M. LIEBERMAN.

SIFTER.

APPLICATION FILED SEPT. 8, 1917.

1,260,409.

Patented Mar. 26, 1918.

Fig. 1.

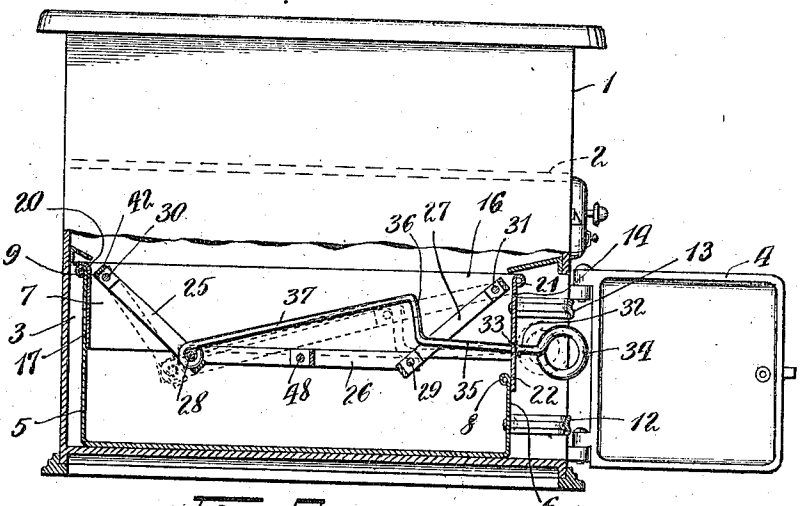


Fig. 2.

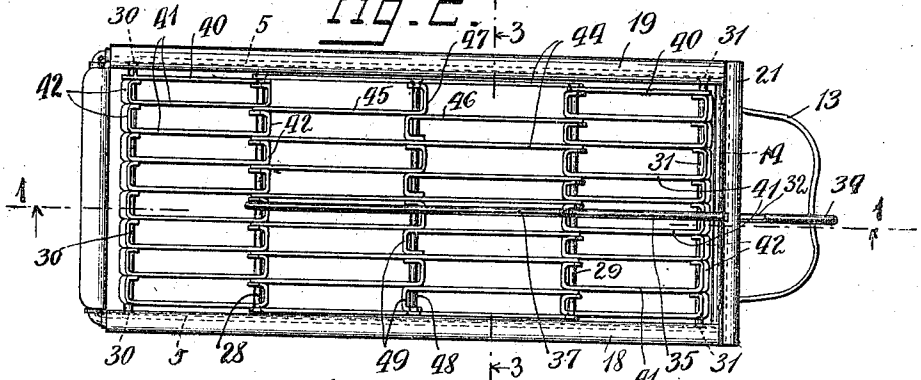
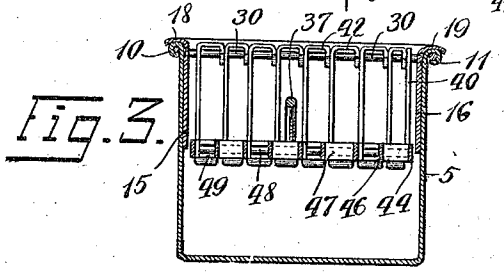


Fig. 3.



Inventor
Moses Lieberman
by Frederick Lachmann
his atty.

UNITED STATES PATENT OFFICE.

MOSES LIEBERMAN, OF WEST ORANGE, NEW JERSEY, ASSIGNOR TO F. & L. MANUFACTURING CO., A COPARTNERSHIP COMPOSED OF SAID MOSES LIEBERMAN AND HYMAN BACHMAN, OF WEST ORANGE, NEW JERSEY.

SIFTER.

1,260,409. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed September 8, 1917. Serial No. 190,292.

To all whom it may concern:

Be it known that I, MOSES LIEBERMAN, a subject of the Emperor of Austria, residing at 2 Central avenue, West Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Sifters, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

My invention relates to sifters adapted primarily for receiving the unburned coal and ashes which fall through the grate of a stove or furnace, and separating the unburned coal from the ashes. The principal object of my invention is to provide a device of this character which is more efficient in action than the devices heretofore known. Another object of my invention is to provide a sifter which may be placed and operated in the ash pit of a stove or furnace and which when operated will not produce an objectionable spread of dust therefrom to the surrounding atmosphere.

A full understanding of the invention can best be given by a detailed description of a construction embodying the same in an approved form, and such a description will now be given in connection with the accompanying drawing showing an approved construction, and in which:—

Figure 1 is a view representing a range having the sifter positioned therein, the range being shown partly in side elevation and partly broken away so as to show the sifter, which latter is shown in longitudinal section taken on line 1—1 of Fig. 2, the movable parts thereof being shown in dotted lines in their extreme rear positions;

Fig. 2 is a plan view of the sifter; and

Fig. 3 is a cross-section thereof taken on line 3—3 of Fig. 2.

The range 1, as shown, is of the usual and familiar construction and contains the usual grate 2 below which is the ash pit 3, which is arranged to be closed at the front thereof by a door 4 hinged to the front of the range.

The sifter comprises a lower pan 5 which has bottom, back, side and front walls and is open at the top. The back and the parallel side walls are of the same height, but the front wall 6 is of less height so as to provide between the side walls and in the front of the pan an opening through which the screening device 7 may be readily slid, as hereinafter described. The top of the front wall is desirably rounded off or beaded, as shown at 8, so as to provide a smooth upper edge on the said wall and also to strengthen the said wall. The rear and side walls are also desirably rounded off or beaded at their upper edges as shown at 9, 10 and 11 respectively. The pan 5 may be made of any suitable material, and is most desirably made of sheet metal. A suitable handle 12 for the pan 5 is desirably provided at the front thereof.

The screening device 7 comprises a frame having a front wall 14, parallel side walls 15 and 16 and a rear wall 17. The said frame is open at the top and bottom and is provided with means such as the outwardly directed flanges 18 and 19 at the upper edges of the side walls thereof, whereby the said frame and the parts carried thereby may be supported from the upper edges of the side walls of the pan 5 for sliding movement into and out of operative position with respect to the said pan. In the construction shown, the beaded upper portions of the side walls of the pan form very efficient rails along which the flanges 18 and 19 may be slid. The upper edge of the rear wall of the screening device is desirably flanged, as shown at 20, and the upper edge of the front wall of said device is desirably rounded off or beaded as shown at 21. When the screening device is in operative position within the pan 5, the rear wall thereof rests closely against the inner surface of the rear wall of the said pan with the flange 20 extending over the latter wall, and the side walls of the said device rest closely against the inner surface of the side walls of the pan. The front wall of the said frame extends downwardly below the side and rear walls thereof as shown at 22, the extension 22 of the front wall forming a shield arranged to extend downwardly below the upper edge of the front wall of the pan and to engage the outer surface thereof from one side edge thereof to the other. The front wall of the frame of the screening device also engages the front edges of the side walls of the pan throughout the distance from the tops of the said edges to the top of the front wall of the pan, or in other words, throughout the height of the opening in the front of the

pan. With this construction, the frame fits closely into the pan 5 and no space is left between them for the escape of dust from the pan 5. A suitable handle 13 may be provided on the front wall of the frame of the device 7. The said frame is made of any suitable material, most desirably of sheet metal.

Mounted within the said frame are the plurality of flat screens 25, 26 and 27. The screen 26 in its normal position, as shown in full lines in Fig. 1, is horizontal and parallel to the bottom of the pan 5. The said screen is pivotally connected, as by pivot rods 28 and 29, to the end screens 25 and 27, which latter are pivotally supported, as by pivot rods 30 and 31, to the sides of the frame adjacent the top and the respective ends thereof. With this construction, the screens 25 and 27 serve to support the screen 26. Each of the screens is, as shown in Fig. 2, most desirably made of sufficient width to extend closely adjacent to the side walls 15 and 16 of the frame; so that the said screens together with the said walls form a pocket or receptacle in which the unburned coal and ashes or other material to be sifted or screened is supported. In the construction shown, the end screens 25 and 27 extend downwardly and inwardly at an angle to the bottom screen 26, the axes of the pivots 28 and 29 being parallel with each other and also with the parallel axes of the pivots 30 and 31, but being arranged closer to each other than the axes of the pivots 30 and 31. The pocket or receptacle formed by the screens and the side members of the frame is accordingly of less length at the bottom than at the top. This construction is found to give the best results in practice.

For moving the screens to agitate the material carried by the screening device, I most desirably employ an actuating member 32 which is operable from a point in front of the sifter. In the construction shown, this member is in the form of a rod which is pivotally connected at one end to the pivot 28, as by being bent around the latter, and which extends adjacent its forward end through an opening 33 in the front wall of the frame of the screening device. This rod desirably is provided with means, such as the loop 34, at its forward end for grasping the rod to move the same backwardly and forwardly. The rod, as shown, is formed with a longitudinally extending front portion 35, an upwardly extending portion 36 and an inclined portion 37 extending from the upper end of the portion 36 to the pivot 28. The object of offsetting the rod, as shown at 36 and 37, is to permit the bottom screen 26 to move upwardly and to different angular positions in back of the portion 36 of the rod without obstruction from the latter when it is moved rearwardly from its normal position, the inclination of the rod being changed only a very little during the movement thereof. The relative positions of the parts when the actuating rod 32 has been moved rearwardly to its extreme position is shown in dotted lines in Fig. 1. The screens most desirably employed by me are in the form of grids. Referring more particularly to Fig. 2, the end screens or grids 25 and 27 are each formed of a straight flat bar 40 closely adjacent one of the side walls of the frame of the screening device and a plurality of bars 41 parallel to each other, to the bar 40 and to the side walls of the said frame. Each of the bars 41 has its ends bent into a U shape, as shown, so as to provide portions 42 which serve as spacing devices for the bars. The pivots 28 and 30 extend through the sides of the U-shaped portions at the respective ends of the bars 40 and 41 of the screen 25, and the pivots 29 and 31 extend through the sides of the U-shaped portions of the bars 40 and 41 of the screen 27. The bottom or middle screen 27 is formed of a number of straight bars 44 parallel to each other and to the sides of the frame of the screening device and extending from the pivot 28 to the pivot 29. The latter pass through the respective ends of the said bars. These bars are spaced apart double the distance of the members 41. Between each adjacent pair of bars 44 are arranged two bars 45 and 46 respectively. Each of the bars 45 has an end portion through which the pivot 28 passes, the said end portion being arranged on the said pivot between adjacent bars 41 of the screen 25. The other end portion of each of said bars is bent to provide a U-shaped spacing portion 47 through the sides of which a central rod 48 parallel to the pivot rods 28 and 29 passes. Each of the bars 46 has one end portion through which the pivot 29 passes, the said end portion being positioned between the U-shaped spacing devices 42 on adjacent bars 41 of the screen 27. The opposite end of each of the bars 46 is bent to provide a U-shaped spacing portion 49 through the sides of which the rod 48 passes. The outer sides of the U-shaped parts 47 and 49 bear against adjacent bars 44 and the opposite sides of said U-shaped portions are in contact with each other, so that the bars 44, 45 and 46 are firmly held in proper spaced relationship upon the rod 48. The bars 44 through their rigidity prevent vertical movement of the opposite sides of the center screen 26 about the rod 48. The said rod coacts with the portions of the bars 44, 45 and 46 through which it passes to hold the same in proper spaced relationship. The bars 44, 45 and 46, as well as the bars 40 and 41, are arranged with their broad surfaces vertical so that the coal and ashes or other material to be sifted is supported upon the

edges of said bars. The said bars may be made of any suitable material, but they are most desirably stamped out of sheet metal.

In operation the screening device is arranged within the top of the pan 5, as shown in the drawing, and the sifter is then placed in the ash pit of the stove, range or furnace, as shown. The loop 34 may project slightly in front of the front wall of the stove, as shown, without interfering with the closing of the door 4; as the latter, as is common, is bulged outwardly so as to provide a hollow inner portion into which the said loop may project. The ashes and unconsumed coal which fall from the grate drop into the sifter, some of the ashes at the same time falling directly through the screens 25, 26 and 27 into the pan 5 below. A large part of the ashes and the unburned coal will, however, collect in the pocket or receptacle formed by the screens 25, 26 and 27 and the side walls 15 and 16 of the supporting frame therefor. When it is desired to separate the ashes and the unburned coal in the said pocket or receptacle, it is only necessary to open the door 4 of the range or other stove or furnace and to move the member 32, as through the loop 34, vigorously backwardly and forwardly. During this operation the screens 25, 26 and 27 are moved relatively to each other about the pivots 28 and 29. Each forward movement of the operating member 22 moves the screens 25 and 26 toward and finally into alinement with each other, at the same time moving the screens 26 and 27 farther out of alinement with each other. Each rearward movement of the said operating member moves the screens 26 and 27 toward and finally into alinement with each other and the screens 25 and 26 farther out of alinement with each other, as shown in dotted lines in Fig. 1. Through this movement of the screens, the material supported thereon is thoroughly agitated, the movement of the screens 25 and 26 on the forward movement of the member 32 throwing the said material violently upwardly and forwardly and the movement of the screens 26 and 27 on the rearward movement of the said member throwing the said material violently upwardly and rearwardly. The tendency of the larger and heavier particles to settle at the bottom of the material and to clog up the screens so as to prevent the passage therethrough of the ashes or lighter material, which interferes greatly with the efficient action of screens now in general use, is accordingly overcome. Another result of the thorough agitating action obtained with my invention is that, as the unburned coal or heavier particles are thrown to the top and the ashes or lighter particles are free to settle through the unburned coal or heavier particles and to pass freely into the pan 5, the production of clouds of dust in the surrounding atmosphere upon the operation of the screening device is effectively avoided. As has heretofore been explained, there is a tight fit between the screening device and the pan 5 so that the escape of dust between the same is prevented. The inclined position of the end screens also assists in the thorough separation of the unburned coal and ashes.

After the member 32 has been reciprocated sufficiently to cause the ashes to be sufficiently separated from the unburned coal, the screening device may be slid forwardly on the rails 10 out of the pan 5, and the unburned fuel placed directly upon the fire or in a suitable receptacle. The ashes from the pan 5 may be immediately placed in a suitable receptacle, or, if desired, the said pan may be permitted to remain in the ash pit until a sufficient amount of ashes accumulates therein to fill the same. After the desired disposition has been made of the unburned fuel and the ashes or either of them, the sifting device is again slid backward upon the rails 10 into operative position within the pan 5, and, if desired, the door 4 closed.

I have found that with my invention unburned coal may be separated from ashes not only very conveniently but also very rapidly, and also, as hereinbefore explained, without the production of objectionable dust. The device is of simple and cheap construction and also durable. Although the device is primarily intended for the separating of unburned coal and ashes, it is evidently adapted for screening various materials. Many modifications may be made in the construction shown without departing from the spirit of the invention.

What is claimed is:

1. A sifter comprising a plurality of pivotally connected screens formed with spaced supporting bars stamped from sheet metal and arranged edgewise.

2. A sifter comprising a movable bottom screen, screens pivotally connected with said bottom screen at opposite edges thereof and extending upwardly from the same, said screens being formed with spaced supporting bars stamped from sheet metal and arranged edgewise, and stationary walls coacting with said screens to form a receptacle for the material to be sifted.

3. A sifter comprising a movable bottom screen, and end screens pivotally connected with said bottom screen at opposite edges thereof and extending upwardly from the same, said screens being formed with separate spaced sheet metal supporting bars arranged edgewise, and each end screen being pivoted to said bottom screen by a rod passing through the adjacent ends of bars of said end and bottom screens.

4. A sifter comprising a frame, end screens pivoted to opposite walls thereof, a bottom screen pivoted to said end screens, and means for moving said screens relatively to said frame in opposite directions from their normal positions of rest, said means comprising a member extending from the juncture of said bottom screen and one of said end screens along said bottom screen and through said frame.

5. A sifter comprising a frame, a screen supported from said frame for movement to different angular positions with respect to said frame, and means for moving said screen relatively to said frame, said means comprising a member connected to said screen at the rear thereof and extending along the same and through the said frame, said member having an offset portion inclined away from said screen to avoid interference thereof with said screen upon the movement of the latter in opposite directions from its normal position of rest.

6. A sifter comprising a frame, end screens pivoted to opposite walls thereof, a bottom screen pivoted to said end screens, said screens being formed with spaced metal supporting bars arranged edgewise and one of said screens being provided intermediate the ends thereof with means for maintaining the bars thereof in proper spaced relationship, each end screen being pivoted to said bottom screen by a rod passing through the adjacent ends of bars of said end and bottom screens, and means passing through said frame for moving said screens relatively to said frame in opposite directions from their normal positions of rest.

7. A sifter comprising a frame, end screens pivoted to opposite walls thereof, a bottom screen pivoted to said end screens, said screens being formed with separate spaced metal supporting bars arranged edgewise and one of said screens being provided intermediate the ends thereof with means for maintaining the bars thereof in proper spaced relationship, each end screen being pivoted to said bottom screen by a rod passing through the adjacent ends of bars of said end and bottom screens, and means for moving said screens relatively to said frame in opposite directions from their normal positions of rest, said means comprising a member extending from one of said rods along said bottom screen at an angle thereto and through said frame.

8. A sifter comprising a pan having back, side and front walls, one of said walls being lower than the others, a frame having portions engaging the front, side and rear walls of said pan to avoid the escape of dust between said pan and said frame, and screening means movably mounted within said frame and arranged closely adjacent the walls thereof, said frame being supported by the upper edges of opposite walls of said pan for movement into and out of said pan over said lower wall.

9. A sifter comprising a pan having back, side and front walls, one of said walls being lower than the others, a frame having portions engaging the front, side and rear walls of said pan to avoid the escape of dust between said pan and said frame, and screening means movably mounted within said frame and arranged closely adjacent the walls thereof, said frame being supported by opposite walls of said pan for movement into and out of said pan over said lower wall.

10. A sifter comprising a pan having opposite walls with parallel upper edges, and a screening device having opposite walls provided at their upper edges with means for supporting the said device from the said upper edges of said pan for movement into and out of said pan, said screening device being formed to entirely inclose said pan when in operative position with respect to the same.

11. A sifter comprising a pan having opposite walls provided with parallel rails upon respective upper edges thereof, and a screening device having walls engaging said first-named walls and provided at opposite upper edges thereof with means for supporting the said device upon said rails for sliding movement into and out of said pan, said screening device being formed to entirely inclose the said pan when in operative position with respect to the same.

12. A sifter comprising a pan having opposite walls with parallel upper edges and a screening device comprising a frame fitting against said pan at the front, sides and back thereof and having opposite walls provided at their upper edges with means for supporting said device from said upper edges of said pan for movement horizontally into and out of said pan, end screens pivoted between opposite walls of said frame, a bottom screen pivoted to said end screens, said screens being arranged closely adjacent said frame, and means passing through said frame for moving said screens relatively to said frame in opposite directions from their normal positions of rest.

13. A sifter comprising a pan having opposite walls with parallel upper edges and a screening device comprising a frame fitting against said pan at the front, sides and back thereof and having opposite walls provided at their upper edges with means for supporting said device from said upper edges of said pan for movement horizontally into and out of said pan, end screens pivoted between opposite walls of said frame, a bottom screen pivoted to said end screens, said screens being arranged closely adjacent said frame and being formed with separate spaced supporting bars arranged edgewise, and means pass-

ing through said frame for moving said screens relatively to said frame in opposite directions from their normal positions of rest.

14. A sifter comprising a pan having opposite walls with parallel upper edges and a screening device comprising a frame fitting against said pan at the front, sides and back thereof and having opposite walls provided at their upper edges with means for supporting said device from said upper edges of said pan for movement horizontally into and out of said pan, end screens pivoted between opposite walls of said frame, a bottom screen pivoted to said end screens, said screens being arranged closely adjacent said frame and being formed with spaced supporting bars arranged edgewise, said bottom screen being provided intermediate its ends with means for holding the bars thereof in proper spaced relationship, and means for moving said screens relatively to said frame in opposite directions from their normal positions of rest, said moving means comprising a rod extending from the juncture of said bottom screen and one of said end screens along said bottom screen and through said frame.

15. A screen comprising a middle and end rods spaced apart and parallel to each other, a bar connected to said middle and end rods to prevent movement thereof transversely with respect to each other, and a bar connecting each of said end rods to said middle rod, said last-named bars having at their inner ends portions bent to form spacing means.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

MOSES LIEBERMAN.

Witnesses:
THERESA LEUCHS,
NATHAN FRIEDMAN.