Aug. 25, 1959 T. J. SWEGER 2,901,296

MEANS FOR CENTERING RAILWAY CAR AXLE JOURNALS

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Fig. 1

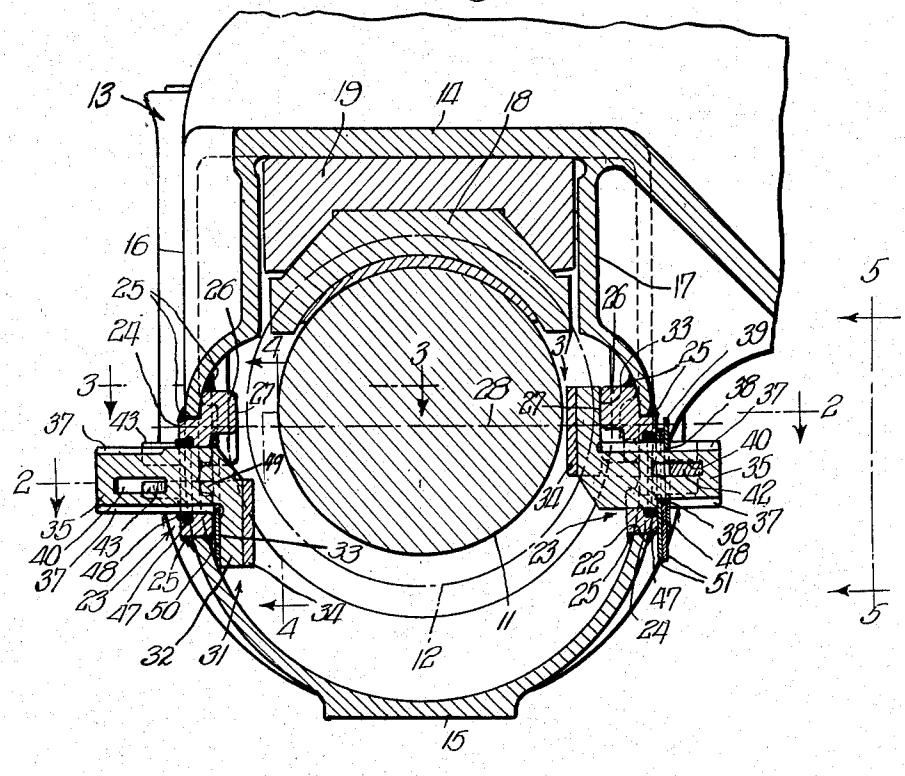

Fig. 5

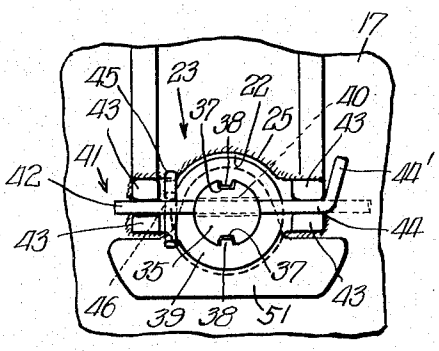

Fig. 4

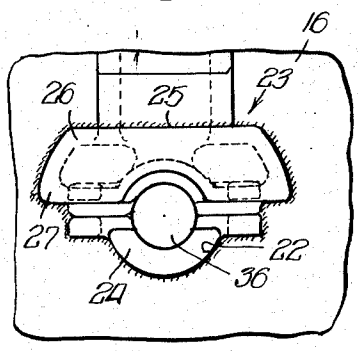

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Fig. 2.

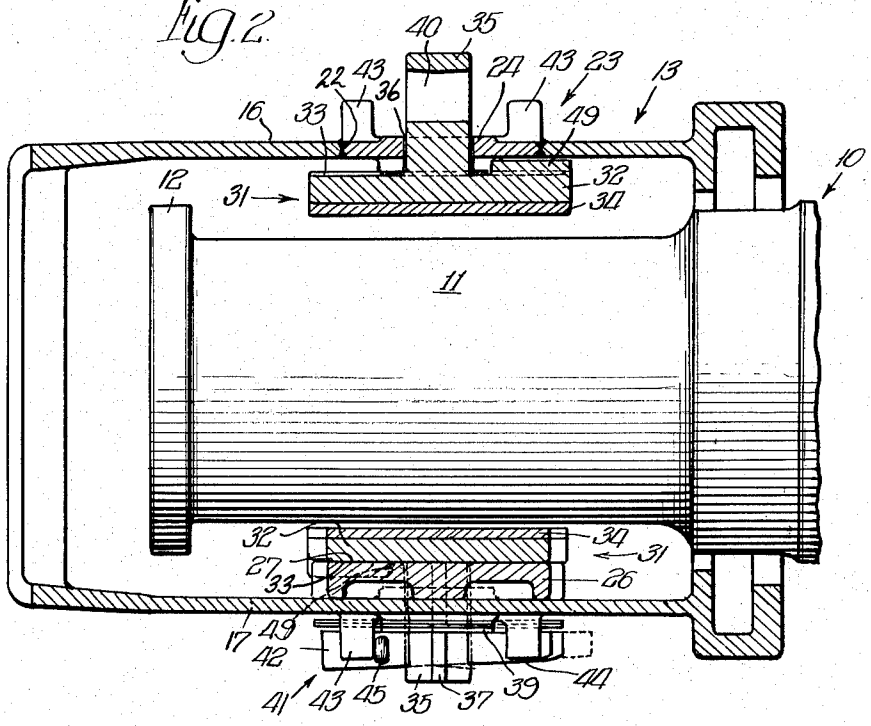
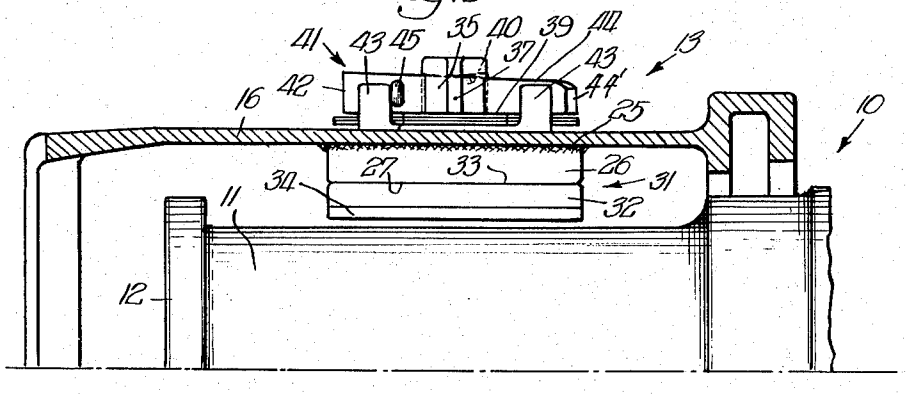


Fig. 3.



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MEANS FOR CENTERING RAILWAY CAR AXLE JOURNALS

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Fig. 6

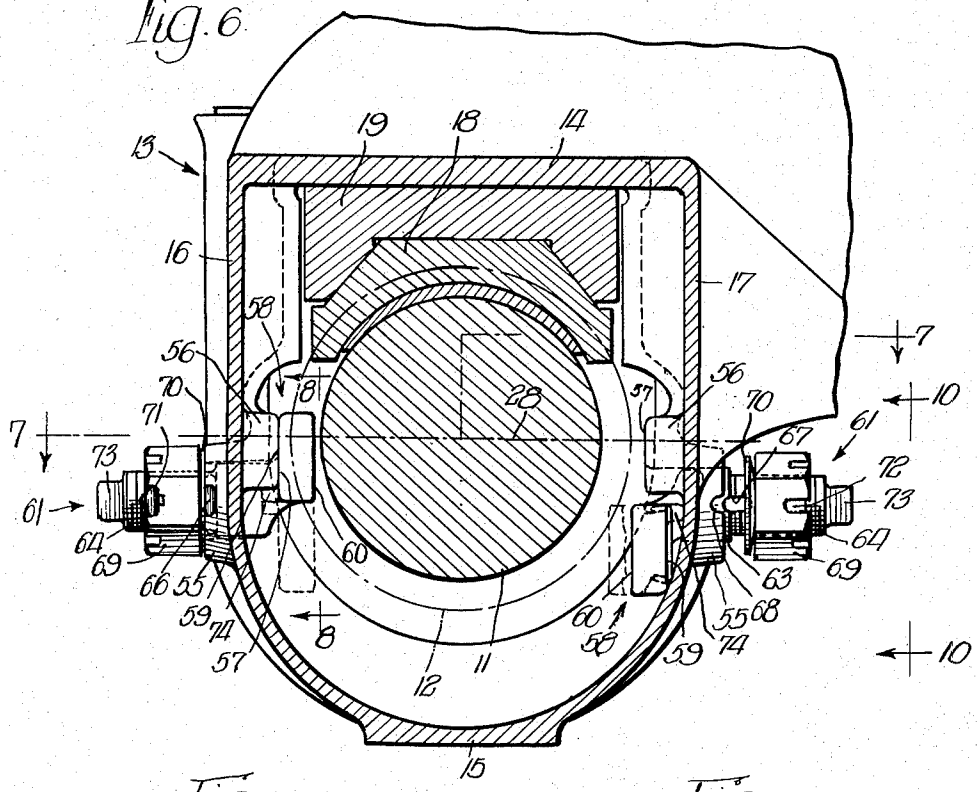

Fig. 10

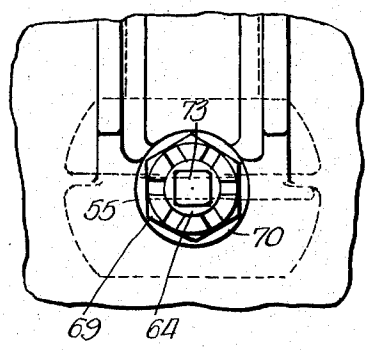

Fig. 8

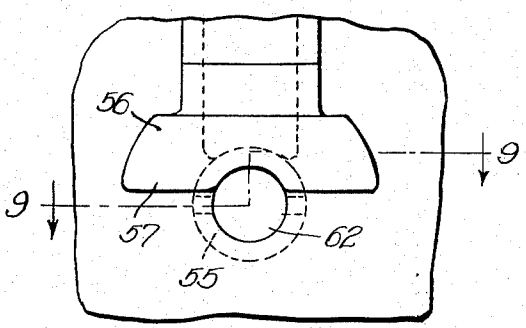

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Fig. 7

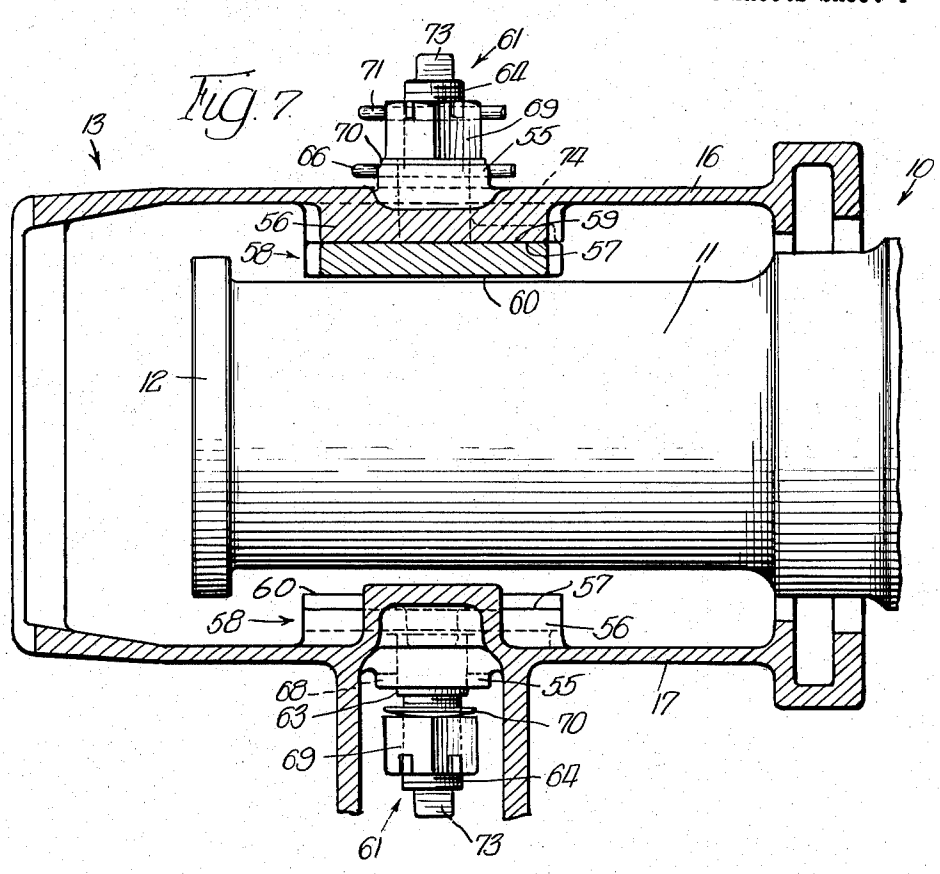
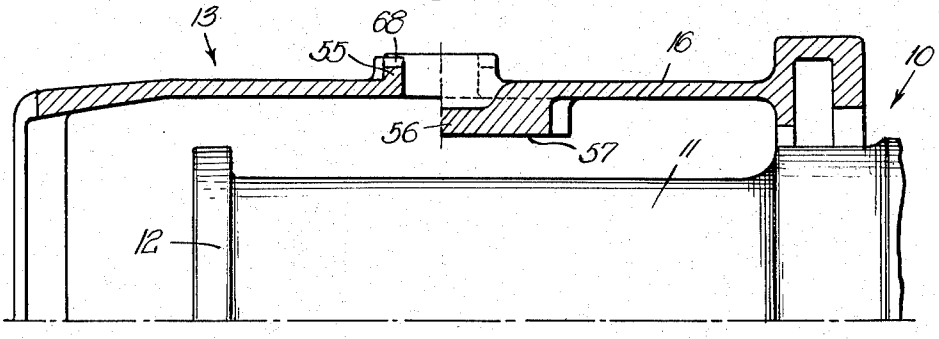


Fig. 9



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2,901,296

MEANS FOR CENTERING RAILWAY CAR AXLE JOURNALS

Theodore J. Sweger, Riverdale, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application November 25, 1957, Serial No. 698,471

15 Claims. (Cl. 308—41)

This invention relates, generally, to journal boxes for railway cars and it has particular relation to devices for centering the axle journal therein.

Among the objects of this invention are: To provide for shifting in a new and useful manner journal centering guides to operative positions on opposite sides of a journal of a railway car axle positioned in a journal box and having an end collar; to shift the guides by operation exteriorly of the journal box and without requiring that the operator's hands or a tool or tools be inserted in the journal box in order to avoid likelihood of injury to the operator resulting from accidental displacement of the side frame during truck assembly; to movably mount the guides for external operation between operative and retracted positions; to mount each guide on a rotatable shaft that is journaled in and extends outwardly through the respective side wall of the journal box; to hold each guide in operative position; to tighten and lock each guide in operative position by means reacting between each shaft and the respective side wall; to employ a tapered key or a lock nut for tightening and locking each guide in operative position; and to prevent loosening of each tapered key or lock nut.

Other objects of this invention will, in part, be obvious and in part appear hereinafter.

This invention is disclosed in the embodiments thereof shown in the accompanying drawings and it comprises the features of construction, combination of elements and arrangement of parts that will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

For a more complete understanding of the nature and scope of this invention reference can be had to the following detailed description, taken together with the accompanying drawings, in which:

Figure 1 is a vertical sectional view through a railway car journal box and axle journal therein and illustrating how the present invention can be applied thereto;

Figure 2 is a horizontal sectional view taken generally along the line 2—2 of Figure 1;

Figure 3 is a horizontal sectional view taken generally along the line 3—3 of Figure 1;

Figure 4 is a vertical elevational view taken generally along the line 4—4 of Figure 1 but showing only the adapter which is secured in the side wall of the journal box, the journal centering guide being omitted;

Figure 5 is a vertical elevational view taken generally along the line 5—5 of Figure 1 and looking in the direction of the arrows;

Figure 6 is a view, similar to Figure 1, and illustrating another embodiment of the invention;

Figure 7 is a horizontal sectional view taken generally along the line 7—7 of Figure 6;

Figure 8 is a vertical elevational view taken generally along the line 8—8 of Figure 1 to show the construction of the inner side of the side wall of the journal box, the journal centering guide being omitted;

Figure 9 is a horizontal sectional view taken generally along the line 9—9 of Figure 8; and

Figure 10 is a vertical elevational view taken generally along the line 10—10 of Figure 6 and looking in the direction of the arrows.

Referring first to the embodiment of the invention illustrated in Figures 1–5 of the drawings, it will be observed that the reference character 10 designates, generally, a railway car axle which is provided with the axle journall 11 at each end terminating in an end collar 12. The axle journal 11 and end collar 12 are located in a railway car journal box 13 which is provided with a top 14, a bottom 15 and side walls 16 and 17. Cooperating with the axle journal 11 is a journal bearing 18 and interposed between it and the top 14 is a wedge 19. The journal bearing construction thus far described is conventional and is typical of journal bearing constructions employed for railway cars.

There is a tendency for the axle journal 11 to move out of the center position under certain operating conditions. It is desirable under these circumstances to provide for maintaining the center position of the axle journal 11 within the journal box 13 and to prevent it riding out from under the journal bearing 18. These include the starting of the train and its stopping and the application of brakes to one or both sides of the wheels. In accordance with this invention retractable means are provided within the journal box 13 for maintaining the axle journal 11 substantially in the center position. The means thus provided is operable exteriorly of the journal box 13 and thus it is unnecessary for the operator to insert his hands inside of the journal box 13 or to insert a tool therein for the purpose of positioning properly the axle journal centering means.

As pointed out above, the railway car journal box 13 is of conventional construction. In accordance with one embodiment of this invention the journal box 13 is modified by cutting openings 22 in the side walls 16 and 17. Such procedure is followed where it is desired to modify existing journal boxes in accordance with this invention. Next adapters 23 are located, as shown in Figures 1 and 2, with hub portions or collars 24 projecting through the openings 22. The adapters 23 are welded inside and outside of the journal box to the respective side walls 16 and 17 as indicated at 25. The construction thus provided includes projections 26 that extend inwardly from the side walls 16 and 17 toward the axle journal 11 which subsequently is positioned therein. Each projection 26 includes a face 27 portions of which extend above and below a line 28 that intersects the axis of rotation of the axle journal 11 and along which transverse forces are exerted tending to effect relative horizontal movement between the journal box 13 or journal bearing 18 and the axle journal 11. It will be apparent that the hub portion or collar 24 and projection 26 forming each adapter 23 could be cast integrally with the side walls 16 and 17 for original installation. Such a construction is disclosed hereinafter.

With a view to maintaining the axle journal 11 in the center position, journal centering guides, shown generally at 31, are provided. Each guide 31 includes a backing member 32 having a face 33 that is arranged to engage the face 27 on the respective projection 26. Thus the guide 31 is interposed between the respective projection 26 and the adjacent side of the axle journal 11 when the assembly is complete. On the opposite side of each guide 31 there is a bearing portion 34 that may be formed of bearing material, such as brass alloy, for contacting the respective side of the axle journal 11 in performing the centering operation.

It will be observed at the right hand side of Figure 1 that the journal centering guide 31, in operative position,

extends within the periphery of the end collar 12 which is indicated by a broken line. It is necessary that the journal centering guides 31 occupy this position in close proximity to opposite sides of the axle journal 11. However, when located in this position, it is not possible either to enter or withdraw the end of the car axle 10 with respect to the journal box 13. The reason for this, of course, is that the end collar 12 prevents such operation.

In accordance with this invention provision is made for shifting each of the centering guides 31 from the operative position, shown at the right of Figure 1, to an alternate position, shown at the left of Figure 1. For this purpose each of the journal centering guides 31 includes a shaft 35 that preferably is formed integrally with the backing member 32. The shaft 35 is rotatable and longitudinally slidable in an opening 36, Figure 4, in each of the hub portions or collars 24 of the respective adapters 23. Since each shaft 35 extends outwardly through the respective side wall 16 or 17, it is possible exteriorly of the journal box 13 to shift the journal centering guides 31 from and to operative positions. This makes it unnecessary for the operator to insert his hands or a tool in the journal box for shifting the journal centering guides to operative position.

It is desirable that means be provided for holding each journal centering guide 31 in operative position. In this connection opposite sides of the shaft 35 are provided with longitudinally extending grooves 37 for receiving tabs 38 of a spring washer 39. Each shaft 35 has a rectangular transverse opening 40 for receiving a tapered key that is shown, generally, at 41. It will be observed that the spring washer 39 is interposed between the respective hub portion or collar 24 and the corresponding tapered key 41. In this manner the tapered key 41 reacts against the respective side wall 16 or 17 as the case may be. The wider end 42 of the tapered key 41 extends between a pair of bosses 43 that are located on one side of the hub portion or collar 24 of the adapter 23. As shown in Figure 5 the wider end 42 is located between the bosses 43 on the left hand side while the narrower end 44 of the tapered key 41 extends between bosses 43 that are located on the opposite side. Further, and in order to secure the tapered key 41 in position, the narrower end 44 is turned upwardly as shown at 44' in Figure 5. As a further means for securing the tapered key 41 in position a cotter key 45 extends through an opening 46 in the wider end 42 and is disposed adjacent the bosses 43 associated therewith.

Where it is desired that a positive seal be provided against the escape of lubricant through the openings 36 in the adapters 23, annular grooves 47 can be provided in the hub portions or collars 24 and around the openings 36 for receiving a sealing ring or gasket 48 of suitable material, such as synthetic rubber or the like.

It may be desirable to provide for spacing the journal centering guides 31 from the respective projections 26 for different diameters of axle journals. For this purpose, as shown at the left of Figure 1, a shim 50 can be employed. The shim 50 is carried by the inner end of the shaft 35 and is interposed between the faces 27 and 33 in operative position. As shown at the right of Figure 1, additional shims can be stored as indicated at 51 between the spring washer 39 and the adjacent surface of the hub portion or collar 24 of the adapter 23. It will be understood that the number of shims used will depend upon the diameter of the axle journal 11 and the distance between the inner faces of the journal centering guides 31.

In operation, before entry of the end of the railway car axle 10 into the journal box 13, the openings 22 are cut in the side walls 16 and 17 and the adapters 23 are welded in position as indicated at 25. Next, the journal centering guides 31 are applied by inserting the shafts 35 through the openings 36 with or without one or more shims 50 as may be desired. The journal centering guides 31 are inserted in the retracted position as shown to the left of Figure 1. In the retracted position the journal centering guides 31 are outside of the periphery of the end collar 12. Consequently the end of the railway car axle 10 can be inserted in the journal box 13 to the position shown in the drawing. Any suitable means can be employed for temporarily holding the journal centering guides 31 in the retracted position.

After the end of the railway car axle 10 has been inserted properly within the journal box 13, the shafts 35 are moved inwardly and then turned through 180° so as to position the journal centering guides 31 in operative position as shown at the right of Figure 1. A stop flange 49, Figure 2, formed integrally with each backing member 32, limits the rotary movement of the respective journal centering guide 31 on engagement with the under side of the respective projection 26. The spring washers 39 and extra shims 51 are slid over the shafts 35 and the tapered keys 41 are inserted in the openings 40 and are driven to a position where the journal centering guides 31 are wedged in their operative positions. The narrower end 44' is turned over and the cotter key 45 is inserted and spread to complete the assembly.

When it is desired to remove the railway car axle 10 from the journal box 13, the cotter keys 45 are withdrawn and the narrower ends 44' of the tapered keys 41 are straightened. Then the tapered keys 41 can be driven out of the shafts 35 and the extra shims 51 removed. This frees the shafts 35 and they can be rotated through 180° to swing or shift the journal centering guides 31 out of position between the projections 26 and the axle journal 11 and then they can be moved longitudinally to the retracted positions by moving the shafts 35 along their axes of rotation outwardly. As before, if desired, any suitable means can be employed for holding the journal centering guides 31 in the retracted positions. Thereafter, the railway car axle 10 can be withdrawn from the journal box 13.

Figures 6–10 show another embodiment of the invention. Here hub portions or collars 55 and inwardly extending projections 56 are cast integrally with the side walls 16 and 17 of the railway car journal box 13. Each projection 56 has a face 57 portions of which extend above and below the line 28 through the axis of rotation of the axle journal 11. Retractable journal centering guides 58 are arranged, as before, to be shifted into and out of operative position. Each journal centering guide 58 has a face 59 for engaging the juxtaposed face 57 of the respective projection 56. On the opposite side each guide 58 has a face 60 that is juxtaposed to the axle journal 11 and spaced slightly therefrom. Shims can be positioned, as described hereinbefore, between the faces 57 and 59 to vary the spacing between the faces 60 when the guides 58 are in the operative positions and interposed between the projections 56 and the respective sides of the axle journal 11.

In order to rotatably and longitudinally slidably mount the journal centering guides 58 to permit retraction thereof, each is provided with a shaft, shown generally at 61, that projects through the respective side wall 16 and 17 for operation exteriorly of the journal box 13. It will be noted that each of the hub portions or collars 55 is provided with an opening 62, Figure 8, for receiving a journal 63 which forms the inner part of each of the shafts 61. Beyond each journal 63 is a threaded section 64.

Provision is made for holding each journal centering guide 58 in the operative position. For this purpose a cotter pin 66 is provided and it extends through a slotted opening 67 at the base of each threaded section 64 and is arranged to interfit with grooves 68 located in opposite sides of the hub portions or collars 55. The operative position of the cotter pin 66 is shown at the left of Figure 6 where it prevents rotation of the respective journal centering guides 58 away from the operative

position. Threaded on the section 64 is a castellated lock nut 69 and interposed between it and the adjacent face of the hub portion or collar 55 is a spring washer 70. In order to prevent rotation of the lock nut 69 with respect to the shaft 61 a cotter key 71 is provided, as shown at the left of Figure 6. It extends through a pair of slots in the lock nut 69 and through a registering slotted opening 72 in the outer end of the threaded section 64.

The turning of the shaft 61 is facilitated by a square head 73 at the outer end. In order to limit the rotary movement of each journal centering guide 58 in the operative position a stop flange 74 is provided at the base of each for extending underneath the respective projection 56, as shown in Figure 7. The cooperation between the stop flanges 74 and the projections 56 effects proper positioning of the guides 58 along the line 28 to provide for maintaining the axle journal 11 in the centered position.

In describing the operation of the embodiment of the invention shown in Figures 6–10 of the drawings, it will be understood that the hub portions or collars 55 and projections 56 are cast integrally with the side walls 16 and 17 of the journal box 13 and that the openings 62 are formed either by machining or by suitable cores during the casting process. Prior to the insertion of the end of the railway car axle 10 into the journal box 13, the journal centering guides 58 are applied with the shafts 61 extending through the openings 62. They are applied in the retracted positions shown to the right in Figure 6 where they are outside of the periphery of the end collar 12 which is shown by a broken line. If desired, the cotter pins 66 can be inserted in the slotted openings 67 to prevent detachment of the guides 58 from the side walls 16 and 17. After the end of the railway car axle 10 has been inserted into the journal box 13 and the journal bearing 18 and wedge 19 have been applied, the journal centering guides 58 are moved inwardly along the axes of rotation of the shafts 61 and a wrench is applied to the square head 73, if necessary, to rotate the guides from the lowermost positions to the operative positions through 180° where further movement is prevented by the stop flanges 74. Here, as shown at the left of Figure 6, the guides 58 are interposed between the projections 56 and the adjacent sides of the axle journal 11. The cotter pin 66, spring washer 70 and lock nut 69 now are applied and the latter is tightened. Finally, the cotter pin 71 is inserted and the ends spread apart. In the operative positions of the journal centering guides 58, they are located, as shown at the left of Figure 6, within the periphery of the end collar 12.

When it is desired to withdraw the end of the railway car axle 10 from the journal box 13, the cotter pins 66 and 71 are removed and the lock nuts 69 are loosened sufficiently far to permit the rotation of the journal centering guides 58 through 180° and to be retracted to positions outside of the periphery of the end collar 12. Then the railway car axle 10 can be withdrawn from the journal box 13.

Since certain further changes can be made in the foregoing constructions and different embodiments of the invention can be made without departing from the spirit and scope thereof, it is understood that all matters shown in the accompanying drawings and described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. In combination with a railway car journal box having therein an axle journal provided with an end collar and having its side walls spaced from said journal further than said end collar extends therefrom, a journal centering guide interposed between a side wall of said journal box and said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position outside the periphery of said end collar, and operating means connected to said journal centering guide and extending through said side wall and operable exteriorly of said journal box for shifting said journal centering guide between said operative and retracted positions.

2. In combination with a railway car journal box having therein an axle journal provided with an end collar and having its side walls spaced from said journal further than said end collar extends therefrom, a journal centering guide interposed between a side wall of said journal box and said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position outside the periphery of said end collar, operating means connected to said journal centering guide and extending through said side wall and operable exteriorly of said journal box for shifting said journal centering guide between said operative and retracted positions, and releasable means reacting between said operating means and said side wall for locking said journal centering means in said operative position.

3. In combination with a railway car journal box having therein an axle journal provided with an end collar and having its side walls spaced from said journal further than said end collar extends therefrom, a journal centering guide interposed between a side wall of said journal box and said journal along a horizontal line through the axis of rotation of said journal to limit the movement thereof toward said side wall and movable generally parallel to said side wall to a retracted position below said operative position, operating means connected to said journal centering guide and extending through said side wall and operable exteriorly of said journal box for shifting said journal centering guide between said operative and retracted positions, and releasable means reacting between said operating means and said side wall for locking said journal centering means in said operative position.

4. The combination with a railway car journal box having a top and a bottom interconnected by vertical side walls and a railway car axle having an axle journal extending horizontally into said box and provided with an end collar, of projections extending from said side walls toward said journal along a horizontal line through its axis of rotation, a journal centering guide interposed between each projection and the respective side of said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position outside the periphery of said collar, and operating means connected to each journal centering guide and extending through the respective side wall and operable exteriorly of said journal box for shifting said journal centering guides between said operative and retracted positions.

5. The combination with a railway car journal box having a top and a bottom interconnected by vertical side walls and a railway car axle having an axle journal extending horizontally into said box and provided with an end collar, of projections extending from said side walls toward said journal along a horizontal line through its axis of rotation, a journal centering guide interposed between each projection and the respective side of said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position outside the periphery of said collar, operating means connected to each journal centering guide and extending through the respective side wall and operable exteriorly of said journal box for shifting said journal centering guides between said operative and retracted positions, and releasable means interconnecting each operating means and the respective side wall for locking each journal centering guide in operative position.

6. The combination with a railway car journal box having a top and a bottom interconnected by vertical side

walls and a railway car axle having an axle journal extending horizontally into said box and provided with an end collar, of projections extending from said side walls toward said journal along a horizontal line through its axis of rotation, a journal centering guide interposed between each projection and the respective side of said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position below and underneath the respective projection outside the periphery of said collar, and a shaft rotatably and longitudinally slidably mounted in each side wall and secured at its inner end to the respective journal centering guide and operable exteriorly of said journal box for shifting its journal centering guide between said operative and retracted positions.

7. The combination with a railway car journal box having a top and a bottom interconnected by vertical side walls and a railway car axle having an axle journal extending horizontally into said box and provided with an end collar, of projections extending from said side walls toward said journal along a horizontal line through its axis of rotation, a journal centering guide interposed between each projection and the respective side of said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position below and underneath the respective projection outside the periphery of said collar, a shaft rotatably and longitudinally slidably mounted in each side wall and secured at its inner end to the respective journal centering guide and operable exteriorly of said journal box for shifting its journal centering guide between said operative and retracted positions, and key means extending transversely of each shaft and cooperating with outwardly extending key receiving means on each side wall for locking each shaft and thereby its journal centering guide in operative position.

8. The combination with a railway car journal box having a top and a bottom interconnected by vertical side walls and a railway car axle having an axle journal extending horizontally into said box and provided with an end collar, of projections extending from said side walls toward said journal along a horizontal line through its axis of rotation, a journal centering guide interposed between each projection and the respective side of said journal and in operative position extending inwardly inside of the periphery of said end collar and movable to a retracted position below and underneath the respective projection outside the periphery of said collar, a bearing in each side wall below said horizontal line, key receiving means extending outwardly from each side wall and offset from the respective bearing, a shaft rotatably and longitudinally slidably mounted in each bearing and secured at its inner end to the respective journal centering guide for shifting the same between said operative and retracted positions, and a key extending transversely of each shaft and cooperating with the key receiving means associated therewith for locking each shaft and thereby its journal centering guide in operative position.

9. The invention as set forth in claim 8 wherein each journal centering guide has a stop flange extending outwardly along one side for interfitting from underneath with the respective projection in the operative position.

10. The invention as set forth in claim 8 wherein the key receiving means includes a flange on each side of the respective shaft, the key is tapered and interfits with a tapered opening in each shaft and reacts against the outside of the respective side wall to tighten and hold the respective journal centering guide in operative position, and the smaller end portion of said tapered key extends angularly to the remaining portion to prevent withdrawal of the key through its opening.

11. The invention as set forth in claim 8 wherein the outer end of the shaft is threaded and a nut is mounted thereon and reacts against the outside of the respective side wall to tighten and hold the respective journal centering guide in operative position.

12. In combination with a railway car journal box having therein an axle journal spaced from its vertical side walls, a journal centering guide interposed in operative position between a side wall of said journal box and said journal along a horizontal line through the axis of rotation of said journal to limit the movement of said journal toward said side wall, operating means eccentrically connected to said journal centering guide and rotatably mounted on and extending through said side wall and rotatable exteriorly of said journal box for rotating said journal centering guide in a vertical plane from said operative position to a retracted position below said horizontal line.

13. In combination with a railway car journal box having therein an axle journal spaced from its vertical side walls, a journal centering guide interposed in operative position between a side wall of said journal box and said journal along a horizontal line through the axis of rotation of said journal to limit the movement of said journal toward said side wall, operating means eccentrically connected to said journal centering guide and rotatably mounted on and extending through said side wall and rotatable exteriorly of said journal box for rotating said journal centering guide in a vertical plane from said operative position to a retracted position below said horizontal line, and means reacting between said operating means and said side wall and holding said journal centering guide in said operative position.

14. In combination with a railway car journal box having therein an axle journal spaced from its vertical side walls, a journal centering guide interposed in operative position between a side wall of said journal box and said journal along a horizontal line through the axis of rotation of said journal to limit the movement thereof toward said side wall and movable generally parallel to said side wall to a retracted position offset from said operative position, and operating means eccentrically connected to said journal centering guide and rotatably and endwise slidably mounted on and extending through said side wall and operable exteriorly of said journal box for rotating said journal centering guide parallel to said side wall and moving it laterally toward the same.

15. In combination with a railway car journal box having therein an axle journal spaced from its vertical side walls, a journal centering guide interposed in operative position between a side wall of said journal box and said journal along a horizontal line through the axis of rotation of said journal to limit the movement thereof toward said side wall and movable generally parallel to said side wall to a retracted position below said operative position, operating means eccentrically connected to said journal centering guide and rotatably mounted on and extending through said side wall and operable exteriorly of said journal box for shifting said journal centering guide between said operative and retracted positions, and means reacting between said operating means and said side wall for holding said journal centering guide in said operative position.

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