Oct. 12, 1937. A. N. LUKENS 2,095,933

SPRING PLATE

Filed May 5, 1937 2 Sheets-Sheet 1

- FIG. 1. -

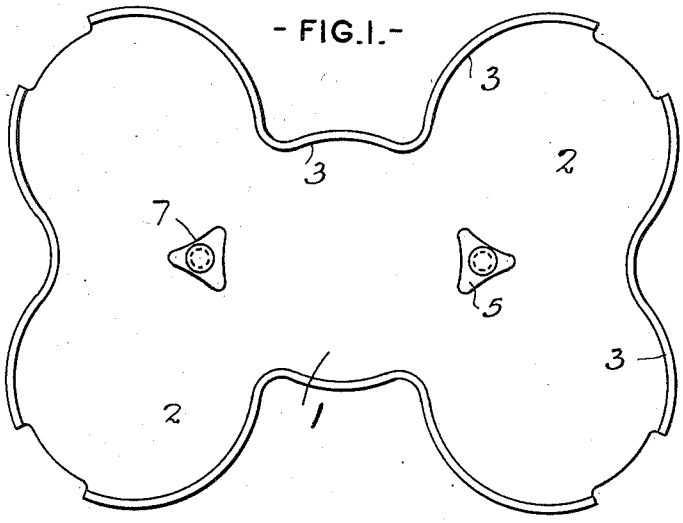
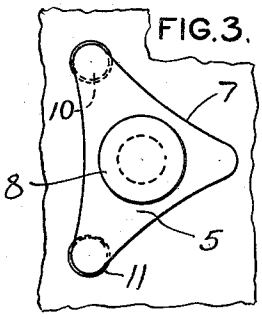
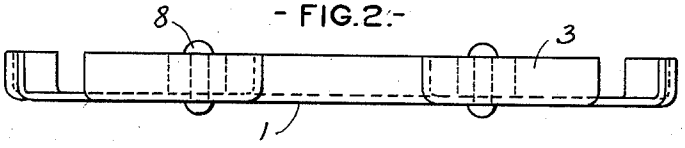


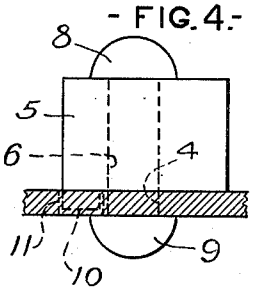
FIG. 3.



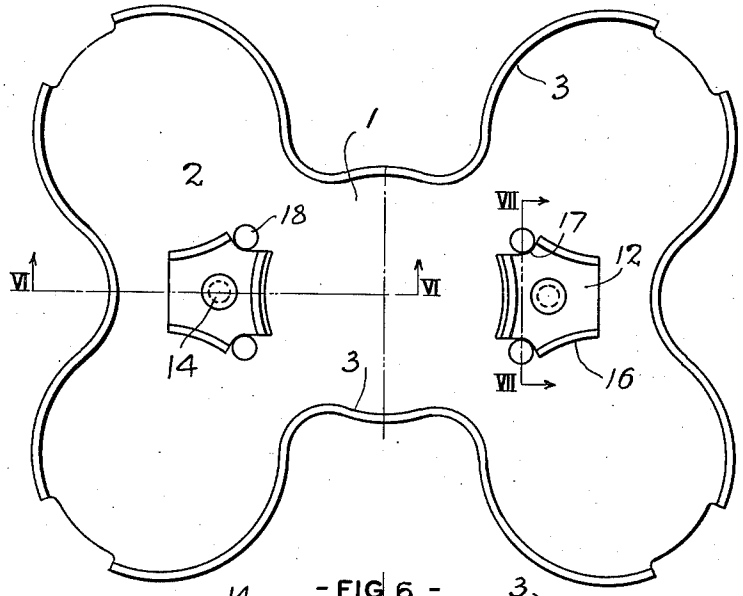
- FIG. 2. -



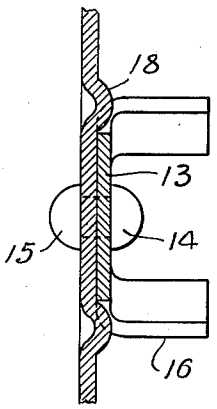
- FIG. 4. -



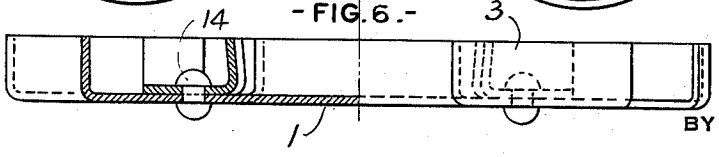
- FIG. 5. -



- FIG. 7. -



- FIG. 6. -



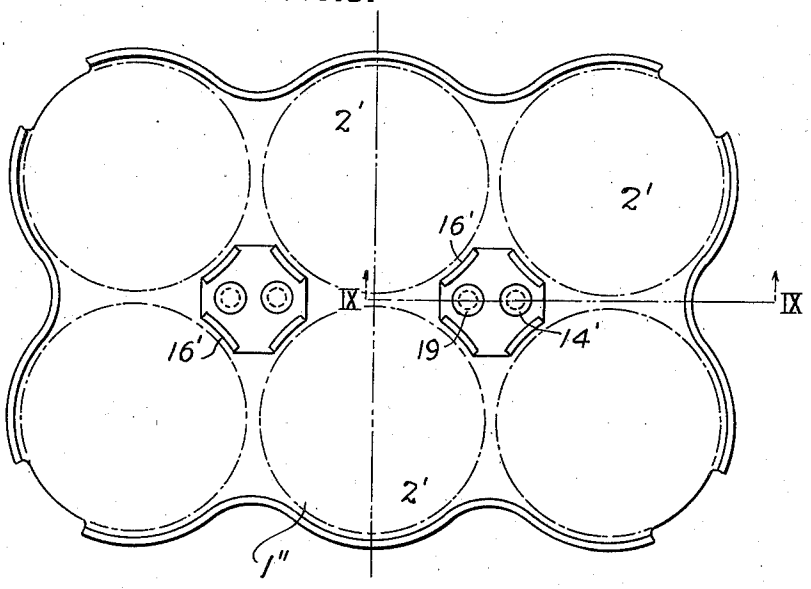
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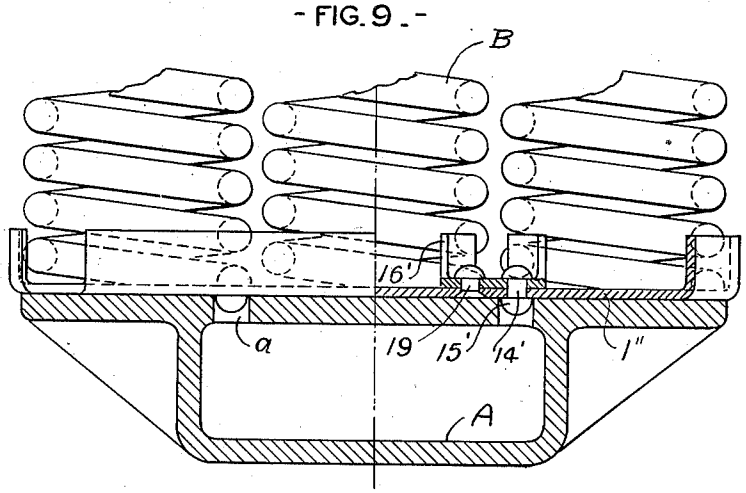
SPRING PLATE

Filed May 5, 1937 2 Sheets-Sheet 2

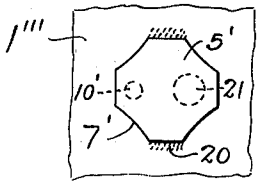
- FIG. 8 -



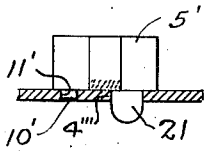
- FIG. 9 -



- FIG. 10 -



- FIG. 11 -



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SPRING PLATE

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Application May 5, 1937, Serial No. 140,808

3 Claims. (Cl. 267—4)

This invention relates to a spring plate structure for a group of helical springs for the bolster window of a railway vehicle truck, and its principal object is to provide means whereby a certain well-known type of structure which has previously been employed in connection with a group of four springs, later to be referred to, may be utilized in connection with groups of larger numbers of springs.

Referring to the drawings forming a part of this application, Figure 1 is a plan view of a spring plate structure, adapted for engaging a group of five helical springs, showing two devices involved in the present invention; Fig. 2 is a front elevation of the structure of Fig. 1; Fig. 3 is an enlarged plan view showing a fragment of the spring plate and one of the devices; Fig. 4 is a front elevation of the parts shown in Fig. 3, the fragment of the plate being shown in section; Fig. 5 is a view, similar to Fig. 1, showing the two devices of modified form; Fig. 6 shows, at the right, a front elevation of the structure of Fig. 5 at the right thereof, and at the left is a section on the line VI—VI of Fig. 5, the rivet being shown in full lines; Fig. 7 is an enlarged section on the line VII—VII of Fig. 5; Fig. 8 is a plan view of a spring plate structure, adapted for engaging a group of six helical springs, showing the two devices involved in the present invention modified to adapt them for a six spring group, the springs being indicated by dot and dash lines; Fig. 9 shows, at the left, a front elevation of the structure of Fig. 8 at the left thereof, at the right, a section on the line IX—IX of Fig. 8, fragmentally three helical springs of the six spring group supported on the spring plate, and the spring plate supported on the truck frame, the frame being shown in transverse vertical section; Fig. 10 is a plan view showing a fragment of the spring plate of Fig. 8 and a modified form of the device; and Fig. 11 is a front elevation of the parts shown in Fig. 10, the fragment of the plate being shown in section.

Referring to Figs. 1 to 4 of the drawings the spring plate structure comprises a plate 1, in this particular embodiment divided into five portions 2, each for engaging a spring at an end portion of the spring group (not shown), and peripheral flange portions. This plate-flange design is of the type shown in the patent to Hall, 1,913,076, wherein the flange portions are adjacent the spring engaging plate portions and are for the purpose of preventing the adjacent spring from being displaced in a direction toward the flange portion. Two plates are employed, one above and the other below the spring group at either end thereof, as shown in the Hall patent, and the assemblage is disposed in the bolster window of a railway vehicle truck, the assemblage commonly resting upon a spring plank and at its upper end supporting the bolster, as shown in the patent to Symington, 1,911,331, but in more modern types of trucks the spring plank is disposed of and the assemblage rests directly upon a face of the truck frame forming part of the bolster window. In either case sockets are provided. In the type employing a spring plank the sockets are in the spring plank as shown in the Symington patent above mentioned, and when the plank is not used the sockets are in the frame as shown in Fig. 9 of the present application. Usually sockets are also provided in the bolster for the upper spring plate as shown in the Symington patent. The sockets are for holding the assemblage in place. There is a pair of sockets for each plate and the space between the sockets of each pair and their location in the window is standard, they being provided by the truck manufacturer who ordinarily is not the manufacturer of the spring plate structure, and it is therefore required of the spring plate manufacturer that the plate be provided with a pair of projecting elements resembling lugs suitably spaced and positioned to render them engageable by the sockets of the truck. Therefore as to the plate structure the spacing and disposition of the lugs must be standard so that any spring plate design for a particular size bolster window may be used for that size of window, the spacing, in some instances, being different for different size windows. This requirement is necessary for original equipment, for replacements and repairs, and for instances where changes as to different spring groupings are desired. For instance it may be desirable, in view of service conditions, to change from a group of four springs to a larger group of springs such as five or six, or vice versa. The sockets are disposed in a line centrally of the window and usually transversely of the truck.

The simplest manner of making the lugs is by pressing them outwardly from the plate as shown in the Hall patent. In this type of plate structure comprising the peripheral flange portions the center is pressed in the reverse direction, as shown in the Hall patent, providing a wall adjacent each of the springs, each wall being for the purpose of preventing the adjacent spring from being displaced in a direction toward the wall similar to the flange portions. In this type of plate structure the flange portions and walls preventing

displacement of the springs are exterior to the springs as distinguished from the type of plate structure shown in the Davis Patent 385,917, where the restricting walls are pressed from the plate for disposition adjacent the interior of the spring. The former type is preferable and is more commonly used at the present time. It provides plate portions for the springs that are unobstructed so that double helical springs, that is to say one coil within another, which are commonly used, may be employed if desired. It will be understood that when the term "spring" is employed it is used broadly and includes a number of springs one within another, as well as a single spring.

In a four spring group, such as that of the Hall patent, the restricting walls are located midway between and spaced from the lugs and are formed by pressing the central portion of the plate reversely to that followed in pressing the lugs. This reverse pressing presents no problem in forming the plate structure from a single sheet for a four spring group, the lugs being merely formed by pressing the plate outwardly at these localities and the walls between the lugs being formed by merely pressing the plate inwardly. It it obvious however that if these walls were disposed in the same locality as a lug, that is to say if the walls surrounded the lug, it would be impossible to form the walls and lug by pressing the plate in said reverse directions.

In a structure of the Hall general type where the restricting walls are exterior to the spring it so happens that the required standard location of the lugs disposes them at the same location as that of the walls when a group of five or six springs is employed. Therefore the double pressing action cannot be resorted to. In the present invention this condition is met by providing devices that are not a part of the plate.

Figs. 1 to 4 show the invention as applied to a five spring group. Here five plate portions **2** are provided, one for each of the five springs, one portion being at each of the four corners of the plate and the fifth portion being at the center of the plate, and two peripheral flange portions **3** are provided for each spring. The plate is provided with two holes **4** disposed so that one will be, when assembled with the truck, in alignment with each of the truck sockets.

There are two devices, one located at each of the holes, each device comprising a body **5** of block formation having an orifice **6** and three concave faces or walls **7**, one for each of the adjacent springs for preventing the adjacent spring from displacement in a direction theretoward, each device in the five spring group being adjacent three springs. The body is secured to the plate by a fastening means, in the present instance by a rivet **8** which passes through the orifice **6** and the hole **4** and extends outwardly from the outer face of the plate and is formed into a head **9** providing a projection which will, when the plate is assembled with the truck, fit within the socket aforementioned, and will hold the plate in place, preventing lateral movement of the spring assemblage relative to the truck. Preferably the body or block **5** is provided with an integral lug **10** and the plate is provided with a hole **11** engaging the lug. This permits accurate positioning of the faces of the block, and moreover proper positioning of the body **5**, the faces of which being usually not uniformly positioned relative to the orifice **6**. Moreover the lug prevents any displacement of the block when in service. In the present instance two such lugs are employed.

Figs. 5 to 7 show a modification of Fig. 1. Here the body or block **5** of the device is replaced by the skeleton-like body **12**. This is made from sheet metal stamped and pressed to provide a base plate **13** riveted to the spring plate similar to the former device by a rivet **14** providing a head **15** functioning similarly to the head **9**. The device of the present embodiment has three upstanding concave flanges **16** providing walls functioning similarly to the concave faces or walls **7**. Adjacent the ends of the flange **16** for the central spring the body **12** is formed with cut out portions **17** which co-act with lugs **18** pressed inwardly from the plate **1**, a lug **18** and its adjacent portion **17** functioning similarly to the lug **10** and hole **11**.

Figs. 8 and 9 show the present invention applied to a plate structure for a group of six springs. Here the plate **1''** is divided into six portions **2'** and instead of having one central plate spring portion, as in the first two embodiments, the present embodiment has two middle plate spring portions **2'** so that there are three similar pairs of plate spring portions, except as to the middle or intermediate pair there is only one flange portion for each spring, that is to say the intermediate springs are held against displacement at three points instead of at four as in the case of the central spring in the former two embodiments.

The devices are made from sheet metal, in this regard being similar to the embodiment of Fig. 5, but each is provided with four upstanding concave flanges **16'** instead of three, as in Fig. 5, each device in the present embodiment being required to be adjacent at its concave faces to four springs. The device is secured to the spring plate by a rivet **14'**, similar to Fig. 5, except that the restricting walls are considerably off center. The present embodiment is shown in Fig. 9 assembled with a truck A and with a six spring group, parts of three of the springs B being shown. For illustrative purposes the truck is shown of the type not employing a spring plate, and therefore sockets *a* which engage the heads **15'** are formed directly in the truck A. The device is further connected to the plate by a rivet **19** which, with rivet **14'**, accurately positions the four restricting walls of the device and prevents the device from being displaced while in service.

It will be understood that the device of the present embodiment instead of being made from sheet metal may be a block similar to that of the first embodiment. Figs. 10 and 11 show such a device and show further modifications which may be employed in connection with any of the devices if desired. Here a portion of a spring plate **1'''** is shown, and a device having a body or block **5'** with four concave faces **7'**. The block is welded to the plate by welds **20** disposed between adjacent faces **7'** which take the place of the fastening rivets of the former modifications. An integral lug **21** is formed on the face of the block **5'** adjacent the plate **1'''**, passes through a hole **4'''** formed in the plate and extends outwardly below the outer face of the plate functioning similarly to the head of the first embodiment. Another lug **10'** is integrally formed on the face of the block **5'** adjacent the plate **1'''** and extends into a hole **11'** formed in the plate to facilitate positioning the device similarly to the lug **10** of the first embodiment.

The invention claimed as new and desired to be secured by Letters Patent is:

1. A spring plate structure for a group of helical springs for the bolster window of a railway vehicle truck comprising a plate having a plurality of portions each for engaging a spring of said group at an end thereof, a peripheral flange portion adjacent each of said plate portions each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward, and two holes spaced to register each with a socket in a part of said truck adjacent the outer face of said plate when said plate is assembled with said truck; and two devices secured upon the inner face of said plate, one at each of said holes, each having a body portion over the hole adjacent thereto and a projection extending through said adjacent hole and having an end portion extending beyond said outer face of said plate, each of said end portions being adapted to enter said socket adjacent thereto, when said plate is assembled with said truck, for securing said plate against lateral movement relative to said truck, each of said devices having a plurality of substantially vertical faces each being adjacent one of said plate portions and each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward.

2. A spring plate structure for a group of helical springs for the bolster window of a railway vehicle truck comprising a plate having a plurality of portions each for engaging a spring of said group at an end thereof, a peripheral flange portion adjacent each of said plate portions each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward, and two holes spaced to register each with a socket in a part of said truck adjacent the outer face of said plate when said plate is assembled with said truck; and two devices secured upon the inner face of said plate, one at each of said holes, each having a body portion provided with an orifice registering with said hole of said plate adjacent thereto, and a rivet extending through said orifice and said adjacent hole securing said device to said plate and having a head projecting from said outer face of said plate, each of said heads being adapted to enter said socket adjacent thereto, when said plate is assembled with said truck, for securing said plate against lateral movement relative to said truck, each of said devices having a plurality of substantially vertical faces, each being adjacent one of said plate portions and each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward.

3. A spring plate structure for a group of helical springs for the bolster window of a railway vehicle truck comprising a plate having a plurality of portions each for engaging a spring of said group at an end thereof, a peripheral flange portion adjacent each of said plate portions each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward, and two holes spaced to register each with a socket in a part of said truck adjacent the outer face of said plate when said plate is assembled with said truck; and two devices secured upon the inner face of said plate, one at each of said holes, each having a body portion provided with an orifice registering with said hole of said plate adjacent thereto, and a rivet extending through said orifice and said adjacent hole securing said device to said plate and having a head projecting from said outer face of said plate, each of said heads being adapted to enter said socket adjacent thereto, when said plate is assembled with said truck, for securing said plate against lateral movement relative to said truck, each of said devices having a plurality of substantially vertical faces, each being adjacent one of said plate portions and each being disposed, when said springs are assembled, to be adjacent the exterior of the spring adjacent thereto to prevent displacement of its said adjacent spring in a direction theretoward, said plate and said device being provided with co-acting parts spaced from said rivet, one of said parts being on said plate and the other on said body portion for positioning said body portion.

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