J. M. HENDRICKS.

Disintegrating-Mill.

No. 168,642.

Patented Oct. 11, 1875.

Fig. 1.

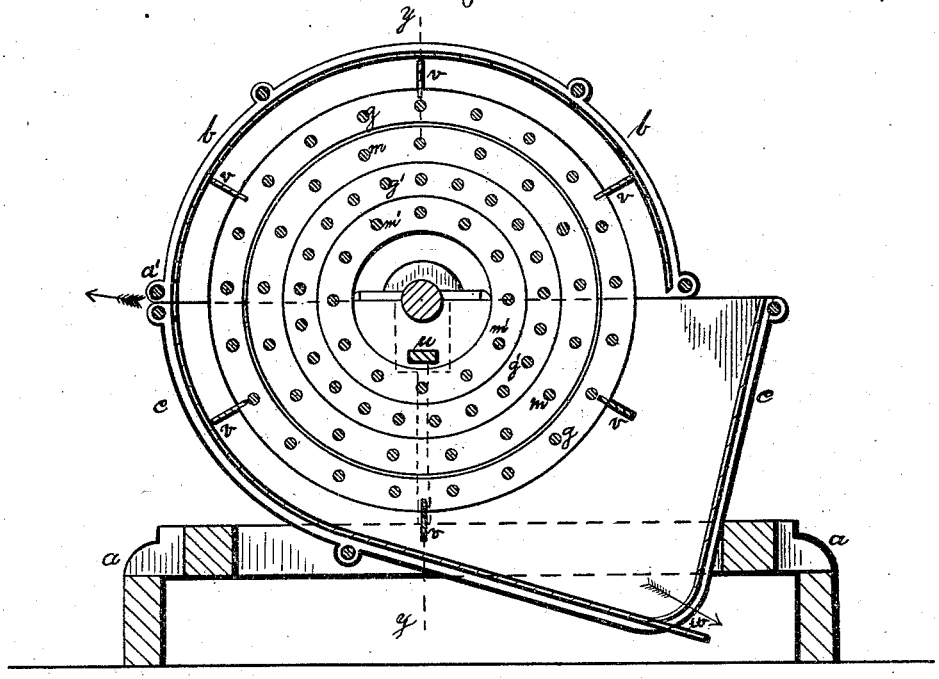
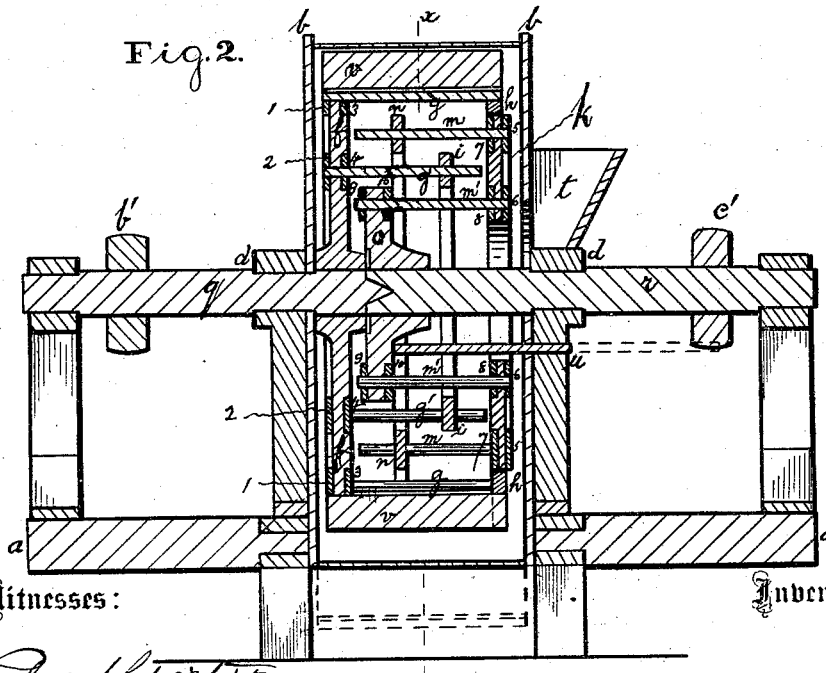


Fig. 2.



Witnesses:

Wm. J. Butlertson

Chas. A. Burtt.

Inventor:

J. Moore Hendricks

UNITED STATES PATENT OFFICE.

J. MOORE HENDRICKS, OF PHILADELPHIA, PA., ASSIGNOR TO PHILADELPHIA DISINTEGRATING MILL AND MANUFACTURING COMPANY.

IMPROVEMENT IN DISINTEGRATING-MILLS.

Specification forming part of Letters Patent No. **168,642**, dated October 11, 1875; application filed June 22, 1875.

To all whom it may concern:

Be it known that I, J. MOORE HENDRICKS, of Philadelphia, Pennsylvania, have invented an Improvement in Disintegrating-Mills, of which the following is a specification:

My invention relates to the mill for which Letters Patent No. 160,771 were granted to me March 16, 1875; and consists in the combination of the rings employed for holding and staying the inner ends of the interior series of cross-bars of the cages with said cross-bars when said rings are set back from the free ends of said bars, which are shortened and caused to leave a clear space between their extremities and the opposite disks or rings of the respective cages, as hereinafter described, a method of construction which avoids the formation of clogging recesses and enables the cages to clear themselves of ground materials.

In the drawings, Figure 1 is a vertical longitudinal section of the mill on the line *x x* of Fig. 2; Fig. 2, a vertical transverse section of the mill on the line *y y* of Fig. 1.

a represents the floor or bottom frame, and *b* and *c* the two sections of the casing of the mill. The lower section *c* is fixed to the floor by bolts, which are passed through side flanges *d*. The upper section *b* is designed to be lifted off when necessary. *f* is a disk, to which one end of each of the cross-bars, marked *g* and *g'*, is attached, the opposite ends of the bars *g* being attached to the ring *h*, and the opposite ends of the bars *g'* being passed through the ring *i*, and caused to project beyond said ring, as shown in Fig. 2. The disk *f* is strengthened by wrought-iron or steel rings 1 and 2 placed on the exterior face of the disk, and by similar rings 3 and 4 set in channels formed in the interior face of said disk, so as to be flush with this face of the disk, as shown in Fig. 2. The several bars *g* and *g'* project through the interior stay-rings 3 and 4, and a portion of said bars, say every fifth or sixth bar, project through the exterior stay-rings 1 and 2, as shown, and are riveted on the outside, thereby fastening the said rings to the disk.

In mills of this description the chief strain falls on the disks and on the ring *k*, which require to be stayed along the line of perforations made through them for the cross-bars, it being found that in use the disks sometimes give way, and fracture along such line. The object of causing the cross-bars to project through the exterior strengthening-rings only at intervals, as above described, is to obtain as much as possible of the staying effect of such rings. The disk *f*, cross-bars *g* and g^1, and rings *h* and *i* together form one of the two sets of cages employed, and may be referred to united as cage *j*. *k* is a ring, to which one end of each of the cross-bars *m* and *m'* is attached, the opposite ends of bars *m* being caused to pass through the ring *n*, and to project beyond this ring toward the disk *f* of cage *j*, leaving a clear space between the ends of the bars and the disk *f*, as shown in Fig. 2. The ring *k* is stayed by wrought-iron or steel rings 5 and 6, placed on the exterior of the ring, as shown, and by the similar rings 7 and 8 set in rabbets or channels formed for them in the interior face of said ring *k*, so as to be flush with the face of the ring, as shown in Fig. 2. The disk *o* is stayed by wrought-iron or steel rings 9 and 10, the ring 9 being placed on the exterior of the disk, as shown, and the interior ring 10 being set in a rabbet or channel formed for it in the interior face of the disk, so as to be flush with said face of the disk, as shown in Fig. 2. The bars *m* and *m'* pass through the interior stay-rings 7, 8, and 10, respectively, and some of said bars, say, every fifth or sixth bar, project through the exterior stay-rings 5, 6, and 9, and are riveted on the outside, thereby fastening these rings in their respective places. The rings *k* and *n*, the disk *o*, and cross-bars *m* and *m'* together form the other of the two sets of cages, and may be referred to unitedly as cage *p*. The cages *j* and *p* are, respectively, fastened to the sections *q* and *r* of the shaft, these shaft-sections being, respectively, concaved or convexed, and caused to work together, so as to constitute a through-shaft, as shown, being substantially similar to the method of construction described in my said Letters Patent, No. 160,771. *t* is a hopper. *u* is an ordinary

bridge. Detachable fans *v* are fastened to the periphery of the cage *j*. There is aperture at *w*, Fig. 1, for the escape of hulled grains, and an aperture at *a'*, Fig. 1, for the escape of hulls or chaff when the mill is employed for hulling grains.

When the mill is employed for grinding bones and other substances the fans *v* are detached, and the apertures *w* and *a'* are closed, the ground materials being removed from the lower portion of the mill-casing by means of an elevator in the manner described in Letters Patent, No. 150,689, granted to me May 12, 1874. *b'* and *c'*, Fig. 2, are pulleys on the sections *q* and *r* of the shaft, to which pulleys power for revolving the cages in opposite directions is applied.

I claim—

The combination of the rings *i* and *n* with the cross-bars *g'* and *m*, respectively, when said rings are set back from the free ends of the cross-bars, which are shortened sufficiently to leave a clear space between the ends of the bars and the opposite disks or rings of the respective cages in the manner and for the purpose substantially as set forth.

J. MOORE HENDRICKS.

Witnesses:

W. P. CUTHBERTSON,

THOS. A. BURTT.