Sept. 13, 1949. J. H. SCOTT 2,481,695

CENTER PLATE

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Fig. 1

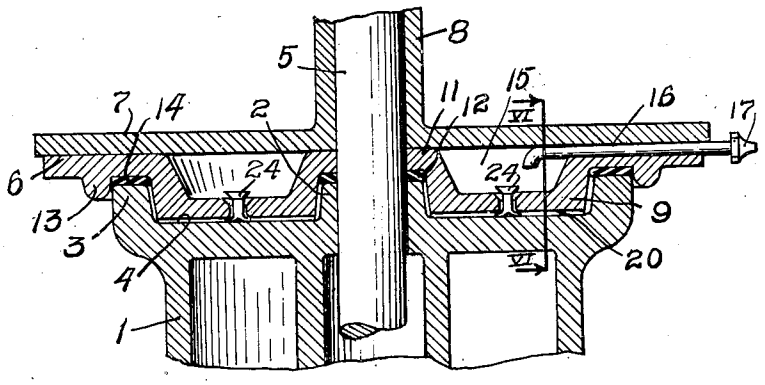
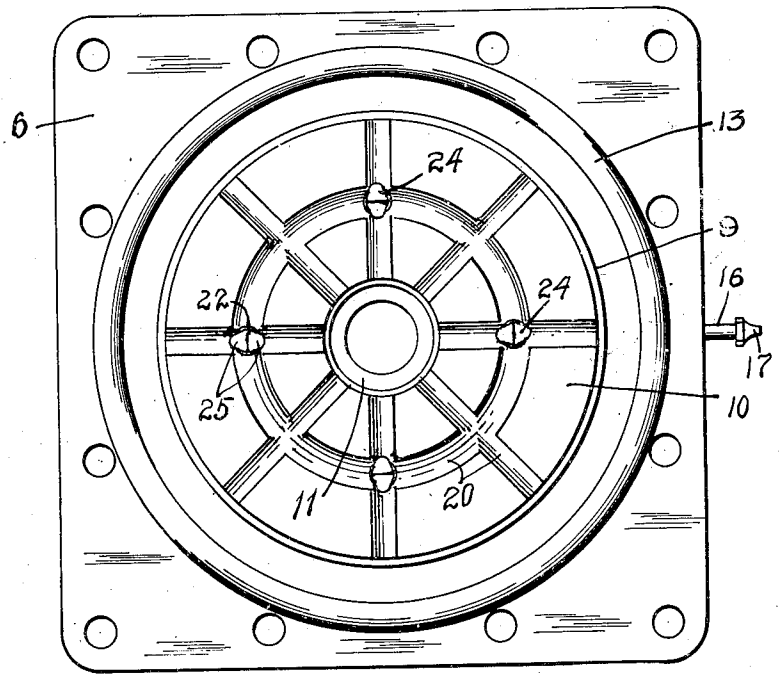


Fig. 2



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Fig. 3

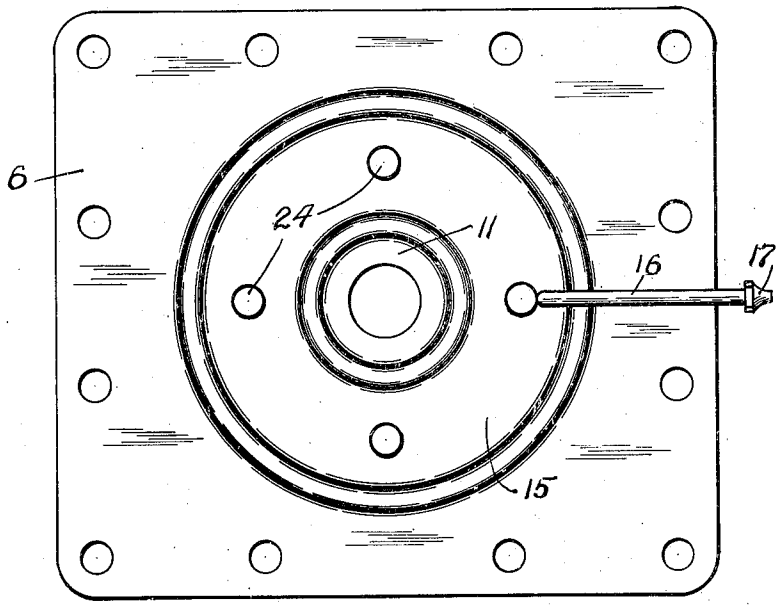


Fig. 4

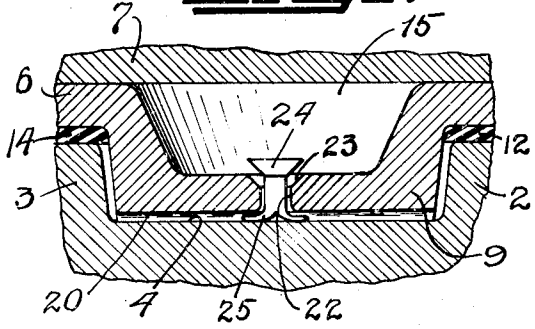


Fig. 5

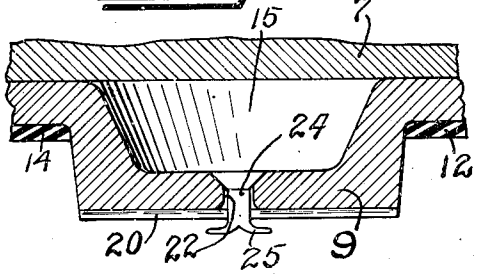
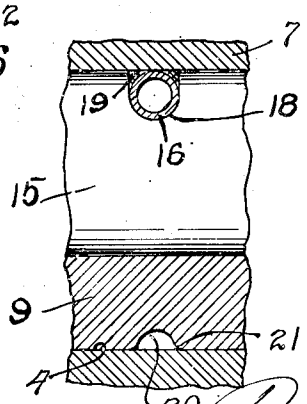


Fig. 6



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CENTER PLATE

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Application September 7, 1944, Serial No. 552,988

4 Claims. (Cl. 308—137)

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This invention relates to improvements in center plates, and more particularly to center plates of the type used in the construction of railway cars and which support the car body on the trucks, allowing the trucks to turn freely beneath the body of the car, and to a center plate assembly, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the past, many and various types of center plates and center plate assemblies have been developed, and while some of those plates have been used substantially continuously, nevertheless they were not free from binding, and that difficulty has not been satisfactorily overcome. Attempts have been made to lubricate the bearing surfaces of the center plates, but in most instances such attempts have been abortive even when the body of the car has been jacked up and the lubricant has been placed directly upon the bearing surfaces. In a relatively short time the lubricant would leave the bearing surfaces, permitting these surfaces to rust and bind, thus preventing free movement of the truck relatively to the car body resulting in injury not only to the rolling stock and tracks, but frequently by virtue of derailment or wrecks, to human life as well. The difficulty with center plates has also been aggravated in the past due to the fact that it has been almost impossible to inspect the center plates except when the car was in the repair shop and the body of the car could be jacked up and thus separated from the trucks. Inspection while the car was in use was substantially impossible.

With the foregoing in mind, it is an important object of the instant invention to provide a self-lubricating center plate so arranged as to contain a body of lubricant and retain that lubricant for an indefinite length of time regardless of whether or not the center plate is separated from its associated plate.

Another object of the instant invention is the provision of a center plate arranged to contain a quantity of lubricant, with valve means controlling the flow of that lubricant to the bearing surface of the plate, such valve means also preventing loss of lubricant when the plate is separated after use from its associated plate.

Still another object of the instant invention resides in the provision of a center plate having

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a grooved bearing surface, the plate being arranged to contain a body of lubricant with communicating channels leading to the grooved bearing surface, and means to control the flow of lubricant to such surface.

It is also an object of this invention to provide a center plate having a cavity therein for holding lubricant, there being an opening leading from such cavity to the bearing surface of the plate, and automatic gravity actuated valve means controlling the flow of lubricant through such opening.

It is also a feature of the instant invention to provide a center plate having a cavity therein for containing lubricant with means to distribute that lubricant to the bearing surface of the plate, and which plate is so constructed that it may be provided with sufficient lubricant to last an indefinite length of time, either before or after the plate is associated in bearing relationship with another center plate, the construction being such that the plate will contain its lubricant regardless of whether or not the car body is separated from its trucks.

It is also a feature of this invention to provide a lubricant-containing center plate with means to insure the distribution of the lubricant to the bearing surface of the plate, and the plate being equipped with a lubricant supply element not only suitable for supplying lubricant to the plate, but also functioning to prevent a ready inspection as to the whether or not an adequate amount of lubricant remains in the plate.

A further feature of the invention resides in the provision of a center plate assembly embodying a pair of center plates with juxtaposed bearing surfaces, one of the plates containing a supply of lubricant with means to insure the feeding of that lubricant to the bearing surfaces between the plates, the plates being packed around the bearing surfaces or in such other location that the load is not carried by the packing so as to retain the lubricant between the plates indefinitely.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawings, in which

Figure 1 is a fragmentary central vertical sec-

tional view, parts being shown in elevation, through a center plate assembly embodying principles of the instant invention;

Figure 2 is a bottom plan view of the upper center plate seen in the structure of Figure 1;

Figure 3 is a top plan view of the center plate of Figure 2;

Figure 4 is a fragmentary enlargement of the structure seen in the left central portion of Figure 1;

Figure 5 is a view similar to Figure 4 with the lower center plate removed, illustrating the operation of the valve means; and

Figure 6 is a fragmentary enlarged transverse vertical sectional view taken substantially as indicated by the line VI—VI of Figure 1, looking in the direction of the arrows.

As shown on the drawings:

The illustrated embodiment of the instant invention is shown in the form of center plates of the type used in connection with railway cars to provide bearing means between the car body and the trucks. This is one highly desirable use for the instant invention, although other uses and purposes may occur to one skilled in the art.

The assembly structure of Figure 1 includes a truck bolster 1 upon which is integrally formed a center plate structure. This center plate structure or formation is preferably circular in contour, and includes a centrally disposed upstanding boss 2, and an upstanding annular flange 3 spaced from the boss to provide a relatively wide sunken annular bearing surface 4 therebetween.

The boss 2 is centrally apertured to accommodate a king bolt 5 or center pin around which the truck center plate may turn.

A body or top center plate 6 is shown in operative association with the truck center plate structure just above described. This center plate 6 may be welded, bolted, or equivalently secured to a body bolster 7 having a centrally apertured portion 8 through which the center pin or king bolt 5 extends. The center plate 6 is shaped complementally to the truck center plate, and includes an annular depending trough-like portion 9 having a bearing surface 10 as best seen in Figure 2 on its underside for bearing association with the surface 4 on the truck center plate. This trough-like portion 9 is, of course, shaped to freely seat within the annular space between the boss 2 and the flange 3 on the truck center plate. The central portion 11 of the center plate 6 is apertured to accommodate the center pin 5 and shaped to seat over the boss 2 with sufficient space therebetween to accommodate a suitable gasket or packing 12. The plate 6 also has a depending annular flange 13 for telescopic association with the flange 3 on the truck center plate, with sufficient space between the plates to accommodate an annular gasket or packing 14 disposed over the top of the flange 3.

The trough-like portion 9 of the center plate 6 is left hollow to provide a cavity 15 in the upper face of the center plate for the reception of a suitable lubricant. When the center plate is secured to the body bolster 7, and especially when some suitable packing compound such as red lead is used between the center plate and the body bolster, the cavity 15 is sealed in and lubricant cannot escape through the top of the cavity. To provide easy means for filling the cavity 15 with lubricant a supply pipe 16 is disposed in the upper surface of the center plate 6. This supply pipe may extend outwardly as far as is desirable, and on its outer end may be provided with a suitable pressure fitting 17 of any desirable character to which a lubricant gun may be connected. It will be noted that the supply pipe 16 thereby affords a very easy method of inspection of the center plate assembly to ascertain whether or not an adequate supply of lubricant still remains in the cavity 15. It is a simple expedient for an inspector to place a lubricant gun on the fitting 17 and in the event no more lubricant can be added by manual pressure, the cavity is filled.

As seen best in Fig. 6, the pipe 16 is preferably embedded in the top surface of the plate 6. It will be noted that the plate may be provided with a groove 18 into which the pipe 6 is disposed. Then with the addition of a suitable compound a weld may be made and the upper portion of the groove 18 above the pipe filled in as indicated at 19 so that the upper surface of the plate 6 will be smooth and even for a flush fit against the body bolster 7, notwithstanding the fact that the pipe extends through a part of the plate. It will be appreciated that the pipe may be embedded in the hot center plate during a forging operation if so desired.

With references to Figures 2 and 6 it will be noted that the bearing surface 10 on the center plate 6 is provided with a plurality of intercommunicating grooves 20. Certain of these grooves extend radially, and certain of them are annular, but all intercommunicate with each other so that when lubricant enters one or more of the grooves, there will be an even distribution of this lubricant between the bearing surfaces 10 and 4 of the respective center plates. As indicated at 21 in Figure 6 the edges of the grooves are preferably rounded to permit free and easy rotation of one of the center plates relatively to the other and the bearing surfaces will not be injured by the edges of the grooves.

In order to insure a free flow of lubricant from the cavity 15 to the grooves 20 and thus to the bearing surfaces 10 and 4, the bottom of the trough-like portion 9 of the center plate 6 is provided with one or more apertures 22. In the illustrated instance, there are four such apertures spaced equidistantly apart. As seen best in Figure 4, the floor of the cavity 15 is preferably counter sunk as indicated at 23 at the upper end of each of these apertures so as to provide a suitable seat for valve means which control the flow of fluid through the apertures. With reference to Figure 2 it will be noted that each aperture preferably communicates directly with one of the grooves 20, and this communication is preferably at a junction between an annular and a radial groove.

In the illustrated embodiment of the invention, a separate valve 24 is preferably associated with each aperture 22. The head of the valve is shaped to fit snugly within the countersunk portion 23 at the top of the opening, as seen in Figure 5. The stem of the valve extends through the opening, but is longer than the opening. The lower end of the valve stem is preferably split and when the valve is inserted in its respective aperture, the tails on each side of the split are extended in opposite directions as indicated at 25 to maintain the valve in position.

As seen clearly in Figure 4, it will be noted that when the center plates are placed together in operative association, the valve 24 is forced upwardly due to the length of its stem so as to permit a free flow of lubricant through the aperture 22 to the bearing surfaces. When the valve is so forced upwardly the tails of the valve 25 seat

within one of the grooves 20 and so do not interfere in any manner with the proper bearing contact between the center plates. Disposing each valve preferably at a junction between a radial and an annular groove 20 insures the tails on the end of the valve stems always finding room for lodgment when the bearing plates are placed together. In the event the bearing plates are separated, such as by jacking up the body of a car and thereby elevating the plate 6 from the truck center plate, the valves drop by gravity into the position seen in Figure 5 and close the openings or ports 22 so that the lubricant in the cavity 15 is retained therein, and it is not necessary to provide a new supply of lubricant simply because it was found desirable to separate the center plates. Upon again dropping the center plate 6 to its operative position upon the truck center plate, the valves will assume the position seen in Figure 4 and again a free flow of lubricant to the bearing surfaces is permitted. Obviously, the valves are automatic, permanently disposed in operative position, and require no attention on the part of an operator.

In the manufacture and use of the instant invention, only one center plate need be shaped in accordance with the teachings of the invention, if so desired. No change need be made in truck center plates already in use. The body center plate 6 may be forged to the desired shape. This forging operation amounts merely to the provision of the grooves 20, and the openings or ports 22 in a regular center plate forging. The supply pipe 16 may be inserted in its groove and welded in place or pressed into position during a forging operation. The valves may be readily set in position in the manner split rivets are mounted. The gaskets or packings 12 and 14 may be provided upon the upper center plate as indicated in Figure 5. This upper or body center plate may be filled with lubricant in the cavity 15 before it is connected with the truck center plate, if so desired. Immediately upon seating the body center plate upon the truck center plate, the valves 24 are raised permitting a flow of lubricant from the cavity 15 into the grooves 20. This lubricant will at once distribute itself among all the grooves and enter between the bearing surfaces 10 and 4 on the respective center plates. Any relative movement of one center plate to the other merely insures an adequate distribution of lubricant over the bearing surfaces. Any lubricant that has passed through the ports 22 is trapped by the gaskets or packings 12 and 14 and cannot escape from the center plate assembly. Consequently no more than the required amount of lubricant will pass through the ports 22, the remainder staying within the cavity 15. It will be noted that it is an easy expedient to check the lubricant supply at any time by merely connecting a lubricant gun to the fitting 17 on the pipe 16, and no further lubricant can be added if the cavity 15 is full, and if a little lubricant is needed it can be added very readily. Once filled with lubricant, the center plate assembly should retain that lubricant for substantially the life of the assembly. There is no place for the lubricant to escape. In the event it becomes desirable to jack up the body of the car and thus separate the plates, only that small amount of lubricant in the grooves 20 and between the bearing surfaces will be lost, if any is lost. The valves 24 prevent any draining of lubricant from the cavity 15. When the plates are again united, the valves permit a flow of lubricant from the cavity to the bearing surfaces and the supply of lubricant in the cavity is amply sufficient to permit a number of such separations of the plates without the need of additional lubricant.

From the foregoing, it is apparent that I have provided a novel center plate and a novel center plate assembly embodying self-lubricating characteristics so that automatically and without attention on the part of an operator, the bearing surfaces between the center plates are constantly provided with an adequate amount of lubricant, thus effectively preventing any binding of these plates. The lubricant is sealed in, and automatically retained in the event the plates are separated. It will further be noted that the instant invention, while highly efficient and economical in use, is also economical to manufacture, highly durable, and very simple to install.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the prinicples of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A center plate having an external bottom bearing surface, said surface having a groove therein, said plate having a cavity for lubricant and an opening leading from said cavity to said groove, and a valve in said opening having a head on the cavity side of the opening and a stem longer than the opening extending through the opening, said stem being split on the lower end with the tails of the split entering said groove when the bearing surface is in engagement with that of another center plate.

2. A center plate having an external bottom bearing surface, said surface having a groove therein, said plate having a cavity for lubricant and an opening leading from said cavity to said groove, a valve in said opening having a head on the cavity side of the opening and a stem longer than the opening extending through the opening, and enlarged means on the lower end of the valve stem to hold the valve in said opening, said means entering the groove when the valve is pushed inwardly by the engagement of said bearing surface with that on another center plate.

3. In combination, a truck bolster, a female center plate carried by said bolster, said plate being centrally apertured to accommodate a king bolt, an upstanding flange around the central aperture and an upstanding flange around the periphery of said plate, said flanges defining an annular recess therebetween the bottom of which is a flat bearing surface, a male center plate having an annular depressed portion complemental to said annular recess with a bearing surface on the bottom and an open topped cavity in the upper side to contain a lubricant, said male center plate having vertical openings establishing communication between said cavity and said bearing surfaces, a car body bolster covering the cavity in said male center plate, and packing between said center plates at the top of said upstanding flanges, said male center plate having intercommunicating grooves in the bearing surface thereof, and automatic valve means controlling the flow of lubricant through said openings when said bearing surfaces are in operative association, portions of said means then seating within said grooves to leave free the confronting bearing surfaces.

4. As an article of manufacture, a male center plate having a central aperture to accommodate

a king bolt, an annular depression in said plate around said aperture defining an open topped cavity for lubricant which cavity may be closed by a body bolster when the plate is in use, the outer bottom face of said depression serving as a bearing face, said plate having an opening leading from said cavity to the bearing face, and said plate being shaped to provide a gasket seat on the underside on each side of said depression, said bearing face having grooves therein, and valve means controlling the flow of lubricant through said opening, a part of said valve means seating in said grooves when in open position to leave said bearing face free.

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