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SEPARATOR FOR GRITS AND MEAL.

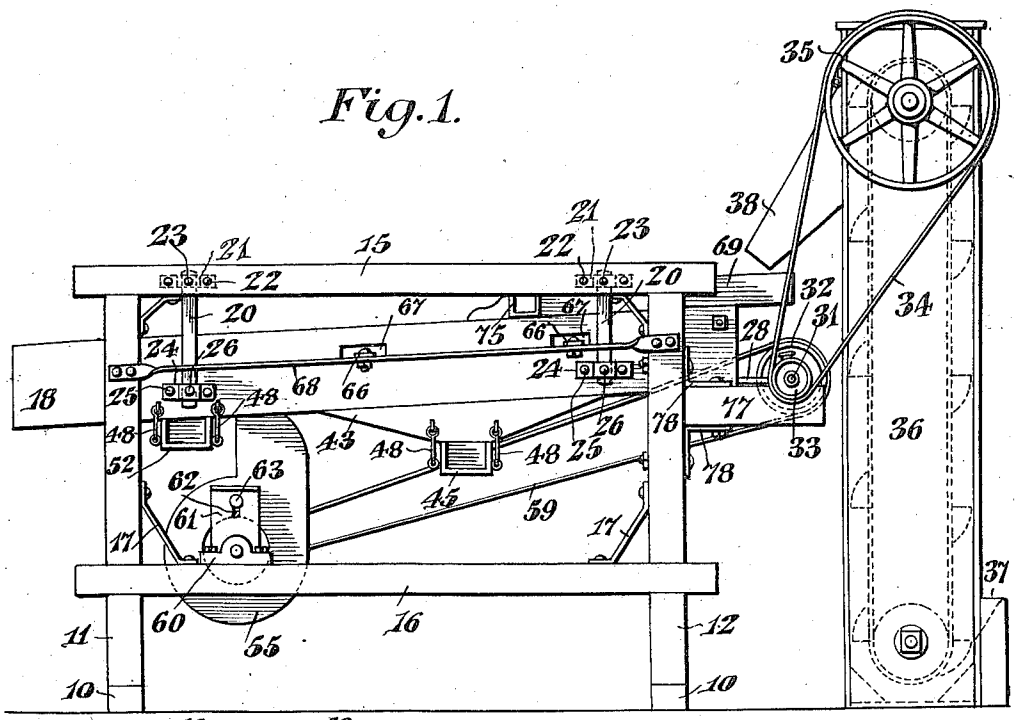
APPLICATION FILED FEB. 28, 1916.

1,260,680.

Patented Mar. 26, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



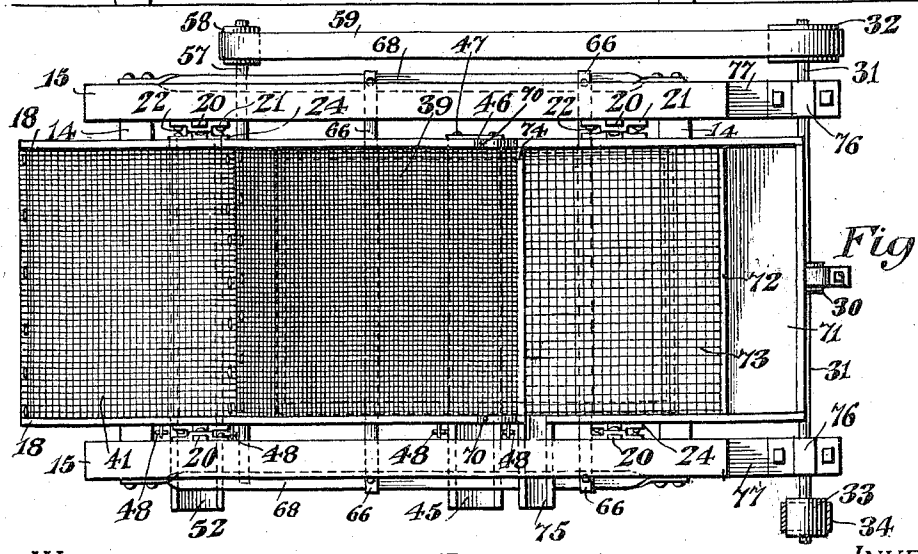


Fig. 2.

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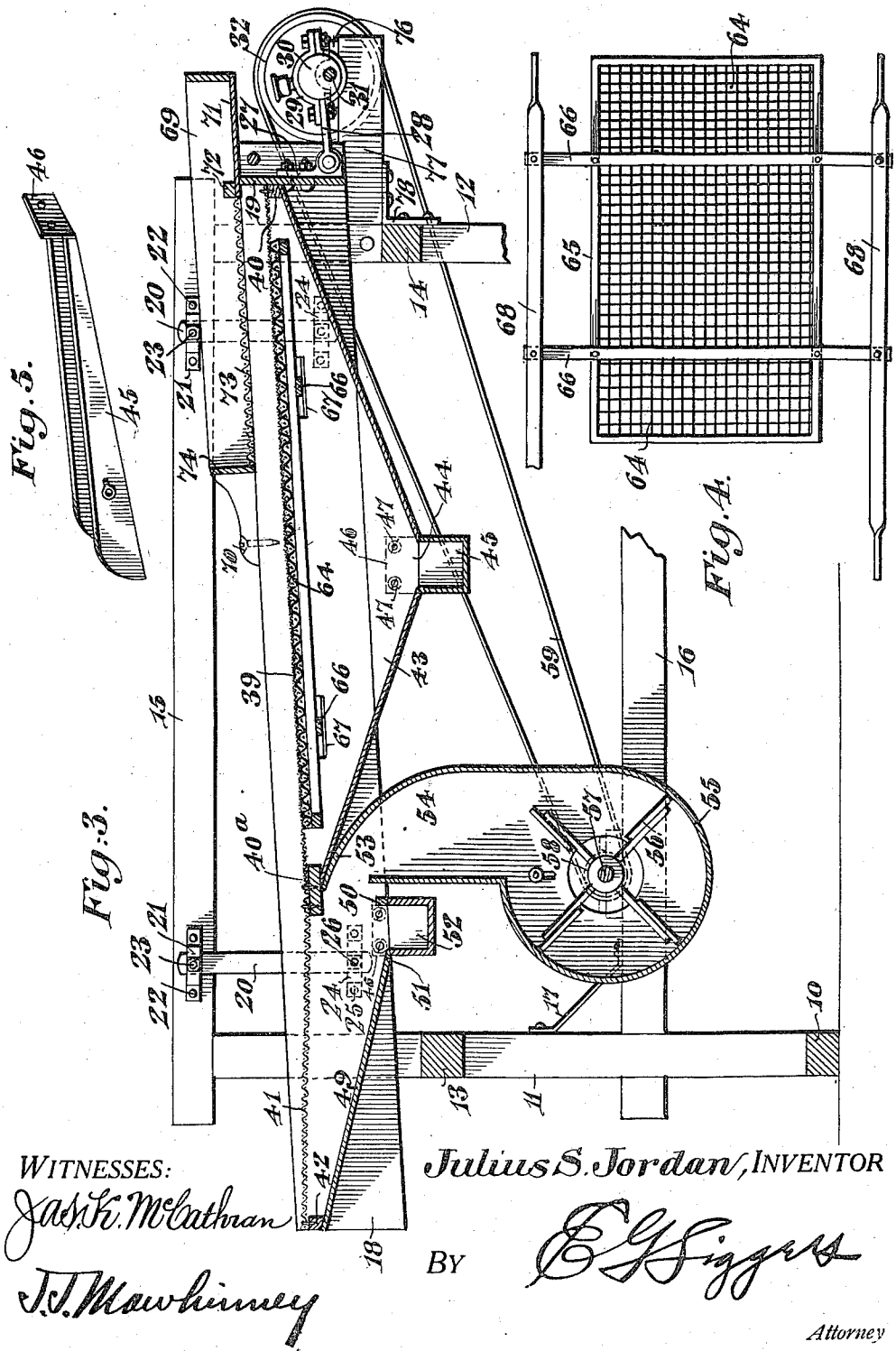


Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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SEPARATOR FOR GRITS AND MEAL.

1,260,680. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed February 28, 1916. Serial No. 80,973.

To all whom it may concern:

Be it known that I, JULIUS S. JORDAN, a citizen of the United States, residing at Lodge, in the county of Colleton and State of South Carolina, have invented a new and useful Separator for Grits and Meal, of which the following is a specification.

The present invention relates to certain improvements in separators to adapt the same particularly for the separation of grits and meal, and to separate therefrom bran and husk, as the materials are passed through the machine.

An object of the present invention is to provide a sifting screen of relatively fine mesh, adapted to be reciprocated to sift meal therethrough, and which is provided with a relatively coarse mesh screen fixed stationarily beneath the meal screen and adapted for frictional contact therewith to cleanse the meal screen and prevent the same from clogging up.

Another object of the invention is to provide a machine capable of effecting this separation, and which is provided with separate outlets adapted to be quickly adjusted to deliver the separated materials from either side of the machine, and which comprises but relatively few parts and requires but little power to operate the same.

The invention further aims at the provision of various other novel devices and arrangements which will hereinafter be pointed out in the following detail description of the present preferred embodiment of the invention, the same being illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a separator involving the features of this invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a longitudinal vertical central sectional view, taken through the machine.

Fig. 4 is a detail under side plan view of the cleaning and supporting screen employed.

Fig. 5 is a detail perspective view of one of the spouts.

Referring to the drawings, wherein like parts are designated by similar characters of reference throughout the several views, the separator involving the features of this invention comprises a main frame, which is stationary, and which supports the cleaning screen; a sifter which is movable in the main frame and has a relatively fine mesh sifting screen and a relatively coarse mesh sifting screen, the fine mesh screen bearing upon and being supported by the stationary coarse screen, a receiving shoe adapted to spread the materials out over a broad surface to deliver the same to the sifter throughout the entire width thereof; a fan on the main frame to produce a current of air against the coarse mesh screen of the sifter to separate the grits from the bran or husk, and blow the latter away from the end of the sifter; and adjustable spouts beneath the respective screens to receive and conduct to the desired point of discharge the meal and the grits.

The main frame of the separator is made up of a pair of spaced apart foot pieces 10 upon which rest the lower ends of spaced apart uprights 11 and 12, a pair of uprights being mounted on the foot piece at each end of the frame. The uprights 11 and 12 are braced in pairs by cross braces 13 and 14, and are provided with upper longitudinal bars 15, and lower longitudinal bars 16. The bars 16 are reinforced by diagonal braces 17, which are preferably arranged in the lower corners of the frame, as shown.

Arranged in the frame is a sifter, which comprises spaced apart side boards 18, joined at their inner ends by a cross piece 19, which closes the inner end of the sifter. The sifter is substantially ten inches in depth and is supported in the main frame upon forward and rear pairs of hangers 20 pivoted at their upper ends to the upper bars 15 of the main frame, and at their lower ends to the sides of the boards 18 of the sifter. It will be noted that the outer pair of hangers is of greater length than the inner pair, so that the sifter is inclined in the frame, or has a drop at its outer end of substantially three or four inches. The upper ends of the hangers are received in straps 21 secured by bolts 22 to the inner faces of the bars 15 of the main frame. Pivot pins 23 pass through the straps, the upper ends of the hangers 20, and the bars 15 so as to pivotally support the hangers and admit of the free swinging of the same. The lower ends of the hangers are received in straps 24 secured to the outer faces of the boards 18 by bolts 25. The lower ends of the hangers 20 engage in the straps and receive therethrough pivot pins 26. Thus, the sifter is free to swing upon the hangers 20. The cross piece 19 is provided with a bracket plate 27 against its rear side to which is hinged a connecting rod 28 terminating at its outer end in an eccen-

tric strap 29 received in the periphery of an eccentric 30 fixed upon a drive shaft 31. The drive shaft 31 is provided on one end with a pulley 32, which is relatively large, and is provided upon its opposite end with a relatively small pulley 33, over which passes a driving belt 34. As shown in Fig. 1, the driving belt 34 is engaged over a large pulley 35 on the upper end of an elevator 36 of any approved type adapted to raise grain which is placed in the inlet 37 and discharge the grain through the spout 38 overhanging the inner end of the machine.

The sifter is provided with a meal screen 39, which is of relatively fine mesh, preferably what is known as 22 or 24 mesh. This screen 39 extends from the upper or inner end of the sifter toward the opposite end thereof substantially two-thirds of the length of the sifter, and is supported approximately two inches below the upper edges of the side boards 18 upon cleats 40 and 40ª, which are secured in the frame of the sifter. It will thus be noted that this meal screen 39 slopes or inclines downwardly with the sifter, and that as the eccentric 30 vibrates the sifter, the material deposited upon the upper end of the meal screen will be fed by gravity downwardly thereover. From the lower end of the meal screen 39 extends a relatively coarse mesh grits screen 41 supported at its inner end upon the cleat 40ª, and at is outer end on the cleat 42, and adapted to be raised by the position of the cleat to any desired height at its free end, so as to lie either in a horizontal plane, or to be raised to any desired height in order to back up or slacken the downward feeding of the material in the sifter. Beneath the meal screen 39 is a hopper 43, made of sheet metal, which extends inwardly from the cleats 40 and 40ª, and from the sides 18, the hopper 43 tapering downwardly to a point beneath the sifter and within the main frame, and terminating in an outlet 44. Beneath the outlet is placed a spout 45. As shown to advantage in Fig. 5, this spout 45 comprises a bottom having upstanding flanges increasing in depth from the inner to the outer end of the spout. An attaching lip 46 upstands from the inner terminal of the spout 45, and is adapted for detachable securement by means of screws 47, or the like, to the outer surface of the hopper 43. The outer end of the spout 45 is detachably connected by means of hooks 48 to the opposite side of the hopper 43, so as to discharge the contents from the outlet opening 44, through the hopper and out through that side of the machine to which the enlarged end of the spout is directed. The spout 45 is adapted to be removed and reversed when it is desired to discharge the contents from the hopper 43 at the opposite side of the machine. The lower or outer end of the sifter is provided with a second hopper 49, which is located beneath the grits screen 41. This hopper 49 is in the form of an inclined board projecting inwardly and downwardly from the cleat 42. The lower end of the hopper 49 terminates substantially in the plane of the lower edges of the sides 18, as at 51. A second spout 52 of substantially the same construction as shown in Fig. 5, is arranged beneath this discharge end 51 to deliver the grits from the board 49 to either side of the machine. This spout 52 extends transversely across the lower end 51 and has the upper edge of its outer wall abutting the edges 51 to thus catch the grits in the spout 52. The inner wall of the spout 52 is surmounted by a strip 50 which deflects the material in the hopper 49 down into the spout 52. An apron or deflector 53 rises between the sides 18 from the inner end of the discharge 54 to a blower casing 55 in which is placed a fan 56. This apron 53 is curved upwardly and outwardly, and terminates against the underside of the cleat 40ª. The fan 56 comprises a plurality of radial blades mounted on a shaft 57 traversing the casing 55, and having upon one outer end a pulley 58 to receive thereover a belt 59 which passes over the large pulley 32 on the main shaft 31. The shaft 57 is mounted in bearings 60 secured to the upper edges of the lower longitudinal bars 16 of the main frame. These bars 16 are also provided with upstanding attaching plates 61 slotted as at 62 near their upper ends to receive therethrough binding screws 63, or the like, which also engage the adjacent sides of the blower casing 55, to admit of the vertical adjustment of the blower casing to raise or lower the outlet 54 thereof and secure the desired adjustment of the blower with respect to the sifter frame. The eccentric 30 is of such size and form as to impart a throw of substantially three-quarters of an inch to the sifter, so that the spout 52 must necessarily be so spaced from the discharge 54 as to admit of this reciprocating movement.

It is an important feature of this invention to provide a novel means for cleaning the meal screen 39 without the provision of knockers, or other devices requiring considerable mechanism and taking up considerable space in the machine. The cleaning means comprises a large mesh wire screen of substantially one half inch mesh, this cleaning screen 64 being mounted upon a frame 65 which is relatively light and adapted to receive the screen 64 over the upper side or edge thereof, as shown in Fig. 3. The frame 65 is supported upon transverse rods 66 secured to the side bars of the frame 65 and adapted to hold the frame up close against the under side of the meal screen 39, and thus hold the coarse

mesh screen 64 up against the meal screen 39 to support the meal screen and also to rub against the lower side thereof and keep the meal screen from clogging up, and keep it free from all accumulations. This supporting and cleaning screen is of large mesh so as not to interfere with the proper sifting of the meal and to effect the cleaning and clearing of the meal screen 39 without unduly vibrating or displacing the same. The cross bars 66 are received through longitudinally formed slots 67 in the side boards 18 of the sifter frame. The outer ends of the cross bars 66 are secured fixedly upon the longitudinal bars 68 secured at their opposite ends to the uprights 11 and 12, as clearly shown in Fig. 1. Thus, the supporting and cleaning screen 64 is rigidly held from movement by the bars 66 and 68, which are carried in rigid relation upon the main frame.

The spout 38 of the elevator 35 delivers the material into a shoe 69. The shoe 69 is in the form of a shallow tray substantially three inches in depth and of a length equal to about one third of the total length of the sifter. The shoe is suitably attached by screws 70, or the like, to the sifter, so as to vibrate therewith. This receiving tray or shoe is of a width equal to the width of the sifter and has an upper receiving compartment provided with an imperforate bottom 71 extending downwardly a distance of about eight inches and terminating at its lower edge in a transverse spreader 72 in the form of a strip, substantially one inch square in cross section, and projecting upwardly from the bottom 71 to check the downward flow of the material, and also to spread the material over the entire width of the shoe. Thus, the material is fed down through the shoe in a relatively broad stream or sheet. The lower end of the shoe, which may be substantially two feet long, is provided with a bottom formed of a coarse screen 73 of substantially eight mesh adapted to separate the bran and other relatively large light material from the grits and the meal, as the same are sifted through the screen 73 onto the main screen of the sifter. These accumulations in the shoe fall downwardly over the screen 73 and against the lower wall 74 of the shoe, which lower wall deflects the collected material into a laterally extending spout 75 carried by the shoe, so as to throw off the rough, or first separated, material.

The main shaft 31 is supported in double bearings 76 carried upon the upper edges of bracket arms 77, projecting rearwardly from the uprights 12 and being secured thereto by means of bracket plates 78 of angle form and which are preferably arranged above and below the bracket arms 77, as clearly shown in Fig. 1.

In the operation of the improved separator, material is deposited upon the upper end of the shoe in any suitable manner, such as by means of the elevator 36, as shown in Fig. 1. The material issues from the spout 38 and falls upon the upper end of the shoe or tray and upon the imperforate bottom 71. The material banks up against the spreader strip 72 and is spread over the entire width of the shoe and flows over the upper edge of the spreader strip in a broad flat stream or sheet. As the shaft 31 rotates, the sifter is vibrated, and consequently the shoe which is carried upon the sifter is also vibrated. The material thus settles downwardly in the shoe over the screen 73 and the large coarse particles of the material are retained by the screen, and collect against the lower wall 74 and are discharged laterally through the spout 75. The bulk of the material, however, passes down through the coarse screen 73 and falls upon the main screen 39, which comprises the meal screen. As the material has been spread out by the strip 72, it is deposited over the entire width of the shoe and the meal screen 39. Thus, the vibrations of the sifter cause the material to settle and feed by gravity downwardly and slowly over the upper face of the screen 39. The fine material, or meal, sifts through this screen 39. The screen 39 is prevented from being clogged by this fine material, by the relatively stationary supporting and cleaning screen 64, which rubs, or frictionally engages, beneath the meal screen 39, and produces the same action upon the meal screen 39 as does the hand in rubbing beneath a sieve to vibrate and clean the same. Thus, the screen 64 not only serves to reinforce and support the meal screen, but it also cleanses the meal screen and prevents the same from clogging up, or accumulations from gathering upon or within the meshes of the meal screen.

The fine particles, or meal sifting through the screen 39, feeds into the hopper 43 and by vibration of the sifter, is fed into the discharge opening 44, and into the spout 45, from which the meal is discharged or delivered from either side of the separator. During the rotation of this shaft 31, the belt 59 turns the blower 56 and as a result, a blast of air is emitted from the discharge end 54 of the blower, and is deflected by the apron 53 into the top of the hopper 49 beneath the grits screen 41. The air is forced upwardly through the grits screen and thoroughly agitates the material which has gravitated down to and over the grits screen. The agitation of the material together with the vibration of the sifter feeds the grits or second grade material down through the screen 41 into the hopper 49 from which the grits is discharged over the end 51 into the spout

52. The spout 52 may be directed to either side of the machine, so as to deposit the grits into any suitable receptacle or place. The air current blows the bran or husk outwardly from the end of the sifter, the material falling on the ground, or into any suitable large receptacle that may be provided for conveniently carrying off the bran or husk.

The main shaft 31 may be driven in any suitable manner, and in the present instance is shown as being driven by the belt 34 from the large pulley 35 of the elevator 36.

It is, of course, understood that material variations and changes may be made in the size, proportion, and material resorted to in the present construction of the separator, as above described, without departing from the spirit of the invention, and being limited only by the scope of the following claims.

What is claimed is:—

1. In a separator, a reciprocatory sifting screen of relatively fine mesh material, and a stationary relatively coarse-mesh wire screen mounted immediately beneath and in frictional contact with the first screen to cleanse it, said second screen being of a width substantially that of the first screen and of a length so much less than that of the first screen to provide clearance for reciprocation of the first screen, whereby the second-named screen constitutes a support for the first-named screen throughout practically its whole extent.

2. In a separator, a reciprocatory sifting screen of relatively fine mesh material, and a stationary relatively coarse-mesh wire screen mounted immediately beneath and in frictional contact with the first screen to cleanse it, said second screen being of a width substantially that of the first screen and of a length so much less than that of the first screen to provide clearance for reciprocation of the first screen, whereby the second-named screen constitutes a support for the first-named screen throughout practically its whole extent, said first-named screen being mounted to slant toward one end and at the lower end provided with a coarse mesh continuation participating in the reciprocatory movements of the screen.

3. In a separator, a reciprocatory sifting screen of relatively fine mesh material, and a stationary screen of relatively coarse-mesh wire mounted immediately beneath and in frictional contact with the first screen to cleanse it and constitute a support therefor.

4. In a separator, a reciprocatory sifter screen and a receiving shoe at and overhanging the receiving end of the sifter screen and having at one end an imperforate bottom and at the other end a bottom formed of coarse mesh screen meeting the imperforate bottom, with the shoe there provided with a spreader strip extending crosswise of the shoe and rising from the bottom.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JULIUS SIDNEY JORDAN.

Witnesses:
ROBERT C. JONES,
B. K. SANDERS.

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