Aug. 11, 1959 N. T. STARR 2,898,985

DUAL DOOR MECHANISM

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Fig 2

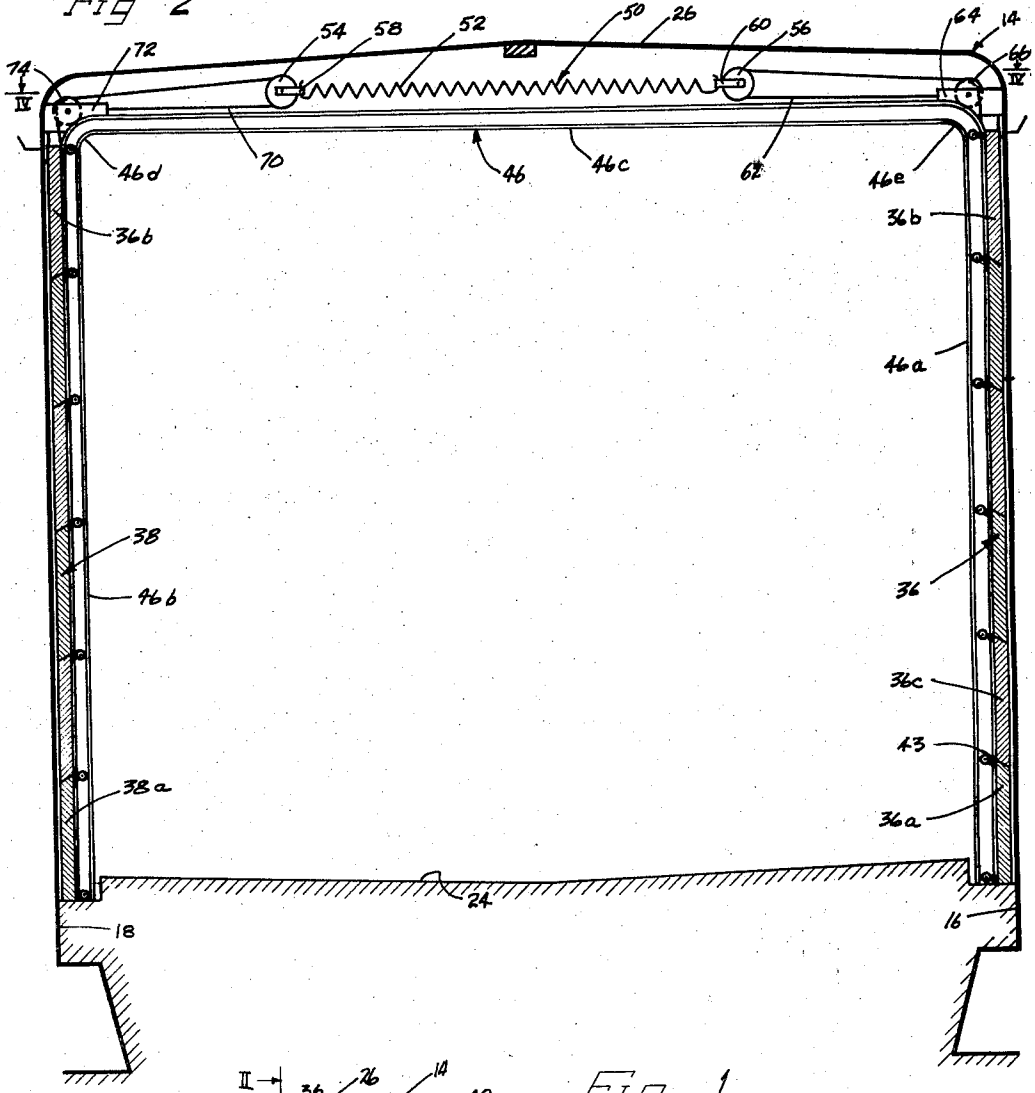
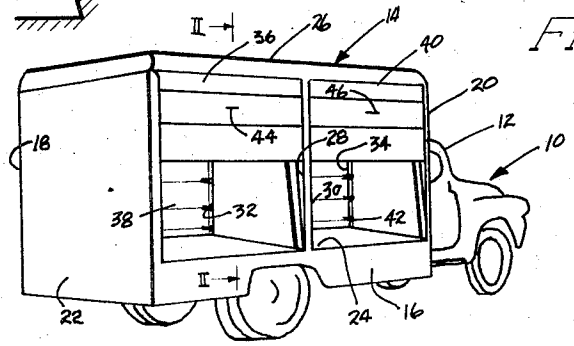


Fig 1



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Fig 3

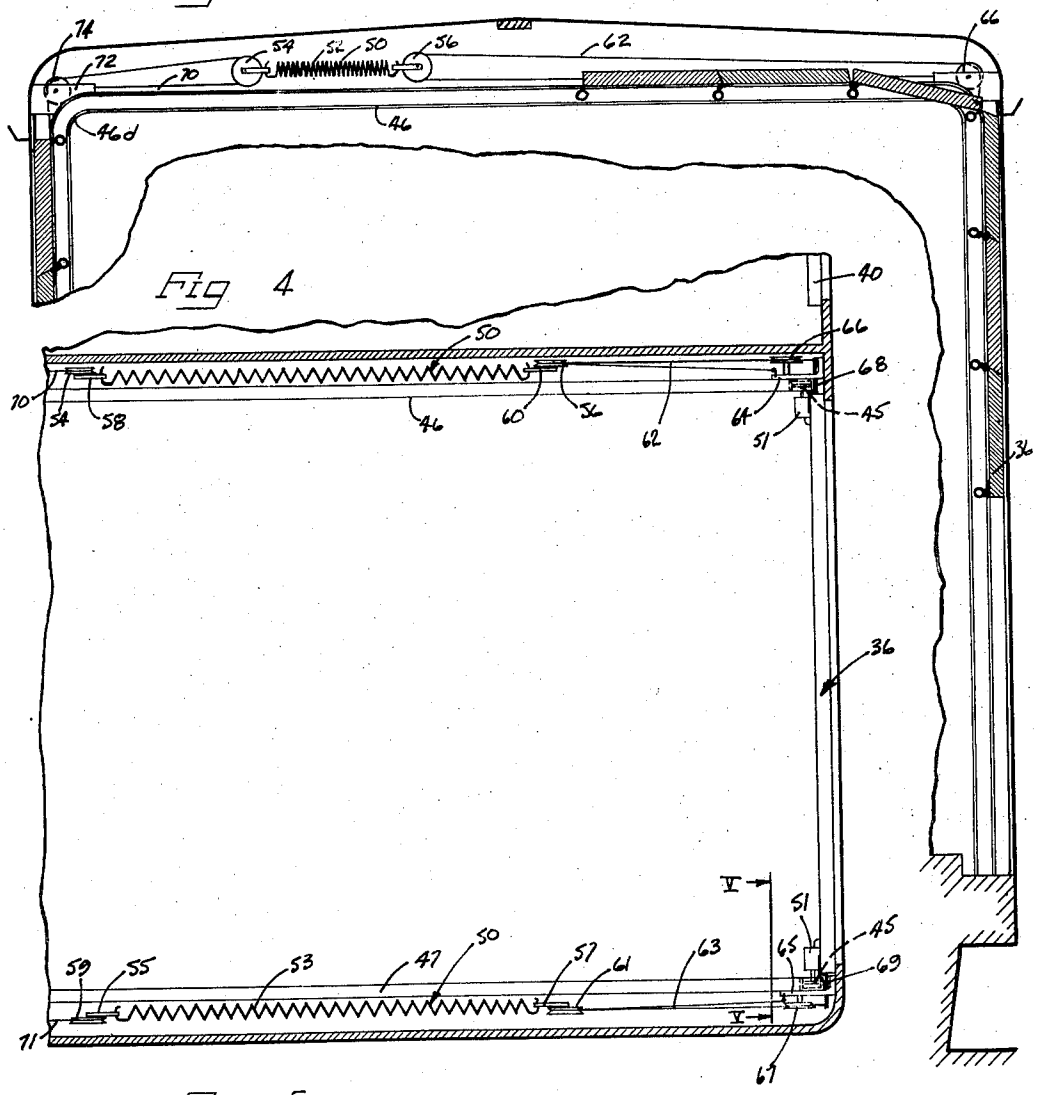
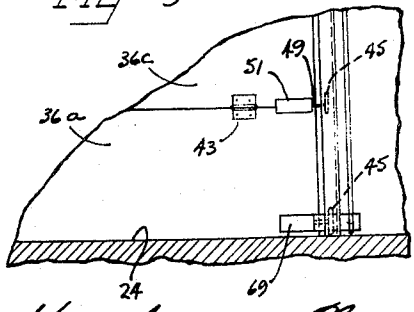


Fig 4

Fig 5



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DUAL DOOR MECHANISM

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Application July 23, 1958, Serial No. 750,346

7 Claims. (Cl. 160—113)

The present invention relates to improvements in doors and operating mechanisms therefor.

More particularly the invention in a preferred form relates to overhead doors with power assist mechanisms for operating the doors. The invention contemplates provision of first and second doors positioned to close spaced opposed doorways such as may be located on opposite sides of an enclosed truck. In a truck having a closed body for hauling produce doorways may be provided on opposite sides for access from either side. The present invention contemplates overhead doors in such installations as truck doorways provided with guide tracks for guiding the doors in movement between a vertical closed lowered position in the doorways and a raised open overhead position when the doors slide or roll up adjacent the roof of the truck. Door operators are provided which are capable of storing energy for assisting and moving the doors to open position. The energy storing mechanisms are irregularly arranged in the form of springs connected so that when either door is moved downwardly to closed position, the springs are loaded and the energy potential increases and is stored for operating either of the doors from the same energy storing mechanism.

Accordingly, it is an object of the present invention to provide an improved door assembly well suited to use for closing opposed spaced facing doorways such as found on opposite sides of closed truck bodies.

Another object of the invention is to provide an improved door operator for assisting in the operation of dual door arrangements.

Another object of the invention is to provide an improved combination of a pair of doors and a single operator therefor which is capable of storing energy with movement of either door for the operation of the other door and with a single operator serving both doors.

Other objects and advantages will become more apparent with the teaching of the principles of the invention in connection with the disclosure and showing of the preferred embodiment thereof in the specification, claims, and drawings, in which:

Figure 1 is a perspective view of a truck body employing doors with a power operator embodying the principles of the present invention;

Figure 2 is a vertical sectional view taken along line II—II of Figure 1 and illustrating the relationship between the doors and the operator therefor;

Figure 3 is a vertical sectional view showing a portion of Figure 2 with one of the doors in raised position;

Figure 4 is a horizontal sectional view taken along line IV—IV of Figure 2; and

Figure 5 is a fragmentary view taken substantially along line V—V of Figure 4 and showing the lower corner of the door.

Shown in the drawings:

Figure 1 illustrates a truck **10** provided with the usual driver-cab **12** and provided with an enclosed body **14** for hauling produce. The body has a side wall **16** on one side of the truck, and another side wall **18** on the opposite side. At the front and back ends are end walls **20** and **22**. At the base of the truck is a floor **24** and the body is provided with a roof **26**.

The side walls **16** and **18** are provided with doorways such as **28** and **30** for the side wall **24** and **32** and **34** for the wall **18** at the other side of the truck. The doorways such as **28** and **32** are shown opposite each other at the sides of the truck and the adjacent doorways **30** and **34** are similarly positioned. This enables the truck to be loaded or unloaded from either side.

The doorways **28** and **32** are closed by opposed overhead doors **36** and **38** and the doorways **30** and **34** are closed by opposed overhead doors **40** and **42**. Since the doorways **30** and **34** with their closing doors are constructed substantially identical with the doorways **28** and **32** and their doors only the latter may be described in detail. Furthermore, it will be understood and appreciated by those skilled in the art that various other arrangements of doors and other numbers of doors may be provided and the principles of the invention may be applied to doors operating in other environments.

As shown in greater detail in Figure 2, the doors are formed in panels with the door **36** having a lower panel **36***a*, and an upper panel **36***b* and other intermediate panels. Each of the panels are attached to their adjacent panels by hinge means **43**. The lower panel **36***a*, for example, is attached to its adjacent panel **36***c* by a hinge **43**, as shown in Figure 5. As will be appreciated by those skilled in the art, various types of hinges may be employed to attach the panels.

The door **38** is of similar construction and is formed of a plurality of panels hingedly attached with the lower panel shown at **38***a* and the uppermost panel at **38***b*. The hinged attachment of the panels permits the panels or sections of the door to flex about a horizontal axis as either of the doors is lifted to the open overhead position. As illustrated in Figure 1, door **36** is provided with a handle **44** for manually raising the door and door **40** with a handle **46**. The doors **38** and **42** are provided with similar handles not shown.

For guiding the doors between their vertical closed position and their open overhead position guide track means are provided. As shown in Figures 2, 3, and 4 U-shaped guide tracks **46** and **47** are located at the ends of the doors. Since track **46** and **47** are of substantially the same construction only track **46** is fully shown. Track **46** has a side **46***a* for the door **36** and a side **46***b* for the door **38**. The top **46***c* of the door track accommodates movement of either of the doors in their overhead position. The other track **47** is provided at the other side of the doors **36** and **38** to support both of the door sides. The track is shaped so as to receive supporting rollers **45** for the located doors. Substantially at each of the hinged connections between the door panels are rollers positioned at each end of the doors to support the doors at the corners of the panels. The guide track **46** is curved at **46***d* and **46***e* which is the juncture between the sides and the top of the track to smoothly guide the doors as either of them are lifted to their overhead open position. As illustrated in Figures 4 and 5 the rollers **45** are rotatably carried on shafts **49** mounted on the door panels by shaft mounts **51**. The mounts are omitted in Figure 2 for clarity. The rollers thus are carried at the door edges to support the door in the tracks, and as will be appreciated by those skilled in the art, various types of rollers and mounts may be used.

A door operator is illustrated generally at **50**. The door operator is an energy storing means and utilizes the stored energy potential in assisting the operation of either door. Further, the energy storing mechanism **50** is loaded, or receives its energy potential, by the movement of either door toward closed position and this potential is utilized in the opening of either door.

The energy storing mechanism **50** includes coil tension springs **52** and **53** provided at the sides of the doors.

The energy storing springs 52 and 53 are positioned adjacent the roof 26 of the truck body 14 and adjacent the U-shaped tracks 46 and 47. At each end of the spring 52 are sheaves 54 and 56 secured to the spring by connectors 58 and 60 which permit free rotation of the sheaves and which permit attachment to the ends of the spring 52. Spring 53 has connectors 55 and 57 for sheaves 59 and 61.

For the door 36 cables 62 and 63 are looped around the sheaves 56 and 61 and attached at one end to fixed anchors 64 and 65 which may be secured to the track or to the truck body 14. The cables 62 and 63 pass around other sheaves 66 and 67 which are fixedly mounted for free rotation such as being mounted on the anchors 64 and 65. The cables 62 and 63 are secured to brackets 68 and 69 at the base of the door 36 for purposes of applying a lifting effort thereto for aiding in moving the door to open position.

For the door 38 cables 70 and 71 are provided. The cables are anchored at one end to fixed anchors 72 for cable 70 and another anchor not shown for cable 71 and are looped over the sheaves 54 and 55. The cables pass over sheaves such as 74 mounted on the anchor 72 for cable 70 and another sheave not shown for cable 71 and pass downwardly to be connected to the base of the door 38. The cables 70 and 71 thereby are able to apply a lifting force to the door to assist in a movement to open position.

The tension storing springs 52 and 53 are tensioned or expanded when the doors are closed and have an energy potential which may be utilized for opening either door. In operation, the springs are loaded or supplied with the potential energy by movement of either of the doors from the open overhead position to the closed position. Therefore when either of the doors is drawn downwardly to closed position the springs are loaded or stretched to operate the same door or the other door at a future time.

In operation, the operator will, after loading or unloading the truck 10, draw the door closed over the doorway which has been used for access to the truck. This will tension the springs 52 and 53 and provide them with an energy potential which remains stored until the other or the same door is opened. When the operator again wishes access to the truck he opens either the door which has been closed or the opposite door and the springs 52 and 53 supplying opening energy to the door being opened.

Thus it will be seen that I have provided an improved combined door and operator mechanism which meets the objectives and advantages hereinbefore set forth. The mechanism is simplified in structure and in operation and requires a minimum of space for the operating mechanism. This achieves an important advantage in allowing more cargo space and also provides less dead weight allowing a larger pay load. This, of course, results in less cost in that a single power unit is used for operating two doors. Door operating energy is simply achieved by closing either of the doors and this energy is stored during use of the truck until such time as the potential is released by opening either of the doors.

I have, in the drawings and specification, presented a detailed disclosure of the preferred embodiment of my invention, and it is to be understood that I do not intend to limit the invention to the specific form disclosed, but intend to cover all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by my invention.

I claim as my invention:

1. An overhead door mechanism comprising means defining first and second opposed facing vertical doorways, first and second vertical overhead doors, guide tracks for said doors guiding said doors upwardly from a closed lowered position to an open overhead position, and an energy storing spring means connected to each of said doors and urging them to open position whereby movement of either door to closed position will increase the stored energy in said spring means for release in opening the other door.

2. An overhead door mechanism comprising means defining first and second doorways, first and second doors for closing siad doorways, guide means for each of said doors positioned to guide the doors for individual movement between closed position in the doorways and an overhead open position, and means for storing energy connected to both of said doors whereby movement of either door to closed position will increase the energy of said storing means for release in operating either door.

3. An overhead door mechanism for closing a plurality of doorways comprising a first overhead door for closing a doorway, means for guiding said first door in movement between a closed position in the doorway and a raised open position, a second overhead door for closing a different doorway, means for guiding said second door in movement between a closed position in the doorway and a raised open position, and common cooperating means attached to both doors simultaneously applying an operating force to both doors to move them toward open position for selective individual movement of said doors to open position.

4. A door assembly comprising a first door for closing and opening a doorway, a second door for closing and opening a different doorway, and operating means connected for applying an operating force to said first door to move it to one of said positions, an energy storing means connected to said drive operating means with a release of stored energy, and means connected between said second door and said storing means and increasing the energy release potential of said storing means with movement of said second door from one position to the other.

5. An overhead door mechanism comprising in combination means defining first and second opposed facing vertical doorways, first and second vertical overhead door members for said doorways, guide tracks for said door members guiding the door members upwardly from a closed lowered position to an open overhead position, an energy storing spring member positioned overhead and between said door members, a cable for each of said door members, a sheave for each of said door members, means for anchoring one end of said cable, means for connecting each of said sheaves and the end of said cable individually to said door member and one end of said spring member whereby said spring member will apply an upward acting force to each of said doors through said cables.

6. An overhead door mechanism for closing a plurality of doorways comprising a first overhead door for closing a doorway, means for guiding said first door in movement between a closed position in the doorway and a raised open position, a second overhead door for closing a different doorway, means for guiding said second door in movement between a closed position in the doorway and a raised open position, and an energy storing means connected between said doors and applying a raising opening force to raise each of said doors, each of said doors increasing the energy potential of said storing means with downward movement toward closed position whereby the weight energy potential of each door in raised position may be utilized for either door.

7. A door assembly for a truck body comprising in combination an enclosure for a truck or the like having opposed side walls with doorways defined therein and an overhead wall spanning between said side walls, first and second doors mounted respectively in said door openings, guide means for guiding said doors between the closed position in said doorways and an overhead open position adjacent said overhead wall, an energy storing spring positioned between said doors adjacent said overhead wall, and means for connecting the ends of said spring to said doors whereby the energy potential of said spring is increased with moving of either door to closed position and said potential is released by moving either of said doors to overhead open position.

No references cited.