3 Sheets—Sheet 1

W. S. BURROUGHS.

Middlings-Separators.

No. 205,724. Patented July 9, 1878.

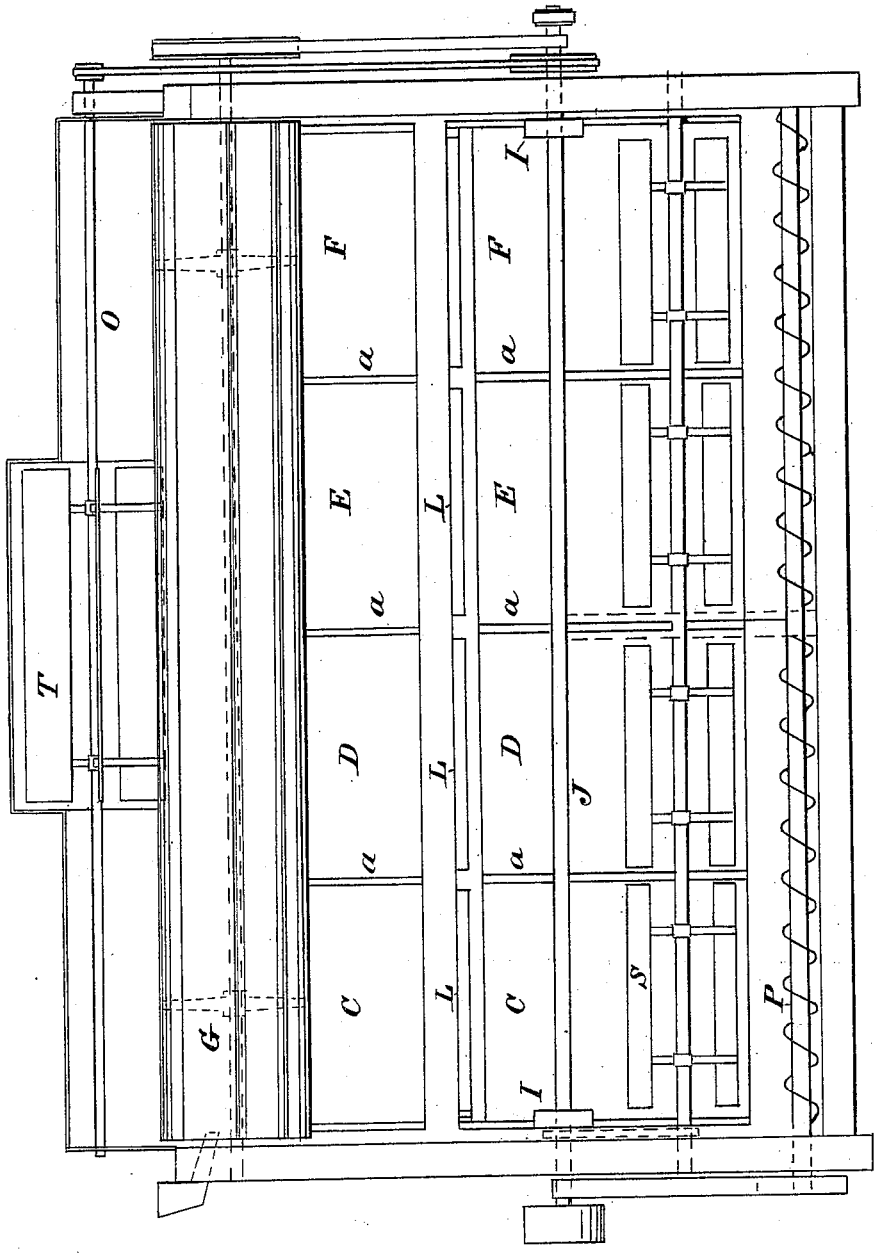

Fig. 1.

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Fig. 2.

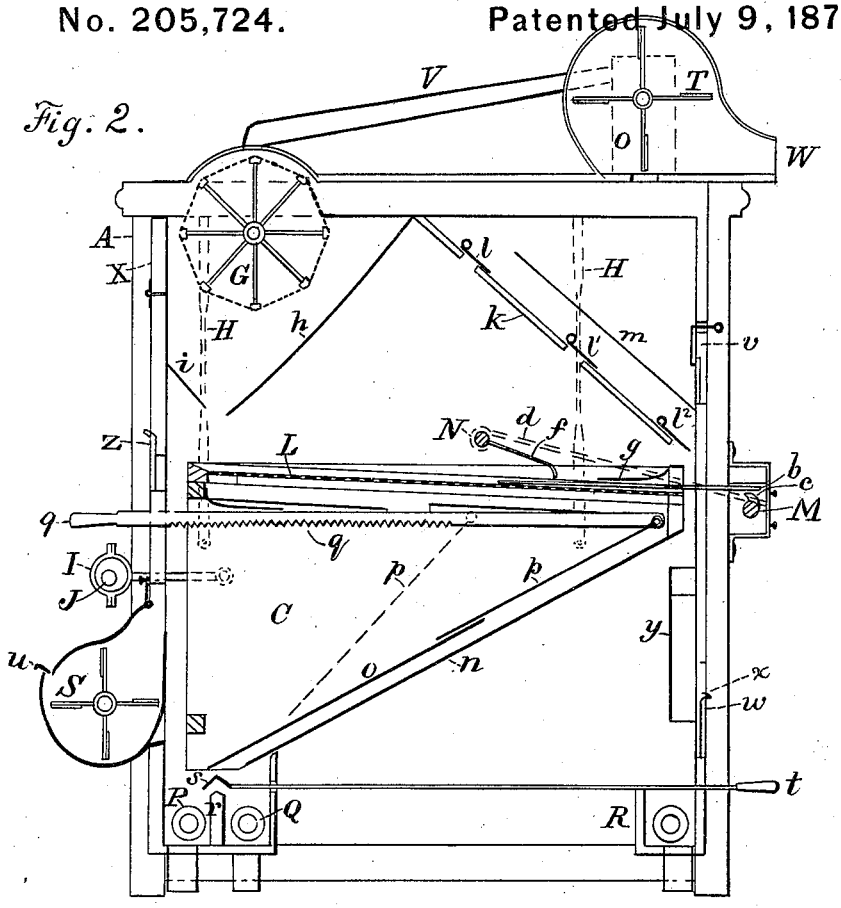

Fig. 3.

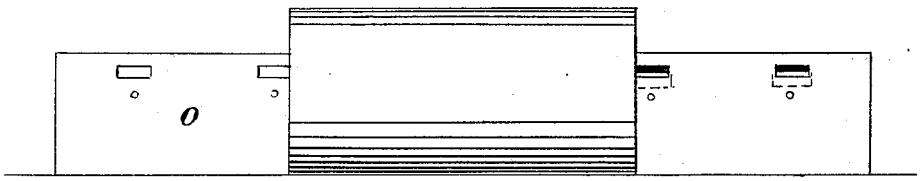

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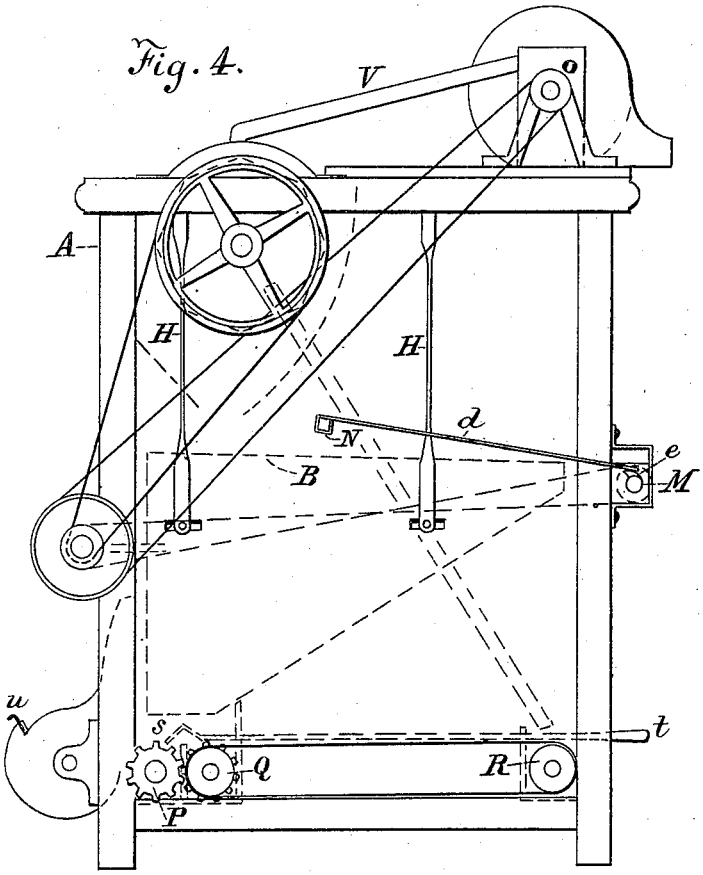
Fig. 4.



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UNITED STATES PATENT OFFICE.

WINFIELD S. BURROUGHS, OF FRIENDSHIP, INDIANA, ASSIGNOR OF ONE-HALF HIS RIGHT TO THOMAS S. JOHNSON, OF SAME PLACE.

IMPROVEMENT IN MIDDLINGS-SEPARATORS.

Specification forming part of Letters Patent No. **205,724**, dated July 9, 1878; application filed May 15, 1878.

To all whom it may concern:

Be it known that I, W. S. BURROUGHS, of Friendship, in the county of Ripley and State of Indiana, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal vertical sectional view. Fig. 2 is a transverse vertical sectional view. Fig. 3 is a front view of the exhaust fan-chamber, and Fig. 4 is an end elevation of a machine embodying the improvements of my invention.

This invention relates to middlings-purifiers; and consists in improvements in the construction of the same, hereinafter fully described in the specification, and particularly pointed out in the claims.

In the accompanying drawings similar letters of reference indicate like parts of the invention.

The case A and the shaker B (shown in dotted lines, Fig. 4) are separated into vertical sections C D E F by partitions *a;* and the bolt-reel G extends the full length of the case A, and is covered with bolt-cloth, the meshes of which increase in size over each successive section C D E F, from the point where the middlings enter the reel to the opposite end.

The sections C D E F of the shaker B are surrounded by a common case, which is suspended in spring-hangers H, and operated by the eccentric-cams I upon the shaft J. The sieves L are slid through openings in the case A into grooves in the sides of the partitions *a* in the shaker; and arms *b*, extending from the center-braces of their frames, pass over the tails of the sieves L, and project through small openings in the rear wall of the case A, and come in contact with cams *c* upon a shaft, M, which traverses the rear of the case A, which imparts a chopping or knocking motion to the sieves L independently of the shaking motion imparted by the shaker itself. A shaft, N, to which a rocking motion is imparted by a lever, *d*, connected to its outer end, and coming in contact with a cam, *e*, upon the shaft M, is provided with knockers *f*, one for each sieve L, which strike upon the arms *b* and impart an additional jar to the sieves, springs *g*, bearing upon the arms *b*, causing the first jar as the arms *b* slip from the cams *c*. Carriers *h* and *i* are placed beneath the bolt-reel G, to guide the middlings to the front end of the sieves L. Sliding partitions *k*, having valves $l\ l^1\ l^2$, separate the exhaust-chamber O from the sieves, and slide-carriers *m* are placed immediately above the partitions *k*. Stationary carriers *n* form the bottom of the shaker B, and stationary half-carriers *o* are placed parallel above and in close proximity to them. Adjustable half-carriers *p*, having notched levers *q* hinged to them, and extending forward so as to project from the front wall of the case A, have bearings in grooves in the partitions *a*, and may be adjusted at any desired point within their grooves—for instance, as in dotted lines, Fig. 2.

A conveyer, P, for the purified middlings extends the full length of the case A at the front and bottom. A conveyer, Q, adjoining it and separated only by a partition, *r*, runs in an opposite direction, and conveys what it receives to the elevator, to be again run through the bolt-reel G. The tailing-conveyer R is located at the bottom and rear of the case A. A series of shifters, *s*, four or more in number to each section C D, &c., their handles *t* projecting from the rear wall of the case A, as shown, are located directly over the partition *r*, between the conveyers P and Q, and are used to throw the middlings from any part of the sieves into either of the conveyers P or Q while the purifier is in operation.

A series of blast-fans, S, are placed at the front of the case A, below the sieves L, to blow the impurities from the middlings as they fall from the sieves over the adjustable half-carrier *p*, to be conveyed back to the bolt-reel by way of the conveyer Q. The suction-fan T is placed in the exhaust-chamber *o* on top of the case A, and air-ducts V, leading from the bolt-reel chamber, connect with it. *w* is the dis-

charge-orifice for the fan-chamber. Doors X in the front wall of the case A open to the bolt-reel G. Slides Z cover the openings in the front wall through which the sieves L are introduced and withdrawn. Slides *u* at the front of the fan-chambers, incasing the blast-fans S, regulate the admission of air for the blast. The valves *l* l^1 l^2 are operated independently of each other by rods connected with them, and projecting through the wall of the case A.

Windows in the rear of the fan-chamber O are provided, through which to inspect the draft. Windows *v v* in the rear wall of case A are supplied to inspect the weight of draft upon the sieves. Hand-holes *w*, provided with slides *x*, are made in the rear wall of the case, to permit the inspection of whatever may come over the tails of the sieves L. Funnels *y* convey the tailings to the tailings-conveyer, and cause it to pass conveniently near the hand-holes *w*. A chute or pipe conveys the tailings from the tail end of the bolt-reel G to the tailings-conveyer R. The suction-fan T draws the impurities from the middlings while they are falling from the reel G and passing through the sieves L, and the blast-fans blow the impurities remaining in the middlings after they fall through the sieves over the half-carrier *p*, which may be adjusted, as desired, to let the middlings near the tails of the sieves fall upon the stationary carriers *n*, to be carried, together with the impurities that have been blown over the adjustable half-carrier *p*, to the conveyer Q, and thence back to the bolt-reel G, to be again acted upon.

The sieves L are arranged in the same horizontal plane beneath the bolt-reel, and have a shaking and two knocking motions.

The shifters *s* permit the middlings to be thrown into either of the conveyers P or Q at any part of the machine at will, as expediency may designate, by simply adjusting them properly. The sieves L may be withdrawn for exchange or repairs when desired.

Having thus described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In a middlings-purifier, the sieve L, provided with the arm *b* and spring *g*, in combination with the cam *c* on the shaft M, substantially as and for the purpose set forth.

2. In a middlings-purifier having the series of sieves L, provided with the arms *b*, and arranged in a horizontal plane beneath the bolt-reel G, the rock-shaft W, having lever *d*, operated by the cam *e*, provided with the knockers *f*, substantially as and for the purpose set forth.

3. A shaker for middlings-purifiers, having the fixed carrier *n*, the fixed half-carrier *o*, and adjustable half-carrier *p*, having notched lever *q*, in combination with the conveyers P and Q, substantially as and for the purpose set forth.

4. In a middlings-purifier, the sliding partition *k*, having valves *l* l^1 l^2, and the carrier *h*, both placed above the sieve L, in combination with the suction-fan T, the revolving bolt, and the shaker B, substantially as and for the purpose set forth.

5. The blast-fan S, in combination with the shaker B and the section C, having the fixed carrier *n* and the adjustable half-carrier *p*, substantially as and for the purpose set forth.

6. In the tailings-chamber of a middlings-purifier, the funnel *y* and hand-hole *w*, provided with the slide *x*, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

WINFIELD S. BURROUGHS.

Witnesses:

EDWD. H. PHILLIPS,

THEO. MUNGEN.