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BREAKAWAY JOINT FOR SPRAY BARS

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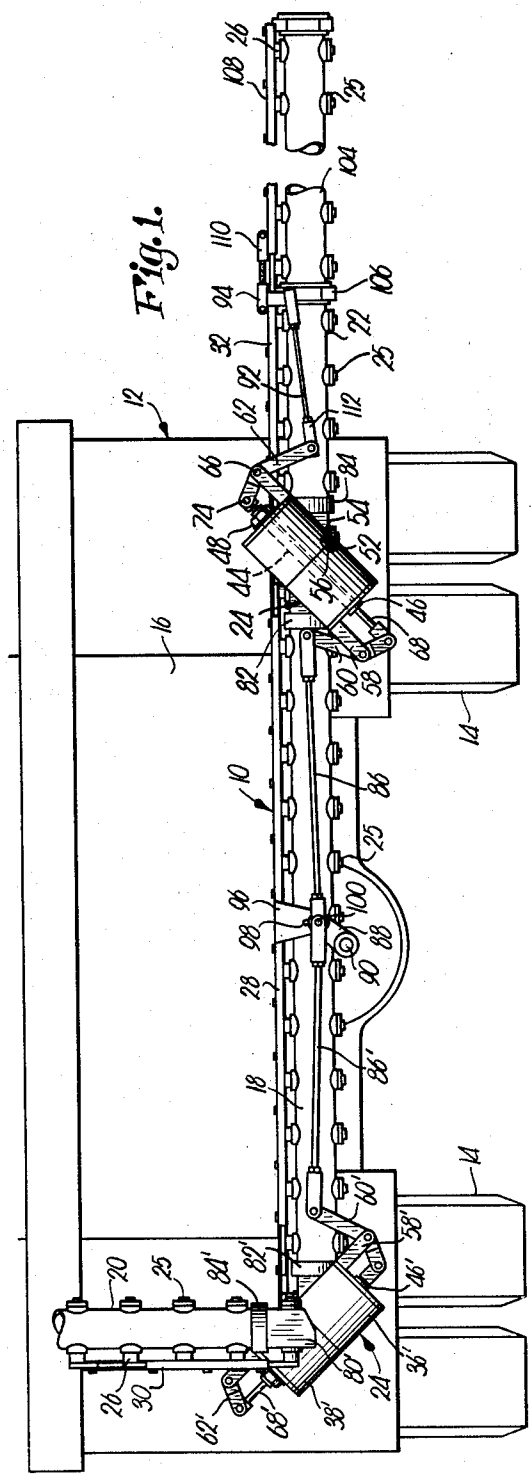


Fig. 1.

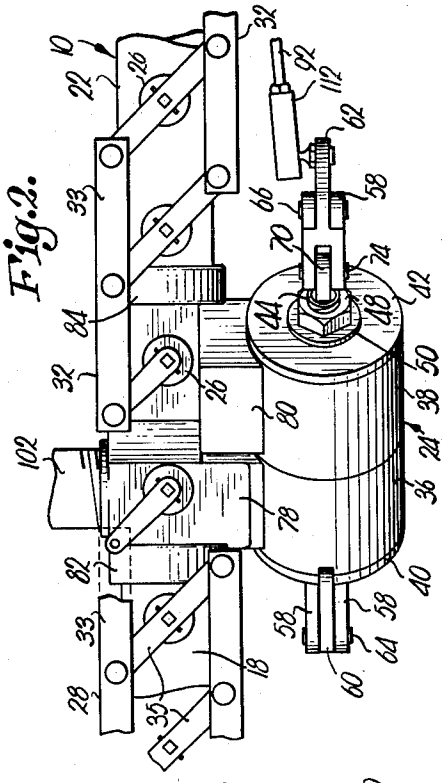


Fig. 2.

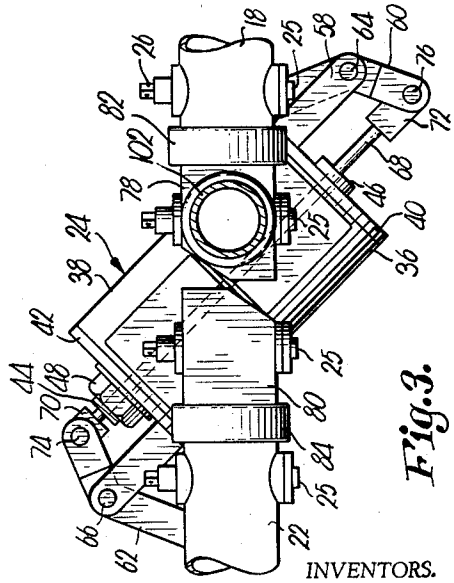


Fig. 3.

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BREAKAWAY JOINT FOR SPRAY BARS

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This invention relates to fluid delivery apparatus, and more particularly, to a spray bar unit for use in road construction and maintenance operations and having relatively shiftable sections interconnected by our improved joint structure.

Spray bar units utilized for the above-mentioned purposes are generally provided with a central, rigidly supported section and a pair of secondary sections swingably carried at the outer ends of the main central section. The manifold sections are each provided with valves along the length thereof which are generally controlled by a single linkage system.

A primary object of the present invention is to provide a spray bar joint that will effectively break away when the outer sections strike obstructions, all without damage in any way to the component parts of the unit.

A most important object of the instant invention is the provision of a breakaway joint that permits valve control therethrough by use of a novel connection with the linkages disposed on the axis of relative rotation of the joint parts.

Another important object of the present invention is to provide a joint that permits the free swinging movement of the outer sections without interrupting flow of fluids therethrough.

In the drawing:

FIGURE 1 is a fragmentary, rear elevational view of a spray bar coupled to the rear of a vehicle and illustrating the breakaway joint of the present invention;

FIG. 2 is an enlarged, fragmentary, top plan view of the spray bar showing one of the joints; and

FIG. 3 is a vertical cross sectional view showing the front face of said one joint in elevation.

The spray bar unit, with which the joints of the present invention are to be utilized, is broadly denoted by the numeral 10 and is adapted to be carried by and at the rear of a tank truck 12 having ground-engaging wheels 14 and a tank 16 for containing a supply of fluid, such as asphalt or the like, for use in road construction and maintenance operations.

Unit 10 includes a rigidly mounted central, tubular section 18, and a pair of tubular end sections 20 and 22. The joint is broadly denoted by the numeral 24 one of which is shown in FIG. 1 interconnecting section 20 with section 18 and the other interconnecting section 22 with section 18. By virtue of the joints 24, each of the sections 20 and 22 is capable of free swinging from a position in end alignment with section 18 to a vertical position normal to the longitudinal axis of section 18. In FIG. 1, section 20 is shown in an inoperative, vertical position, whereas section 22 is illustrated in an operative, horizontal position aligned with section 18.

Each of the manifold sections 18, 20 and 22 is provided with a plurality of fluid outlets 25 provided with control valves 26 having linkages 28, 30 and 32 coupled therewith for actuating the same. Each of the linkages 28, 30 and 32 includes a pair of bars 33 and an arm 35, rigid to each valve 26 and pivotally coupled with the bars 33.

The joint 24 between sections 18 and 22 includes an elongated, hollow body having a pair of cylindrical drums 36 and 38 disposed in end-to-end abutment and provided with end closures 40 and 42 respectively. A tube 44, extending through the drums 36 and 38, is provided with a flanged head 46 which abuts the outer surface of end 40. A nut 48 is threaded on the opposite end of tube 44, and a washer 50 on tube 44 is interposed between nut 48 and end 42.

As shown in FIG. 1, the innermost annular edges of drums 36 and 38 are provided with continuous grooves 52 and 54 which receive a sealing member 56 in the nature of an O-ring or the like.

Each of a pair of spaced fingers 58, extending outwardly from each end 40 and 42 respectively, receives a swingable crank therebetween. Crank 60 is pivotally coupled with its fingers 58 by a pintle 64 and crank 62 is coupled with its fingers 58 by a pintle 66. A bolt 68, extending through and shiftable in tubular axle 44 for joint 24, is pivotally coupled with the proximal, bifurcated ends of cranks 60 and 62 by pins 74 and 76. Suitable packing seals and glands (not shown) may be provided for tube 44 and bolt 68 if needed or desired. Tapped block 70 on bolt 68 receives pivot pin 74, and boss 72 rigid to rod 68 receives pivot pin 76; hence, the block 70 is free to rotate relative to bolt 68.

The outer end of crank 60 is pivotally coupled to a rod 86 which in turn is pivotally coupled to an ear 88 rigid to a rotatable shaft 90 controlled from some remote point (not shown) on truck 12. The outer end of crank 62 is pivotally connected with a coupling 94 mounted rigidly on linkage 32.

A plate 96, having a slot 98 receiving a pivot connection 100 with ear 88, is rigid to linkage 28 so that swinging of ear 88 shifts the linkage 28.

A hollow extension 78 extends laterally from the cylindrical side wall of the drum 36 and a hollow extension 80 extends laterally from the cylindrical side wall of the drum 38.

Extension 78 is provided with a collar 82 which threadably receives section 18 and extension 80 is provided with a collar 84 threadably receiving section 22. A fluid supply pipe 102 for the unit 10 interconnects tank 16 and extension 78.

The same numerals, suitably primed, are used to designate the joint between sections 18 and 20 in FIG. 1.

In the event that an obstruction is encountered by sections 20 or 22 they will freely swing rearwardly and upwardly without damage.

The inclined axis of swinging movement of sections 20 is the central axis of drums 36 and 38 which is coincident with tube 44 and bolt 68. Since blocks 70 and 70' are free to rotate on their bolts 68 and 68', the positions of the linkages 28, 30 and 32 are uneffected by the swinging movements of sections 20 and 22 relative to section 18.

FIG. 1 illustrates how another segment 104 may be coupled to the outer end of section 22 by a threaded collar 106. Linkage 108 is carried by segment 104 for controlling the valves 26 thereof. A take-up device 110 interconnects linkage 108 with coupling 94 so that linkage 108 is shifted simultaneously with linkage 32.

When either of sections 20 or 22 strikes an obstruction causing rearward and upward movement they may be easily and quickly returned manually to the normal, horizontal operating positions. The inherent frictional interengagement of drums 36 and 38 has proved to be quite adequate to hold sections 20 and 22 in normal operating positions, regardless of the location of the center of gravity of such sections with respect to their joints 24 and 24'. However, any suitable means, such as a spring or the like, might be employed in the conventional manner, as desired, to yieldably hold the movable sections 20 and 22 in their normal operating positions. In this respect, extensions 78 are configured to operate as stops engaged with extensions 80 to properly hold the movable sections 20 and 22 in their normal operating positions.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In combination with a pair of elongated, tubular sections normally in end-to-end alignment, a joint swingably interconnecting the sections and comprising:

an elongated, hollow body exteriorly of the sections and having a pair of drums, each provided with a side wall and an outermost end closure, each section being connected with the side wall of a corresponding drum in communication with the interior thereof; and

an elongated axle in said drums interconnecting said closures and disposed for free, relative rotation of the drums about an axis that is coincident with the longitudinal axis of the axle, spaced laterally from the longitudinal axes of the sections, and in angular relationship to said axes of the sections, said axle extending longitudinally of the body for holding the drums in relative communication with the innermost edges thereof in end-to-end, relatively rotatable abutment.

2. The invention of claim 1, and a fluid supply pipe connected to and communicating with one of said drums.

3. The invention of claim 1, the side wall of each drum having a hollow, lateral extension communicating with the interior of the body, each section being coupled with a corresponding extension in communication therewith and extending laterally therefrom.

4. The invention of claim 3, and a fluid supply pipe connected to and communicating with one of said extensions.

5. In combination with a pair of elongated, tubular sections normally in end-to-end alignment, a joint swingably interconnecting the sections and comprising:

an elongated, hollow body exteriorly of the sections and having a pair of drums, each provided with a side wall and an outermost end closure, each section being connected with the side wall of a corresponding drum in communication with the interior thereof, and each section having a fluid outlet provided with a control valve;

an elongated, tubular axle in said drums interconnecting said closures and disposed for free, relative rotation of the drums about an axis that is coincident with the longitudinal axis of the axle, spaced laterally from the longitudinal axes of the sections, and in angular realtionship to said axes of the sections, said axle extending longitudinally of the body for holding the drums in relative communication with the innermost edges thereof in end-to-end, relatively rotatable abutment; and

valve actuating structure coupled with said valves and including a member shiftable in the axle.

6. In combination with a pair of elongated, tubular sections normally in end-to-end alignment, a joint swingably interconnecting the sections and comprising:

an elongated, hollow body exteriorly of the sections and having a pair of drums, each provided with a side wall and an outermost end closure, each section being connected with the side wall of a corresponding drum in communication with the interior thereof, and each section having a fluid outlet provided with a control valve;

an elongated, tubular axle in said drums, extending through and interconnecting said closures and disposed for free, relative rotation of the drums about an axis that is coincident with the longitudinal axis of the axle, spaced laterally from the longitudinal axes of the sections, and in angular relationship to said axes of the sections, said axle extending longitudinally of the body for holding the drums in relative communication with the innermost edges thereof in end-to-end, relatively rotatable abutment; and

valve actuating structure coupled with said valves and including a member extending through and reciprocable longitudinally of the axle.

7. In combination with a pair of elongated, tubular sections normally in end-to-end alignment, a joint swingably interconnecting the sections and comprising:

an elongated, hollow body exteriorly of the sections and having a pair of drums, each provided with a side wall and an outermost end closure, each section being connected with the side wall of a corresponding drum in communication with the interior thereof, and each section having a fluid outlet provided with a control valve;

an elongated, tubular axle in said drums, extending through and interconnecting said closures and disposed for free, relative rotation of the drums about an axis that is coincident with the longitudinal axis of the axle, spaced laterally from the longitudinal axes of the sections, and in angular relationship to said axes of the sections, said axle extending longitudinally of the body for holding the drums in relative communication with the innermost edges thereof in end-to-end, relatively rotatable abutment; and

valve actuating structure coupled with said valves and including a member extending through and reciprocable longitudinally of the axle, an element movably mounted on each closure respectively, and means for each element respectively pivotally connecting the same with said member.

8. The invention of claim 7, one of said elements being rotatable relative to said member.

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