W. R. KINREAD.

ASH SIFTER.

APPLICATION FILED MAR. 5, 1919.

1,305,223.

Patented May 27, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

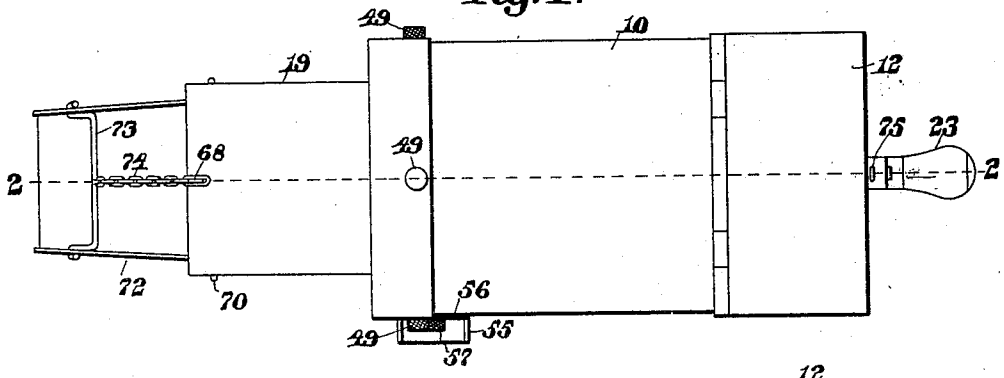



Fig. 2.

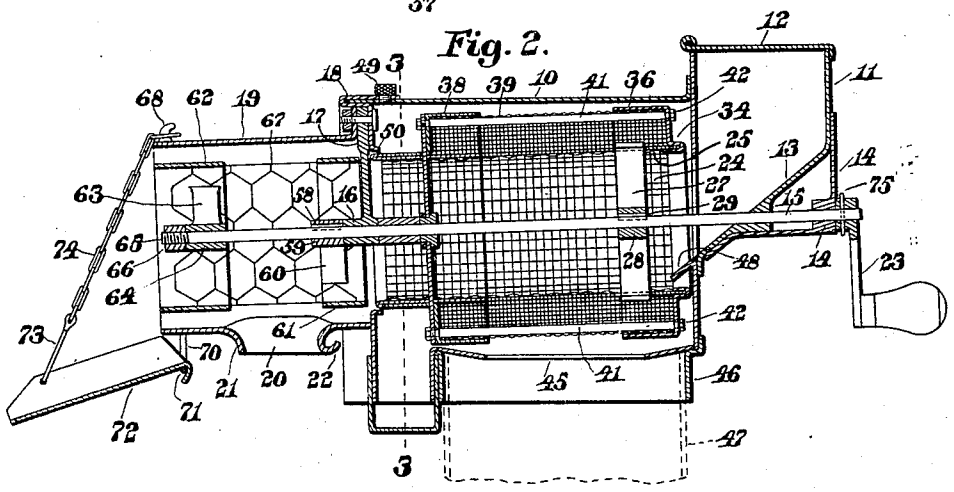



Fig. 4.

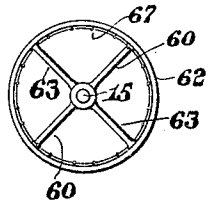



Fig. 3.

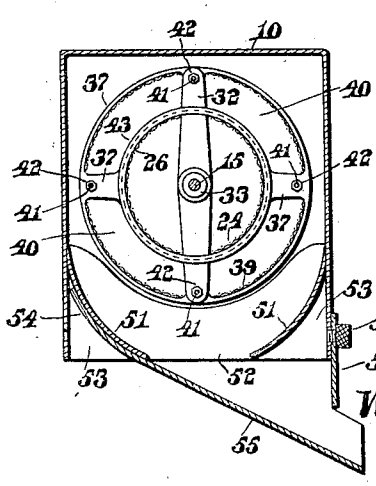
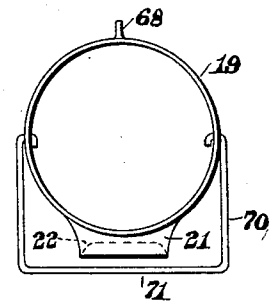



Fig. 5.




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2 SHEETS—SHEET 2.

Fig. 6.

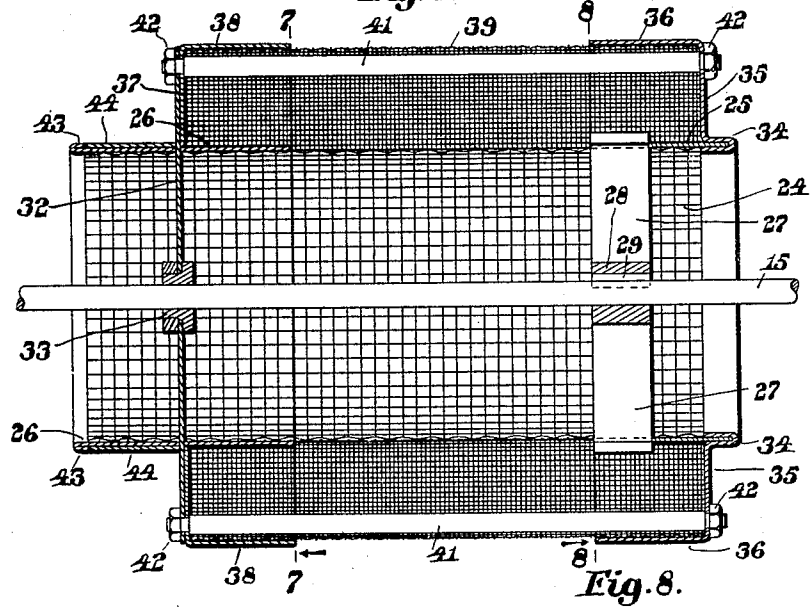



Fig. 8.

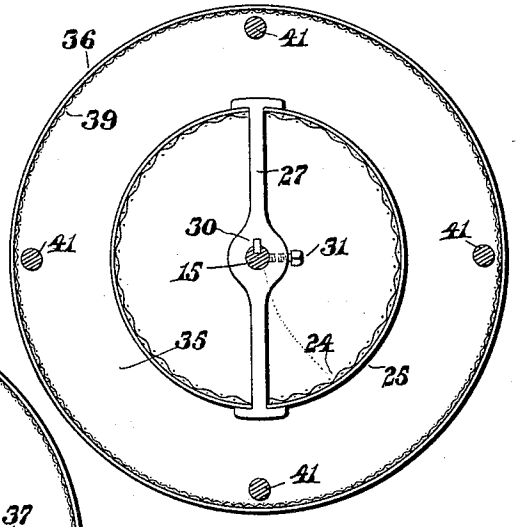
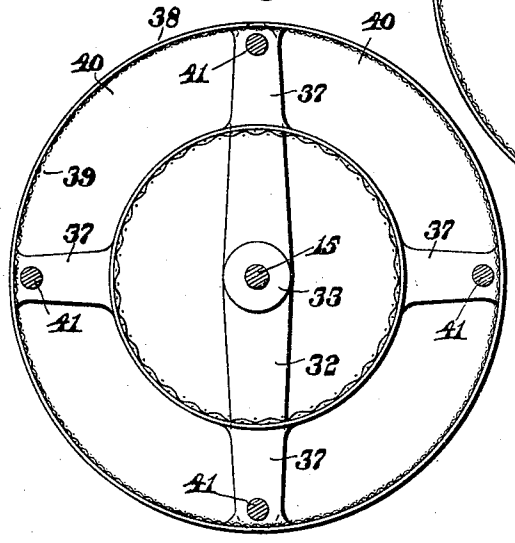



Fig. 7.




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# UNITED STATES PATENT OFFICE.

WILLIAM R. KINREAD, OF WAVERLEY, MASSACHUSETTS.

## ASH-SIFTER.

1,305,223. Specification of Letters Patent. Patented May 27, 1919.

Application filed March 5, 1919. Serial No. 280,871.

*To all whom it may concern:*

Be it known that I, WILLIAM R. KINREAD, a citizen of the United States of America, and a resident of Waverley, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Ash-Sifters, of which the following is a specification.

This invention relates to ash sifters and particularly to that class of ash sifters in which a rotary sieve is employed.

The object of the present invention is to provide a means whereby the ashes may be disposed in the ash receptacle and the fine coal, the larger pieces of coal and the clinkers may each be separated from the other and be deposited in separate receptacles.

The invention consists in certain novel features of construction and arrangement of parts which will be fully understood by reference to the description of the drawings and to the claims to be hereinafter given.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described, except as required by the scope of the appended claims.

Of the drawings.

Figure 1 represents a plan of an ash sifter embodying the principles of the present invention.

Fig. 2 represents a vertical section of same on line 2, 2, on Fig. 1.

Fig. 3 represents a vertical section on line 3, 3, on Fig. 2.

Fig. 4 represents an end view of the auxiliary revoluble screen at the delivery end of the device.

Fig. 5 represents an end view of the tubular extension at the delivery end of the device.

Fig. 6 represents an enlarged vertical section of the rotary sieve.

Fig. 7 represents a section of same on line 7, 7, on Fig. 6, and

Fig. 8 represents a section of same on line 8, 8, on Fig. 6.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a rectangular casing provided at one end with a hopper 11 having a cover 12 hinged thereto, said hopper being provided with an inclined bottom 13. The hopper 11 has secured thereto, in any well-known manner, the outboard bearing 14 in which is mounted a revoluble shaft 15, the opposite end of which extends through a bearing 16 secured to the member 17 depending from the upper end of the removable plate 18 at the delivery end of the casing 10. The plate 18 has secured to its outer face a tubular extension 19 having a discharge opening 20 in the bottom thereof. This opening 20 is surrounded by an annular flange 21 having an upwardly turned lip 22 forming a support for the bail of a receptacle adapted to receive the material discharged through said opening 20.

The revoluble shaft 15 is provided with a crank 23 by which rotary movement may be imparted to said shaft 15. Secured to, and revoluble with the shaft 15, is a sieve 24 surrounded at either end by cylindrical members 25 and 26. The member 25 is secured to the outer ends of a diametrical arm 27 having a central bearing 28 provided with a slot 29 in which is positioned a key 30 projecting from the periphery of the shaft 15. End movement of the bearing 28, on the shaft 15, is prevented by the set screw 31.

Near the opposite end of the sieve 24 is a diametrical plate 32 having a central bearing 33 through which the shaft 15 extends.

The outer end of the cylindrical member 25 extends into an annular recess in the cylindrical flange 34 of an end plate 35 having a cylindrical flange 36 surrounding and at some distance from the cylindrical member 25. Surrounding the inner end of the cylindrical member 26 is another end plate 37 having a cylindrical flange 38 extending toward the cylindrical flange 36, these flanges 36 and 38 being of the same diameter.

Within the flanges 36 and 38 and supported thereby, is a fine mesh screen 39.

The end plate 35 is imperforate between the cylindrical member 25 and flange 36 thus closing the inlet end of the space between the sieve 24 and the screen 39.

The plate 37 at the opposite end of the screen 39, is provided with a plurality of large perforations 40 through which may be delivered any material which cannot pass through the outer fine mesh screen 39. Between the end plates 35 and 37 are a plurality of separating rods 41 having reduced threaded ends extending through said plates and provided with nuts 42 thus giving a great rigidity to the rotary sieve 24 and the screen 39 supported thereby.

A portion of the cylindrical member 26 extends beyond the outer face of the diametrical plate 32 and with its outer end turned upon itself as at 43, thereby forming a shoulder against which abuts the outwardly extending annular flange 44 of the plate 37.

It is obvious that the diametrical plate 32 extends through slots formed in the annular member 26 and flange 44 and is secured rigidly to the end plate 37 by means of the rods 41 and nuts 42.

The bottom of the rectangular casing 10 is provided with a discharge opening 45 surrounded by an annular, downwardly extending flange 46 adapted to fit over the upper end of an ash can 47 of any well-known construction.

At the lower end of the bottom wall 13 of the hopper 11, is an inclined extension 48 projecting into the inlet end of the sieve 24.

The removable end plate 18 is provided with a recess near its edge into which the delivery ends of the walls of the casing 10 are positioned. This removable end plate 18, is secured to the casing 10 by a plurality of threaded members 49. The removable end plate 18 is also provided with an annular flange 50 extending inwardly and surrounding the cylindrical extension 43 of the sieve 24. Between the removable end plate 18 and the plate 37, is a space forming a receptacle into which the material between the sieve 24 and the screen 39 may be delivered. This space, at the bottom of the casing 10, is partially closed by the curved bottom walls 51, the inner ends of which are separated thereby forming an opening 52 through which the material in said receptacle may be delivered. The side walls of the casing 10 and the curved walls 51, form pockets 53 in either of which is adapted to be positioned the inner end 54 of a removable delivery chute 55 having an inclined bottom wall as shown in Fig. 3 of the drawings.

This chute 55 has an outer plate 56 adapted to be secured to the outer wall of the casing 10 by means of a threaded member 57. By removing the member 57, the chute 55 may be removed and its position reversed from that shown in Fig. 3, with its extension 54 disposed within the pocket 53 at the right of said figure.

As will be seen by reference to Fig. 2 of the drawings, the shaft 15 extends nearly to the end of the tubular extension 19.

This shaft 15 is provided with a key 58 adjacent to the outer face of the bearing 16, said key 58 extending into a keyway in the hub 59 of the diametrical supporting member 60, the outer ends of which have secured thereto an annular member 61.

A similar annular member 62 of the same diameter as that of the annular member 61, is provided with a diametrical supporting member 63 having a hub 64 mounted on the shaft 15. The extreme outer end of the shaft is threaded as at 65 and is provided with a nut 66 which prevents displacement of the members 61 and 62, these members 61 and 62 having secured thereto, a screen 67 of very coarse mesh.

The members 61 and 62 are separated, a distance equal to the diameter of the delivery opening 20, so that any material delivered into said coarse mesh screen 67 and capable of passing through said sieve, will be deliverel through said opening 20 into any receptacle disposed beneath said opening.

The outer upper end of the extension 19 is provided with a hook 68 and supported by said extension 19 is a swinging bail 70, the lower portion of which is horizontal as indicated at 71. The horizontal portion 71 is adapted to support the inner end of a chute 72 as indicated in Fig. 2 of the drawings.

The outer end of the chute 72 has a bail 73 pivotally mounted in the side walls thereof. A linked flexible member 74 extends from the bail 72 and is adapted to engage with the hook 68, it being obvious that the inclination of the chute 72 may be varied by engaging different links with said hook 68.

In the operation of the device, the ashes from the stove, or furnace, are disposed within the hopper 11 and the cover 12 is then closed.

These ashes will move down to the inclined bottom 13 and the extension 48 into the interior of the sieve 24.

The shaft 15 is then rotated by means of the crank 23, and the finest ashes will pass through the sieve 24 into the space between said sieve 24 and the fine mesh screen 39.

The continued rotation of the shaft 15 will cause the powdered portion of the ashes to pass through the fine mesh screen 39 and then through the delivery opening 45 into the ash barrel 47.

The fine coal which has passed through the sieve 24 into the space between said sieve 24 and the screen 39, will pass through the openings 40 in the end plate 37 into the space between the end plate 37 and removable end plate 18, said material being delivered onto the curved bottom walls 51

within said space and moving down these curved bottom walls through the opening 52 into the chute 55 from the lower end of which it may be delivered into any receptacle disposed beneath the outer end thereof.

The larger coal and clinkers, which cannot pass through the mesh of the sieve 24, will be delivered from the end of the sieve 24 into the cylindrical screen 67. As this screen 67 is of a very coarse mesh, the larger pieces of coal will pass through the screen 67 and through the delivery opening 20 into any receptacle disposed beneath said opening 20. The clinkers and any coal too large to pass through the mesh of the screen 67, will pass from the outer end of the screen 67 onto the chute 72 and be collected in any receptacle disposed beneath the outer end of said chute.

This device provides a means whereby the powdered ashes may be collected in one receptacle, the fine screenings collected in another receptacle, the coarser coal in a third receptacle, while the clinkers and larger pieces of coal may be disposed in another place where they may be easily separated one from the other.

In case of any clogging in the screen 67, the nut 66 may be removed and said screen removed from the shaft 15.

In case access is desired into the interior of the casing 10, the members 49 may be removed and the entire end plate 18 disconnected from the casing 10.

If it is desired to remove the sieve 24 and screen 39 for any reason, the crank 23 may be removed from the shaft 15 to permit this removal, said shaft 15 being moved endwise toward the delivery end of the casing.

In order to facilitate the removal of the crank 23, said crank is secured to the shaft 15 by means of a pin 75 which may be quickly displaced when it is desired to remove the crank from the shaft 15.

The entire device is so constructed as to give great rigidity to all of the parts thereof and is assembled in such a manner that access to the various operating parts may be obtained readily when necessary.

By the construction of the device as herein shown and described, all useless material will be disposed in certain receptacles while the unburned coal will be collected in other receptacles, the fine screenings being separately collected from the larger pieces.

This entire separation of the different materials is accomplished without permitting any dust to escape.

It is believed that the operation and many advantages of the invention will be fully understood without further description.

Having thus described my invention, I claim

1. In a device of the class described, the combination of a rectangular casing provided with openings in its oppositely disposed end walls and having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve revoluble therewith and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a shaft on which said sieve is detachably mounted; a crank for rotating said shaft; and an imperforate member surrounding that portion of said sieve extending through said end receptacle.

2. In a device of the class described, the combination of a rectangular casing provided with openings in its oppositely disposed end walls and having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends; a cylindrical fine mesh screen surrounding said sieve and revoluble therewith; a receptacle at the discharge end of said screen and communicating with the space between said screen and sieve; imperforate members surrounding the opposite ends of said sieve and screen; and radial separators interposed between said imperforate members.

3. In a device of the class described, the combination of a rectangular casing provided with openings in its oppositely disposed end walls and having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends; an imperforate member surrounding the delivery end of said sieve; a cylindrical fine mesh screen surrounding said sieve and revoluble therewith; a receptacle at the discharge end of said screen with an opening in its inner wall adapted to receive the delivery end of said screen; and a removable inclined delivery chute from said receptacle.

4. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends; a removable end plate to said casing having an opening therein registering with the open delivery ends of said sieve; a cylindrical fine mesh screen surrounding said sieve and revoluble therewith; a receptacle at the discharge end of said screen and communicating with the space between said screen and sieve; and a removable inclined delivery chute from said receptacle.

5. In a device of the class described, the

combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve revoluble therewith and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; and a tubular member secured to the end plate and adapted to receive the material delivered from said sieve.

6. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve revoluble therewith and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a shaft on which said sieve is mounted; a crank for rotating said shaft; a tubular member on the delivery end of said casing; and a coarse cylindrical screen on said shaft within said tubular member.

7. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve revoluble therewith and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a shaft on which said sieve is mounted; a crank for rotating said shaft; a tubular member on the delivery end of said casing; and a coarse cylindrical screen removably mounted on said shaft within said tubular member.

8. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve revoluble therewith and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a shaft on which said sieve is mounted; a tubular member on the delivery end of said casing having a delivery opening in the bottom thereof; and a coarse cylindrical screen on said shaft within said tubular member.

9. In a device of the class described, the combination of a rectangular casing, an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a hopper at the admission end of said receptacle having an inclined lower wall, the inner end of which extends into the open end of said screen; a shaft supporting said sieve and screen; a tubular member secured to the delivery end of said casing and having an opening in the bottom thereof; a coarse cylindrical screen revoluble with said shaft within said tubular member; and means for supporting a pail beneath said opening.

10. In a device of the class described, the combination of a rectangular casing, an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh, said sieve extending through an opening in the delivery end of said casing; a screen surrounding said sieve and having a fine mesh; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a hopper at the admission end of said receptacle having an inclined lower wall, the inner end of which extends into the open end of said screen; a shaft supporting said sieve and screen; a tubular member secured to the delivery end of said casing and having an opening in the bottom thereof; a coarse cylindrical screen revoluble with said shaft within said tubular member; a chute mounted on the outer end of said tubular member adapted to receive the contents of said coarse cylindrical screen; and means for supporting a pail beneath said opening.

11. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom, said casing having alined cylindrical holes in the ends thereof; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends, the open ends of said sieve registering with said cylindrical holes; an annular flanged member at each end of said sieve, the flange at the inlet end being imperforate and the other having large perforations therein; and a cylindrical fine mesh screen surrounding said sieve and revoluble therewith, said screen being supported by said annular flanged members.

12. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom, said casing having alined cylindrical holes in the ends thereof; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends, the open ends of said sieve registering with said cylindrical holes; an annular flanged member at each end of said sieve, the flange at the inlet end being imperforate and the other having large perforations therein; a cylindrical fine mesh screen surrounding said sieve and revoluble therewith, said screen being supported by said annular flanged members; and tie rods connecting said flanged members.

13. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom, said casing having alined cylindrical holes in the ends thereof; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends, the open ends of said sieve registering with said cylindrical holes; an annular plate secured to the delivery end of said sieve provided with perforations therein and having a cylindrical flange at the center and a cylindrical flange at the periphery extending in the opposite direction; an annular imperforate plate at the inlet end of said sieve having a peripheral flange and a central cylindrical flange; and a cylindrical fine mesh screen surrounding said sieve and revoluble therewith said screen being supported by said peripheral flanges.

14. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom, said casing having end plates provided with alined cylindrical holes; an annular flange surrounding said opening; a revoluble cylindrical sieve above said opening and open at both ends, the open ends thereof registering with said cylindrical holes; a cylindrical fine mesh screen surrounding said sieve and revoluble therewith; a receptacle at the discharge end of said screen and communicating with the space between said screen and sieve, said receptacle having curved bottom plates extending toward each other with their inner ends separated; a removable inclined delivery chute from said receptacle having an extension at the inner end adapted to be positioned in a pocket formed by a curved bottom wall and a side wall of said casing; and means for securing the outer end of said chute to said casing.

15. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve revoluble therewith and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve, the plate at the delivery end having a U-shaped flange to receive the end of said casing; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; and means for locking said flanged plate to said casing.

16. In a device of the class described, the combination of a rectangular casing having a hopper at one end and an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve revoluble therewith and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a shaft on which said sieve is detachably mounted; a crank for rotating said shaft; a collar on the delivery end of said shaft having a radial projection; and a supplemental coarse mesh screen on said shaft provided with a bearing having a slot therein for the reception of said projection.

17. In a device of the class described, the combination of a rectangular casing having an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a tubular member on the delivery end of said casing; a coarse mesh screen therein; a bail suspended from said tubular member; and a chute provided with hooks at one end adapted to be positioned on said bail.

18. In a device of the class described, the combination of a rectangular casing having an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a tubular member on the delivery end of said casing; a coarse mesh screen therein; a bail suspended from said tubular member; a chute provided with

hooks at one end adapted to be positioned on said bail; and a flexible member secured at one end to the outer end of said chute and with its other end attached to a hook on said tubular member.

19. In a device of the class described, the combination of a rectangular casing having an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a tubular member on the delivery end of said casing; a coarse mesh screen therein; a bail suspended from said tubular member; a chute provided with hooks at one end adapted to be positioned to said bail; and a flexible member secured at one end to the outer end of said chute and with its other end adjustably attached to a hook on said tubular member.

20. In a device of the class described, the combination of a rectangular casing having an opening in the bottom; an annular flange surrounding said opening; a revoluble sieve above said opening, open at both ends and having an open mesh; a screen surrounding said sieve and having a fine mesh; end plates to said casing having openings registering with the open ends of said sieve; a receptacle at the delivery end of said casing communicating with the space between said sieve and screen; a tubular member on the delivery end of said casing; a coarse mesh screen therein; a shaft supporting said sieve and coarse mesh screen; and a bearing for said shaft interposed between said sieve and coarse mesh screen and supported by the end plate at the delivery end of said casing.

Signed by me at 4 Post Office Square, Boston, Mass., this 3rd day of March, 1919.

WILLIAM R. KINREAD.

Witnesses:
JOHN WAUGH,
WALTER E. LOMBARD.

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