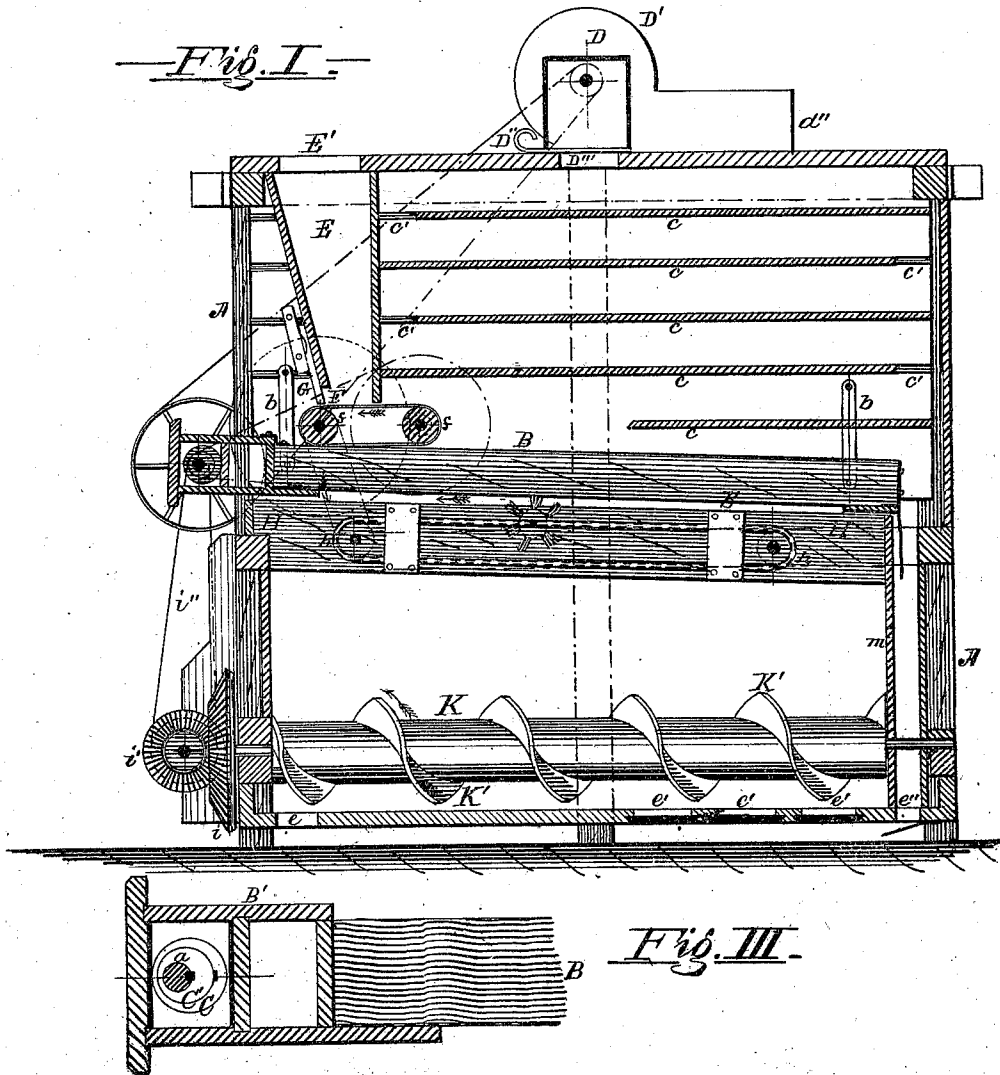


EDMUND N. LACROIX.

Improvement in Middlings Separators.

No. 126,719.

Patented May 14, 1872.



WITNESSES:

Geo. H. Howard

Geo. P. Fulton

INVENTOR:

Edmund N. Lacroix

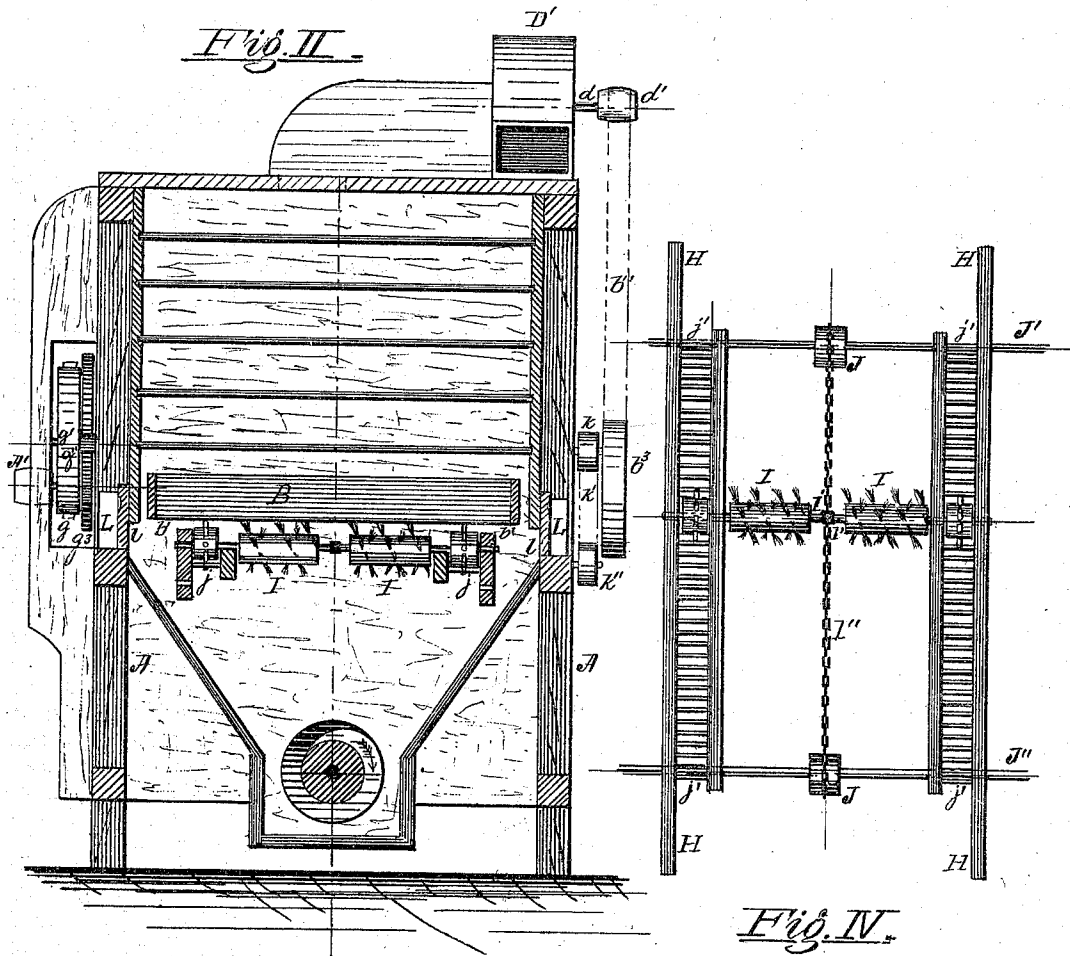
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UNITED STATES PATENT OFFICE.

EDMUND N. LACROIX, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN MIDLINGS-SEPARATORS.

Specification forming part of Letters Patent No. 126,719, dated May 14, 1872.

I, EDMUND N. LACROIX, of Minneapolis, in the county of Hennepin, in the State of Minnesota, have invented certain Improvements in Flour-Bolts or Middlings-Separators, of which the following is a specification:

In the manufacture of flour from wheat by the best process known some of the fine flour will adhere to that portion of the meal, after passing through an ordinary bolt, called "middlings," which is desirable to separate from such middlings as well as to more completely separate the middlings from fine bran and any other light fibrous substance that may have been ground in passing between the millstones and has passed through the bolt-cloth and been deposited in the division with the middlings; and the object of this invention is to separate the flour, as well as the fine bran and other fibrous matter, from the middlings, preparing such middlings for regrinding or for having them pure and free from other substances; and it consists in the construction and arrangement of the devices of the machine by which the result aimed at is effected.

In the drawing, Figure 1 is an upright sectional view. Fig. 2 is a transverse sectional view. Fig. 3 is an enlarged view of the shaking device, and Fig. 4 is a plan view of the devices for brushing the bolt-cloth.

A represents the frame to which all the operating parts of the machine are attached, and by which they are supported. A' is the driving-pulley, on a transverse shaft, *a*, and by which the machine is put in motion. B is a vibrating frame, on the under side of which is attached the bolt-cloth *b'*, and is suspended by the arms *b* that are pivoted to the frame A at their upper ends and to frame B at their lower ends, and having its forward or tail end lower than the head end that receives the middlings. The bolt-cloth *b'* may be of several numbers of fineness of mesh to allow the fine flour to fall through first and the coarser stuff at or toward the tail end of the bolt. C is an eccentric, placed around, and can be adjusted upon an inner eccentric, C', that is keyed fast upon shaft *a*. This eccentric C can be adjusted upon C' to give a greater or less projection from the center of shaft *a*, and, when adjusted as desired, by turning it upon C', a key is driven into the key-seat in C to hold it in its position on C', as seen in Fig. 3. D is a suc-

tion-fan, revolving within fan-case D' on the top of the separator, and is revolved by pulley *d'* on fan-shaft *d* by belt *b''* passing around pulleys *d'* and *b''* on shaft *a*. D'' is a sliding valve, to regulate the opening under the fan D. E is a feeding-hopper, into which the rough middlings are fed through opening E' on the top of the machine. F is an endless feed-belt, passing around pulleys *f f* in the direction shown by the arrow in Fig. 1, and distributes the middlings regularly upon the bolt-cloth *b'* by means of the graduating-slide G in the hopper F. Motion is given to the pulleys *f* by belt *g*, around a pulley on shaft *a* and pulley *g'*, on the shaft of which is a gear-wheel, *g''*, gearing into toothed wheel *g''* that is on the axle of one of the pulleys *f*. H is a horizontal frame, situated below the vibrating bolt-frame B, its sides constructed to have grooves *h* therein for the journals of a revolving brush, I, to travel around in and bring the revolving brush in contact with the under side of the bolt-cloth *b'* as the brush revolves from the tail toward the head of the bolt-cloth, thus clearing away all the dust or stuff that may adhere to the bolt-cloth; and as it comes to the head of the bolt it is caused to travel down around a half-circle at the end, and passes to the tail of the bolt out of contact with the bolt-cloth, when it rises and again comes in contact with the under side of the cloth to repeat its operation of cleaning it. This traveling and revolving brush I is around a transverse shaft, I', and is revolved by means of an endless-chain, I'', around pulleys J J on shaft J' and J'', and in contact with a center pulley on shaft I', and it is caused to travel around by means of toothed pinions *j*, on shaft I', taking hold of and gearing into racks *j'* on each side of frame H, as seen in Fig. 4. Shaft J'' is revolved by means of pulleys *k''*, band *k'*, and pulley *k* on the shaft of one of the feed-pulleys *f*. K is a revolving conveyer, with the spiral projecting sweeps K' around it, and gets its revolving motion through bevel-gear wheels *i* and *i'*, a pulley on shaft of wheel *i'*, belt *i''*, and pulley on shaft *a*. *cc* are partitions, placed one above the other in the chest above the bolt-cloth, and so that all the air passing through the chest will have to pass around and over each of the partitions, through apertures *c'* at the end of each partition, but placed

at opposite ends alternately, as represented in Fig. 1. *L L* are openings in the sides of the chest below the bolt-cloth for the admission of air, and the size of the opening is regulated by the sliding valves *l l*. In the casing below or underneath the conveyer *K* are openings *e*, *e'*, *e'*, *e'*, and *e''*. Opening *e* discharges all the flour or middlings that falls between it and opening *e'* by the conveyer forcing it to be so discharged. Openings *e'* are three or more in number, furnished with slides, so that one or all of them may be closed or open, as the condition of the stuff fallen upon them may dictate; for if they are all closed, then the conveyer will sweep all from the partition *m*, that divides the opening *e''* from the others, to be discharged through opening *e*; or any one of openings *e'* may be left open, or the whole number, if desired. The coarse stuff that will not pass through the bolt-cloth goes over the tail end of the reciprocating-bolt and falls between the partition *m* and the wall of the chest through opening *e''*, while that which has been discharged at opening *e* is kept by itself, and what has passed out of opening *e'* may be conveyed to be reground or to be again passed through the separator.

The machine being constructed as above described, motion is given through shaft *a* to the several acting parts. The middlings to be treated are fed into hopper *E* in any practical way, when they are evenly fed to the vibrating or reciprocating and nearly horizontal bolt, which is reciprocated by the revolution of the adjustable cam to give a greater or less throw to the frame *B*, and sufficient to agitate the cloth to have the fine stuff pass through it; and as this is going on the suction-fan *D* by

its high velocity draws or sucks up the air, inside of the chest, that has passed through the bolt-cloth, and with it the lighter fibrous stuff that is intimately mixed with the middlings, carrying them in a zigzag manner over and around the partitions *c*, through the openings *c'*, to the opening *D'''* under the fan, when all that has not fallen upon the top of the partitions *c* will be discharged at their exit *d''*.

By the employment of the double-eccentric *C* and *C'*, as above described, the nicest kind of adjustment of the throw of the frame *B* is effected.

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

1. The adjustable eccentrics *C C*, constructed as above described, in combination with the suspended and vibrating bolt-frame *B* and bolt-cloth *b'*, in the manner and for the purpose set forth.

2. The combination of the reciprocating bolt-cloth *b*, endless chain *I''*, cap-brushes *I*, when constructed to revolve on their own axis while traveling with the chain and in contact with the bolt-cloth, substantially in the manner and for the purpose specified.

3. The middlings-separator herein described, composed substantially of the feeding device *F*, reciprocating bolt-cloth *b'*, traveling and revolving brushes *I*, conveyer *K*, partitions *c*, and exhaust-fan *D*, all constructed and arranged to operate as described.

EDMUND N. LACROIX.

Witnesses:

CHAS. H. WOODS,
R. R. BRYANT.