Dec. 27, 1932. N. M. LOWER 1,892,353

STOKER

Filed Nov. 26, 1928 3 Sheets-Sheet 1

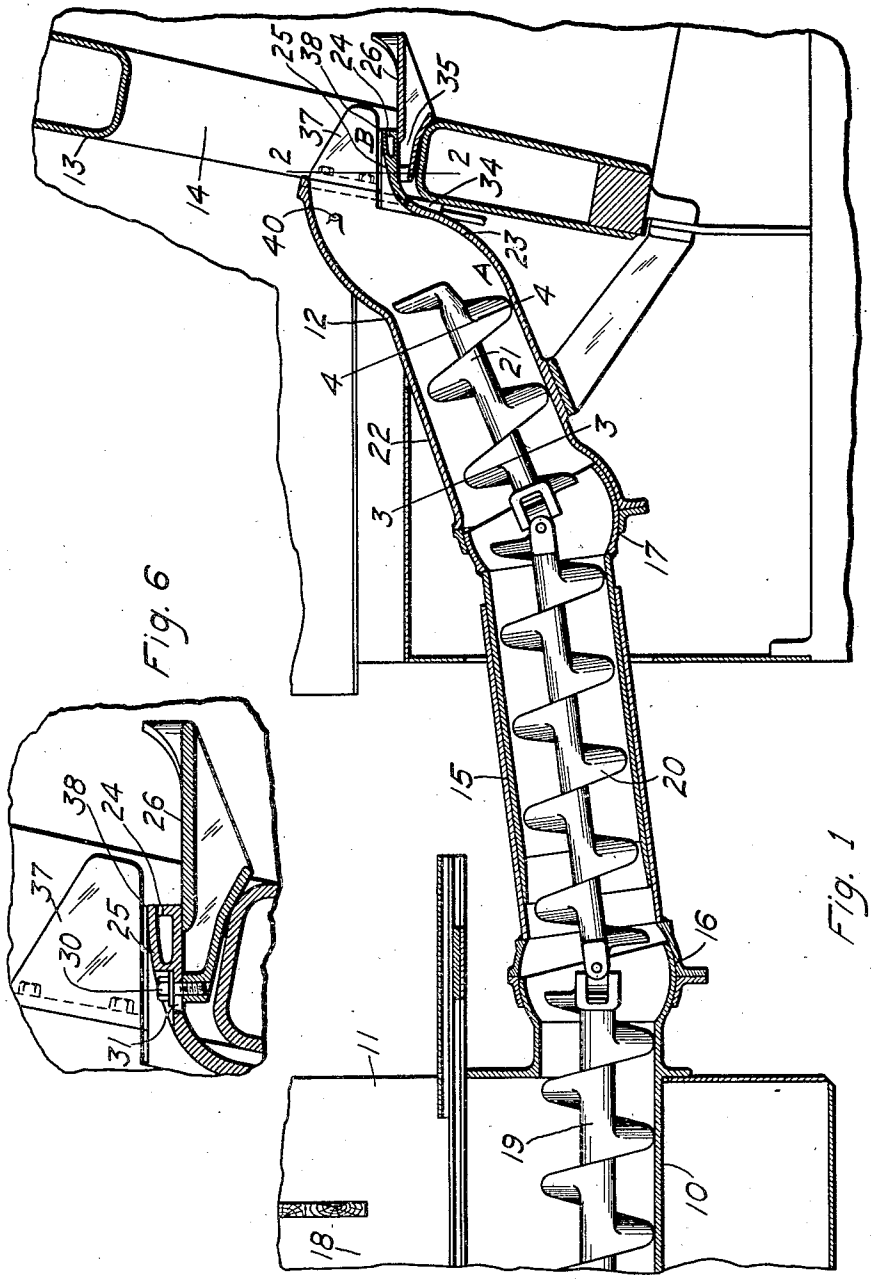

Fig. 1

Fig. 6

INVENTOR

Nathan M. Lower

Dec. 27, 1932. N. M. LOWER 1,892,353

STOKER

Filed Nov. 26, 1928 3 Sheets-Sheet 2

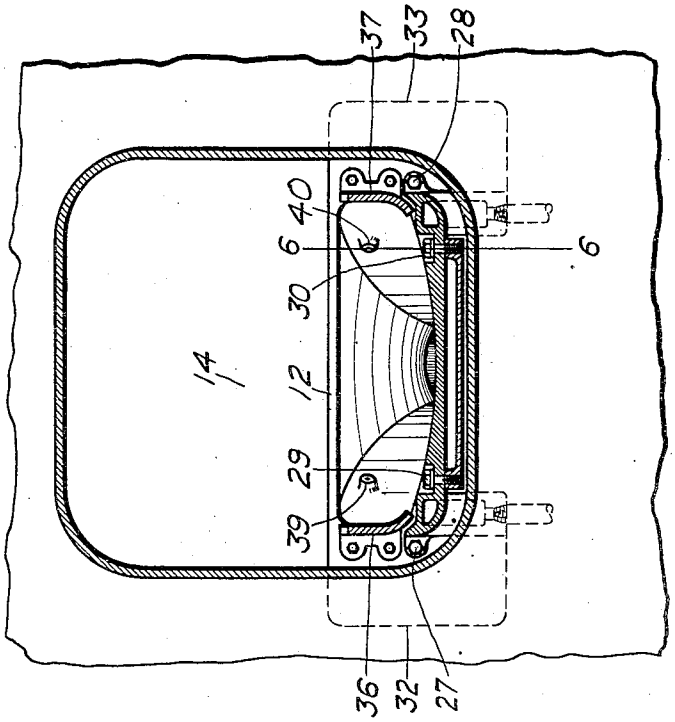

Fig. 2

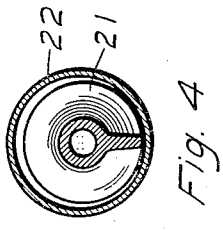

Fig. 4

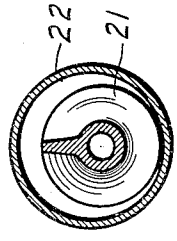

Fig. 3

INVENTOR

Nathan M. Lower

Dec. 27, 1932. N. M. LOWER 1,892,353

STOKER

Filed Nov. 26, 1928 3 Sheets-Sheet 3

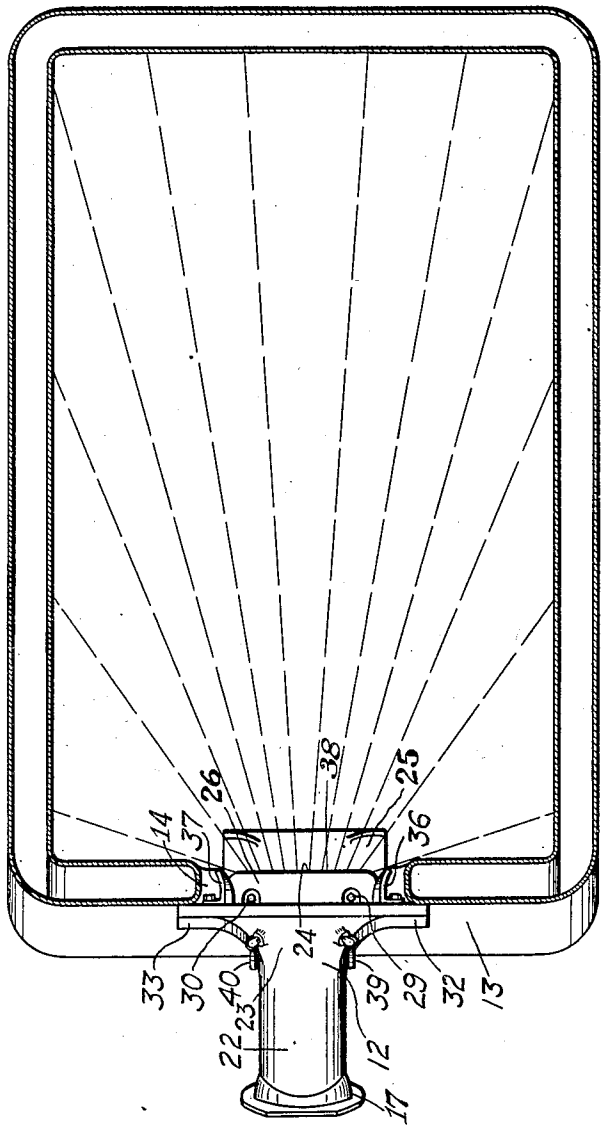

Fig. 5

INVENTOR

Nathan M. Lower

Patented Dec. 27, 1932 1,892,353

UNITED STATES PATENT OFFICE

NATHAN M. LOWER, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR TO THE STANDARD STOKER COMPANY, INCORPORATED, A CORPORATION OF DELAWARE

STOKER

Application filed November 26, 1928. Serial No. 322,053.

This invention relates to mechanical stokers for locomotives of the type that transfers the fuel from the tender to the firebox through the lower portion of the firedoor opening by a screw conveyor.

An object of the invention is the provision of a stoker in a locomotive that will convey the fuel from the tender to the firebox with very little forcing and abrasion, and still occupy a small part of the locomotive cab.

Other objects and advantages of this invention will appear from the following description and appended claims, taken in connection with the accompanying drawings, in which;

Fig. 1 is a vertical sectional view taken on the center-line of the locomotive, the tender, and the invention, showing the invention as applied thereon.

Fig. 2 is a transverse sectional view, taken on line 2—2 of Figure 1, looking in the front end of the stoker.

Fig. 3 is a transverse sectional view taken on line 3—3 of Figure 1.

Fig. 4 is a transverse sectional view, taken on line 4—4 of Figure 1.

Fig. 5 is a sectional plan view taken through the locomotive boiler and illustrates the method of fuel distribution.

Fig. 6 is a sectional view taken on line 6—6 of Figure 2, and illustrates the method of securing the distributing table in the fire door opening.

This invention pertains particularly to the section of a stoker secured in the locomotive, but for the purpose of rendering the invention more clear, especially to those not skilled in the art, I will describe briefly the path of the fuel from the tender to the firebox.

In Figure 1 the numeral 10 represents the tender unit or trough of the stoker, which is rigidly secured to the tender 11. The stoker section 12 is rigidly secured to the backhead 13 of the locomotive and delivers fuel to the fire door opening 14. The telescopical intermediate conduit 15 is flexibly connected to the trough 10 by the ball joint 16 and the back head section 12 by the ball joint 17. This construction allows for angular movement between the locomotive and tender as they travel on curves, cross-overs and turn tables.

The run-of-mine coal falls by gravity from the coal bunker 18 into the trough 10, where a conveying screw 19 (driven from the rear in the well known manner, not shown here) carries it forward to the intermediate screw 20 in the intermediate conduit 15. The intermediate screw 20 is universally jointed to the conveying screw 19 in the trough 10. The intermediate screw 20 carries the coal forward to the elevating screw 21 in the backhead section 12. The elevating screw 21 in the backhead section 12 is universally jointed to the intermediate screw 20. The backhead section 12 is approximately cylindrical at its rearward portion 22 as shown in Figures 3 and 4 of the drawings. Immediately forward of this cylindrical portion the back head section 12 curves upward and changes in cross sectional shape to substantially rectangular, as illustrated in Figure 2 of the drawings.

Referring to Figures 3 and 4 of the drawings, it will be noted that clearance is provided around the elevating screw 21 in the backhead section 12, and that there is more clearance at the rearward end than at the forward end of the cylindrical portion. This clearance for the elevating screw 21 permits longitudinal extensibility of the stoker without fracture to the conveying screws when the locomotive and tender travel on a curve, or cross-over. The screw 21 carries the coal forward to the upwardly curved neck 23 and it is forced by said screw the short distance up this neck to the fluid jets 24, which distribute the fuel evenly to all parts of the firebed. It will be noted that the surface, in the backhead section 12, from the letter A to the letter B, is free of obstructions and approaches a reverse curve. It will be noted in referring to Figure 1 of the drawings that the elevating screw 21 is more nearly horizontal than vertical, therefore a very great angle is not required on the universal joints between the screws 19, 20, and 21. From this paragraph it will be seen that I have provided a stoker, feeding fuel through the fire door, that occupies less locomotive

cab space and conveys the fuel to the fire door with less pressure exerted on the fuel than occurs in the stokers now in use.

The coal distributing means consists of the renewable jet casting 25 and the distributing table 26. The jet casting 25 is secured to the backhead section 12 by the studs 27 and 28. The distributing table 26 is secured to the underside of the jet casting 25 by the studs 29 and 30. It will be noted that the holes 31 for the studs 29 and 30, are slotted so the distributing table 26 can be adjusted to fit any boiler. By locating the jet casting 25 in the fire door opening 14, instead of between the backhead 13 and the section 12, as in present practice, the section 12 is permitted to be placed nearer to the backhead 13, thus conserving cab deck space. The jet casting 25 offers no obstruction to the movement of the fuel. The section 12 is secured to the backhead by the flanges 32 and 33, with an opening 34 provided between it and the backhead. An opening 35 is provided in the rearward end of the distributing table 26 to admit air for cooling. The side vanes 36 and 37 are secured to the section 12 to prevent the coal from coming in contact with the backhead 13.

The jets 24 are equally spaced in the jet casting 25 as can be seen in Figure 5 of the drawings. As the coal advances in a mass of even thickness over the edge 38 of the jet casting 25, each jet receives the same weight of coal in pounds per minute, and it will be seen that the grate portions fired by each jet must be equal in area. This is accomplished by drilling the jet holes at predetermined angles. Where the length of projection is great, the width of grate apportioned to that particular jet is narrow, and where the jet projection length is short, the grate space that it supplies is wide. The area of the jet holes is also in proportion to the distance the fuel is to be blown, therefore the jets at the side of the jet casting 25 are smaller in diameter than the jets at the center. Sometimes one side of the firebox becomes filled more than the other and to give the fireman additional control over the firebox, the auxiliary jets 39 and 40 are provided. The action of these jets, when used, is to project some coal into the fire at the opposite side of the firebox and to project some coal on to the opposite side of the distributing table 26, from which it eventually reaches the desired opposite side of the firebox. Only one jet at a time is used, depending upon the side of the fire that is thin.

I claim:

1. In a locomotive having a firebox provided with a backhead having a firing opening therein, a stoker conduit section secured to said backhead in communication with said opening, a distributing jet casting secured to said conduit section and projecting forwardly into said opening, a plate for receiving fuel thereon having its rear end in contact with said jet casting and means extending through said jet casting for rigidly securing said plate thereto, whereby said plate can be secured to said jet casting without getting into the firebox.

2. In a locomotive having a backhead provided with a firing opening, a stoker conduit section secured to said backhead in communication with said opening, a distributing jet casting secured to said conduit section and projecting forwardly into said opening, a plate for receiving fuel thereon having its rear end positioned beneath the forward end of said jet casting and in contact therewith, slotted openings in said jet casting and means extending through said slotted openings for rigidly securing said plate to said jet casting, said means being capable of movement in said slotted openings whereby said plate can be adjusted to fit the firing opening before securing.

3. In a locomotive having a firebox provided with a back head having a firing opening therein, a stoker conduit section secured to said backhead in communication with said opening, a distributing jet casting secured to said conduit section and projecting forwardly into said opening, a plate for receiving fuel thereon having its rear end positioned beneath the forward end of said jet casting and in contact therewith, and means extending through said jet casting for rigidly securing said plate thereto.

4. In combination, a boiler having a firebox provided with a wall having a firing opening therein, a fuel feed casing mounted externally of the firebox in communication with said opening, a distributing jet member secured to said casing and projecting forwardly into said opening, a substantially horizontal plate for receiving fuel thereon having its rear end in contact with said jet member and means extending substantially vertically through said jet member for rigidly securing said plate thereto.

NATHAN M. LOWER.