April 30, 1940. J. M. HALL 2,199,339

SPRING PLATE

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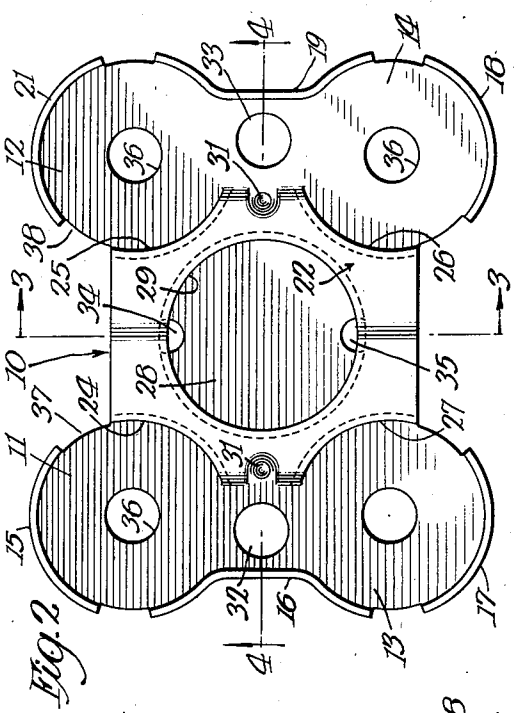


Fig. 2

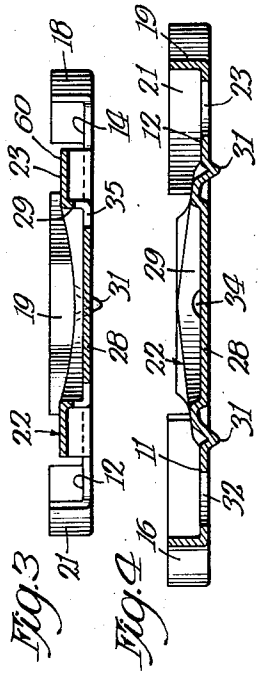


Fig. 3

Fig. 4

Fig. 6

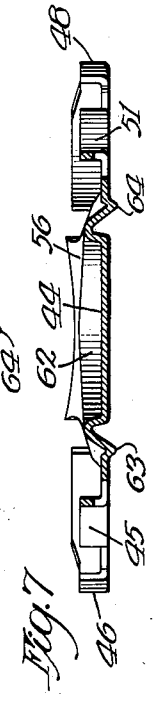


Fig. 7

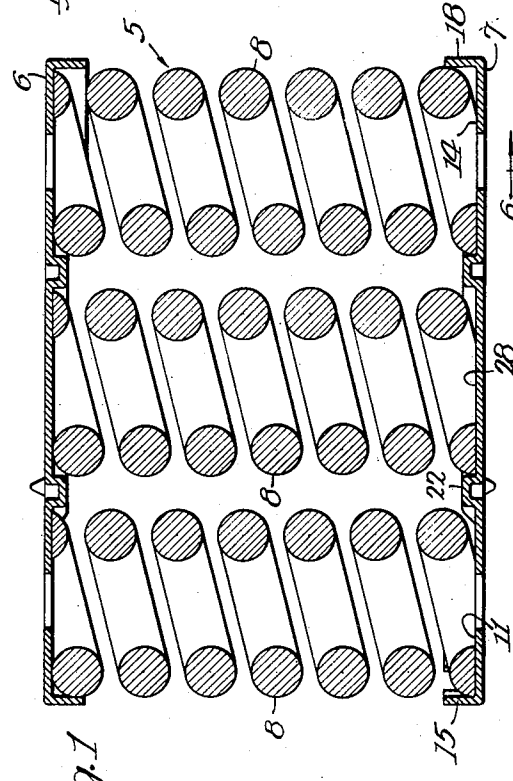


Fig. 1

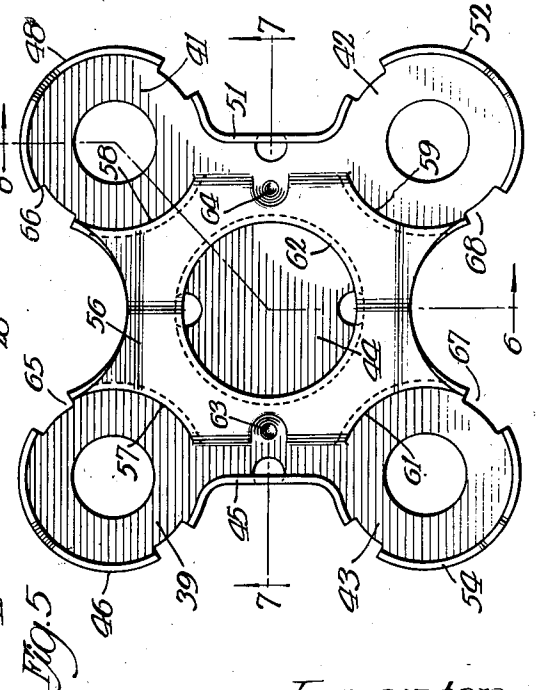


Fig. 5

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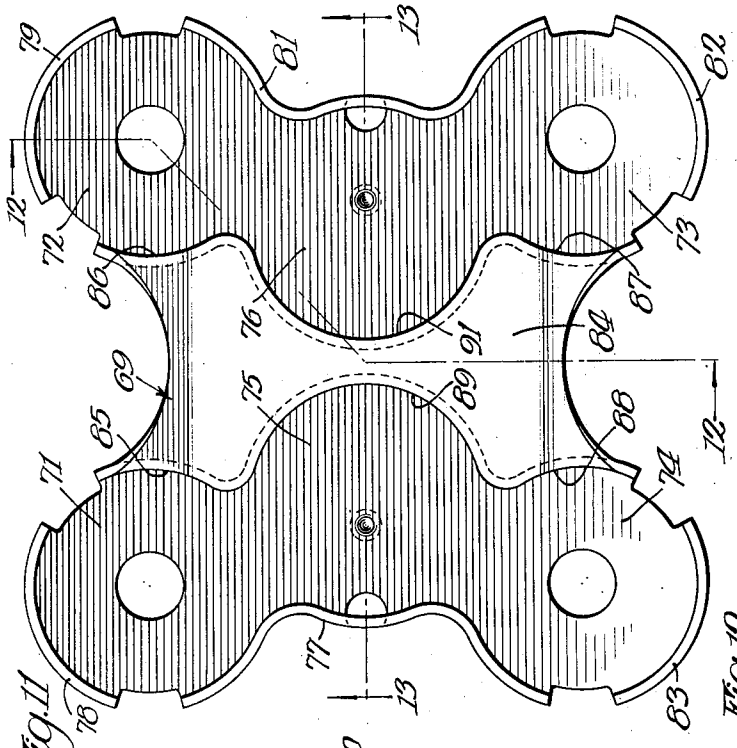


FIG. 11

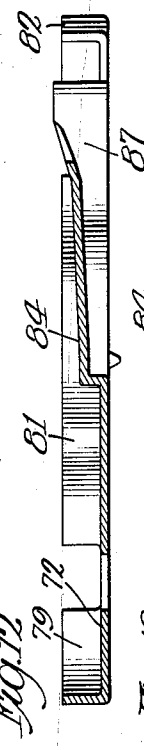


FIG. 12

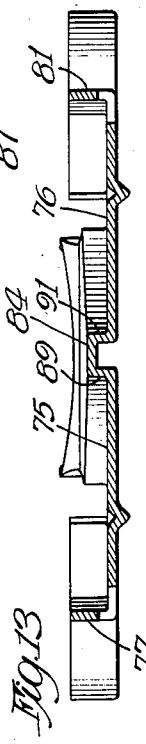


FIG. 13

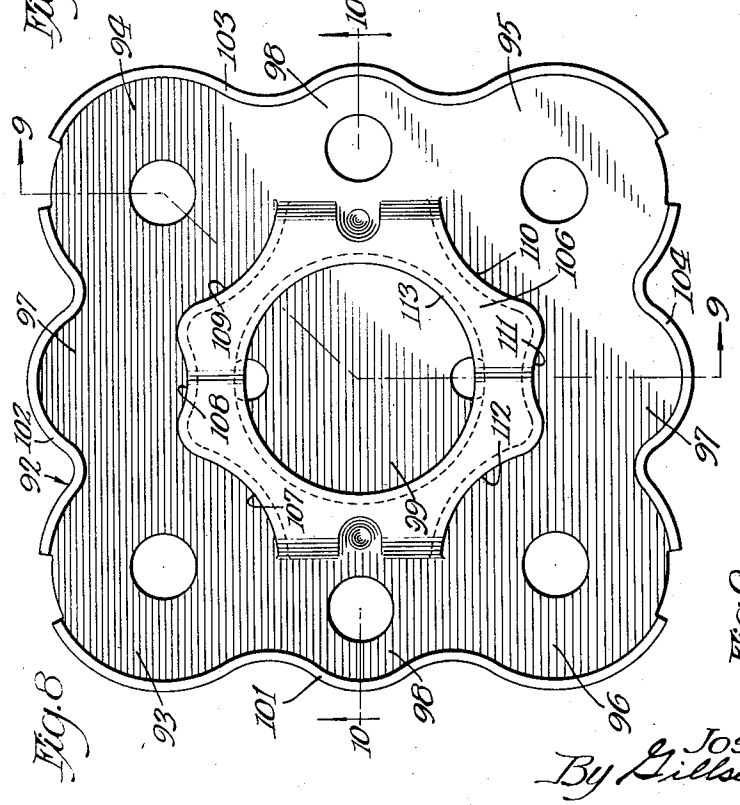


FIG. 8

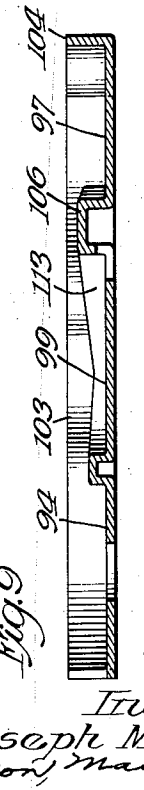


FIG. 9

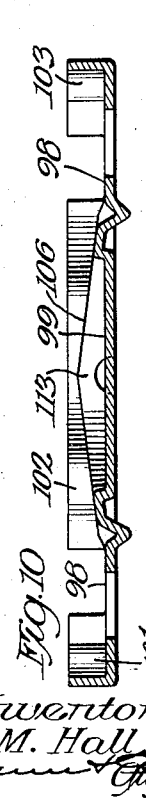


FIG. 10

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UNITED STATES PATENT OFFICE

2,199,339

SPRING PLATE

Joseph M. Hall, Chicago, Ill., assignor, by mesne assignments, to Universal Railway Devices Company, a corporation of Delaware

Application April 6, 1938, Serial No. 200,301

3 Claims. (Cl. 267—4)

This invention relates to spring plates for use on railway cars and more particularly for use on bolster spring assemblies for railway trucks.

One of the objects of the invention is the provision of a new and improved spring plate having means for retaining the springs in position so constructed as to reinforce the plate.

Another object of the invention is the provision of a new and improved spring plate having its central portion so constructed as to form reinforcing means for strengthening the central portion of the plate and at the same time constituting means for assisting in positioning the springs.

Another object of the invention is the provision of a spring plate having new and improved means for reinforcing a spring plate having one or more intermediate spring seats.

A further object of the invention is the provision of a new and improved spring plate that has its central portion reinforced, is inexpensive to manufacture, is stamped from sheet metal and that is not likely to become distorted or broken while in use.

Other and further objects and advantages of the invention will appear from the following description, taken in connection with the accompanying drawings, in which—

Fig. 1 is a transverse section of a spring assembly showing the invention in position thereon;

Fig. 2 is a plan view thereof;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a plan view of a modified form of construction;

Fig. 6 is a section on the line 6—6 of Fig. 5;

Fig. 7 is a section on the line 7—7 of Fig. 5;

Fig. 8 is a plan view of a further modified form of construction;

Fig. 9 is a section on the line 9—9 of Fig. 8;

Fig. 10 is a section on the line 10—10 of Fig. 8;

Fig. 11 is a plan view of another modified form of construction;

Fig. 12 is a section on the line 12—12 of Fig. 11; and

Fig. 13 is a section on the line 13—13 of Fig. 12.

The tendency in railway construction has been to increase the carrying capacities of the cars. This has necessitated the use of more springs for supporting the bolster and the load carried by it. The shape of the spring plates is such that portions of the seats extend in front of, and in rear of, the adjacent portions of the columns of the truck side frame at the sides of the bolster openings. The present invention seeks to provide a plate that will meet this requirement and accommodate one or more central springs and yet have a reinforced plate provided with means for positioning the springs.

It is common practice in the manufacture of spring plates to stamp the same from sheet metal and in order that the plates shall have the proper rigidity, it is desirable that the edges be provided with flanges and that the central portions be reinforced. In my Patent No. 1,913,076, June 6, 1933, is disclosed a spring plate stamped from sheet metal having a central spring engaging portion or member and segmental flanges on the edge of the plate but in that form of construction, the central raised portion is merely a spring retaining and bolt engaging member. Moreover, only four spring seats are employed. With the increasing size and capacity of freight cars, it has become necessary to increase the number of springs in the spring assembly and the present invention seeks to provide spring plates for accommodating from five to seven springs in the assembly and to so construct the plate that it will be provided with a reinforced central portion and with a reinforced edge portion.

Referring now to the drawings, the reference character 5 designates a spring assembly comprising a pair of spring plates 6 and 7 between which are positioned the springs 8 constituting the assembly. This assembly is adapted to support the end of a truck bolster in the bolster opening of a side frame of a car truck.

Referring now more particularly to Figs. 1 to 4, the spring plate 10 is roughly rectangular in form somewhat resembling a four-leaf clover and having the spring seats 11, 12, 13 and 14 at each corner thereof. The edge of the plate at the corners is concentric with these spring seats and in this form of construction, the curved edge of each spring seat is greater than 180 degrees.

A suitable segmental flange is provided about the edge of the plate. In the form of the construction shown, this flange comprises the segments 15, 16, 17, 18, 19 and 21 arranged at spaced points about the edge of the plate. The segments 16 and 19 have their ends concentric with two spring seats, as shown more clearly in Fig. 2 and the remaining segments are each concentric with a contiguous spring seat.

The central portion 22 of the plate is pressed in a direction which, for convenience of description, will be referred to as upwardly as shown at 23, see Fig. 3, and this central portion has upstanding walls 24, 25, 26 and 27 concentric with the spring seats 11, 12, 13 and 14, respectively,

and which cooperate with the flanges 15, 16, 17, 18 and 21, for preventing displacement of the springs in said seats. The central part of the elevated portion 23 is depressed to form the spring seat 28, Fig. 3, for the center spring of the spring assembly. Or, to be more accurate, the central portion about the central spring seat is pressed upward. The springs for all of the seats may be interchanged if desired. The elevated portion 23 has a vertical wall 29 surrounding the spring seat 28 for retaining the center spring in position on said seat.

The plate, as stamped, is provided with depending lugs 31 for engaging corresponding recess in the bolster or side frame member for preventing displacement of the spring plate during use. If desired, the plate may be provided with openings 32 and 33 for the drainage of water that may accumulate on the plate. The spring seat 28 may also be provided with the openings 34 and 35 for the same purpose. Each of the spring seats 11, 12, 13 and 14 may likewise be provided with drainage openings 36. The flange segments 15 and 21 are spaced from the central raised portion of the plate to form notches 37 and 38 which are adapted to receive the inner corners of the columns of the truck side frame. Likewise, provision is made for receiving the truck column at the opposite side of the plate.

It will thus be seen that a comparatively light spring plate is provided which is properly reinforced between the spring seats as well as across the center of the plate in all directions by the flange segments and raised portions of the plate and that provision is made for using five springs. It will be noted that the corner springs are positioned by curved flange segments and a curved wall of the central reinforcing portion at three widely separated points but less than 180 degrees apart and that the central spring is positioned by a circular wall of the raised portion which extends entirely around the spring seat 28 for strengthening the entire central portion of the plate.

The form of the construction shown in Figs. 5, 6 and 7 differs from that just described only in matters of detail. This plate is also intended to accommodate five springs positioned on the five seats 39, 41, 42 and 43 at the corners of the plate and the seat 44 at the central part of the plate. This plate is provided with a segmental flange extending about its edge. The flange comprises the segments 45, 46, 48, 51, 52, and 54. The flanges 45 and 51 have their ends concentric with adjacent spring seats. The spring seats are all in a common plane and the central seat is surrounded by a raised portion 56 which has the curved walls 57, 58, 59 and 61 concentric with the spring seats 39, 41, 42 and 43, respectively. This raised portion also provides an upstanding circular wall 62 which surrounds the spring seat 44 and is adapted to position the spring therein. The plate is also provided with depressed portions forming plate retaining lugs 63 and 64, see Fig. 7, for engaging in corresponding openings in the bolster or the side frame for positioning the plates.

The upper and lower edges of the central portion 56, as viewed in Fig. 5 are curved upwardly at their outer edges as shown at 50 in Fig. 6 for accommodating portions of the structure of certain types of cars. In Figs. 1 to 4 the corresponding edges are horizontal, as shown at 60 in Fig. 3.

Suitable openings are provided in the spring seats and the central portion of the plate for draining water from the plate the same as in the previous construction.

The notches 65, 66, 67 and 68, formed between the flange segments and the adjacent reinforced central portions of the plate, are so positioned that they will receive the columns of the truck side frame. The flanges 46, 48, 52 and 54 have portions 47, 49, 51 and 53 that are wider than the remaining portions of the flanges as shown in Figs. 6 and 7.

In the form of the construction shown in Figs. 11, 12 and 13, the plate 69 is constructed to accommodate six conventional bolster springs and is of the same general contour as the plate shown in Fig. 5. The plate has re-entrant portions or recesses in its edge and these portions are reinforced with parts of a segmental flange and with the reinforcing central portion of the plate as in the previous constructions. The raised or reinforcing central portion may be elongated and may be positioned on the central part of the plate. It is provided with recesses concentric with the spring seats for cooperating with the segmental flange which also has portions concentric with at least two of said seats and other portions concentric with the remaining seats for constituting retaining means for the springs.

The form of the plate in this construction is similar to the plate shown in Fig. 5 in that the spring seats arranged at the corners of the plate have curved edges greater than 180 degrees. The plate 69 is provided with six spring seats 71, 72, 73 and 74 at the corners of the plate and the spring seats 75 and 76 between the spring seats 71 and 74 and between 72 and 73, respectively. The plate is provided with a segmental flange extending about the edge thereof with the segments spaced from each other varying distances. The flange comprises sections 77, 78, 79, 81, 82 and 83, respectively. The flanges 77 and 81 have their ends concentric with two spring seats and have a central portion concentric with the spring seats 75 and 76. The remaining flange segments are concentric with the contiguous spring seats.

In this form of the construction, the central portion 84 of the plate is pressed upwardly to form a reinforcement for the plate and the side portions at the ends thereof are provided with upstanding curved walls 85, 86, 87 and 88 which are concentric with the contiguous spring seats. The central part of the raised portion 69 is provided with upstanding curved walls 89 and 91 which are concentric with the intermediate spring seats 75 and 76. It will thus be seen that in this form of construction, the spring seats at the corners of the plate are provided with spring retaining means which engage the springs at three widely separated points for retaining the same in position and that the central elevated portion 84 materially strengthens the plate 69.

In the form of the construction shown in Figs. 8, 9 and 10, provision is made for a seven spring assembly. In this form of construction, the plate 92 is roughly rectangular in form and has the spring seats 93, 94, 95 and 96 at the corners thereof. It also has the intermediate spring seats 97 and 98 located between the spring seats 93 and 94 and between the seats 95 and 95, respectively. The spring seats 97 and 98 are smaller than the remaining seats and are intended to accommodate lighter springs for engaging wedges in connection with friction mech-

anism used in certain types of spring assemblies for increasing their capacities and for preventing harmonic action of the assemblies.

The plate is also provided with a central spring seat 99. The plate has a segmental flange extending about the edge thereof as in the previous constructions. This flange comprises the segments 101, 102, 103, and 104. The ends of each of these segments are concentric with the two spring seats. The spring seats are all in the same horizontal plane and the spring seat 99 is surrounded by a raised central reinforcing portion 106 which extends about the spring seat 99. This raised central portion is provided with curved upstanding walls 107, 108, 109, 110, 111 and 112 which are concentric with the corresponding spring seats 93, 97, 94, 95, 98 and 96, respectively. The central portion is also provided with an upstanding circular wall 113 which extends about the spring seat 99 for positioning the central spring therein.

In the description, the lower plate has been described but this is for convenience only as the upper plate of the spring assembly is a duplicate of the lower one.

It is thought from the foregoing taken in connection with the accompanying drawings that the construction and operation of my device may be apparent to those skilled in the art and that changes in size, shape, proportion and detail may be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. A spring plate for the spring assembly of a railway car having four spring seats thereon arranged at the corners of a generally rectangular form, the edge of the plate being curved about each of the named seats and being reentrant between adjacent pairs thereof, a raised central portion rigid with said plate and extending substantially from at least one reentrant edge to substantially the opposite reentrant edge of the plate and having spring positioning wall portions concentric with said seats, and a segmental flange extending around said plate and having portions concentric with said seats.

2. A spring plate for the spring assembly of a railway car having four spring seats thereon arranged at the corners of a generally rectangular form, the edge of the plate being curved about each of the named seats and being reentrant between adjacent pairs thereof, a raised central portion rigid with said plate and extending from one edge to the opposite edge of the plate and having spring positioning wall portions concentric with said seats, a portion of said raised central portion being depressed to form a central spring seat, and a segmental flange extending around said plate and having portions concentric with the first named seats.

3. A spring plate for the spring assembly of a railway car having four spring seats thereon arranged at the corners of a generally rectangular form, the edge of the plate being curved about each of said seats and being reentrant between adjacent pairs thereof, a raised central portion integral with said plate and extending from one edge to the opposite edge of the plate and having spring positioning walls concentric with said seats, a segmental flange extending around said plate and having portions concentric with said seats, and an additional spring seat on each opposite side of the raised portion, between two of the corner seats, and defined in part by one of the walls of the raised portion.

JOSEPH M. HALL.