

June 21, 1938.

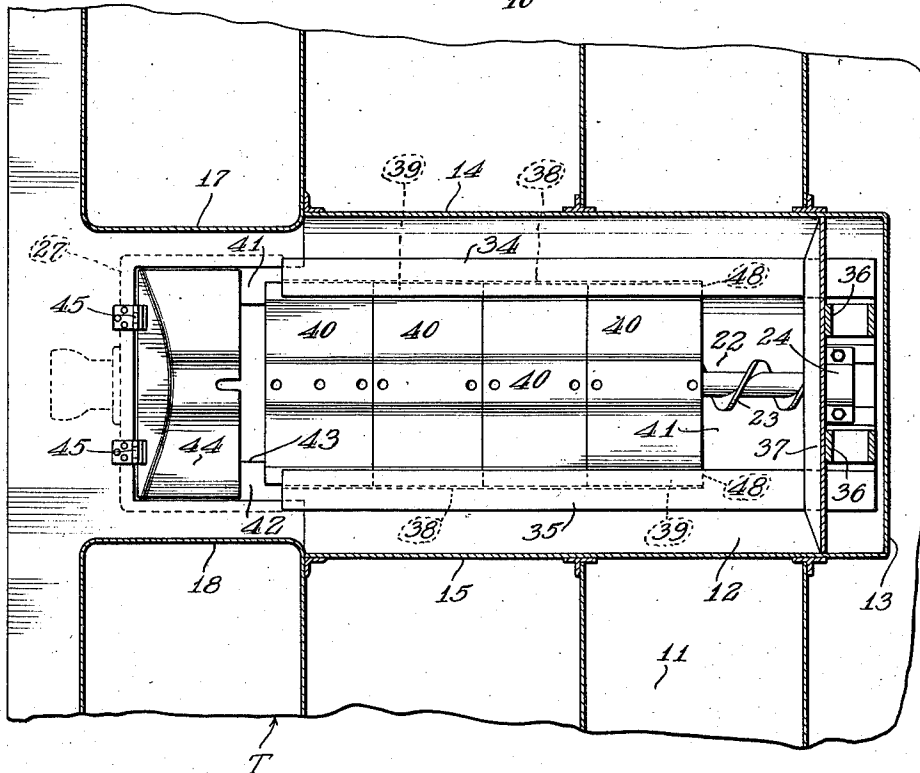
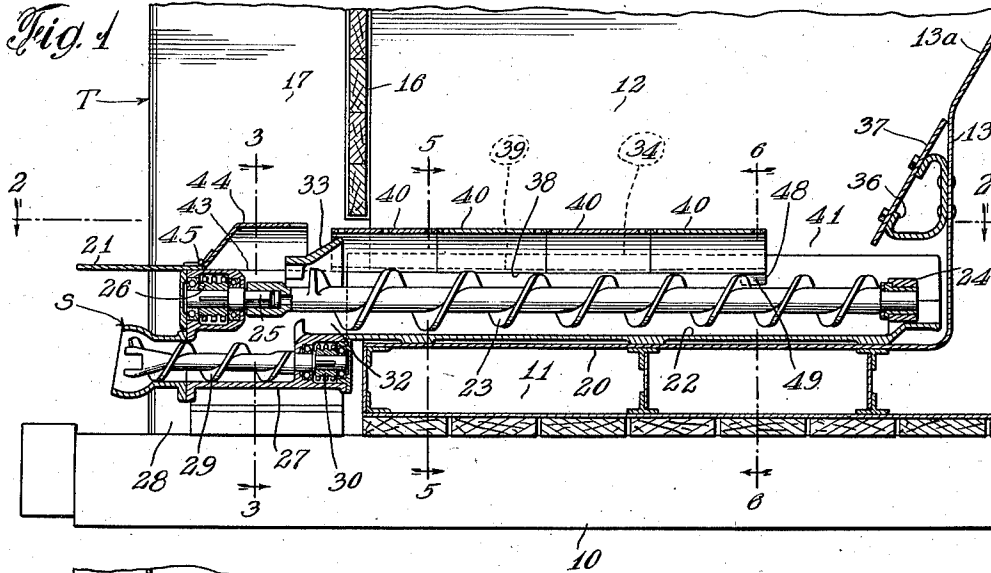
F. P. ROESCH

2,121,328

LOCOMOTIVE TENDER

Filed May 19, 1936

2 Sheets-Sheet 1



INVENTOR.  
*Frank P. Roesch*  
BY *Turner, Suddox Moeller*  
ATTORNEYS

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2 Sheets-Sheet 2

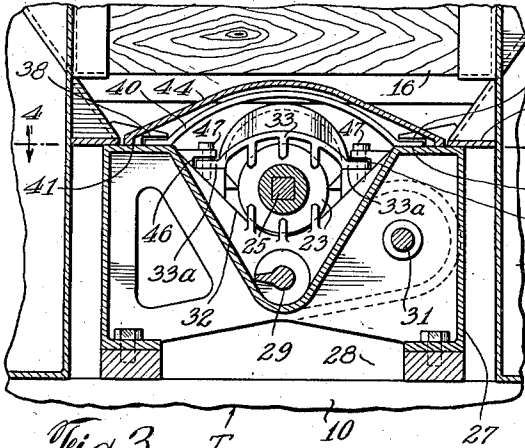


Fig. 3

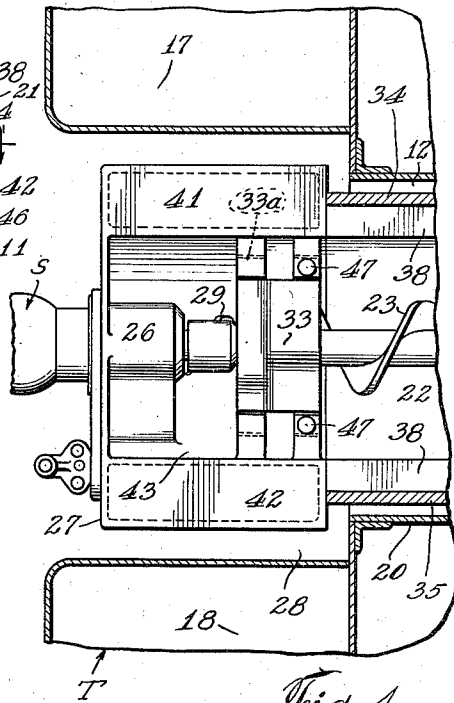


Fig. 4

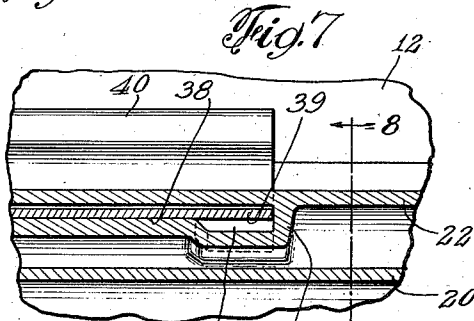


Fig. 7

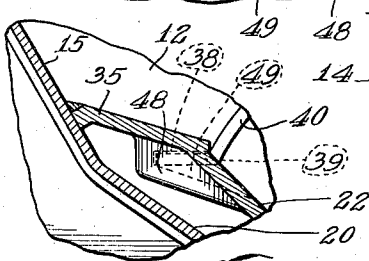


Fig. 8

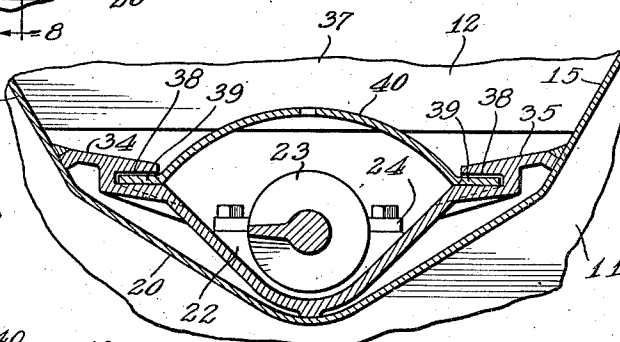


Fig. 5

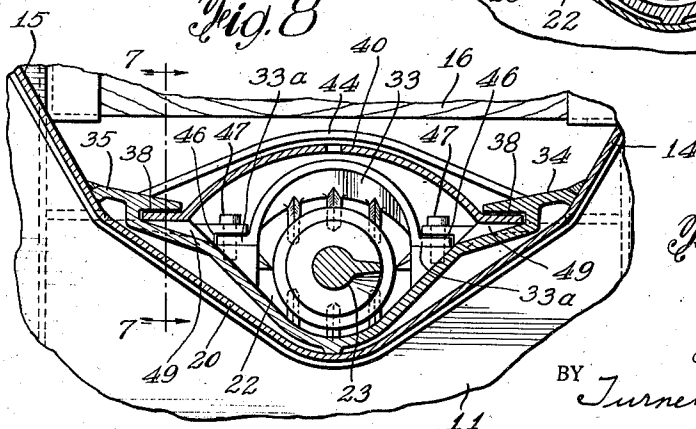


Fig. 6

INVENTOR.  
Frank P. Roesch  
BY Turner, Sundry & Moeller  
ATTORNEYS

## UNITED STATES PATENT OFFICE

2,121,328

## LOCOMOTIVE TENDER

Frank P. Roesch, Chicago, Ill., assignor, by  
mesne assignments, to The Standard Stoker  
Company, Inc., New York, N. Y., a corpora-  
tion of Delaware

Application May 19, 1936, Serial No. 80,518

14 Claims. (Cl. 105—234)

This invention relates to locomotive tenders and seeks to improve the construction and operation of tenders which employ conveying means for urging fuel, such as coal, from the fuel bin toward the locomotive.

In the United States Letters Patent 1,724,593, granted August 13, 1929, to Andrew M. Hunt, a locomotive tender is shown having embodied therein a means for urging coal toward the locomotive. This means includes a trough housing a conveyor screw, the illustrated arrangement being of approved construction and its commercial use is extensive. The flow of coal from the bin to the trough, in such arrangements, is controlled by a series of slidable plates mounted over the open mouth of the trough. As evident from the disclosure of the patent, the slidable plates are arranged to be moved forward for permitting passage of coal into the trough as the supply diminishes.

It is the practice, in the railroad industry, to replenish the coal supply prior to complete depletion of the fuel bin. The zone of coal at the rear of the bin seldom enters the stoker trough and therefore rests upon the steel sheets forming the rearward portion of the fuel bin.

Because of this condition, the steel sheets forming the rear portion of the fuel bin become corroded, necessitating their frequent removal and replacement. Furthermore, coal which is dormant for a long period deteriorates in quality through "weathering" and is consequently of little fuel value.

In emergencies, it is sometimes necessary to utilize all the coal in the fuel bin. To do this, the stoker operator usually employed a pick to loosen the zone of dormant coal at the rear portion of the bin. This manual operation is arduous, time consuming and dangerous.

Accordingly, it is the main object of this invention to improve locomotive tenders of the character specified by an arrangement of parts whereby the coal will not remain dormant for long periods upon the sheets of the fuel bin.

Specifically, the invention contemplates a novel arrangement of slidable plates over the stoker trough which permits the primary feed of coal from the bin into the trough to occur from the rearmost zone of the bin.

Other objects reside in specific details of construction which permit free sliding movement of the plates, and their ready removal from and insertion within the guideways thereof.

Further objects and the advantages of this invention over past practice will become apparent

as the following description is read in connection with the accompanying drawings, wherein,

Fig. 1 is a central vertical longitudinal section through the forward portion of a locomotive tender, illustrating the invention in similar section;

Fig. 2 is a plan view taken on the line 2—2 of the structure illustrated in Fig. 1;

Fig. 3 is a view in section taken along line 3—3 of Fig. 1;

Fig. 4 is a sectional view in plan taken along line 4—4 of Fig. 3;

Figs. 5 and 6 are sectional views taken on lines 5—5 and 6—6, respectively, of Fig. 1;

Fig. 7 is a fragmentary sectional view taken on line 7—7 of Fig. 6; and

Fig. 8 is a fragmentary sectional view taken along line 8—8 of Fig. 7.

On these drawings, the tender is indicated by T and comprises a base frame 10 on which is supported a water tank 11 having a fuel bin 12 formed in its forward portion. The fuel bin 12 is defined by a rear sheet 13, the side sloping sheets 14, 15 and the coal gate 16 which extends between bulkheads 17, 18 at the front of the tender. In its bottom the fuel bin 12 is separated from the water compartment 19 by a steel sheet 20, the opposite sides of the latter joining the lower edges of respective side sloping sheets 14, 15. The sheet 20 is depressed below the plane of the tender deck plate 21 and receives a trough 22 of a stoker conveying mechanism S.

The stoker conveying mechanism comprises the trough 22 in which is mounted a conveyor screw 23 having its rearward end journaled in a removable bearing 24 and operably connected at its forward end with a shaft 25 driven by transmission gearing 26 carried by the terminal member 27. Terminal member 27 is mounted in an alcove 28 formed at the front end of the tender below the plane of the deck plate 21 and houses a conveyor screw 29 which is disposed adjacent the trough conveyor screw 23 to receive fuel therefrom for delivery toward the locomotive. Transmission gearing 30 is carried by the terminal member 27 for driving the conveyor screw 29 from its rearward end; the gearings 26, 30 are each operatively connected with a power actuated shaft 31. At its upper rearward portion 32, the terminal member 27 constitutes a forward extension of the trough 22 and is in abutting relation with the forward end of said trough 22 at a point within the alcove 28. The upper rearward portion 32 of the terminal member 27 supports a crusher 33 which arches over

the conveyor screw 23 and is disposed in a plane below and forward of the coal gate 16.

The trough 22 is seated upon the bottom sheet 20 and is provided with laterally extending flanges 34, 35, one at each side of the upper marginal edge of the trough. Flanges 34, 35 extend from the forward end of the trough 22 rearwardly to the rear sheet 13 and are secured, by means of welding, to the lower portions of the respective side sloping sheets 14, 15. The rear sheet 13 carries brackets 33 on which is mounted a guide plate 37 inclined at approximately the same angle as the sloping portion 13a of the sheet 13 and arranged with its lower end spaced slightly forward of the conveyor screw bearing 24. This construction assures that coal in the rearward zone of the fuel bin 12 will fall onto the conveying flight of the screw 23 and not upon the bearing 24 or in the space immediately at the rear thereof.

In approximately the plane of the deck plate 21, the trough flanges 34, 35 are each provided with a runway 38 within which are mounted the flat sides 39 of plates 40. The plates 40 are arranged in a series, and extend from a point slightly forward of the coal gate 16 rearwardly toward the downwardly sloping guide plate 37 but terminate short thereof a distance sufficient to form an opening 41 for the preliminary feed of coal into the rearward portion of the trough 22. In the present embodiment, the plates 40 are bowed upwardly a sufficient distance above the trough conveyor screw 23 to permit conveyance of lump coal therebeneath and into the zone of action of the crusher 33, the latter being disposed below the plates 40 for the purpose which will be hereinafter set forth.

Forward of the trough flanges 34, 35, the terminal member 27 is provided with flat table-like surfaces 41, 42, respectively, which are in approximate horizontal alignment with the bottom surface of each runway 38. These flat table-like surfaces 41, 42 extend along each side of the upwardly opened mouth 43 of the terminal member 27 and serve to support the deck plate 21 and the hood 44, the latter being mounted over the mouth 43 and hinged as at 45 to the deck plate 21. The hinged hood 44 is so shaped that the foremost fuel control plate 40 may be moved thereunder, the flat sides of which rest upon the flat table-like surfaces 41, 42 of the terminal member 27. By swinging the hood 44 about its hinge 45, each plate 40, when moved to a position forward of the runways 38 may be removed, or, insertion of the plates 40 into the runways may be accomplished placing each over the open mouth 43 of the terminal member and moving each plate rearwardly to an engaging relation with the runways 38.

The described construction is also of utility in maintaining the screw 23 in good working condition. When the screw 23 becomes worn to an extent requiring its removal from the trough 22 for purposes of repair or replacement, the hinged hood 44 is swung open and the plates 40 are each moved forwardly to a position directly over the open mouth 43 of the terminal member 27 and removed.

The crusher 33 is also removable from its position over the screw 23 since the crusher 33 is provided with foot members 33a disposed along each side thereof for engaging the grooves 46 formed in the terminal member 27, whereby upward movement of the crusher is normally prevented. Pins such as 47, passing through one

set of oppositely arranged foot members 33a and into the terminal member 27, normally prevent fore and aft movement of said crusher. Upon removal of pins 47, the crusher 33 may be moved to the left a distance sufficient to cause the foot member 33a thereof to disengage the grooves 46, whereupon, the crusher may be removed by lifting the same vertically.

The conveyor screw 23 may then be removed from the trough 22 by loosening the bolts of the bearing 24, permitting rearward movement of the screw 23 and bearing 24 a distance sufficient to cause the screw 23 to become disengaged from driving relation with the shaft 25. As apparent from Figs. 1 and 4, the crusher 33 may also be removed from its position over the screw 23 when the plates 40 are in the relation shown in Fig. 1. This is accomplished by disposing the crusher 33 slightly to the left of the coal gate 16 and by providing an overlapping relation between the first plate 40 and the crusher 33 which is less than the distance required to move the crusher leftward for disengaging the latter from the grooves 46.

The opening 41 for the preliminary feed of coal into the rearward portion of the trough 22 is maintained by the provision of means for limiting rearward movement of the plates 40 from the position shown in Figs. 1 and 2. This limiting means is formed by a wall 48 at each end of runway 38 of the flanges 34, 35 and against which wall the ends of the flat sides 39 of the rearmost plate 40 are arranged to abut. Extending forwardly from this wall 48 is a pocket 49 which opens inwardly into the trough 22 and permits passage into the trough 22 of any coal dust which may accumulate between the flat sides 39 of the rearmost plate 40 and the wall 48. It will be readily understood that such accumulation of coal dust would prevent the rearward movement of the plates 40 to the position shown in Figs. 1 and 2.

In operation, assuming the fuel bin 12 to be filled with coal and the plates 40 in the position as shown in Figs. 1 and 2, the coal passing into the trough 22 through the preliminary feed opening 41, is conveyed forwardly by the screw 23 which cooperates with the crusher 33 to reduce large lumps of fuel to a size more suitable for efficient firing. The crushed coal drops onto the subjacent conveyor screw 29 for delivery toward the locomotive. It will be apparent that the preliminary feed opening 41 controls the flow of a considerable zone of coal into the trough 22; consequently, the coal adjacent the coal gate 16 will be available, for a greater period than heretofore has been possible, as an emergency supply which may be fed manually into the locomotive firebox during periods when the stoker mechanism is not in operation for any reason.

Upon depletion of the coal supply in the zone adjacent the opening 41, the stoker operator draws forwardly the foremost plate 40 to a position underneath the hinged hood 44, thereby creating a secondary fuel feed opening immediately rearward of the coal gate 16. The plates 40 are each moved forward successively as the fuel supply is depleted rearward of the coal gate 16. Any reserve of fuel remaining above the plates 40 will be in the form of a ridge extending transversely between the side sheets 14, 15, and since this ridge is unsupported at its forward or rearward sides, this ridge will be broken down and mixed with additional coal supplied to the bin 12 when replenishment thereof is necessary.

From the foregoing, it will be apparent to those skilled in the art that by the present invention, coal will not remain for long periods at any point of the bin 12; consequently there will be very little "weathering" of coal and deterioration of the steel sheets of the fuel bin. Furthermore, the construction is such that a supply of coal adjacent the coal gate 16 is available to the stoker operator for greater periods than possible heretofore.

I claim:

1. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, a conveyor arranged to receive coal by gravity from said bin, a plurality of shiftable plates shielding a portion of said conveyor from the coal in said bin, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, and a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said conveyor.

2. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, a conveyor arranged to receive coal by gravity from said bin, a plurality of shiftable plates shielding a portion of said conveyor from the coal in said bin, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, and a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said conveyor, each of said plates arranged for movement forwardly toward said coal gate.

3. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, a trough arranged to receive coal by gravity from said bin, a conveyor in said trough, a plurality of shiftable plates shielding a portion of said conveyor from the coal in said bin, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, and a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said conveyor.

4. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, a trough arranged to receive coal by gravity from said bin, a conveyor screw in said trough, a plurality of shiftable plates shielding a portion of said conveyor screw from the coal in said bin, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, and a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said conveyor screw.

5. A locomotive tender comprising a bin for the storage of coal, an approximately horizontally disposed deck for said tender forward of said bin,

a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates over said conveyor, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, said plates extending above the plane of said deck and arranged for movement forwardly, and a removable hood forward of said bin extending from the plane of said deck to a point above said shiftable plates, said hood arranged to receive one of said shiftable plates thereunder for withdrawal of such plate from its operative position upon removal of said hood.

6. A locomotive tender comprising a bin for the storage of coal, an approximately horizontally disposed deck for said tender forward of said bin, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates over said conveyor, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, said plates extending above the plane of said deck and arranged for movement forwardly, and a removable hood forward of said bin extending from the plane of said deck to a point above said shiftable plates and over a portion of said conveyor, said hood arranged to receive one of said shiftable plates thereunder for withdrawal of such plate from its operative position upon removal of said hood.

7. A locomotive tender comprising a bin for the storage of coal, an approximately horizontally disposed deck for said tender forward of said bin, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates over said conveyor, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, said plates extending above the plane of said deck and arranged for movement forwardly, and a hood forward of said bin extending above the plane of said deck and being hinged thereto, said hood arranged to receive one of said shiftable plates.

8. A locomotive tender comprising a bin for the storage of coal, an approximately horizontally disposed deck for said tender forward of said bin, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates over said conveyor, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, said plates extending above the plane of said deck and arranged for movement forwardly, and a hood forward of said bin extending above the plane of said deck and over a portion of said conveyor, said hood being removable from its position over said conveyor and arranged to receive one of said shiftable plates when in position over such portion of said conveyor.

9. A locomotive tender comprising a bin for the storage of coal, an approximately horizontally disposed deck for said tender forward of said bin, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates over said conveyor, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, said plates extending above the plane of said deck and arranged for movement forwardly, and a hood forward of said bin extending above the plane of

said deck and over a portion of said conveyor, said hood being hinged with respect to said deck and arranged to receive one of said shiftable plates when in position over such portion of said conveyor.

10. A locomotive tender comprising a bin for the storage of coal, a coal gate at the forward end of said bin, an approximately horizontally disposed deck for said tender extending forward of said coal gate, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a crusher extending above the plane of said deck and cooperating with said conveyor for reducing lump coal, a plurality of shiftable plates extending over said conveyor including a plate adjacent said coal gate arranged to slide over said crusher, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, and a removable hood forward of said coal gate extending from the plane of said deck to a point above said crusher and shiftable plates, said hood arranged to receive one of said plates thereunder and above said crusher for withdrawal of such plate from its operative position upon removal of said hood.

11. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, an approximately horizontally disposed deck for said tender extending forward of said coal gate, a conveyor extending below the plane of said deck arranged to receive coal by gravity from said bin, a plurality of shiftable plates shielding a portion of said conveyor from the coal in said bin, means carried by the tender at the lower portion of said fuel bin affording slidable support for said shiftable plates, a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said conveyor.

12. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, an approximately horizontally disposed deck for said tender extending forward of said coal gate, a trough in said bin extending below the plane of said deck and arranged to receive coal by gravity from said bin, a conveyor in said trough for urging fuel forwardly, said trough being pro-

vided along its opposite sides with runways, a plurality of shiftable plates extending over said conveyor and being mounted for movement in said runways, and a stop element disposed forwardly of said rear wall, said plates extending from a point adjacent said coal gate rearwardly to said stop element forming an opening for the preliminary feed of coal from said bin to the rearward end of said trough.

13. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, an approximately horizontally disposed deck for said tender extending forward of said coal gate, a trough in said bin extending below the plane of said deck and arranged to receive coal by gravity from said bin, a conveyor in said trough for urging fuel forwardly, said trough being provided along its opposite sides with runways, and a plurality of shiftable plates extending over said conveyor and being mounted for movement in said runways, said runways terminating short of said rear wall and forming a means for limiting rearward movement of said plates, said plates extending from a point adjacent said coal gate rearwardly to said means to form an opening for the preliminary feed of coal from said bin to the rearward end of said trough.

14. A locomotive tender comprising a bin for the storage of coal, said bin including a rear wall and a coal gate at the forward end of said bin, an approximately horizontally disposed deck for said tender extending forward of said coal gate, a trough in said bin extending below the plane of said deck and arranged to receive coal by gravity from said bin, a conveyor in said trough for urging fuel forwardly, said trough being provided along its opposite sides with runways, and a plurality of shiftable plates extending over said trough and being mounted for movement in said runways, said runways terminating short of said rear wall and forming a means for limiting rearward movement of said plates, said plates extending from a point adjacent said coal gate rearwardly to said means to form an opening for the preliminary feed of coal from said bin to the rearward end of said trough, said trough being provided adjacent said means with coal dust pockets which open into said trough.

FRANK P. ROESCH.