J. A. SWARTZ.

LOCOMOTIVE ASH PAN.

APPLICATION FILED MAR. 12, 1909.

1,038,987. Patented Sept. 17, 1912.

Fig. 1.

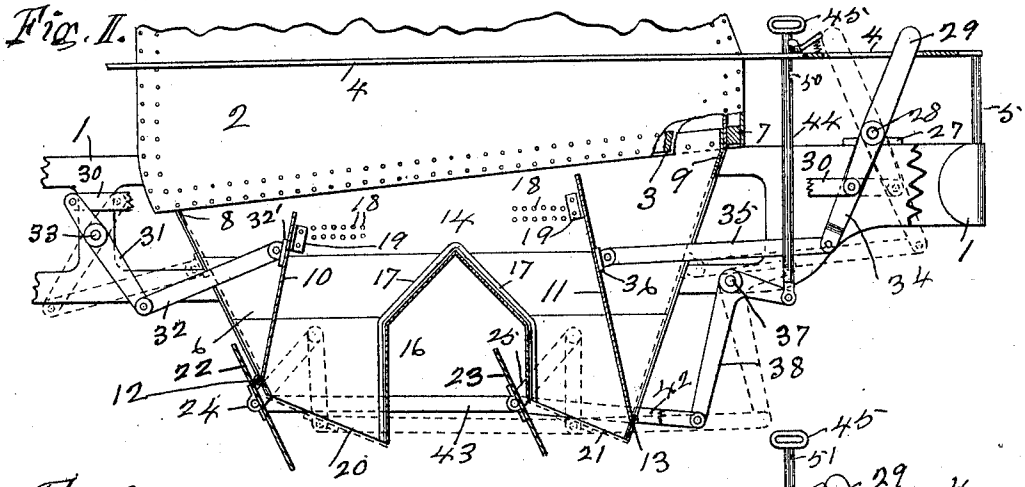


Fig. 2.

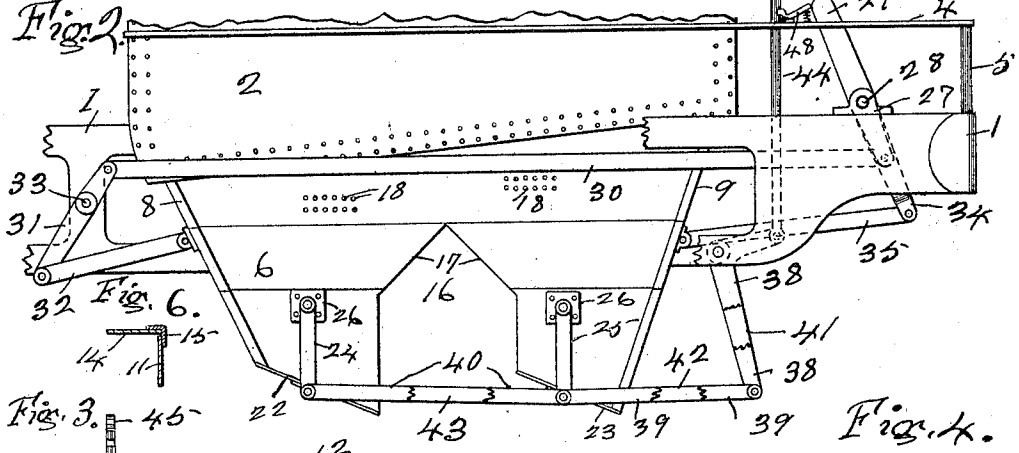


Fig. 6.

Fig. 3.

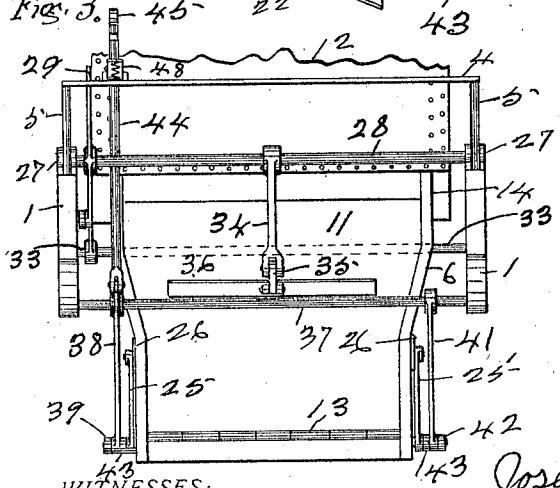


Fig. 4.

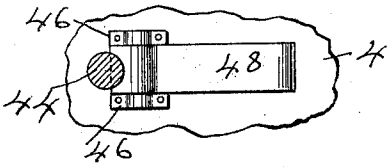
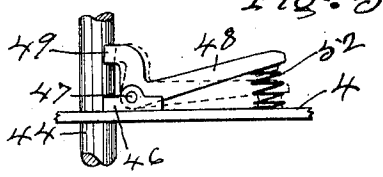


Fig. 5.



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LOCOMOTIVE ASH-PAN.

1,038,987. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed March 12, 1909. Serial No. 482,932.

To all whom it may concern:

Be it known that I, JOSEPH A. SWARTZ, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Locomotive Ash-Pans; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in locomotive ash pans.

The primary object of my present invention is to provide a locomotive ash pan of comparatively cheap and simple construction, so constructed and arranged as to enable the fireman or other operator to perfectly relieve the same of its contents from the engine cap without stopping the locomotive, and regardless of its speed, and without the necessity of going beneath the locomotive for any purpose connected with the operation of such ash pan.

Another object is to provide an ash pan which can be perfectly cleaned without the aid of scrapers or other ash discharging means, and also adapted to retain the hot coals, cinders and ashes until sufficiently cooled to be safely discharged upon the track; the said ash receptacle being so suspended from the fire-box as to prevent any leakage from entering the same, thereby preventing the ashes from becoming water soaked and frozen in cold weather.

My invention consists of an ash pan or ash holding compartment suspended beneath the fire box, having suitable draft openings at its sides, and a transverse arch midway of its ends to aid the discharge of the ashes by gravity; normally closed discharge openings in the bottom of the pan upon the opposite sides of the arch; means for keeping the discharge openings normally closed; means for aiding the prompt discharge of the contents through the said openings; and means for opening the discharge openings independently of the last mentioned means.

The principal novel feature of my invention resides in the means for discharging ashes from the engine cab without the employment of scrapers or other similar discharging means, and in the means for retaining the ashes at pleasure in their receptacle.

Similar reference numerals indicate like parts throughout the several views in which—

Figure 1 is a longitudinal vertical section of the ash pan with the means for closing the discharge openings being shown in their open position. The means for aiding the discharge of the ashes are shown at the inner limit of their movement, the actuating levers for the above mentioned means being shown in dotted outlines and the engine frame and part of the lever mechanism being partly broken away. Fig. 2 is a side elevation of my invention with the engine frame and some of the levers partly broken away showing the general arrangement of the lever mechanism. Fig. 3 is a rear elevation of my invention showing the connection of the two sets of levers upon the opposite sides of the pan. Fig. 4 is an enlarged detail plan of the spring-pressed catch for securing the discharge opening closing means in either its open or closed position, its engagement with the vertical operating lever, shown in cross-section. Fig. 5 is a side elevation of the same, showing in dotted lines the position which the catch assumes when released from its engagement. Fig. 6 is a fragmentary detail of one corner of the ash pan to show the angle iron thereon and the relative arrangement of the hinged ends which have an inward movement to aid in the discharge of the contents of the pan.

The engine frame 1, the fire box 2 with its grate-bars 3, the floor 4, and the upright standards 5 are of the usual or other proper construction and relative arrangement.

The ash pan 6, of proper material, dimensions and contour is opened at its top whose upper edge is riveted to the inner face and lower edge of the fire box 2 adjacent to the mud-ring 7, as shown in Fig. 1. The opposite ends 8 and 9 of the pan are inwardly inclined, and are provided with proportionally large doors 10 and 11 respectively which are hinged at their lower edges to the said ends of the pan by the hinges 12 and 13 respectively. The opposite sides 14 of the ash pan of similar construction are provided at the outer face of each end thereof with the upright angle-iron 15, Fig. 6, rigidly fixed thereto, one side of which receives the opposite sides of the respective doors 10 and 11 and limits their outward movement.

The lower portion of the pan is divided into substantially equal parts by the transverse opening 16 for the rear driving axle of the engine, not shown. The bottom of the ash pan, forming the roof of the opening 16, is preferably arranged in two oppositely inclined sides 17, Fig. 1, whereby the discharge of the contents of the pan is materially aided by gravity. At proper points on the inner face of the two sides 14 are arranged suitable draft openings 18, and also suitable fixed stops 19, Fig. 1, to limit the inner movement of the said doors when the same are opened inwardly to aid in discharging the ashes.

The discharge openings 20 and 21 in the bottom of the pan extend from side to side thereof, and are normally closed by means of the transverse doors 22 and 23, whose opposite ends are rigidly fixed to links 24 and 24′ and 25 and 25′ respectively. These links have their upper ends pivotally mounted on suitable plates 26 fixed upon the outer faces of the opposite sides 14 of the ash pan.

In suitable bearings 27 on the rear end of the engine frame 1, Figs. 1, 2 and 3, is rotatably mounted a shaft 28 carrying upon one end thereof an upright hand lever 29, whose upper free end projects upward through the floor 4 of the engine cab, and to whose lower end is pivotally connected the rear end of the horizontal link 30 whose forward end is pivotally connected to the upper end of a short lever 31 pivotally fulcrumed near the middle of its length on the transverse shaft 33 whose opposite ends are pivotally mounted in the corresponding sides of the engine frame 1. To the lower end of the lever 31 is pivotally connected one end of the link arm 32 whose other end is pivotally connected to the outer face of the door 10 as shown in Fig. 1, by means of the bar 32′ on the door 10.

At or near the central portion of the shaft 28 is fixed a pendant arm 34 to whose lower end is pivotally connected the lever 35 whose other end is pivotally connected to the bar 36 which is rigidly fixed on the outer face of the door 11, whereby the doors 10 and 11 are simultaneously opened or closed by means of the lever 29.

At suitable points in the engine frame are rotatably mounted the opposite ends of the transverse shaft 37 adjacent to the rear end of the ash pan, Figs. 2 and 3. On the shaft 37 near one end thereof is fixed a bell-crank lever 38 whose lower extended end is pivotally connected to the rear end of the horizontal link 39 whose forward end is pivotally connected to the lower end of the link arm 25. The lower ends of the links 24 and 25 are pivotally connected by means of the link 40. On the shaft 37 near the other end thereof is fixed the upper end of the pendant lever arm 41, whose lower end is pivotally connected with the link 42 whose other end is pivotally connected to the adjacent end of the link 43. The links 24′ and 25′ are pivotally connected at their ends by means of the link 43. Link 24′ is not shown, but corresponds in construction and operation with the link 24, and the links 42 and 43 correspond to the links 39 and 40.

To the upper and short end of the bell-crank lever 38 is pivotally connected the lower end of the vertical operating rod 44 whose upper free end passes upward through a suitable opening in the floor 4 and has a suitable operating handle 45, whereby the discharge openings 20 and 21 can be opened and closed at pleasure by the vertical movements of the rod 44. In cooperative relation with the upper end of the rod 44 are arranged the bearings 46 in which is loosely mounted the pivot 47 on which is fixed a catch 48 whose upright end is provided with a lateral lug 49 adapted to engage the notches 50 and 51 in the rear face of the rod 44. The rear end of the catch 48 is mounted in a small coil spring 52 of proper tension whose other end is fixed to the floor 4, whereby the said catch is normally adapted to firmly engage one or the other of the notches 50 or 51 in the manner hereafter described.

The operation and manner of employing my invention thus described is obvious and briefly stated is as follows: Assuming the operative parts of my invention to be in their normal position as shown in Figs. 1 and 3, when the operator desires to discharge the contents of the ash pan he simply seizes the handle 45 of the operating rod 44 and pushes it downward to its lowest limit, and in doing so he releases the catch 48 from its engagement therewith by pressing upon the rear end thereof with his foot. When the rod 44 has reached its lowest limit the catch 48 under the impulse of the spring 52 will automatically engage the rod in the notch 51 and thereby firmly secure it in such position at the pleasure of the operator. This downward movement of the rod 44 simultaneously opens the discharge doors 22 and 23 through the medium of the bell-crank 38, and the lever 41, thereby permitting the contents of the pan to discharge by gravity through the openings 20 and 21.

To insure the prompt discharge of such of the contents as may cling to the sides of the pan, the operator pushes the end doors 10 and 11 inward to their limit against the stops 19 by means of the lever 29, and the links 30, 31, 32 and 35, after which they are returned to their normal inclined position against the respective angle irons 15, where they are secured in position by gravity and the weight of the ashes against their inner faces. In the inward movement of the doors 10 and 11 they coöperate with the transverse

arch previously referred to, thereby exerting pressure upon the contents of the pan to break up the same and facilitate discharge of such contents through the openings in the bottom of the pan.

When the ashes have been properly discharged the operator from his position in the engine cab closes the doors 22 and 23 by swinging them back to normal position through the medium of the same means by which they were opened, as described. It is evident that the inclined portions 17 of the bottom of the pan not only centrally divide the contents and thus render its discharge easier, but they also aid their discharge by gravity. It is also evident that in the use of my invention the operator can readily and quickly discharge the contents of the pan at any time without stopping the locomotive, whereby the grates can be shaken at any time, and kept in proper condition for generating steam, without fear of burning them. It is also evident that when the doors 22 and 23 together with their operating mechanism are returned to their normal position, they will be secured therein against displacement by the engagement of the spring-pressed catch 48 with the notch 50 of the rod 44.

Having thus described my invention and the manner of employing the same, what I desire to secure by Letters Patent is:

1. A locomotive ash pan having a transverse arch intermediate its ends, the bottom of said pan being open to provide discharge orifices at the sides of said arch, means for normally closing said discharge orifices, means for actuating said closing means, and means arranged within the pan above said discharge orifices and coöperating with the transverse arch to exert lateral pressure on the contents thereof in the plane of said arch and at right angles thereto.

2. A locomotive ash pan having a transverse arch midway of its ends; normally closed vertical discharge openings in the bottom of the pan upon the opposite sides of the arch; means for opening and closing the opposite discharge openings from the engine cab simultaneously; inwardly opening doors in the ends of the pan and hinged at their lower ends; said doors coöperating with said arch to exert pressure upon the contents of the pan to facilitate discharge of said contents, and means for opening and closing such doors simultaneously from the engine cab independently of the last mentioned means.

3. A locomotive ash pan having a centrally disposed transverse arch, the bottom of said pan being open to provide discharge orifices at the sides of said arch, means for closing said orifices, means for actuating said closing means, means arranged at the sides of the arch and coöperating therewith to exert a pressure upon the contents of the pan to effect discharge thereof, and means for actuating the closing means for said orifices simultaneously and independently of the movement of the means for aiding discharge of the contents.

4. A locomotive ash pan having a transverse arch arranged centrally thereof, the bottom of said pan being open to provide discharge orifices at the sides of said arch, means for normally closing said openings, means for actuating said closing means simultaneously from the engine cab, means arranged within the pan and above said discharge orifices for coöperation with said transverse arch, whereby to aid the discharge of the contents of the pan by lateral pressure upon said arch, and means for actuating the last mentioned means from the engine cab independently of the actuation of the closing means for said discharge orifices.

5. In a locomotive ash pan the combination of a pendant pan transversely divided by an arched portion of its bottom, and having a vertical discharge opening upon each side of the arch; means for simultaneously opening and closing the said openings from the engine cab; means for exerting a lateral pressure upon the contents of the pan from the ends thereof to aid in its discharge, consisting of hinged doors operatively mounted in the opposite ends of the pan; means for operating the said doors from the engine cab independently of the means for opening and closing the said openings; and means for firmly securing the discharge opening closing means in an open position.

6. A locomotive ash pan having a transverse arch and provided in its bottom with discharge openings arranged at opposite sides of said arch, closures for said openings, freely-movable devices pivoted within the pan at opposite sides of said arch and coöperating with the latter to exert pressure upon the contents of the pan in the plane of the latter to facilitate the discharge of said contents through said discharge openings, and means for actuating said closures and the freely-movable devices.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 10th day of March, 1909.

JOSEPH A. SWARTZ.

Witnesses:

AUGUSTA VIBERG,

AUGUSTE SPIEGEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."