Dec. 21, 1965 K. J. AUSTGEN 3,224,598

TRAINLINE ARRANGEMENT

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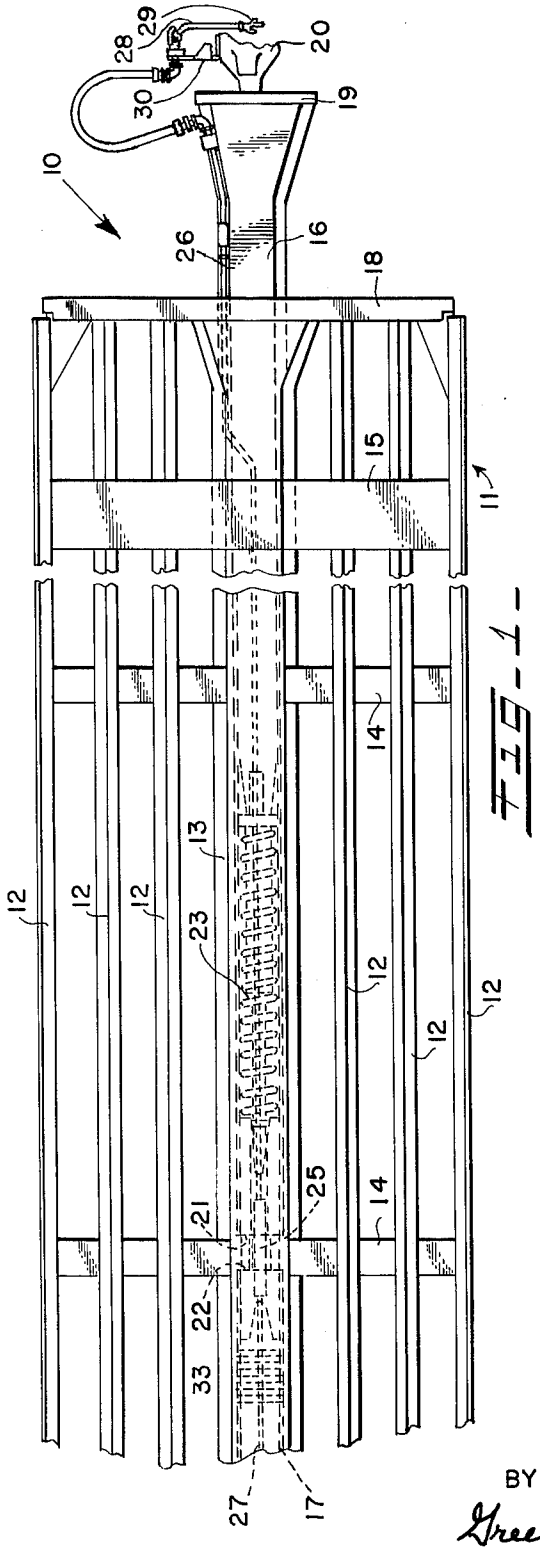


FIG. 1

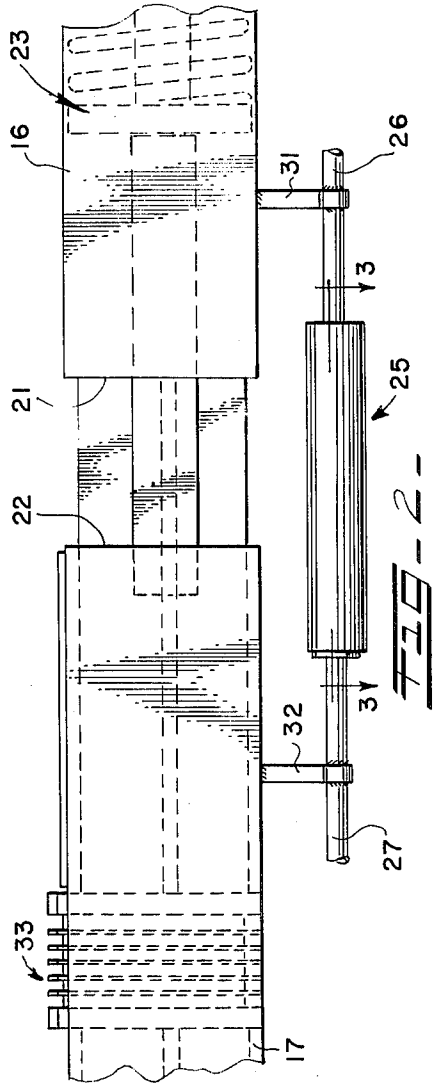


FIG. 2

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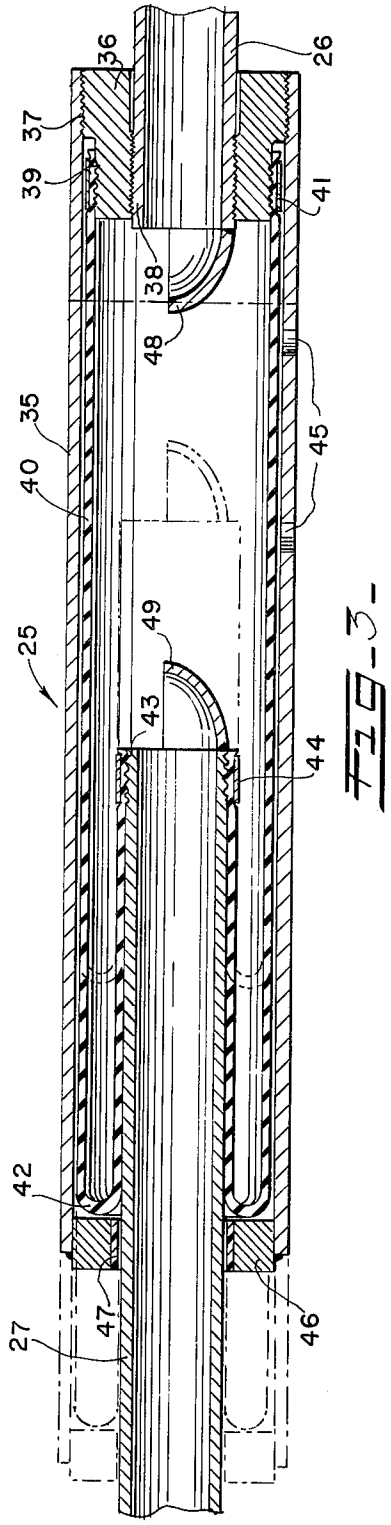


FIG. 3

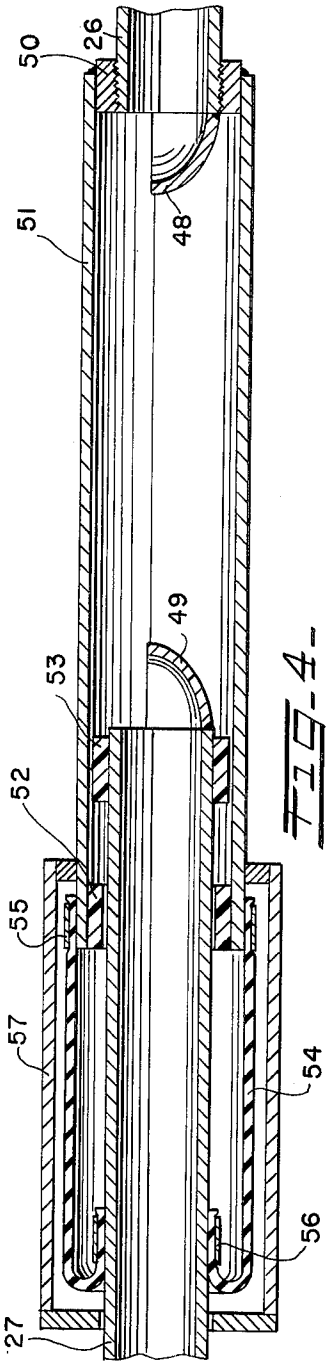


FIG. 4

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United States Patent Office 3,224,598 Patented Dec. 21, 1965

3,224,598

TRAINLINE ARRANGEMENT

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Filed Sept. 21, 1964, Ser. No. 401,284
7 Claims. (Cl. 213—1)

This invention relates to trainline arrangements in general and more particularly is directed to a new and improved telescoping trainline arrangement particularly adapted for use in railway cars having dual sliding sills each of which is independently movable relative to the other and relative to the remainder of the car. More specifically, the present invention involves a new and improved telescoping means to permit the collapsing and extension of a trainline to accommodate cushioned movement of the sliding sill sections while maintaining fluiitight continuity in the trainline.

Cushion underframe railway cars in general are provided with a sliding sill structure extending the length of the car and movable relative thereto to transmit energy from impacts to an energy dissipating means. In some railway cars the sliding sill structure is divided into two sill sections which are spaced at their inner ends an amount equal to the total movement necessary to accommodate and dissipate the impact forces applied at the couplers mounted at opposite ends. In cars of this general type, suitable means must be provided in the trainlines to accommodate movement of each of the sill sections relative to each other and relative to the car body since the trainline extends from one coupler to the other. In railway cars of this general type, the trainline is usually mounted adjacent the coupler for connection to the adjacent car and is provided with looped hoses of resilient material to accommodate relative movement between the couplers and the trainline which is carried on the car. The problem of accommodating such movement increases in complexity when travel of each of the sill sections relative to each other and relative to the car underframe exceeds more than a few inches for example, or falls in the range of about 20 to about 40 inches. Obviously, the more conventional methods of providing a loop of flexible hose have proved to be inadequate to accommodate movement of this magnitude in addition to presenting other problems because of the rather restricted geometry of the over-all exterior outline of the car permitted by A.A.R. standards.

The present invention is directed towards a new concept in trainline arrangements, being directed to a simplified telescoping means carried beneath the sliding center sill and which permits movement between conduits carried on the sill sections as they move relative to each other and/or relative to the car underframe. The unique manner of mounting the conduits forming the trainline and the means to accommodate movement of one conduit relative to the other without interrupting the continuity of fluid flow therethrough is achieved through a highly sophisticated form of telescoping means having an elastomeric boot means extending therebetween.

A better comprehension of the more detailed and important aspects of the present invention may be gained by a consideration of the stated objects and a detailed description of a preferred form of the invention both of which follow.

It is an object of this invention to provide a new and improved trainline arrangement particularly adapted for railway cars having sliding sill structures.

It is a further object of this invention to provide a new and improved trainline arrangement for railway cars of the type having a pair of sill sections each of which is

independently movable relative to the other and also movable relative to an underframe portion of the car.

It is a still further object of this invention to provide a new and improved trainline arrangement which is mounted beneath sliding sill sections carried by a cushioned underframe car, including a novel telescoping means to permit movement of the sills relative to the car and relative to each other.

Further and fuller objects will become readily apparent when reference is made to the accompanying drawings wherein:

FIG. 1 is a broken fragmentary plan view of a railway car with the deck portion removed and having sliding sill sections which are operable independently of each other and the underframe of the car;

FIG. 2 is enlarged fragmentary side elevational view of the sill sections with the stationary sill portion removed and showing the improved trainline arrangement in elevation;

FIG. 3 is an enlarged cross sectional view of the trainline arrangement of FIG. 2 taken generally along the lines 3—3 of FIG. 2; and

FIG. 4 is a view similar to FIG. 3 illustrating a modified form of the invention;

Referring now to FIG. 1, a skeletal plan view of a railway car is indicated generally by the reference numeral 10 being of the usual design and including an underframe portion 11 having the usual side sills 12 supported by a stationary center sill 13 through the usual cross members 14 and bolster 15 in the area of the wheel trucks. The stationary center sill 13 supports the underframe, and in addition telescopically and slidably mounts a pair of sill sections 16 and 17, the latter being shown only fragmentarily. The sill section 16 projects beyond the end sill portion 18 of the car 10 terminating in a flared housing 19 which receives a standard coupler 20. The same coupler mounting arrangement is provided at the outer end of the sill section 17, the illustration and description of the same being omitted for sake of brevity. The inner end 21 of the sill section 16 is spaced from the inner end 22 of the sliding sill 17 a distance at least equal to the total cushioned travel or movement between sill sections.

An energy absorbing device such as a hydraulic cushion arrangement shown in dotted lines at 23 is carried within one of the sill sections and is engageable with the sill sections to retard movement of the sill sections relative to the underframe 11 and each other. The details and operation of this arrangement are completely described in the application to a co-employee, William H. Peterson, Serial No. 196,320, filed May 21, 1962, now abandoned, entitled Split Sliding Sill and Cushioning Arrangement, and the application of Norman E. Bateson, Serial No. 387,408, filed August 4, 1964, entitled "Sill Lockout Device" and is incorporated herein.

In the latter application, a lockout arrangement is provided which permits spacing of the sill sections any desired distance since they may be readily interconnected or locked together for over-the-road travel while still being relatively movable relative to the car underframe 11 to provide lading protection when at rest.

The present trainline arangement is primarily concerned with a unique construction which accommodates shifting of the sill sections 16 and 17 relative to the underframe 11 as well as accommodating relative movement between the sill sections 16 and 17. The trainline arrangement, indicated in dotted lines in FIG. 1, is disposed generally below the inner ends 21 and 22 of the sill sections 16 and 17. The usual conduits 26 and 27 forming a part of the trainline lead to the flared coupler housings (only one shown at 19) at the outer end of the sill sections where they are

provided with a flexible hose to permit lateral movement of the coupler. A hose coupler **29** is carried by a hose **28** supported by a bracket **30** carried on the coupler **20**. This arrangement is shown and described in my Patent No. 3,042,223 of July 3, 1962.

It is to be appreciated that the conduits **26** and **27** and telescoping means **25** forming the training arrangement on the car **10** are carried by the sill sections **16** and **17**. This is more clearly evident in FIG. 2 wherein each of the sill sections **16** and **17** is shown fragmentarily in side elevation as it appears when removed from the stationary center sill **13**. A pair of pipe clamps **31** and **32** or an equivalent support means mounts each of the trainline conduits **26** and **27** on the respect sill sections **16** and **17** with the telescoping means **25** extending therebetween. For convenience of illustration, the conduits **26** and **27** are illustrated as being disposed immediately below the sill sections **16** and **17**. It is obvious, however, that they may be carried immediately adjacent the sill sections **16** and **17**, and in some designs it is even possible to carry the same within the sill sections, particularly those which are of the silhouette type. As illustrated, each of the pipe clamps **31** and **32** joins the associated conduits **26** and **27** to the sill sections **16** and **17** respectively for movement therewith.

A telescoping means forming a part of the trainline is indicated generally at **25** in FIGS. 1 and 2 and is uniquely designed to accommodate movement of the sill sections **16** and **17** in response to impacts which are absorbed by the hydraulic cushioning arrangement **23**. In addition the telescoping means also accommodates run-in and run-out between the sill sections **16** and **17** as is permitted by the draft gear **33** which joins the same.

The telescoping means **25** is best seen in the cross sectional view of FIG. 3 and includes an outer tubular member **35** which is joined by an annular collar **36** to the conduit **26**. As indicated in the drawings, the outer tubular member or elongated sleeve **35** may be joined by means of threads as at **37** to the annular collar **36**, while the collar **36** is joined by threads to the conduit **26** through co-operating external threads as indicated at **38**.

An axially extending shoulder **39** is provided on the collar **36** and may be ribbed or grooved adjacent the end to receive an end portion of a flexible boot **40** which is surrounded and clamped thereto by a circumferential clamp **41**. The flexible boot **40** extends longitudinally within the tubular sleeve **35** curling inwardly within itself as at **42** to snugly overlie the conduit **27**. The inner end of the conduit **27** may be ribbed as at **43** and the end of the boot **40** fluidtightly joined to the rib portion by means of a circumferential clamp **44** or the equivalent.

The tubular sleeve **35** backs up the flexible boot **40** to control its shape when the trainline is under pressure, and it also serves to protect the same damage by rocks and other debris which is stirred up by the motion of the car. A guide bearing arrangement **46** is disposed at the free end of the tubular sleeve **35** and may be provided at its inner periphery with a suitable self-lubricating anti friction material **47** such as a plastic or the like. Drain holes **45** in the lower part of the sleeve **35** permit the escape of the moisture from within the sleeve.

The inner end of each of the conduits **26** and **27** is provided with a water trap **48** and **49** respectively, to prevent liquid from entering and/or collecting in the flexible boot **40**. If water, which is normally found in trainlines, were allowed to collect in the telescoping means **25** it could cause distortion. As long as the water is maintained in the conduits **26** and **27**, it may be readily drained from the conduits when the connecting hose **28** is disconnected from an adjacent car.

In operation when the car is impacted or a force of unusual magnitude is applied to the coupler **20**, the sill section **16** moves relative to the underframe **11**. During such movement, the conduit **26** and attached outer sleeve **35** of the telescoping means **25** is carried with the sill section **16**, while the sill section **27** and associated conduit **17** remains stationary. The position assumed by one conduit relative to the other under these conditions is indicated in phantom lines in the left-hand portion of FIG. 3. When the energy dissipating device or hydraulic cushion **23** returns the sill sections to the normal separation, the trainline assumes the position shown in solid lines. Extension of the couplers as the car is pulled in draft is also accommodated by the rolling of the boot **40** in the manner shown in phantom lines. When the sill section **16** is held against movement and an impact applied to the sill section **17**, the conduit **27** moves within the tubular sleeve **35** to the position shown in phantom lines at the inner end portion of the conduit **27**. The water traps **48** and **49** at the collapsed position are spaced a sufficient distance so that contact is avoided with an adequate margin of safety.

The total spacing of the conduits and available telescoping movement of one relative to the other will to a large degree be governed by the total cushion movement available on the car. As is pointed out in the cases mentioned above, cushioned movement of each sill section may vary from a few inches up to and including about 40 inches of travel or more. These dimensions are not by way of limitation since it is obvious that any degree of spacing may be provided if warranted by requirements for increased travel between the sill sections.

A modified form of trainline arrangement is shown in FIG. 4 wherein like parts are identified by like reference numerals. The conduits **26** and **27** are provided with the usual water traps **48** and **49** and are spaced apart the desired distance. An annular collar **50** mounts one end of an elongated tubular member **51** on the conduit **26**, while the opposite end extends into overlapping engagement with the conduit **27**.

Anti friction means **52** in the form of an annular bearing may be provided on the internal periphery of the tubular member **51** with a similar anti friction means **53** carried on the end of the conduit **27**. In this manner full support of the tubular member **51** is provided throughout the full range of telescoping movement. Obviously, the spacing between the anti friction members **52** and **53** at the extended position must be at least equal to the total run-out afforded by the draft gear **33** with a satisfactory margin of safety. The tubular member **51** is sealed to the conduit **27** by means of a flexible boot **54** which is tightly joined to the conduit **51** by means of an annular clamp **55**. A similar clamp **56** joins the opposite end of the flexible boot **54** to the outer surface of the conduit **27**.

As the conduits **26** and **27** move relative to each other in response to movement of the sill sections, the flexible boot **54** rolls to accommodate such movement while providing fluid tight continuity between the ends of the conduits **26** and **27**. An annular boot guard **57** may extend from the tubular sleeve **51** over the flexible boot **54** to provide protection for reasons noted above. The operation of the modified form of trainline arrangement in FIG. 4 is substantially like that of the embodiment of FIG. 3. Anti friction means **52** and **53** provide additional support to the tubular sleeve **51** during telescoping movement and permit a reduction in the length of the flexible boot **54**.

After considering the foregoing it will be obvious to those skilled in the art that departures may be made from the construction shown without departing from the inventive concepts embodied herein. Therefore, only such limitations should be imposed on the scope of the invention as are indicated by the spirit and scope of the appended claims.

I claim:

1. A trainline arrangement for a railway car of the type having a pair of sill sections, each of said sill sections being movable relative to the other and relative to an underframe portion of said car, a pair of conduits forming a part of the trainline and being carried by each of said sill sections, each conduit being fixed relative to

the associated sill section to which it is joined for movement therewith, and means telescopically joining each of said conduits to the other to permit movement of said sill sections relative to each other while maintaining continuity of said trainline, said means telescopically joining said conduits including an outer tubular means extending between said conduits and flexible boot means fluid-tightly joining the conduits, said tubular means having one end fixed with one conduit and having the other end reciprocably disposed about the other conduit, said other conduit having a portion thereof extending within said tubular means, said flexible boot means having one end part connecting with the one end of the one conduit and having the other end part connected with the conduit portion, the other boot end part being folded over on itself in an invaginated position to define a variably invertible boot section stored and guided between the other end of the tubular means and the portion of the other conduit.

2. In a railway car having a pair of sliding sill sections spaced apart at their inner ends and being movable to and independently of each other and said car, coupler means mounted on each of said sill sections and being movable therewith, the improvement comprising the provision of a trainline adapted to extend between said couplers and accommodate movement of said sill sections relative to each other, said trainline including a conduit attached to each of said sill sections, and means telescopically joining one of said conduits to the other to permit relative movement therebetween during movement of one sill section relative to the other, said means permitting said movement between said conduit means without interruption of the continuity of said trainline, said means telescopically joining said conduits including an outer tubular means extending between said conduits and flexible boot means fluid-tightly joining the conduits, said tubular means having one end fixed with one conduit and having the other end reciprocably disposed about the other conduit, said other conduit having a portion thereof extending within said tubular means, said flexible boot means having one end part connecting with the one end of the one conduit and having the other end part connected with the conduit portion, the other boot end part being folded over on itself in an invaginated position to define a variably invertible boot section stored and guided between the other end of the tubular means and the portion of the other conduit.

3. The invention according to claim 1 and the one conduit end and the conduit portion being provided with means to prevent flow of liquid to the boot means.

4. The invention according to claim 1 and the tubular means having a boot shield housing enclosing the flexible boot means and encasing same about the conduit portion extending within said tubular means.

5. The invention according to claim 1 and anti-friction guide means for the tubular means and the conduit end portion comprising a first element on the interior of the tubular means and a second element spaced axially inwardly from the first element on the conduit portion to limit telescopic movement between the conduits.

6. The invention according to claim 1 and said boot means being connected to the tubular means.

7. The invention according to claim 1 and a tubular housing surrounding the boot means and connected with the other end of the tubular means.

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