Jan. 27, 1942. E. A. TURNER 2,271,237

DISTRIBUTOR FOR STOKERS

Filed Sept. 23, 1938 2 Sheets-Sheet 1

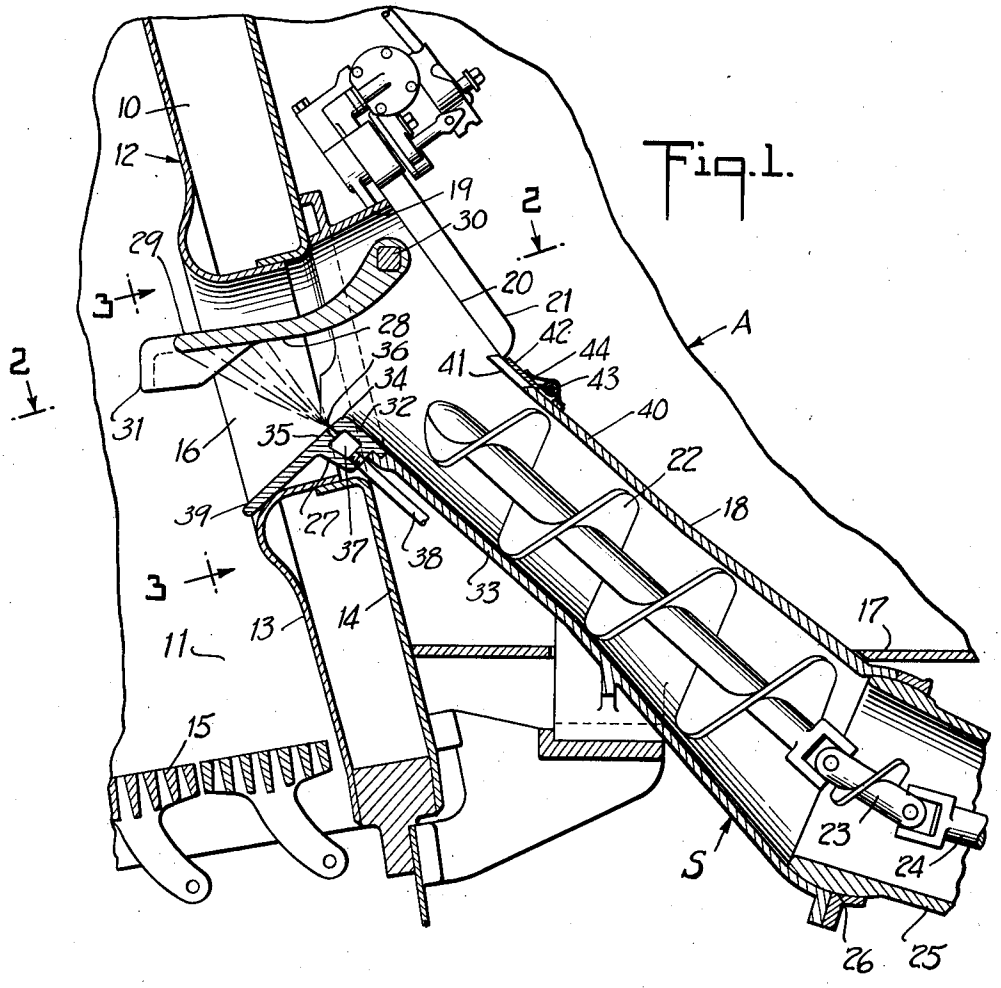


Fig. 1.

INVENTOR
E. ARCHER TURNER
BY
Turner, Sandy & Moeller
ATTORNEYS

Jan. 27, 1942. E. A. TURNER 2,271,237

DISTRIBUTOR FOR STOKERS

Filed Sept. 23, 1938 2 Sheets-Sheet 2

Fig. 2.

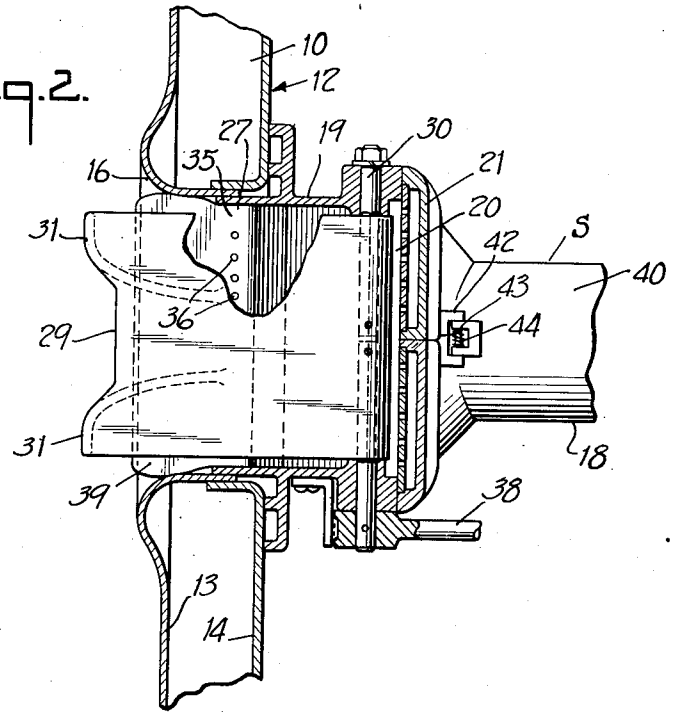


Fig. 3.

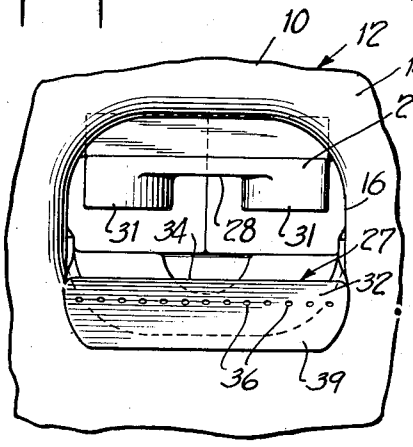
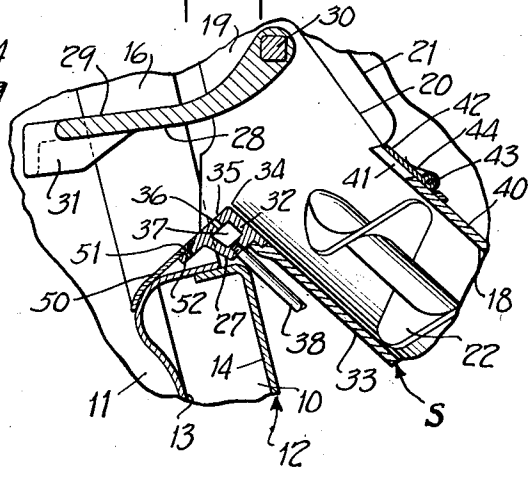


Fig. 4.



INVENTOR
E. ARCHER TURNER
BY
Turner, Sandy & Moeller
ATTORNEYS

Patented Jan. 27, 1942 2,271,237

UNITED STATES PATENT OFFICE

2,271,237

DISTRIBUTOR FOR STOKERS

Edwin Archer Turner, New York, N. Y., assignor to The Standard Stoker Company, Incorporated, a corporation of Delaware

Application September 23, 1938, Serial No. 231,291

2 Claims. (Cl. 110—105.5)

This invention relates to stokers of the type which spread fuel over the firebed of a furnace from a point above the grates.

In certain stokers of this type, the distribution of fuel over the firebed is effected by means of a blast of fluid under pressure which is directed toward a plate member disposed above the origin of the blast, the fuel being delivered into the zone of action of the blast and propelled thereby toward the plate member from which the fuel that strikes it rebounds and is scattered over the firebed.

It is an object of this invention to provide a novel distributing arrangement of the type described that will efficiently distribute fuel over all parts of the firebed and that is simple in construction.

It is another object of the invention to provide a distributing arrangement of the type described wherein the volume of fluid pressure used to project the fuel is maintained at a minimum while effectively distributing fuel over all parts of the firebed.

Other objects reside in the novel form of the parts and in their relation with one another, substantially as described in the following specification and as shown in the accompanying drawings, in which—

Fig. 1 is a central vertical longitudinal section through a portion of a locomotive and its boiler firebox with the novel stoker applied thereto and shown in similar section;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, the fuel deflector plate of the novel stoker being shown in plan elevation with a portion thereof broken away;

Fig. 3 is a view in elevation showing a portion of the stoker as viewed along the line 3—3 of Fig. 1 in the direction of the arrows; and

Fig. 4 is a view in section similar to Fig. 1 showing a modified form of the invention.

The invention is shown in the drawings and will be described in the following description as applied to the firebox of a locomotive, but it will become apparent that the invention is equally adaptable to other types of fireboxes.

In the drawings, the letter A indicates a locomotive having a boiler 10, a firebox 11 and a backhead 12 at the rear thereof comprising an inner sheet 13 and an outer sheet 14. The bottom of the firebox is formed by grates 15 wrich support the firebed. A firing opening 16 is formed in the backhead 12 above the level of the locomotive cab deck 17 and also above the level of the grates 15.

A stoker, designated by the letter S, delivers fuel from a suitable source of supply, as from the tender fuel bin (not shown) to the firebox 12. The stoker S comprises a conduit 18 extending upwardly and forwardly from beneath the cab deck 17 to the lower portion of the firing opening 16, and a casing 19 surmounting the conduit 18 having an aperture 20 at the rear thereof opposite the firing opening 16. A door 21 is supported from the casing 19 and forms a movable closure for the aperture 20. Fuel is conveyed forwardly and upwardly toward the firing opening 16 by a conveyor screw 22 disposed within the conduit 18. At its lower end the screw 22 is flexibly connected at 23 to a screw 24 which is housed within a conduit 25 leading forwardly from the tender (not shown). The conduits 18 and 25 are connected by a ball and socket joint 26 which provides for the necessary flexibility between the conduits during operation of the locomotive.

Fuel is conveyed by the conveyor screw 22 into the zone of action of a blast of fluid under pressure issuing from a jet head 27 and is projected thereby toward the underside 28 of a deflector plate 29 which extends into the firing opening 16 and forwardly into the firebox 11. At its rearward end the deflector plate 29 is mounted upon a polygonal shaft 30 within the casing 19 and is arranged for vertical adjustment about the axis of the shaft 30. The deflector plate 29 at each lateral side thereof is provided with an outwardly curved wall 31 which serves to intercept a portion of the fuel projected upwardly by the blast issuing from the jet head 27, as will presently appear.

The jet head 27 is disposed at the lower portion of the firing opening 16 and is supported on the upper forward end of the conduit 18. The jet head 27 includes a top wall 32 which forms an upward continuation of the bottom wall 33 of the conduit 18 and terminates in an edge 34 within the firing opening 16 and below the deflector plate 29. The jet head 27 also includes an upwardly directed face 35 extending downwardly and forwardly of the edge 34 and having therein a plurality of transversely spaced jet apertures 36 in communication with chambers 37 formed in the jet head. Fluid under pressure is conducted to the chambers 37 by pipes 38. The jet apertures are so formed that their extendd axes will intersect the deflector plate 27.

The jet head 27 has formed therewith a ledge 39 extending forwardly and downwardly therefrom in the plane of the upwardly directed face

35 to the lower marginal edge of the firing opening adjacent the inner sheet 13 of the backhead 12. The ledge 39 extends laterally substantially the width of the firing opening.

As stated before, the jet apertures 36 are spaced transversely. The blasts of pressure fluid spread as they issue from the jet apertures and intersect at a position above the upwardly directed face 35 of the jet head 27 to form a blanket-like stream of pressure fluid. Were the jet apertures 36 spaced so closely together that all the fuel passing over the edge 34 of the jet head 27 would be subjected to the blasts of fluid under pressure, an excessive volume of pressure fluid at high pressure would be consumed. In the present construction the jet apertures 36 are spaced apart a sufficient distance so that some of the fuel passes between the blasts issuing from the jet apertures and rolls downwardly and forwardly along the ledge 39 and is scattered over the rear central portion of the firebed. The major portion of the fuel is struck by the pressure fluid blast and is projected upwardly toward the underside 28 of the deflector plate 29. As the fuel strikes the underside 28 of the plate 29, it rebounds or ricochets downwardly and forwardly for distribution over the firebed. The lateral portions of the projected fuel stream are intercepted by the outwardly curved walls 31 and deflected laterally toward the corners of the firebox. Some of the fuel, particularly that which is contacted by the outer edges of the blast where the force is not as great will not strike the deflector plate 29 but will be projected directly into the firebox. More of the fuel can be made to strike the top deflector by lowering it about the shaft 30 without increasing the intensity of the blast. Thus fuel is projected over the entire firebed with the use of a minimum volume of pressure fluid. In stokers of the type described, the present construction permits the use of a blast of great intensity so that fuel can be projected to the forward end of the longest fireboxes, yet provides for delivery of fuel to the rear portion of the firebox, at the same time minimizing the volume of pressure fluid used.

In order that the distributing action of the head 27 and the deflector plate 29 may be observed, the rear wall 40 of the conduit 18 is provided with a recess 41 immediately below the firedoor 21. This recess is closed by a cover 42 which is mounted upon a hinge pin 43. A spring 44 is coiled about the pin 43 with one end thereof pressing upon the cover 42 for normally retaining the latter in the position illustrated. Whenever it is desired to observe conditions within the firebox, it is only necessary to draw the cover 42 rearwardly against the pressure of the spring 44 to expose the recess 41. Upon releasing the cover 42, the spring 44 will return it to its closed position.

In Fig. 4 is shown a slightly modified form of the invention. In the modified form, the ledge 50 is detachably secured to the jet head 27 by means of threaded members 51 passing through the rearward portion of the ledge 50 and the seat 52 instead of being formed integral with the jet head 27 as in the preferred form of the invention.

I claim:

1. In a stoker for feeding fuel to a firebox having a grate and an upright wall with a firing opening therein above the level of said grate, said stoker comprising a fuel feed conduit communicating with said opening, means for urging fuel through said conduit, a jet member disposed at the lower forward end of said conduit adjacent the lower outer marginal edge of the firing opening, said jet member being adapted to be connected to a source of fluid under pressure and having a front wall provided with a plurality of upwardly inclined orifices for directing said fluid forwardly and upwardly against the fuel flowing over the jet member, a ledge extending forwardly and downwardly from said front wall subjacent the orifices therein to the lower inner marginal edge of the firing opening, the declination of said ledge and the inclination of said jet orifices being such that fuel passing through and between the blasts of fluid under pressure issuing from said orifices is freely movable forwardly and downwardly along said ledge outside the zone of action of the said blasts of fluid under pressure and drops by gravity over the forward edge of said ledge onto the grate at the rearward portion of the firebox adjacent said upright wall, and a superimposed deflector member above said jet member and in the path of fuel thrown upwardly therefrom for distributing said fuel throughout the firebox.

2. In a stoker for feeding fuel to a firebox having a grate and an upright wall with a firing opening therein above the level of said grate, said stoker comprising a fuel feed conduit communicating with said opening, means for urging fuel through said conduit, a jet member disposed at the lower forward end of said conduit adjacent the lower outer marginal edge of the firing opening, said jet member being adapted to be connected to a source of fluid under pressure and having a front wall provided with a plurality of upwardly inclined orifices for directing said fluid forwardly and upwardly against the fuel flowing over the jet member, a ledge extending forwardly and downwardly from said front wall subjacent the orifices therein to the lower inner marginal edge of the firing opening, said ledge extending laterally substantially the width of the firing opening, the declination of said ledge and the inclination of said jet orifices being such that fuel passing through and between the blasts of fluid under pressure issuing from said orifices is freely movable forwardly and downwardly along said ledge outside the zone of action of the said blasts of fluid under pressure and drops by gravity over the forward edge of said ledge onto the grate at the rearward portion of the firebox adjacent said upright wall, and a superimposed deflector member above said jet member and in the path of fuel thrown upwardly therefrom for distributing said fuel throughout the firebox.

EDWIN ARCHER TURNER.