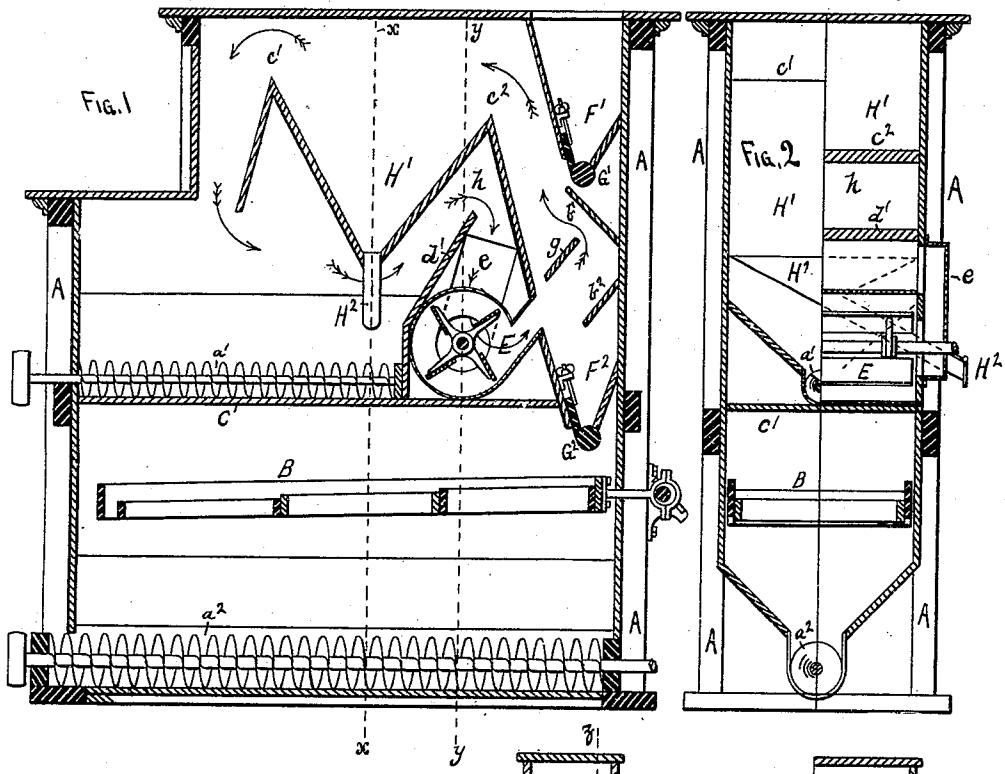
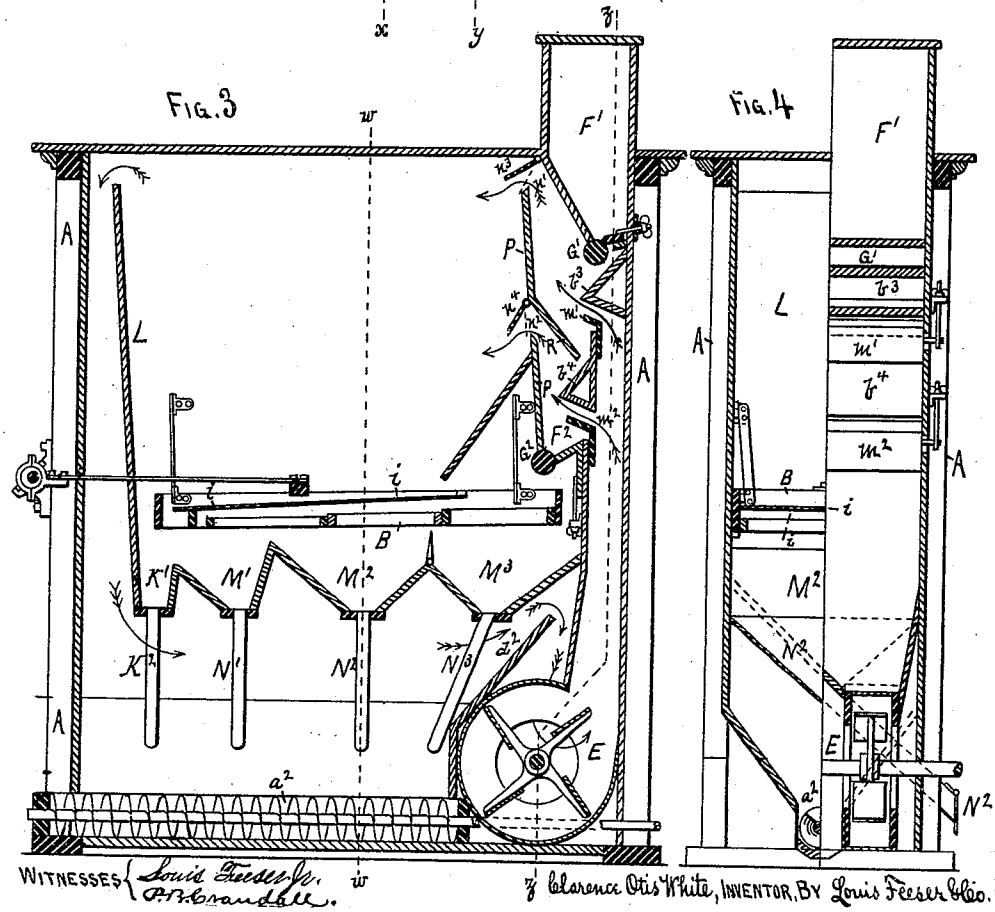
(No Model.)

C. O. WHITE.

MIDDLINGS PURIFIER.

No. 267,389. Patented Nov. 14, 1882.





WITNESSES { Louis Fleser Jr. P. B. Crandall.

Clarence Otis White, INVENTOR, By Louis Fleser & Co. Atty's.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CLARENCE O. WHITE, OF MINNEAPOLIS, MINNESOTA.

MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 267,389, dated November 14, 1882.

Application filed March 14, 1881. (No model.)

To all it whom may concern:

Be it known that I, CLARENCE OTIS WHITE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Middlings-Purifiers, of which the following is a specification.

My invention relates to middlings-purifiers; and it consists in the construction and arrangement hereinafter particularly described, and then sought to be specifically defined by the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a middlings-purifier with the separating apparatus arranged entirely above the shaker-frame. Fig. 2 is an end elevation, the right-hand half in section on the line *y y* of Fig. 1 and the left-hand half in section on the line *x x* of Fig. 1. Fig. 3 is a longitudinal sectional elevation of a middlings-purifier with the separating apparatus partially above and partially below the shaker-frame. Fig. 4 is an end elevation, the right-hand half in section on the line *z z* of Fig. 3 and the left-hand half in section on the line *w w* of Fig. 3.

A is the frame or casing in which the shaker-frame B is suspended in the usual manner, and divided by a diaphragm or horizontal partition, C, into two compartments, as shown, with their bottoms made hopper-shaped and provided with conveyers a' a^2.

E is a fan, and F' F^2 two feed-hoppers, supplied with any of the well-known styles of adjustable feed slides or rollers G' G^2, one feed-hopper being below the fan and one above it, and arranged as shown.

b' b^2 are two chutes or wind-boards, arranged, as shown, to deflect the blast from the fan and turn it at right angles and pass it up over chutes c' c^2 and down into the lower compartment formed by the partition C, and from thence up over another chute, d', and through pockets or hoods *e* into the fan again, thus securing a circulation of the blast within the machine.

The letter *g* designates a small chute, upon which the chop falls from the first feed-roller, G', and from which it runs through the blast from the fan into the second feed-hopper, F^2, and from thence through the feed-roller G^2 upon the shaker-frame B.

Between the chutes c' c^2 a hopper, H', is formed, from which a spout, H^2, leads to the outside of the machine. When the blast strikes the stream of "chop" flowing from the first hopper, F', it takes up the particles lighter than the middlings and carries them over the chute c^2, while the heavy middlings only drop into the second hopper, F^2, and are conducted from thence to the shaker-frame.

By the arrangement of the chutes b', b^2, and *g* the chop is caused to pass twice through the blast, so that such particles as the blast fails to take up the first time will be removed by the second current. When the blast passes over the chute c^2 and enters the large open space or hopper H' it expands so that it has less power upon the individual particles of matter taken from the chop. Hence the larger of these particles will fall into the hopper and be conveyed from the machine by the spout H^2, while the lighter particles only and the blast will be carried over the chute c'. When the blast reaches the narrow throat *h*, between the bottom of the hopper H' and chute d', it is retarded somewhat, so that the coarser particles of the dust and bran which have been carried over the chute c' will fall into the conveyer a', while the very fine dust only will be carried into the fan, and from thence again through the stream of chop, and so on in a complete circulation until the air becomes so heavily charged with the dust that it will take up no more. Hence all additional fine dust will be dropped into the conveyer. By this means the dust, bran, &c., is removed from the middlings by the air in the machine and without blowing it out again into the mill, thus doing away with the necessity for purifying the air by passing it through cloth dust-catchers or other devices or the annoyance of its presence in the mill.

Figs. 3 and 4 represent a machine with the separating apparatus arranged partially above and partially below the shaker-frame, in some styles of machine this arrangement being more convenient than that shown in Fig. 1; but the operation is substantially the same. In the last arrangement a sheet-metal plate, *i*, is placed above the shaker B, upon which the heavier particles of the dust, bran, &c., after being taken from the chop by the blast, and

from which it is run by the vibrations of the shaker into a small hopper, K′, and from thence by a spout, K^2, to the outside, the plate *i* and hoppers K′ K^2 thus taking the place and doing the work of the hoppers H′ H^2 of Fig. 1.

A long board or partition, L, is arranged in the rear end of the casing A, over which the lighter particles and air-blast are driven, and from thence into the space below the shaker-frame, (this board thus taking the place of the chute *c′* of Fig. 1,) and the very fine dust only carried into the fan over a chute, d^2, similar to the chute *d′*, the heavier particles falling into the conveyer a^2.

Hoppers M′ M^2 M^3 and spouts N′ N^2 N^3 are arranged beneath the shaker B to divide the middlings into their different grades in the ordinary manner.

Beneath the first feed-hopper, F′, in Fig. 3, a deflecting-plate, b^3, is arranged similar to the deflector b^2 of Fig. 1, and beneath it a short distance another similar deflector, b^4, is set, the spaces between them being provided with adjustable valves m' m^2, so that the power of the blast may be regulated. These valves will be arranged, as shown, to form, in connection with the deflectors b^3 b^4, short upwardly-inclining spouts, so that the blast will take an upward course through the chop and lift it slightly as it passes through to more perfectly separate the bran, dust, &c., therefrom.

Between the deflectors b^3 b^4 and the space above the shaker-frame a partition, P, is arranged, and pierced by openings n' n^2, provided with adjustable valves n^3 n^4, and the lower opening provided with a hood or chute, R, projecting nearly to the deflecting-plate b^4, so that the portion of the blast passing through the space between the deflector b^4 and valve m^2 will be carried directly through the opening n^2 and not interfere with that portion passing through the space between the deflector b^3 and valve m', thus dividing the blast into two streams and causing the chop to pass twice through the blast, like the arrangement in Fig. 1. A valve may also be placed upon the chute *g* in Fig. 1, if desired, to regulate the power of the blast.

When the apparatus is arranged as in Fig. 3 a large narrow fan will be employed to set upon one side of the conveyer-shaft; but the operation of the machine is the same in both styles.

The upper and lower compartments referred to in the claims are the compartments over and under the hoppers and formed by the hoppers, which in Fig. 1 of the drawings are shown above the shaker-frame and in Fig. 2 beneath the shaker-frame.

What I claim as new is—

1. In a middlings-purifier, the combination of a casing divided into a lower and an upper compartment, communicating at both ends with each other, and the upper compartment having a hopper in its bottom, a fan located in the lower compartment, a feed-hopper and a series of chutes between the fan and upper compartment, and arranged substantially as shown, and an inclined chute in the lower compartment next to the fan, substantially as shown, the several parts being adapted to operate as set forth.

2. In a middlings-purifier, the combination of a casing divided into an upper and a lower compartment, communicating at both ends with each other, and the upper compartment having a hopper in its bottom, a fan located in the lower compartment, a feed-hopper and series of chutes arranged between the fan and upper compartment, a shaker-frame and a feed-hopper arranged between it and the fan, so that the middlings as they pass onto the shaker-frame will not be affected by the blast, and an inclined chute in the lower compartment next to the fan, the several parts being adapted to operate as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CLARENCE OTIS WHITE.

Witnesses:
C. N. WOODWARD,
LOUIS FEESER, Sr.