Nov. 28, 1950 R. N. JANEWAY 2,532,272

SWING HANGER PIN FOR RAILWAY TRUCKS

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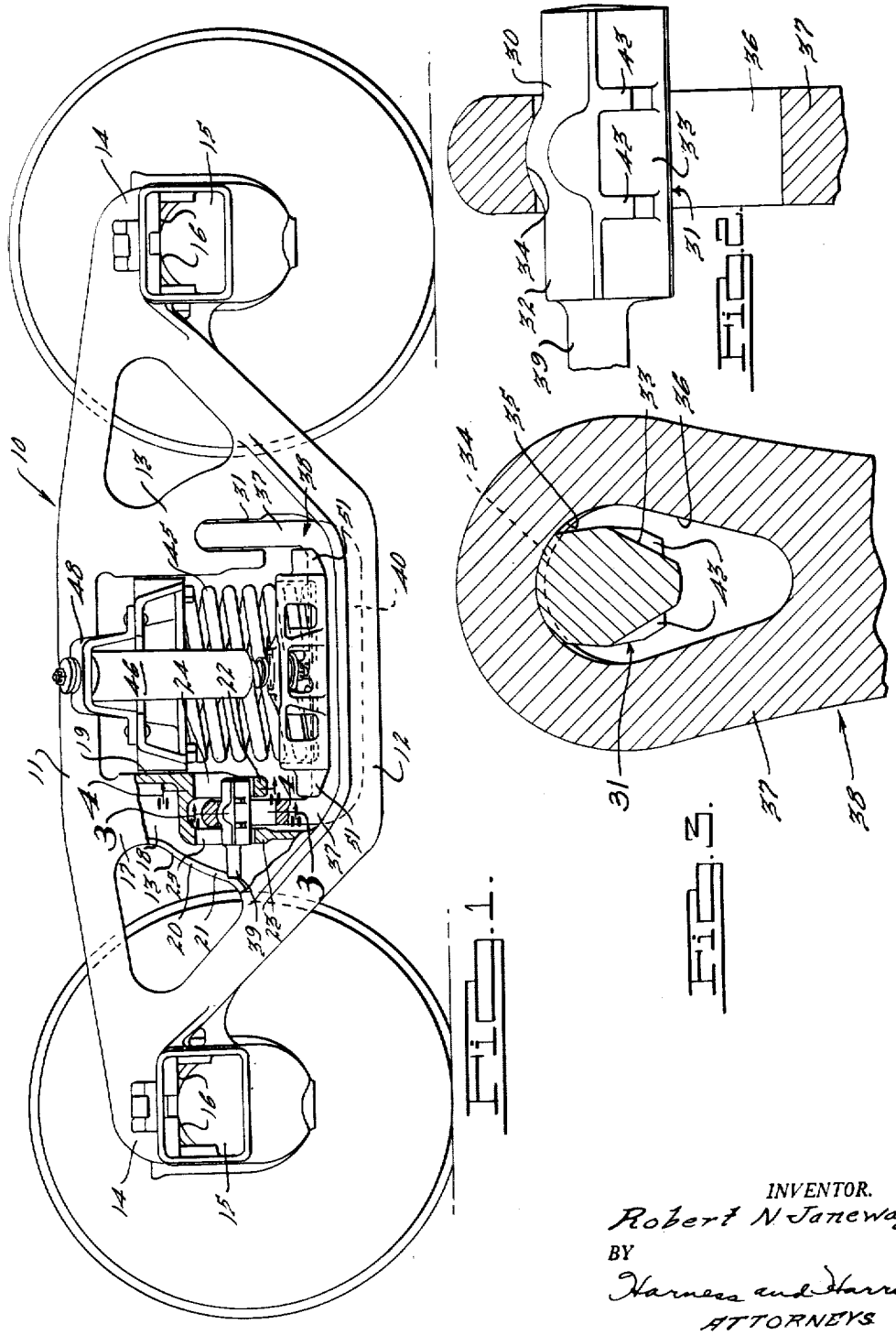


Fig. 1.



Fig. 2.



Fig. 3.

INVENTOR.
Robert N Janeway
BY
Harness and Harris
ATTORNEYS

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SWING HANGER PIN FOR RAILWAY TRUCKS

Filed Feb. 21, 1948 3 Sheets-Sheet 2

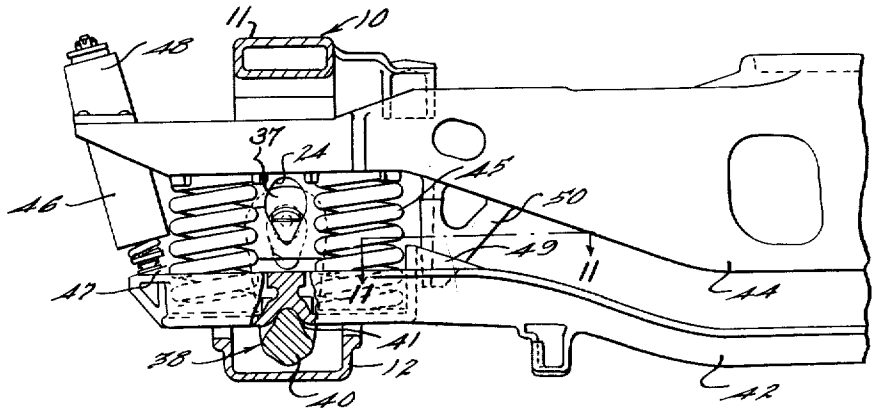



Fig. 5.

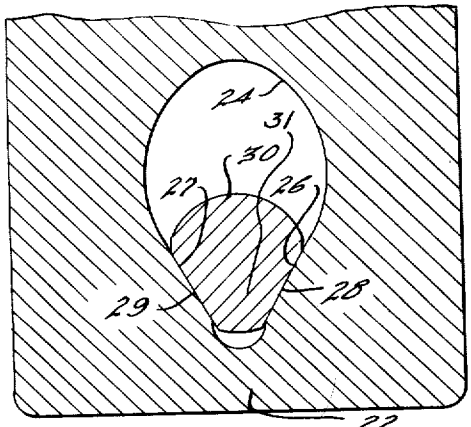



Fig. 4.

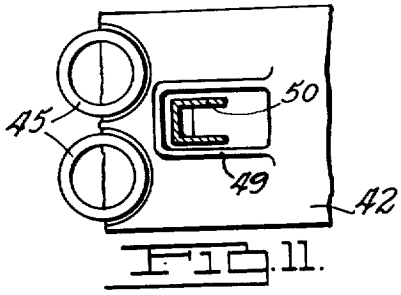



Fig. 11.

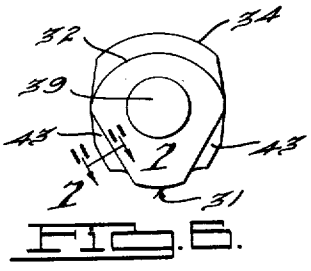



Fig. 6.

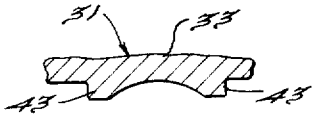



Fig. 7.

INVENTOR.
Robert N Janeway.
BY
Harness and Harris
ATTORNEYS.

Nov. 28, 1950 R. N. JANEWAY 2,532,272

SWING HANGER PIN FOR RAILWAY TRUCKS

Filed Feb. 21, 1948 3 Sheets-Sheet 3

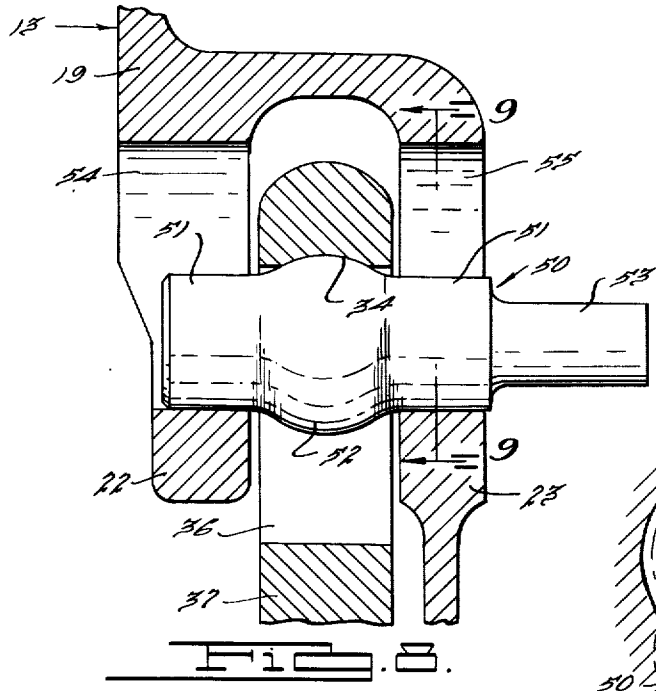



Fig. 8.

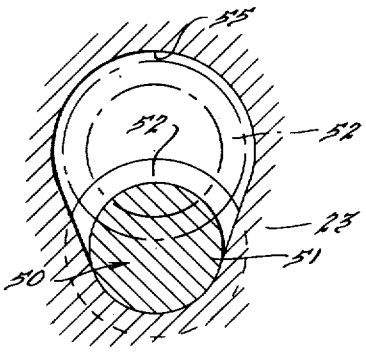



Fig. 9.

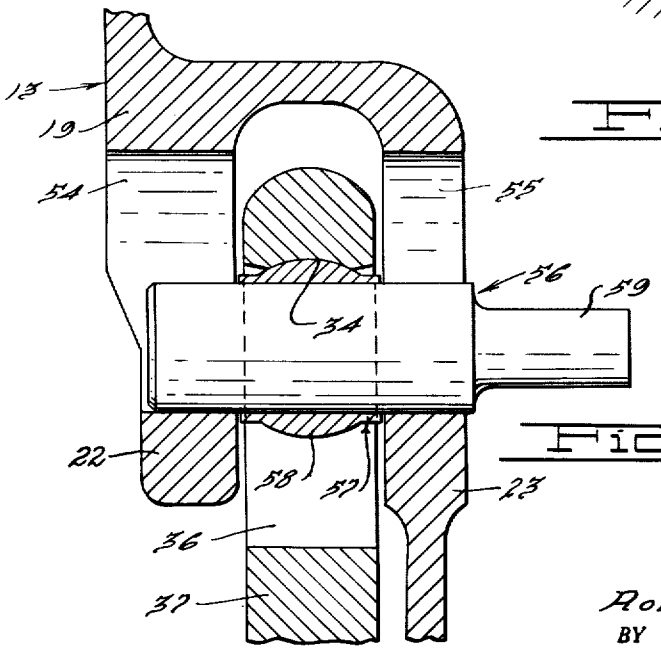



Fig. 10.

INVENTOR.
Robert N. Janeway
BY
Harness and Harris
ATTORNEYS.

Patented Nov. 28, 1950

2,532,272

# UNITED STATES PATENT OFFICE

2,532,272

## SWING HANGER PIN FOR RAILWAY TRUCKS

Robert N. Janeway, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich., a corporation of Delaware

Application February 21, 1948, Serial No. 10,055

23 Claims. (Cl. 105—191)

1

This invention relates to an arrangement for mounting swing hangers in a railway truck. More specifically, it relates to pins for mounting swing hangers in side members of a railway truck in which the pins and the swing hangers are part of means for resisting unsquaring of the side members.

An object of the present invention is to provide improvements in a swing-hanger pin such that the need for accurate alignment of the pin with respect to the member in which it is carried is eliminated. This involves providing the pin with a specially shaped bearing surface engageable with a swing hanger.

A further object is to improve the mounting of a swing hanger on a pin in a railway truck in which the swing hanger and the pin constitute a part of means for controlling unsquaring of the truck.

Other objects will appear from the disclosure.

In the drawings:

Fig. 1 is a side view of a railway truck with parts broken away showing the use of the present invention in such truck;

Fig. 2 is an enlarged sectional view of the upper end portion of one of the swing hanger legs and its supporting pin member arranged as shown in Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a transverse view with parts broken away of the railroad truck of the present invention;

Fig. 6 is an end view of a mounting pin for a swing hanger of the present invention;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6;

Fig. 8 is a sectional view of a portion of a railroad truck side member having pin means supporting a swing hanger, this view showing a modified form of the invention;

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 8;

Fig. 10 is a sectional view similar to Fig. 8 showing a portion of a railroad truck side member with a different type of pin means for supporting the swing hanger, this view constituting another modification of the invention, and

Fig. 11 is an enlarged sectional elevational view taken along the line 11—11 of Fig. 5, showing the interengaging means on the plank and bolster to limit relative transverse movement between these members.

2

The reference character 10 designates a side member on a railroad truck. The term "side member" as used in the present application is intended to mean either a side frame or an equalizer member. The side member 10 has an upper compression part 11, a lower tension part 12 of channel-shape, as indicated in Figs. 1 and 5, and columns 13 extending between the compression and tension parts. Each end of the side member 10 has a bearing portion 14 resting on a journal box 15, the region of contact between bearing portion 14 and journal box 15 being at about a level indicated by 16. Each column 13 comprises spaced, longitudinally extending, side walls 17 and 18, an inner end wall 19 joining the side walls, and flanges 20 on the side walls 17 and 18 directed toward one another at the outer end of each column 13 and defining an opening 21. The inner end wall 19 has spaced portions 22 and 23 in which generally elliptical openings 24 and 25 are formed. As shown in Fig. 4, elliptical opening 24 has flat converging surfaces 26 and 27 in its lower part engaged by mating flat surfaces 28 and 29 on an end portion 30 of a mounting pin 31. The mounting pin 31 has an end portion 32 with similar flat surfaces engaging corresponding flat surfaces defining the opening 25 in the column portion 23. Thus rotational movement of the mounting pin 31 with respect to the column 13 is prevented. As shown in Fig. 2, the mounting pin 31 has a central portion 33 provided with an upper spherical surface 34 engaged by a spherical surface 35 formed on the upper side of a generally elliptical opening 36 in the end of a leg 37 of a U-shaped swing hanger 38. The swing hanger pin 31 has a handle portion 39 formed as an axial extension toward the opening 21 in the outer end of the column 13. The mounting pin 31 is grasped by the handle portion 39 and inserted through the column opening 21 into the seats formed in the openings 24 and 25.

Base 40 of the U-shaped swing hanger 38 fits in a groove 41 formed in the bottom of a plank 42. The swing hanger 38 has another leg 37 pivotally mounted by another mounting pin 31 in the other column 13. The central portion 33 of the mounting pin 31 has at each side a pair of laterally or radially extending projections 43, extending outwardly beyond the flat surfaces of the end portions 30 and 32 of the swing hanger pin and engaging the sides of the column portions 22 and 23 facing one another so as to prevent endwise movement of the mounting pin 31, once it has been placed in operating position with its

converging flat surfaces in engagement with the converging flat surfaces of the openings 24 and 25.

The end of the plank 42 extends through and beyond the window opening defined by the compression and tension parts 11 and 12 and columns 13 of the side member 10 and extends transversely of the truck into a corresponding window opening in a side member at the other side of the truck, which is not shown. Positioned above the plank 42 is a bolster 44 which extends through and beyond the window openings in the side members of the truck. Each end of the bolster 44 is supported on an end of the plank 42 by a plurality of coil springs 45 positioned at the window opening in a side member. Each end of the plank is connected with the adjacent end of the bolster 44 outward of the coil springs 45 by an inclined damping means or shock absorber 46, the lower end of the damping means being connected to an inclined portion 47 on the plank 42 and the upper end being connected to a U-shaped bracket 48 extending above the end of the bolster 44. Each end of the plank 42 is formed with an upstanding U-shaped projection or flange 49, and each end of the bolster 44 has a depending projection 50 extending within the plank projection 49 arranged as shown in Fig. 11. The projections toward one end of the plank and bolster are spaced apart slightly so as to permit limited relative lateral movement in one direction between plank and bolster laterally of the truck and thereafter conjoint movement of bolster and plank laterally of the truck. The projections toward the other end of plank and bolster similarly permit limited relative lateral movement between the plank and bolster in one direction and thereafter conjoint movement.

Unsquaring of the side members 10 is controlled or resisted by the plank 42, the swing hangers 38, and the mounting pins 31. When unsquaring forces are imposed upon a truck, tending to produce relative longitudinal movement of the spaced side members, the plank 42 tends to rotate about a vertical axis at its center. The hangers 38 engaging the plank 42 also tend to rotate with respect to the side members 10 but this is resisted by the pins 31 which support the hangers in the side members. A resisting torque is thus imposed on each hanger which reacts on the seats in the plank. Since the reaction is in the form of a couple, the engaging surfaces between hanger and plank are more effective the farther they extend from the transverse center line of the truck. These engaging surfaces are lengthened out into the lateral projections 51 on the plank. The ends of the swing hanger legs 37, when unsquaring forces are set up try to move laterally of the truck with respect to the mounting pins 31, but such movement cannot take place because of engagement between the spherical surfaces 35 on the openings 36 in the swing hanger legs 37 and the spherical surfaces 34 formed on the central portions 33 of the mounting pins 31. The swing hanger pins 31 try to move laterally with respect to the columns 13, that is twist in a horizontal plane due to the couple applied thereto, but this is impossible, because the flat regions 28 and 29 on mounting pin ends 30 and 32 and flat regions 26 and 27 of openings 24 and 25 in columns 13 are in engagement with one another and provide a solid mounting for the pins 31 preventing such lateral movement.

The spherical surfaces 34 and 35 on mounting pins 31 and swing-hanger-leg openings 36 respectively, make possible a satisfactory mounting of the swing hangers without an accurate alignment of the mounting pins 31 in their seats in the columns 13 with respect to each other, for even though the mounting pins 31 be shifted angularly, the full bearing will be maintained between swing hangers and pins, since the only effect of an angular shifting of the mounting pins 31 would be to shift the spherical surfaces 34 and 35 with respect to one another. The spherical surfaces do not detract from the ability to take the unsquaring reaction, which is in a horizontal plane through the center of the bearing surfaces. It will be noted from Figs. 1 and 4 that the openings 24 and 25 are considerably larger at their upper end portions than the end portions 30 and 32 of the mounting pins 31 which fit in these openings. Thus the mounting pin is inserted through the column opening 21 at a relatively high level and is lowered until its flat surfaces engage the flat surfaces around the openings 24 and 25 and the locating projections 43 are brought into engagement with the facing sides of the spaced portions 22 and 23. Similarly, the swing hanger openings 36 are larger than the central portions 33 of the mounting pins 31 so that there is room for the swing hanger legs to be shifted with respect to the swing hanger pins when the spherical surfaces on swing hanger legs and mounting pins are to be disengaged or engaged and the mounting pins are to be inserted in or removed from the swing hanger legs.

The pivot axis for each swing hanger 38 on a side member 10 lies in the mounting pins 31 at a level below the lines 16 at the journal boxes 15, at which the side-member bearing portions 14 rest upon the journal boxes. Since the swing hanger pivot axis is below the side member tilting line 16, the swing hanger will act as a pendulum and return to a stable position at all times. With this arrangement, the swing hanger will not tend to tilt the side member in such a way as to make it unstable. Thus it is unnecessary to provide tilt-preventing ties between the side members, which would interfere with limiting the control of unsquaring of the side members to the plank 42, the swing hangers 38, and the mounting pins 31.

In the modification shown in Fig. 8 a mounting pin 50 has circular end portions 51, a central portion 52 having a spherical surface surrounding it, and a handle portion 53 extending from one end portion 51. Since the central portion 52 has a spherical surface on all sides, the relative angular position of the mounting pin 50 is immaterial, and consequently the end portions 51 can be circular as previously stated. The spaced portions 22 and 23 of the inner end wall 19 of the side frame column 13 have openings 54 and 55. Each of these openings, as seen in Fig. 9, is generally elongated and provided with arcuate ends, the upper arcuate end being of greater diameter than the lower arcuate end. Thus at the upper arcuate end there is room for the enlarged spherical central portion 52 of the mounting pin to be passed endwise through the opening 55 when the mounting pin is moved endwise into the upper portions of the openings 54 and 55 and then lowered until the end portions engage the lower arcuate sides of the openings. In Fig. 9 the dotted-line position of the pin 50 shows that the upper portion of the opening 55 is large enough to receive the enlarged spherical central portion 52 of the mounting pin 50. The spheri-

cal central portion 52 is engaged by the spherical surface 34 on the upper end of the opening 36 in the swing-hanger leg 37.

In the swing hanger pin modification of Fig. 8 the spherical central portion 62 is integrally formed with the remainder of the mounting pin 60.

Fig. 10 shows a mounting pin 66 upon which is affixed with a shrink fit a short sleeve 67 having an external spherical surface 68 on all sides. The mounting pin 66 has circular end portions. This mounting pin with its sleeve 68 is inserted through openings 54 and 55 in the side frame column 13 in the manner described with reference to Figs. 8 and 9. The length of the sleeve 68 is just slightly less than the spacing between the portions 22 and 23 in the side-frame-column 13, and consequently the spherical surface on the sleeve 67 is properly positioned for engagement with the spherical surface 34 on the upper end of the opening 36 in the swing hanger leg 37. The mounting pin 66 is provided with a handle portion 69 by which the mounting pin is inserted in the side-frame-column 13.

In the broad sense, each of the above described spherical surfaces on mounting pins and swingers is a curved surface formed by revolution of a curved line about an axis in the plane of the curved line.

I claim:

1. In a railway truck comprising a side member having a top compression part, a bottom tension part, and spaced columns extending between the top and bottom parts and defining therewith an opening, each column having spaced portions with openings therein having flat surfaces on the lower side converging outwardly of the openings, a pair of pins, one pin in each pair of the openings in the spaced portions of each column, each pin having end portions with flat converging surfaces on the lower side engaging the flat converging surfaces of the openings and a central portion having a spherical surface on the upper side, and a swing hanger having a base and legs provided with openings spaced from the base receiving the central portions of the pins, one side of each leg opening having a spherical surface engaging the spherical surface on the central portion of a pin.

2. In a railway truck comprising a side member having spaced portions provided with openings having flat converging surfaces, a pin having end portions with flat converging surfaces engaging the flat converging surfaces of the openings and a central portion having a spherical surface, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and having a spherical surface on one side engaging the spherical surface on the pin.

3. In a railway truck comprising a side member having a top compression part, a bottom tension part, and spaced columns extending between the top and bottom parts and defining therewith an opening, each column having spaced portions with openings, a pair of pins, one each in the openings in the spaced portions of each column, each pin having end portions non-rotatably engaging the sides of the openings in the column and a central portion having a spherical surface on one side, and a swing hanger having a base and legs provided with openings spaced from the base receiving the central portions of the pins, one side of each leg opening having a spherical surface engaging the spherical surface on the central portion of a pin.



4. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions non-rotatably mounted in the openings and a central portion having a spherical surface on one side, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and having a spherical surface on one side engaging the spherical surface on the pin.

5. In a railway truck comprising a side member having a top compression part, a bottom tension part, and spaced columns extending between the top and bottom parts and defining therewith an opening, each column having spaced portions with openings having flat converging surfaces on the lower side, a pair of pins, one each in the openings in the spaced portions of each column, each pin having end portions with flat converging surfaces on the lower side engaging the flat converging surfaces of the openings in the columns and a central portion having projections extending laterally beyond the converging surfaces into engagement with the spaced portions of the column to prevent endwise movement of the pins with respect to the column and a spherical surface on the upper side of the central portion of the pin, and a swing hanger having a base and legs provided with openings spaced from the base receiving the central portions of the pins, one side of each leg opening having a spherical surface engaging the spherical surface on the central portion of a pin.

6. In a railway truck comprising a side member having spaced portions provided with openings having flat converging surfaces on one side, a pin having end portions with flat converging surfaces on one side engaging the flat converging surfaces of the openings and a central portion having projections extending laterally beyond the converging surfaces into engagement with the spaced portions of the side member to prevent endwise movement of the pins with respect to the side member and a spherical surface on the opposite side of the central portion of the pin.

7. In a railway truck comprising a side member having a top compression part, a bottom tension part, and spaced columns extending between the top and bottom parts and defining therewith an opening, each column having spaced portions with openings therein, a pair of pins, one each in the openings in the spaced portions of each column, each pin having end portions non-rotatably engaging the side surfaces of the column openings and a central portion having projections on one side in engagement with the spaced portions of the column to prevent endwise movement of the pins with respect to the column and a spherical surface on the opposite side of the central portion of the pin, and a swing hanger having a base and legs provided with openings at regions spaced from the base receiving the central portions of the pins, one side of each leg opening having a spherical side surface engaging the spherical surface on the central portion of a pin.

8. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions non-rotatably engaging the side surfaces of the openings and a central portion with projections on the lower side engaging the spaced portions of the side frame to prevent endwise movement of the pin with respect to the side member and a spherical surface on the upper side of the central portion, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and

having a spherical surface on the upper side engaging the spherical surface on the pin.

9. A mounting pin for a swing hanger comprising end portions having flat converging surfaces on one side and a central portion having a spherical surface on the other side.

10. A mounting pin for a swing hanger comprising end portions having flat converging surfaces on one side and a central portion having radial projections extending transversely beyond the flat regions and a spherical surface on the other side.

11. A mounting pin for a swing hanger comprising end portions and a central portion having spaced projections extending transversely of the pin beyond the end portions at one side and a spherical surface formed on the central portion at the other side.

12. A mounting pin for a swing hanger comprising end portions having flat converging surfaces on one side, a central portion having a spherical surface on the other side, and a handle portion projecting axially from one end portion.

13. In a railway truck comprising a side member provided with an upper compression part, a lower tension part, and spaced columns joining the upper and lower parts and forming therewith a window opening, each column being formed of side walls at the opposite sides of the side member and an inner end wall at the side of the column facing the other column, the inner end wall including spaced portions provided with openings having flat surfaces converging downwardly toward the lower tension part, the column having at its outer end an open region opposite the spaced portions, a pair of mounting pins, one supported in the openings of each column and each provided with end portions having flat converging surfaces engaging the flat converging surfaces of the openings in the spaced portions of the supporting column, a central portion having spaced, laterally extending, projections extending beyond the flat converging surfaces of the end portions and engaging the spaced column portions to prevent endwise movement of the pin with respect to the supporting column and a spherical surface between the projections, and a handle portion projecting axially from one end portion toward the open region in the outer end of the supporting column, each mounting pin being insertable by means of the handle portion through the open region in its supporting column into the openings in the spaced portions in the column.

14. In a railway truck comprising a side member having a top compression part, a bottom tension part, and spaced columns extending between the top and bottom parts and defining therewith an opening, each column having spaced portions with openings therein, a pair of pins, one each supported in the openings in the spaced portions of each column, each pin having end portions engaging the sides of the openings to prevent lateral movement of the pin relative to the supporting column and a central portion having a spherical surface arranged between laterally projecting formations that engage the spaced portions to prevent endwise movement of the pin relative to the supporting column, and a swing hanger having a base and supporting legs provided with openings at regions spaced from the base receiving the central portions of the pins, one side of each leg opening having a spherical surface engaging the spherical surface on the central portion of a pin.



15. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions mounted in the openings so as to prevent lateral movement of the pin relative to the side member and a central portion located between the spaced portions having a spherical surface and means engageable with the spaced portions to prevent endwise movement of the pin relative to the side member, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and having a spherical surface on one side engaging the spherical surface on the pin.

16. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions mounted in the openings so as to permit the pin to be angularly shiftable about its axis of rotation with respect to the said spaced portions of the side member, the central portion of the pin located between the spaced portions having a spherical surface surrounding it, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and having a spherical surface on one side engaging the spherical surface on the pin.

17. In a railway truck as specified in claim 16, the spherical surface around the central portion of the pin being formed by a ring surrounding the pin.

18. In a railway truck comprising a side member having spaced portions provided with openings having flat converging surfaces, a pin having end portions with flat converging surfaces on the lower side engaging the flat converging surfaces of the openings and a central portion having on the upper side a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, and a swing hanger having a leg provided with an opening receiving the central portion of the pin and having on the upper side a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, said last mentioned curved surface engaging the curved surface on the pin.

19. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions mounted in the openings and engaging the surfaces defining the openings so as to prevent lateral movement of the pin relative to the side member and a central portion having a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, and a swing hanger having a base and supporting legs each of which is provided with an opening at a region spaced from the base for receiving the central portion of the pin, one side of each leg opening having a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, said last mentioned curved surface engaging the curved surface on the pin.

20. In a railway truck comprising a side member having spaced portions provided with openings, a pin having end portions mounted in the openings so as to permit the pin to be angularly shiftable about its axis of rotation with respect to the said portions of the side member while preventing lateral movement of the pin relative to the side member, the central portion of the pin having a curved surface surrounding it, said curved surface being formed by revolution of a curved line about an axis in the plane of the curved line, and a swing hanger having a leg provided with an opening receiving the central

portion of the pin and having on one side a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, said last mentioned curved surface engaging the curved surface on the pin.

21. In a railway truck, a pair of pins, each pin having end portions with flat converging surfaces on the lower side and a central portion having a spherical surface on the upper side, and a swing hanger having a base and legs therefor provided with openings spaced from the base receiving the central portions of the pins, the upper side of each leg opening having a spherical surface engaging the spherical surface on the central portion of a pin.

22. In a railway truck, a swing hanger supporting pin having end portions adapted to be non-rotatably mounted in a supporting member and a central portion having a spherical surface, and a swing hanger having a leg provided with an opening therein adapted to receive the central portion of the pin, said opening having a side with a spherical surface engaging the spherical surface on the pin.

23. In a railway truck, a swing hanger supporting pin having transversely extending formations adjacent the ends thereof adapted to



be supported on the truck so as to prevent endwise and lateral movement of the pin relative to its support, said pin having a curved surface thereon formed by revolution of a curved line about an axis in the plane of the curved line, and a swing hanger having a supporting leg provided with an opening adapted to receive the pin, a side of the opening including a curved surface formed by revolution of a curved line about an axis in the plane of the curved line, said last mentioned curved surface engaging the curved surface on the pin.

ROBERT N. JANEWAY.


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