June 13, 1950 S. GUARNASCHELLI 2,511,335

STEAM CONNECTION BETWEEN RAILWAY CARS

Filed Aug. 12, 1947

Fig. 1

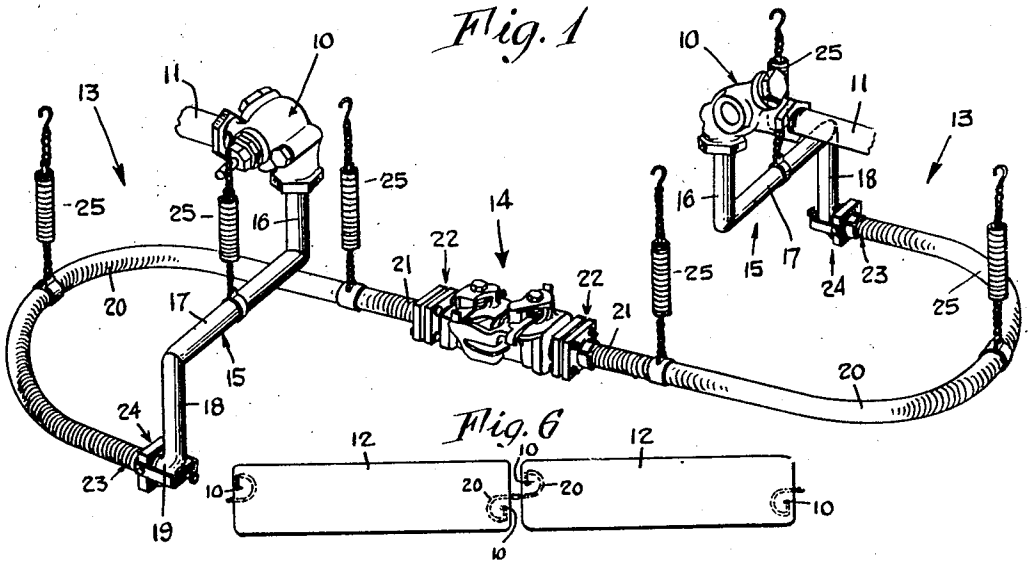


Fig. 6

Fig. 2

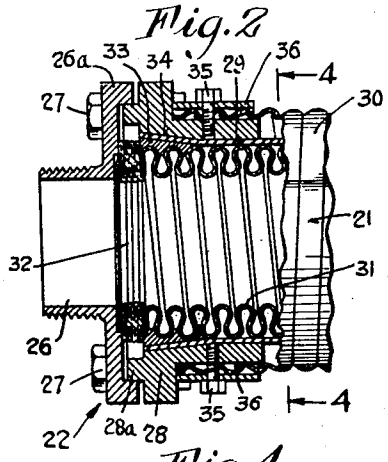


Fig. 3

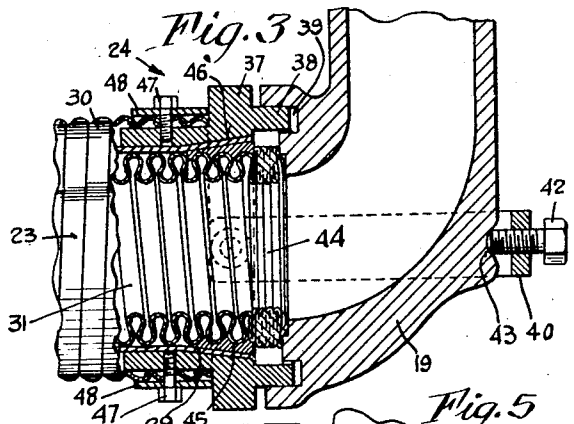


Fig. 4

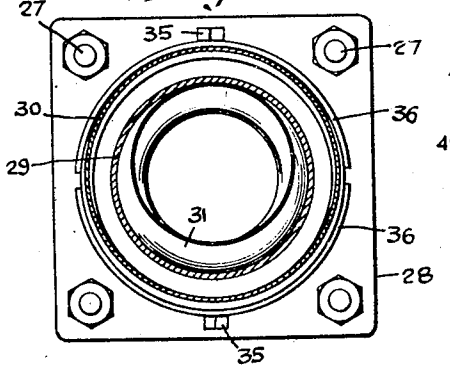
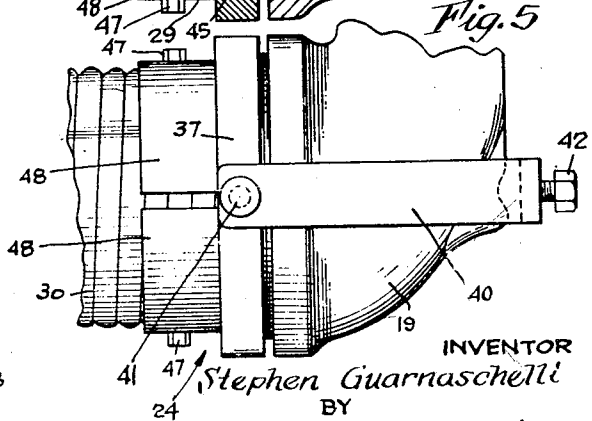


Fig. 5



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STEAM CONNECTION BETWEEN RAILWAY CARS

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2 Claims. (Cl. 285—8)

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This invention relates to steam connections between railway cars.

An object of the invention is to provide improved extendable and swingable steam connections for railway cars, which connections despite continued and long usage are proof against wear and consequent leakage, and are proof against mechanical freeze-up which would result in difficulty in the coupling and uncoupling operations.

Another object of the invention is to provide improved steam connections as above, which are simple, rugged and sturdy, and economical to manufacture.

Heretofore it has been the practice to employ, on the end of each railway car, a swingable and extendable steam connection formed of rigid or inflexible pipes swivel-jointed together and to the end valve of the car in such a manner as to provide freedom of movement of the coupling-carrying end of the pipes.

These prior articulatedly jointed steam connections have been subject to a number of drawbacks. In use the swivel parts of the connections are constantly being shifted on each other due to the movements of the cars, and consequently these parts become worn, and result in leakage of steam from the connections. Also, the swivel parts freeze up mechanically, making it extremely difficult if not impossible to couple or uncouple the connections easily, and requiring the use of some sort of tool or implement which is used to hammer the connections.

According to the present invention these drawbacks are overcome and the above objects are accomplished by the provision of an improved novel organization, including a pipe or hose for connection at one end to the steam line of the car, the pipe being so constructed that it can be made to extend from the steam line in different directions, including inward from the side and toward the longitudinal center line of the car, and then generally along said center line toward the end of the car where it carries a separable coupling part, and the pipe is so extended, and at least a portion of it is made so flexible, as to enable the coupling-carrying end and coupling part to be readily swung and moved laterally and longitudinally between limits such that the coupling part may, without difficulty due to restraint by the pipe, be attached to or detached from a companion coupling on a steam connection of another car which is or is to be coupled to the first car. The arangement is such that swivels, knuckles, gaskets and other parts which move or slide on each other and are subject to wear are eliminated, and that sufficient freedom and universality of movement is had, without twisting, of the coupling part and of the end of the pipe carrying the said part, as to enable the mating coupling parts of two connections to be readily coupled and uncoupled, and also to allow for the necessary relative movements of the cars without rupturing the connections.

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This improved connection when used on existing railway cars may, as indicated in a specific embodiment of the invention illustrated herein, include a rigid pipe, preferably a formed single continuous pipe, rigidly connected to the end valve of the car and extending downwardly from the valve and laterally toward the side of the car nearest the valve. The lower end of the rigid pipe may include an inwardly turned elbow, connected with one end of a flexible pipe or hose yieldingly supported from the car in a substantially horizontal position, the hose being preferably formed by providing continuous spiral or concentric corrugations in tubing. The flexible hose preferably is of such length and so positioned that when the couplings on two such hoses are connected the hose on each car extends inwardly along the center line of the car, then in a wide U curve toward the side and end of the car where it extends to and connects with the rigid pipe. The rigid pipe of the connection thus serves as an offset whereby sharp excessive-stress producing curves are avoided, but instead a desirable gradual curvature of the flexible hose is effected. This is an advantageous arrangement when the hose is formed of spirally corrugated tubing, since the coupling-carrying portion of the hose may be readily moved laterally without twisting in the hands, and therefore the coupling parts may be easily joined or separated.

For use as original equipment on new railway cars, the car steam line can be made to terminate near the side of the car and at the desired level, thereby obviating the necessity of using the rigid offset above referred to.

By the provision of the present improved steam connections, sliding and wearing parts have been largely eliminated, and therefore the connections are extremely durable and not subject to mechanically frozen joints, have long life, prevent escape of steam and do not require servicing or replacement of parts as is the case where articulated connections are used having ball and socket joints and the like.

Other features and advantages will hereinafter appear.

In the accompanying drawings—

Figure 1 is a perspective view of a pair of im-

proved steam connections made in accordance with the invention and coupled together.

Fig. 2 is an axial sectional view through the coupling fitting and an adjacent portion of the flexible metal hose of the steam connection.

Fig. 3 is a vertical section through the pipe fitting and adjacent ends of the flexible metal hose and rigid pipe of the steam connection.

Fig. 4 is a transverse section taken on line 4—4 of Fig. 2.

Fig. 5 is an elevational view of the fitting and parts shown in Fig. 3; and

Fig. 6 is a diagrammatic plan view of a pair of coupled railroad cars having the improved steam connections of the present invention.

Referring to Fig. 1, end valves 10 are shown, of the usual type carried by railway cars, the said valves being connected with steam pipes or lines 11 which feed steam through the cars for heating purposes and the like.

As seen in Fig. 6, the end valves 10 are usually located in off-center positions at the ends of cars 12, in accordance with standards of location established by the Railroad Association.

According to the present invention, improved inarticulated leakproof steam connections 13 are provided, for use in connection with a coupler 14 whereby the lines 11 may be connected together through the end valves 10, the said steam connections being so organized that uniform and adequate freedom and universality of movement of the parts of the coupler 14 may be had at all times to enable the coupler parts to be readily and conveniently manipulated and connected together or separated when the railroad cars 12 are coupled end-to-end, the said improved connections being devoid of structures subject to wear and consequent malfunctioning, such as swivels, knuckles, sliding parts, etc. as found in prior articulated connections where mechanical freezing of joints commonly occurs.

The improved steam connections 13, as set forth in the specific embodiment of the invention illustrated, comprise rigid pipe members 15 rigidly connected with the end valves 10 and extending downwardly therefrom and laterally or toward the nearest sides of the cars 12. The pipe members 15 may have any desired shape or configuration, that at present preferred (as shown in Fig. 1) being a straightened Z-shape. That is, each pipe 15 has a straight portion 16 rigidly connected with its valve 10 and extending vertically downward therefrom, and has a horizontal portion 17 joined to the bottom extremity of the portion 16. At the other end of the horizontal portion 17 a second vertical portion 18 is secured, extending downward and terminating at an elbow 19 (Figs. 1, 3 and 5) which faces away from the end of the car.

For carrying steam between the elbows 19 of the connections and the coupler 14, there is provided by the invention flexible pipes 20 in the form of metal hoses having ends 21 joined through fittings 22 to the coupler 14, and having ends 23 joined through novel separable fittings 24 with the said elbows. Each metal hose 20 is carried in a substantially horizontal position under its railway car 12, and so as to have generally a U shape, so that the coupled end of the hose is located centrally at the car end. In order to support the hose 20 in this position, and to enable the end of the hose which carries the coupling to have a wide and universal range of relatively free movement, extension springs 25 are provided, connected with the hose and with the horizontal portion of the pipe 15, the said springs being hooked to the underside of the railway car. As shown in Fig. 1, two springs 25 may be attached to each flexible hose 20 and a third spring 25 attached to each rigid pipe 15.

By the provision of the rigid offsetting pipes 15 the anchored ends 23 of the hoses 20 may be supported closely adjacent the sides of the cars 12 as now in use, thereby to avoid sharp bends in the hose, which would cause excessive stresses and strains, and instead to provide an open loop permitting gradual bending of the hoses about a large radius whereby danger of rupture or failure is avoided. Moreover, due to the relatively large radius of curvature provided, the ends 21 of the hoses which carry the parts of the coupler 14 may be readily shifted laterally in all directions, and may also be readily shifted longitudinally of their axes. By virtue of this, the parts of the coupler 14 will be unhampered in movement since no sliding joints or swivels are present to freeze up, and therefore the coupler parts may be easily and quickly joined together or separated.

From the foregoing description and by reference to Figs. 1 and 6 of the drawing it can be seen that the coupling has a length materially greater than those usually employed for this purpose. By taking as a unit of measurement the normal distance between the steam fittings 10 on adjacent cars when in coupled relation, it can be seen that the total length of the coupling pair including sections 15 thereof will have a length greater than four times this unit. Correspondingly, the coupling 15, 20 and including one half of coupler 14 which is found on each car, will exceed twice this unit by a substantial amount, and the flexible section 20 thereof with its attached coupler half represents a length in excess of 150 percent of such unit.

As shown in Fig. 2, each fitting 22 comprises a threaded pipe section 26 integral with a recessed flange 26*a*, the latter being fastened by bolts 27 to a collar 28 which engages the end 21 of the flexible pipe or hose 20. The end of the collar 28 has a bead 28*a* nesting in the flange 26*a*. The inside of the collar 28 engages a braided metal covering 29 which forms part of the hose 20 and which is interposed between an outer armor jacket 30 formed of a spirally wound strip of metal having interlocked edges, and a steam-carrying corrugated flexible tube or pipe 31 having spiral corrugations. The corrugations at the end 32 of the tube 31 are flattened and compressed to form a dense annulus or ring which is faced by applying solder to its outer end. Around the flexible tube 31 a tapered crimping ring 33 is disposed, the said ring having internal threads and being threaded on the tube prior to flattening the end corrugations thereof. The ring 33 is located within the end of the metal braid 29 and expands the braid against a conical bore 34 in the collar 28. Tightening of the bolts 27 by which the collar 28 is drawn against the flange 26 causes the tapered crimping ring 33 to be forced against the flattened corrugations of the tube end 32, thereby providing an effective and tight seal between the tube 31 and flange 26*a*. The armor 30 is secured to the collar 28 by screws 35 and semi-circular clamps 36, as shown in Fig. 4.

Referring to Figs. 3 and 5, the fitting 24 by which the end 23 of the flexible pipe is secured to the elbow 19 of the rigid pipe comprises a collar 37 having an annular rib 38 on its end face, the said rib being received within the groove

39 in the end or face of the elbow 19. A U-strap 40 is secured to the collar 37 by pins 41 and carries a screw 42 in its yoke portion for engagement with a recessed portion 43 of the elbow 19, thereby to secure the collar firmly to the elbow.

The end corrugations of the flexible tube 31 are flattened or compressed to provide a ring 44 which is faced with solder and which engages the face or mouth of the elbow 19. Around the tube 31 adjacent the ring 44, a threaded tapered clincher ring 45 is provided, the said ring spreading apart the end of the metal braid 29 and forcing the braid against a conical bore 46 in the collar 37 when the screw 42 on the strap 40 is tightened.

Also, tightening of the screw 42 to force the collar 37 against the mouth of the elbow 19 causes the clincher ring 45 to force the compressed convolutions 44 of the flexible tube against the elbow, providing a tight seal. The armor jacket 30 is secured to the collar 37 by screws 47 and semi-circular clamps 48, as shown. The fitting 24 and hose end 23 are readily separable from the elbow 19 by merely loosening the screw 42 and swinging the strap 40 downward, and thus the flexible pipes 20 may be quickly and easily removed from the rigid pipes 15 and replaced if desired. It will be noted that the screws 42 are readily accessible from the ends of the cars 12 having the steam connections.

By forming the hose or pipe 20 to extend in different directions and to have substantial length, as provided by a U shape, when the hose is formed of spirally corrugated tubing there is substantially avoided any twisting of the coupling parts in the hands as the hose ends carrying the parts are swung upward to couple the said parts.

A single improved steam connection 13 as provided by the present invention may be advantageously coupled to a prior articulated type connection, since the coupling parts match each other and are cooperable.

When the present invention is to be applied to new cars the steam lines of the cars may terminate at or near the side of the car and at the desired level, thereby obviating the necessity of offsetting rigid pipe connections shown herein.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A steam-line coupling connection for railway cars, having a rigid pipe extending downwardly and laterally from the steam line of the car to a point adjacent the side of said car; a flexible pipe at one end connected to the lower outer end of the rigid pipe; and a separable coupling part connected to the other end of the flexible pipe for engagement with a companion coupling part on another car, said flexible pipe extending from said rigid pipe substantially horizontally inwardly from the end of the car, then in a large arc toward the longitudinal center of the car and there extending tangentially to said arc outwardly to beyond the adjacent end of the car to position the coupling part in position to receive a companion coupling part on another car.

2. A steam-line coupling connection for a railway car comprising a flexible metallic hose, releasable clamping means for securing the hose at one end to the steam-line terminal at the side of the car and having a separable coupling part, releasable clamping means for securing the coupling part to the hose at the other end thereof, said hose extending from its point of connection with the steam-line at the side of the car substantially horizontally inwardly from the end of the car, then in a large arc toward the longitudinal center of the car and there extending tangentially to said arc to beyond the adjacent end of the car to locate the coupling part in position to receive a companion coupling part of another coupling connection on another car, whereby torsional forces in the hose resulting from approaching and separating movement of adjacent cars is prevented, and rotational movement of the coupling part about its axis is permitted in order that connection and disconnection of said coupling part with a companion coupling part may be readily effected.

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