Nov. 3, 1936. O. MOELLER 2,059,705

STOKER CONVEYER

Filed May 4, 1935

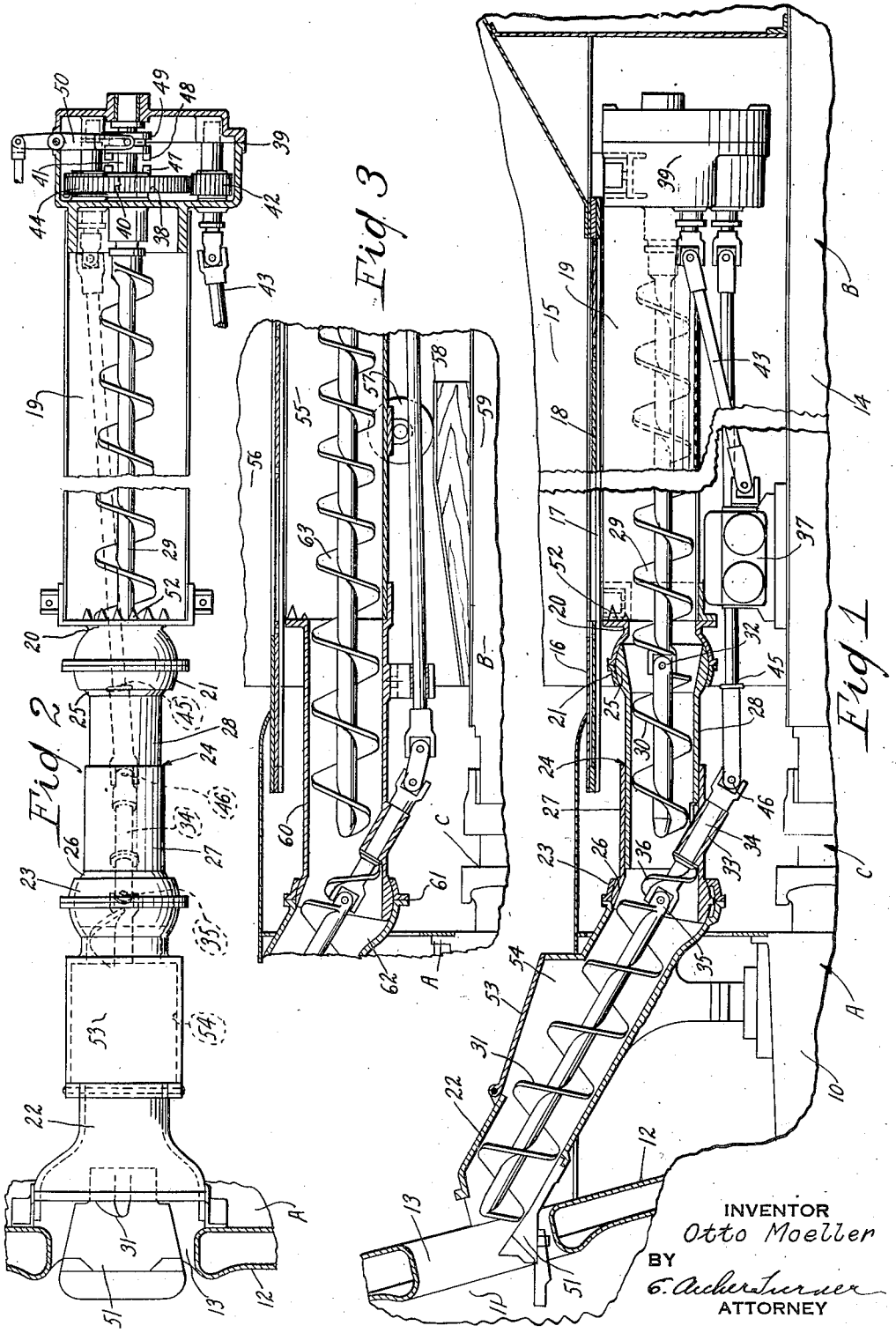


Fig 2

Fig 3

Fig 1

INVENTOR
Otto Moeller
BY
E. Ackerson
ATTORNEY

Patented Nov. 3, 1936 2,059,705

UNITED STATES PATENT OFFICE

2,059,705

STOKER CONVEYER

Otto Moeller, Brooklyn, N. Y., assignor to The Standard Stoker Company, Incorporated, a corporation of Delaware

Application May 4, 1935, Serial No. 19,769

5 Claims. (Cl. 198—15)

My invention relates generally to a conveying system and its driving arrangement and more specifically to a conveying system and drive arrangement including a pair of communicating conduits having a separate conveying screw in each and driving means arranged for their independent operation.

It is an object of the invention to provide, in mechanism of the type described, for relative movement of one conduit with respect to the other about a flexible connection at their adjacent ends, at the same time permitting a shaft for operating the screw in one conduit to pass through the wall of the other conduit, the shaft and screw remaining in operative relation irrespective of the relative movement between the conduits.

Another object is the provision of a specific embodiment of the invention as above wherein the adjacent ends of the conduits are in endwise communication.

Another object of the invention resides in the provision, in stoker mechanism for application to a locomotive and tender, of a novel and practical conveying system and driving arrangement therefor.

To the above and other ends the invention consists in the arrangement of parts and in their relation and association one with the other or in combination as hereinafter described and as illustrated in the accompanying drawing, in which,

Fig. 1 is a vertical medial section through adjacent portions of a locomotive and tender with a stoker embodying the invention applied thereto, parts of the stoker being shown in vertical medial section with other parts shown in side elevation;

Fig. 2 is a plan view of the stoker and driving mechanism illustrated in Fig. 1, as applied to a locomotive backhead shown in section; and

Fig. 3 is a vertical medial section through adjacent portions of a locomotive and tender with a modified form of the invention applied thereto and shown in vertical medial section.

Referring to the drawing, a locomotive is indicated generally at A, a tender at B, and coupling means connecting the two in the usual manner, at C. The locomotive is provided with a frame 10, a firebox 11 having a boiler backwall 12 with a firing opening 13 therein. The tender includes a frame 14, a fuel bin 15 having a floor 16 provided with a longitudinal centrally located opening 17, and a plurality of slidably mounted plates 18 normally closing the opening 17 and which may be moved from covering position to regulate the delivery of fuel from the bin 15.

In the preferred form of the invention, illustrated in Figures 1 and 2, an open mouth trough 19 is rigidly mounted on the tender beneath the bin 15 and is arranged to receive fuel therefrom through the opening 17. The forward end of the trough 19 terminates in a tubular extension 20 which includes a spherical split clamp 21.

A riser conduit 22 is rigidly mounted on the locomotive and communicates at its discharge end with the lower portion of the firing opening 13. At its lower or receiving end, the riser conduit 22 is provided with a spherical split clamp 23. An intermediate conduit 24 forming with the trough 19 and its extension 20 a transfer section for passing fuel from the tender to the locomotive, carries at its rearward end a ball member 25 arranged to be received in the spherical clamp 21 forming a flexible connection and carries at its forward end a ball member 26 arranged to be received in the spherical clamp 23 forming a flexible connection. The intermediate conduit 24 comprises the telescopically related sections 27 and 28 to permit relative longitudinal movement between the locomotive and tender.

Fuel is advanced through the trough 19 and conduits 24 and 22 by a screw conveying system including a screw 29 mounted in the trough 19, a screw 30 mounted in the intermediate conduit 24 and a screw 31 mounted in the riser conduit 22. The screws 29 and 30 are universally connected as at 32 within the flexible connection between the trough and intermediate conduit. At its forward end the screw 30 terminates a distance rearward of the flexible connection between the riser and intermediate conduits.

A bearing 33 is formed in the bottom wall of the section 27 of the intermediate conduit 24. Mounted in the bearing 33 and extending from a point without the intermediate conduit to a point within is a shaft 34. This shaft 34 is universally connected as at 35 with the lower rearward end of the screw 31 within the flexible connection between the intermediate and riser conduits. That portion of the shaft 34 within the intermediate conduit is preferably provided with a screw flight 36 to assist in advancing fuel.

The drive means for the conveying screws of the stoker includes the prime mover 37, a gear train 38 housed within the casing 39 at the rear of the trough 19, and suitable shafting which connects the prime mover 37 with the screws 29 and 31 for operating the same. The gear train 38 comprises the main gear 40 loosely mounted on

the shaft 41 of the screw 29, a pinion gear 42 which meshes with the main gear 40 and is driven directly by the prime mover 37 through the shaft 43, and a gear 44 meshing with the main gear 40 and having operatively associated therewith the telescopic shaft 45 which is flexibly connected as at 46 with the shaft 34. On one side, the main gear 40 carries clutch teeth 47 which are normally engaged by clutch teeth 48 of the clutch member 49. The clutch member 49 is operatively mounted on the shaft 41 and slidable therealong by the shifting yoke 50 for selectively engaging or disengaging the clutch teeth 47 and 48.

In the normal operation of the device, the clutch member 49 is moved to a position causing the clutch teeth 48 to engage the clutch teeth 47, thereby operatively connecting the main gear 40 to the shaft 41. Operation of the prime mover 37 sets the entire gear train 38 in motion whereby the main gear 40 rotates the screw 29 and its connected screw 30, and the gear 44 operates the riser conduit screw 31 by means of the shafts 45 and 34. The conveying screws 29 and 30 force the fuel through the forward end of the intermediate conduit 24 into the zone of action of the flight 36 and the screw 31 which elevates the fuel to the distributing means 51 for delivery to the firebox.

At times extraneous material in the fuel will become lodged between the crusher 52 and the conveying screw 29, rendering the entire conveying mechanism inoperative. The fireman may, by shifting the clutch member 49, disengage the clutch teeth 48 from the clutch teeth 47, thereby disconnecting the shaft 41 and the conveying screws 29 and 30 from operative relation with the gear train 38. The gear train 38, however, remains in operative relation with the riser conduit screw 31 and fuel may continue to be delivered to the firebox by raising the hinged cover 53 over the hopper 54 formed in the riser conduit 22 and manually introducing fuel into the hopper 54.

In Fig. 3 is shown a modified form of the invention wherein the trough 55 is movably mounted on the tender beneath the fuel bin 56. Movement of the trough 55 incident to the relative movements of the locomotive and tender is provided for in part by mounting the trough upon rollers 57 which rest upon track elements 58 supported from the frame 59 of the tender and extend longitudinally thereof. A tubular conduit 60 communicates with and extends forwardly from the trough 55 to the locomotive and is flexibly connected at its forward end, as at 61, with the lower or receiving end of a riser conduit 62. Fuel is advanced through the trough 55 and its tubular extension 60 by a conveyer screw 63 which terminates at its forward end a distance rearward of the flexible connection 61. In other respects the device is the same as the preferred form of construction and the description thereof need not be repeated.

I claim:

1. In a conveying system including a conduit having a material discharge portion and a portion for advancing material to the receiving end of said discharge portion, said conduit portions being flexibly connected for relative movement therebetween and being in endwise communication, a conveying screw in said material discharge portion and a conveying screw in said material advancing portion, said last named screw being free at its forward end and spaced apart from the rearward end of said first named conveying screw, a motor for operating said screws, shafting operatively connecting said motor with the conveying screw in the material advancing portion of said conduit and shafting extending through the wall of said last named conduit portion at one end flexibly connected to the screw in the material discharge portion of said conduit adjacent the flexible connection between said conduit portions and at its other end operatively connected with said motor.

2. In a conveying system including a conduit having a material discharge portion and a portion for advancing material to the receiving end of said discharge portion, said conduit portions being flexibly connected for relative movement therebetween and being in endwise communication, a conveying screw in said material discharge portion and a conveying screw in said material advancing portion, said last named screw being free at its forward end and spaced apart from the rearward end of said first named conveying screw, a motor for operating said screws, shafting operatively connecting said motor with the conveying screw in the material advancing portion of said conduit, a bearing formed in the wall of said last named conduit portion and shafting operatively connecting the motor with the screw in the material discharge portion of said conduit including a shaft mounted in said bearing flexibly connected to the screw in said last named conduit portion adjacent the flexible connection between said conduit portions.

3. In a locomotive having a firebox and a tender having a fuel bin, a feed conduit extending between said bin and said firebox comprising a transfer section extending forwardly from beneath said bin to the locomotive and an inclined elevator section communicating in end-to-end relation with and extending upwardly and forwardly from the front end of said transfer section, said transfer section and elevator section being flexibly connected to each other at their junction for relative movement therebetween, a screw conveyer in said transfer section and a separate screw conveyer in said elevator section, a motor for operating said screws, shafting operatively connecting said motor with the conveyer screw in said transfer section and shafting operatively connecting said motor with the conveyer screw in said elevator section including a shaft flexibly connected with said last named conveyer screw and extending rearwardly through the wall of the transfer section to a point exterior thereof.

4. In a locomotive having a firebox and a tender having a fuel bin, a feed conduit extending between said bin and said firebox comprising a transfer section extending forwardly from beneath said bin to the locomotive and an inclined elevator section rigidly mounted on the locomotive communicating in end-to-end relation with and extending upwardly and forwardly from the front end of said transfer section, said transfer section and elevator section being flexibly connected to each other at their junction to permit movement of said transfer section with respect to said elevator section, a screw conveyer in said transfer section and a separate screw conveyer in said elevator section, a motor for operating said screws, shafting operatively connecting said motor with the conveyer screw in said transfer section and shafting operatively connecting said motor with the conveyer screw in said elevator section including a shaft flexibly connected with said last named conveyer screw adjacent the flexible connection between said

conduit sections and extending rearwardly through the wall of the transfer section to a point exterior thereof.

5. In a locomotive and tender, a stoker comprising a rearward conduit section on the tender, a forward conduit section on the locomotive and an intermediate conduit section, said sections being flexibly connected in end-to-end relation, a screw section in each of said conduit sections, said rearward conduit screw section and said intermediate conduit screw section being universally connected at their adjacent ends, the adjacent ends of said intermediate conduit screw section and said forward conduit screw section being free and spaced apart from each other, a motor for operating said screw sections, shafting operatively connecting said motor with the rearward conduit screw section for operating said rearward and intermediate conduit screw sections and shafting operatively connecting said motor with said forward conduit screw section including a shaft flexibly connected with said last named screw section adjacent the flexible connection between said intermediate and forward conduit sections and extending downwardly and rearwardly through the wall of said intermediate conduit section to a point exterior thereof.

OTTO MOELLER.