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W. C. PEYTON ET AL

2,119,086

STOKER CONVEYER

Original Filed Aug. 31, 1931 2 Sheets-Sheet 1

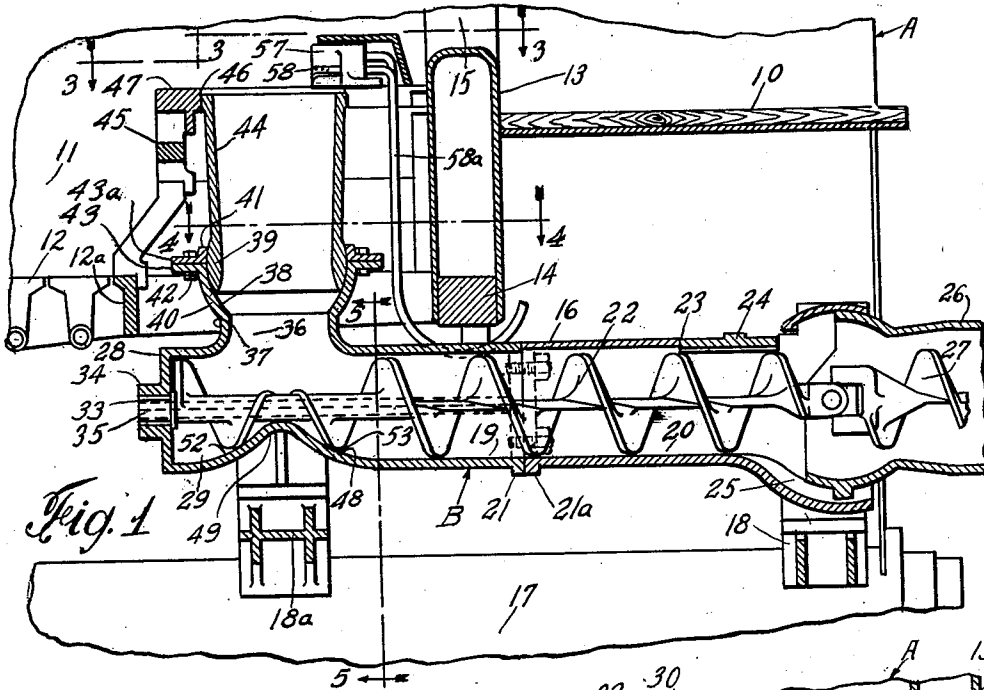


Fig. 1

Fig. 3

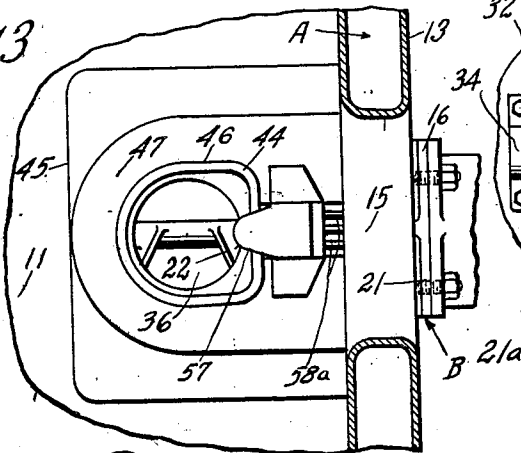


Fig. 4

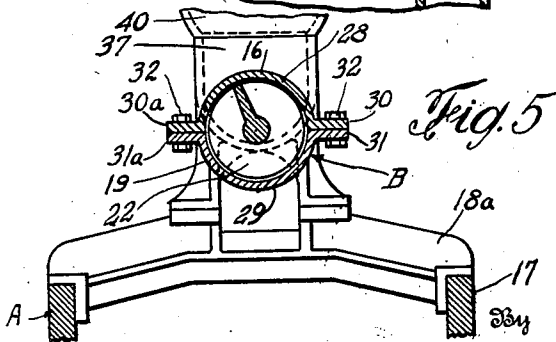


Fig. 5

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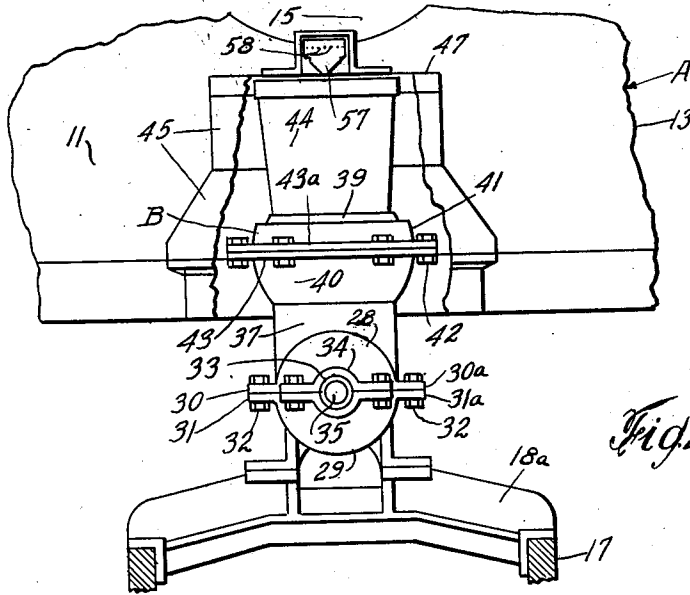


Fig. 2

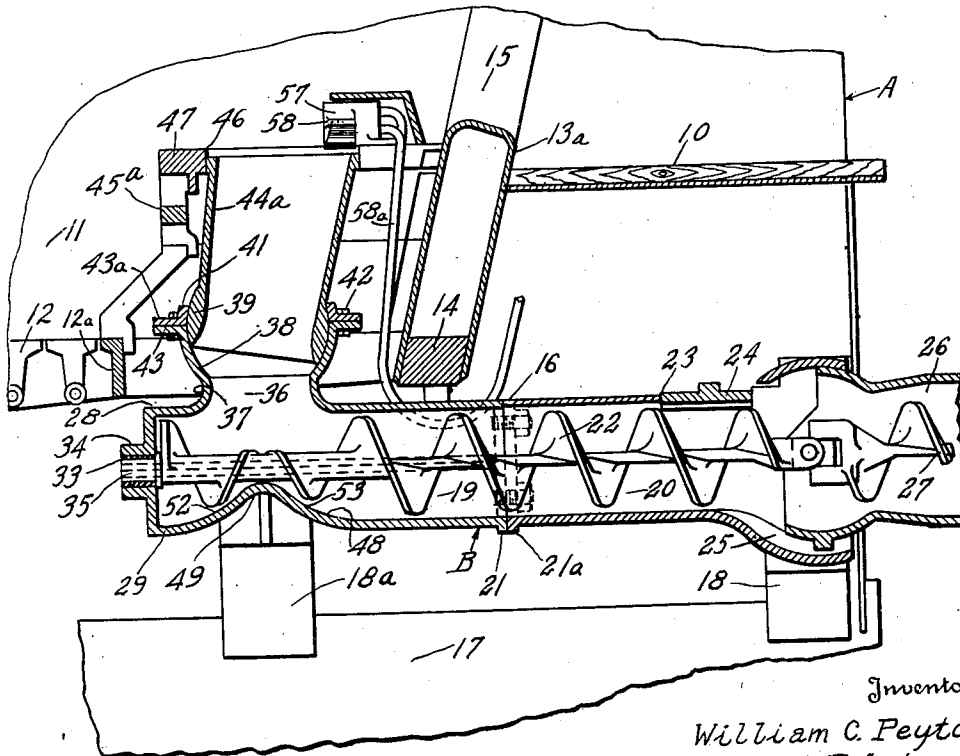


Fig. 6

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## UNITED STATES PATENT OFFICE

2,119,086

## STOKER CONVEYER

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Original application August 31, 1931, Serial No. 560,378. Divided and this application March 15, 1935, Serial No. 11,208

## 4 Claims. (Cl. 110—101)

This application is a division of our co-pending application Serial No. 560,378, filed August 31, 1931, for Stoker conveyer, patented April 30, 1935, No. 1,999,979.

The present invention relates to conveying systems for stokers, particularly for stokers applicable to locomotives. More especially the invention appertains to conveying systems including a transfer conveyer and an upstanding riser conduit receiving fuel therefrom.

Accordingly, an object of the invention is the provision of a conveying system applicable to locomotive stokers and adapted for application to any locomotive boiler construction regardless of the angle of the boiler backhead.

Another object of the invention is the provision in a locomotive stoker of a conveying system including a conduit rigidly mounted on the locomotive frame and a riser conduit in communication with and flexibly related to the rigid conduit and loosely connected to the boiler firebox to be movable therewith with respect to the locomotive frame.

Other and further objects and advantages of the invention will become apparent from the following description taken in connection with the drawings, in which,

Figure 1 is a central, vertical longitudinal section through the rearward portion of a locomotive and the locomotive unit of the stoker mechanism;

Figure 2 is a front view in part diagrammatic of the stoker mechanism taken from within the firebox;

Figure 3 is a plan view in part diagrammatic of the stoker mechanism on the line 3—3—3 of Figure 1 with the backhead in section;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is a section on the line 5—5 of Figure 1; and

Figure 6 is a view similar to Figure 1 showing a modified form of the invention.

The conveying system constituting the present invention is illustrated in the aforesaid drawings and will be hereinafter described as applied to a locomotive stoker of the class which delivers the fuel upwardly through the firebox grates to a point of distribution within the firebox. It will be understood, however, that the invention can be used equally as well with stokers which deliver the fuel through the boiler backhead.

In the drawings, referring particularly to Figures 1 to 5, the locomotive is designated generally by the letter A and is provided with a deck 10 and the firebox 11. The firebox grates are shown at 12, the firebox backwall at 13, having a firing opening 15 therethrough and a foundation or mud ring is shown at 14 bounding the bottom of the firebox 11. The stoking mechanism is desig-

nated generally by the letter B and comprises a horizontal conveyer conduit 16 rigidly supported from the locomotive frame 17 at its rearward end by the transverse foot member 18, and at its forward end by the transverse foot member 18a. The conveyer conduit 16 is preferably formed in two sections, a forward conduit section 19 and a rearward conduit section 20, the adjacent ends of said sections being provided with the flanges 21 and 21a through which they are joined in any desired manner. The conveyer conduit 16 passes beneath the mud ring 14 and has mounted therein a screw conveyer 22 for advancing fuel therethrough.

The rearward section 20 of the conveyer conduit 16 is provided in its top portion with an inspection opening 23 arranged to receive a cover plate 24, and at its rearward end is formed with a spherical flange 25 arranged to receive the forward end of a transfer conveyer conduit unit 26. Mounted in the transfer conduit 26 is a rotatable screw conveyer 27. The forward section 19 of the conduit 16 is of a peculiar construction, being split horizontally on its longitudinal center line into an upper portion 28 and a lower portion 29. The adjacent edges of the upper portion 28 and the lower portion 29 are provided respectively with the outwardly extending flanges 30, 30a, and 31, 31a and are securely attached together as by bolts 32. The forward wall of the conveyer 16 is apertured at 33 and is provided with a bearing member 34 in which is journaled the extended shaft 35 of the screw 22.

The upper portion 28 of the conduit section 19 has an opening 36 formed in the top thereof intermediate its forward and rearward ends. Circumscribing the opening 36 and bounding its marginal edge is a neck 37 preferably formed integral with the upper portion 28. Surmounting the neck 37 is a spherical horizontally split flange 38 constituting one element of a ball joint 39, the lower portion 29 of the split flange 38 being preferably integral with the neck 37 and the upper portion 41 being attachable to the lower portion 40 by means as bolts 42 joining the outwardly extending flanges 43 and 43a of the lower and upper portions 40 and 41 respectively of the split flange 38.

An upwardly extending conduit 44 opens at its upper end above the level of the grates 12 and at its lower end is arranged to form an element of the ball joint 39. The upwardly extending conduit 44 is held in position by the protecting grate or wall 45, which is provided with an opening 46 in its top face 47 to loosely receive and laterally support the upper end of the upwardly extending conduit 44. The protecting grate or wall 45 rests on the U-shaped grate bearer bar 12a and is therefore a part of the firebox structure. The heat of the fire in the firebox causes

expansion of the firebox structure and consequently movement thereof relative to the locomotive frame. The protecting grate 45, since it is part of the firebox structure, also moves and movement thereof exerts a force against the conduit 44, the upper end of which it embraces, thereby causing the conduit 44 to move angularly about its lower end. Now, since movement of the grate 45 is a bodily displacement, while the movement of the conduit 44 is an angular one, the grate 45 is arranged to loosely receive while laterally supporting the conduit 44. A rigid connection between the grate 45 and conduit 44 would not permit of angular movement of the conduit 44 and movement of the grate 45 would cause a strain on the conduit 44 and eventual breaking thereof.

To facilitate the delivery of fuel from the conduit 16 into the conduit 44 the forward end of the screw 22 and the adjacent floor portion 48 of the lower portion 29 of the conduit section 16 are of novel form, more fully described in the parent application.

At the rear of the discharge opening of the upwardly extending conduit 44 is mounted a steam jet distributor 57. The distributor 57 is carried by the wall 45 and is provided with a number of jet openings 58 through which steam is emitted against the rising column of fuel being discharged from the conduit 44, so arranged as to distribute fuel evenly over the firebed. A series of pipes 58a is provided for supplying steam to the distributor 57.

In operation, fuel from a suitable source of supply is advanced through the transfer conduit 26 and conduit 16 by means of the screws 27 and 22. When the forward portion of the conduit 16 becomes filled with fuel, that portion of the screw 22 rearward of the ridge 49 and adjacent the sloping wall 53 cooperates with the wall 53 to force the fuel in a forward and upward direction and that portion of the screw 22 forward of the ridge 49 and adjacent the oppositely sloping wall 52 cooperates with the wall 52 to force the fuel in a rearward and upward direction. The resultant of the forces, is, therefore, in an upward direction and fuel is forced through the upwardly extending conduit 44 and scattered over the firebed as it emerges from the conduit 44 by the steam blast issuing from the distributor 57.

In Figure 6 is shown the same form of fuel conveying mechanism as described in connection with Figures 1 to 5, but applied to a locomotive, the backhead 13a of which slopes inwardly from top to bottom. The ball joint 39 permits movement of the upwardly extending conduit 44a to a position parallel with the backhead, and the novel conveying system makes possible the delivery of fuel through the conduit 44a at an acute angle with the delivery of fuel through the horizontal conduits 26 and 16.

In both forms of the invention, movement of the boiler over the locomotive frame such as movement due to expansion or contraction of the boiler is made possible without injury to the stoker mechanism by reason of the universal mounting of the base of the conduits 44, 44a and the loose engagement at their upper ends with the protecting and supporting walls 45, 45a. In like manner, upward deflection of the locomotive frame will not impart stresses to the boiler or to the stoker conveyor.

We claim:

1. In combination, a base frame, a firebox

mounted on said frame, a feed conduit disposed rigidly on said frame, a riser conduit pivotally connected at its lower end to said feed conduit for angular movement thereof about its lower end, said riser conduit communicating at its lower end with said feed conduit and extending upwardly in the firebox, and means carried by said firebox loosely engaging the upper end portion of said riser conduit for laterally supporting the riser conduit in the firebox in an upright position, the loose engagement of said riser conduit by said means permitting flexure at the area of engagement when relative movement between said frame and said firebox occurs.

2. In combination, a base frame, a firebox mounted on said frame, a feed conduit disposed rigidly on said frame, a riser conduit pivotally connected at its lower end to said feed conduit for angular movement thereof about its lower end, said riser conduit communicating at its lower end with said feed conduit and extending upwardly in the firebox, and a protecting wall inside the firebox partially surrounding and loosely embracing the upper end portion of the riser conduit for laterally supporting the riser conduit in the firebox in an upright position, the loose engagement of said riser conduit by said protecting wall permitting flexure at the area of engagement when relative movement between said frame and said firebox occurs.

3. In combination with a firebox having an upstanding wall, a frame for supporting the firebox, a fuel feed conduit rigidly mounted on said frame, said conduit having a discharge mouth adjacent the lower end of said upstanding wall, an upstanding discharge conduit pivotally connected at its lower end to said feed conduit for angular movement thereof about its lower end, said discharge conduit communicating at its lower end with the discharge mouth of said feed conduit and at its upper end terminating in the firebox, and means carried by said firebox loosely engaging the upper end of said discharge conduit for laterally supporting the riser conduit in the firebox in an upright position, the loose engagement of said discharge conduit by said means permitting flexure at the area of engagement when relative movement between said frame and said firebox occurs.

4. In combination with a firebox provided with a grate and having an upstanding wall, a frame for supporting the firebox, a fuel feed conduit located below said grate and rigidly mounted on said frame, said conduit having an upwardly opening discharge mouth adjacent the lower end of said upstanding wall, an upstanding discharge conduit pivotally connected at its lower end to the first named conduit for angular movement of said discharge conduit about its lower end, said discharge conduit communicating at its lower end with the discharge mouth of said first named conduit and at its upper end terminating in the firebox above the grate, and a protecting grate for the upstanding discharge conduit, said protecting grate embracing and loosely engaging the upper end of said discharge conduit for laterally supporting the same in the firebox in an upright position, the loose engagement of said discharge conduit by said protecting grate permitting flexure at the area of engagement when relative movement between said frame and said firebox occurs.

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