# C. F. KELLER.

## MIDDLINGS SEPARATOR.

No. 181,182. Patented Aug. 15, 1876.

*Fig. 1.*

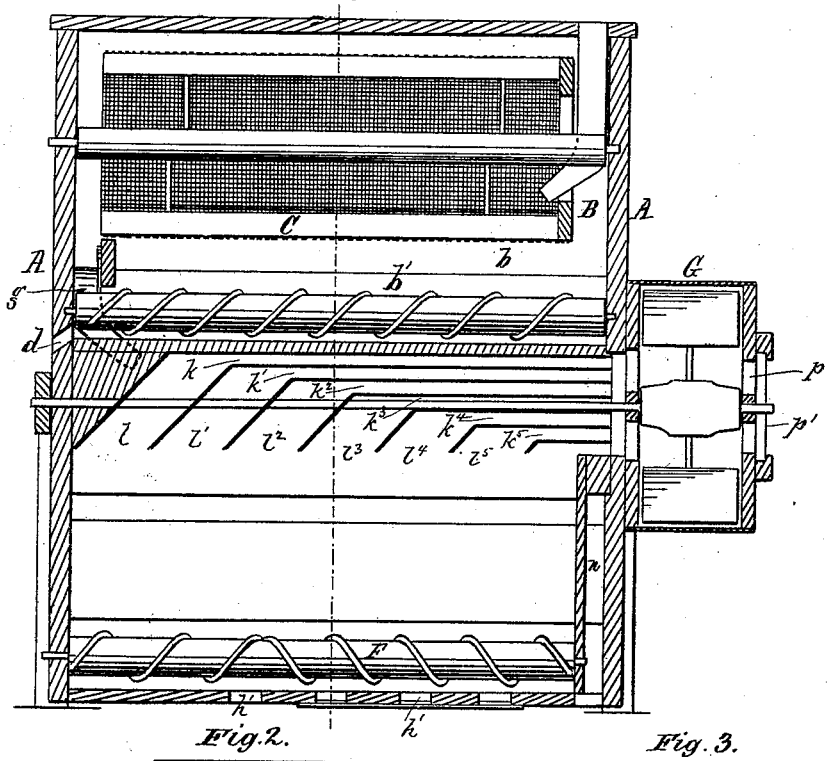



*Fig. 2.*

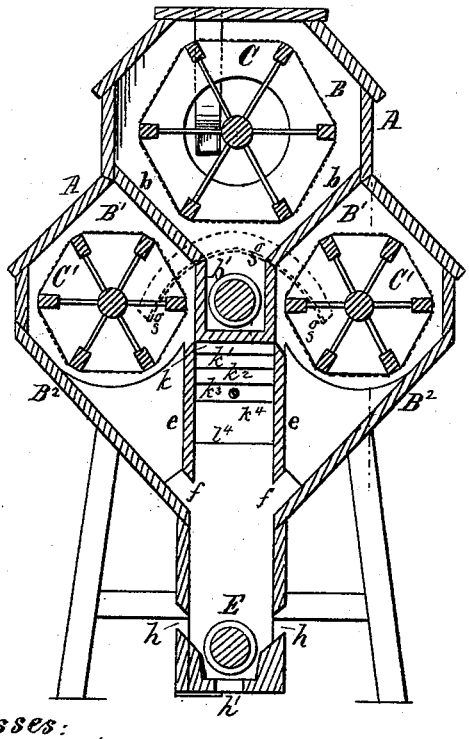
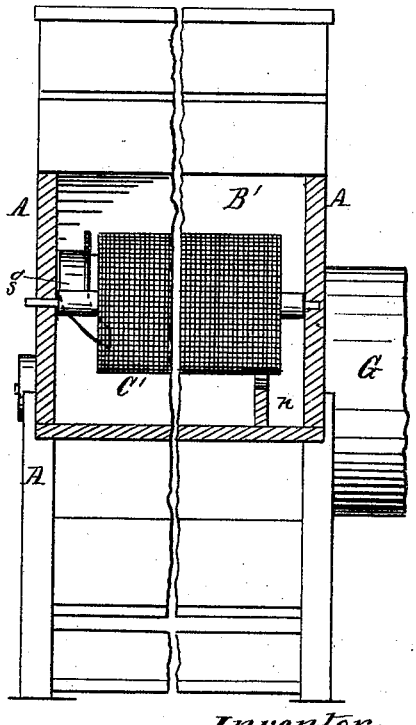



*Fig. 3.*

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN MIDDLINGS-SEPARATORS.

Specification forming part of Letters Patent No. **181,182**, dated August 15, 1876; application filed June 7, 1876.

*To all whom it may concern:*

Be it known that I, CHAUNCY F. KELLER, of Nevada, county of Wyandot, and State of Ohio, have invented certain new and useful Improvements in Middlings-Purifiers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a vertical longitudinal section through my improved middlings-purifier. Fig. 2 is a vertical transverse section through the same, and Fig. 3 is a side elevation (shortened) with the outer casing to one of the bolting-chambers removed.

The invention relates to a novel arrangement of pipes or passages controlling the currents of air relative to the bolts and bolting-chambers, whereby the middlings are acted upon by the currents of air after they have escaped from said bolts and bolting-chambers, and in their descent therefrom to the conveyer after they have been thoroughly opened up by the bolts, and are in best condition for effecting the separation of the lighter particles and fuzzy matter therefrom, as hereinafter explained.

In the accompanying drawings, A represents the inclosing frame-work and casing of the machine, divided substantially into three separate horizontal compartments, B and $B^1$ $B^1$, extending lengthwise of the frame or machine. The upper one of these compartments, B, is made, by preference, in the form of an octagon, as conforming substantially to the shape of the bolting-reel C, the object of which is to extract or remove the fine flour adhering to the middlings.

These middlings, with the adhering flour, are fed in at the head of the bolt C through a spout or pipe, *a*, curved at its lower end to enter the open end or head of the bolt, as shown, and the flour separated from the middlings during their passage lengthwise of the bolting-reel passes through the bolting-cloth, and is deposited upon the inclined bottom boards *b b*, down which it descends to the conveyer-trough *b'*, located between the lower bolting-chambers $B^1$ $B^1$, and from which it is discharged by any usual form of conveyer, D, and passes out of the machine at an end outlet, *d*, whence it is returned to the bolting-chest. The chambers $B^1$ $B^1$ are similar to chamber B, except that they more nearly approach a pentagon in outline in transverse section, the inclined bottom boards $B^2$ extending inward and downward from the outer vertical side boards to, and terminating in the vertical plane of, but below, the inner vertical side boards *e e*, leaving the discharge-openings at *f f*, through which the middlings pass to the lower conveyer-trough E. Within the chambers $B^1$ $B^1$ are placed the middlings-bolts C' C', which receive the middlings after they have passed through the flour-extracting bolt C, said middlings being conveyed to the bolts C' through chutes or spouts *g g*, arranged at the discharging end of bolt C, and adapted to divide the middlings about evenly between the bolts C' C'.

These bolts C' may be graded, and the middlings discharged therefrom pass down the inclined sides or bottom $B^2$ through the outlets *f f*, and into the conveyer-trough E, whence they are discharged through outlets *h'*, by means of a conveyer, F, of any usual or preferred construction. The vertical walls or sides of the trough F have horizontal slots or openings *h h*, extending their entire length, arranged at or near the plane of the upper face of the conveyer F, and the upper and lower walls of these slots are inclined inward, as shown, to prevent the escape of the middlings, and for giving direction to the currents of air passing inward through them.

Directly over the conveyer-trough E, above the openings *f f*, between the inclined bottom boards $B^2$ and side walls or boards *e e*, and between said side walls, a series of air-pipes, $k^1$ $k^1$, &c., are arranged horizontally, one above another, as shown in Figs. 1 and 2. These pipes are made of varying lengths, and at their inner ends are provided with obliquely arranged or inclined mouths or mouth-pieces *l l'*, &c., which all terminate in the same horizontal plane between the side walls *e e*, these mouths extending together the entire length of the space between the walls *e e*, and dividing it into about equal parts, as shown. The outer ends of the air pipes or ducts *k* $k^1$, &c., all terminate, in the same vertical transverse

plane, in a fan-chamber, G, at the head or one end of the machine, as shown.

Within the fan-chamber is a fan-wheel, G′, of any suitable construction, mounted upon and operated through the medium of a shaft, *m*, which extends longitudinally through the machine, and is driven by means of a band-wheel, *m′*, upon its opposite end.

The operation of the parts above described is as follows: Motion being imparted to the bolts C C′ C′ and fan G′, the middlings to be operated upon are fed in through the spout or chute *a* to the head of bolt C, and, passing through the same, have the adhering fine flour thoroughly extracted or removed, as explained, while the middlings, passing on through said bolt and out at the tail end, are conveyed by the spouts *g g* to the bolts C′ C′, and, being thoroughly bolted and graded thereby, fall upon the inclined bottom boards $B^2$ $B^2$, the bran or tailings passing out at the ends of the bolts, and thence through an end duct or spout, *n*, out of the machine. The middlings, passing down the boards B and out of the bolting-chambers at *f f*, are met by the ascending currents of air drawn through the slots *h*, and upward into the pipes *k* $k^1$, &c., by the fan G, and being in the thoroughly opened-up and separated condition in which they were discharged by the bolts, the lighter impurities and fuzzy particles are readily separated therefrom, and are drawn by the currents of air upward and outward through the pipes *k k* into the fan-chamber, whence they are discharged into the dust-chamber in the usual manner.

The outer end of the fan-chamber is provided with an opening, *p*, covered by slides *p′*, by withdrawing which, to uncover the opening *p*, to a greater or less extent, more or less air may be drawn through said opening for supplying air to the fan-chamber, thereby relieving the pipes *k* $k^1$, and modifying the force of the currents of air acting on the middlings, as desired. By the arrangement of air pipes or passages, as described, it will be seen that the middlings are not acted upon by the currents of air until the operation of bolting is fully completed, and the middlings have left the bolting-chamber proper, and in their passage therefrom to the conveyer-trough; and, further, that each air passage or pipe acts independently of the others, and upon its own particular portion of the graded middlings, to which, by its length, size, or capacity, it may be especially adapted.

Where the quantity of middlings to be acted upon is small, a single middlings-bolt, C′, may be employed, arranged underneath the conveyer-trough, and where the work requires it the number may be increased, care being taken in either case to preserve the intermediate relation of the discharge-outlets *f f* to the air-inlets *h* and the pipes *k* $k^1$.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The air passages or pipes arranged intermediate between the bolting-chambers $B^1$ $B^1$, and in the described relation to the outlet-passages *f f*, substantially as and for the purpose specified.

2. The bolting-chambers B $B^1$ $B^1$, with their respective bolts arranged in the described relation to each other, and to the air pipes or passages *k* $k^1$ $k^2$, &c., and operating substantially as described.

3. The middlings-discharge outlets *f* of the bolting-chambers $B^1$, arranged intermediately between the inlet air-passage *h* in the conveyer-trough and the air pipes or passages *k* $k^1$, substantially as and for the purpose set forth.

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Witnesses:

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