H. R. WINCHELL.

MIDDLINGS-SEPARATORS.

No. 194,494. Patented Aug. 21, 1877.

Fig. 1

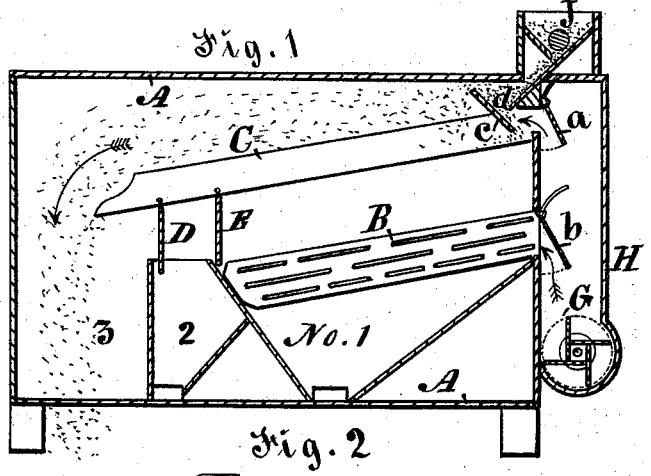


Fig. 2

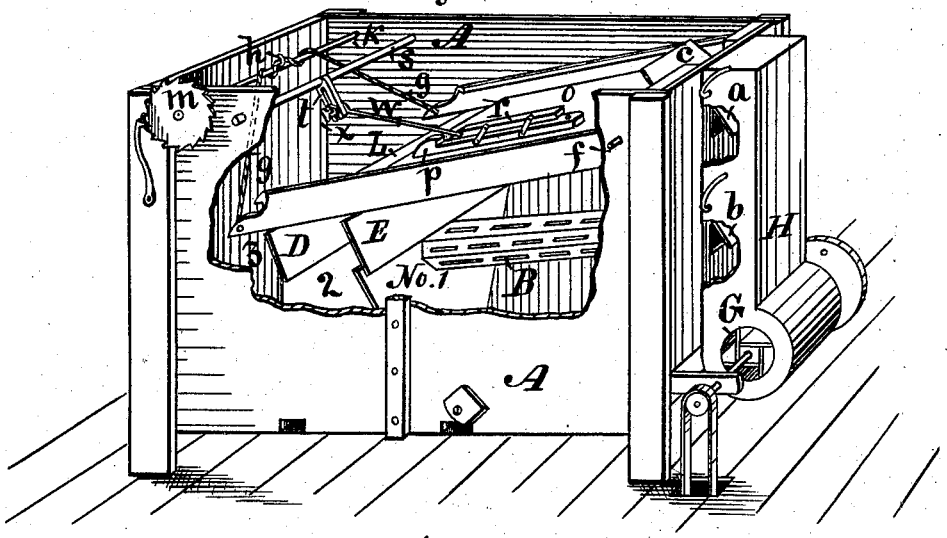
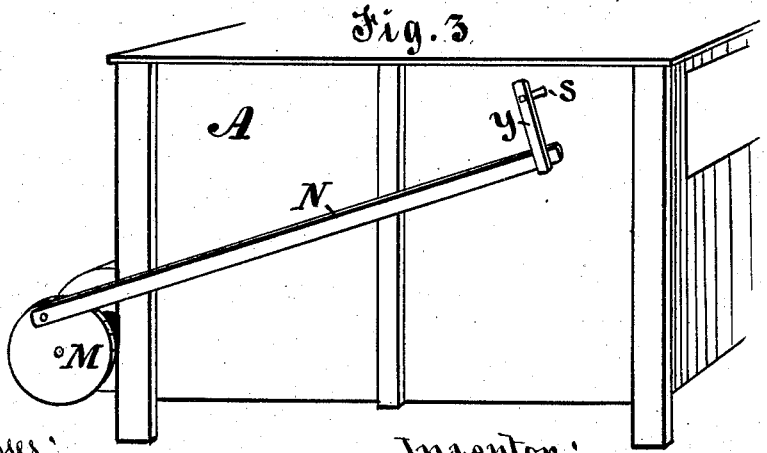


Fig. 3



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UNITED STATES PATENT OFFICE.

HARVEY R. WINCHELL, OF MONTOUR, IOWA.

IMPROVEMENT IN MIDDLINGS-SEPARATORS.

Specification forming part of Letters Patent No. **194,494**, dated August 21, 1877; application filed November 25, 1876.

To all whom it may concern:

Be it known that I, HARVEY R. WINCHELL, of Montour, in the county of Tama and State of Iowa, have invented an Improved Middlings-Purifier, of which the following is a specification:

The nature of my improvements will appear from the following description and appended claims.

Figure 1 of my drawings is a sectional view and elevation, showing the construction and relative arrangement of the various parts. Fig. 2 is a perspective view, illustrating the construction and operation of the complete apparatus. Fig. 3 is a perspective view, showing the reverse side of Fig. 2, to illustrate the manner of imparting motion to the suspended sieves.

A A represent a portable frame and case of oblong form, supported upon suitable feet. It may be framed or joined together in any suitable way, and vary in size as desired. Its lower half is divided into three separate compartments. No. 1 is a hopper-form compartment at the right hand and front end of the case A, designed to receive the purified middlings as it drops from the sieves. No. 2 is a hopper in rear of No. 1, designed to receive a second grade of material, from which some pure middlings may be taken by returning it to be passed through the machine a second time. No. 3 is a compartment in rear of No. 2. It is open at its bottom, and serves as an exhaust and eduction-way for the passage of the blast and the impure foreign substances separated from the middlings.

B is a slotted or perforated air-distributing tube or cylinder fixed in the top or over the top of the compartment No. 1, and under the vibrating sieves, in such a manner and position as will allow it to receive, conduct, and distribute a forced air-current from the fan upward through the sieves and their contents. C is a suspended sieve-case, carrying adjustable sieves. D and E are vanes suspended from the sieve-carrier C, to cut off the blast and prevent the air from pressing upward underneath that portion of the sieves intermediate between the two pendent vanes, to thereby allow all heavy and valuable material to drop through that portion of the sieves into the hopper No. 2, from which it can be conveyed to the mouth of the machine in any suitable way, to be again passed through the machine. All valuable material is thus prevented from being carried over the sieves with the impurities that pass through the exhaust-chamber No. 3.

G is a fan in the lower end of the fan-box H, attached to the front end of the portable case A. *a* is an adjustable valve or cover hinged or pivoted over the opening or air-port, that allows the blast of the fan to pass into the case A, immediately under the mouth of the machine, and over the front and top ends of the sieves carried in the suspended sieve-case C. *b* is a valve, corresponding in form with the valve *a*, and placed over a port that admits the blast of the fan to enter the air-distributer B. *c* is a screen-board, placed across the front and upper end of the suspended sieves in such a manner that it will incline upward and rearward from the top sieve. It does not come in contact with the roof of the case A, and, consequently, allows the blast from the fan and the bulk of the material fed to the machine to pass upward and rearward to reach the sieves. The middlings fed from the hopper J through the mouth *d* are met by the blast passing through the upper air-port *a*, and thereby thrown with force against the inclined screen-board *c*, and spread to pass in separate particles to and over the sieves. Particles that adhere together, and would be liable to be blown over the sieves and carried off with waste matter through the exhaust-chamber No. 3, are either separated when they strike the screen-board *c*, or arrested thereby to roll off forward to drop upon the sieve, and then pass rearward underneath the screen-board and onto the sieve, where they will be subjected to the blast, distributed from the slotted cylinder B, which blast, together with the jarring and vibrating of the sieves, will cause them to become separated and purified.

The sieve-carrier C is pivoted at its front and upper end to the sides of the case A by means of pins *f*, as shown in Fig. 2. At its front end it is suspended by means of a cord, strap, or chain, *g*. The center and doubled portion of the flexible cord *g* is passed over the hook *h* of a rotating shaft, *k*, which extends across the case, and has its bearings

formed in or attached to the sides A. *m* is a ratchet-wheel, rigidly fixed to the end of the shaft *k* outside of the case A. *n* is a pawl, fixed to the outside of the case in a suitable position to engage the wheel *m*. By turning the wheel *m* and shaft *k*, the cord *g* can be readily wound upon the shaft *k*, and alternately lengthened and shortened to raise and lower the front end of sieve-carrier C. Different degrees of inclination can thus be conveniently given to the suspended sieves, as may be required to suit the varying conditions of the material operated upon.

L is a sieve stretched upon a frame, that slides longitudinally upon bearings fixed on the inside of the sieve-carrier case C. O is a second and shorter sieve in the same frame, placed above the sieve L, to form a vacant space between the two sieves. *p* is a plate, rigidly fixed on the top and center of the top sieve O, and provided with an upward projection at one end, as shown. *r* is a bar, linked to the plate *p* in such a manner that it will rise and fall alternately when a reciprocating motion is imparted to the sieves. Every time it falls upon the plate and strikes the projection it will jar the sieves, and thereby prevent any substance from adhering to and clogging the sieves. *s* is a rock-shaft that has its bearings in the sides A. *t* is a bifurcated branch, extending at right angles from the center of the shaft *s*, to form a bridle to adjust the pitman. *w* is a pitman, connecting the rock-shaft *s* with the knocking-bar *r* resting on plate *p*, connected thereto by links, as shown, and, when lifted in the motion of the link, striking with its rear end an upward shoulder or projection, preferably armed with rubber, of said plate *p*. It is clamped to the branch *t* of the shaft *s* by means of a bolt and set-screw, *x*, which bolt and screw can be adjusted in the bridle *t*, to lengthen and shorten the stroke of the pitman. The vibratory or reciprocating motion of the sieves is thus readily regulated as required to suit the incline of the sieves, which incline is governed by the lengthening and shortening of the cords *g* wound upon the shaft *k*. *y* in Fig. 3 is a crank on the end of the rock-shaft *s* opposite to the ratchet-wheel *m*. M is a crank-wheel on the end of the shaft that operates the fan G. N is a pitman, connecting the crank-wheel M and the crank *y* of the rock-shaft *s*. The fan and sieves are thus connected to operate simultaneously.

In the practical operation of my apparatus it is placed in position in a mill so that it can readily be connected with the mill-gearing and motor power by means of belts or gear-wheels.

The simultaneous operation of the fan and sieves to effect the results contemplated is obvious from the foregoing detailed description of the various parts and their functions.

By closing the air-ports by means of the covers *a b*, or otherwise making the fan inoperative, my machine can be advantageously used as a buckwheat-bolt.

I claim as my invention—

1. The combination, with sieve O and plate *p*, formed with an upward projection, of the knocking-bar *r*, freely connected to said plate and the pitman *w*, substantially as and for the purposes set forth.

2. The inclined screen-board *c*, supported over the top and front end of the sieve O, the fan G in the fan-box H, having an air-port at its top under the adjustable valve *a*, and the slot or mouth *d* in the front and top of the case A, arranged and combined substantially as and for the purposes shown and described.

3. The combination, with the sieve O, plate *p*, and knocker *r*, of adjustable pitman *w*, provided with arm *t*, substantially as and for the purpose set forth.

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Witnesses:
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