

G. MILBANK.
MIDDLINGS-PURIFIER.

No. 171,833.

Patented Jan. 4, 1876.

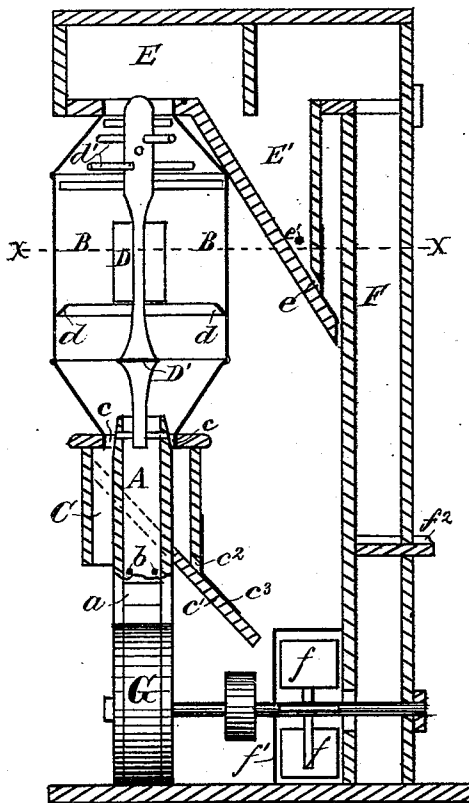


Fig. 1.

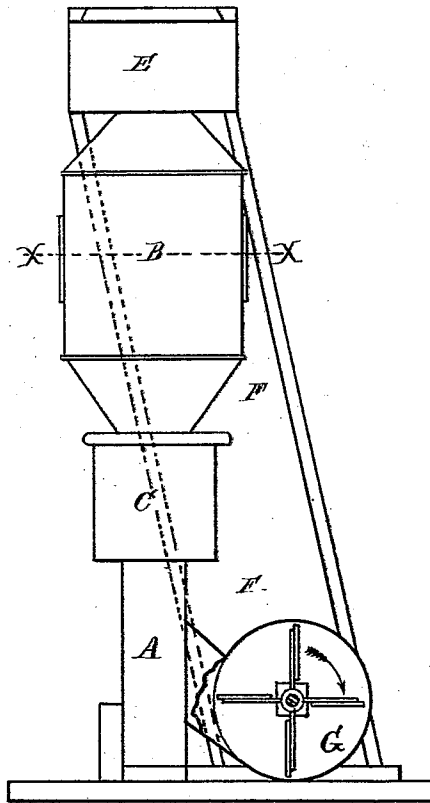


Fig. 2.

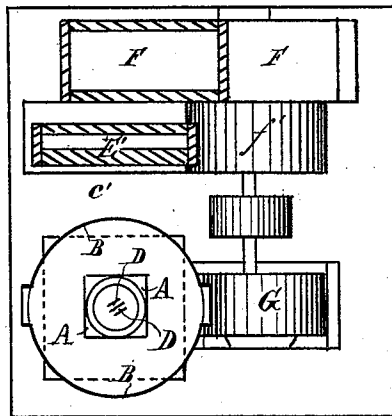


Fig. 3.

Witnesses:
J. H. Heithel.
Chas. P. Mesner.

Inventor:
George Milbank
per Heithel & Co.
- His Atty -

UNITED STATES PATENT OFFICE.

GEORGE MILBANK, OF CHILLICOTHE, MISSOURI.

IMPROVEMENT IN MIDDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **171,833**, dated January 4, 1876; application filed June 2, 1875.

To all whom it may concern:

Be it known that I, GEORGE MILBANK, of Chillicothe, Livingston county, and State of Missouri, have invented a new and useful Improved Middlings-Purifier, of which the following is a specification:

In this invention the middlings are purified by being passed upward and acted upon within the machine by the force of suction or blast, or both combined. The machine consists, chiefly, of a vertical spout and expansion-chamber, the former being the feed-spout, and the latter having peculiarly-arranged devices, against which the middlings are caused to be beaten, while at the same time the currents or drafts are in varying direction, so that the air-currents pass through and completely permeate the middlings, acting upon the particles thereof, the heavier and better quality of middlings gravitating below, while the lighter and impure stuff is carried out at top.

Of the drawings, Figure 1 is a sectional elevation, excepting the blast-fan, which is shown as a front view. Fig. 2 is a side elevation. Fig. 3 is a top sectional plan on line *x x*.

A is a vertical spout. This has a feed-opening at *a*, Fig. 1, through which the middlings are fed, in order to be passed up said spout A. At *b* in the spout A are one or more stationary beaters, against which the middlings in the spout A are caused to strike by the current force, and in doing so separate the lighter and filmy stuff from the better middlings. The middlings carried up the spout A next pass into the chamber B, which I term "expansion-chamber," as will hereinafter appear. The expansion-chamber B I support at top of a discharge-hopper, C. (See Figs. 1 and 2.) The discharge-hopper C surrounds the feed-spout A, as shown in Figs. 1 and 2. In order that the pure and good middlings gravitating below can drop out of the expansion-chamber and into the hopper C, I leave clearancespaces *c*, surrounding the top end of the spout A. (See Fig. 1.) It is through the passage *c* that the purified middlings drop into the hopper C upon an incline board, *c'*, thence out of said hopper, through its discharge-opening at *c''*, into a receptacle. The opening at *c''* has a flap-valve, *c'''*, so that it is closed by the force

of suction or blast, and will open by the force of the middlings passing out of the hopper. As apparent, as soon as the current enters the chamber B, this, owing to its enlarged capacity, permits expansion of the air, and weakens the suction or blast. In order, however, to specially divide the current of suction or blast, and to impart to same varying force and direction, I arrange within the chamber B a vertical shaft, D. This has its lower end secured to a cross-piece, (see Fig. 1,) so as to support said shaft stationary. Further, for this purpose, near the lower end of the shaft D, I provide or form an enlarged addition at *D'*. (See Fig. 1.) The upward current is, by means of the part *D'*, caused to spread away from the center and force middlings with it, which, being lighter than the current, do not drop below. The divided currents carrying the middlings will next be passed in the direction of an inner projecting flange, *d*, (see Fig. 1,) against which said currents force the middlings to strike, and thus said flange acts as a separator of the middlings. Further, this flange also again divides the direction of the current force by causing same to pass again in the direction to the center, and by means whereof the upward currents are permitted to intersect and more fully permeate the middlings and pass through the same; which said action is a most effective process for producing at varying stages the middlings to drop the better quality thereof. Near the top of the shaft D, this has a number of beaters, *d'*, arranged crosswise, one above another, top and below each other. (See Fig. 1.) Against these beaters the middlings carried upward are forced to strike, producing a shaking agitation, facilitating still further the purification of the middlings, while at the same time currents of air are by these beaters intersected, divided, and enabled the better to still further act upon the impurities contained, before the lighter middlings and impurities are passed out over the top of the expansion-chamber. E is a top chamber, into which the impurities and un-separated middlings pass when coming out of the expansion-chamber. Forming part of this chamber E is an inclined discharge-chamber, *E'*. (See Figs. 1 and 3.) At *e* this chamber

E' has a discharge-opening covered by a flap-valve. The valve opens to permit the exit of the middlings, but closes by force of the suction. Whatever middlings pass out of the chamber E' can be repassed through the purifier as before. The dirt, dust, impure stuff, and lighter particles are carried along with the current force into and down a vertical spout, F, arranged as shown in the figures. The spout F will have the suction-fan *f* in suitable casing *f*¹, (see Fig. 1,) also a regulating-slide at *f*².

As apparent, by such a construction and arrangement of parts, the machine can have the required upward current of air produced simply by means of the suction-fan *f* and its regulating-slide. At or near the bottom of the spout A I can, however, arrange a blast-fan attachment, G, (see figures,) and so at times can dispense with the suction-fan. Both suction and blast can also be used, especially where great power of separation is required. *e'* are openings in each side of chamber E', (see Fig. 1,) for the purpose of admitting an upward current of air to assist in purifying the middlings that come out of said chamber at *e*.

What I claim is—

1. A middlings-purifier consisting of the feed-spout A, having feed-opening at *a*, its

beaters *b*, the surrounding discharge-hopper C, having incline board *c'*, the expansion-chamber B, having current-dividing shaft D, with the part D' and beaters *d'*, the flange *d*, said parts being arranged with relation to discharge-chambers E E' at top, and blast G at bottom, to operate in the manner substantially as herein set forth.

2. The combination of the feed-spout A, the discharge-hopper C, expansion-chamber B, its shaft D, beaters *d'*, its flange *d*, the top chambers E E', and side spout F, and suction-fan, to operate in the manner substantially as herein set forth.

3. The combination of the feed-spout A, discharge-hopper C, expansion-chamber B, containing current-dividing parts and agitators, as shown and described, the top chamber E E', side spout F, said parts being constructed with relation to each other, and a blast, G, and suction *f*, to operate substantially as set forth.

In testimony of said invention I have hereunto set my hand.

GEORGE MILBANK.

Witnesses:

E. W. DARLINGTON,
RICHARD CLENKSEALE.