May 18, 1943 C. M. DRINKWATER 2,319,725

DUSTLESS ASH RECEIVER

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Fig. 1.

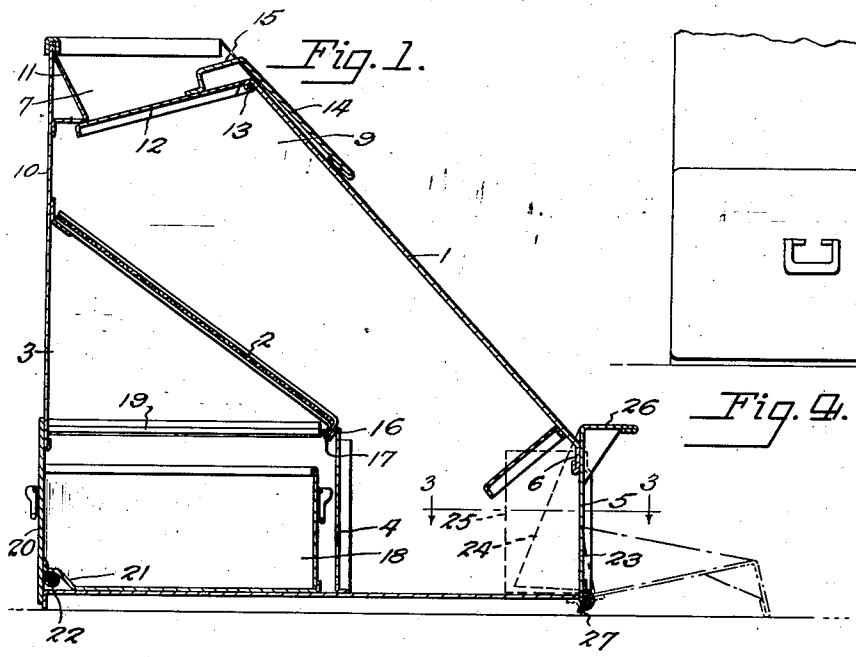


Fig. 4.

Fig. 2.

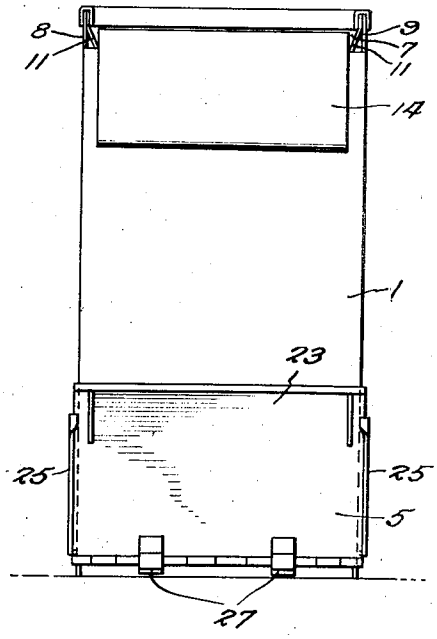
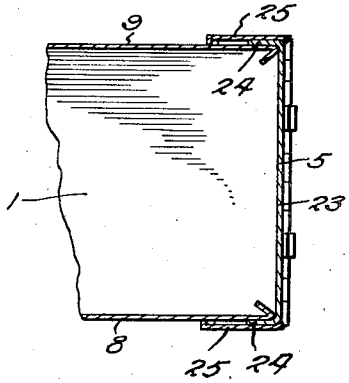


Fig. 3.



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DUSTLESS ASH RECEIVER

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3 Claims. (Cl. 209—246)

This invention pertains to improvements in a combined ash and cinder receiver.

A purpose in developing this invention is to minimize the dustiness often associated with ash disposal.

A further purpose is to develop for such a receiver a structure that can be built in large quantities, but rapidly and inexpensively, as in assembly line production.

A special object is to enable manufacturers to use relatively thin gauge material to a great extent in building an ash and cinder receiver and yet to produce a substantially dustless receiver.

There have been receptacles for ashes that sift the fines and divert them into one compartment while conducting the cinders into another compartment. Such receivers have contained inlet closures that swing open when ashes are placed thereon and that are arranged to close themselves as the weight is removed. Some inlet closures have required gearing and rotating spindles. Such types of apparatus not only are expensive to construct, but are likely to be hindered in their operation by collection of ashes in the mechanism, and they are awkward and slow to operate.

Dust escapes from ash and cinder receivers to a considerable degree. The escape is usually around seams or edges between the body and the ash or cinder doors. This disadvantage is emphasized when attempts are made to use light gauge metal in the structure. For example, obstruction by ash dust often prevents the ash drawer from being pushed into place, unless special attention is given to remove the clogging dust. Or, where cinders are removed through a door, weight of the cinders may tend to push open the door; or pressure against the side walls may buckle the receiver and tend to oppose tight sealing of the door. Thus in actual use, receivers may come to permit considerable amounts of dust to escape, and in such cases careless attendants inadvertently may promote this tendency. One advantage of this invention resides in the quick acting closure for the single inlet by which ash dust is drawn into the receiver, rather than being permitted as accumulate and fly about in the atmosphere near the receiver. Another advantage of this invention resides in the door for removal of cinders from the receiver. Obstruction by cinders, and scattering and overflowing of cinders near any removal door, and also difficulties to insertion of a shovel into the receiver, all make not only for uncleanliness from the cinders themselves, but acting against suitable closing of a door and act to dissipate ashes and other dust into the atmosphere.

The present invention combats escape of dust from the combined ash and cinder receiver by assuring adequate sealing of various closures. Means are employed that act effectively despite carelessness on the part of attendants, and despite extreme simplicity and cheapness of structure in the receiver.

The present invention consists in the combination of parts hereinafter more fully set forth and described in the appended drawing and in the novel structure clearly pointed out in the accompanying claims.

In the drawing:

Figure 1 is a vertical cross section of a preferred embodiment of improved ash and cinder receiver under this invention;

Figure 2 is a side view taken at right angles to the section shown in Figure 1 and depicting the top portion of the ash receiver shown in Figure 1;

Figure 3 is a section view of the cinder closure portion of the novel receiver shown at right angles to the section presented in Figure 1;

Figure 4 is a front view of the receiver and particularly of the ash drawer end of the receiver taken at right angles to the section shown in Figure 1 and taken oppositely to the view of the cinder door shown in Figure 3.

Various objects of this invention and various useful results may be attained by a structure adapted to draw dust into the receiver while receiving ashes, and to minimize escape of dust from various outlets of the receiver. In the preferred form illustrated in the drawing, these purposes are accomplished with an ash inlet door that opens quickly with a shovel, and a cinder outlet door that snaps open quickly under the weight of a shovel. An ash receiver drawer snaps back into firmly closed position when pushed into the receiver. The principles of this invention may be illustrated by more detailed reference to the preferred form of receiver illustrated in the drawing.

Particular reference is made to the drawing for the purpose of illustration, but this invention may be practiced otherwise than in the particular form illustrated In the drawing is shown a receiver 1 of generally box-like nature. Internally the receiver is divided by a downwardly sloping screen 2 into compartments to receive separately screened dust and removed cinders. The dust compartment 3 is under the

screen and is walled in between an end and two side walls of the receiver and a vertical inner partition 4. This partition rises only part way of the receiver from the floor. Upon its inner end rests the foot of the screen.

The receiver, by means of this partition 4, contains not only an ash compartment but also an open compartment to receive cinders from the screen 2. For access to the cinder compartment is a hinged door 5 in the front end wall 6 of the receiver. Details of this door 5 and its cooperating structure will be described more fully hereinafter. The door 5 however advantageously rises only a relatively short distance from the bottom of the receiver.

End 6 of the receiver 1 above cinder door 5 slopes rearwardly from the door to the top to form a simply constructed ash receiving hopper 7. This hopper 7 is formed within the top of the receiver 1 by means of receiver side walls 8 and 9 and by the receiver rear wall 10. The hopper opening may be slightly constricted by inner sloping false walls 11 that are secured within the top edge of the receiver. The front edge of the hopper joins the top of rearwardly sloping receiver wall 6 and is somewhat lower than the side edges and the rear edge of the hopper.

A quick acting closure is mounted at the front edge of the hopper. This comprises a simple plate door 12 of dimensions to close the hopper throat. Plate 12 extends somewhat under the hopper baffle walls 11 and is mounted at the front edge by a hinge. The hinge may be formed conveniently for large scale production by striking out fingers 13 from the edges of door 12 and receiver front 6, and by extending a rod across the front edge of the receiver hopper and through these hinge fingers.

Quick action of this swinging hopper door is controlled according to this invention by a particular counterweight arrangement to be described. The counterweight and its mounting shown in the drawing comprise a heavy sheet 14 that extends across the hopper front and is fastened upon door 12 near the hinge. This fastening of counterweight plate 14 is accomplished by bending an edge of the plate parallel to hopper door 12, and an intermediate portion of the plate to form a horizontal shelf 15 upon which a shovel may rest conveniently. From shelf 15 the major portion of counterweight plate 14 extends downwardly along the receiver front 6. Counterweight shelf 15 is positioned inwardly of door hinge 13 sufficiently for weight on any portion of the shelf to fulcrum inwardly of the hinge. In consequence any resting of a shovel on the shelf 15 not only pushes door 12 downwardly but because of the short leverage from hinge 13 pushes door 12 downwardly with considerable rapidity. This creates a pronounced in-rush of air. Thus as soon as a shovel of ashes is placed on door shelf 15 the hopper throat is opened, while the shelf tilts the shovel downwardly into the hopper throat. At the same time the rapid opening of the hopper door produces a downward draft into the receiver to pull ash dust into the receiver.

A feature of advantage that will be observed in this construction of a counterweight to close the ash receiver door is the width of counterweight shelf 15. This shelf is available to open the ash door quickly wherever along its width a shovel may rest. Though this is an exceedingly simple arrangement, its simplicity is a feature of advantage in use. Careless workmen need pay no particular attention to opening the ash door. Even haphazard resting of the shovel on the counterweight shelf dumps the shovel-ful of ashes downwardly, while the door is opening out of the way and opening in such a rapid manner as to draw ash dust into the receiver. Another feature of advantage in this positive operation of the hopper door resides in the fact that opening of the door is not dependent on pressure of a shovel against the door itself, but only against the shelf. Thus is avoided any awkward elevation of the shovel handle. Moreover, an advantage of this structure is the fact that opening of the door does not depend on the weight of ashes. Where dependence is placed on the weight of ashes to swing a door downwardly, there comes a time when the weight of ashes is hardly sufficient to hold the door open. In fact this objectionable failure of the ashes to hold the door open is gradual and occurs during the entire period of operation. Gradual closing of the door with ashes yet retained tends to stir up ash dust. In fact ashes or ash dust tend to remain permanently on the door. Such conditions make for dustiness. In any event, such dependence on the weight of ashes themselves to open the door fails to provide the draft of air that features the cleanliness of this receiver.

From the drawing it will be evident that ashes dropped through the receiving hopper fall upon inclined screen 2. This screen extends from back of the hopper opening downwardly to inner partition 4. As will be apparent, the upper portion of the screen is in the line of discharge from a shovel that rests upon the shelf 15 as the shelf is tilted downwardly. Thus the screen is useful throughout its extent and a sufficient balance becomes possible between the steepness of the screen and the extent of the screen. Effective screening is obtained without requiring too great length of screen, nor size of receiver. The structure is compact and efficient.

The present arrangement likewise facilitates removal of the screen when necessary. As will be apparent from the drawing, screen 2 comprises at its lower end an angular down-turned face edge 16. This supporting edge 16 of screen 2 rests against the upper edge 17 of vertical inner partition 4. This structure provides sufficient strength and also permits ready removal or insertion of a screen. For example, if one desires to insert a screen into the receiver, the screen may be lowered through the ash hopper while a person presses down on the hopper shelf 15. The lower end of the screen is placed simply against the supporting angle element 17. It is removable through the ash drawer.

Under screen 4 is provided an ash receiving drawer 18. This is arranged to minimize expulsion of ash dust, and yet to permit leakage of air from the receiver when an indraft is caused by opening ash hopper closure 12. Ash drawer 18 is adapted to be pulled out from the receiver and conveniently may be provided with handles both front and back. The outer face of the ash drawer 20 extends upwardly, and also downwardly, to overlap adjacent walls of the receiver. Ordinarily, leakage of ashes might occur along the meeting faces of this drawer, particularly from carelessness in closing the drawer or from accumulation of dust that would impede tight closing of the drawer. To combat this tendency, and particularly in view of the probability of carelessness or inattention on the part of the ordinary type of laborer, provision is made to as-

sure tight closing of the ash drawer. In the first place, ash deflectors 19 extend along the inner sides of the receiver under screen 2 to minimize falling of dust between a wall and the sides of the ash drawer.

An important feature is provided in that the outer edge of the drawer bottom is inclined upwardly along an inner portion designated as 21. This inclined portion preferably is intermediate between the horizontal drawer bottom and a horizontal front portion of the bottom outwardly of the inclined portion. Cooperating with this inclined face 21 is a cross rod or roller 22 under the drawer. This is secured between the sides of the receiver near the lower edge in such position that when the ash drawer is nearly closed, the inclined bottom portion 21 rides down over cross roller 22. Thus the drawer propels itself into tightly closed position. The weight of the drawer ordinarily assures setting of the outer face of the drawer tightly against the contacting edges of the receiver. More than this, cross roller 22 serves as a balancing element when a drawer containing ashes is partly opened. The drawer partly withdrawn from the receiver is readily tilted so that the front inclines downwardly and the weight of the ashes promotes outward movement of the drawer. Moreover, this downward tilting of the drawer raises the back of the drawer to some extent so as more conveniently to be grasped by a laborer. These functions are more readily served where the cross member 22 comprises a roller, though a rod alone would serve a useful purpose. In addition, when element 22 constitutes a roller, the support for the roller may be sufficiently loose to permit the roller to be raised slightly away from the receiver floor. This is desirable as an aid to cleaning the floor around the roller, and so to avoid clogging the path of the drawer or the action of the roller. A simple arrangement of this sort is of considerable assistance to combat any tendency to carelessness in closing the receiver. The general effect is to assure snapping into place of the ash drawer so as to resist escape of dust or inadvertent opening of the drawer. Nevertheless there is such slight leakage of air around the edges of the drawer face as to permit a down draft into the receiver when the ash hopper door is swung open.

Further provision against the escape of dust from the receiver is embodied in a closure for the cinder compartment at the front of the receiver. This closure comprises a door 23 hinged along its bottom edge to swing outwardly and downwardly. This door extends upwardly along the front of the receiver. The cinder door comprises guide walls 24 that fit outside the receiver walls when the door is in upward closed position. This arrangement strengthens the door and also the side walls and tends to permit use of relatively lighter gauge material in the side walls of the receiver. Moreover, these door sides 24 with their extent of contact with the receiver walls, tend to exclude escape of ash dust from the receiver. To maintain the door walls in smooth undamaged contact with the receiver, the door walls 24 are housed in an envelope 25. Such an envelope may be fastened outside the door walls. It serves materially to strengthen the receiver walls. The envelope may be closed along the rear side and top and bottom. However the front is left open to permit movement of the door side walls 24 into and out of envelope 25. This envelope serves not only for protection; it serves also to resist any tendency of the cinder door to fall away from the receiver. This is accomplished by extending a front edge of envelope 25 and inclining it sufficiently toward the door to exert pressure constantly against side walls 24 of the door. This pressure serves not only to keep the door closed, but also to minimize escape of ashes around the sides of the door. This is important in view of the inward draft created by the rapidly opening ash receiver closure 12. The envelope 25 serves further as an element to strengthen the lower side walls of the receiver and counteract buckling of the material and to permit use of lighter gauge material.

The cinder door 23 is constructed further with a shelf 26 along its upper edge. This shelf permits the user to open the cinder door against the confining pressure of its side walls by the weight of a foot or of a shovel upon the shelf. It is not necessary to stoop over nor apply a hand to the door. More than this, when the door is down so that shelf 26 rests on the ground, sufficient space is provided under the front end of the cinder door for a foot to be inserted, or a shovel, so as to raise the door again into closed position. The shelf 26 serves further to keep the front edge of the lowered door somewhat higher than the rear or hinged edge, and thus tends to keep cinders from spilling out beyond the door. The arrangement and disposition of the cinder door shelf 26 strengthen the edge of the door so as to minimize buckling or distortion of the door wall, even though some heavy weight inadvertently be placed upon the open door. This minimizes escape of ash dust, and promotes the general purpose of dustlessness in a simple and inexpensive receiver.

It sometimes occurs that the front end of the receiver is lifted from the ground in such a way that the cinder door 23 may fall open. Inasmuch as it is desirable to keep the door side walls within the envelope 24, it is consequently undesirable to permit the door 23 to swing open too far. Should the door swing open too far it well might happen that the side would not be reinserted into the envelope, but would become bent or sprung and out of place, and so would permit subsequent escape of dust from the receiver. To maintain this envelopment of the door side walls, stop elements 27 are arranged along the hinged edge of door 23. These comprise a simple strap having an end projecting downwardly from the door hinge, but turning with the opening door, so as to press against the bottom of the receiver when the door is finally in opened position. Such pressure of stop elements 27 keeps the door in position for the side walls 24 to remain enclosed in their envelope even though the receiver be off the ground. The receiver bottom may be supported slightly away from the ground, as is illustrated in the drawing, in order that at any time stop elements 27 may bear against the receiver bottom when the door is opened. Thus stop elements 27 cooperate with cinder door shelf 26 and distribute the load of aligning the cinder door when that door is open.

It will be evident that this receiver is constructed with such extreme simplicity as to facilitate production in quantity and to facilitate assembly line production. In use, the receiver is substantially dustless, yet its parts are uncomplicated. In use by even a careless laborer, a positive indrawing of air with ashes and the positive prevention of the escape of ash dust around the ash drawer and around the cinder door are

maintained in highly dependable manner. Using elements to strengthen the receiver as well as to hamper escape of dust permits maintenance of dustless qualities of the receiver throughout a relatively long period of usefulness.

While in accordance with the patent statutes, I have described a preferred embodiment of this invention, it will now be apparent to those skilled in the art that alterations and modifications may be made within the scope of the appended claims.

What I claim is:

1. In a dustless ash receiver of that type having an opening in the top for the deposit of ashes, an inclined screen beneath said opening and dividing the receiver into a fine ash compartment below said screen and a cinder compartment at the opposite side of said screen, and said receiver having a clean-out opening in said ash compartment, in combination with an ash drawer in said fine ash compartment having a front wall larger than the clean-out opening to overlie the edges of said opening when the drawer is in closed position, said ash drawer having a bottom portion upwardly inclined toward the front of the drawer, and roller means connected to the receiver to support the bottom of the drawer, whereby the drawer by its own weight may cause its front wall to be drawn into sealing contact with the wall of the receiver about the clean-out opening.

2. In a dustless ash receiver of that type having an opening in the top for the deposit of ashes, an inclined screen beneath said opening and dividing the receiver into a fine ash compartment below said screen and a cinder compartment at the opposite side of said screen, and said receiver having a clean-out opening in said ash compartment, in combination with an ash drawer in said fine ash compartment having a front wall larger than the clean-out opening to overlie the edges of said opening when the drawer is in closed position, said ash drawer having a bottom portion upwardly inclined toward the front of the drawer, a rod extending across the fine ash compartment, and a sleeve loosely mounted upon said rod to support the bottom of said ash drawer, whereby the drawer by its own weight may cause its front wall to be drawn into sealing contact with the wall of the receiver about the clean-out opening.

3. In a dustless ash receiver of that type having an opening in the top for the deposit of ashes, an inclined screen beneath said opening and dividing the receiver into a fine ash compartmet below said screen and a cinder compartment at the opposite side of said screen, and said receiver having a clean-out opening in said ash compartment, in combination with an ash drawer in said fine ash compartment having a front wall larger than the clean-out opening to overlie the edges of said opening when the drawer is in closed position, said ash drawer having a bottom portion flat for the greater portion of its length and inclined upwardly near the front wall of the drawer to form a cam surface, a rod extending across the fine ash compartment, and a sleeve loosely mounted upon said rod to support the bottom of said ash drawer, whereby the drawer by its own weight may cause its front wall to be drawn into sealing contact with the wall of the receiver about the clean-out opening.

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