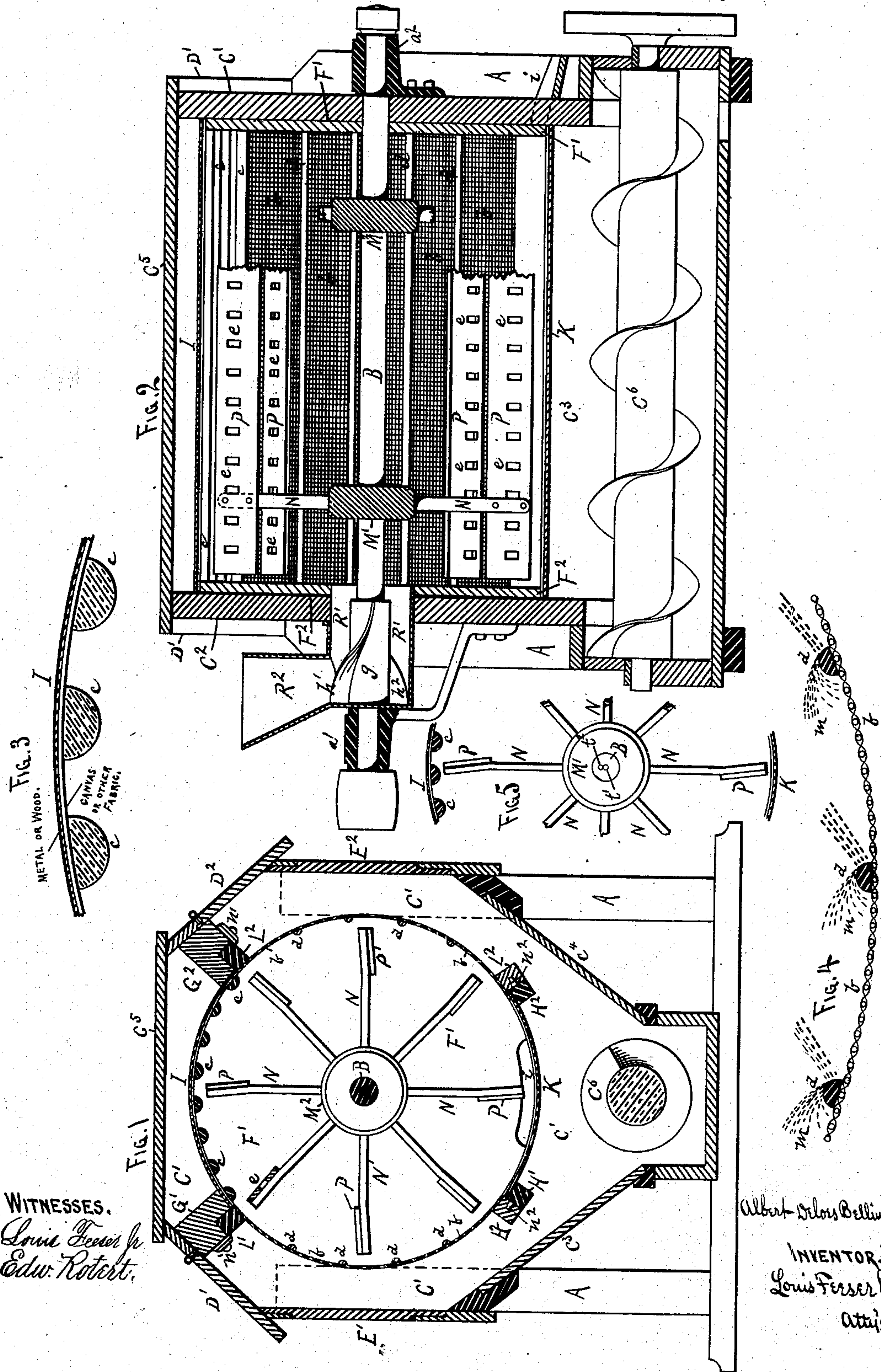


(No Model.)

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CENTRIFUGAL SEPARATOR.

No. 257,841

Patented May 16, 1882.



WITNESSES.
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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 257,841, dated May 16, 1882.

Application filed January 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALBERT DELLOSS BELLINGER, a citizen of the United States, and a resident of Minneapolis, in the county of Hennepin and State of Minnesota, have made certain new and useful Improvements in Centrifugal Separators, of which the following is a specification.

This invention relates to machines for separating the particles of middlings and flour from the bran which cling together too tenaciously for ordinary reels or screens to disengage; and it consists in the construction and mechanism hereinafter specified and claimed.

I attain my proposed object by means of the mechanism illustrated by the accompanying drawings, in which—

Figure 1 is a cross-sectional elevation, and Fig. 2 is a longitudinal sectional elevation. Fig. 3 is an enlarged sectional detached view of a portion of the beater-armed lining, illustrating its construction. Fig. 4 is a similar view of the bolting-cloth covering of the sides of the reel. Fig. 5 is an outline view of a portion of the reel and casing, showing a variation in the construction.

A is the frame, supporting in suitable hangers or brackets, a' a^2 , a horizontal shaft, B, and provided with heads C' C^2 , inclining inward at their bottoms to form ends for the sides C^3 C^4 , and casing for a screw-conveyer, C^6 .

C^5 is a flat top, and D' D^2 inclined hinged doors, and E' E^2 removable sides, these three parts last named enabling the interior of the case to be exposed by their removal.

F' F^2 are two circular heads, secured around the shaft B against the interior of the heads C' C^2 , and connected to each other by longitudinal bars or ribs G' G^2 H' H^2 , the inner surfaces of the ribs being even with the outer edges of the heads F' F^2 , as shown. The ribs G' G^2 are connected to each other by a curved sheet-metal hood or plate, I, conforming to and connecting at its ends with the heads F' F^2 , while a similar curved plate, K, is arranged to connect the ribs H' H^2 , the two plates thus forming segments of a circle, the center of the upper segment being directly above the shaft B, and the center of the lower segment being directly below the shaft B. This arrangement leaves open spaces at the sides of the heads

F' F^2 , which are occupied by curved frames L' L^2 , covered with bolting-cloth b , either of silk or wire, so that a complete cylinder is formed around the shaft B, the upper and lower parts of sheet metal and the sides of bolting-cloth. At equal distances apart along the inside of the plate I ribs or beater-strips c are secured, while similar but smaller beater-strips, d , are arranged in front of or are attached to the bolting-cloth-covered sides L' L^2 , of any suitable form, size, or distance apart, the drawings showing them semicircular; but any other suitable form may be used, their object to be hereinafter explained.

Upon the shaft B, between the heads F' F^2 , are hubs M' M^2 , having arms N branching therefrom, and provided with flat metal plates or wings P, connecting the arms of one hub with those of the other, as shown. These wings P are formed with perforations e of any suitable size, form, or distance apart, as hereinafter explained.

R' is a spout or feed-trough around the shaft B, and fitting through the heads C^2 F^2 and with a feed-hopper, R^2 , leading into its outer end, as shown.

g is a collar attached to the shaft B inside the trough R' , and provided with curved spiral wings h' h^2 upon either side, the sweep of the wings being the same as the interior diameter of the trough R' , so that a "screw-feed" is formed to force the material from the hopper R^2 into the cylinder. By this arrangement, also, the material will cease running just as soon as the shaft B and wings h' h^2 cease revolving, as the wings, when stationary, serve as "stops" to the material, so that feeding will only occur when the machine is running.

In the process of milling, a large percentage of middlings and flour becomes crushed into and caused to adhere tenaciously to the bran, so that they cannot be separated by ordinary reels or screens, and to separate this material into its component parts is the object of my invention. The material, in this mingled condition, is fed into the cylinder through the feed mechanism R' h' h^2 , as before described, where it is caught by the rapidly-revolving beaters P and thrown around with considerable force against the interior of the cylindrical casing. Some portions of the middlings and

flour will be forced out through the bolting-cloth *b*; but the larger portion requires to be thrown repeatedly against the beater-strips *c* to break the particles of middlings and flour loose from the bran, this being the object of these beater-strips. The perforations *e* in the beaters *P* also greatly aid in this work, as they form just so many additional sharp edges to act upon the material. As soon as the middlings are loosened from the bran and pulverized fine enough to pass through the bolting-cloth *b* they will do so, and fall into the screw-conveyer *C*⁶ and be carried off, while the coarser particles of bran will escape from the spout *i*.

The material as it is rapidly carried around the inside of the casing is thrown outward, and if the ribs *c* were not present a mere layer of the material would be formed against the casing and held in that position by the centrifugal force of the air-current produced by the wings *P*; but these ribs serve to break the material up into uneven shape, so that none of it becomes "fixed" in one position, but every separate particle comes in contact at some time with the beaters *P* or the ribs *c*.

The ribs *d* on the bolting-cloth *b* serve the same purpose as the ribs *c*, but in addition thereto serve to keep the cloth free from clogging by breaking the material up into a spray-like form, as shown at *m* in Fig. 4, so that none of the particles can become pressed against the cloth to choke it up, but will be forced loose by the beaters *P* sweeping it against the ribs *d*.

In Fig. 5 is shown an outline view of portions of the two plates *I* *K* and the beaters *P*, with their arms *N* and hub *M'*, and the shaft *B*, illustrating a variation in their construction, consisting in placing the center *t'* of the shaft *B* below the center *t*² of the heads *F'* *F*², whereby the beaters *P* approach the segment *K* nearer than they do the segment *I*, so that all the material will be swept from the segment *K*, and at the same time the beaters *P* prevented from running too close to the ribs *c*. The tendency of the material is to fall upon the segment *K*, and unless it is thus swept off it is likely to "bank" or remain thereon; but by this arrangement no banking can occur.

The inner surfaces of the sheet-metal segments *I* and *K* will be covered with canvas or other suitable fabric, where the metal is exposed, to keep the middlings and flour from coming in contact therewith, as the metal has a tendency to discolor them.

The ribs *d* will be either attached to the bolting-cloth *b* or secured to the frames *L'* *L*² across its face, and may be made of leather, wood, or other suitable substance.

The frames *L'* *L*² are made removable, as shown, by buttons *n'* and dowels or pins *n*², or in any other suitable manner, so that the cloth may be renewed or the interior of the cylinder reached. By providing a number of these frames *L'* *L*², covered with different grades or numbers of cloth, the machine may be easily and quickly adapted to different kinds of material.

What I claim as new is—

1. In a separator, a fixed cylinder constructed with a closed top and bottom, and bolting-cloth sides, with beater-strips *d* on the inside thereof, in combination with a revolving beater, substantially as set forth.

2. In a separator, a fixed cylinder constructed with bolting-cloth sides, a closed top, *I*, a fabric covering the inside of the top, and beater-strips in front thereof, in combination with a revolving beater, substantially as set forth.

3. In a separator, a fixed cylinder constructed with a closed top, *I*, beater-strips *c*, a closed bottom, *K*, open sides covered with bolting-cloth *b*, and beater-strips *d* in front thereof, in combination with a revolving beater, substantially as set forth.

4. In a separator, a fixed cylinder constructed with closed top *I*, strips *c* in front thereof, a closed bottom, bolting-cloth sides, and strips *d*, smaller than strips *c*, in front of the bolting-cloth, in combination with a revolving beater, substantially as set forth.

5. In a separator, a fixed cylinder constructed with a closed top, beater-strips *c* in front of said top, a closed bottom, bolting-cloth side strips, *d*, on the inside of said cloth, and a discharge-spout, *i*, next to the closed bottom, in combination with revolving beater, substantially as set forth.

6. In a separator, a cylinder composed of heads *F'* *F*², ribs *G'* *G*² *H'* *H*², plates *I*, strips *c*, plate *K*, connecting ribs *H'* *H*², bolting-cloth sides *b*, and strips *d*, in combination with a revolving beater, substantially as set forth.

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

ALBERT DELLOSS BELLINGER.

Witnesses:

C. N. WOODWARD,
LOUIS FEESER.