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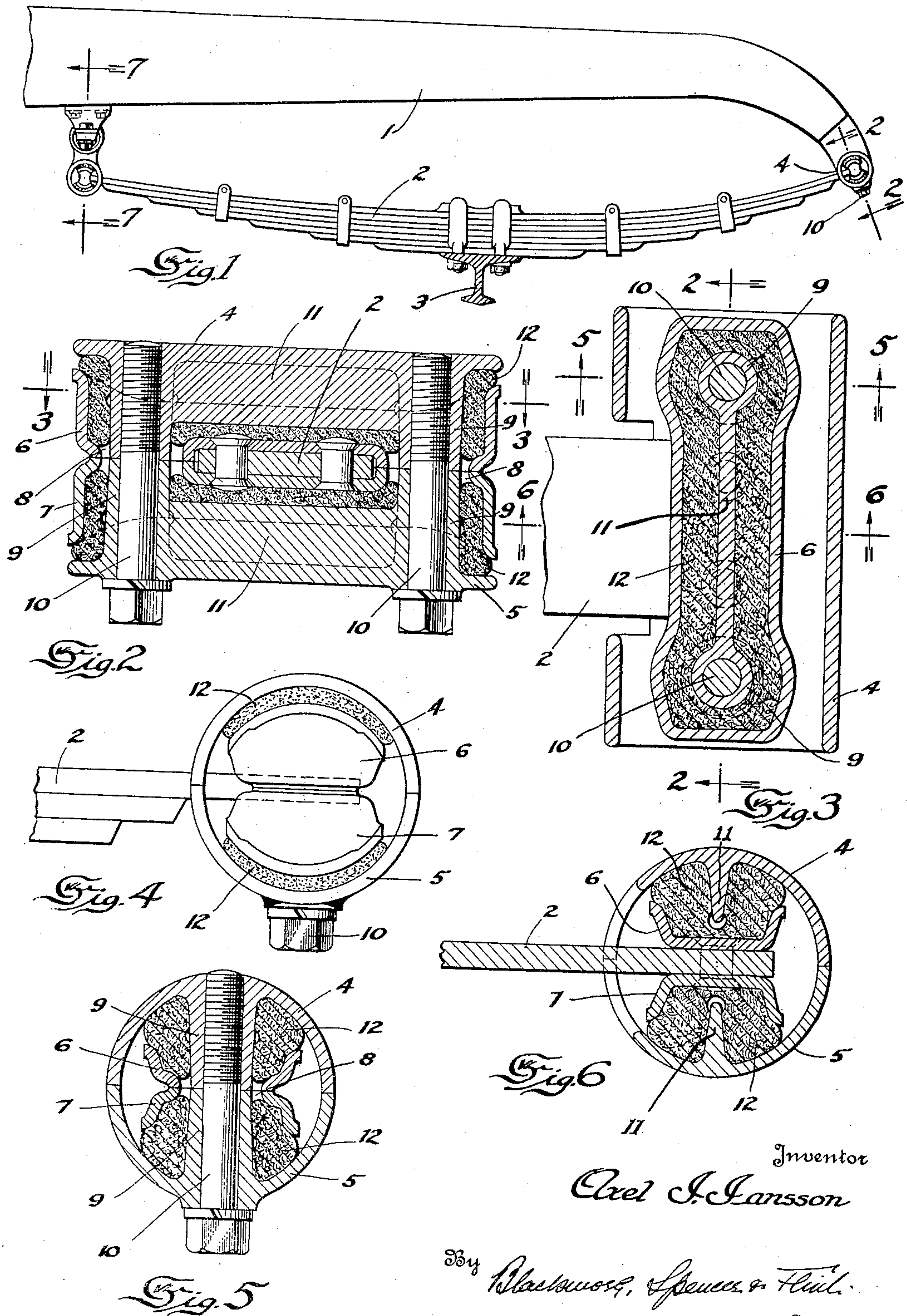
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1,897,806

PIVOT JOINT

Filed July 2, 1927

5 Sheets-Sheet 1



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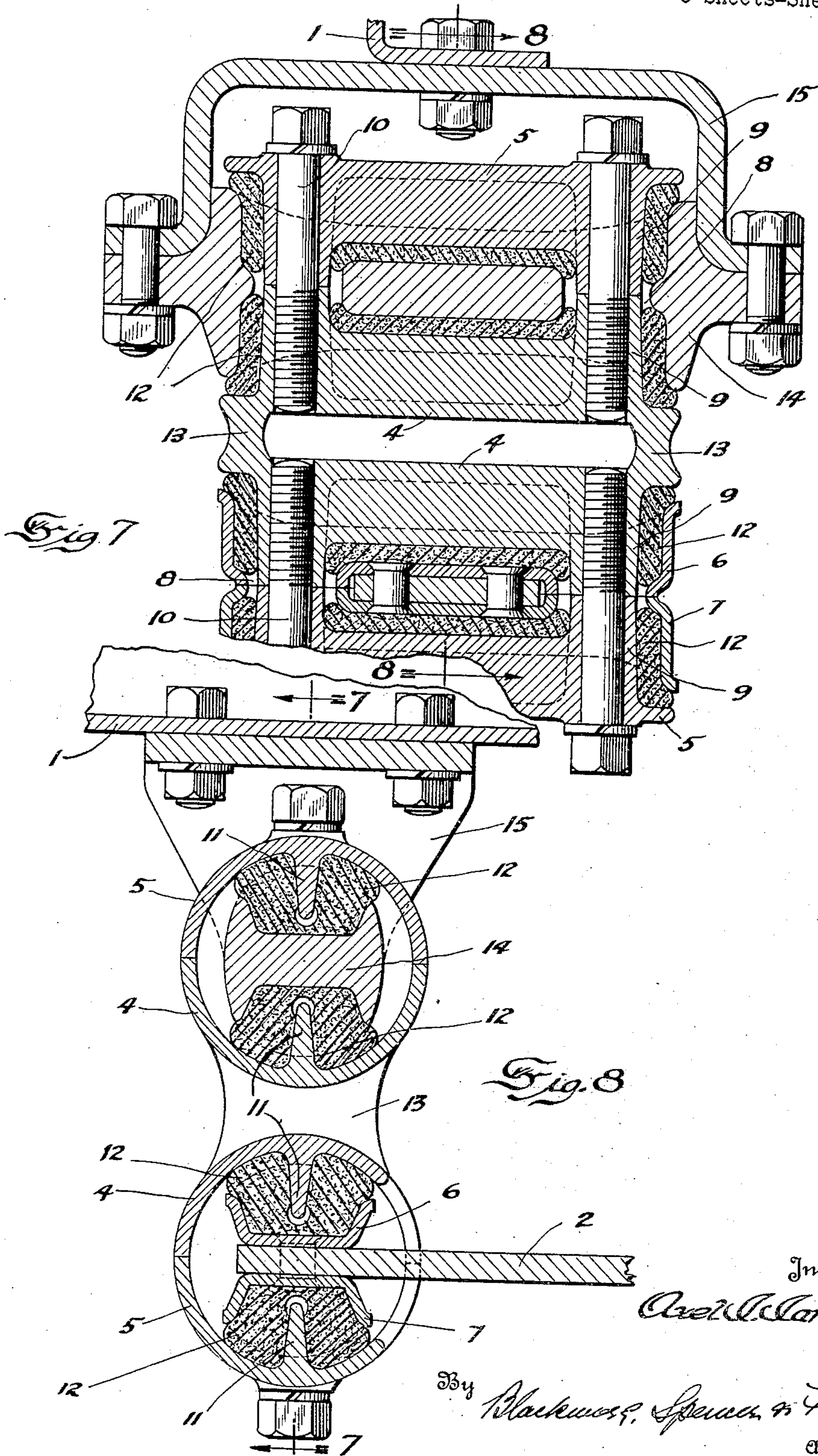
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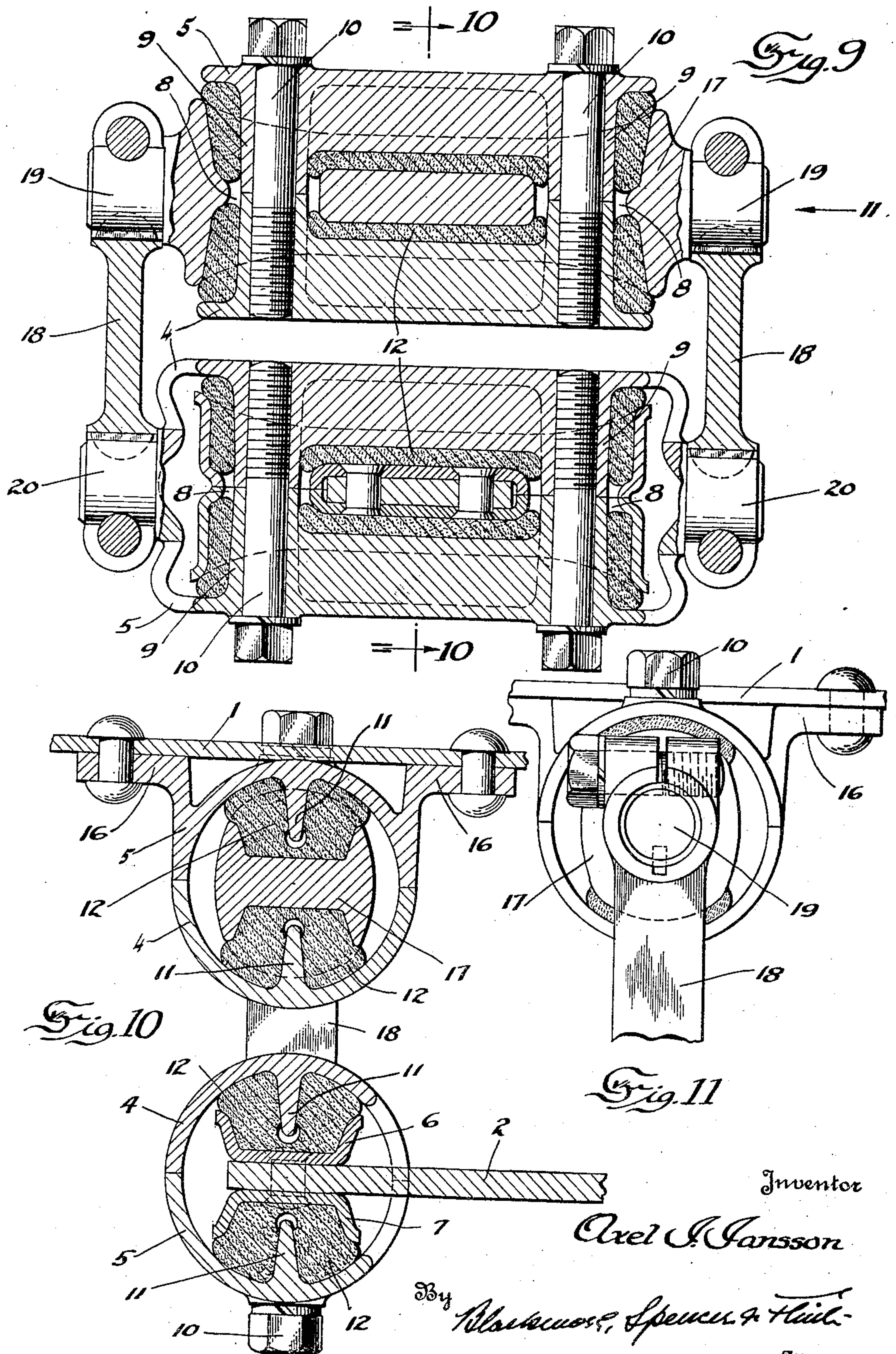
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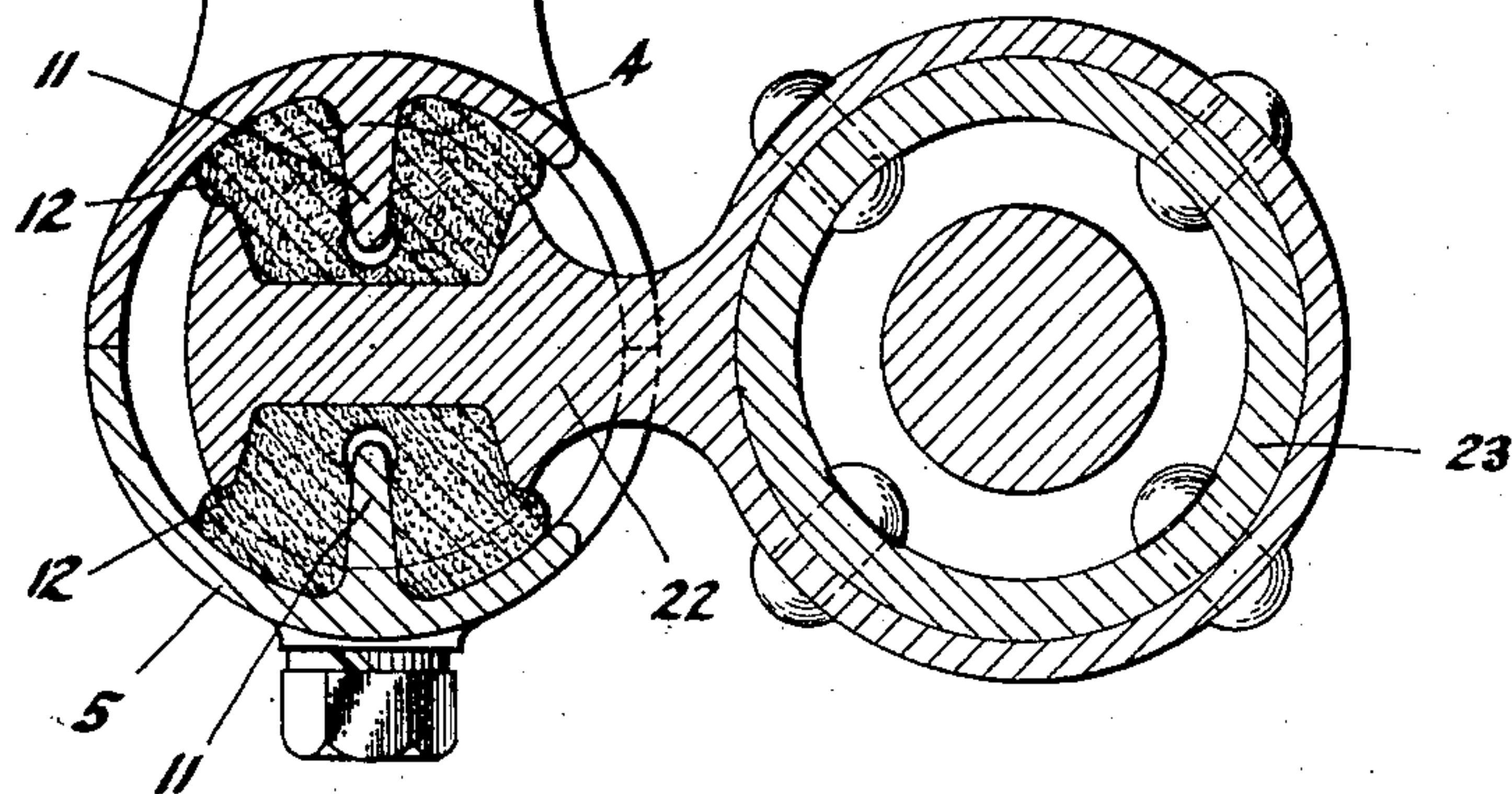
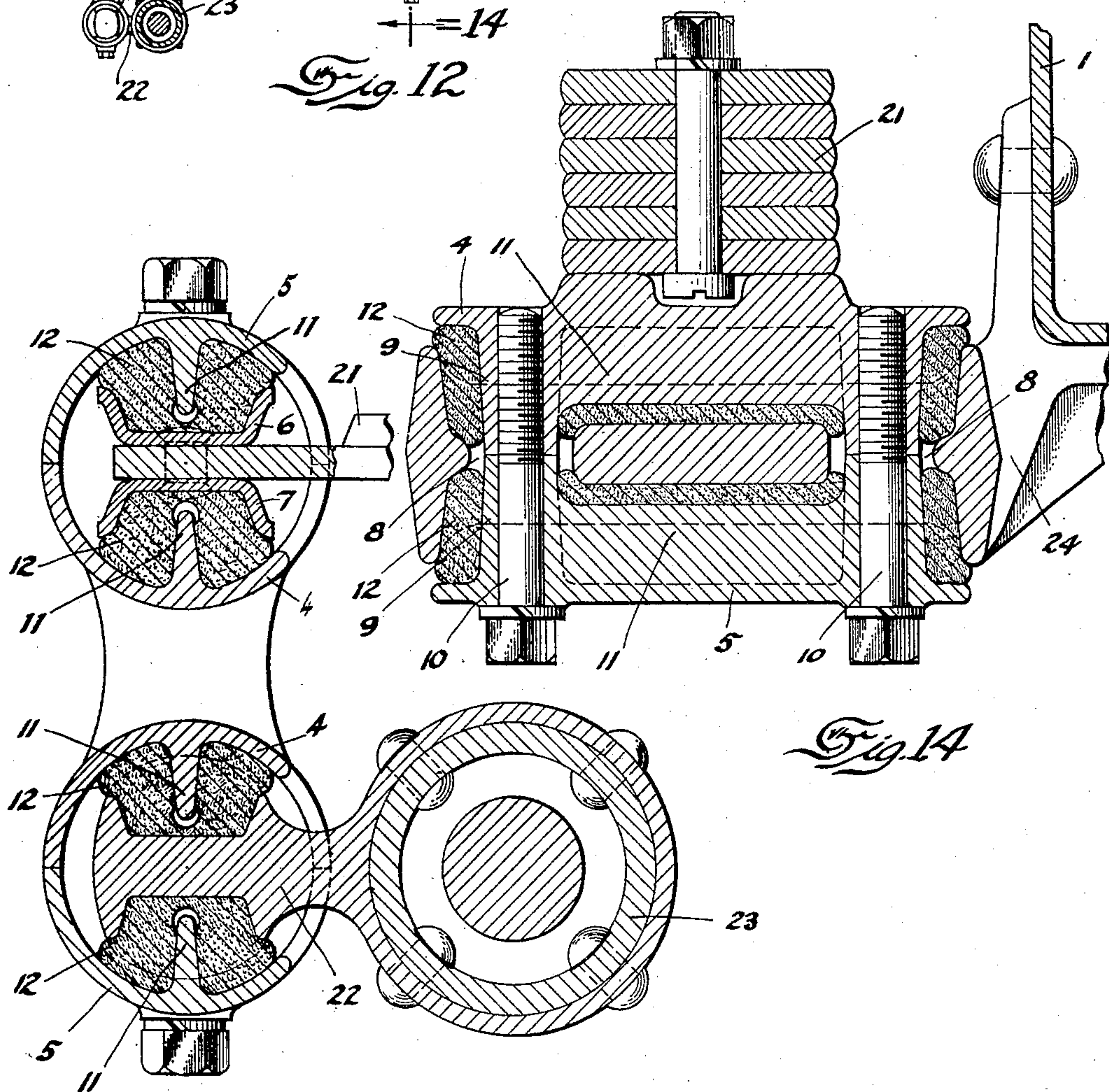
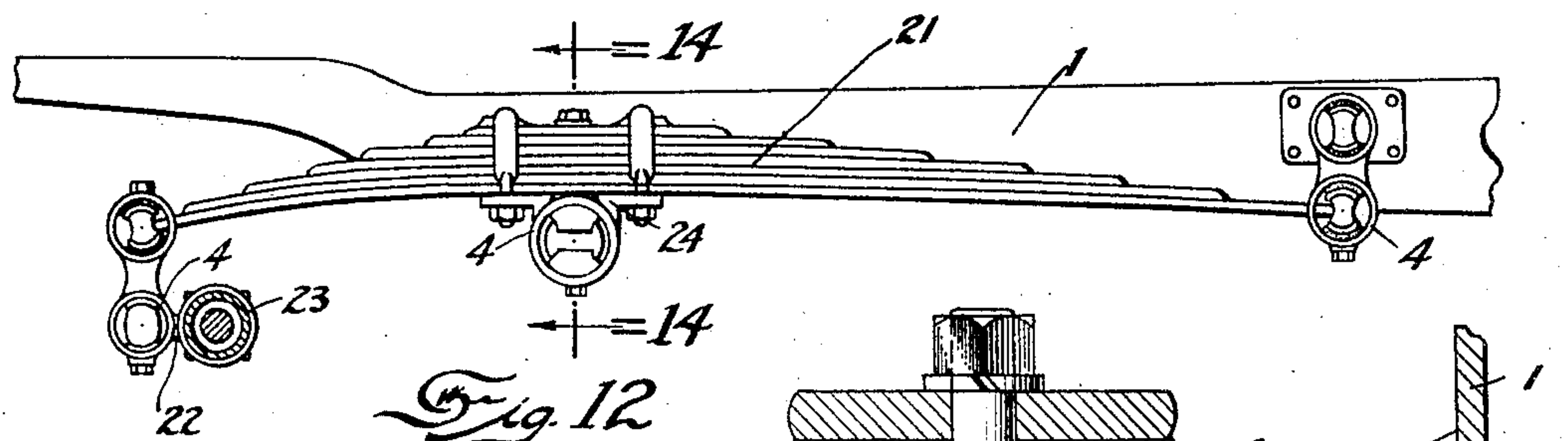
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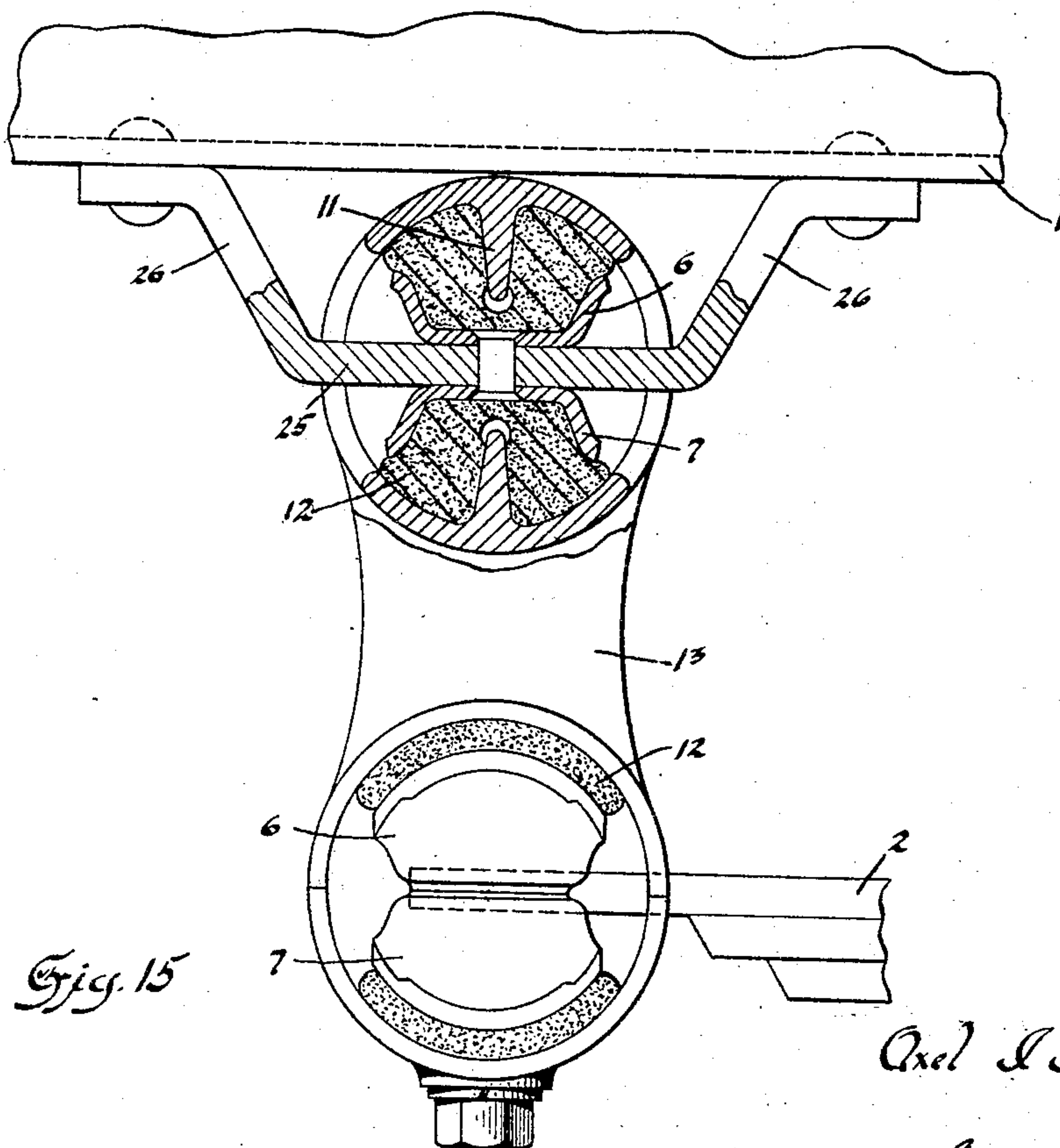
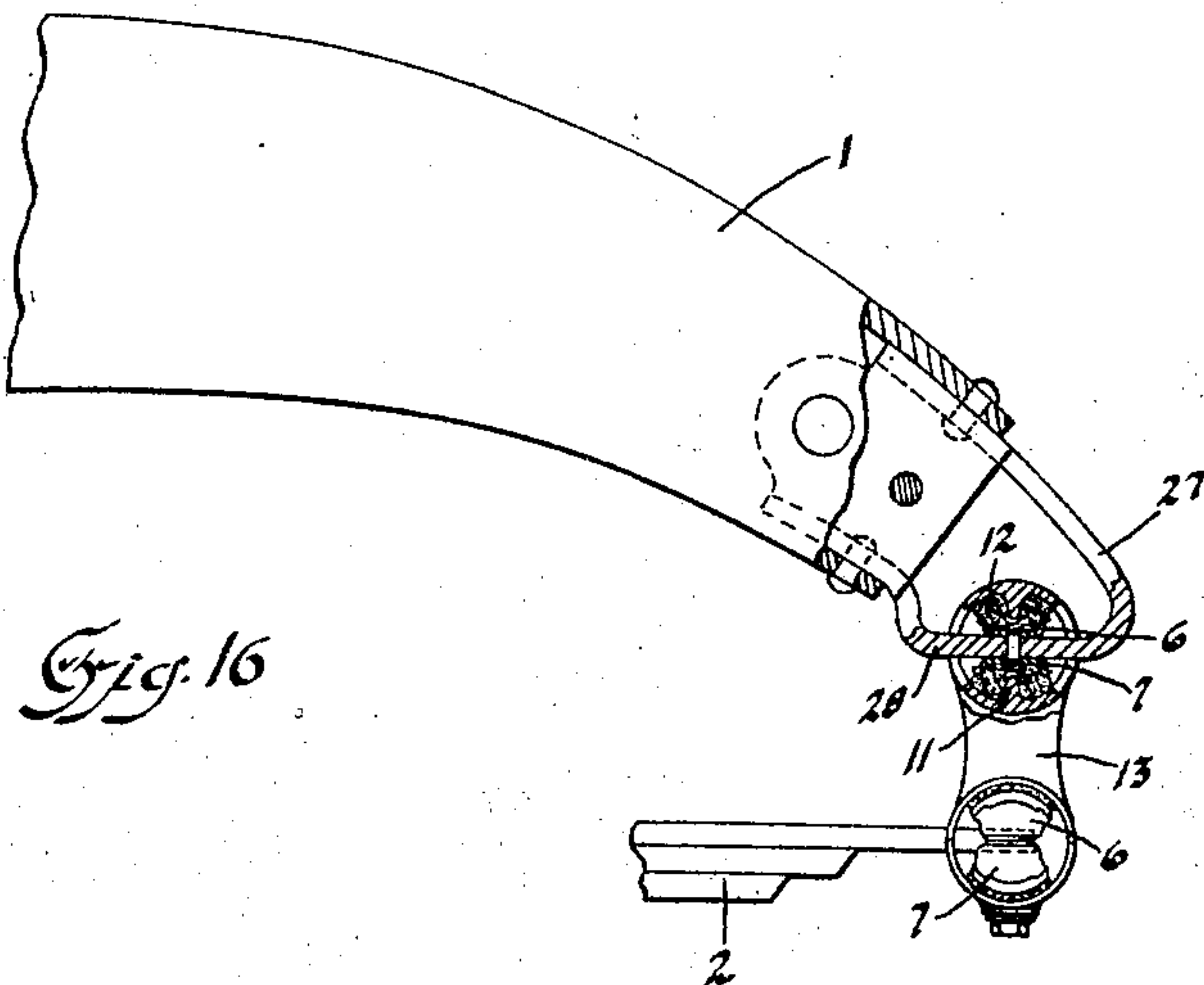
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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

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PIVOT JOINT

Application filed July 2, 1927. Serial No. 203,193.

This invention relates to pivot joints wherein non-metallic elastic material is employed between the parts to be joined, for deformation to accommodate relative movement. The invention has particular utility as a mounting for the ends of vehicle load supporting springs and will be described in such connection.

One of the primary objects of the invention is to afford a simple and inexpensive mounting of improved construction, with the provision of an elastic medium between the members to allow free movement of the parts and avoid frictional metallic contact, thereby obviating necessity for lubrication or other attention in use, and reducing wear and breakage of the parts.

Other objects and advantages will be apparent from the following specification, taken in connection with the accompanying drawings, illustrating the application of the principle involved in several forms of mountings and wherein:

Figure 1 is a side elevation of a vehicle frame mounted on a semielliptical spring following approved practice of pivoting one end of the spring directly on the frame and the other end to a swinging link, which in turn is pivoted to the frame.

Figure 2 is a section on line 2—2 of Figure 1 and on line of 2—2 of Figure 3.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a side elevation of the joint.

Figure 5 is a section on line 5—5 of Figure 3.

Figure 6 is a section on line 6—6 of Figure 3.

Figure 7 is a section on line 7—7 of Figure 1, and also on line 7—7 of Figure 8.

Figure 8 is a section on line 8—8 of Figure 7.

Figure 9 is a vertical section of the modified form of the swinging shackle link shown in Figure 7.

Figure 10 is a section on line 10—10 of Figure 9.

Figure 11 is an end elevation of portion of the device shown in Figure 9.

Figure 12 is a side elevation of a cantilever spring mounted in accordance with the present invention.

Figure 13 is a vertical sectional view through the swinging link connecting the vehicle axle with the end of the cantilever spring.

Figure 14 is a section on line 14—14 of Figure 12.

Figures 15 and 16 are side elevations partly in section showing modified forms of connecting the swinging shackle to the chassis form.

Like parts are indicated by similar reference characters throughout the several views.

Referring to the drawings, the reference character 1 indicates a longitudinally extending member of the chassis frame and 2 is a semi-elliptical multi-leaf spring, connected at either end with the frame and at an intermediate point with the axle 3. The end of the frame terminates a down turned horn to which one end of the spring is pivotally mounted. The mounting in this instance, consists of a housing member on the end of the horn, enclosing the end of the spring; the housing or outer member of the joint, comprising a portion 4 permanently carried on the end of the horn and the detachable portion 5. Within the housing or outer member of the mounting are a pair of cup members 6 and 7, stamped from sheet metal or otherwise formed, and secured by rivets or the like, back to back on the top and bottom of the main leaf of the spring. These cups constitute the inner member of the joint, which is substantially of H shape in cross section, affording axially extending top and bottom channels. The inner member projects beyond either side of the vehicle spring, where the medial wall at the bottom of the channels is cut away leaving apertures or openings 8. Each portion 4 and 5 of the outer member has a pair of spaced inwardly extending attachment lugs or bosses 9, the lugs of one portion being aligned with those of the other and secured together by screw studs 10 extending through the lugs in portion 5 into threaded engagement within the lugs of portion 4. These lugs extend through the apertures 8,

the diameter of the openings being slightly greater than that of the lugs to provide ample clearance for relative movement of the members. A web or rib 11 extends between the two lugs of each portion 4 and 5 and into the channels of the inner member. Elastic blocks 12 of rubber or similar substance, are located within the channels and on opposite sides of the webs 11 and also around the lugs 9, and serve to insulate the inner and outer members from each other. In order to provide for the proper degree of elasticity of the rubber, as well as to enable employment of unskilled labor in the assembly and replacement of parts in devices made in accordance herewith, the inwardly extending bosses 9 are utilized, which by their abutment or contact with each other, limit to a predetermined positive extent the initial pressure placed on the rubber blocks and thereby definitely control responsiveness to deformation. Side sway or axial movement of the members is cushioned and resisted by the elastic materials surrounding the bosses 9, and particularly that located between the studs and the end walls of the cup shaped members. The walls or webs 11 projecting into the blocks 12 within the channels of the cup members 6 and 7, divide the elastic material into equal portions on opposite sides of the walls. As a result, relative fore and aft movements are permitted and cushioned to the same extent in both directions. That is, successive extension and contraction of the vehicle spring, similarly deform an equivalent mass of elastic material insuring smooth and uniform spring action and a ready return of the parts to normal position. Obviously, the elastic material will readily yield or be deformed between the webs and walls of the channels, to permit relative movement of the inner and outer members, and since there are no moving surfaces in contact there will be no necessity for lubrication.

To accommodate extension of the vehicle spring upon deflection, the end opposite to that before referred to, is fastened to the frame by a swinging shackle link. The pivot joints for the link are constructed in accordance with that heretofore described and as is shown in detail, Figures 7 and 8. In this instance, the portion 4 of the lower joint is united by webs 13 with the portion 4 of the upper joint and the portion 5—5 are detachably secured to the respective portions 4—4. The upper housing pivots about the member 14 which is bolted to the bracket 15 carried by the frame member 1, the member 14 being provided with channels or grooves on opposite faces for the location of elastic blocks 12. The construction and arrangement of the parts is otherwise as before described.

Figures 9, 10 and 11 illustrate an alterna-

tive form of swinging shackle, in which the outer member of the upper joint is provided with feet 16 riveted or otherwise secured to the chassis frame member, and outer member of the lower joint is hung on the inner member 17 of the upper joint by arms 18. Each arm 18 has a split eye at either end contractable by a draw bolt about extensions 19—19 of the inner member 17 and extensions 20 of the outer member of the lower joint respectively.

The cantilever spring 21 in Figure 12 is hinged or pivoted at an intermediate point to the frame member 1 and swinging shackle links connect opposite ends of the spring with the frame and axle. Figure 13 is an enlarged section of the axle shackle and shows a bracket 22 having an arm channeled in the upper and lower faces, forming the inner member of the lower joint and an integral band encircling and riveted to the axle housing 23. In the hinge or pivot connection for the intermediate portion of the spring, the spring is shown as secured to the portion 4 or the outer member, while the inner member consists of a bracket 24 extending laterally from the frame member with top and bottom channels for reception of rubber blocks 12.

Figure 15, relating to a more simplified form of connection than that illustrated in Figure 8, shows the cup shaped members 6 and 7 of the inner member of the upper joint, as being carried by bracket 25 of strap iron or the like, whose upwardly extending arms 26 are riveted or otherwise fastened to the frame member 1.

In Figure 16 there is shown a somewhat similar arrangement, wherein the looped bracket 27, fastened within the channel of the frame member, is provided with a portion 28 on which the cups 6 and 7 are secured for the reception of the rubber blocks.

Thus it will be seen that the arrangement and operation of the several joints referred to is the same in each instance, and any tendency for the inner and outer members of the respective joints to rotate relative to each other will be freely accommodated by the ready response on the elastic blocks 12 to deformation between adjacent surfaces of the members.

While the invention has been described more or less specifically it is to be understood that it is not limited to exact details, but that such obvious modifications may be made as come within the scope of the appended claims.

Having described my invention, I claim:

1. A pivot joint including two members of approximately the same length disposed one within the other and capable of relative rotational movement and elastic material interposed between said members for deformation upon relative movement of the members,

the inner member being provided with longitudinally extending closed end channels on opposite sides thereof in which said elastic material is located, the outer member comprising separable portions each having an axially extending web portion which projects into the elastic material located within one of the channels.

2. A pivot joint including two members disposed one about the other for relative rotational movement and elastic material interposed between said members for deformation upon relative movement of the members, the inner member being provided with channels on opposite sides thereof in which said elastic material is located, the outer member comprising separable portions having inwardly projecting attachment lugs which extend through apertures in the wall intermediate the channels, said apertures being of greater size than said lugs, and axially extending webs connecting the lugs of each portion and projecting into the elastic material within said channels.

3. A swinging shackle link for connecting the end of a vehicle spring to a vehicle part, including in combination a pair of pivotal joints, each joint consisting of two relatively movable members, one of the members having cavities in opposite sides thereof, the other member having axially extending webs projecting into said cavities and elastic material located within said cavities on opposite sides of the webs for deformation upon relative movement of said members, one member of one joint being adapted for connection with a vehicle spring and one member of the other joint being adapted for connection with a vehicle part, and the remaining members of the two joints being connected with each other.

4. A pivot joint including an inner member having an axially extending channel which is closed at its two ends, an outer member of approximately the same length as said inner member surrounding said inner member and having an axially extending web portion projecting within said channel, and elastic non-metallic material located within said channel on opposite sides of said web for deformation to accommodate relative movement of said members.

5. A pivot joint including a pair of members disposed one within another for relative rotational movement, a pair of cups disposed back to back on the inner member, a pair of inwardly extending webs on the outer member projecting into the cups, and a pair of similar blocks of elastic material located within said cups and having depressions into which said webs extend.

6. In a pivot joint of the class described, an inner member having a pair of outwardly opening oblong cups arranged back to back and having side and end walls, a two-part

outer member enclosing said cups and having a pair of inwardly-extending webs projecting into said cups, and a pair of blocks of elastic material located within said cups and extending to and engaging the interior of said outer member, and which blocks have depressions into which said webs extend.

7. The structure set forth in claim 6 and wherein the cups and blocks are alike in form so that the blocks are interchangeable, and wherein the inner and outer members are of substantially the same length.

In testimony whereof I affix my signature.

AXEL J. JANSSON.

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