

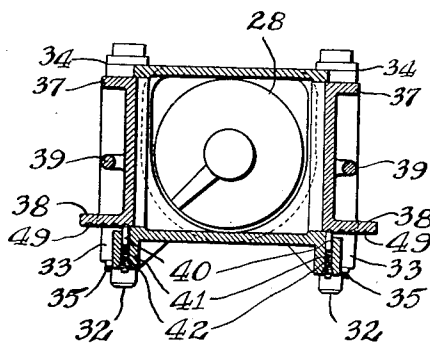
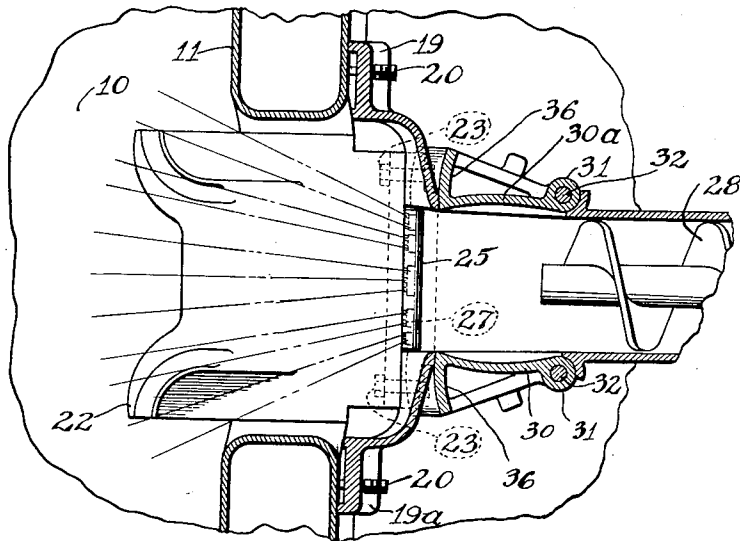
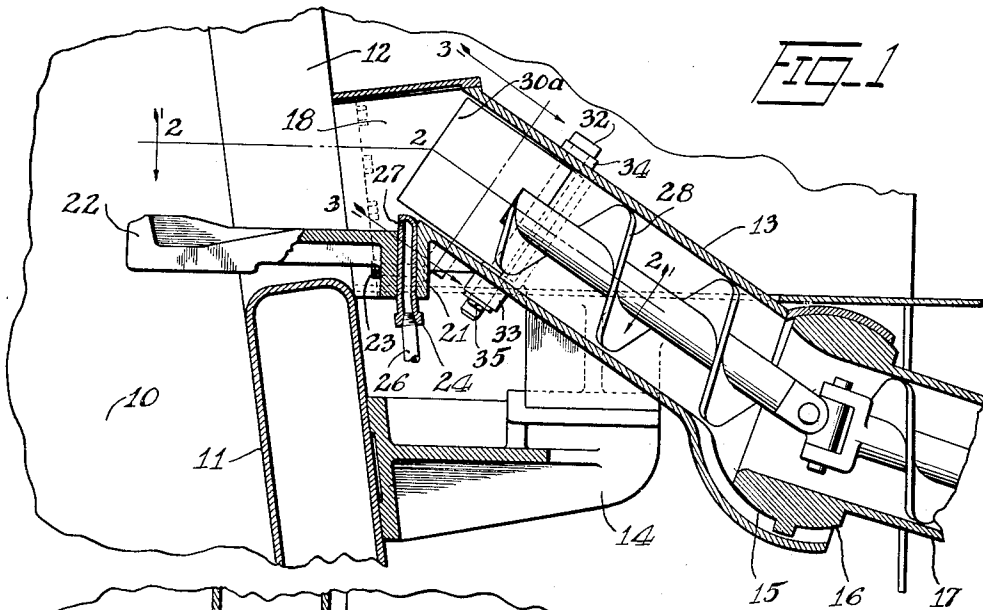
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E. A. TURNER

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STOKER MECHANISM

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STOKER MECHANISM

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Application November 20, 1929, Serial No. 408,485
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10 Claims. (Cl. 110—101)

This invention appertains particularly to the type of stoker wherein fuel is delivered by a conveying means more or less unevenly to a distributor which acts to spread the fuel over the fire of a boiler firebox.

The main object of the invention is the provision of a deflecting means in a stoker of the character specified to insure even delivery and distribution of fuel over the fire, or from another aspect, by the use of which trimming of the fire can be accomplished.

This invention consists in the arrangement of the deflecting means and its associated parts and in the construction of the deflectors as clearly illustrated by the drawing wherein

Fig. 1 is a fragmentary central vertical section through the rear portion of a locomotive with the fuel feed conduit thereof shown in similar section;

Fig. 2 is a plan section on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary section on the line 3—3 of Fig. 1.

In these figures the boiler firebox represented at 10 is of conventional form having a backhead 11 with a firing opening therein at 12. The fuel is delivered to the firebox by suitable stoker mechanism only enough of which is shown to illustrate the invention.

13 indicates the forward tubular conduit section or riser of a flexible conduit system extending from a source of supply, as a fuel bin of a locomotive tender, to the firing opening of the boiler. This riser is carried by a supporting bracket 14, extending from the backhead 11. The riser at its lower end terminates in a spherical seat 15 receiving the ball member 16 of a conduit section 17 leading forwardly from a source of supply.

From its lower end the riser extends upwardly and forwardly to the firing opening 12 with which it communicates through its laterally spreading and substantially horizontally disposed mouth portion 18 having the flanges 19, 19a for attachment to the backhead by fastening means as the bolts 20. The lower wall or floor portion of the mouth portion of the riser and particularly at the laterally spreading end thereof, the lower wall is provided with a stepped recess or seat 25 for the outer end of the distributor plate 22 and distributor head 24, respectively. This mouth portion is formed with an upstanding wall 21 constituting an approximately vertical face in the lower or bottom wall of the conduit to which upstanding wall or face

is detachably connected a distributor plate 22, by bolts as at 23 and forms an extended floor portion of the riser projecting through the firing opening 11 of the backhead. A nozzle or distributor head 24 is vertically disposed rearward of the distributor plate and outside of the firebox in a recess or seat 25 centrally of the mouth portion and is held in position in any suitable manner. Pressure fluid such as steam is supplied to the nozzle by a desired number of supply pipes 26. Openings at 27 in the nozzle are arranged sidewise and in horizontal alignment to issue a horizontally directed fan-shaped blast of fluid across the distributor plate, the spread of the blast being such that at its source it is substantially the width of, or somewhat less than that of the inclined portion of the riser and spreads laterally as it sweeps across the plate, but enters the firebox without impinging the walls of the firing opening.

Any suitable means may be provided for the advancement of fuel in to and through the riser conduit, but for the purpose of illustrating the invention a screw means 28 has been shown. Preferably, the delivery end of the screw stops short of the nozzle or distributor head in order to form the fuel into a stream like column before it is delivered on to the fan-shaped blast.

In such a stoking device as the one illustrated it has been found in practice that the screw means has a tendency to discharge more coal to one side of the riser than to the other and in turn the fuel stream delivered on to the steam blast is of unequal distribution and more fuel is spread over one side of the firebox than the other, establishing troublesome fire conditions. The side to which more fuel is delivered depends upon the direction of rotation of the screw means and whether or not it is a left or right hand screw.

To overcome this uneven delivery and distribution of the fuel this invention provides a controlling means comprising the deflector members 30, 30a, mounted at opposite sides of the riser for directing or regulating the delivery of the fuel to the distributing means. These deflecting members may be disposed within the riser adjacent its sidewalls, but preferably, and as shown by the drawing each deflector member constitutes a laterally movable section of a sidewall of the riser intermediate its receiving and delivery ends. Each deflector member is provided with a hub portion 31 receiving a headed pin 32. This pin or shaft is disposed per-

- pendicular with the floor of the riser and is seated in the extensions 33 of the bottom wall and the hub 34 of the top wall. A cotter key 35 holds the pin in position. The upright face of each deflector at its forward end has formed therewith and extending laterally therefrom an arcuate skirt portion 36. The deflector is also provided with top and bottom walls 37 and 38 respectively. A handle bar 39 is arranged between the top and bottom walls for use when adjusting the position of the deflector. The top and bottom walls and the skirt prevent loss of fuel when the deflector is adjusted inwardly.
- Each deflector is held in a predetermined or desired position by a catch arrangement cooperating with serrations 49 formed on the under side of the lower wall 38. This catch arrangement comprises a pointed pin 40 seated in a recess 41 of the extension 33 from the lower wall of the riser. A compression spring 42 in the recess under the pin holds it firmly in one of the serrations of the deflector. Any desired number of serrations can be used with the deflector as may be found necessary in practice of the invention.
- In order to deliver the fuel evenly onto the distributor plate only one deflector 30 or 30a need be provided in that side of the riser toward which the greater volume of fuel is directed by the screw conveyor, however, the provision of two deflectors oppositely disposed as shown makes it possible to control the volume of fuel delivered to either side of the firebox should it be desired to trim the fire or vary the relative volume delivered to each side.
- From the foregoing description it will be seen either one or both of the deflector members can be moved laterally and inwardly to act upon the fuel stream before its discharge on to the distributing blast and it will be obvious to those familiar with stoker construction that the deflectors can be adjusted in such manner as to deliver the fuel uniformly to the distributing means or unevenly as may be desired.
- This invention provides a new and novel form of deflecting means and arrangement of its associated parts, and it is believed various modifications may be made without departing from the spirit and substance of the invention.
- I claim:
1. In combination, a firebox having a backwall with a firing opening therein, a tubular feed conduit delivering fuel to the firebox through said opening and a chambered distributor head apertured to receive and discharge pressure fluid disposed adjacent the forward end of said conduit outside the firebox, a section of a sidewall of said conduit rearward of but immediately adjacent said distributor head being hinged to be laterally adjustable and movable inwardly of the conduit.
 2. In combination, a firebox having a backwall with a firing opening therein, a tubular feed conduit delivering fuel to the firebox through said opening and a chambered distributor head apertured to receive and discharge pressure fluid disposed adjacent the forward end of said conduit outside the firebox, a section of a sidewall of said conduit rearward of but immediately adjacent said distributor head being hinged to be laterally adjustable and movable inwardly of the conduit and means for securing said section in any one of a predetermined number of positions.
 3. In a tubular fuel conduit having top, bottom and oppositely arranged sidewalls, a feed screw in said conduit and a section of at least one of said sidewalls intermediate the ends of the conduit being hinged to swing laterally and being movable inwardly of the conduit, one end of said screw terminating at a point between the ends of said hinged conduit section.
 4. In a fuel conduit having a screw conveyor mounted therein, the improvement comprising an adjustably hinged section of the sidewall of said conduit adjacent the terminus of said screw mounted on an axis perpendicular to the axis of said conduit, said adjustable section being adapted to swing laterally about its axis and said screw terminating at a point between said axis and an end of said adjustable section.
 5. In combination, a firebox having a backhead with a firing opening therein, a riser conduit without said firebox but communicating with said firing opening, a chambered distributor head apertured to receive and discharge pressure fluid disposed in said riser conduit rearward of said backhead, deflector vanes mounted on axes substantially perpendicular to the axis of said riser conduit intermediate the ends of said riser conduit adjacent said distributor head, said vanes arranged opposite each other in said riser conduit and being laterally adjustable inwardly thereof, and means for advancing fuel through the riser conduit.
 6. In combination, a firebox, a riser conduit without said firebox but in communication therewith, a distributor means mounted in the mouth portion of said conduit, a screw in said conduit terminating short of said distributor means, a pair of deflector vanes, each forming a portion of a sidewall of said riser conduit intermediate its ends, said vanes being adjustably mounted adjacent the distributor means and the terminus of said screw and arranged to incline forwardly over the terminus of said screw, which terminus is disposed intermediate the ends of the deflector vanes.
 7. In combination, a firebox, a riser conduit without said firebox but in communication therewith, a distributor means mounted in the mouth portion of said conduit, a screw in said conduit terminating short of said distributor means, deflector vanes adjustably mounted intermediate the ends of said conduit adjacent the distributor means and the terminus of said screw and arranged to incline forwardly over the terminus of said screw, which terminus is disposed intermediate the ends of the deflector vanes.
 8. In combination, a firebox having a wall with an opening therein, a fuel feed conduit having its forward discharge end communicating with said opening, a fuel distributor adjacent the discharge end of the conduit, a screw conveyor in said conduit, and a pair of deflector vanes oppositely disposed and pivotally mounted one at each side of the conduit on axes disposed rearward of the distributor and substantially perpendicular to the axis of said screw, the plane passing through the vane axes cutting the screw and the vanes being wholly disposed without the firebox.
 9. In a stoker, the combination with a firebox provided with an upstanding wall having a firing opening therethrough, a fuel discharge conduit exterior of the firebox having a mouth portion communicating with said firing opening, said mouth portion including bottom and side walls extending to the plane of said upstanding

5 wall, said bottom wall being provided with a recess forming an opening between said bottom wall and the upstanding wall of the firebox and intermediate said side walls of the conduit in the bottom thereof, the bottom wall at the recess having an approximately vertically disposed transverse face, an approximately horizontally disposed fuel distributor plate mounted in said firing opening and having an end thereof extending outwardly from the firebox into the conduit and being received in said recess to constitute a continuation of said bottom wall, the end of said plate in the recess contacting said approximately vertical face of the bottom wall, a distributor head approximately vertically disposed in said recess between said distributor plate and said bottom wall and being insertable from the under side of the conduit through the opening formed therein by said recess, and means for detachably connecting the distributor plate to the conduit.

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25 10. In a stoker, the combination with a firebox provided with an upstanding wall having a firing opening therethrough, a fuel discharge conduit exterior of the firebox having a mouth portion communicating with said firing opening, said

mouth portion including bottom and side walls extending to the plane of said upstanding wall, said bottom wall being provided with a stepped recess forming an opening between said bottom wall and the upstanding wall of the firebox and intermediate said side walls of the conduit in the bottom thereof, the bottom wall at the recess having an approximately vertically disposed transverse face, an approximately horizontally disposed fuel distributor plate mounted in said firing opening and having an end thereof extending outwardly from the firebox into the conduit and being received in a step of said recess to constitute a continuation of said bottom wall, the end of said plate in the recess contacting said approximately vertical face of the bottom wall, a distributor head approximately vertically disposed in another step of said recess between said distributor plate and said bottom wall and being insertable from the under side of the conduit through the opening formed therein by said recess, and means for detachably connecting the distributor plate to the conduit.

EDWIN ARCHER TURNER. 100

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