

Dec. 17, 1968

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3,416,836

SIDE-LOADING MOVING VAN

Filed Sept. 21, 1967

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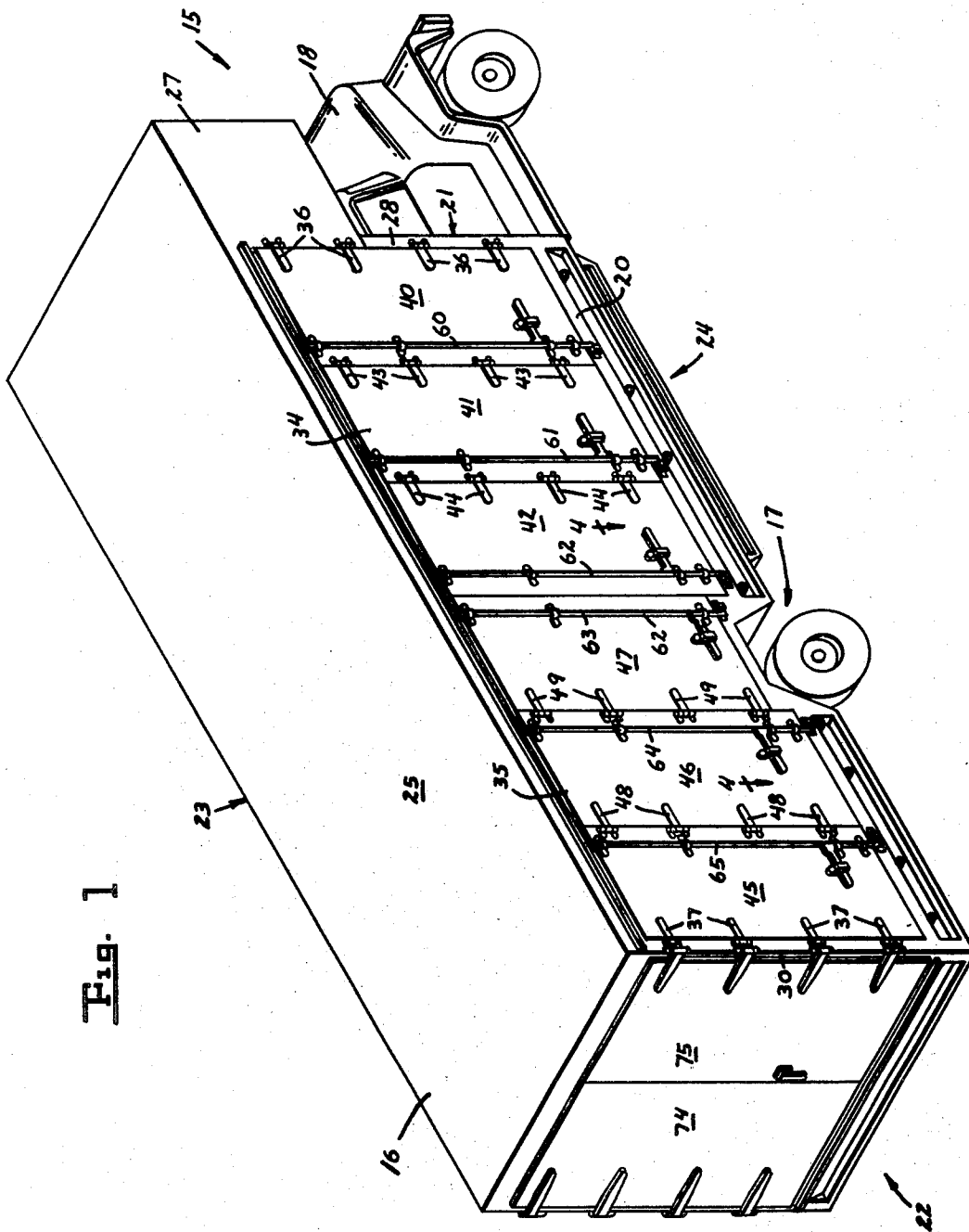


Fig. 1

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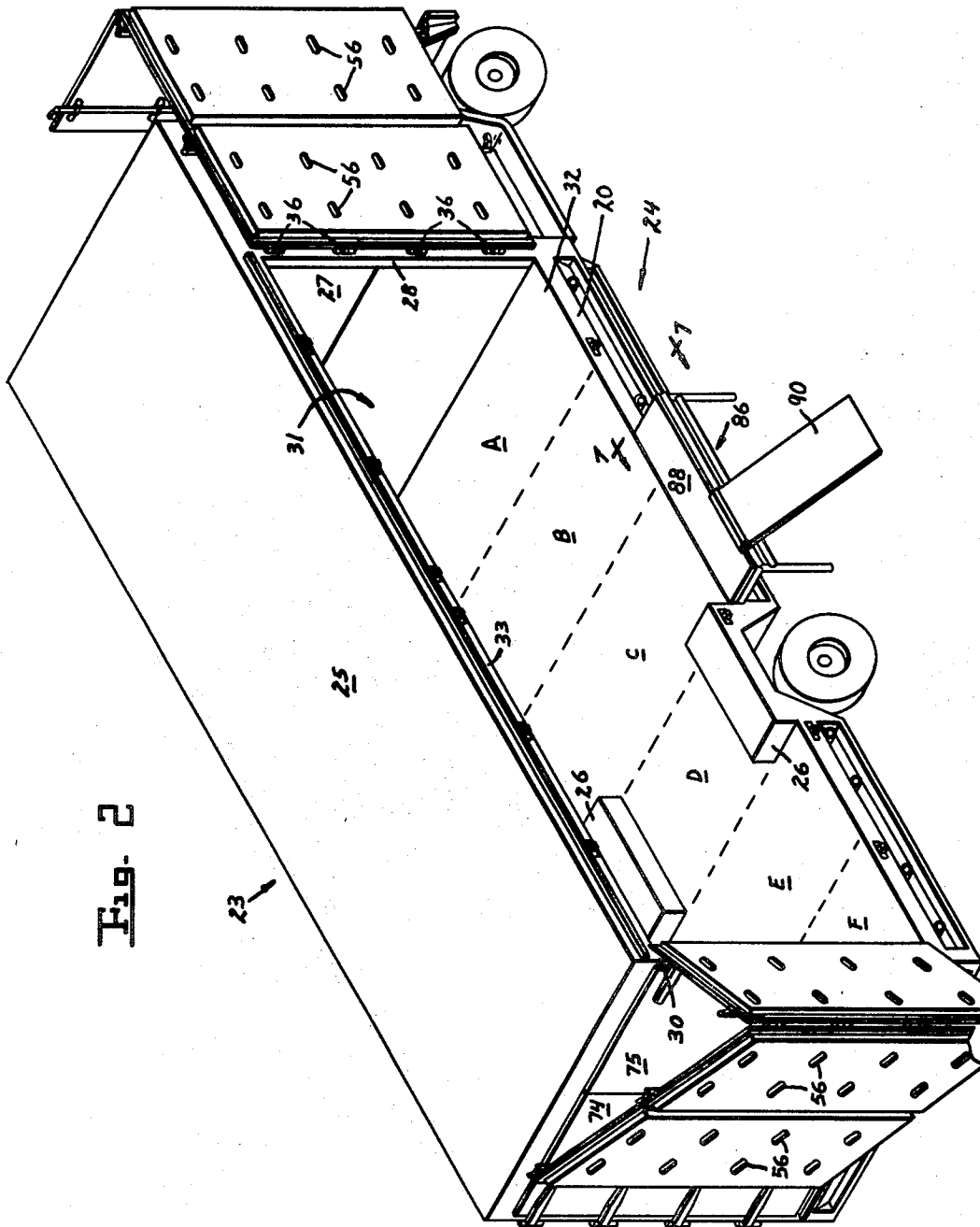


Fig. 2

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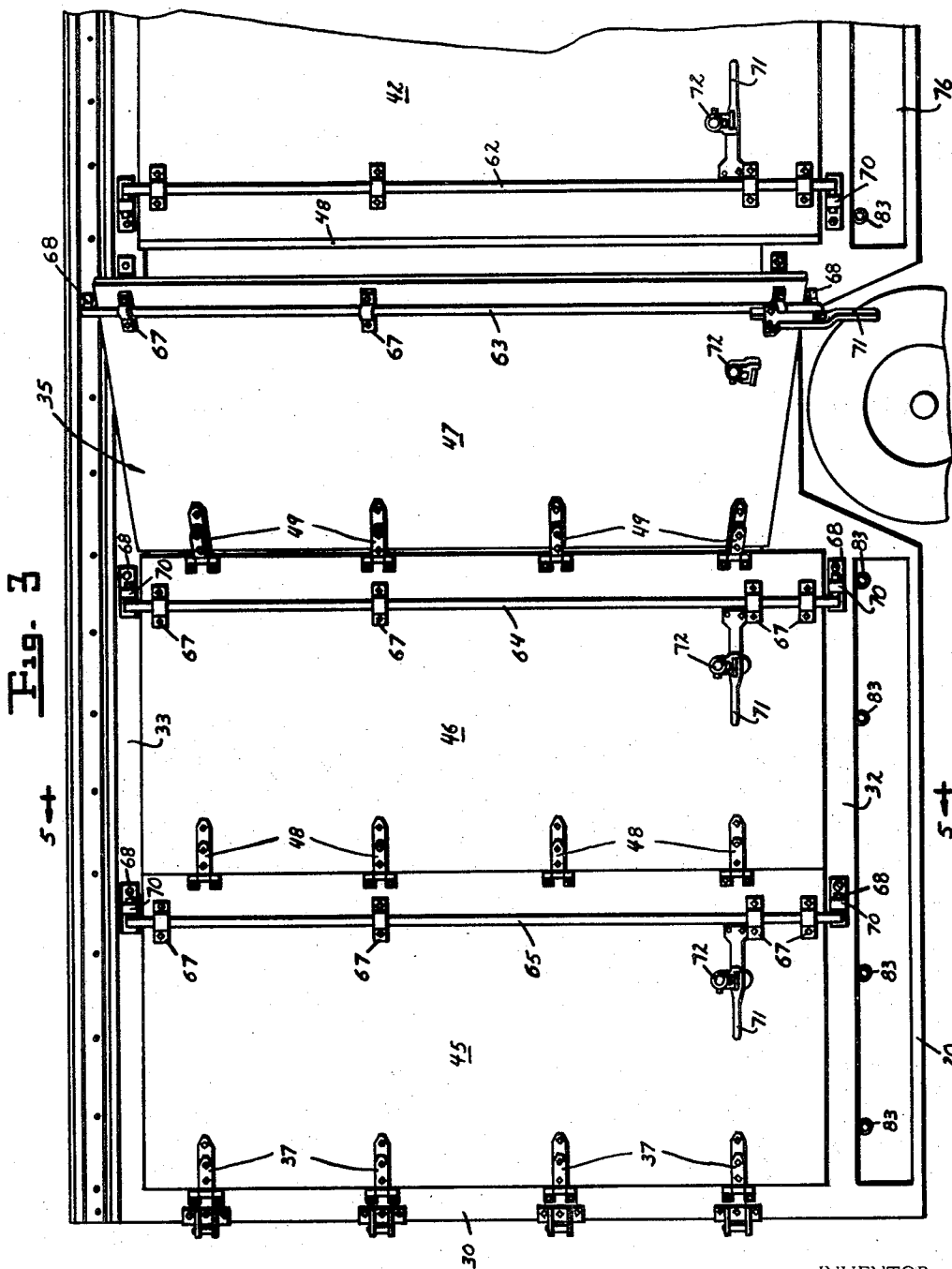


Fig. 3

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Fig. 4

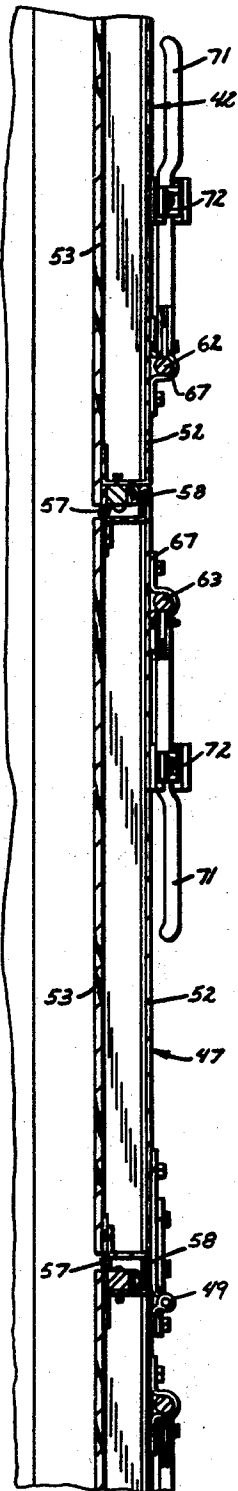
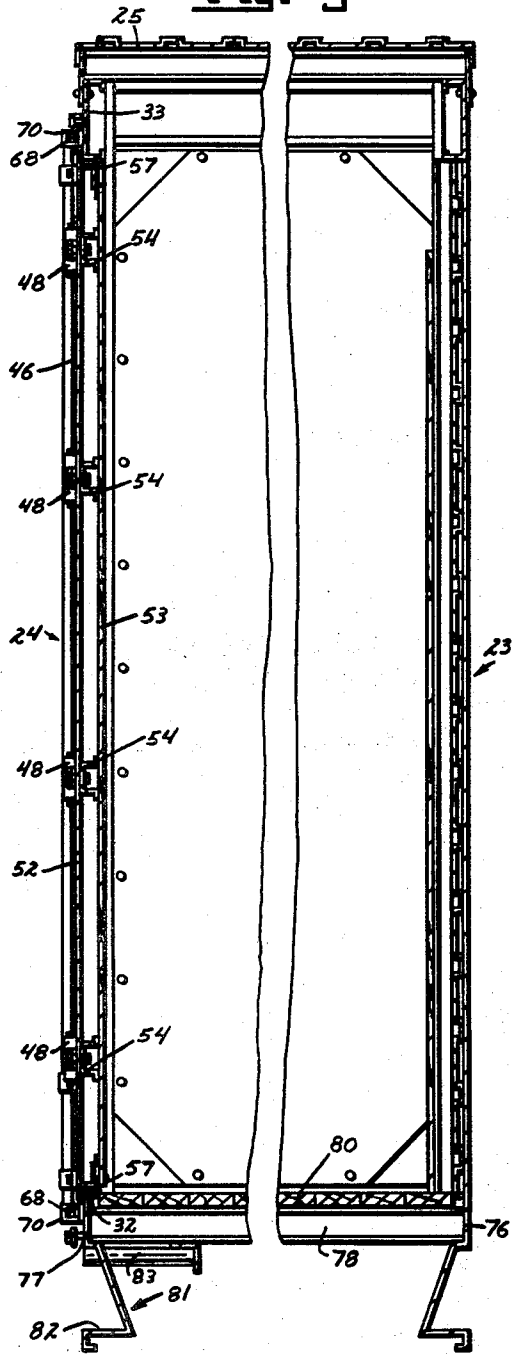


Fig. 5



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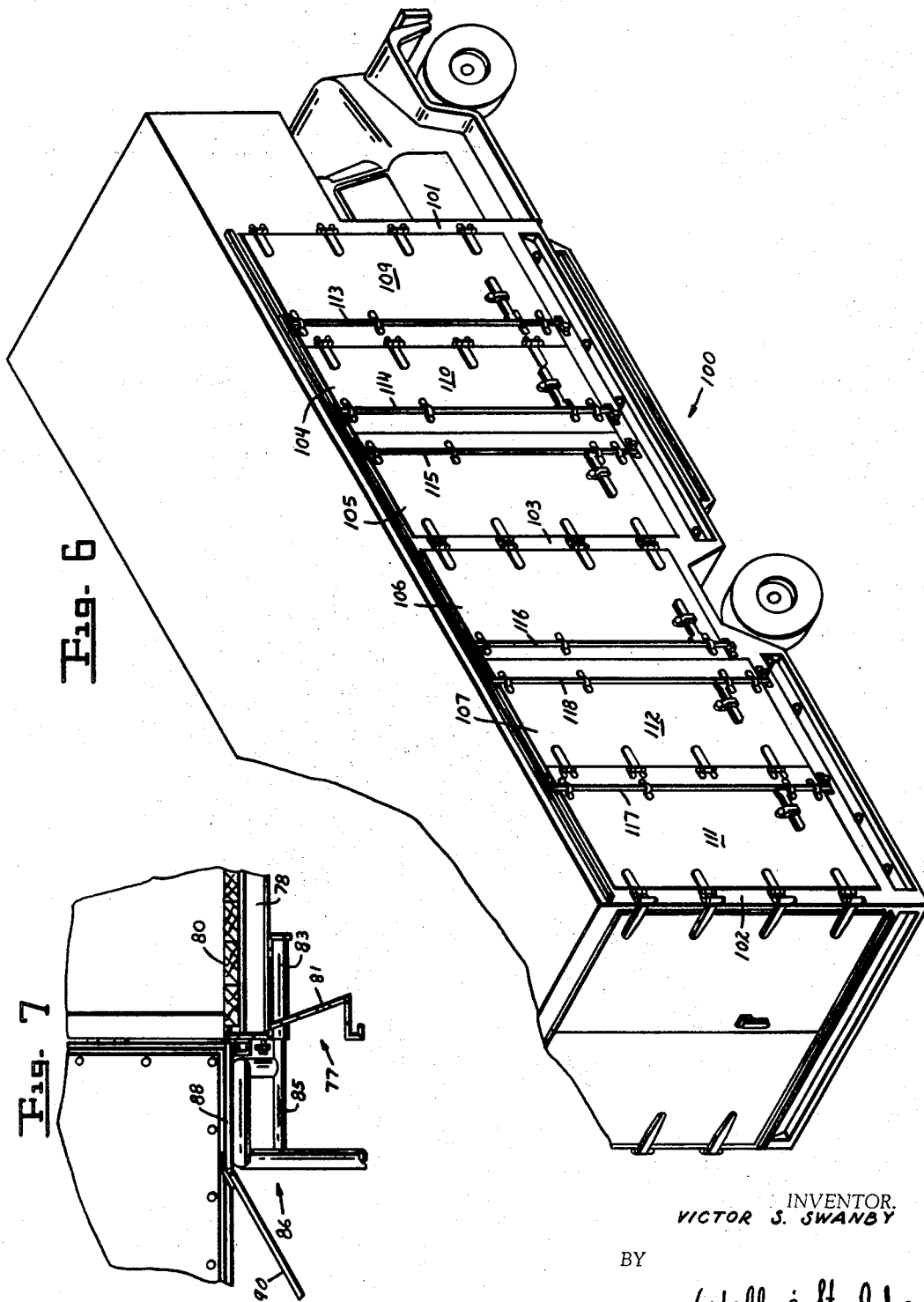


Fig. 6

Fig. 7

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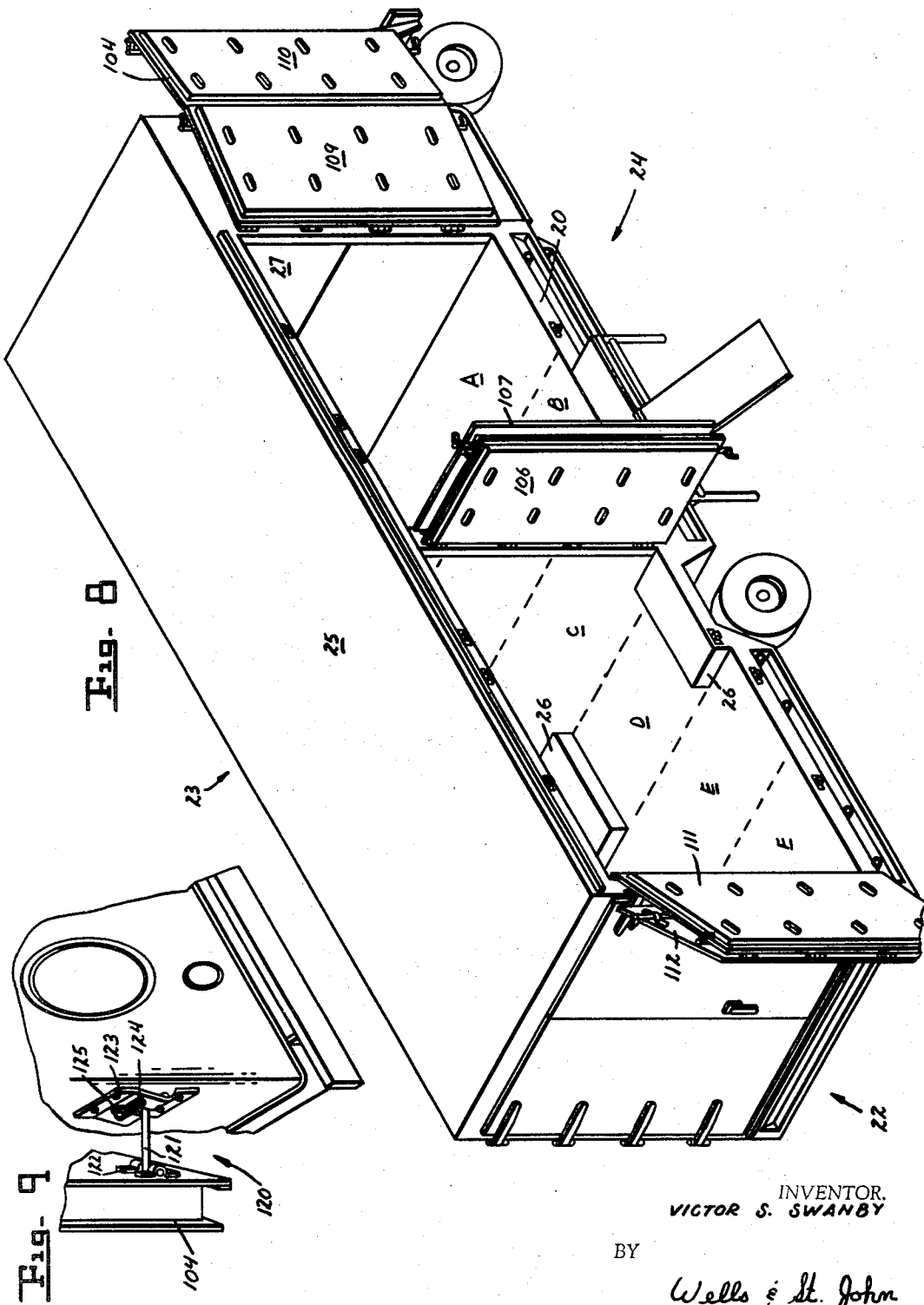
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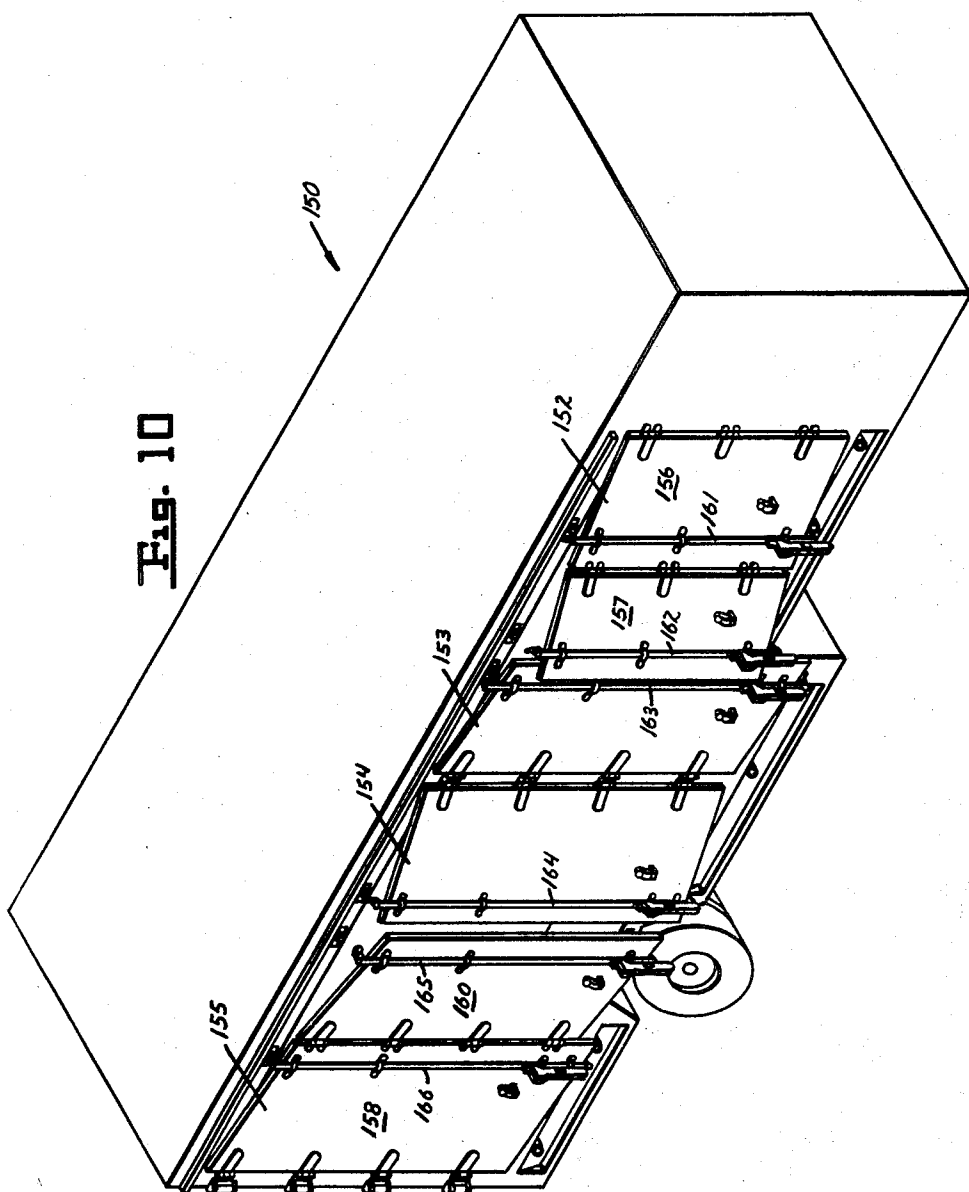
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**Fig. 10**

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6 Claims. (Cl. 296-148)

**ABSTRACT OF THE DISCLOSURE**

A side-loading moving van is described for permitting side access to the interior of the van along the entire side. The side is enclosed by multi-leaf doors that are hinged to the corner posts of the van. A latching bar is provided on each door leaf adjacent the hinges for the adjacent leaf for applying pressure on the outside of the leaf to hold the leaf securely against the frame of the van to provide a structurally integrated side panel for resisting the deflection and twisting of the van and for providing a rigid hinge support for the adjacent leaf.

*Background of the invention*

This invention relates to moving van trucks and trailers and more particularly to moving van trucks and trailers that are side-loading.

Since the start of the industrial revolution, people in the United States and other industrial nations have become more mobile and have on the average changed residence several times in their lifetimes. The advent of World War II brought on further mobility of the populus which has continued to the present day. Every indication is that this mobility will steadily increase in the future.

Corresponding with the increase in mobility has been the growth of the moving industry which is at present a multi-million dollar industry. The vehicle used in transporting household goods of a family from their prior residence to their new home is commonly referred to as a moving van. Generally the moving vans are of two types—(1) a special type of truck in which a sturdy enclosure body is mounted on the truck chassis for housing the household goods and (2) a special semi-trailer that may be readily detached from the prime mover termed as a tractor. The semi-trailer type van is generally larger than the truck type van and is used for long distances in which heavy loads of furniture of between 25,000 and 30,000 pounds are involved. It frequently takes between six to ten households to completely fill the semi-trailer van. The truck version is generally used for smaller loads and smaller distances.

Moving vans have to be of a special construction for exceptional endurance, because it is not uncommon for a moving van to travel more than 100,000 miles a year. It is also important that the moving van be as light as possible so that it can carry as heavy a load as possible without exceeding the road load limit. A ratio that is very important is the volume that the van can hold to the unloaded weight of the van. In recent years considerable effort has been made to reduce the weight of the van. Aluminum has been used as frame members to minimize the weight without compromising the strength of the van or the useful life of a van.

The side walls of a moving van must have sufficient strength and structural rigidity to support the roof and to withstand the effects of the load when the van is subjected to angular acceleration tending to push the load into the side walls. Any internal supports have many obvious objections.

A further special requirement of moving vans is that the interior surfaces must be relatively smooth so that the goods, particularly furniture, may be readily loaded

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into and out of the van without becoming damaged by protruding or sharp surfaces. A still further requirement of moving vans is that they must be totally enclosed with no doors or windows that may be easily opened by thieves. Also the truck must be air and rain tight so that the goods will not be damaged during their journey.

Up until about 15 years ago, moving vans were generally loaded and unloaded through rear doors. For a moving van that contains several households, special scheduling has to be made to make sure that the goods were unloaded in the reverse order to the loading sequence. Often this was impractical and a portion of the load had to be unloaded and set on the sidewalk or front yard in order to have access to the desired household goods. This greatly increased the unloading time per household. It frequently required additional help which meant substantial increase in the cost of the unloading.

As the moving van trucks and trailers became larger the problem intensified. A limited solution was devised approximately 15 years ago of putting a single or double side door on one side of the van near the middle so that limited access could be had to the middle of the load. However, even with this limited access to the side it frequently required the removal of part of the load to obtain access to the desired goods. The size of the side doors were limited so as not to compromise the structural integrity of the moving van.

Each time the goods were handled, the possibility of damage increased. This is particularly true when the goods had to be moved from the van, set on the sidewalk or lawn until the desired goods were removed, and then reloaded back into the van in a new location.

A principal object of this invention is to provide a moving van that is so constructed that any portion of the load may be removed without disturbing the rest of the load.

An additional object of this invention is to provide a moving van that decreases the amount of handling that is required in moving household goods and thereby decreases the possibility of damage to the goods.

A further principal object of this invention is to provide a moving van with side access along the full length of the van so that any portion of the load may be removed therefrom without disturbing the rest of the load.

An additional object of this invention is to provide a moving van with a multi-leaf side door for permitting side access to the load in which the multi-leaf door has provisions for enabling one leaf to act as a rigid support for the pivotal opening of the adjacent leaf.

A further object of this invention is to provide a moving van with side doors that when closed provide structural support for the roof and resist the deflection and twisting of the moving van body.

An additional object of this invention is to provide a novel side door locking arrangement for enabling side access to the entire load in which one portion of the door may be used as a rigid support for another portion.

These and further objects of this invention will become apparent upon the further reading of the following description of several embodiments.

*Brief description of the drawings*

Several embodiments of this invention are illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of a moving van of the truck type embodying the principles of this invention showing one side of the van enclosed by two joining multi-leaf doors;

FIG. 2 is a perspective view similar to FIG. 1 except showing the two multi-leaf doors fully open to permit direct side access along the full length of the van;

FIG. 3 is a fragmentary side elevation view of the



multi-leaf doors showing the outer leaf of one door partly open emphasizing a leaf latching means;

FIG. 4 is a fragmentary horizontal cross sectional view taken along line 4—4 in FIG. 1 showing a portion of the side doors in cross section to illustrate the structure of the doors;

FIG. 5 is a fragmentary vertical cross sectional view taken along line 5—5 in FIG. 3 showing the van body in transverse cross section emphasizing the structure of the doors;

FIG. 6 is a perspective view of an alternate embodiment showing a moving van with four side doors for permitting direct side access along the full length of the van;

FIG. 7 is a fragmentary vertical cross sectional view taken along line 7—7 in FIG. 2 showing tubular members mounted to the side of the van bed for receiving support arms of a platform that is positioned adjacent the van for facilitating the loading and unloading of the van;

FIG. 8 is a perspective view similar to FIG. 6 except showing the four side doors for direct access along the full length of the van;

FIG. 9 is a fragmentary perspective view of the front right fender of the truck type moving van showing a latching means for holding the front side door open; and

FIG. 10 is a fragmentary perspective view of an alternate embodiment of a semi-trailer type moving van having four side doors for permitting side access along the full length of the trailer.

#### *Description of the preferred and several alternate embodiments*

Referring now to FIG. 1, there is shown a moving van 15 of the truck type that has a van body or enclosure 16 mounted on a truck chassis 17. The van body or enclosure 16 is mounted immediately behind the truck cab 18. The van body or enclosure 16 has a bed 20, a front side 21, a rear side 22, a left side 23 and a right side 24. A roof 25 covers the enclosure to form the body. As may be particularly seen in FIG. 2, the bed of the truck includes wheel wells 26 that are located immediately over the wheels of the truck. In this particular embodiment, the van body includes a loft 27 that extends forward from the main body of the enclosure immediately over the cab of the truck. For purposes of identification, the interior volume of the van body is divided into six space segments lettered from front to back A, B, C, D, E and F (FIG. 2).

On the right side of the moving van the frame portion of the van includes a front corner post 28 and a rear corner post 30. Between the front and rear posts is an unobstructed opening 31 (FIG. 2) that extends the full length of the van for permitting side access for loading and unloading. The bed of the truck at the side of the van serves as a door seal 32. A metal channel 33 extends the full length of the van between the front and rear corner posts 28 and 30.

Two multi-leaf pressure doors 34 and 35 are mounted to the front and rear corner posts respectively for enclosing the opening 31. The multi-leaf door 34 is mounted to the front corner post 28 by a plurality of door hinges 36 for permitting the door to swing outward to expose spaces A, B and C. The multi-leaf door 35 is mounted to the rear corner post 29 by a plurality of door hinges 37 or for permitting the door to swing outward to provide side access to spaces D, E and F.

The multi-leaf pressure door 34 has three connected leaves 40, 41 and 42. Leaf 40 is the inside leaf and is hinged to the front corner post 28 by the hinges 36. The second or intermediate leaf 41 is hinged to the inside leaf 40 by a plurality of hinges 43 for enabling the second leaf to pivot outwardly with respect to the first leaf 40 to provide access to space B. The outer leaf 42 is hinged to the intermediate leaf 41 by a plurality of hinges

44 that enable the outer leaf to swing outwardly with respect to the intermediate leaf 41 to provide access to space C.

The multi-leaf door 35 includes an inner leaf 45, an intermediate leaf 46 and an outer leaf 47 with the outer leaf 47 joining with the outer leaf 42 of the door 34 to complete the side enclosure of the moving van. The inner leaf 45 is hinged to the rear corner post 30 by hinges 37. The second or intermediate leaf 46 is hinged to the inner leaf 45 by a plurality of hinges 48 that are vertically spaced for permitting intermediate leaf 46 to swing outward with respect to inner leaf 45 to provide access to space E. The outer leaf 47 is hinged to the intermediate leaf 46 by a plurality of vertically spaced hinges 49 to enable the outer leaf to pivot or swing outward with respect to intermediate leaf 46 to provide access to the space D.

As may be particularly seen in the cross sectional view of FIGS. 4 and 5, each door leaf includes a metal outside panel 52 that is riveted or bolted to a plurality of horizontal, vertically spaced, channel irons 54. An inside panel 53, generally made of plywood, is attached to the channel iron for enclosing the panel to provide a substantially hollow door panel or leaf. A plurality of hand holes 56 are formed in the plywood inside panel 53 immediately above the horizontal channel irons 54 (see FIG. 2). Although not shown in the drawings, holddown ties are mounted to the channel irons 54 immediately inside the handholes 56 for facilitating the tie down of the household goods. An inside rubber or plastic seal 57 is mounted around the inside edges of the leaves to provide a moisture resistant barrier. A cushion seal 58 is mounted along the outer edge of the leaves for sealing against the lips of the adjacent leaves as the leaves are closed to provide a substantially airtight enclosure when the doors are latched.

Latching means are provided for each door panel for securely holding the panel closed so that it forms a rigid support for the adjacent panel that is hinged to it. The latching means are positioned adjacent the hinges that are supporting the adjacent leaf. Specifically, the latching means includes latching bars 60, 61, 62, 63, 64 and 65 that are mounted on door leaves 40, 41, 42, 54, 46 and 47 respectively. The latching bars are vertically mounted on the outside of the leaves and extend above and below the leaves for engaging elements of the door header and seal for securely latching the door closed. As best seen in FIG. 1 the vertical latching bar 60 is mounted on the outside of intermediate leaf 41 adjacent the hinges 44. The latching bar 62 is vertically mounted on the outside of the outer leaf 42 for latching the outer leaf in the closed position. As shown in FIG. 3, the latching bar 65 is mounted on the outside of the inner leaf 45 immediately adjacent the hinges 48. The latching bar 64 is mounted on the outside of the intermediate leaf 46 adjacent the hinges 49. When the latching bar 64 is in the closed position, the leaf 46 is securely attached to the frame structure so that it forms a rigid support for the opening of the leaf 47 as shown. The latching bar 63 is mounted on the outside of the outer leaf 48 adjacent the outer edge of the leaf for latching the leaf closed with the lip of the leaf overlapping and sealing against the seal 48 of the leaf 42.

Each of the latching bars 60-65 are rotatably supported in vertically spaced clamps 67. At the upper and lower ends of each of the latching bars 60-65, radial curved hooks 68, extend therefrom for projecting into lugs or U-shaped brackets 70 that are mounted on the outside of the door header and the bed. As best viewed in FIGS. 3 and 4, a handle 71 is attached to each of the latching bars 60-65 for pivoting the bars to latch and unlatch the bars. Each of the handles 71 may be vertically pivoted with respect to the latching bar. A conventional locking bracket 72 is mounted on the outside of each

of the door leaves for securely supporting the respective handles when they are in the latch position. In FIG. 3, the latching bar 63 is shown in the unlatched position in which the handle 71 has been removed from its respective locking bracket 72 and pivoted outwardly to rotate the latching bar 65 to pull the respective end hooks 68 from the lugs attached to the frame of the moving van. When this is accomplished, the panel or leaf 47 may be swung open to provide side access to the interior space D to load or unload household goods. If it is desired to obtain access to the area E the operator merely unlocks the handle 71 attached to the latching bar 64. He then swings the handle outwardly to rotate the latching bar 64 to remove the hooks from their respective lugs 70. At this point the operator may then swing both panels 46 and 47 outwardly to expose the areas D and E. FIG. 2 shows the moving van with all of the latching bars 60-65 unlatched and the leaves swung outwardly to expose the entire space A-F. Thus, it can be readily seen that the operator may have easy access to any portion of the load contained within the van without having to move or disturb any other portion of the load. To close the doors the operator latches each leaf starting with the inner leaf and working to the outer leaf. For example, in FIG. 3 to close the door 35 the operator swings the inner leaf 40 to the near close position and then pivots the handle 71 to rotate the latching bar 63 to move the hooks 68 into the lugs 70 to force the door securely against the door seal and the door header to form a substantially rigid and structurally integrated side panel. When this is completed, the leaf 35 then becomes a rigid support for the leaf 46. The leaf 46 is then swung to the near close position so that the hooks 68 are adjacent the lugs 70. The handle 71 is then rotated against the leaf to move the hooks into the lugs 70 to apply pressure to force the leaf 46 inwardly to secure the leaf against the door seal and door header. When this is completed the leaf 46 then becomes a rigid structurally integrated side panel for supporting the roof and resisting the deflection and twisting of the moving van as it is moving. Likewise, the outer leaf 47 may be securely closed against the door seal and door header to form an integrated structural member while enclosing the area D.

The moving van shown in FIGS. 1, 2, and 3 has two conventional rear doors 74 and 75 for enclosing the rear of the moving van.

The bed of the moving van, as shown in cross section in FIGS. 5 and 7, includes two longitudinal side channels 76 and 77 that support transverse channels 78. The flooring 80 of the moving van bed is mounted on the transverse channel 78. The side channel 77 has an indented lower section 81 that includes a horizontal step segment 82. As may be particularly seen in FIGS. 1, 2, 3 and 5, a plurality of transverse tubular members 83 are spaced along the right side of the moving van. The tubular members 83 extend through the indented section 81 of the side channel 77 (FIG. 7). The transverse tubular members 83 receive horizontal front tubular arms 85 (see FIGS. 2 and 7) of a platform for facilitating the loading and unloading along the side of the moving van. The platform includes legs 87 that extend to the ground for supporting a flooring 88 substantially even with the flooring of the moving van itself. The front horizontal arms 85 extend forward into the transverse tubular members 83. The platform 86 may be positioned along the side of the moving van as desired in locations indicated by the positions of the tubular members. A walk board 90 is particularly helpful in loading and unloading the moving van and may be positioned with the upper end resting on the platform 86.

An alternate moving van 100 is shown in FIGS. 6 and 8 in which the van frame elements on the right side of the truck include a front corner post 101, a rear corner post 102, and a center corner post 103 intermediate between

the front and rear corner posts. The center post 103 blocks only a very small portion of the side access to the spaces C and D.

Four doors 104, 105, 106 and 107 are mounted on the right side of the moving van for enclosing the openings between the posts. The doors 104 and 107 are multi-leaf doors and doors 105 and 106 may be considered as single doors. The door 104 is hinged to the front post 101 and the door 107 is hinged to the rear post 102. The intermediate doors 105 and 106 are hinged to opposite sides of the center post 103 as may be seen in FIGS. 6 and 8.

The door 104 comprises an inside leaf 109 and an outer leaf 110 with the leaf 110 being hinged to the leaf 109. The door 107 includes an inner leaf 111 and an outer leaf 112. The inner leaf 111 is hinged to the rear corner post and the outer leaf 112 is hinged to the inner leaf 111. The doors 104 and 105 when closed join together to enclose the opening between the front corner post and the center corner post and the doors 106 and 107 when joined together enclose the opening between the center post and the rear post. Latching bars 113 and 114 are mounted on the leaves 109 and 110 respectively for individually latching the leaves to the frame of the moving van. The latching bar 115 is mounted to the door 105 for latching the door closed to provide a structurally integrated side member. A latching bar 116 is mounted on the door 106 for latching the door closed to form an integrated structural side member. Latching bars 117, 118 are mounted to the leaves 111 and 112 respectively at the door 107 for separately latching the leaves closed to form integrated structural side members. When closed the doors resist deflection or twisting of the moving van. The door 106 is somewhat shorter than the other door because it fits over the wheel well of the moving van and provides side access to the space D. This particular embodiment has several advantages over the embodiment shown in FIGS. 1 and 2 in that if the operator desires to have side access to area E he needs only to open the panel 112 instead of opening two panels as would be required in the embodiment shown in FIGS. 1 and 2. However, to obtain this advantage some compromise is made in providing the center post. However, the center post does not interfere with the loading and unloading of the household goods located in either areas D or C and D. In one moving van of the truck type that is presently in operation, the distance from the front of the van to the back of the van is 26.5 feet and the opening between the front corner post and the center corner post is 12.6 feet and the distance between the center post and the rear corner post is 12.6 feet. Thus it can be seen that over 94% side exposure may be obtained even using the center post.

To make sure that the multi-leaf doors are not moved either by wind or inadvertently while the moving van is being loaded, latching mechanisms are provided for holding the doors open. In FIG. 9, one of the latching mechanisms 120 is shown for holding the multi-leaf door 104 open at the front right fender of the truck. The latching mechanism includes an H-shaped latching bar with one of the legs pivotally housed in a clamp 122. A bracket 123 is mounted on the front right fender of the truck cab for receiving the latching bar. A T-shaped slot 124 is formed in the bracket 123 for receiving the other leg of the H-shaped latching bar. A spring 125 is affixed to the bracket 123 and extends upwardly through the slot 124 for biasing against the latching bar to prevent the inadvertent upward movement of the latching bar and the unlatching of the door.

A third embodiment is shown in FIG. 10 of the semi-trailer type moving van which may be readily mounted to a tractor. The semi-trailer shown in FIG. 10, has four side doors on the right side of the trailer for enclosing an opening that extends substantially the full length of the trailer, except for a center post. The door arrangement is very similar to the door arrangement of the moving van of the truck type 100 shown in FIGS. 6 and 8. Four doors

152, 153, 154 and 155 are mounted to the right side of the trailer for enclosing the side of the trailer. The doors 152 and 155 are multi-leaf doors similar to the doors 104 and 105 shown in FIGS. 6 and 8. The doors 153 and 154 are the single leaf type and are similar to the doors 105 and 106. The door 152 has an inner leaf 156 and an outer leaf 157. The leaf 156 is hinged to the front corner post and the leaf 157 is hinged to the leaf 156. The door 155 has an inner leaf 158 and an outer leaf 160. The leaf 158 is hinged to the rear corner post and the leaf 160 is hinged to the inner leaf 158. Similar latching means are provided for the doors on the trailer type moving van as provided in the other embodiments. The locking means includes latching bars 161 through 166 that are similar to the latching bars 113-118 respectively.

Although the doors are shown mounted on the right side of the moving van, they could be very well mounted on the left side.

It should be understood that the above described embodiments are simply illustrative of the principles of this invention and numerous other embodiments may be readily devised that incorporate the principles and fall within the scope thereof. Therefore, only the following claims are intended to define this invention.

What I claim is:

1. A side loading moving van for transporting household goods and the like, said van having a van body with a substantial loading exposure on one side thereof that is enclosed by a plurality of hinged pressure doors mounted between a body bed and a door header in which at least one of the doors is a multi-leaf door having at least two leaves that are hinged together for outward pivotal movement in which the first leaf is hinged to a door post and second leaf is hinged to the first leaf and wherein latching means having a rotatable vertical latching bar is mounted on the first leaf adjacent the hinges between the first and second leaves and wherein ends of the latching bar have radially extending hooks for interlocking with the body bed and door header when the first leaf is closed and the latching bar is rotated to apply pressure to the first leaf to force the first leaf securely closed to provide an integrated side panel of the van body and to provide a rigid support for the second leaf as the second leaf is pivoted.

2. A side-loading moving van as defined in claim 1 wherein transverse horizontal tubes are arranged along the side of the enclosure bed below the pressure side doors for receiving tubular extension support arms of a platform to be positioned alongside the enclosure to facilitate the side loading and unloading of the moving van.

3. A side loading moving van as defined in claim 1 wherein the substantial loading exposure includes one or more side openings that provide side access to the interior of the van body over fifty percent of the length of the van body.

4. A side loading moving van as defined in claim 3 wherein the van body has a front corner door post, a rear corner door post, and a center door post mounted along one side of the van body with side openings ex-

tending between said door posts to provide side access along more than 50 percent of the length of the van body and wherein four pressure doors are hinged to said door posts for enclosing the side openings and wherein at least two of the pressure doors are multi-leaf doors with at least two leaves each in which the first leaf of each multi-leaf door is hinged to one of said door posts and the second leaf or each multi-leaf door is hinged to a first leaf.

5. A side-loading moving van as defined in claim 3 wherein the enclosure body has a side opening that extends along the entire side thereof between a rear corner door post and a front corner door post and wherein two multi-leaf pressure doors are attached to the door posts for enclosing the side opening and wherein the leaves of each door are hinged together for outward pivotal movement to sequentially increase the side opening for side access to any portion of the enclosure.

6. A side-loading moving van for transporting household goods and the like, said van having a van body with a substantial loading exposure on one side thereof that is enclosed by a plurality of hinged pressure doors mounted between a body bed and a door header in which at least one of the doors is a multi-leaf door and in which the leaves are hinged together for outward pivotal movement and wherein latching means are provided for the inner door leaves for separately holding the inner leaves securely closed between the body bed and the door header so that the inner leaves when closed provides a rigid support for the outer leaves when the outer leaves are pivoted open, wherein the enclosure body has a front corner door post, a rear corner door post and a center corner door post mounted along one side of the enclosure and wherein said pressure doors are hinged to the door posts for enabling the side loading along the entire side of the enclosure except for the center door post and wherein at least two of the pressure doors are multi-leaf doors with at least two leaves each in which the first leaf is hinged to one of the door posts and the second leaf is hinged to the first leaf and wherein the latching means includes a vertical latching bar mounted on the first leaf adjacent the second leaf for interlocking with the body bed and door header to securely hold the first leaf closed to provide a rigid support for the second leaf as the second leaf is pivoted open.

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PHILIP GOODMAN, *Primary Examiner.*

U.S. Cl. X.R.

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