July 22, 1958 K. J. AUSTGEN ET AL 2,844,109

MULTIPLE BERTH ARRANGEMENT

Filed Dec. 22, 1952 6 Sheets-Sheet 1

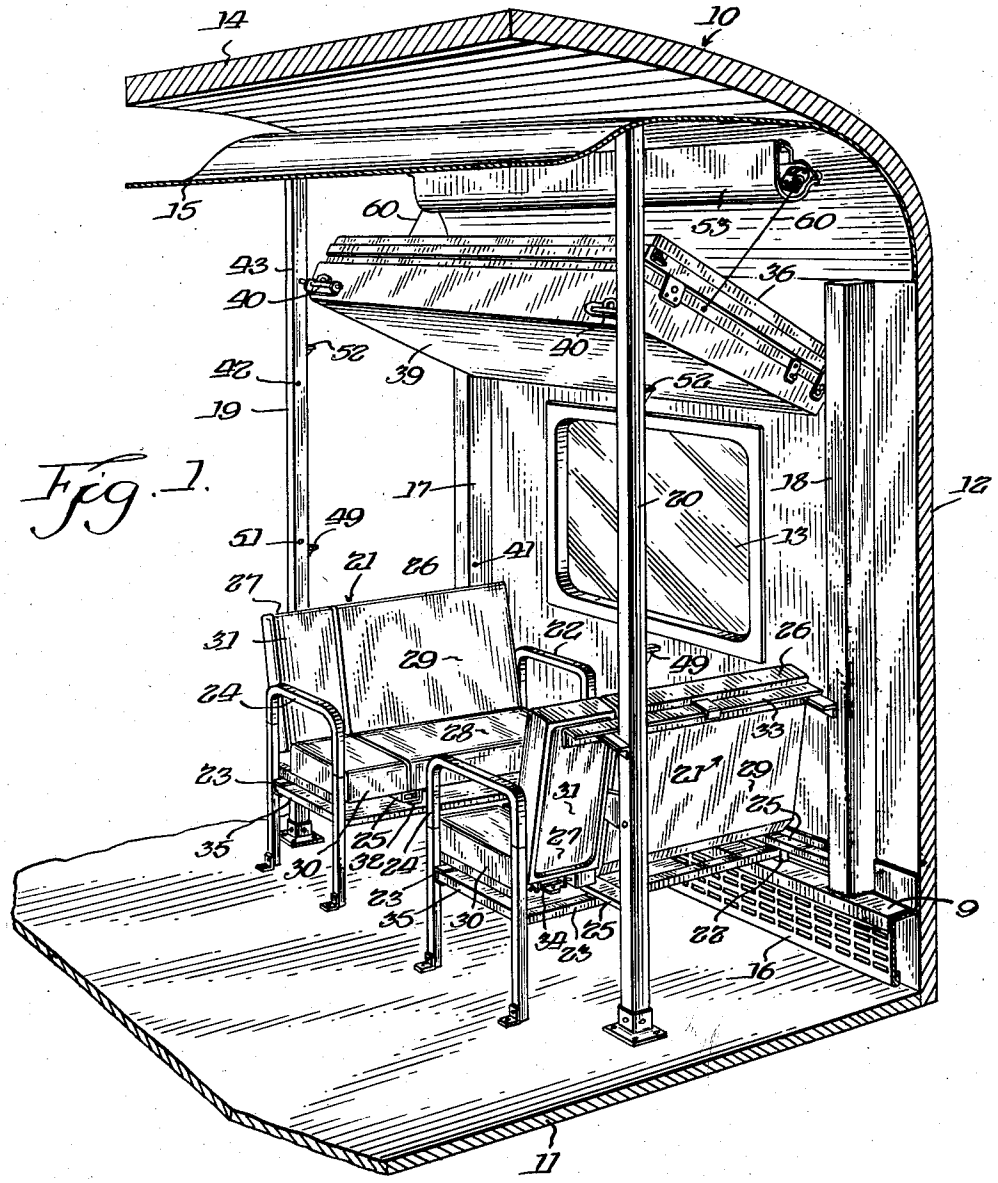


Fig. 1.

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MULTIPLE BERTH ARRANGEMENT

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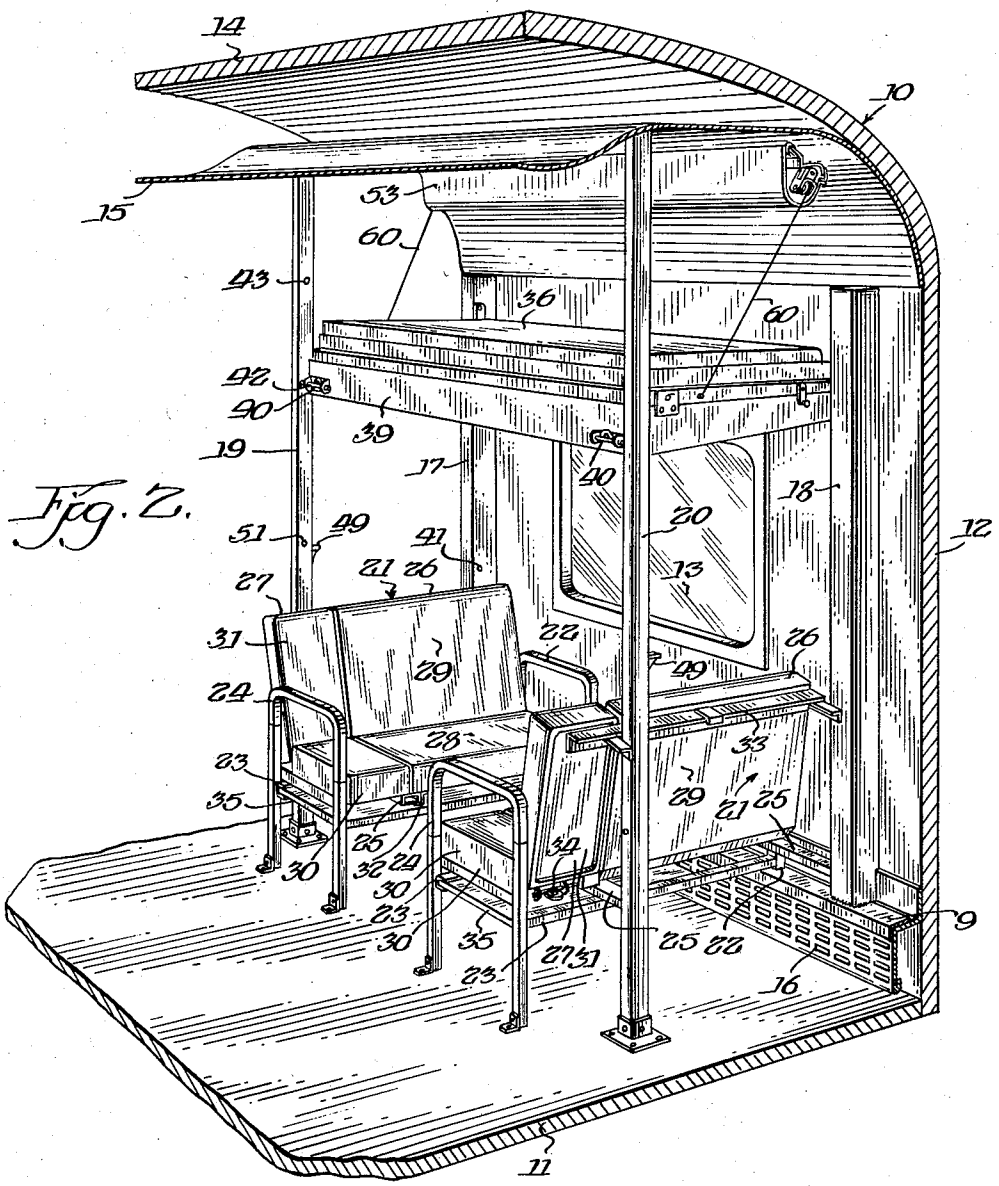


Fig. 2.

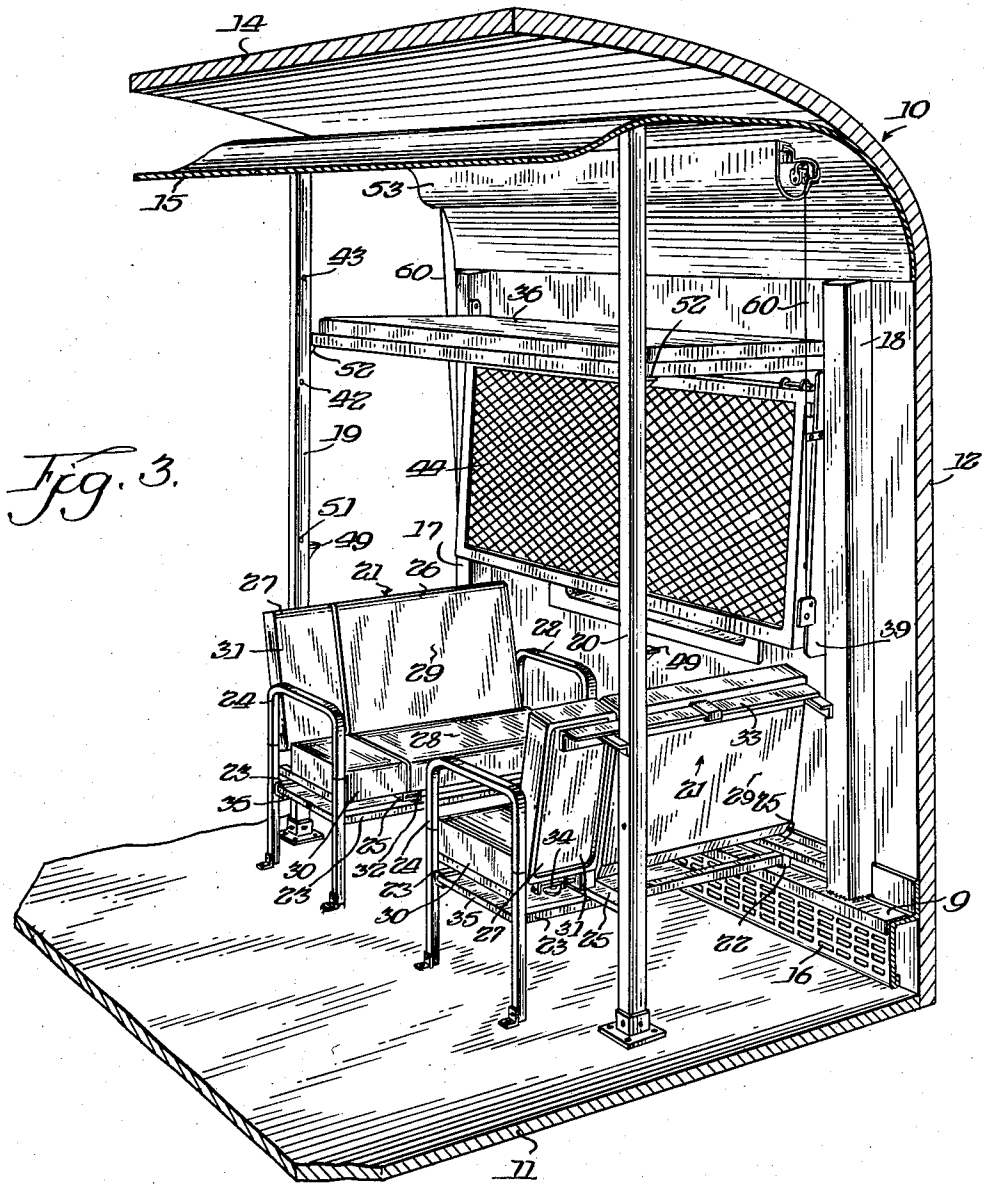
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MULTIPLE BERTH ARRANGEMENT

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Fig. 3.



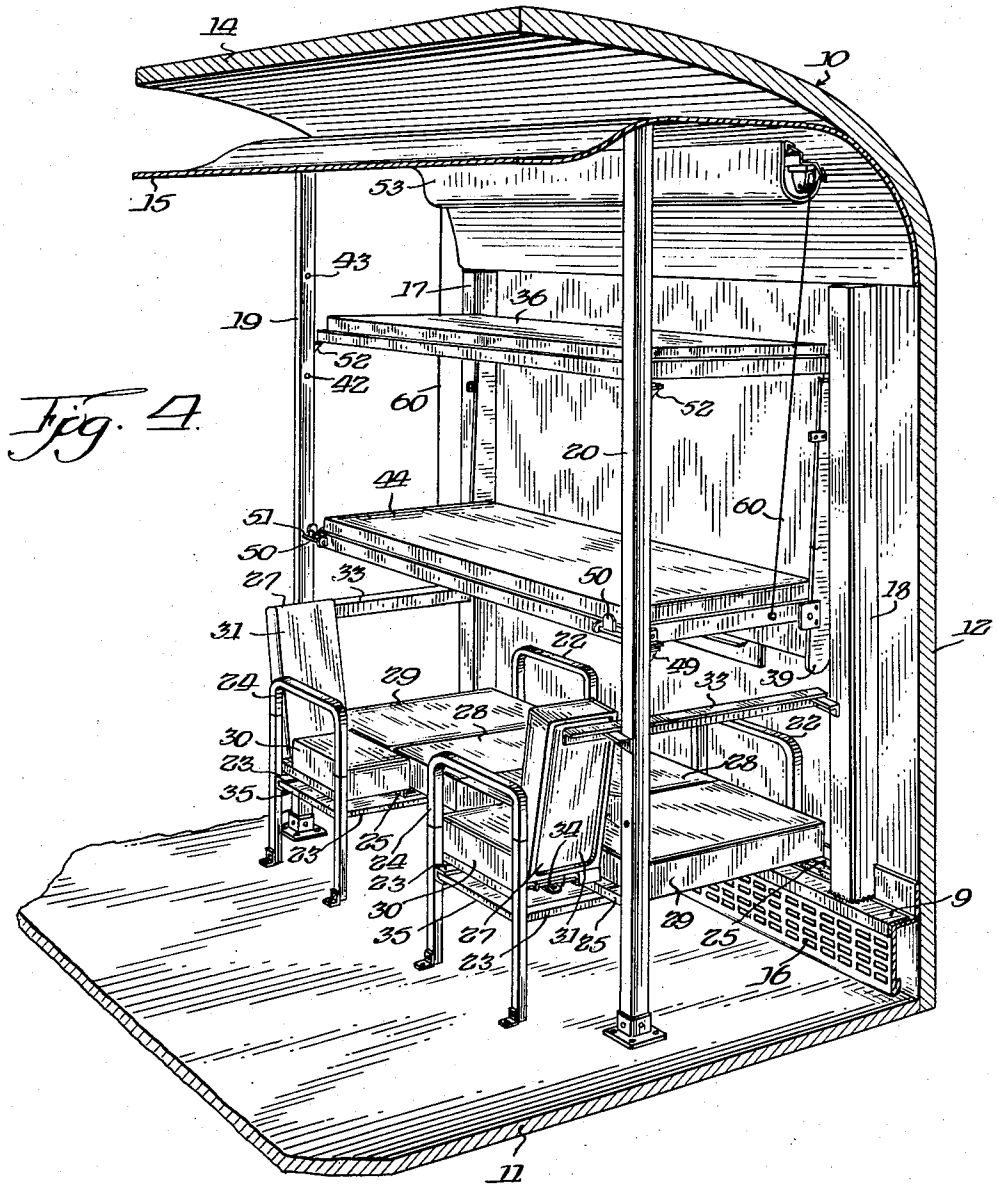
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MULTIPLE BERTH ARRANGEMENT

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Fig. 4.



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Fig. 5.

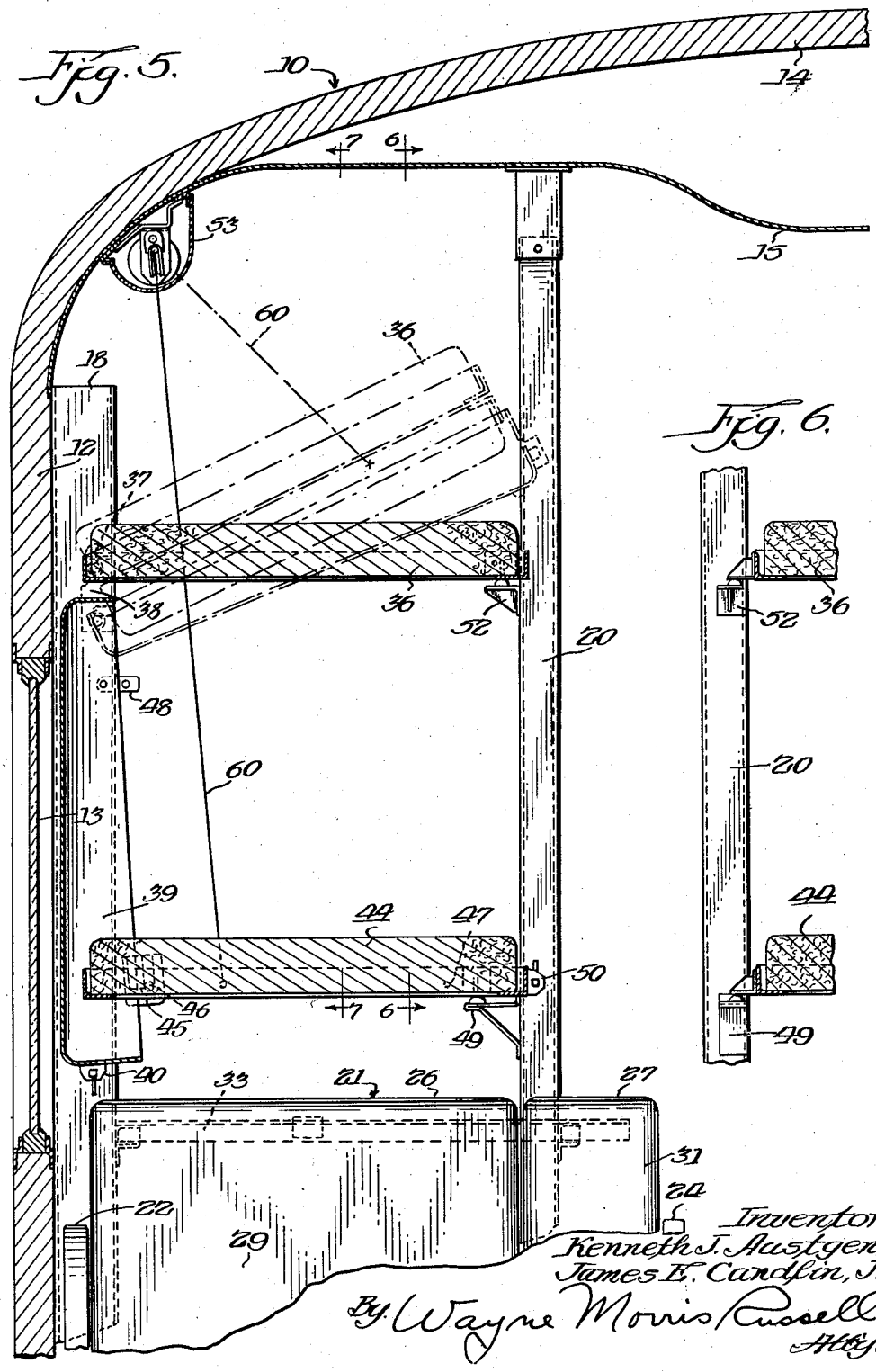


Fig. 6.

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MULTIPLE BERTH ARRANGEMENT

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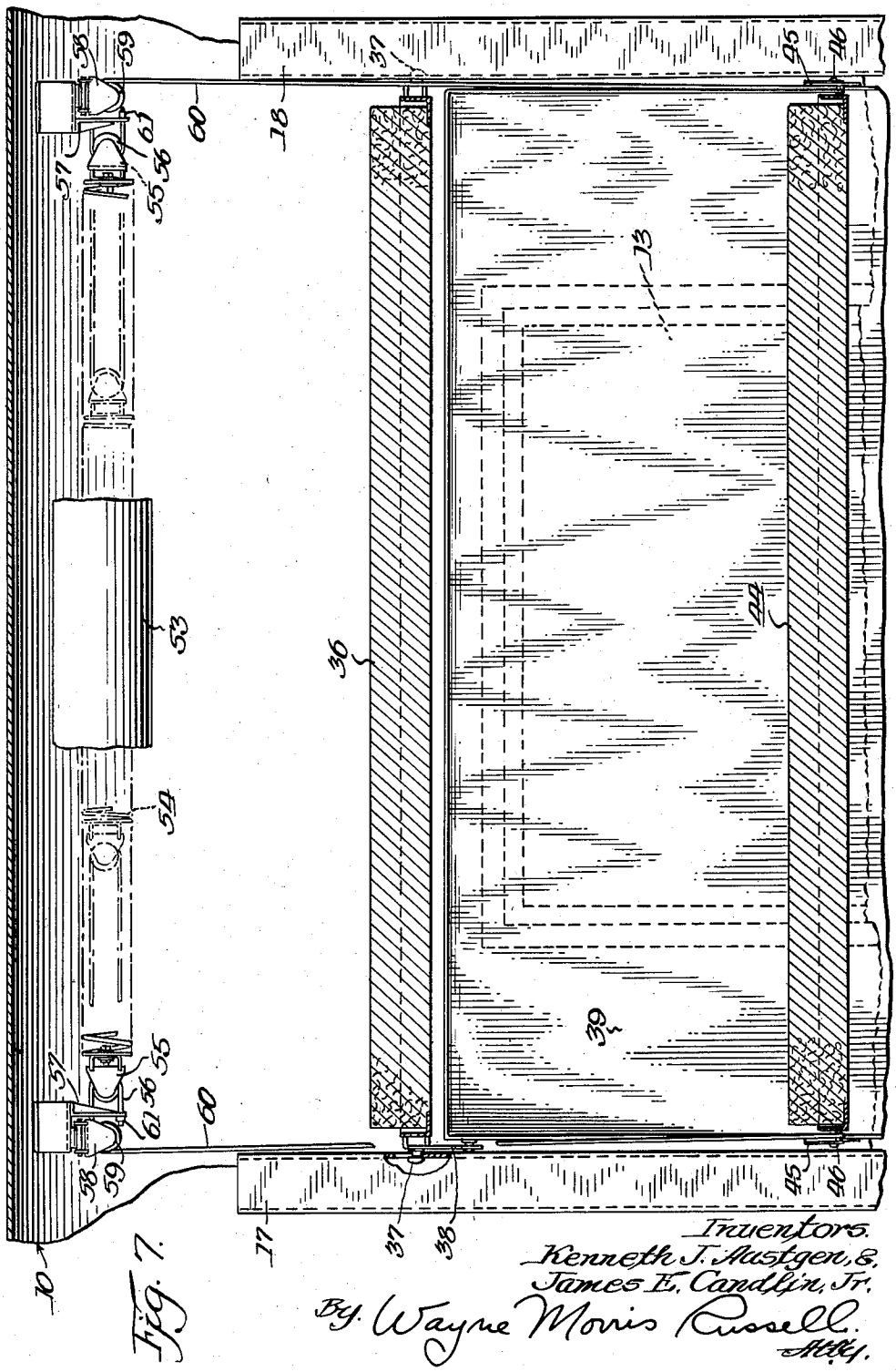


Fig. 7.

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United States Patent Office 2,844,109 Patented July 22, 1958

2,844,109

MULTIPLE BERTH ARRANGEMENT

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Application December 22, 1952, Serial No. 327,397

4 Claims. (Cl. 105—321)

This invention relates to berth arrangements for enclosures and is primarily concerned with a multiple tier berth arrangement for a railway passenger car.

The principal object of the invention is to provide in an enclosure a pan pivotally connected to the enclosure and a first berth pivotally connected to the pan and a second berth spaced above the first berth and pivotally connected to the enclosure and means connected to the enclosure and the first berth and operative to raise the first berth and the pan and the second berth to an out of the way position.

Another object of the invention is to provide in an enclosure a pan having one side pivotally connected to the enclosure and a first berth having one side pivotally connected to the other side of the pan and a second berth spaced above the first berth and having one side pivotally connected to the enclosure and a spring connected to the enclosure and the first berth and operative to raise the first berth and the pan and the second berth to an out of the way position.

A further object of the invention is to provide in an enclosure having a wall a pair of standards spaced from the wall and a pan having one side pivotally connected to the wall and a first berth having one side pivotally connected to the other side of the pan and means on the first berth adapted to engage the standards to hold the first berth in a horizontal position and a second berth spaced above the first berth and having one side pivotally connected to the wall and stops on the standards to support the second berth in a horizontal position and a spring connected to the enclosure and the first berth and operative to raise the first berth and the pan and the second berth to an out of the way position.

A further object of the invention is to provide in an enclosure having a wall, a pair of standards spaced from the wall and a pan having one side pivotally connected to the wall and means on the pan adapted to engage either the wall or the standards to hold the pan in a desired position and a first berth having one side pivotally connected to the other side of the pan and means on the first berth adapted to engage the standards to hold the first berth in a horizontal position and a second berth spaced above the first berth and having one side pivotally connected to the wall and stops on the standards to support the second berth in a horizontal position and a spring connected to the enclosure and the first berth and operative to raise the first berth and the pan and the second berth to an out of the way position.

A more specific object of the invention is to provide in a passenger carrier having a side wall, a pair of standards spaced from the side wall and a pair of chairs positioned on the floor of the carrier and convertible into a lower berth and a pan spaced above the chairs and having one side pivotally connected to the side wall and latches on the pan adapted to engage either the side wall or the standards to hold the pan in a desired position and a first berth adapted to be positioned in the pan and

having one side pivotally connected to the other side of the pan and releasable means adapted to hold the first berth in the pan and stops on the standards to support the first berth in a horizontal position and latches on the first berth adapted to engage the standards to hold the first berth in a horizontal position and a second berth spaced above the first berth and having one side pivotally connected to the side wall and stops on the standards to support the second berth in a horizontal position and a spring connected to the carrier and the first berth and urging the first berth upwardly and operative to raise the first berth and the pan and the second berth to an out of the way position.

The foregoing and other objects of the invention are attained by the construction and arrangement illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view of the berth arrangement shown installed in a railway passenger car with the berth arrangement being in the day position;

Fig. 2 is a perspective view of the berth arrangement shown in the first position in moving from the day position to the night position;

Fig. 3 is a perspective view of the berth arrangement shown in the second position in moving from the day position to the night position;

Fig. 4 is a perspective view of the berth arrangement shown in the night position, the pair of chairs being converted into a lower berth;

Fig. 5 is a cross sectional view through the berth arrangement shown in the night position, the day position of the berth arrangement being shown in dotted lines;

Fig. 6 is a cross sectional view taken on the line 6—6 of Fig. 5; and

Fig. 7 is a cross sectional view taken on the line 7—7 of Fig. 5 particularly showing the spring arrangement for raising the first and second berths.

The invention proposes a new type multiple tier berth arrangement for a railway passenger car. A pair of chairs are positioned on the floor of the car and are convertible into a lower berth. A pan is arranged in spaced relation above the chairs and has one side pivotally connected to the side wall of the car. A first berth is adapted to be positioned in the pan and has one side pivotally connected to the other side of the pan. A second berth is arranged in spaced relation above the first berth and has one side pivotally connected to the side wall of the car. A spring is connected to the car and the first berth and this spring urges the first berth upwardly and is operative to raise the first berth and the pan and the second berth to the day position from the night position. Standards, latches, and stops are provided to hold the various parts of the berth arrangement in different positions. This berth arrangement is particularly adapted to be installed in a railway passenger car; however, it is equally adapted to be installed in buildings, ships, airplanes, and in other types of enclosures.

In the drawings, **10** generally designates an enclosure or passenger carrier or railway passenger car having a floor **11**, side walls **12**, windows **13** in the side walls, a roof **14**, and a ceiling **15** spaced below the roof. Heater pipe grilles **16** extend longitudinally of the car and are secured to the respective side walls **12** at the floor **11**. A plurality of berth sections are arranged in spaced relation along each side wall of the car and the berth sections on opposite side walls are spaced from each other so that a center aisle is formed extending longitudinally of the car. These berth sections are all identical; therefore, only one berth section will be described. A plurality of angles **9** are arranged in spaced relation with respect to each other along each grille **16** and are positioned upon the grille and secured thereto but supported from the car floor by

support means not shown. Each angle extends the full length of its respective berth section space.

A first pair of standards 17 and 18 are arranged in spaced relation with respect to each other and are positioned upon the respective angle 9 and secured to car framing members of the side wall 12. A second pair of standards 19 and 20 are arranged in spaced relation with respect to each other and are spaced from the side wall 12 and extend between the floor 11 and the ceiling 15 or generally speaking the roof 14. The standards 19 and 20 are secured to the floor and to the ceiling. A pair of chairs 21 are arranged in confronting spaced relation with respect to each other on the floor. The arms 22 of the chairs next to the side wall 12 are positioned upon the angle 9 and secured thereto. A pair of spaced parallel channel-shaped members 23 extend under each chair between the chair arms 22 and the chair arms 24 adjacent the center of the car and the members are secured to the chair arms. A pair of spaced parallel hollow members 25 rectangular-shaped in cross section are positioned upon the respective pair of members 23 transversely thereof and each pair of members 25 are secured to the standards 17 and 19 or the standards 18 and 20 and extend to the leg room space between the chairs. Each pair of members 25 are spaced above and are secured to the respective pair of members 23. Each chair comprises a pair of sections 26 and 27 and the section 26 has a chair seat 28 and a chair back 29 hingedly connected to the chair seat 28 and the section 27 has a chair seat 30 and a chair back 31. A pair of spaced parallel Z-shaped angles 32 are secured to each chair seat 28 and the lower flange of each angle rides on the bottom of the adjacent member 25, thus, the chair seats 28 are slidable on the members 25. The chair seats 28 of the sections 26 may be slid upon the members 25 until they are in end to end abutting relation with respect to each other and the chair backs 29 are swung to a horizontal position behind the respective chair seat 28 and thus the chair seats 28 and chair backs 29 of both chairs together are convertible into a lower berth extending longitudinally of the car. The chair backs 31 are held in their upright position by angles 33 secured to the standards 17 and 19 or 18 and 20 and by a slide bolt mechanism 34 engageable in an apertured block integral with the chair seat 30 and are pivotally mounted on the chair arms 24 and are swingable on the pivot to a horizontal position where the same slide bolt mechanism engages an opening in the adjacent one of the standards 19 or 20 to hold the chair backs in a horizontal position. In the horizontal position the chair backs 31 function as trays or as steps to aid occupants of the first or second berths. A step 35 is slidably mounted in each pair of channel-shaped members 23 and the purpose of these steps is to aid occupants in the first or second berths.

A second berth 36 is arranged longitudinally of the car and pivot studs 37 project from the ends of the second berth adjacent one side thereof into the pair of standards 17 and 18 thus pivotally connecting one side of the second berth to the standards. A pair of brackets 38 are mounted on the pivot studs 37 and depend therefrom. A pan 39 is arranged longitudinally of the car in spaced relation above the chairs and the ends of the pan adjacent one side thereof are pivotally connected to the free ends of the brackets 38. Thus, one side of the pan 39 is pivotally connected to the brackets 38 or more generally to the pair of standards 17 and 18 or the side wall 12. A first pair of latches 40 in the form of slide bolts slidably mounted in brackets are positioned on the other side of the pan 39 and the brackets are secured to the pan and the slide bolts are adapted to engage or project into the pair of openings 41 in the pair of standards 17 and 18 to hold the pan in a vertical position against the side wall 12. The slide bolts on the latches 40 are also adapted to engage or project into the pair of openings 42 in the standards 19 and 20 to hold the pan in a horizontal position and the slide bolts are also adapted to engage or project into the pair of openings 43 to hold the pan in an out of the way position or day position.

A first berth 44 is arranged longitudinally of the car and is adapted to be positioned in the pan 39 and brackets 45 are secured to the pan and pivot studs 46 project from the ends of the first berth adjacent one side thereof into the brackets thus pivotally connecting one side of the first berth to the other side of the pan. A pair of studs 47 are secured to the first berth 44 and these studs are adapted to project into apertured spring biased members 48 secured to the ends of the pan adjacent the side where it is pivoted to the side wall 12. The studs 47 and the members 48 together form locks or releasable means adapted to hold the first berth 44 in the pan 39. A first pair of stops 49 are secured to the pair of standards 19 and 20 and are adapted to support the free side of the first berth 44 in a horizontal position. A second pair of latches 50 in the form of slide bolts slidably mounted in brackets are positioned on the free side of the first berth 44 and the brackets are secured to the first berth and the slide bolts are adapted to engage or project into the pair of openings 51 in the pair of standards 19 and 20 to hold the first berth in a horizontal position.

The second berth 36 is arranged in a spaced relation above the first berth 44 and a second pair of stops 52 are secured to the pair of standards 19 and 20 to support the free side of the second berth in a horizontal position. An open ended housing 53 extends longitudinally of the car at the ceiling 15 and is secured to the car framing structure and is located above the second berth 36. Referring to Fig. 7 a yieldable or resilient means or coil spring 54 is positioned in the housing 53 and the ends of the spring are bolted to pulley housings 55 in which are mounted pulleys 56. Brackets 57 are secured to the housing 53 and depend therefrom. Pulley housings 58 are pivotally mounted on pins secured in the housing 53 and pulleys 59 are mounted in these housings. A cable 60 is disposed at each end of the spring 54 and has a stop 61 secured on one end thereof and the cable is threaded through the bracket 57 and the stop bears against the bracket and the cable is threaded around the pulley 56 and then it is threaded around the pulley 59 and the other end of the cable is secured or connected to the first berth 44. The spring 54 urges the first berth 44 upwardly and is operative to raise the first berth and the pan 39 and the second berth to an out of the way or day position.

The day or out of the way position is that position when the pan 39 is approximately 26 degrees above the horizontal and the first berth is in the pan and the upper berth is positioned upon the first berth and the chairs 21 are in upright position as shown in full lines in Fig. 1 and in dotted and solid lines in Fig. 5. The night position is that position when the chairs 21 are converted into a lower berth and the first berth is in a horizontal position resting upon the stops 49 and the pan is in a vertical position against the side wall 12 and the second berth is in a horizontal position resting upon the stops 52 as best shown in Fig. 4.

The mode of operation of the berth arrangement in going from the day position to the night position is as follows: The pair of latches 40 on the pan 39 are engaged in the pair of openings 43 in the standards 19 and 20 and function to hold the pan, first berth and second berth at an angle above the horizontal in the day or out of the way position. To go from the day position to the night position the latches 40 on the pan are released from engagement with the standards 19 and 20 and the pan and first berth swing to a horizontal position where these latches engage the pair of openings 42 in the standards and the second berth 36 also swings down with the pan and first berth until it reaches a

horizontal position where it is stopped by the stops **52** on the standards **19** and **20** as best shown in Fig. 2. Then the latches **40** are released from engagement with the pair of openings **42** in the standards and the pan and first berth swing down until they are in a vertical position against the side wall **12** of the car. The latches **40** on the pan are then engaged in the openings **41** in the standards **17** and **18** to hold the pan and the first berth in a vertical position as best shown in Fig. 3. The releaseable means made up of the studs **47** and the members **48** keeps the first berth from falling out of the pan when the first berth and pan are in a vertical position. The first berth is then released by disengaging the members **48** from the studs **47** and it swings down to a horizontal position where it is stopped by the stops **49** on the standards **19** and **20**. The pair of latches **50** on the first berth which engage the pair of openings **51** in the standards **19** and **20** hold the first berth in a horizontal position against the spring **54** which urges the first berth upwardly as best shown in Figs. 4 and 5. The chairs **21** may be converted into a lower berth at whatever time the attendant may select independently of the operation of the first and second berths.

To go from a night position to a day position the latches **50** on the first berth are released from the openings **51** in the standards **19** and **20** and the first berth is swung into the pan and is locked to the pan by the studs **47** and the members **48**. Then the latches **40** holding the pan in vertical position against the side wall **12** of the car are released from the openings **41** in the standards **17** and **18** and the spring **54** raises the pan and the first berth. The pan and the first berth continue to move upwardly until the first berth comes into contact with the second berth and movement upwardly is continued until the pan, the first berth, and the second berth have reached the day or out of the way position.

The cables **60** are secured to the first berth at approximately one-fourth of the width of the berth measured from the pivoted side of the berth. The spring **54** is under its greatest tension and therefore exerts its greatest pull when the first berth **44** is in the horizontal or night position. When the latches **50** on the first berth **44** are released from the openings **51** in the standards **19** and **20** the berth swings into the pan and the ends of the cables **60** secured to the berth swing through a very small arc and the spring only contracts a minimum amount and still exerts almost the same tension as when the berth was in the night position. Upon the release of the latches **40** on the pan **39** from the openings **41** in the standards **17** and **18** the spring **54** then raises the pan and the first berth and as the pan and the first berth rise the distance from the point of connection of the cables to the first berth to the side wall **12** gradually increases and as this distance increases the leverage increases and as the pan and the first berth rise, the spring gradually contracts until the pan and the first berth and the second berth have reached the day position. Thus as the pan and the first berth and the second berth move toward the day position the leverage gradually increases and the pull of the spring gradually decreases due to the compression of the spring.

This berth arrangement is primarily adapted for installation in a railway passenger car or a railway hospital car but could be installed in a stationary building such as a hospital, or it could be installed in a ship or an airplane and in other types of enclosures.

From the foregoing it will be seen that there has been provided a multiple tier berth arrangement having a new mode of operation resulting in simple and quick and easy movement of the berths from the day position to the night position or vice versa which is particularly adapted to be installed in railway passenger cars and is also adapted to be installed in stationary buildings, ships, airplanes, and many other types of enclosures.

What is claimed is:

1. A sleeping arrangement for an enclosure having a wall, the sleeping arrangement comprising a pair of spaced standards positioned in the enclosure and spaced from the wall and secured to the enclosure, a pan having one side pivotally connected to the wall, a first berth having one side pivotally connected to the other side of the pan, a pair of latches positioned on the other side of the first berth and secured thereto and engaging the pair of standards to hold the first berth in a horizontal position, a second berth arranged in spaced relation above the first berth and having one side pivotally connected to the wall, a pair of stops on the pair of standards to support the other side of the second berth in a horizontal position, and counterbalancing means connected to the enclosure and the first berth and urging the first berth upwardly and operative to raise the first berth and the pan and by contact of the first berth with the second berth to move the berths and pan to an out of the way position.

2. A sleeping arrangement for an enclosure having a wall, the sleeping arrangement comprising a pair of spaced standards positioned in the enclosure and spaced from the wall and secured to the enclosure, a pan having one side pivotally connected to the wall, a first pair of latches positioned on the other side of the pan and secured thereto and engaging either the wall or the pair of standards to hold the pan in a desired position, a first berth having one side pivotally connected to said other side of the pan, a second pair of latches positioned on the other side of the first berth and secured thereto and engaging the pair of standards to hold the first berth in a horizontal position, a second berth arranged in spaced relation above the first berth and having one side pivotally connected to the wall, a pair of stops on the pair of standards to support the other side of the second berth in a horizontal position, and counterbalancing means connected to the enclosure and the first berth and urging the first berth upwardly and operative to raise the first berth and the pan and by contact of the first berth with the second berth to move the berths and pan to an out of the way position.

3. A sleeping arrangement for an enclosure having a wall, the sleeping arrangement comprising a pair of spaced standards positioned in the enclosure and spaced from the wall and secured to the enclosure, a pan having one side pivotally connected to the wall, a first pair of latches positioned on the other side of the pan and secured thereto and engaging either the wall or the pair of standards to hold the pan in a desired position, a first berth having one side pivotally connected to said other side of the pan, releasable means on the first berth and the pan to hold the first berth in the pan, a second pair of latches positioned on the other side of the first berth and secured thereto and engaging the pair of standards to hold the first berth in a horizontal position, a second berth arranged in spaced relation above the first berth and having one side pivotally connected to the wall, a pair of stops on the pair of standards to support the other side of the second berth in a horizontal position, and counterbalancing means connected to the enclosure and the first berth and urging the first berth upwardly and operative to raise the first berth and the pan and by contact of the first berth with the second berth to move the berths and pan to an out of the way position.

4. A sleeping arrangement for an enclosure having a vertical wall and a top wall, the sleeping arrangement comprising a pan positioned in the enclosure and pivotally connected to the vertical wall, a first berth pivotally connected to the pan, a second berth arranged in spaced relation above the first berth and pivotally connected to the vertical wall, an open ended housing positioned above the second berth and secured to the top wall, a spring positioned in the housing, a pulley mounted on each end of the spring, a pulley positioned at each end of the hous-

ing and supported from the housing, a first cable having one end secured to one end of the first berth and passed around the adjacent pulley supported from the housing and the adjacent pulley on the spring and having its other end secured to the housing, and a second cable having one end secured to the other end of the first berth and passed around the adjacent pulley supported from the housing and the adjacent pulley on the spring and having its other end secured to the housing, the spring urging the first berth upwardly and operative to raise the first berth and the pan and by contact of the first berth with the second berth to move the berths and pan to a position adjacent the top wall.

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