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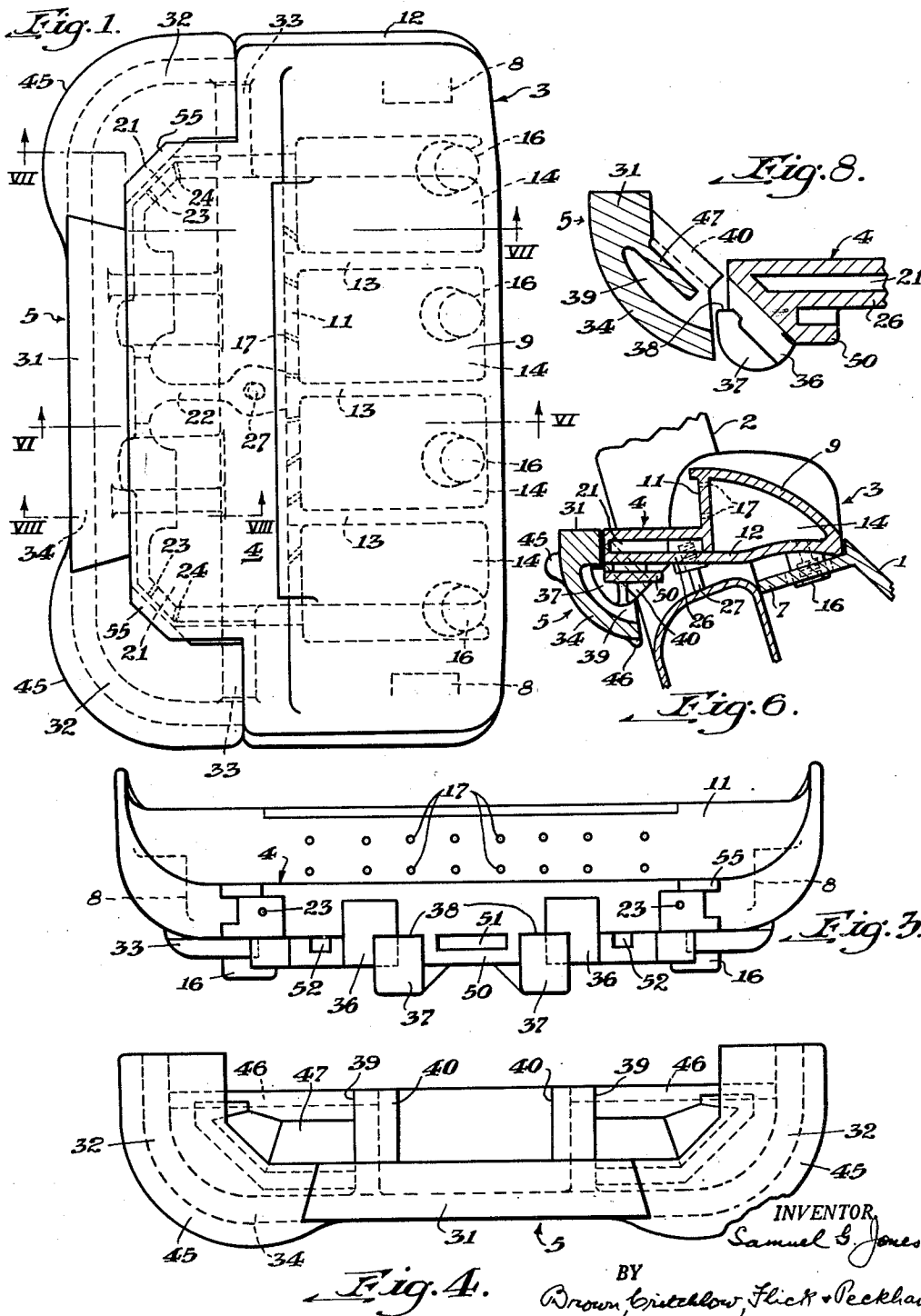
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LOCOMOTIVE STOKER DISTRIBUTOR HEAD

Filed June 11, 1947

2 Sheets-Sheet 1



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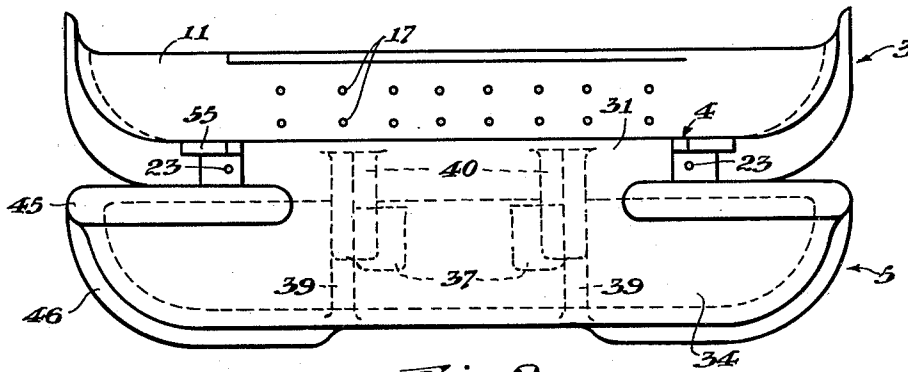


Fig. 2.

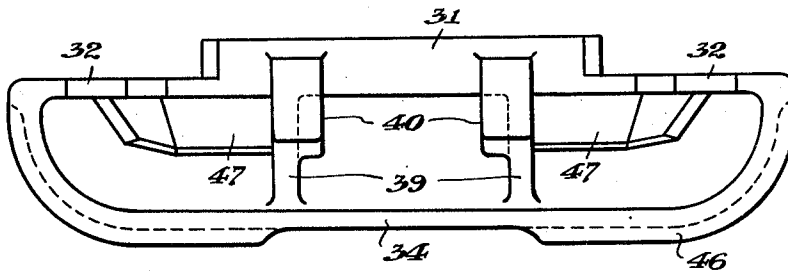


Fig. 5.

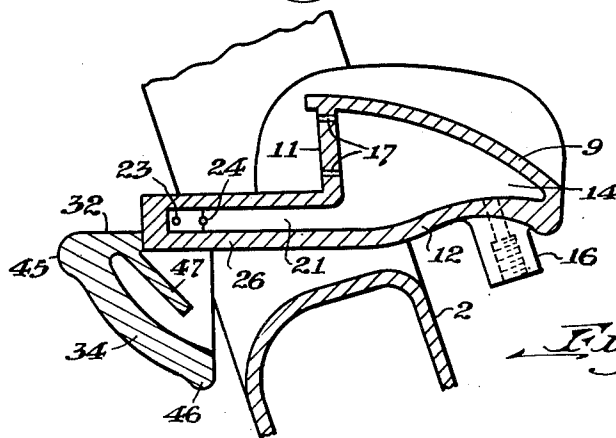


Fig. 7.

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LOCOMOTIVE STOKER DISTRIBUTOR HEAD

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6 Claims. (Cl. 110-105.5)

1

2

This invention relates to locomotive stokers, and more particularly to the distributor heads by which coal that is conveyed to the firing opening in a firebox backwall is distributed over the grate.

It is among the objects of this invention to provide a stoker distributor head which distributes coal properly over the fire bed, which includes an apron for protecting the rest of the head from burning away, and in which the protective apron itself has a long life and cannot become accidentally disconnected from the rest of the distributor head.

In accordance with this invention, the distributor head, which is adapted to extend through the firing opening in a locomotive, includes a hollow jet member connected to steam in the boiler. This member has a front wall provided with outlets for jets of steam, while its upper wall is inclined downward and rearward from the top of the front wall to form a floor up which a stream of coal can be led from the tender. A table extends forward from the front wall below its steam outlets and is provided interiorly with chambers adapted to be connected to high pressure steam. The opposite ends of the table have laterally directed outlets in diagonal corners for steam jets by which coal is delivered to the back corners of the firebox. The table is protected from the destructive heat of the firebox by an apron detachably connected to it and extending downward and rearward under it from a central portion of the apron which engages and protects the front of the table. The apron has ledges at its ends located below the table steam outlets. Each ledge is provided with a rounded integral nose extending along its front and side to protect the edges from being burned. The rear end of the apron's bottom wall beneath the ledges is provided with transversely rounded ribs extending downward to protect the rear edge of the apron from burning and to deflect flames forward away from that edge. The front portion of the table is provided with one or more rearwardly and downwardly inclined openings into which slide inclined lugs connected to the apron. Therefore, to disconnect the apron from the table, the apron must be moved not only upward but also forward. The bottom of the table, preferably is provided with an air chamber open at front and back so that air from outside the firebox will be drawn through the chamber into the apron for cooling the latter.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which Fig. 1 is a plan view of my distributor

head; Fig. 2 is a front view thereof; Fig. 3 is a front view of the jet member alone; Fig. 4 is a plan view of the apron alone; Fig. 5 is a rear view of the apron; Figs. 6 and 7 are vertical sections taken on the lines VI—VI and VII—VII, respectively, of Fig. 1; and Fig. 8 is a fragmentary vertical section through the distributor head taken on the line VIII—VIII of Fig. 1, showing the apron about to be connected to the jet member.

Referring to the drawings, coal from a locomotive tender is fed in the usual way by means of conveyor screws to the lower end of an upwardly and forwardly inclined riser conduit, only a small portion of whose floor 1 is shown in Fig. 6. The upper end of the riser conduit is rigidly mounted relative to the backwall 2 of the locomotive firebox in the usual manner, and is enlarged to substantially the width of the firing opening in the backwall. The coal is carried up through the riser conduit by a screw (not shown) and fed in a stream to an improved distributor head by which the coal is distributed over the fire bed. The principal parts of the distributor head are a hollow jet member 3, a hollow table 4 integral therewith, and a separate protective apron 5.

As shown in Fig. 6, the rear end of the hollow jet member 3 is seated in a notch formed at the junction of the upper end of the riser floor 1 and a flat extension 7 extending forward to the firebox backwall. The jet member is held in place by means of bolts (not shown) that are threaded in the side walls of the riser conduit and that project into sockets 8 in the ends of the jet member in a well-known manner. The top wall 9 of the jet member is inclined from the riser floor upward and forward so that coal from the conduit will be pushed up across this inclined top wall. The front of this wall is connected by an upright wall 11 to the bottom wall 12 which curves upward at the ends of the jet member and extends above the top wall. The inside of the jet member is divided by parallel vertical partitions 13 (Fig. 1) into a plurality of separate chambers 14, preferably four in number, from the bottom of each of which a threaded nipple 16 extends down through an oversize hole through the flat extension 7 of the riser conduit for connection to a steam pipe connected to the locomotive boiler. Each pipe may be controlled in conventional manner by a separate valve to regulate the steam delivered to the different chambers. Jets of steam issue from chambers 14 through upper and lower rows of orifices 17 formed in front wall 11 of the jet member.

The table 4 extends forward from front wall

3

11 below orifices 17 and likewise is provided interiorly with chambers 21, preferably two of them separated by a central vertical partition 22. The two chambers open at their outer rear corners into the two end chambers 14 in the jet member, whereby the table is filled with high pressure steam from inside of the jet member. The front corners of the table at its opposite ends are flattened and lie in vertical planes diagonal to the front and sides of the table and that converge in front of the center of the table at approximately a 90° angle. These diagonal corner walls are provided with steam jet orifices 23 and 24 directed toward the back corners of the firebox. As shown in Fig. 6, the bottom wall 26 of the table is an integral continuation of the lower wall 12 of the jet member and is spaced from the bottom of the firing opening by means of a pin 27 projecting from a socket in the bottom of the table and resting on the lower wall of the firing opening.

The hollow table 4, which projects into the firebox, is protected from the flames under it by apron 5 which has a heavy central bar-like body 31 that engages the front wall of the table and that is substantially the same thickness as the table. At the opposite ends of this central body there are horizontal ledges 32 located at a lower level and extending back around the ends of the table beneath the steam outlets 23 and 24 therein. The rear ends of those ledges rest on supports 33 integral with the jet member. The apron has a bottom wall 34 that extends downward from the front portions of body 31 and ledges 32 and curves inward under the ledges and table. The bottom wall shields the exposed bottom of the table from the flames below it, while the central body 31 protects the front of the table from burning.

To detachably connect the apron to the table, the front of the table is provided in its lower edge with a pair of laterally spaced recesses 36 extending up into it, as shown in Figs. 3 and 8. Each recess has a rearwardly and downwardly inclined bottom wall extending only about half way across it. These bottom walls are formed by bosses 37 integral with the table and projecting forward from it to provide steps 38 on which the central body of the apron may rest. As shown in Figs. 5 and 8, the inside of the apron is provided with a pair of laterally spaced vertical ribs 39 which project into the table recesses. Each rib has an inclined lug 40 integral therewith overlying the inclined bottom wall of the recess to support the apron from the table. The apron is connected to the table by first positioning the lower ends of the lugs in front of the upper ends of the table recesses, as shown in Fig. 8, and then sliding the lugs down the inclined bottom walls of the recesses, whereby the central body 31 of the apron moves down and back against the front of the table, and the ledges 32 move back around the ends of the table and rest on supports 33. It will be seen that in order to remove the apron from the jet member, the apron must be moved forward as well as upward. This eliminates any danger of a fireman accidentally catching a shovel or poker on the apron and unhooking it from the jet member. Also, no separate fastening members, having obvious disadvantages, are required for locking the apron and jet member together.

The outer edges of apron ledges 32 are protected from burning by transversely curved ribs or noses 45 integral therewith and extending

4

around them from their rear ends to the body 31 of the apron. This not only increases the mass of metal at these locations, but also eliminates the sharp upper edges that flames might burn. Beneath the ledges, the outer rear edge of the curved bottom wall 34 of the apron likewise is protected by integral noses or ribs 46 that start at the ledges and extend downward and part way across the bottom of the apron.

Further protection is given the table by providing the inside of the apron with heat baffles 47. These extend from vertical ribs 39 outward under the ledges 32, and are inclined rearward and downward from the upper wall of the apron as shown in Fig. 7.

The apron is cooled, and therefore its life is increased, by air directed into it from an air chamber directly below the table. This chamber is formed between the bottom wall 26 of the table and a horizontal wall 50 below it integrally joined at its front and ends to the table. The back of the chamber is open, while its front is provided with three slots, the center one 51 being located behind the center of the apron, and the two end openings 52 directing air into the spaces above baffles 47. The draft through the firebox will draw cool air in through the firing opening beneath the bottom wall of the distributor head, and through the chamber below the table. The air issuing from the chamber slots 51 and 52 will enter the upper portion of the apron from which it then will flow downward and rearward. As the air stream leaves the back of the apron it will sweep down around the back of the lower wall and then up into the firebox. Furthermore, in case the apron does burn away after a considerable period of time, due to poor firing by the fireman, the air chamber below the table will in itself protect the table to a considerable extent from the heat below it.

Most of the coal that falls over front wall 11 will be blown forward across the grate by the jets of steam issuing from orifices 17; some of this coal being caught in mid-air by the steam, and the rest being swept forward off the table. Some coal escapes the steam from orifices 17, and rolls off the ends of the table and of the jet member into the jets of steam issuing from orifices 23 and 24. The ends of the table are provided with hoods 55 that project a short distance from above the table orifices so that the coal cannot pile up between the jets. The diagonal front corners of the table, together with the parallel ends of the table behind them, help in directing the coal to these jets at points from which it will be swept into the rear corners of the firebox. The apron ledges 32 serve as tables below the table jets.

According to the provisions of the patent statutes, I have explained the principle and construction of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A locomotive stoker distributor head adapted to extend through the firing opening of a firebox, comprising a hollow jet member adapted to be connected to a steam supply, said member having a front wall provided with outlets for steam jets and having an upper wall inclined downward and rearward from the top of the front wall to

5

form a floor up which a stream of coal can be fed, a hollow table extending forward from said front wall below said outlets and provided interiorly with chambers throughout substantially the full length of the table adapted to be connected to a steam supply, said chambers having a front wall forming the front wall of the table and connecting the opposite ends of the table, the opposite ends of the table having laterally directed outlets for steam jets, and a protective apron detachably connected to the table and having a wall extending downward and rearward under it from a central portion engaging the front wall of the table, said apron having ledges at its ends below said table outlets.

2. A locomotive stoker distributor head adapted to extend through the firing opening of a fire-box, comprising a jet member provided centrally with a pair of laterally spaced chambers adapted to be connected to a steam supply, said member having a front wall provided with outlets from said chambers for steam jets and having an upper wall inclined downward and rearward from the top of the front wall to form a floor up which a stream of coal can be fed, a hollow table integral with the jet member and extending forward from said front wall below said outlets and provided interiorly with a pair of chambers adapted to be connected to a steam supply, the opposite ends of the table having laterally directed outlets from its chambers for steam jets, the table having a front wall connecting said opposite ends of the table in front of said laterally directed outlets, and a protective apron detachably connected to the table and having a wall extending downward and rearward under it from a central portion engaging the front wall of the table, said apron having ledges at its ends projecting forward and laterally from below said table outlets.

3. A locomotive stoker distributor head adapted to extend through the firing opening of a fire-box, comprising a hollow jet member adapted to be connected to a steam supply, said member having a front wall provided with outlets for steam jets and having an upper wall inclined downward and rearward from the top of the front wall to form a floor up which a stream of coal can be fed, a hollow table extending forward from said front wall below said outlets and provided interiorly with chambers adapted to be connected to a steam supply, the opposite ends of the table having laterally directed outlets for steam jets, the table having a front wall connecting said opposite ends of the table in front of said laterally directed outlets, and a protective apron detachably connected to the table and having a central portion extending across the front wall of the table with the tops of said portion and table in substantially the same plane, said apron having ledges at the opposite ends of said central portion projecting forward and laterally from below said table outlets, and said apron having a wall extending downward and rearward under the table from said central portion and from the front edges of said ledges.

4. A locomotive stoker distributor head adapted to extend through the firing opening of a fire-box, comprising a hollow jet member adapted to be connected to a steam supply, said member having a front wall provided with outlets for

6

steam jets and having an upper wall inclined downward and rearward from the top of the front wall to form a floor up which a stream of coal can be fed, a hollow table extending forward from said front wall below said outlets and provided interiorly with chambers adapted to be connected to a steam supply, said chambers having a front wall forming the front wall of the table and connecting the opposite ends of the table, the opposite ends of the table having laterally directed outlets for steam jets with extensions projecting out over the table outlets, and a protective apron detachably connected to the table and having a wall extending downward and rearward under it from a central portion engaging the front wall of the table, said apron having ledges at its ends below said table outlets.

5. A locomotive stoker distributor head adapted to extend through the firing opening of a fire-box, comprising a hollow jet member adapted to be connected to a steam supply, said member having a front wall provided with outlets for steam jets and having an upper wall inclined downward and rearward from the top of the front wall to form a floor up which a stream of coal can be fed, a table extending forward from said front wall below said outlets and provided interiorly with chambers adapted to be connected to a steam supply, the opposite ends of the table having laterally directed outlets for steam jets, a wall connected to the bottom of the table and spaced therefrom to form an air chamber, the rear and front ends of the air chamber being provided with openings for passage of air forward through the chamber from outside the firebox, and a protective apron detachably connected to the table and having a wall extending downward in front of said air chamber and rearward beneath it from a central portion of the apron engaging the front of the table, said apron having ledges at its ends projecting forward and laterally from below said table outlets.

6. A locomotive stoker distributor head adapted to extend through the firing opening of a fire-box, comprising a jet member adapted to be connected to a steam supply, said member having a forwardly extending portion provided with a pair of laterally spaced recesses each having at one side a rearwardly and downwardly inclined bottom surface, and a front member provided with a pair of laterally spaced vertical ribs projecting into said recesses and having laterally projecting inclined lugs overlying said inclined bottom surfaces for detachably connecting said members together.

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