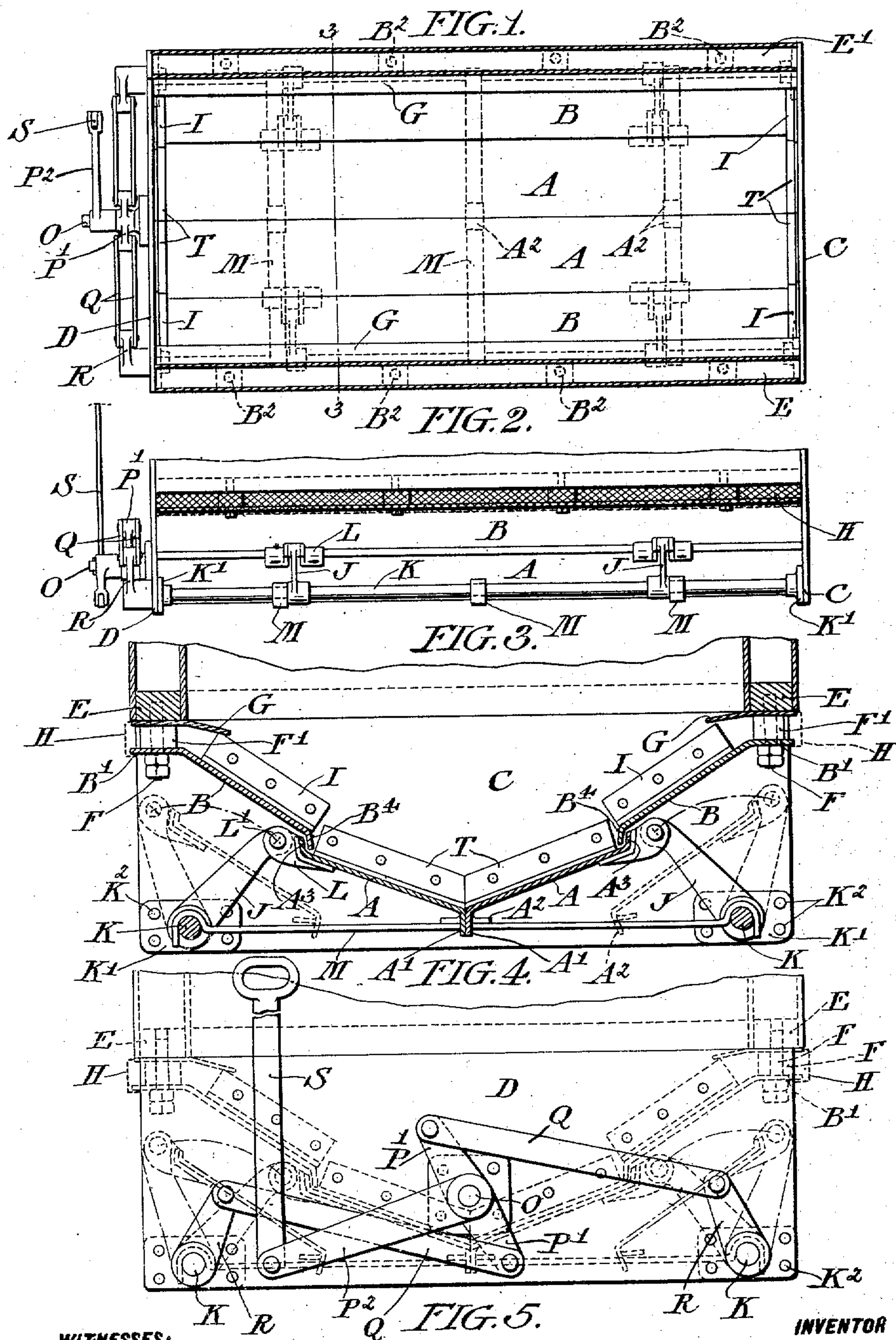


R. W. CLARK.  
LOCOMOTIVE ASH PAN.  
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Patented Nov. 2, 1909.



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# UNITED STATES PATENT OFFICE.

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AND ONE-HALF TO ADOLPH G. KANTMANN, OF NASHVILLE, TENNESSEE.

LOCOMOTIVE ASH-PAN.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, ROBERT W. CLARK, a citizen of the United States of America, residing in Nashville, in the county of Davidson, in the State of Tennessee, have invented a certain new and useful Improvement in Locomotive Ash-Pans, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

The present invention relates to the construction of ash pans secured beneath the grate bars of locomotives and particularly to locomotive ash pans designed for use where the conditions are such that relatively shallow pans are desired.

The main object of the invention is to provide a simple, effective, reliable and durable ash pan for the purpose mentioned which may be operated easily at all times, may be readily installed, removed and replaced when necessary, and which is provided with a movable bottom portion which, when moved into an open position, insures a ready discharge of the contents of the pan and permits easy access to the interior of the pan and to the grate bars, etc. located above the ash pan, and when open tends to remain open and when closed tends to remain closed without requiring any special mechanism for locking the movable bottom portion in either the open or the closed position.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, and the more specific objects obtained with the invention, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described one form of ash pan embodying my invention.

Of the drawings, Figure 1 is a plan view of the ash pan and a portion of the locomotive frame to which it is attached. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section on the line 3—3 of Fig. 1. Fig. 4 is an end elevation, and Fig. 5 is an elevation of a portion of one of the end members of the pan illustrating a detail of construction.

In the preferred embodiment of the invention illustrated in the drawings the pan

proper is formed of movable bottom members A, stationary side members B, and end members C and D, all of these members being formed of metal plates. The plates B are oppositely inclined to the horizontal with their inner edges lowermost. Each plate B is formed at its upper and outer edge with a horizontal flange B<sup>1</sup> and the ash pan as a whole is connected to some portion of the engine frame with the members B extending parallel to the length of the locomotive. For instance the boiler mud sills E may have bolts F tapped into them which pass through apertures B<sup>2</sup> formed in the flanges B<sup>1</sup> of the plates B, and have nuts on their lower ends for securing the plate B in place. As shown, the flanges are not clamped directly against the mud sills but are spaced away therefrom as by means of collars F<sup>1</sup> surrounding the bolts F. This permits air to enter the ash pan at its upper edge, baffle plates G being provided to prevent this air from running up the side walls of the fire box. Wire netting H may also be provided to check any escape of sparks through the spaces between the mud sills and the flanges B<sup>1</sup>. The end members C and D are suitably secured to the ends of the members B as by means of the angle bar brackets I.

The two movable bottom members A are oppositely inclined and, in the closed position, have their lower edges in engagement, the two bottom members A then uniting to form a trough like ash support or pan bottom extending longitudinally of the boiler frame and the two side members B then serve as extensions of the trough formed by the bottom members A so that the ash receptacle as a whole, when in the closed position, is of a trough or hopper like form. Each side member B is formed at its lower edge with a downturned flange B<sup>4</sup> which in the closed position of the pan overlaps an upturned flange A<sup>3</sup> on the corresponding bottom member A. The bottom edges of the plates A are formed into depending flanges A'. The flanges A' of the two members A meet in the closed position of the pan thus forming relatively large abutting surfaces. It will be obvious that the flanges A', A<sup>3</sup>, and B<sup>4</sup> tend to stiffen the side and bottom members A and B.

The two bottom members A are moved transversely of their upper and lower edges from the closed position shown in full lines



in Fig. 3 into the dotted position shown in that figure by means of arms J pivotally connected to the upper edges of the plates A and carried by rock shafts K pivotally supported by the end members C and D. 5 The connection between each plate A and the corresponding set of arms J is formed by means of brackets L secured to the upper edge of the plate and connected to the ends of the corresponding arms by pins or pin- 10 tles L'. The members A have their lower edges supported at all times by horizontal guide bars M extending transversely of the ash pan and having their ends supported on the shafts K. To provide a proper bearing 15 surface on each member A for engagement with each guide bar M a tab or portion A<sup>2</sup> of the flange A' is turned back as shown in the drawings. The shafts K, plate A, and arms J are so relatively arranged that as 20 each plate A is moved from the closed position into the open position, or reversely, the arms J guide the movement of the upper edge of the plate A, so that this edge, and consequently the plate, as a whole, first rises 25 and then falls during the movement in each direction. In consequence, the weight of each plate and its arms J act to hold the plate in whichever of its two positions it may be in. Angle bar stop members T are 30 secured to end members C and D to check the inward movement of the ends of bottom members A.

The rock shafts K are preferably detachably connected to the end members C and D. 35 For instance, each end member C and D is formed with a notch N (see Fig. 5) at its lower corner receiving the corresponding end of the corresponding shaft K and is provided at each lower corner with bolt holes 40 N' by means of which the bearing members K' for the end of the corresponding shaft K may be secured in position by bolts K<sup>2</sup>.

The rear end member D of the ash pan has 45 secured to it a pivot pin O on which is mounted a lever provided with two opposing arms P' and a third arm P<sup>2</sup>. The arms P' are connected, one to one rock shaft K, and the other to the other rock shaft K. The 50 connection between each arm P' and the corresponding rock shaft is made by links Q, each pivotally connected at one end to one end of the arm P', and pivotally connected at the other end to the end of an arm 55 R secured to the corresponding shaft K. In consequence when the lever is rotated as it may be through the arm P<sup>2</sup>, the rock shafts K are turned to move the bottom plates A from the full line closed position 60 shown in Fig. 2 into the dotted line open position of that figure, and vice versa. The lever P<sup>2</sup> is provided with an operating link S running up above the top of the pan in the position where it can be operated from 65 the cab or other convenient location.

With the construction illustrated, it will be observed that in service the plates A constantly tend to jar closer and hence will not open accidentally to spill ashes on the right 70 of way. The construction is such that very little power is required to open the bottom of the ash pan when it is desired to discharge the contents and the opening in the bottom of the ash pan provided when the 75 plates A are spread apart is very large. It may be fifty per cent. or more of the horizontal area of the pan as a whole. This not only insures, in conjunction with the slope of the side members B, a complete and rapid 80 discharge of the ash pan contents whenever desired but also provides ample space for a workman who may desire to repair or adjust the grate bars or like parts of the engine above the ash pan. Furthermore, there 85 is no danger of the bottom members coming together while a workman is in the space between them. The end members C and D form complete closures for the ends of the ash receptacle proper. This prevents the 90 escape of ashes from the ends of the ash pan on to the right of way, and what is perhaps more important, prevents the ashes from being violently fanned by air entering the ash pan at its ends. This, of course, reduces the 95 chances of injury to the ash pan from the heat of the ashes. As the movable bottom members A are entirely supported by, as well as moved through, the rock shafts K and the latter are supported from the end 100 members C and D at points remote from the ash receiving parts of the pan structure, the operating parts are not liable to be warped, with consequent binding, through 105 unequal expansion in various portions of the ash pan, and, of course, the shafts and bearings therefor are not apt to be injured by heat derived from the ashes. In consequence, any warping or distortion in the ash pan structure which may occur from expansion of various portions of it relative to the 110 other portions does not interfere with the operation of the movable bottom portion of the pan.

The pan as a whole may be made relatively shallow and when open no portion 115 of the pan extends below the bottom of the pan when closed.

The pan may obviously be made as long as conditions make it desirable without any change in design other than in proportions. 120 Moreover, the depth of the pan may be increased when conditions permit, and it is immaterial whether the top of the pan is above or below the wheel axles of the locomotive. In the latter case the side members 125 B may obviously be notched at their upper edges to accommodate the axles.

The pan as a whole is selfcontained and to remove it and replace it requires only 130 manipulation of the nuts at the lower ends



of the studs F. The operating connections for moving the bottom require no modification whatever of the engine frame structure and need not be connected in any way thereto. Not only may the ash pan as a whole be readily removed, but by simply removing the bolts K<sup>2</sup> fastening the bearing members K' in place and removing the operating lever S or disconnecting its arms P' from the shafts K, the entire bottom may be quickly and easily removed and replaced when necessary.

While in accordance with the provisions of the statutes I have herein described and illustrated the best form of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention, and it will also be apparent to those skilled in the art that certain features of construction described and claimed herein may sometimes be used with advantage without a corresponding use of other features described and claimed, and I do not wish the claims hereinafter made to be limited to the particular form of embodiment disclosed more than is made necessary by the state of the art.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a locomotive ash pan, the combination of an inclined bottom member movable transversely to its upper and lower edges from a closed position to an open position, and means for causing the upper edge of said member to first rise and then fall without substantial change in level of the lower edge of the member as the member moves from either position into the other, whereby said member is normally prevented by gravity from moving into either of said positions from the other position.

2. In a locomotive ash pan, the combination of an inclined bottom member movable transversely to its upper and lower edges from a closed position to an open position, horizontal guides on which the lower edge of said member works during said movement, and means for causing the upper edge of said member to first rise and then fall as it moves from either position into the other, whereby said member is normally prevented by gravity from moving into either of said positions from the other position.

3. In a locomotive ash pan, the combination of a movable inclined bottom member, an arm or arms pivotally supported to turn about an axis parallel to the upper and lower edges of said member and pivotally connected to said member at a distance from said axis, said arm or arms, axis, and bottom member being so relatively arranged that as said member is moved from either

its closed or open position into the other of those positions the pivotal connections between said arm or arms and said member swings over said axis.

4. In a locomotive ash pan, the combination of a movable inclined bottom member, an arm or arms pivotally supported to turn about an axis parallel to the upper and lower edges of said member and pivotally connected at a distance from said axis to said member adjacent its upper edge, said arm or arms axis and bottom member being so relatively arranged that as said member is moved from either its closed or open position into the other of those positions the pivotal connections between said arm or arms and said member swings over said axis, and guides on which the lower edge of said member slides during the opening and closing movements.

5. In a locomotive ash pan, the combination of a movable bottom formed of two inclined members which in the closed position meet at their lower edges to form a trough-like ash support extending lengthwise of the pan, and which are movable transversely of their meeting edges each away from the other to open the bottom of the pan, and means for causing the upper edge of each member to rise and fall without substantial change in the level of the lower edge of the member as the member moves from either the open or closed position into the other, whereby said member is normally prevented by gravity from moving into either of said positions from the other position.

6. In a locomotive ash pan, the combination of a movable bottom formed of two inclined members, which in the closed position meet at their lower edges to form a trough-like ash support extending lengthwise of the pan, and which are movable transversely of their meeting edges each away from the other to open the bottom of the pan, means for causing the upper edge of each member to rise and fall without substantial change in the level of the lower edge of the member as the member moves from either the open or closed position into the other, whereby said member is normally prevented by gravity from moving into either of said positions from the other position, and means for positively checking the movement of each member in the closing direction.

7. In a locomotive ash pan, the combination of side portions extending parallel to the length of the locomotive, end members connected to the ends of said side members and extending transversely thereto, a pair of rock shafts extending parallel to the length of the locomotive, and arms carried thereby, oppositely inclined movable bottom members one having its upper edge hinged directly to the arms of one of said rock shafts



and the other being similarly hinged to the other shaft.

8. In a locomotive ash pan, the combination with side members extending parallel to the length of the locomotive, end members extending transversely of, and connected to, said side members, a pair of rock shafts extending parallel to the length of the locomotive, bearings for the rock shafts detachably connected to the end members, arms carried by the rock shafts, and oppositely inclined bottom members one having its upper edge hinged directly to the arms of one shaft and the other being similarly hinged to the other shaft.

9. In a locomotive ash pan, the combination with side members extending parallel to the length of the locomotive, of end members extending transversely to the side members, a pair of rock shafts extending parallel to the length of the locomotive, arms carried thereby, oppositely inclined bottom members one having its upper edge pivotally connected to the arms of one shaft and the other being similarly connected to the other shaft, and guide bars supported on the rock shafts on which the lower edges of the bottom members slide as they are moved.

10. In a locomotive ash pan, the combination of side members adapted to extend longitudinally of and be secured to the frame of the locomotive, end members extending transversely of the side members and secured thereto, a pair of rock shafts extending parallel to the side members, bearings for the ends of the rock shafts detachably connected to the end members, arms secured to the rock shafts, a pair of oppositely inclined bottom members one having its upper edge pivotally connected to the arms of one shaft and the other being similarly connected to the other shaft, and guide bars supported at their opposite ends on the rock shafts on which the lower edges of bottom members rest.

11. In a locomotive ash pan, the combination of side members adapted to extend longitudinally of and be secured to the engine frame, end members extending transversely of and connected to the ends of said side members, rock shafts extending parallel to the side members and pivotally supported at their ends by the end members, arms carried thereby, oppositely inclined bottom members one having its upper edge hinged directly to the arms of one shaft and the other being similarly hinged to the other shaft, and mechanism including a single operating handle for simultaneously rotating said shafts in opposite directions.

12. In a locomotive ash pan, the combination of oppositely inclined side members provided with horizontal flanges at their upper edges adapted to be secured to the

engine frame, end members connected to the ends of said side members and provided with portions extending below the lower edges of the latter, rock shafts pivotally supported by said end members, arms carried thereby, a pair of oppositely inclined bottom forming plates adapted to meet at their lower edges when in their closed position and each pivotally connected at its upper edge to the arms of one of said rock shafts, each bottom plate having an upturned flange at its upper edge and each side member having a downturned flange formed at its lower edge adapted to overlap the upturned edge of the corresponding bottom member when the latter is in the closed position.

13. A self-contained locomotive ash pan construction comprising in combination a pair of oppositely inclined side plates adapted to be detachably connected to the engine frame, end members connected to the ends of said side members and formed with portions projecting below the side members, a pair of rock shafts extending parallel to said side members and located one beneath each side member and having its ends pivotally supported by the corresponding portions of the end members, guide bars extending transversely to the side members and supported at their opposite ends on the two rock shafts, a movable bottom formed of a pair of oppositely inclined members each pivotally connected at its upper ends to the arms carried by the extending rock shaft and each having its lower edge resting on said guide bars, an operating lever pivotally supported on one end member, and link and arm connections between said lever and the two rock shafts whereby rotation of said lever rotates the two rock shafts in opposite directions and moves the bottom members toward and away from each other.

14. In a locomotive ash pan, a bottom composed of two oppositely inclined metal plates adapted when in their closed position to meet at their lower edges and movable transversely of their meeting edges and toward and away from each other to close and open the bottom of said pan, said plates having depending flanges at their lower ends adapted to abut against one another when the bottom is closed, and having portions of said flanges bent back toward the horizontal to form guide bar engaging surfaces, and guide bars supporting the lower edges of said plates arranged in position to be engaged by the said bent back portions of the depending flanges.

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Witnesses:

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J. K. BLACK.