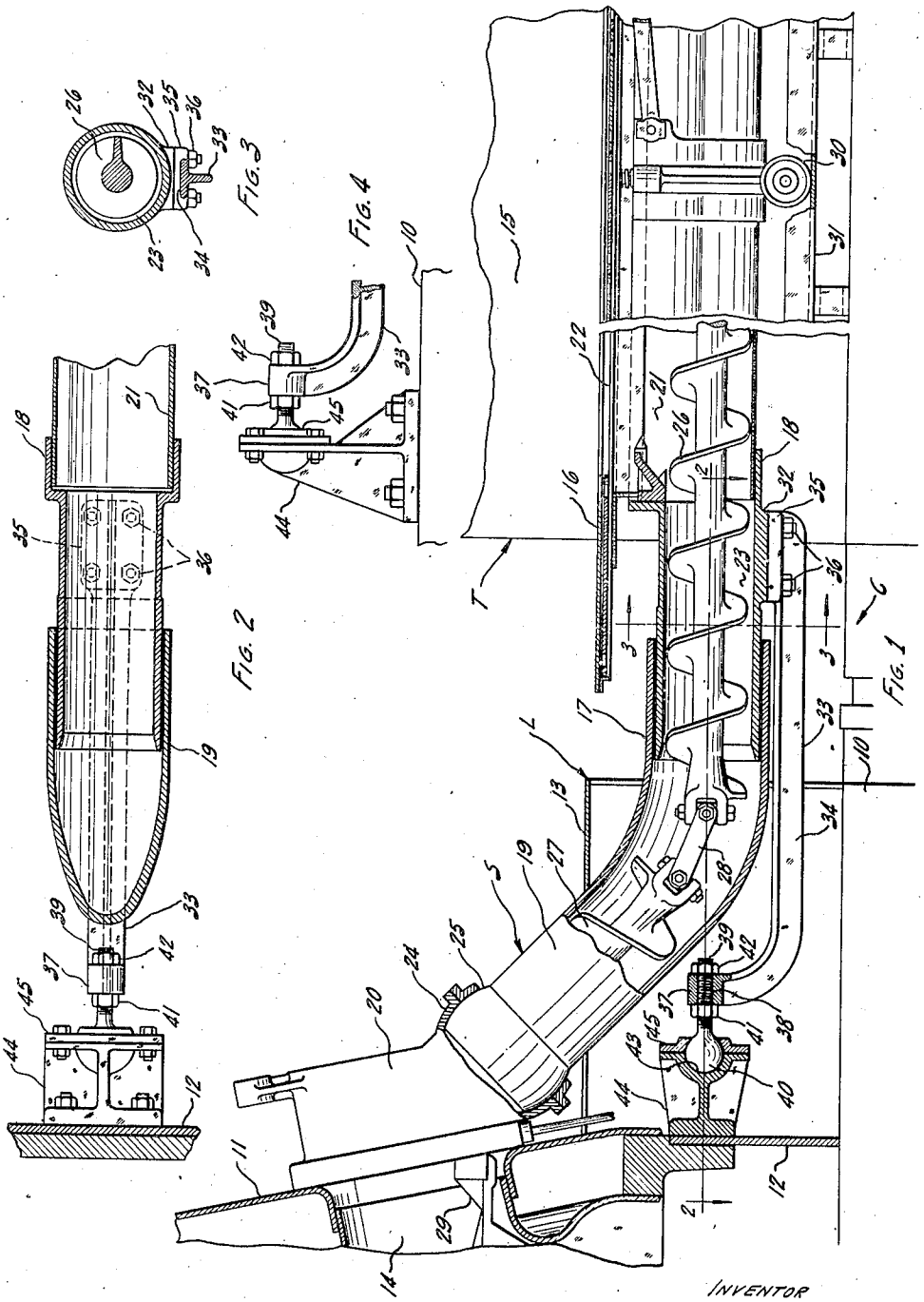
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STOKER AND SUPPORT THEREFOR

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STOKER AND SUPPORT THEREFOR

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This invention relates to stokers for intercoupled locomotives and tenders including a system of conduits and conveyors extending from beneath the tender fuel bin to the firing opening of the locomotive firebox. Provision is made in an intercoupled locomotive and tender for relative movement therebetween as they travel on curves, cross-overs and turntables, and since a portion of the stoker extends rearwardly in the tender and a portion extends forwardly in the locomotive, flexibility in the conduit and conveyor system of the stoker must also be provided for. In the rigid trough type of stoker, where the trough or rear conduit is rigidly mounted on the tender, flexibility is provided for by a pair of longitudinally spaced universal connections in the conduit system. In the swinging trough type of stoker, where the trough or rear conduit is movably mounted in the tender, only a single universal connection in the conduit system is essential to provide for necessary flexibility. The present invention relates to the latter or swinging trough type of stoker.

It is an object of the invention to provide an improved stoker and mounting arrangement of the type described, that is simple in construction, cheap to manufacture and conveniently installed.

An important consideration in stokers of this latter type is the provision of practical and efficient supporting means for the movable trough or rear conduit section. It is, therefore, another object of the present invention to provide in stokers of this type, supporting means that is simple in construction, and that firmly supports the movable conduit section while permitting free movement thereof about a vertical and a horizontal axis as relative movement between the locomotive and tender occurs.

Another object of the invention is to provide supporting means for the movable trough or rear conduit section that will minimize strains on the locomotive backhead and the flexible connection in the conduit system due to the thrust and pull of the movable trough in stopping and starting the locomotive, while at the same time providing the necessary flexibility the conduit system must have because of the relative movement between locomotive and tender.

Further objects and advantages of the invention reside in the novel construction of parts and the novel combination and relation of elements, all as brought out in the following description and the appended claims and shown in the accompanying drawing, in which

Fig. 1 is a vertical longitudinal central section of adjacent ends of a locomotive and tender with the invention embodied therein and shown partly in similar section and partly in elevation;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; and

Fig. 4 is a fragmentary view of the rear portion of the locomotive showing a modification of the stoker supporting arrangement.

Referring now to Figs. 1, 2 and 3, illustrating one embodiment of the invention, the locomotive is indicated by the letter L and comprises a frame 10 upon which the boiler backhead 11 is supported by means of an expansion plate 12. A cab deck 13 extends rearwardly from the backhead 11 beneath the level of the firing opening 14 in the backhead 11. Coupled to the locomotive in the conventional manner, as at C, is a tender T having a fuel bin 15 above the apertured floor 16.

A stoker indicated by the letter S, transfers fuel from the fuel bin 15 to the firing opening 14, and includes a discharge conduit or box 20 and a transfer conduit 17, the latter comprising the telescopically connected trough or rear conduit section 18 and forward conduit section 19. The normally horizontally extending trough or rear conduit section 18 comprises an open mouth trough 21, arranged to receive fuel from the bin 15 through the opening 22, and a tubular portion 23 communicating with and extending forwardly of the trough 21.

The forward conduit section 19 is formed with a bend intermediate its ends, the portion rearward of the bend telescoping the tubular conduit portion 23 and the portion forward of the bend extending upwardly and forwardly through the cab deck 13 to the discharge box 20. The discharge box 20 surrounds the firing opening 14 and is rigidly secured, in any suitable manner, to the backhead 11. It is provided with a spherical concave fragmental conduit portion 24 at its lower side to receive the hollow spherical portion 25 of the forward conduit section 19, forming therewith a universal connection.

Coal is transferred through the transfer conduit 17 to the discharge box 20 by screw conveying means including a screw conveyor 26 disposed in the trough or rear conduit section 18 and a screw conveyer 27 disposed in the upwardly and forwardly extending portion of the forward conduit section 19. The fuel delivered by the screw conveying system is received by suitable dis-

tributing means 29 well known in the art, and is projected in aerial paths over the fire. The forward or elevating screw conveyor 27 is driven from the rear screw conveyor 26 by means of the double universal joint 28 which is located at the bend in the forward conduit section 19. The rear screw conveyor 26 is driven by suitable power means through gearing (not shown) disposed at the rear of the screw conveyor.

The mounting arrangement for the rear conduit section 18 provides for longitudinal movement thereof with respect to the tender, and for lateral swinging movement thereof about a vertical axis and vertical swinging movement thereof about a transverse horizontal axis when relative movement between the locomotive and tender occurs, as in rounding curves or passing over switches and turntables. This mounting arrangement comprises rollers 30 suitably attached to the trough portion 21 of the rear conduit section 18 and arranged to move on suitable tracks 31.

The tubular conduit portion 23 is provided with a foot pad 32 to which is rigidly secured one end of a tie rod or brace 33. The tie rod 33 comprises a longitudinally extending bar 34 having at its rearward end a horizontal flange 35 fitting against the foot pad 32 and to which it is rigidly secured by suitable means, as by the bolts and nuts 36. The forward end of the bar 34 is provided with a boss 37 having an opening 38 therethrough in which is loosely received the threaded projection 39 of the ball member 40. The nut 41 and lock nut 42 threaded on the threaded projection 39 at opposite sides of the boss 37, rigidly secures the ball member 40 to the brace 33. The ball member 40 is received in the spherical seat 43 of the bracket 44 and the clamp 45 prevents disengagement of the ball member 40 from the seat 43 but permits universal movement of the tie rod about its forward end. The bracket 44 may be rigidly secured to the expansion plate 12, as shown in Fig. 1, or to the frame 10 as shown in Fig. 4.

The bracket 44 is so disposed that the center of the ball member 40 is below but in vertical alinement with the center of the ball joint between the forward conduit section 19 and the concave portion 24 of the discharge box 20. This permits lateral swinging movement of the tie rod 33 and the transfer conduit 17 as a unit about a vertical axis as relative lateral movement between the locomotive and tender occurs when traveling over curving tracks. While providing for such movement, the tie rod 33 at the same time firmly maintains the rear conduit section 18 in a normally horizontal position, supporting the overhanging weight of the trough or rear conduit section 18 when the rollers 30 are disposed rearward of the center of gravity and preventing the forward end of the trough or rear conduit section 18 from tilting upwardly when the rollers 30 are disposed forward of the center of gravity. It is also apparent, since the rearward end of the forward conduit section 19 is carried by the rear conduit section 18, that the tie rod 33 acts as a supporting medium for a portion of the weight of the forward conduit section 19, thereby relieving the backhead 11 of a further portion of the weight of the stoker and prevents binding between the telescopically joined ends of the conduit sections 18 and 19.

When relative vertical movement between the locomotive and tender occurs, as in passing over switches and turntables, the rear conduit section 18 swings in a vertical plane about the axis of the ball member 40 while the forward conduit section 19 swings in a vertical plane about the axis of the ball joint between the forward conduit section 19 and the concave portion 24 of the discharge box 20. The slight relative longitudinal movement between the forward and rear conduit sections 19 and 18, due to the difference in vertical swing about their vertically offset axes, is provided for by the telescopic relation of their adjacent ends.

The present construction and arrangement of parts minimizes strains on the flexible connection in the conduit system and the strains on the locomotive backhead when starting and stopping the locomotive. When stopping the locomotive, the rear conduit section of the stoker, since it is movably mounted on the tender, has a forward thrust due to its inertia and when starting exerts a pull, which unless otherwise taken care of is transmitted to the flexible connection in the conduit system and the locomotive backhead. In the present construction these strains are transmitted by the tie rod 33 to the expansion plate 12, when the bracket 44 is secured to the expansion plate 12 as shown in Fig. 1, and to the frame 10, when the bracket 44 is secured to the frame 10 as shown in Fig. 4. This is accomplished without sacrificing the necessary flexibility the stocker must have because of the relative movement between locomotive and tender.

Minor adjustments in the positioning of the double universal joint 28 are readily made by threading nut 41 and lock nut 42 farther forward or rearward on the threaded projection 39 of the ball member 40. It is desirable to have the universal joint 28 centralized in the bend in forward conduit section 19, and by the present adjustment arrangement such positioning is assured.

I claim:

1. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and a front conduit section supported at its forward end on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section and a pivotal connection with the locomotive, said pivotal connection having no physical connection with said front conduit section.

2. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and a front conduit section having a universal connection at its forward end for pendulously supporting said front conduit section on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section and a pivotal connection with the locomotive, the axis of said pivotal connection being in vertical alinement with the axis of said universal connection, said pivotal connection having no physical connection with said front conduit section.

3. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and

a front conduit section pendulously supported at its forward end on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section forward of its first named support and a pivotal connection with the locomotive, said pivotal connection having no physical connection with said front conduit section.

4. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and a front conduit section pendulously supported at its forward end on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section forward of its first named support and a pivotal connection with the locomotive, the axis of said pivotal connection being in vertical alinement with the axis of said pendulous support, said pivotal connection having no physical connection with said front conduit section.

5. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and a front conduit section supported at its forward end on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section and a pivotal connection with the locomotive, and adjusting means associated with said additional supporting means for moving said rear conduit section fore and aft to any one of a number of positions.

6. In an intercoupled locomotive and tender, the combination of a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender and a front conduit section having a universal connection at its forward end for pendulously supporting said front conduit section on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section and a pivotal connection with the locomotive, the axis of said pivotal connection being in vertical alinement with the axis of said universal connection, and adjusting means associated with said additional supporting means for moving said rear conduit section fore and aft to any one of a number of positions.

7. In an intercoupled locomotive and tender, a fuel transfer conduit extending forwardly from the tender to the locomotive and comprising a rear conduit section movably mounted and supported on the tender, said mounting and support being arranged for pivotal movement of said rear conduit section about a horizontal transverse axis, said fuel transfer conduit also comprising a front conduit section having a universal connection at its forward end for pendulously supporting said front conduit section on the locomotive, said conduit sections being telescopically connected at their adjacent ends, and means carried by the locomotive for additionally supporting said conduit sections, said means having a rigid connection with said rear conduit section forward of its first named support and a pivotal connection with the locomotive, said pivotal connection having no physical connection with said front conduit section.

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