

[54] **RAILWAY CAR DOOR**

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[58] Field of Search 151/54, 55; 49/426, 216,
49/218, 219; 16/99, 105

[56] **References Cited**

UNITED STATES PATENTS

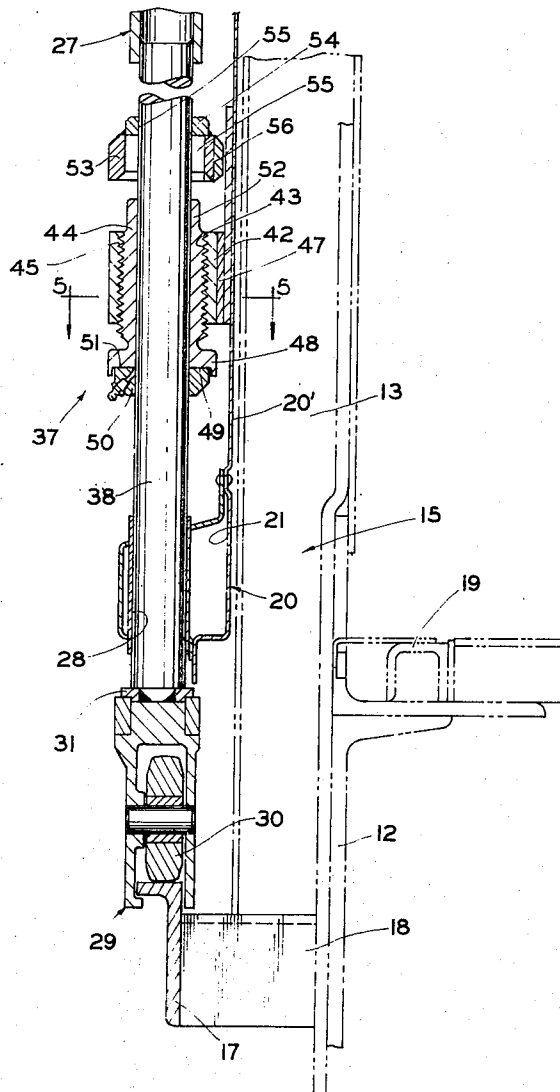
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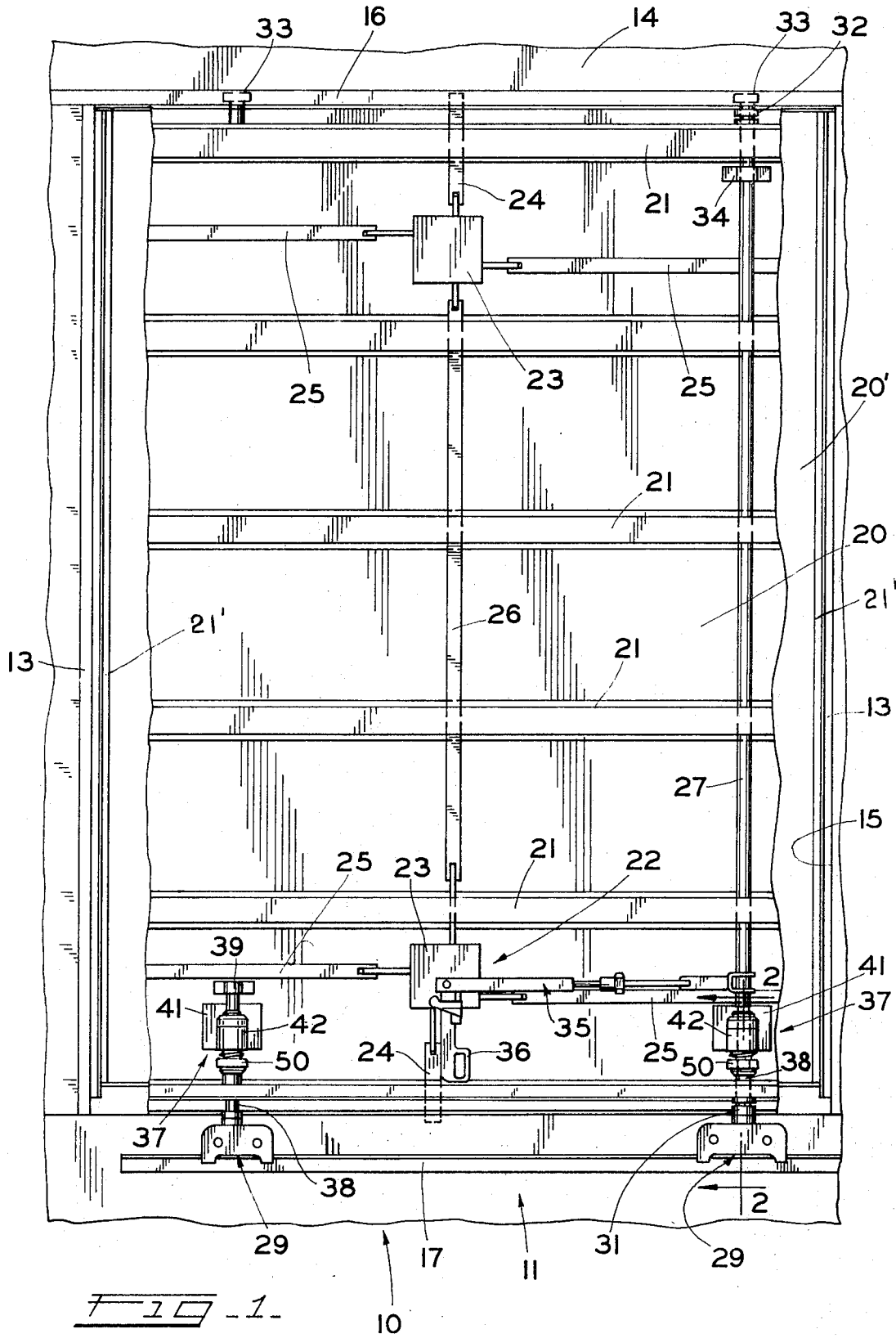
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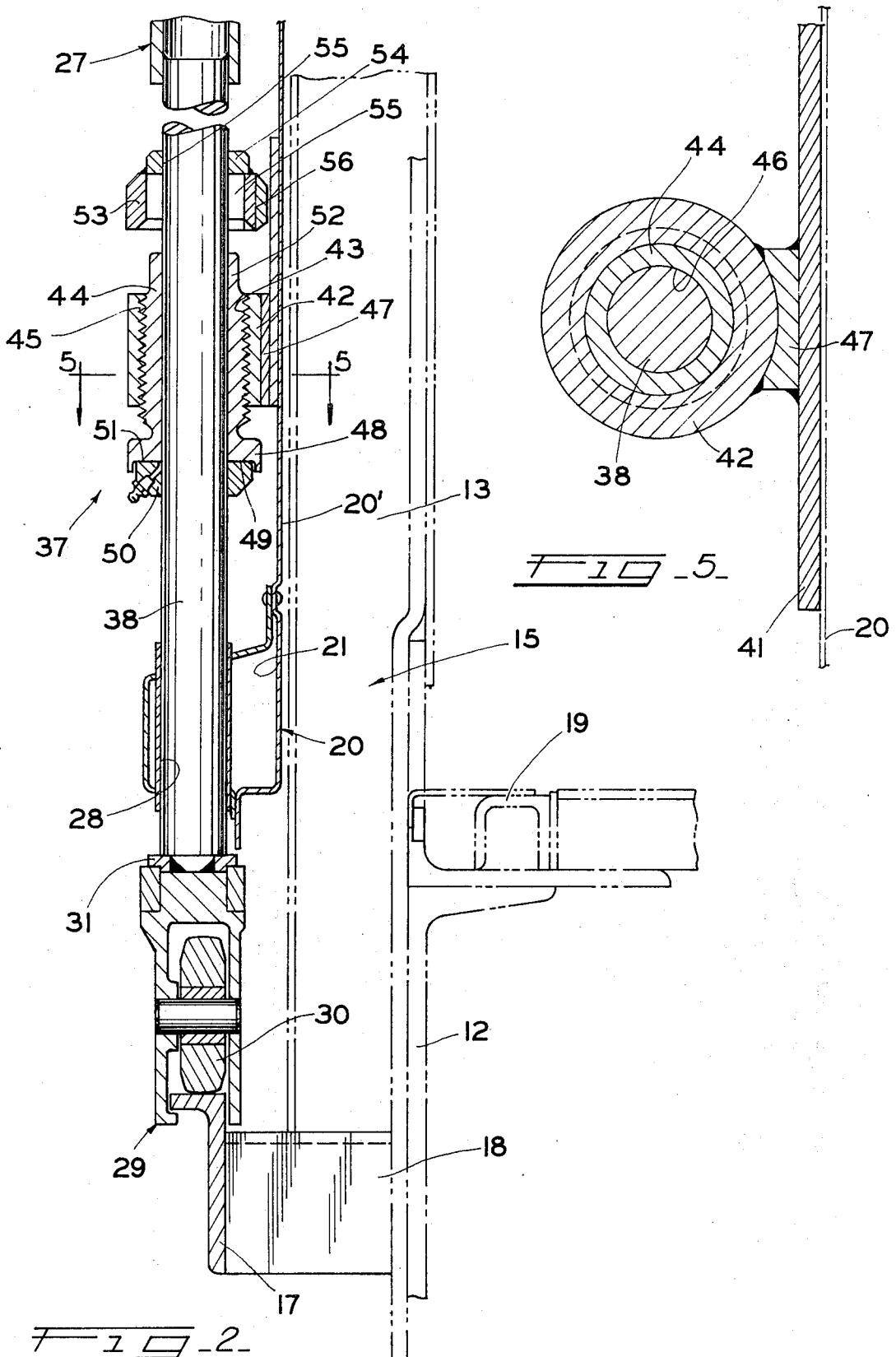
[57] **ABSTRACT**

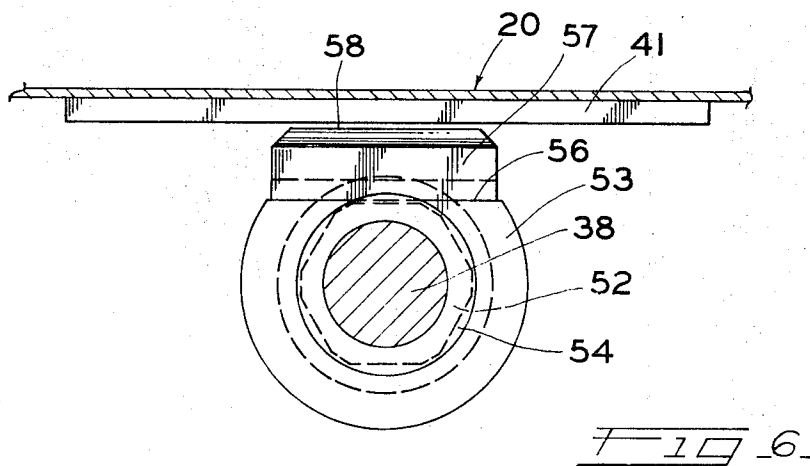
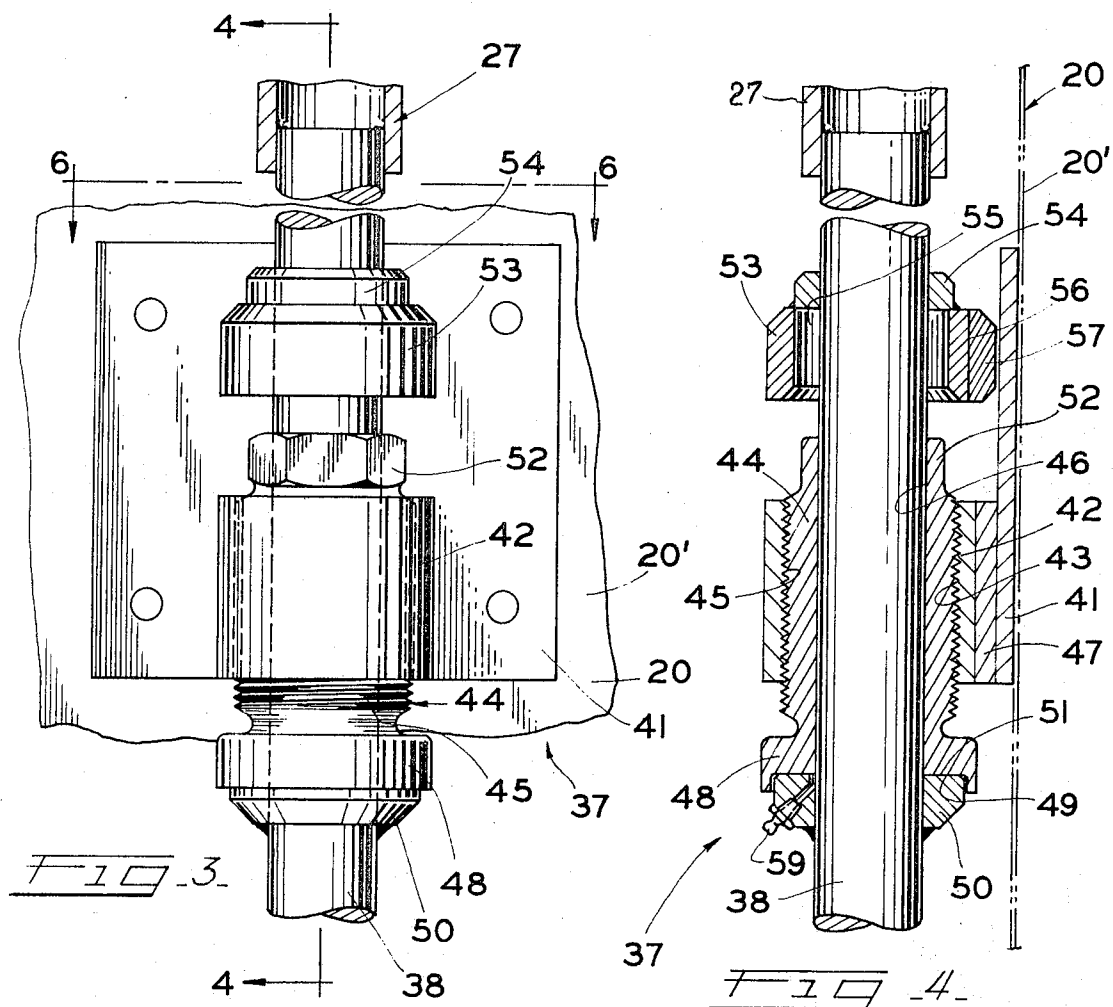
A railway car door of the laterally movable and sliding type is supported on a track beneath a door opening by means of a pair of connector assemblies adjustable to position the door relative to the opening. The connector assemblies each include a bracket connected to the door within which a threaded sleeve is rotatably positioned. The sleeve, which is supported on a vertical pedestal connected to a slide assembly, includes a tool engageable projection and the internal threads of the sleeve and bracket are enclosed and protected by a vertically shiftable enclosing sleeve.

4 Claims, 6 Drawing Figures









RAILWAY CAR DOOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to railway cars and particularly to a door of the sliding and laterally movable type which is moved into the door opening on a side of the railway car.

2. Description of the Prior Art

The prior art is disclosed in U.S. Pat. Nos. 3,216,067, Nov. 9, 1965; 3,269,059, Aug. 30, 1966; 3,653,153, Apr. 4, 1972. These patents disclose sliding plug or laterally movable doors which are rolled into position on a track disclosed beneath a railway car door opening. The railway car doors are supported on laterally spaced roller assemblies which in turn have connected thereto crank arms and swivel connector assemblies which in turn are supported on rotatable shafts connected to the door. This type of construction is standard in the prior art and the swivel assemblies usually include a pedestal type of member which is connected to the shafts and also connected to the slide members, the same having a screw thread and nut adjustment capability whereupon by rotation of the nut, the operator may raise and lower the door relative to the door opening, thereby adjusting the position of the door during assembly. Occasionally during maintenance the door may be readjusted so that it is accurately centered vertically and horizontally within the door opening. In new car construction the exterior surface of the railway car is generally shot-blasted to clean the same prior to the application of paint. Such operation has been found to be detrimental to the threaded parts of the door connector assemblies since in most instances a considerable portion of the threaded sleeve member of each connector assembly is exposed and thus is affected by this slot-blast operation. Also, the adjustment, namely the threaded connector assembly, during utilization of the cars over a long period of time is subject to deterioration insofar as the threaded members are concerned since the exposed threaded members are subject to the elements of weather as well as damage from other sources. U.S. Pat. No. 3,269,059 particularly shows the exposure of the threads and other critical members of the connector assembly which provides for deterioration, the same being avoided by the present invention.

SUMMARY OF THE INVENTION

It is a prime object of the present invention to provide an improved adjustable connector assembly for a railway car door which facilitates fine adjustment of the door within the door opening of a side in a railway car. The connector assemblies, two of which are provided for a door, each includes at the lower ends a roller or slide assembly which is supported on a track beneath the door opening. A pedestal is supported on the slide assembly the same being rotatably connected about a vertical axis to the side of the door and also being connected to an operating shaft or shafts extending vertically the length of the door. The pedestal supports a rotatable sleeve type member having outer threads which engage the inner threads of a bracket rigidly connected to the side of the door. The sleeve also is provided with an extension which may be engaged by a tool for rotating the sleeve to provide for adjustment between the threaded sleeve and the threaded bracket. The projec-

tion may be in the form of a nut which may be suitably engaged by a wrench in the hands of an operator. The arrangement is such that a minimum number of threads of the sleeve member are exposed and the projecting portion or nut, which also must be protected, is adapted to be enclosed by an enclosing member or shroud which also engages the threaded member and, by virtue of its relation to the side of the door, locks the threaded sleeve and tool engaging member against rotation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a railway car side having a door opening and a laterally movable and slidable door positioned therein.

FIG. 2 is a cross sectional view taken substantially along the line 2—2 of FIG. 1;

FIG. 3 is an elevational view of a portion of a connector assembly;

FIG. 4 is a cross sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is a cross sectional view taken substantially along the line 5—5 of FIG. 2; and

FIG. 6 is a cross sectional view taken substantially along the line 6—6 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now particularly to FIG. 1, a railway car body is generally designated by the reference character 10 and includes a conventional side 11, including a side sill 12 on which spaced vertically extending corner posts 13 are positioned, the same being connected to a horizontally extending top plate 14 which with the corner posts 13 and side sill 12 define a door opening generally designated at 15. A horizontal upper track 16 extends above the door opening 15 and a lower track 17 is supported on a side sill 12 by means of bracket 18 beneath the door opening 15. As best shown in FIG. 2, the car body 10 includes a conventional threshold and floor construction 19.

A sliding and laterally movable door 20 is provided with door sheathing 20' and also includes horizontal vertically spaced box members 21. The door may be of conventional design and construction and include vertical horizontally spaced side members 21' connected to the spaced members 21 to provide a rigid structure, the same not being described in detail. Conventional door constructions are generally disclosed in the aforementioned patents and the present invention may function with any conventional door design. The conventional door also includes a door actuating and locking mechanism 22, generally disclosed in FIG. 1. The present door includes a pair of vertically spaced rack and pinion housings 23 which are provided to reciprocate vertical locking bolts 24 and horizontal locking bolts 25. A vertical shiftable actuating bar 26 interconnects the mechanisms disposed in the housings 23 to provide for actuation of said bolts.

The present type of door is similar to that disclosed in U.S. Pat. No. 3,653,153 wherein only one actuating rod or pipe 27 is provided at one end of the door, the other door being merely supported by means of a swivel connector assembly. However, the invention is equally applicable to the conventional doors having double actuating rods disposed at opposite sides of the door. As best shown in FIG. 2, vertical sleeves 28 are

supported on the lower horizontal boxes 21. Also, as shown in FIG. 1, the lower track 17 supports a pair of roller assemblies 29 having rollers 30, as shown in FIG. 2, which are adapted to be retained and roll along the track 17. Swivel and connector assemblies are designated at 37, and each is supported on the roller assembly 29. A pedestal or shaft 38 is connected to each of the roller assemblies 29. The pedestal 38, as shown in FIGS. 1 and 2, on the right hand side of the door is also connected at its upper end to the operating rod 27. The lower end of the pedestal 38 on the side is also connected to a crank arm 31. The shaft or pipe 27 extends through each of the horizontal box members 21 and through an upper bracket 34 and in turn is connected to a crank arm 32, in turn connected to a roller 33, rollable in an upper track 16. Referring now to FIG. 1, on the left hand side of the door there is also provided a bracket 39 which is connected to the door and supports the upper end of the pedestal 38. In this case the pedestal 38 is not connected to a shaft and crank arm assembly as it is on the right hand side of the door since the upper and lower tracks 16 and 17 are curved inwardly at this point and after the right hand side of the door has been opened the swivel assembly on the left hand side permits the door to be rolled outwardly on the curved track 16 and 17. The connector assemblies 37, however, on both sides of the door are similar in their adjusting mechanisms.

The swivel and connector assemblies 37 will now be described. As best shown in FIGS. 2 through 6, mounting plates 41 are rigidly supported on the sheathing 20' of the door 20 adjacent the lower edges thereof on opposite sides of the door. A bracket 42 is suitably connected by means of a connector block 47 to each of the mounting plates 41. Each of the brackets 42 is provided with a vertical threaded bore 43. A sleeve designated at 44 includes threads 45 which are in threaded engagement with the threaded bore 43 so that upon rotation about a vertical axis of the sleeve 44, the same moves vertically relative to the threaded bore 43. The sleeve 44 is also provided with relatively smooth bore 46 within which the pedestal 38 is journaled. The lower end of the sleeve 44 is provided with an annular shoulder 48 having an annular undercut 49. A collar 50 is rigidly secured and supported on the pedestal 38. The collar 50 includes a flat swivel surface 51 on which the annular undercut 49 is supported to permit rotation of the collar 50 during rotation of the pedestal 38. The sleeve 44 is also provided with an upper tool engageable projection which may be in the form of a suitable hexagon type nut 52. An enclosing sleeve 53 includes a cylindrical top wall 54 and an enlarged recess 55 also of hexagon shape to engage the nut 52 in complementary relation. The sleeve 53 is freely vertically movable relative to the pedestal 38. The sleeve 53 is also machined to provide a vertical flat wall 56 to which a stop boss 57 is connected. The stop boss 57 also includes a vertical flat wall, stop face 58 which is in close proximity and parallel to the mounting plate 41.

Operation of the door actuating and locking mechanism 22 is well described in the aforementioned U.S. Pat. No. 3,653,153 and need not be further described. A handle 36 is adapted to be actuated by the operator for locking and unlocking. Further, the swivel mechanism includes a grease fitting, as best shown in FIG. 38, which is used for providing for free and ready swiveling movement of the assembled parts.

OPERATION

In operation the actuation of the lever 36 provides for retraction of the locking bolts 24 and 25 so that the door may now be moved laterally outwardly. Further, actuation of the lever 36 provides for movement of the linkage assembly 35 in a manner wherein the shaft 27 and pedestal 28 are rotated about a vertical axis actuating the crank arms 31 and 33 which move one side of the door laterally outwardly with respect to the door opening. The rollers 33 are provided at the upper ends of the doors as shown in FIG. 1 and the door may now be moved laterally with respect to the door opening on the curved track 16 and 17. Swivel and connector assemblies 37 swivel sufficiently to permit the door to freely roll to one side of the door opening. Generally, this describes the operation in opening the door, the reverse being necessary to close same.

Specifically, the operation of the swivel and connector assemblies 37 is as follows:

It is desired, of course, that the door in each instance be properly centered within the door opening both vertically and horizontally. Horizontal adjustment, of course, is obtained by merely moving the door on its rollers, assemblies 29, to the position desired. On the other hand, vertical adjustment which is exceedingly important is accomplished by means of the swivel and connector assemblies 37. Since the sleeve 44 is rigidly supported on the collars 50, rotation of the sleeves 44 by virtue of the threaded engagement with the threaded bore 43 provides for vertical movement of the door 20, mounting plates 41 and brackets 42. Thus, by rotating the sleeves 44, the door being supported on the track merely moves upwardly or downwardly and in this way both sides of the door may be individually adjusted. Rotation of the sleeve is obtained by engaging the hexagon nut 52 by means of a suitable tool and rotating the same. Prior to rotation of the hexagon nut 52, it is necessary to move the enclosing sleeve 53 upwardly from the position shown in FIG. 1 to the position shown in FIGS. 2, 3 and 4, whereby the hexagon nut 52 is then exposed. In the position shown in FIG. 1, the hexagon nut is protected and shrouded against the elements since the enclosing sleeve is anchored against turning movement by virtue of the engagement of the face 58 of the stop boss 57 with the mounting plate 41. In other words, while the enclosing sleeve 53 may be moved vertically from the enclosing or shrouding position relative to the stop nut 52, it cannot rotate and thus in its enclosing position it also prevents rotation of the sleeve 52, thereby effectively locking the same in position.

It can be seen that the enclosing of the lock nut 52 protects the same from shot-blast operations and the weather and other operating conditions which might be detrimental, so that the tool engagement projection or nut 52 always retains its exact shape and will be effective for its purpose at all times. Also, a positive locking means has been provided which cannot under vibration rotate the sleeve 44 out of its adjusted position. Further, only a minimal number of threads are shown and thus the entire swivel assembly adjusting elements are guarded against the shot-blast operations which are attendant to the finishing of a new car or other wear and tear which is attendant to exposure to the elements and normal operating conditions.

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Thus, it is believed a new and effective connector and swivel assembly for adjusting laterally movable doors has been described and disclosed.

What is claimed is:

1. For a railway car having a side with a door opening, a door, a track on said side adjacent said opening, a slidable member supported on said track, the improvement of
 - a connector assembly for supporting said door on said slidable member whereby said door may be moved on said track between open and closed positions, comprising:
 - a pedestal connected to said slidable member and extending vertically with respect thereto,
 - a bracket on said door having a threaded bore,
 - a rotatable sleeve within said bore, said sleeve having an outer threaded cylindrical surface engaging said first threaded bore and a second bore and said pedestal extending slidably within said second bore,
 - a collar rigidly supported on said pedestal and in supporting relation below and relative to said sleeve which is rotatable with respect to said collar whereby said bracket and door are supported on said pedestal and slidable member,
 - said threaded cylindrical surface and said first threaded bore providing adjusting means between said sleeve and said bracket whereby upon rotation of said sleeve said bracket and door may be ad-

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- justed relative to said opening,
- actuating means including a tool engageable projection on said sleeve projecting upwardly from said bracket adapted to be engaged by a tool for rotating said sleeve, and
- enclosing means supported on and axially movable along said pedestal from a covering position relative to said actuating means to provide access to the same.
2. The invention in accordance with claim 1, said enclosing means having a third bore in sliding engagement with said pedestal, and means on said enclosing means engageable with said projection and with said door thereby restraining rotation of said sleeve during the covering position of said enclosing means.
3. The invention in accordance with claim 2, said restraining means on said enclosing means including means within said third bore inter-locking with said tool engageable projection.
4. The invention in accordance with claim 2, said restraining means including a flat portion on said enclosing means positioned contiguously with respect to said door to prevent rotation of said restraining means, and interlocking means between said third bore and said tool engageable projection.

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