

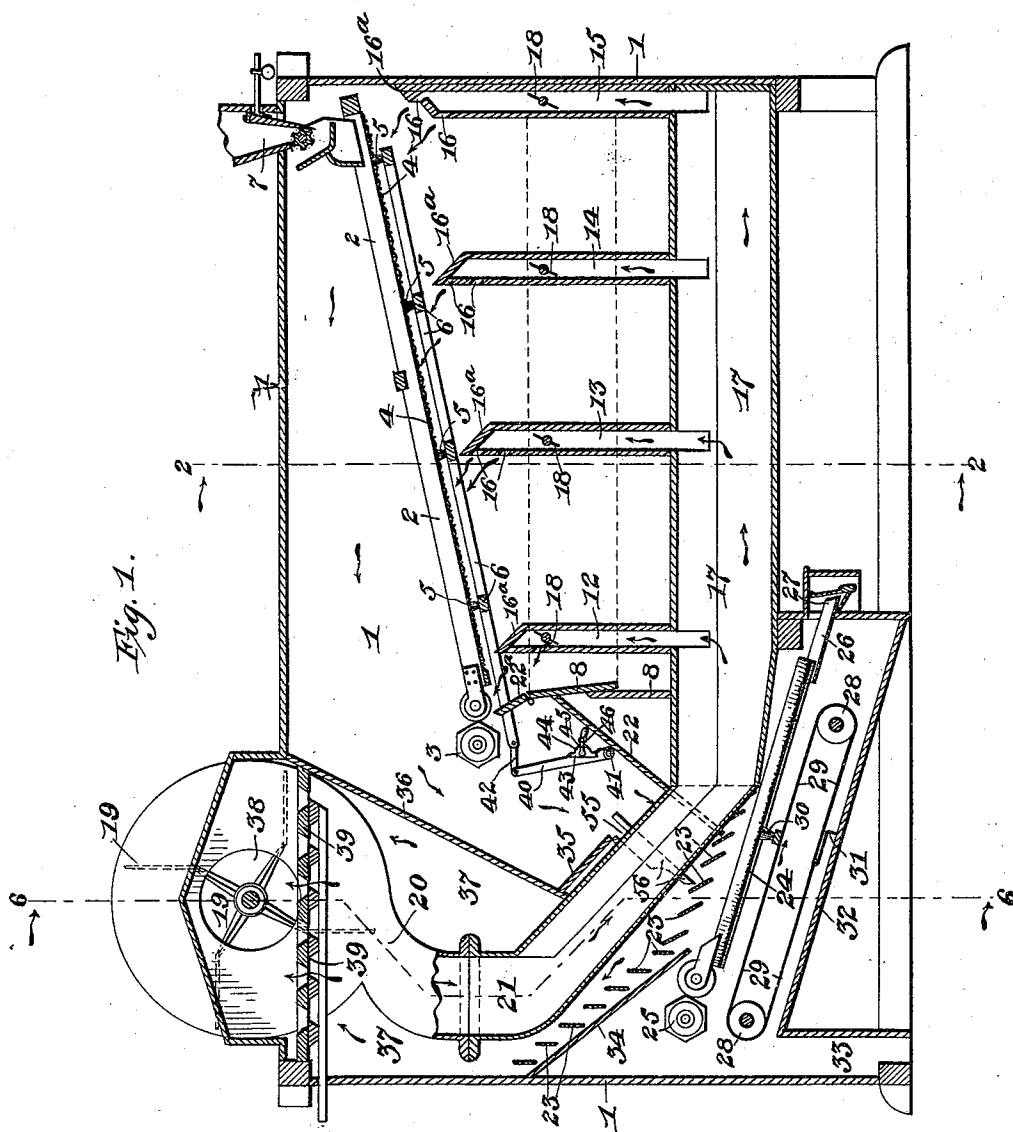
(No Model.)

3 Sheets—Sheet 1.

D. E. BURNER.
MIDDLINGS PURIFIER.

No. 512,095.

Patented Jan. 2, 1894.



Witnesses

Everance
Walter E. Allen

Inventor

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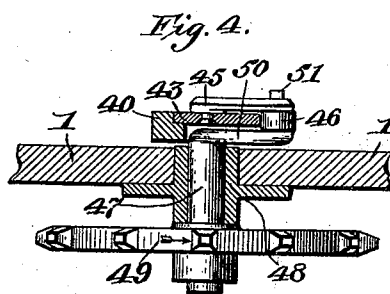
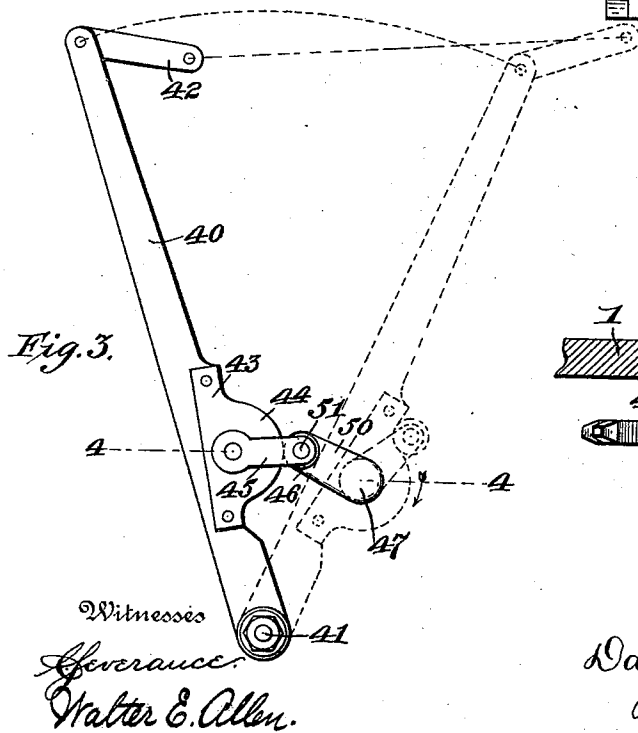
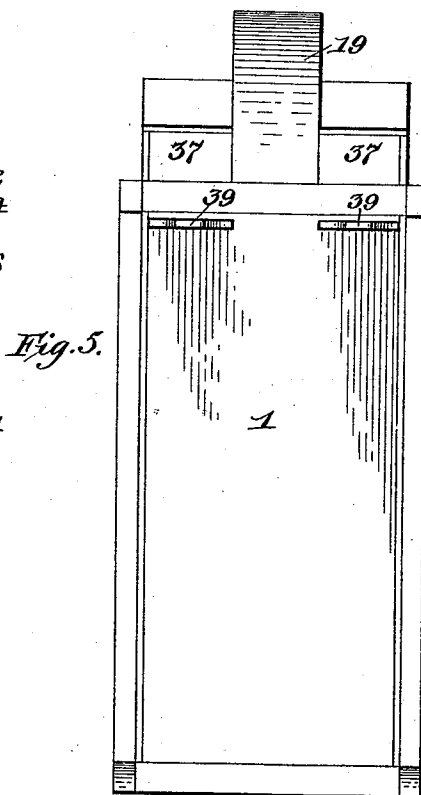
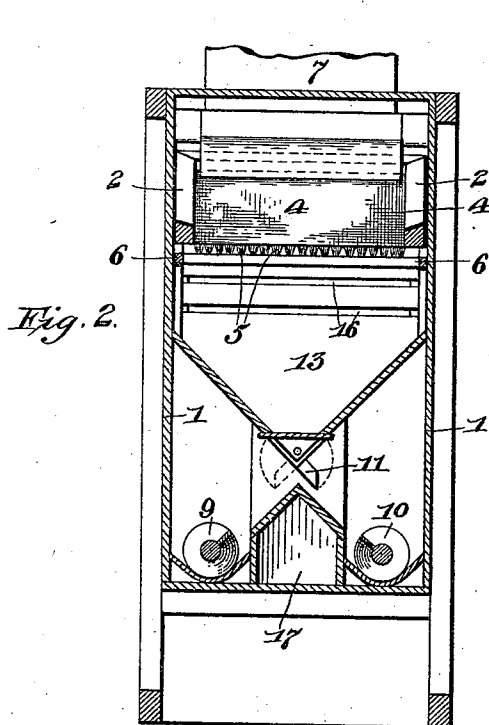
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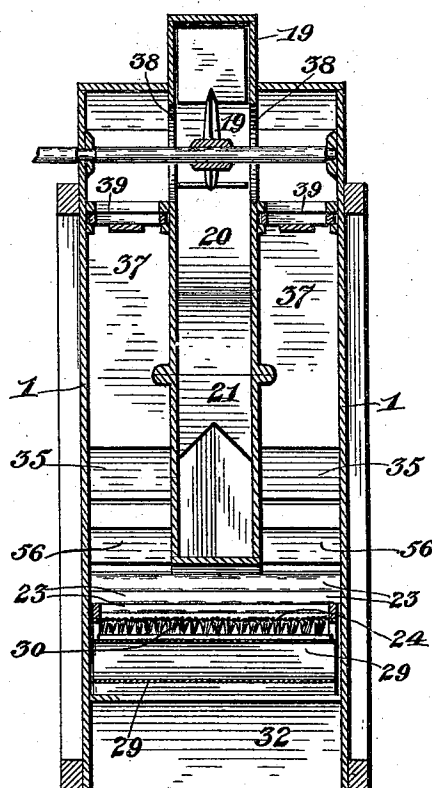
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Fig. 6.



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UNITED STATES PATENT OFFICE.

DANIEL E. BURNER, OF COLUMBUS, OHIO, ASSIGNOR TO THE CASE MANUFACTURING COMPANY, OF SAME PLACE.

MIDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 512,095, dated January 2, 1894.

Application filed April 4, 1893. Serial No. 469,005. (No model.)

To all whom it may concern:

Be it known that I, DANIEL E. BURNER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and Improved Middlings - Purifier, of which the following specification, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 The object of my invention is to purify middlings without the usual waste incident to the use of the customary dust rooms and dust collectors, and for this purpose I provide a combined purifier and dust collector which
15 is adapted to deliver a good stock directly to the reel and a completely finished feed to the bin; a continuous current of air at a uniform pressure being constantly circulated through the machine during its operation, and the
20 same air being used over and over again in a closed circuit for preventing contamination by outside dust or smoke and facilitating the collection of all of the dust from the dust-laden air.

25 My machine comprises an upper purifier sieve or riddle provided with a suitable cloth cleaner, feed-box, cut-offs and other necessary accessories; a lower dust collector sieve or riddle also provided with its cloth cleaner
30 and other necessary accessories; and a suitable fan and air passages arranged in proper relation to the sieves and provided with suitable controlling valves, whereby a continuous circulation of air at a uniform pressure
35 can be maintained through the machine during the purifying operation. The dust collector is so arranged that all of the dust drawn into the air space is delivered onto the lower screen or riddle for completing the
40 separation.

My invention consists of certain other features of construction, all of which will be first fully described with reference to the accompanying drawings, and afterward more particularly pointed out in the claims.

45 In said drawings:—Figure 1 is a longitudinal sectional elevation showing my improved machine. Fig. 2 is a transverse section thereof taken on the line 2—2 of Fig. 1, and looking in the direction of the arrows. Fig. 3 is an enlarged detail view of the cleaner-brush

operating mechanism. Fig. 4 is a detail sectional view thereof taken on the line 4—4 of Fig. 3. Fig. 5 is an end view of the machine. Fig. 6 is a transverse section of the machine
55 on the line 6—6 Fig. 1 looking in the direction of the arrows.

1 is the body of the machine which may be built of any suitable material in the usual way, and 2 is the upper purifier sieve which
60 is supported so as to be shaken longitudinally by means of the cam 3 which is operated in a manner well understood. The sieve or riddle 2 is provided with the usual bolting cloth 4, and has a series of cleaner brushes 5 working
65 on its under surface as shown. These cleaner brushes are mounted in a suitable frame 6, which is supported to slide intermittently under the purifier screen, said frame being intermittently operated by suitable
70 mechanism which will be hereinafter described.

7 is a suitable feed hopper which may be provided with any suitable feed regulator for controlling the supply of stock to the riddle 2.
75

8—8 are deflector boards forming a hopper under the sieve 2 for the purpose of directing the purified material which passes through the sieve to the center of the machine over
80 the roof of the air trough, where it may be thrown to either conveyer 9, 10 by means of the adjustable cut-off 11.

The conveyers 9, 10, are provided with suitable screws for passing the purified material
85 into a roll or suitable receptacle outside of the machine.

12, 13, 14, and 15 are a series of air trunks arranged vertically beneath the riddle 2 and provided with upwardly inclined outlet slits
90 or openings 16 extending entirely across the machine so as to cover the whole width of the sieve cloth, and inclined or beveled tops 16^a for giving the air currents an upward tendency.
95

17 is an air trough extending longitudinally through the machine and communicating with the air trunks 12, 13, 14 and 15.

18 are suitable cut-off valves in the air trunks for regulating the currents of air passing through them.

19 is a suitable pressure fan or blower hav-

ing the tangential outlet opening 20 which communicates with the air trough, the flue 21, and inlet side eyes or openings 38.

The currents from the trunks 13, 14, and 15 blow directly through the cloth and cause a ripple in the stock on the sieve 2, turning it over and exposing it on all sides to the action of the air, causing the dust and fluff to rise in the space above the screen. The lower trunk 12 supplies the space between the outlets with air to aspirate the tailings of the sieve as they drop on to the inclined board 22 and pass through the dust collecting slats 23, on to the lower dust collecting sieve 24. A stronger current of air can be used at the lower air trunk 12 than the others, and the good stock is prevented from blowing over into the tailings by means of the adjustable hinged valve 22^a. The sieve 24 is supported so as to be longitudinally reciprocated by means of the cam 25. The lower end of the dust collecting sieve 24 is formed with a chute 26 which projects through a valved outlet opening 27 through which the coarse materials pass, said outlet opening being valved for the purpose of preventing the entry of the outside air.

Supported below the dust collector sieve 24 are two belt-supporting rollers 28 upon which is supported the endless belt 29 carrying the cloth cleaning brush 30 and the middlings elevating scraper 31. The brush 30 serves the purpose of keeping the meshes of the sieve cloth clean, while the scraper 31 operates against the inclined body wall 32 of the dust collector and raises the fine flour and deposits it in the trough 33.

Suitable partitions 34, 35 and 36 are provided to render the machine air-tight and properly direct the current of air. The air is forced from the fan or blower through the air trunks up through the cloth and down through the dust collector, where it ascends through the side passages 37 through the central eyes 38 at each side of the fan.

39 is a suitable slatted register in the passages 37 for controlling the flow of air to the fan. The direction of the air currents is indicated by arrows. A constant pressure of five-tenths of an ounce to the square inch is maintained throughout the series of air trunks.

Referring now particularly to the mechanism for reciprocating the cloth-cleaning brush shown in Figs. 3 and 4, it will be seen that a lever 40 is pivotally supported at its lower end upon a pin 41 and attached to the brush-carrying frame 6 at its upper end by means of a link or pitman 42. Secured to the lever 40 near its lower end is a plate 43 having a semi-circular bearing portion 44, to the center of which is pivoted a crank 45 provided with a roller 46 journaled at its outer end and working on the circular portion 44 of the plate 43. 47 is a crank shaft journaled in the bearing 48 of the frame-piece 1 and provided at its outer end with a sprocket-wheel 49 and its inner end with a crank arm 50, said crank

arm 50 being journaled to the pin 51 which passes through the roller 46 and the end of the crank 45.

In operating the device, the sprocket-wheel is rotated in the direction indicated by the arrow, which causes the lever 40 to intermittently reciprocate, as indicated in dotted lines.

Referring particularly to Fig. 3 it will be seen that as the sprocket-wheel moves in the direction of the arrow, the crank 50 will move to the right and carry with it the lever 40 until the crank 45 reaches the position indicated in dotted lines. This will be the extreme point of motion of the lever 40 to the right. As the rotation of the crank 50 continues, it will be seen that the crank 45 will be carried with it (the roller 46 traveling over the curved portion of the plate 43) until the roller 46 reaches the limit of its movement on the plate 44, (the centers of rotation of the cranks 50 and 45 being at the same point during this movement,) at which point the roller 46 will engage the plate 43 and move the lever 40 to the left until it reaches the position shown in full lines, said roller passing over the lower portion of the curved surface 44 during this return movement. The advantage of this movement for reciprocating the brush is that the durability of the cloth of the riddle is increased, as the brushing action is only half as frequent as in the continuously operating brushes. The brush stops at the end of each half stroke and allows a slight accumulation of dust in the cloth, which accumulation is brushed off by the return stroke.

The operation of my mechanism may be briefly described as follows:—The middlings to be purified are fed on to the upper sieve 2 which is constantly reciprocated. The air from the fan or blower passes through the series of air trunks and is directed up against the cloth of the sieve at an angle, passing through the cloth and stock, which raises the fluff and dust and carries it in the direction indicated by the arrows, the partition 35 turning it downward toward the dust collector. At this point the downward current is materially assisted by the suction of the fan which is continually exhausting the air from the passages leading from the dust collector. This causes the dust and fluff to descend rapidly into the space below the slats, while the air passes upward to the fan. During this operation the heavier particles of dust fall down upon the slanting board 22 and pass with the tailings to the dust-collecting sieve, while the lighter particles enter a dust pocket 55 and pass from there by the covered spouts 56 under the dust-collecting slats into the dead air space over the lower screen. This lower screen makes a further separation of the tailings into fine flour and feed, the feed tailing from the sieve through the trapped spout as has already been explained. The fine flour is raised by the scraper and carried to the bin as explained.

The cloths or sieves are kept clean by the brushes as above described. The dust collecting part of the machine is so arranged that all of the dust settling in it is deposited on the upper half of the lower sieve so there is always ample space below to insure the complete separation of the good materials from the tailings. The spout opening for the tailings allows the material to discharge freely, while it is normally closed to prevent the entry of the air. A similar valve is preferably employed at the flour outlets.

Having thus fully described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a middlings purifier, the combination of an air-tight casing, a suitable shaking screen, supported therein, the intermittently operated frame having brushes working on the under surface of the screen, the deflector boards forming a hopper under the screen, the series of vertically arranged air-trunks provided with upwardly inclined outlet slits extending entirely across the machine the whole width of the screen cloth and inclined tops for giving the air-currents an upward tendency, the air-trough extending longitudinally through the machine and communicating with the air trunks, a dust pocket, the inclined board, the partitions, the pressure fan having

the tangential outlet opening, the inclined flue, the side air passages communicating with the fan, and the dust collecting slats; substantially as described.

2. In a middlings purifier, the combination of an air-tight casing, a suitable shaking screen, or riddle supported therein, air trunks for directing currents against the bottom of said screen, an air passage leading to said air trunks, suitable deflector boards for directing the currents of air and tailings, a dust pocket, the dust collecting slats below which the dust pocket leads, a fan for circulating the air in a closed circuit, and a lower sieve or riddle below the dust collecting slats, substantially as set forth.

3. In a middlings purifier, the combination of the shaking screen or riddle, a blower, and air conduits, with a reciprocating brush operating below said screen, a pivoted lever connected to said brush, an arm pivoted to said lever, and a power crank shaft journaled in a suitable stationary bearing and provided with a crank arm which is pivoted to said arm, substantially as explained.

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Witnesses:

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