No. 885,730. PATENTED APR. 28, 1908.

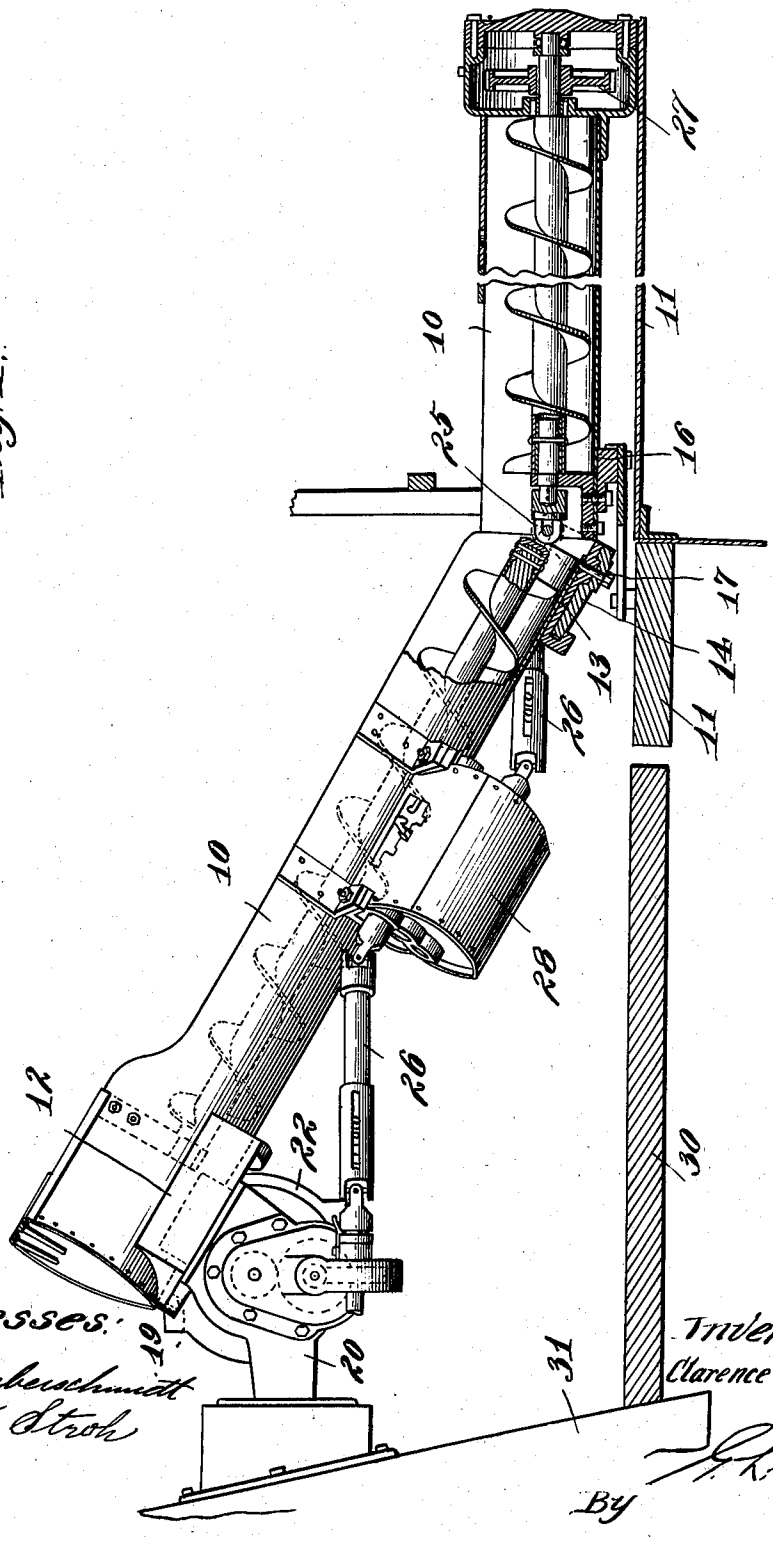
C. W. CROSBY.

CONVEYING MECHANISM.

APPLICATION FILED FEB. 4, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
G. A. Pauberschmidt
Leon E. Stroh

Inventor:
Clarence W. Crosby
By F. K. Gregg
Atty

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3 SHEETS—SHEET 2.

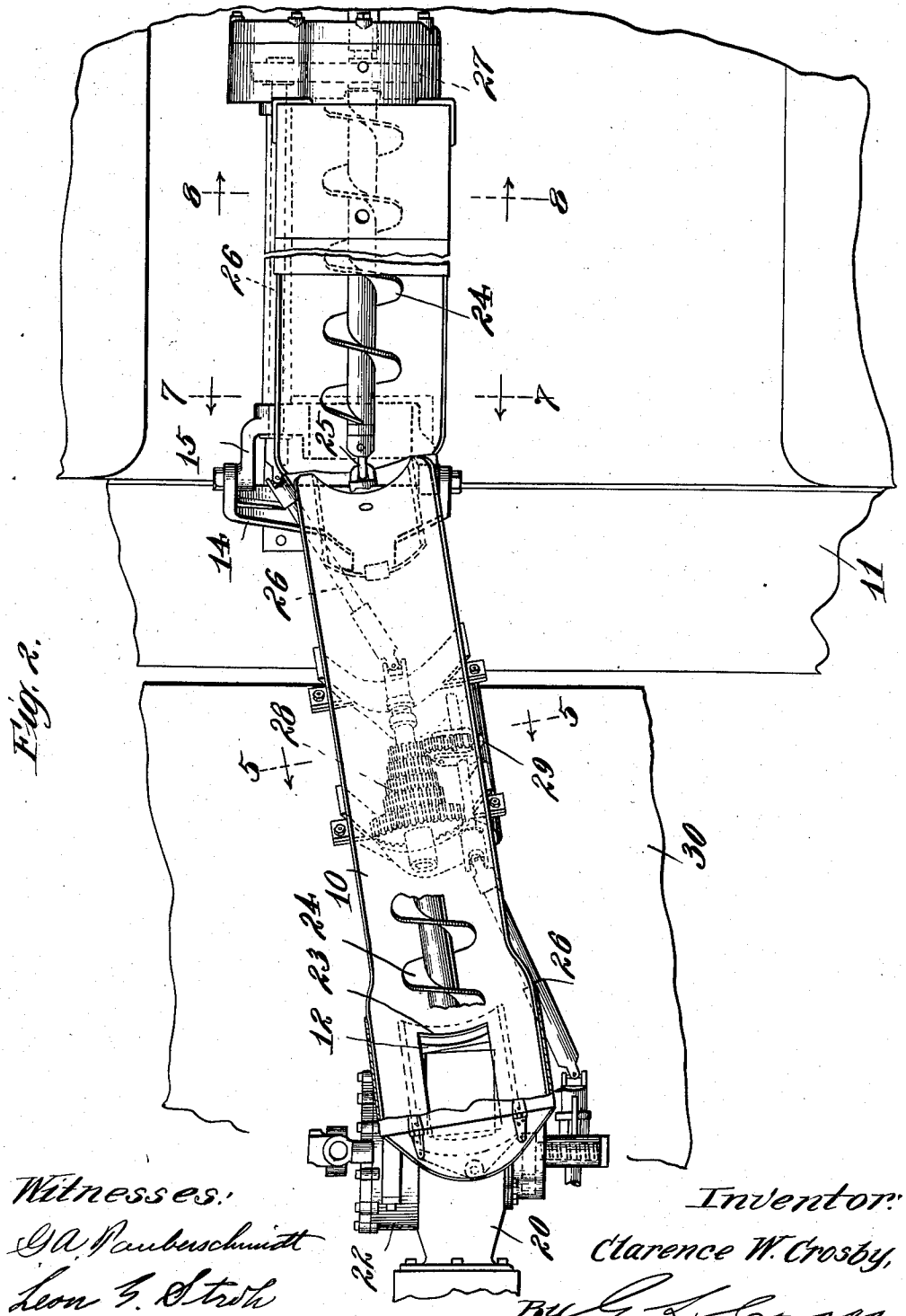


Fig. 2.

Witnesses:
G. A. Pauberschmidt
Leon E. Stroh

Inventor:
Clarence W. Crosby,
By G. L. Gregg
Atty

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3 SHEETS—SHEET 3.

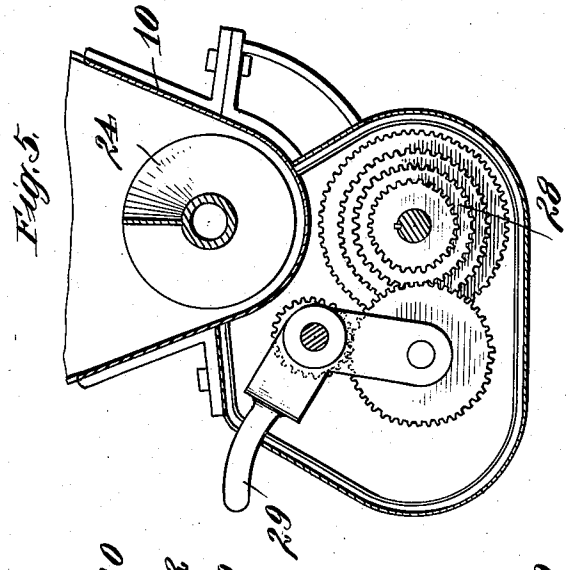


Fig. 5.

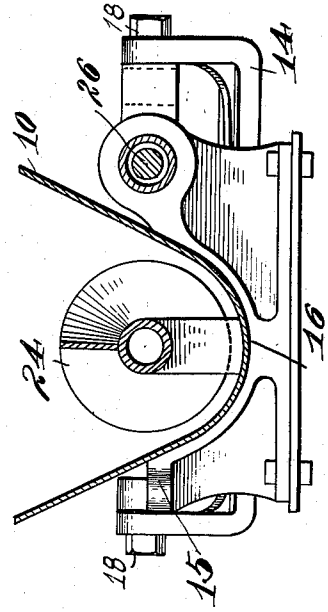


Fig. 7.

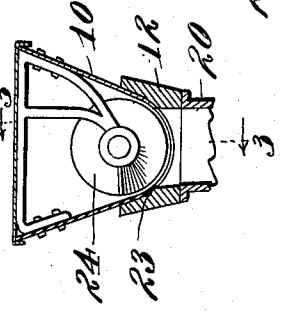


Fig. 4.

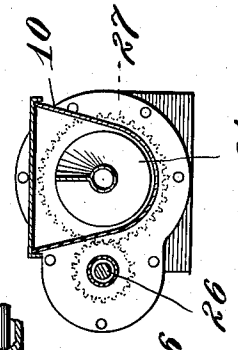


Fig. 8.

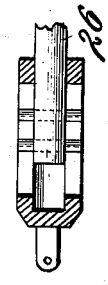


Fig. 9.

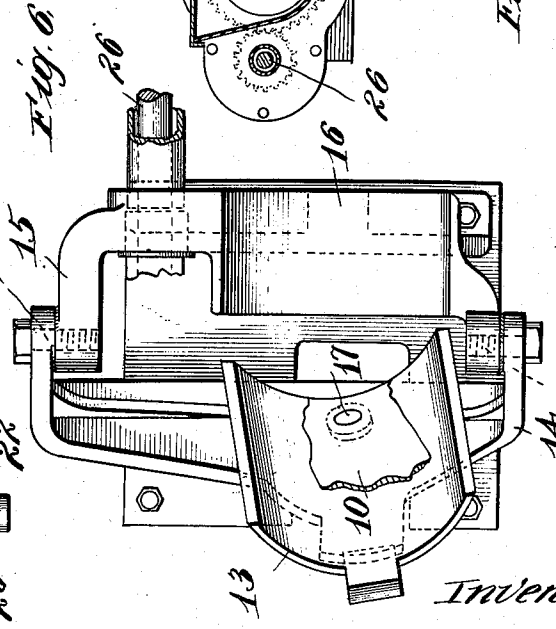


Fig. 6.

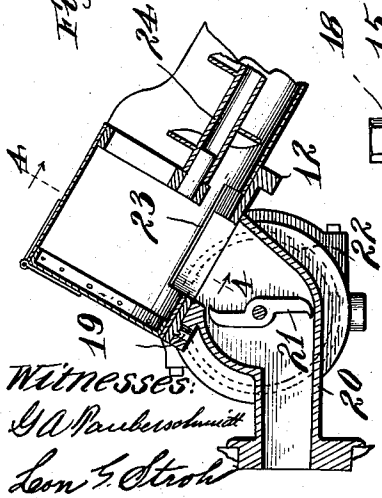


Fig. 3.

Witnesses:
G. A. Rauberschmidt
Leon E. Stroh

Inventor:
Clarence W. Crosby,
By G. L. Grigg
Atty

UNITED STATES PATENT OFFICE.

CLARENCE W. CROSBY, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL STOKER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF SOUTH DAKOTA.

CONVEYING MECHANISM.

No. 885,730. Specification of Letters Patent. Patented April 28, 1908.

Application filed February 4, 1907. Serial No. 355,565.

To all whom it may concern:

Be it known that I, CLARENCE W. CROSBY, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Conveying Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to conveying mechanism of the type disclosed in my United States Patent No. 797,100, issued August 15, 1905, my invention being an improvement upon the general class of conveyers shown in my said patent. The conveyer of my present invention is designed particularly for use in connection with locomotives and is employed for transferring fuel from locomotive tenders to the locomotive fire boxes.

While the apparatus of my invention is of principal utility in connection with locomotives, and while the invention is most generally realized in connection with locomotives and their tenders, I do not wish to be limited altogether to this embodiment and adaptation of my invention.

In the device of my aforesaid patent, I employ a conveyer tube containing universally jointed sections of a conveying screw and adapted to hold fuel being conveyed from the fuel box to the locomotive fire box, but have found the construction as set forth in said patent, is not best adapted to locomotive practice, and I, therefore, in the preferred embodiment, form the conveyer tube or trough in universally jointed sections, one section being stationarily mounted upon the tender, while the companion section extends from the tender to the fire box of the locomotive. By reason of the universal joint between the sections of the conveyer trough or tube, the locomotive and tender may oscillate or rock in passing over rough or curved tracks, without impairing the said trough. I have further found in practice that the device of my aforesaid patent is not best adapted to locomotive practice, for the further reason that the locomotive and tender have violent movement longitudinally with respect to each other, owing to the considerable lost motion in the couplers uniting the locomotive and tender. I overcome this difficulty by permitting the trough to move longitudinally with respect to one of its supports, preferably that support which positions the trough in front of the boiler door, to which end I desirably construct this support of sufficient length and with a hole of sufficient size, so that, notwithstanding the degrees of relative movement between the locomotive and tender, the hole in said trough support is always in position to have the fuel discharged from the trough through the hole into the fire box of the boiler. I employ an injector where the fuel finds passage into the fire box, which injector is operated by a suitable prime mover, and, in accordance with another feature of my invention, I drive the conveying screw that is located in the conveyer trough, by means of flexible shafting that is interposed between this prime mover and the tail of the conveying screw. In this way, power is applied to the conveying screw at its rear end (which is preferred practice) without the necessity of employing an additional prime mover, and, in order that the rate of operation of the conveying screw may be regulated without modifying the speed of the prime mover, I employ a speed changing gear in the flexible shafting.

I will explain my invention more fully by reference to the accompanying drawing, showing the preferred embodiment thereof, in which—

Figure 1 is a view in side elevation, partially in section, of conveying mechanism constructed in accordance with the preferred embodiment of the invention, said conveying mechanism being disposed upon the decks of the locomotive and its tender. Fig. 2 is a plan view of certain of the parts shown in Fig. 1, some of the parts being broken away and removed in order that certain of the characteristics of the structure may be more clearly revealed. Fig. 3 is a sectional view on line 3 3 of Fig. 4. Fig. 4 is a sectional view on line 4 4 of Fig. 3. Fig. 5 is a sectional view on line 5 5 of Fig. 2. Fig. 6 is a plan view illustrating the trough supports that constitute the universal joint for the trough. Fig. 7 is a sectional view on line 7 7 of Fig. 2. Fig. 8 is a cross-sectional view on line 8 8 of Fig. 2. Fig. 9 is a detail showing the manner of connecting sections of the flexible shafting interposed between the prime mover and the tail of the conveying screw.

Like parts are indicated by similar char-

acters of reference throughout the different figures.

The conveyer trough 10 is desirably of the shape indicated, this trough being formed in two sections, the rear and horizontal section being desirably stationarily mounted upon the deck 11 of the locomotive tender, this section of the trough extending into the fuel bunker of the tender. The forward section of the conveying trough is carried at its upper end in a saddle 12, as will more fully appear, and at its lower end in a saddle 13 that is pivotally mounted upon a yoke 14, which is journaled upon a yoke 15 that is adapted to directly support the stationary section of the trough at 16.

Fig. 6 shows in detail the elements 13, 14, 15 and 16, a fragmentary section of the trough 10 being shown disposed within the saddle 13.

As shown in Fig. 1, the saddle 13 is desirably lipped at its upper end to afford a groove to engage the upper end of the yoke 14, so that while the saddle may rotate about the pivot 17, the directions of the saddle and the contiguous portion of the yoke are maintained parallel and the pivotal bolt 17 is prevented from receiving undue stress. It will be seen that the inclined section of the conveyer trough is adapted to turn about the pivotal bolt 17, furnishing one axis of rotation, and is also adapted to turn about the stud shafts 18, arranged in the ends of the yoke 14 transversely to the bolt 17, and furnishing an axis of rotation for the tilted member of the conveying trough that is angular to the axis of rotation furnished by the bolt 17. In this way, a universal joint of one form is constituted, that is, the joint thus formed affords motion sufficiently universal for the slanting section of the trough to fulfil the purpose of my invention. The lower end of the slanting section of the conveying trough being supported as it is upon the tender, the upper section is desirably supported upon the saddle 12, that is pivotally mounted at 19 upon the housing 20 of the fuel injector. The pivotal mounting 19 permits the upper end of the slanted section of the conveying trough to oscillate as relative lateral movements between the locomotive and tender occur, while, in order to compensate for relative longitudinal movements of the locomotive and tender, due to lost motion in the coupler that unites said locomotive and tender, the slanting section of the conveying trough is permitted to slide in said saddle 12, this being the preferred mechanism for permitting a sliding relation between the conveyer trough and its mounting to compensate for the lost motion at the coupler. A passage for fuel is afforded through the housing 20, which passage desirably communicates with an opening in the door of the fire box of a locomotive boiler, and through which passage fuel may be thrust into the said fire box, by means of the injector blades 21 that are rotated by a suitable prime mover 22. An opening is provided in the saddle 12, through which fuel is received from the trough, and an opening 23 is provided in said trough, which is longer than the corresponding opening in the saddle 12, so that the passage into the housing 20 need not be restricted, owing to the reciprocation of the slanting section of the conveyer trough. The conveying screw 24 is divided into sections, one for each section of the conveyer trough, which screw sections are universally jointed or hinged at 25.

By the construction thus far specifically described, it will be seen that no matter what may be the relative movements between the locomotive and tender, the conveyer trough always adapts itself to said movements, and the universal joint between the sections of the conveying screw being in line with the axis of rotation furnished by the shafts 18, there is no material relative longitudinal movement between the slanting section of the conveyer trough and the section of the conveying screw located therein, the said sections of trough and conveying screw maintaining proper relative positions, irrespective of the relative movements between the locomotive and tender. It is desirable to operate the conveying screw by applying driving force to the tail thereof, to which end I interpose shafting formed of universally jointed sections 26, between the prime mover 22 and gearing 27 housed at the tail of the screw and there connected with the screw. It is desirable to employ a constant speed prime mover for operating the injector blades 21, and, in order that the rate at which the fuel is fed may be regulated, I include in the flexible shafting interposed between the prime mover and the tail of the shaft, a suitable form of changeable speed gear 28 including a suitable speed change lever 29. As the speed change gear illustrated is of a well known type, I do not deem a detailed description thereof to be essential.

In order that longitudinal movement between the locomotive and its tender and the motions of the locomotive in rounding curves may be compensated for in the flexible shafting, the two forward sections 26 of said shafting are preferably formed in sub-sections united as indicated in Fig. 9. Referring to Fig. 1, the upper section 26 is thus formed in sub-sections to compensate for relative longitudinal movements between the locomotive and tender, while the next and lower section 26 is thus formed in sub-sections to compensate for the movements of the locomotive in rounding curves.

I have not deemed it necessary to illustrate the locomotive and its tender completely, having deemed it sufficient to show the deck 11 of the tender and the deck 30 of the loco-

motive and the rear boiler head 31 of the locomotive, through which boiler head fuel is to be injected by way of the housing 20.

I use the term "trough" herein in the sense of any suitable conveying passage. I use the term "tender" herein in the sense of a fuel vehicle that is separately formed from the locomotive, for if the locomotive itself carried its fuel, there would be no need for some of the features of my present invention. In the claims, therefor, the term "tender" is used in the sense of a separate vehicle that is coupled to the locomotive.

It is obvious that changes may readily be made in the preferred embodiment of my invention shown and specifically described, without departing from the spirit of my invention, and I do not, therefore, wish to be limited to the precise construction illustrated, but,

Having thus described my invention, I claim as new and desire to secure by Letters-Patent:—

1. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it is slidable.

2. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a flexible support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it has pivotal connection.

3. The combination with two vehicles in the form of a locomotive and tender, of a conveyer pivotally connected with one vehicle for transferring fuel from the tender to the locomotive fire box, said conveyer having a support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it is slidable.

4. The combination with two vehicles in the form of a locomotive and tender, of a conveyer supported upon both locomotive and tender for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles.

5. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender having flexible connection with the locomotive fire box.

6. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles and a support upon the other vehicle, with respect to which it is slidable.

7. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with respect to which it is slidable.

8. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles and a support upon the other vehicle, with which it has pivotal connection.

9. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with which it has pivotal connection.

10. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles and a support upon the other vehicle, with respect to which it is slidable.

11. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with respect to which it is slidable and pivotal.

12. The combination with two vehicles in the form of a locomotive and tender, of a conveyer supported upon both locomotive and tender for transferring fuel from the tender to the locomotive fire box, said conveyer having flexible connection with the locomotive fire box.

13. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer including a conveying trough formed of universally jointed sections, and having flexible connection with the fire box of the locomotive, and a conveying screw within said trough, formed of universally jointed sections.

14. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer including a conveying trough formed of universally jointed sections, and having flexible connection with the fire box of the locomotive.

15. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a support upon one vehicle and a second sup-

port upon the other vehicle, with respect to which latter support it has pivotal connection and is slidable.

16. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer being carried by both the locomotive and tender and being movable with respect to its supports upon the locomotive and tender as the locomotive and tender move relatively.

17. Conveying mechanism including a conveying trough formed of relatively movable sections, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, and flexible shafting for operating the conveyer, forming power connection between said prime mover and the tail of the conveyer.

18. Conveying mechanism including a conveying trough, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, and power transmission mechanism for operating the conveyer, forming power connection between said prime mover and the tail of the conveyer.

19. Conveying mechanism including a conveying trough, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, power transmission mechanism for operating the conveyer, forming power connection between said prime mover and the tail of the conveyer, and speed changing mechanism included in said power transmission mechanism.

20. Conveying mechanism including a conveying trough formed of relatively movable sections, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, flexible shafting for operating the conveyer, forming power connection between said prime mover and the tail of the conveyer, and speed changing gearing included in the shafting that extends to the tail of the conveyer.

21. Conveying mechanism including a conveying trough, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, power transmission mechanism in connection with the prime mover, for operating the conveyer, and speed changing mechanism included in said power transmission mechanism.

22. Conveying mechanism including a conveying trough formed of relatively movable sections, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, and flexible shafting for operating the conveyer, forming power connection between said prime mover and the conveyer.

23. Conveying mechanism including a conveying trough formed of relatively movable sections, an injector at the discharge end of the trough, a prime mover in driving connection with said injector, flexible shafting for operating the conveyer, forming power connection between said prime mover and the conveyer, and speed changing mechanism included in said shafting.

24. The combination with two vehicles in the form of a locomotive and tender, of a conveyer for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it has pivotal connection and is slidable.

25. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it is slidable.

26. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal support upon one vehicle and a second support upon the other vehicle, with respect to which latter support it has pivotal connection.

27. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough, having flexible connection with the fire box of the locomotive, and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles.

28. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough, having flexible connection with the fire box of the locomotive, and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender.

29. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and having flexible connection with the locomotive fire box.

30. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with respect to which it is slidable.

31. The combination with two vehicles in the form of a locomotive and tender, of a con-

veyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles and a support upon the other vehicle, with which it has pivotal connection.

32. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with which it has pivotal connection.

33. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon one of said vehicles and a support upon the other vehicle, with respect to which it is slidable.

34. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer having a universal mounting upon the tender and a support upon the locomotive, with respect to which it is slidable and pivotal.

35. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough, having flexible connection with the fire box of the locomotive, and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer including a conveying trough formed of universally jointed sections, and a conveying screw within said trough formed of universally jointed sections.

36. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough, having flexible connection with the fire box of the locomotive, and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer including a conveying trough formed of universally jointed sections.

37. The combination with two vehicles in the form of a locomotive and tender, of a conveyer, including a trough and feeding screw, for transferring fuel from the tender to the locomotive fire box, said conveyer being carried by both the locomotive and tender and being movable with respect to its supports upon the locomotive and tender as the locomotive and tender move relatively.

38. The combination with two vehicles in the form of a locomotive and tender, of a conveyer supported upon both locomotive and tender for transferring fuel from the tender to the locomotive fire box, said conveyer being adapted to have movement with respect to the tender and having flexible connection with the locomotive fire box, whereby the conveyer may adapt itself to all relative positions of the tender and locomotive in travel.

In witness whereof, I hereunto subscribe my name this 21st day of January A. D. 1907.

CLARENCE W. CROSBY.

Witnesses:
G. L. CRAGG,
LEON G. STROH.