May 18, 1937. H. P. ANDERSON ET AL 2,081,114

STOKER

Filed April 15, 1935

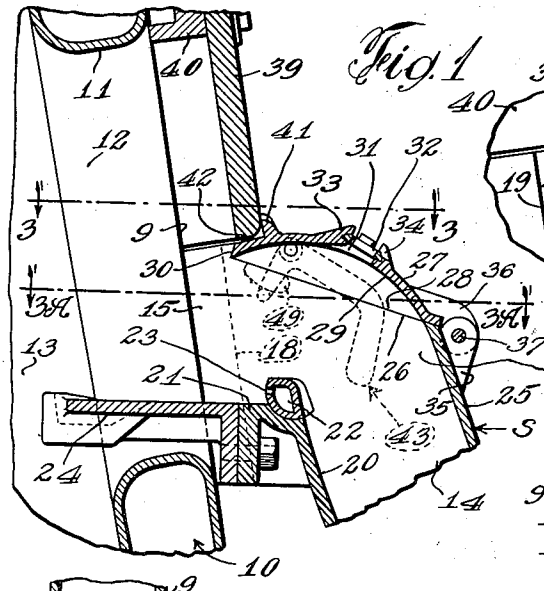


Fig. 1

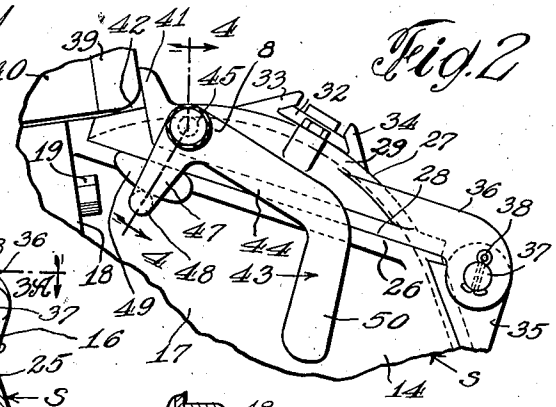


Fig. 2

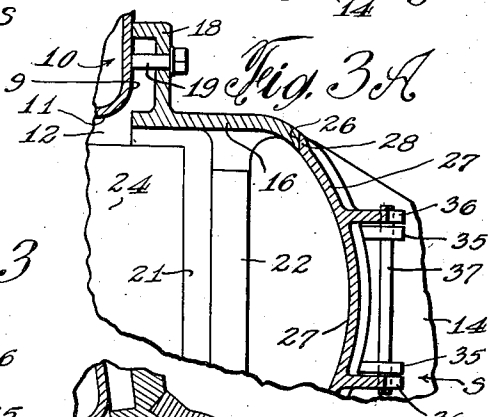


Fig. 3A

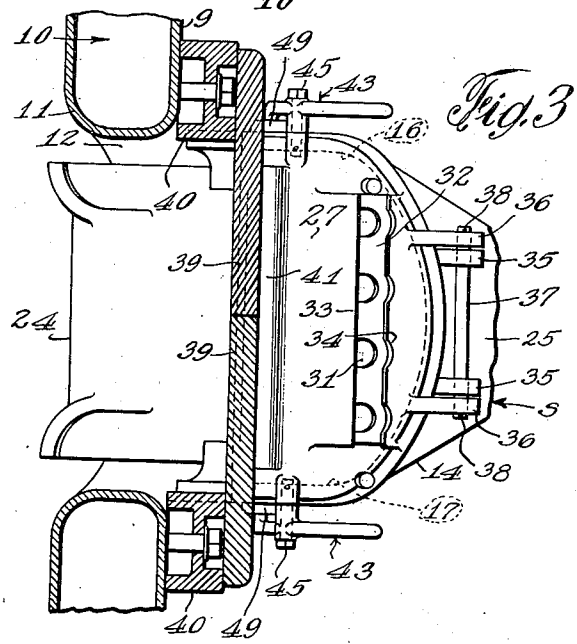


Fig. 3

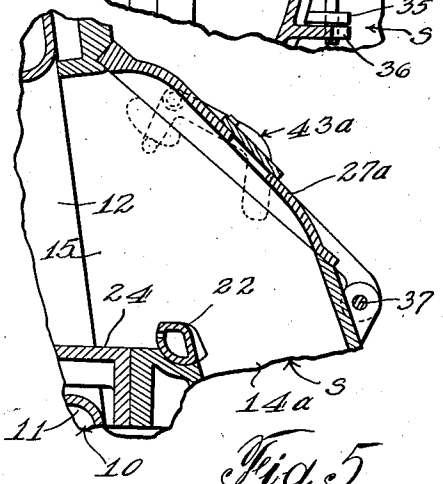


Fig. 5

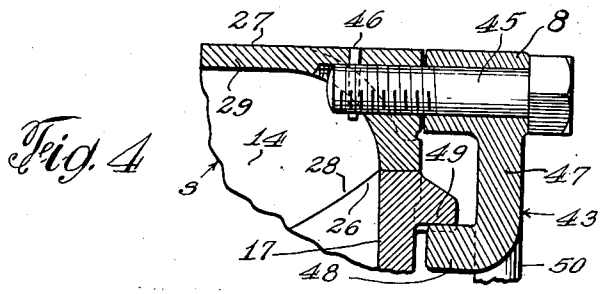


Fig. 4

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STOKER

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Application April 15, 1935, Serial No. 16,287

4 Claims. (Cl. 110—101)

This invention relates to improvements in stokers of the type which feed fuel into a furnace through a wall thereof, and specifically to locomotive stokers of this type.

It is an object of this invention to provide in a cover forming a closure for an opening in a stoker conduit, a new and improved latching device which firmly retains the cover on its seat over the opening in the delivery conduit and which device may be quickly unlatched to permit removal of the cover from its normal closing position.

More specifically, it is an object of this invention to provide the improved latching device for a stoker conduit cover which is hinged to a stoker conduit at an end thereof remote from the improved latching device.

Other objects and advantages of our invention such as the improved construction of the cover and the latching device therefor will be apparent as the following description is read in connection with the accompanying drawing, in which,

Fig. 1 is a central vertical longitudinal section through adjacent portions of a locomotive firebox and the stoker therefor, in which the invention is embodied;

Fig. 2 is an enlarged side elevation of a portion of the structure shown in Fig. 1;

Fig. 3 is a plan section taken on the line 3—3 of Fig. 1;

Fig. 3A is a sectional view taken on the line 3A—3A of Fig. 1;

Fig. 4 is an enlarged detail sectional view taken on the line 4—4 of Fig. 2; and

Fig. 5 is a view similar to Fig. 1, illustrating another embodiment of our invention.

Referring to Figures 1 to 4 of this drawing, which illustrate the invention embodied in a stoker for locomotives, 10 indicates the boiler having a hollow backwall 11 provided with an opening 12 therein constituting an entranceway to the interior of the firebox or furnace 13 and also serving as an opening through which a stoker S feeds fuel into said firebox.

The stoker S is of a well known commercial form and for this reason only the fuel discharging and distributing means thereof is shown. As illustrated, the stoker S includes a riser conduit member 14 which extends in an upward and forward direction and is arranged with the discharge mouth 15 thereof in communication with said firebox through the firing opening 12 thereof. Extending laterally from the forward end of each side wall 16, 17 of the riser conduit is a flange 18 through which bolts 19 are passed for securing the riser conduit 14 to the backwall 11. Mounted at the juncture of the conduit front wall 20 and the bottom wall 21 of the discharge mouth 15 is a chambered member 22 which is provided with apertures 23 for issuing blasts of pressure fluid over a distributing table 24 from which the fuel is spread over the firebed.

The rear wall 25 of the riser conduit 14 is in spaced relation with its front wall 20 and extends to a point above its bottom wall 21, while the side walls 16, 17 extend forwardly in an upward direction so that each side wall merges into a respective flange 18. In horizontal cross section the upper end of the riser conduit is U-shaped and the upper marginal edges of the side walls 16, 17 and the rear wall 25 terminate in a common forwardly inclined plane to form a seat 26 for a removable cover member 27 which is provided with a complementary seat 28.

Curving upwardly, then forwardly, as a forward continuation of the rear wall 25, is the cover 27 terminating in a forward edge 30 which is spaced rearward of the outer surface 9 of the backwall 11. The top wall or cover 27 is spaced a distance above the bottom wall 21 which is sufficient to permit the column of fuel passing through the conduit 14 to rise above the bottom wall to a height whereby the columnar formation of fuel will break along its line of repose and fall downwardly onto the distributor table 24 in front of the jet apertures 23 for distribution over the firebed.

At or immediately forward of this normal angle or line of repose of the fuel, the cover 27 is provided with a plurality of transversely spaced apertures 31 which are arranged to be covered or uncovered by a plate 32 which is slidable transversely of the conduit in a guideway formed by the parallel pair of ledges 33, 34. The rear ledge 34 is cut away immediately opposite each aperture 31 whereby a greater range of vision is afforded for inspecting stoker operation and fire conditions from a point exterior of the firebox.

Preferably, the removable cover 27 is hinged to the conduit 14, and for this purpose a pair of ears 35 are formed with the rear wall 25 to be received between the lugs 36 which are formed at the rear side of the cover 27. A pin 37 passes through the ears 35 and the lugs 36 for hinging the cover 27 to the conduit. The pin 37 is locked in position by means of cotters 38.

In the embodiment of our invention illustrated in Figures 1 to 4, inclusive, it will be observed that the discharge mouth 15 of the riser conduit

14 communicates with the firebox 13 through the lower portion of the firing opening 12. Pneumatically operated doors 39, mounted upon a frame 40 which is rigid with the backwall 11, close the upper portion of the firing opening. Slightly to the rear of its forward edge 30, the cover 27 is provided with a lug or bead 41 which extends transversely of the backwall 11 and forms with the lower rearward edge of the frame 40 a way 42 within the confines of which fits the lower portions of the doors 39. The lug or bead 41 forms a stop for restraining rearward movement of the doors 39 which might be caused by explosions within the firebox 13.

It will be observed from Figures 1 and 2 that when the fire doors 39 are in their normal position, they will serve to limit upward swinging movement of the cover 27. However, the doors 39 cannot, in actual practice, be made to firmly retain the cover 27 on the seat 26 of the riser conduit 14. It is necessary that the cover 27 be firmly seated over the conduit 14 in order that the rising column of fuel will not unseat the cover and cause fuel to spill out and, therefore, we have provided a simple and efficient latch device 43, at each side of the cover 27 for retaining it in a firm position over the conduit 14.

Each latch device 43 consists of a lever 44 which is pivoted on a capped bolt 45 screwed into the cover 27 and locked thereto by a pin 46. Extending downwardly and forwardly from the pivoted portion 8 of the lever 44 is an arm 47 having an inwardly projecting finger 48 arranged to engage the under side of a lug 49 which extends outwardly from a side wall 16, 17 of the conduit 14 and below the cover seat 26. The under side of the lug 49 is in the form of a curve which is eccentric from the pivot bolt 45 or it may be an involute curve described from this pivot bolt. This curve is so related with the axis of the pivot bolt 45 that the radial distances from such axis to the curved under side of the lug 49 increase successively in a forward direction. The radial distance from the axis of the pivot bolt to the lug engaging portion of the finger 48 is greater than the least radial distance from such axis to the curved under side of the lug 49 but less than the greatest radial distance between the curved under side and the pivot axis. In this manner, when the stoker operator presses downwardly and forwardly on the handle 50 of the lever 44, the finger 48 will freely engage the eccentrically curved under side of the lug 49. Further downward and forward movement of the handle will cause the finger 48 to be wedged tightly against the under side of the lug 49, thus drawing the cover 27 downwardly so that it is firmly seated upon the seat 26 of the conduit 14.

Whenever access to the interior of the firebox 13 is desired, the stoker operator pulls the handles 50 in an upwardly rearward direction until the fingers 48 are free of the lugs 49, whereupon the doors 39 are opened and the cover 27 swung rearwardly. Since the upper end of the conduit 14 is open in a direction forward from its rear wall 25, the mouth 15 of the conduit forms a portion of the entranceway into the firebox so that a smaller firing opening can be used than would be possible otherwise.

In the modification illustrated in Fig. 5, the cover 27*a* constitutes a fire door as well as a cover for the conduit 14*a*. The latch device 43*a* is of identical form with that used in the preferred form, and for this reason does not require further description.

From the foregoing, it will be apparent to those skilled in the art that the latch device according to our invention will enable the stoker operator to quickly remove the stoker conduit cover with considerable ease and also to replace the same in a similar manner so that it is firmly seated upon the conduit 14.

We claim:

1. In combination with a furnace having a wall with a firing opening therein, a stoker for delivering fuel into said firebox comprising a conduit having a discharge mouth communicating with said furnace through said firing opening, said conduit having an opening therein extending rearward from a point close to the plane of said furnace wall, a cover normally closing said opening, said cover being hinged at its end remote from the plane of the furnace wall to said conduit, said cover being provided with a latching lever pivoted on the forward end of said cover and cooperating with a device on the conduit to latch the cover in place, said latching lever having a handle portion normally disposed between the lever pivot and the pivot of the cover and being operative by a substantially continuous rearward and upward pull to unlatch the cover and swing it upward and rearward on its pivot.

2. In combination with a furnace having a wall with a firing opening therein, a stoker for delivering fuel into said firebox comprising a conduit having a discharge mouth communicating with said furnace through said firing opening, said conduit having an opening therein extending rearward from a point close to the plane of said furnace wall, a cover normally closing said opening, said cover being hinged at its end remote from the plane of the furnace wall to said conduit, said cover being provided with a latching lever pivoted on the forward end of said cover and cooperating with a device on the conduit to latch the cover in place, said latching lever having a handle portion normally disposed between the lever pivot and the pivot of the cover and below the plane passing through the pivotal axes of said lever and cover.

3. In combination with a furnace having a wall with a firing opening therein, a stoker for delivering fuel into said firebox comprising a conduit having a discharge mouth communicating with said furnace through said firing opening, said conduit having an opening therein extending rearward from a point close to the plane of said furnace wall, a cover normally closing said opening, said cover being hinged at its end remote from the plane of the furnace wall to said conduit, said cover being provided with a latching lever pivoted on the forward end of said cover and cooperating with a device on the conduit to latch the cover in place, said latching lever having a handle portion normally disposed between the lever pivot and the pivot of the cover and being operative by a substantially continuous rearward and upward pull to unlatch the cover and swing it upward and rearward on its pivot, said latching lever and the cooperating device on the conduit being arranged for increasing the pressure of the cover against the conduit with increasing pressure on the handle portion of said latching lever.

4. In combination with a furnace having a wall with a firing opening therein, a stoker for delivering fuel into said firebox comprising a conduit having a discharge mouth communicating with said furnace through said firing opening, said conduit having an opening therein ex-

tending rearward from a point close to the plane of said furnace wall, a cover normally closing said opening, said cover being hinged at its end remote from the plane of the furnace wall to said conduit, said cover being provided with a latching lever pivoted on the forward end of said cover and cooperating with a device on the conduit to latch the cover in place, said latching lever having a handle portion normally disposed between the lever pivot and the pivot of the cover and below the plane passing through the pivotal axes of said lever and cover, said latching lever and the cooperating device on the conduit being arranged for increasing the pressure of the cover against the conduit with increasing pressure on the handle portion of said latching lever.

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