a straight line from a point intermediate the posts 2, 3 to a point similarly spaced to the right of post 2. The door and its mounting and track corresponds generally to similar door structures in general use.

Door 7 is mounted on a track 19 carried by brackets 20 on a sill reinforcing channel 18 which extends throughout the length of the door opening and also to the right of the door opening. Track 19 extends in a straight line from near corner post 3 to below the right hand

end of track 9 and mounts a pair of carriages 21, 22 which pivotally support at P the outer ends of cranks 23, 24 projecting laterally from the lower ends of shafts 26, 27 respectively journaled on and supporting the door. Track 19 is below the level of track 9. When cranks 23, 24 are swung from the position shown in FIGURES 1 and 4 to the position shown in light lines in FIGURE 5, carriages 21, 22 may move rearwardly along track 19 (FIGURE 3) without interfering with the main door or its mounting elements. In this position auxiliary door 7 may be spaced so far from wall 1 that it is outboard of the limit established for clearing bridges, tunnels and buildings but this is unimportant because the door will only be in the outermost position during loading and unloading. At other times it will be moved forwardly and inwardly to the closed position shown in FIGURES 2 and 4 in which it is in the same general plane as side wall 1.

Auxiliary door 7 is secured in closed position by a pair of locking shafts 29, 31 journaled on the door and having eccentrics 33, 35 respectively at their ends disposed to engage keepers 37 on the car wall so that rotation of shafts 29, 31 by handles 39, 41 to the left and to the right respectively will force the auxiliary door inwardly to the position shown in FIGURES 2, 4, 6, 7, 8 in which it compresses gaskets 43 to form an effective seal with the wall. Rotation of shafts 29, 31 in the opposite directions will release the auxiliary door from the keepers so that it may swing freely on cranks 24 into the position shown in FIGURES 3 and 5. When the doors are positioned as in FIGURES 1 and 2, a bar 45 which is slidable horizontally on door 7 may be projected into engagement with a front edge element 47 on main door 5 to lock the two doors against relative movement transversely of the wall.

The upper ends of the doors are also assembled with the car sides so as to accommodate the movement of the doors past each other. Main door 5 has a top edging 50 (FIGURE 5) received behind an eave 51 mounted on side plate 52. A retainer 55 carried by brackets 56 on side plate 52 extends throughout the length of the door tracks and receives rollers 57 journaled on the swinging ends of crank arms 58, 59 on the upper ends of door mounting shafts 27, 29. Crank arms 58, 59 and their rollers 57 operate above elements 50, 51, 52 without interfering with the latter.

While the structure described above is particularly advantageous where it is desired to place a long door opening at one end of the car, the construction may also be advantageous where the door opening is spaced from the end of the car as shown in FIGURES 9 and 10. In these figures the transverse center line X of the car and the transverse center line Y of the main door 60, when the latter is in closed position, are coincident. The door openings in side walls 61 at opposite sides of the car may be abreast of each other throughout one half their length or throughout their entire length, according to whether the auxiliary doors 62 are directly opposite each other or are disposed diagonally of the car relative to each other. Other of these arrangements may be preferable for loading and unloading different kinds of lading or for spotting the cars relative to doors in warehouses or other building structures.

In either form of the invention the main door moves from closed position into full open position independently of the closed auxiliary door and the latter may remain in closed position substantially in line with the wall or may be moved outwardly and rearwardly alongside the outer face of the main door. The inside of the car may be as wide as in any other house car having the usual sliding door and the addition of the auxiliary door slid-

able past the open main sliding door does not require track structure extending beyond established clearance lines which limit lateral extension of car structure.

The construction may be applied to a wall with both doors in alignment with the wall, when closed, and to transport containers and to structures other than the railway house car illustrated, and the details of the structure may be varied substantially from those shown without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

I claim:

1. The combination of an upright wall having an elongated door opening, a horizontal track mounted on and parallel to said wall substantially throughout its length and extending alongside a part of said opening and beyond the same but offset vertically therefrom, a main door mounted on and movable along said track to an advanced position partially closing said opening and to a retracted position along said wall beyond said opening, a second, horizontal track mounted on said wall and parallel thereto substantially throughout its length and extending throughout the length of said opening and alongside said first-mentioned track, carriages movable along said second-mentioned track, upright crankshafts journaled on said carriages, an auxiliary door mounted on said crankshafts and movable along and transversely of the second-mentioned track to an advanced position in which the auxiliary door is in end to end relation with the main door, to complete the closing of said opening, and to a retracted position in which it is positioned outwardly of the retracted main door and alongside the same.

2. The combination of an upright wall with an elongated door opening, a horizontal track alongside a part of but vertically offset from said opening, a door mounted on and movable along said track lengthwise of said opening to an advanced position partially closing said opening and to a retracted position alongside said wall, a horizontal track mounted on said wall alongside of but vertically offset from all of said opening and extending past said first mentioned track, a second door mounted on and movable along and transversely of said second mentioned track lengthwise of said opening to a position in which it is in end to end relation with said first door but is offset therefrom toward the inner face of the wall, and to a position in which it is alongside of said first mentioned door but is offset therefrom away from the outer face of the wall.

3. A wall and door combination according to claim 1 in which the first mentioned track is at a higher level than the second mentioned track and is offset therefrom away from the wall.

4. The combination of an upright wall with an elongated door opening, a first horizontal track substantially straight from end to end mounted on said wall and extending alongside of said opening and beyond one end of the same, a door movable along said track to a position opposite said opening and to a position beyond said opening, a second horizontal track substantially straight from end to end mounted on said wall and extending alongside said opening and beyond said opening, said tracks being parallel substantially throughout their length, carriages on said second track, a second door mounted on said carriages by upright shafts journaled on the door and having crank arms pivoted at their swinging ends on said carriages whereby the second door may move along the second track and may also move transversely thereof into a position in the door opening aligned with the wall and into a position beyond the opening alongside the first door.

5. A wall and door structure according to claim 4 in which the second track is at a lower level than the first track but at a less distance from the wall and the crank arms swing outwardly on the carriages to clear the second door from the first track and the first door when the doors are abreast of each other.

6. A wall and door structure according to claim 4 in which the first track extends only part-way alongside the wall opening and the second track is below the level of the first track throughout the length of the latter and extends beyond the end of the latter alongside the portion of the wall opening remote from the first track.

7. A wall and door structure according to claim 3 in which a top retainer for the first door extends alongside the top of the wall opening and has a downwardly opening channel receiving an upstanding element on the first door, and a top retainer for the second door extends alongside the top of the wall opening above the level of and inwardly of the car from the first retainer and having a downwardly opening channel and the second door has upright mounting shafts with crank arms on the upper portion of the mounting shafts arranged to swing over the first retainer and terminating in upstanding elements received in said second retainer channel.

8. A wall and door structure according to claim 7 in which there are stops fixed on the wall adjacent to the second track and the door mounting shafts have projections engageable with said stops as the shaft-mounted door moves along the track to automatically swing the crank arms toward the wall at predetermined points in the closing movement of the door.

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