

A. HERR.
Middlings Purifiers.

No. 141,557.

Patented August 5, 1873.

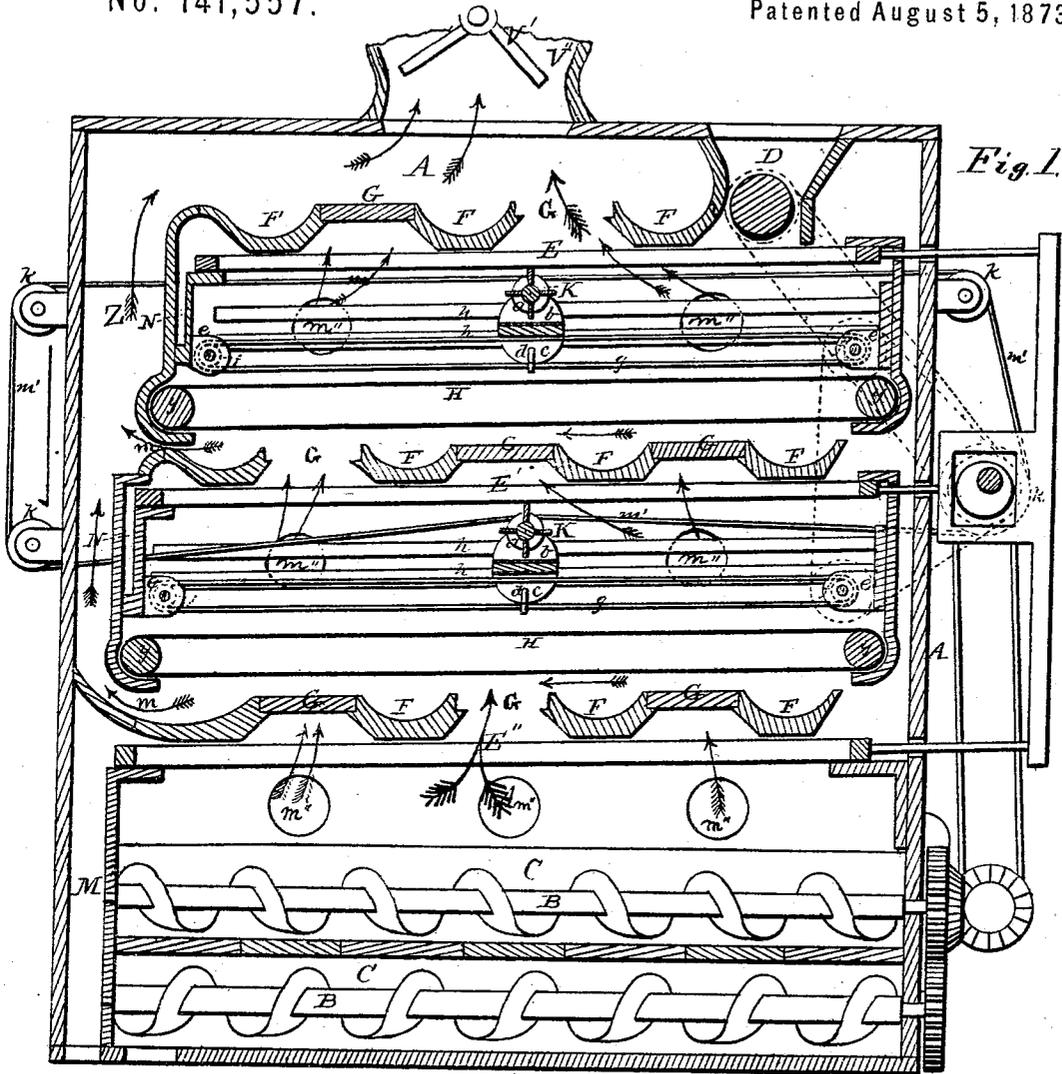
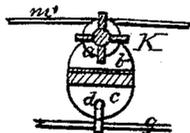


Fig. 6.



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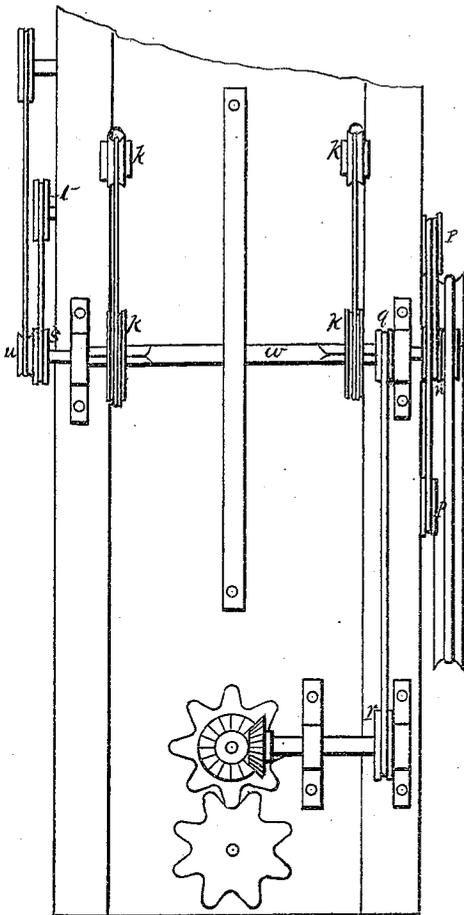


Fig. 2.

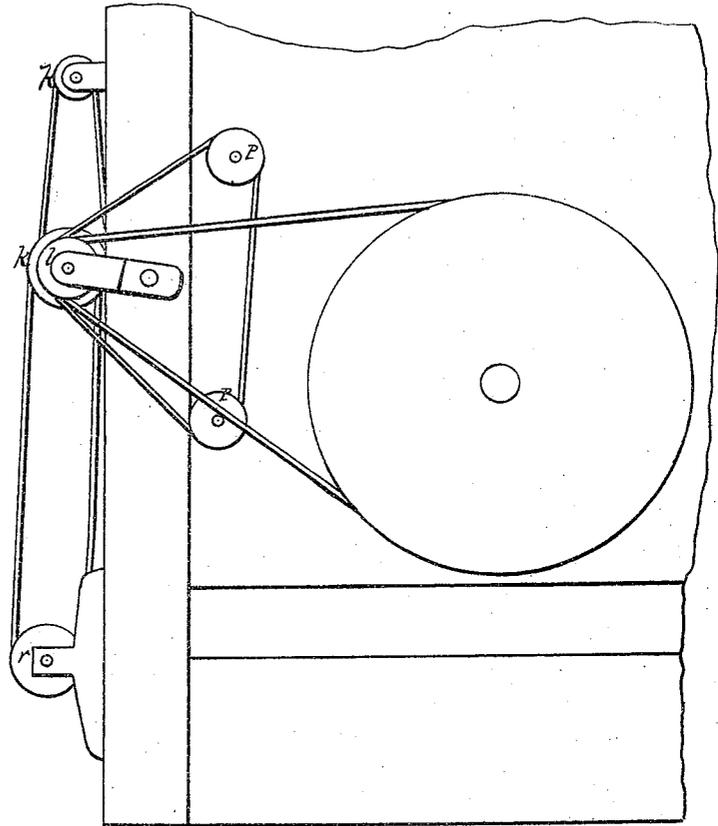


Fig. 3.

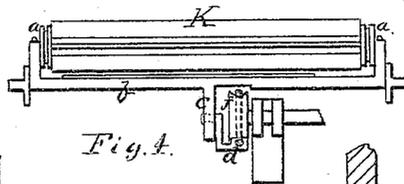


Fig. 4.

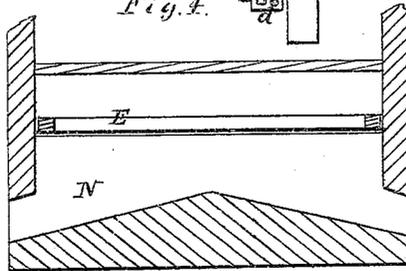


Fig. 5.

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UNITED STATES PATENT OFFICE.

AUSTIN HERR, OF GEORGETOWN, DISTRICT OF COLUMBIA.

IMPROVEMENT IN MIDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **141,557**, dated August 5, 1873; application filed June 16, 1873.

To all whom it may concern:

Be it known that I, AUSTIN HERR, of Georgetown, in the county of Washington and District of Columbia, have invented a new and valuable Improvement in Middlings-Purifier; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical section of my middlings-purifier. Fig. 2 is an end view of same. Fig. 3 is a side view. Figs. 4 and 5 are details. Fig. 6 is a detail, showing fan.

This invention has relation to middlings-purifiers; and it consists in the construction and novel arrangement of the reciprocating rotating fans working underneath the bolting-screens; of the horizontal series of alternate hoppers and draft-boards transversely arranged above each screen; of the current-passages and endless-partition belts between the screens; of the independent oblique transverse chutes by which the tailings of the upper screens are discharged; and of all the devices, as combined and operating together, forming a middlings-purifier of efficient action. The main object of this invention is to assist the action of the shakers or bolting-screens in loosening up the middlings thereon, and working up the light particles of dust and chaff to the surface of the layer, whence they are easily lifted by the upward draft of the suction-fan.

In the accompanying drawings, the letter A designates the case of the purifier, suitably arranged with conveyers B and conveyer-trough C in its lower portion, and at its upper part the ordinary suction-fan V' and fan-case V''. D represents the hopper provided with a feed-roller or conveyor in its throat in the ordinary manner. E E' E'' designate the first, second, and third screens, all that are illustrated in the drawings, although the series may be extended if desirable, but in practice, with my improvements, it is thought that the above number will prove sufficient to produce the best results. These screens are respectively arranged one above another, and may be

of varying grades of fineness, according to the work to be performed. These screens are shaken in the usual manner, the eccentric action being preferred. Above each screen is arranged a horizontal series of alternate hoppers F and flat boards G, all designed to be easily removable, the former for the purpose of discharging such particles of flour as may have fallen therein, and the latter in order to let the suction-draft on the screens at such points as may be desirable, according to the exigencies of the work. Between every two screens is arranged an endless band, H, of such material and width that it will constitute a partition between the screens impervious to air. These bands pass over rollers at the ends of the case, each band extending toward the hopper, and to such a distance that the middlings conveyed by it will fall on the head of the screen below. K designates the rotating reciprocating fan, transversely arranged beneath the screens E and E', and in contact or almost in contact therewith. If desirable, a similar fan may be arranged to work beneath the lowest screen E''.

This fan may be operated in the following manner: Its shaft, having been provided at one or both ends with pulleys *a*, is journaled in a transverse frame, *b*, provided with a center stud, *c*, extending downward, and having a crank-arm, *d*, pivoted thereto. To the inner wall of the casing A, at each end, a bracket, *e*, is provided, to which is pivoted a pulley, *f*. These pulleys are centrally arranged, and carry the endless cord *g*, which is fastened to the crank-arm *d* of the center stud *c* of the traveling frame, said arm *d* being about equal in length to the radius of the pulleys *f*. The ends of this frame are arranged to slide in suitable ways *h* situated at the sides of the case. Pulleys *k* are externally arranged in connection with the casing to carry the endless cords *m'*, which are rove around the pulley or pulleys *a* of each fan-shaft, and serve to rotate the fans. At the same time the endless cord *g* connected with the crank-arm *d* carries the frame *b*, with the rotating-fan, backward and forward lengthwise under the screen.

According to the mechanism illustrated in the drawings, but which may be varied, as

required, these different devices are moved by cords or bands from pulleys on the shaft *w* of the eccentric, this shaft receiving its motion from the power-wheel by a band connecting with its pulley *l*. A cord from the pulley *n* connects with the pulleys *p* on the ends of the rollers *y* of the endless-partition bands. The pulley *q* is connected with the pulley *r* of the conveyer-gearing. The pulleys *k* carry the endless cords *m'*, which give rotary motion to the screen fans. Pulley *s* is connected with the pulleys *t* on the ends of the shafts of the pulleys *f*, at the hopper-end of the casing, and the pulley *u* turns the feed-roller of the hopper. At the foot of the casing a vertical chute, *M*, discharges the tailings from the lowest screen, those from the screens above being separately discharged by means of the oblique transverse chutes *N* extending downward each way from the center, and opening through the sides of the casing.

The operation of this purifier is as follows: The hopper having been filled, the draft is admitted to each screen by the removal of such of the draw-boards *G* as may be thought desirable. As the middlings spread over the shaker *E* the rotating fan *K*, passing back and forth under the bolting-cloth, loosens up the mass, throwing the light matter and dust to the surface, whence it is easily raised by the air-current and drawn off through the passages *m m* and flue *Z*, by means of the suction-blast, the air being admitted under the several screens through openings *m'' m''* in the sides of the casing. Such flour as may be drawn up with the air-currents falls into the alternate hoppers *F* above the screen. The tailings bolted over the foot of the screen pass into the oblique chutes *N*, and are discharged at the sides of the casing. The middlings bolted through this screen fall on the endless-partition band *H*, by which they are carried toward the hopper-end of the case and dropped on the head of the screen *E'*. Over this screen the middlings pass, being acted on in a similar manner, the tailings passing over the end into the oblique transverse chute *N*, and the middlings being bolted through upon the endless band below, by which they are discharged upon the head of the lowest screen *E''* of the series illustrated,

by which the last separation is made, the tailings passing directly into the vertical chute, and the middlings bolted through into the conveyer-trough, by which it passes to the proper spout. By means of the flue *Z* and passages *m m* light particles of bran, &c., are drawn upward by means of the suction-fan; and, by means of the draft-board *G*, said draft may be applied to any part of the screen desired.

I am aware that it is not new to use a series of troughs arranged above a bolting-screen; hence I do not claim such troughs, broadly.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a purifying or separating screen, of a rotating fan having a reciprocating motion, in contact or nearly so with the under side of said screen, substantially as specified.

2. The combination, in a middlings purifier or separator, of the screens *E E' E''*, arranged one above another, with the endless-partition bands *H*, substantially as shown and described, and for the purpose specified.

3. The combination, with the screens *E E' E''*, arranged one above another, and the endless-partition-bands *H*, of the series of alternate hoppers *F* and flat draft-boards *G* transversely arranged, as specified.

4. The combination, with a shaker or screen, of the reciprocating frame, carrying an open fan, the stud *c*, pivoted arm *d*, endless cord *g*, pulleys *f*, and slide-ways *h*, substantially as specified.

5. In a middlings-purifier, the combination, with the draft-case *A* and the series of alternate hoppers *F* and draft-boards *G*, of the flue *Z* and draft-passages *m m* and partitions *H* between the screens, substantially as specified.

6. The combination, with the pulleys *k* and endless cord *m'*, of the pulleys *a* and traveling fan *K*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

AUSTIN HERR.

Witnesses:

PHIL. C. MASI,
D. D. KANE.