

(No Model.)

2 Sheets—Sheet 1.

S. DODSON.

DISINTEGRATING MACHINE.

No. 307,633.

Patented Nov. 4, 1884.

Fig. 2.

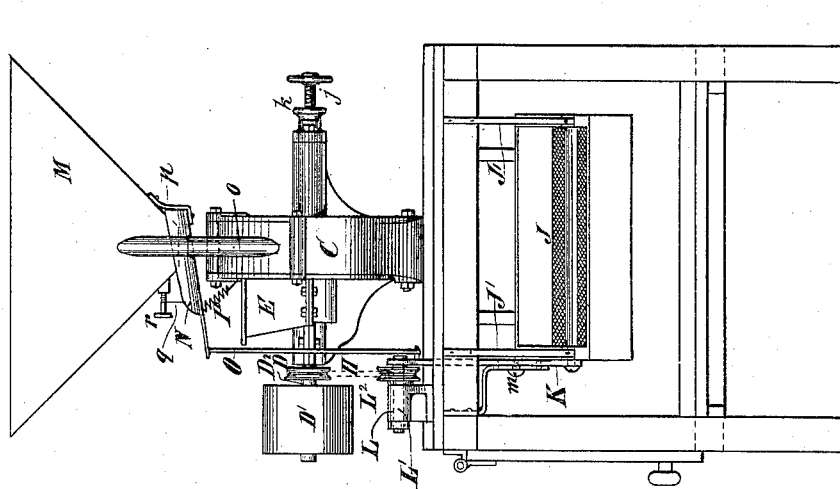
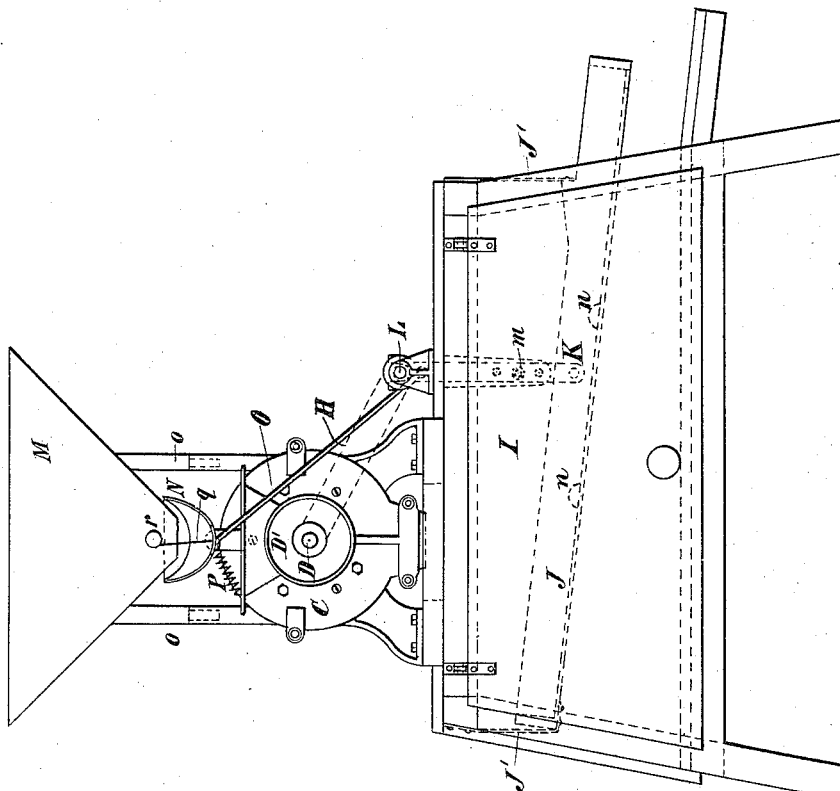


Fig. 1.



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Fig. 4.

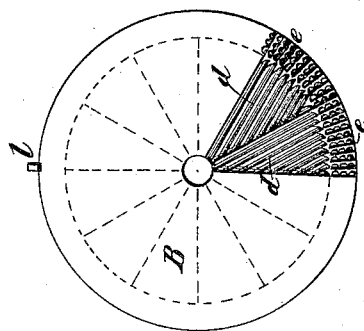
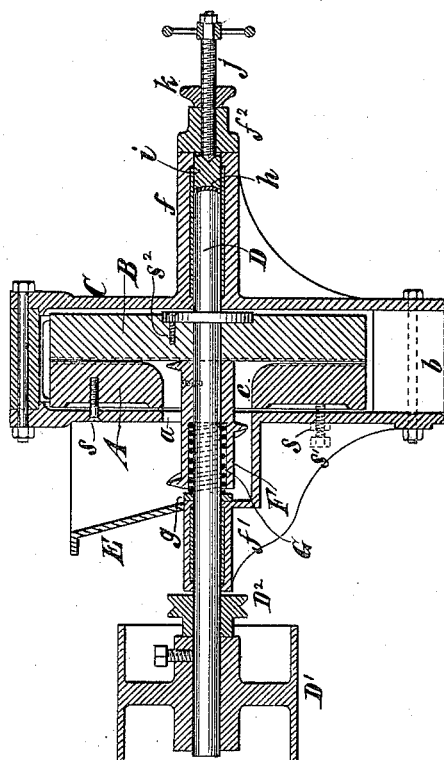


Fig. 3.



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# UNITED STATES PATENT OFFICE.

SILAS DODSON, OF NEW YORK, N. Y.

## DISINTEGRATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 307,633, dated November 4, 1884.

Application filed January 22, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, SILAS DODSON, of New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Disintegrating Machines, of which the following is a specification.

I will describe a disintegrating-machine embodying my improvement, and then point out its various novel features in the claims.

In the accompanying drawings, Figure 1 is a side view of a disintegrating-machine embodying my improvement. Fig. 2 is an end view thereof. Fig. 3 is a transverse section of certain parts of the machine on a larger scale, and Fig. 4 is a face view of one of the burrs of the machine.

Similar letters of reference designate corresponding parts in all the figures.

A and B are the burrs of the machine, and C is the case in which they are arranged. This case may consist of two cast-iron disks and an intermediate circular part secured together by screws or bolts. Corn or other material to be disintegrated passes through an opening, *a*, in one of the disks of which the case is composed in order to enter the case. When disintegrated it passes out of the case through an opening, *b*, in the lower portion of the circular part of the case.

The burr A is stationary, and has an opening, *c*, in its center, in order that the material to be disintegrated may pass through it and get between it and the burr B. This stationary burr A is fastened by screws *s s'* to that disk of the case which is provided with the opening *a*. The screws *s* pass loosely through the said disk and are screwed into the burr, whereas the screws *s'* are screwed into the said disk and made to press against the back of the burr. By manipulating the screws *s s'* the face of the burr may be easily adjusted into its proper position.

The burr B is affixed to a shaft, D, by means of screws *s'* passing into it from a collar that is a fixture on the shaft, or in any other suitable manner.

The burrs A B may be made of cast-iron, and will have hard-chilled faces. Their dress is similar, and when they are made of cast-iron the dress will be produced in the casting. The

dress comprises a number of grooves, *d*, arranged in groups, one in each group being radially arranged, and the remainder of each group parallel therewith. These groups of grooves do not extend to the periphery of the burrs. Beyond their outer ends are radial rows of semi-cylindric recesses or cavities *e* in the same plane with the grooves. I find that this dress produces better results than the ordinary dress. The semi-cylindric cavities *e*, beyond the outer ends of the groups of grooves *d*, prevent any material lying in these grooves from sliding or flying outward beyond the circumference of the burrs without being further disintegrated, because the outlines or walls of the cavities *e* cross the ends of the grooves *d*. The grooves *d* and the cavities *e* are arranged in the burr A in contrary direction to those in the burr B, so that when the burr B is in motion their grooves and cavities operate with a shear action.

The shaft D is supported in bearings *f f'*, extending from the disks, which form part of the case C. These bearings are preferably lined with Babbitt metal, and may be lubricated in any suitable manner.

Outside that disk of the case C which is provided with the inlet-opening *a* a hopper, E, is arranged. This hopper may be cast with the disk or made separately and secured thereto by screws or bolts. The shaft D within this hopper E has affixed to it a screw-conveyer, F, whereby material entering this hopper will be passed thence through the burr A and get between the latter and the burr B. This screw-conveyer is fastened on the shaft D so that it will turn therewith. It is not quite so long as the distance between the burr B and the outer wall of the hopper E, and as it is arranged close to the burr B a space is left between its outer end and the outer wall of the said hopper.

In the interior of the screw-conveyer is a cavity receiving a spiral spring, G. This spring extends beyond the screw-conveyer and abuts against a washer, *g*, interposed between it and the outer wall of the hopper E. The purpose of this spring is to push the burr B away from the burr A. Of course to accomplish this it has also to push the shaft D lengthwise.

At the end of the shaft D, which extends

beyond the burr P, a washer, *h*, of leather or other suitable material, fits. Beyond this washer a block, *i*, is arranged in the bearing *f*, and is capable of adjustment lengthwise thereof by means of a screw, *j*, working in a tapped hole in the cap *f*<sup>2</sup> of this bearing, and provided with a jam-nut, *k*, whereby it can be fixed in any position. By loosening the jam-nut and turning the screw, so as to move it farther into the bearing *f*, the burr B may be forced toward the burr A against the resistance of the spring G, and then may be fixed in position by the jam-nut to maintain the burr B in the position into which it has been adjusted. By loosening the jam-nut and turning the screw in such direction as to move it farther out of the bearing *f*, the spring G will be allowed to force the burr B away from the burr A, after which, if desirable, the jam-nut may be manipulated to secure the screw in the position into which it has been adjusted.

The interior of the case C is diametrically much larger than the burrs, and the rotary burr B is provided with a scraper, *l*, consisting of a bar of metal or other suitable material affixed to the periphery of the said burr B, and extending over the stationary burr A. By thus providing a space between the burrs and the case abundant circulation of air for keeping the machine and its contents cool is afforded, and by furnishing the burr B with a scraper the periphery of the burr A is kept clean, and the space between the burrs and the case is prevented from choking or clogging.

The shaft D is provided with a pulley, D<sup>1</sup>, capable of receiving a belt, whereby motion may be transmitted to the shaft. The shaft D is also provided with a pulley, D<sup>2</sup>, whereby motion may be transmitted from the shaft through a belt, H, to a pulley, L<sup>2</sup>, on the shaft L.

I designates a chamber, which may be made of wood or other suitable material, and is erected on legs. The case C of the burrs is affixed to the top of this chamber, and the disintegrated material is discharged from the said case into this chamber, so as to fall upon a sieve, J, arranged in the latter. This sieve J is supported at the ends by springs J', consisting of strips of metal secured to it, and the chamber I by screws or other means. A reciprocating motion is imparted to this sieve by means of a lever, K.

The lever K is fulcrumed to a bolt, *m*, affixed to a bracket extending from one of the sides of the chamber I, and at the lower end is pivotally connected by a pin or screw to one of the sides of the sieve-frame. The upper end of the lever K is bifurcated, and embraces an eccentric which is arranged upon a shaft, L. The shaft L is supported in a bearing, L', erected on the top of the chamber J, and provided with a pulley, L<sup>2</sup>, around which passes the belt H.

The lever K is provided with a number of holes, and the adjacent side of the chamber I has in it a corresponding number of holes in the same vertical plane; hence by fitting the fulcrum-bolt *m* into different holes in the lever and chamber the lever may be fulcrumed nearer to either end to vary the length of the reciprocating motion which it will impart to the sieve.

The husks or refuse of the material disintegrated are intended to be caught on the sieve and discharged over its end, while the valuable portions of the material will pass through the meshes of the sieve.

Across the top of the reticulated material of the sieve extend, between the sides of the frame, bars *n*. Any material which may have balled or agglomerated will be thrown against these bars as the sieve reciprocates, and will be broken up by contact with them.

M designates a hopper erected upon the top of the case C of the burrs. The legs *o*, which support it, are composed of sections, the upper of which have stems entering sockets in the lower; hence this hopper may be removed by simply lifting it off.

N is a chute arranged under an opening in the bottom of the hopper M, for conducting material to be disintegrated from the hopper M into the hopper E. The chute N may be made of wood or other material, and its sides and back extend above the bottom of the hopper M. At the back it has affixed to it a strap, *p*, which hangs upon a screw or pin extending from the hopper M. The front or open end of the chute is supported by a cord, *q*, fastened at one end to a projection from the chute, and at the other end to a spindle, *r*, journaled in the hopper M. By turning the spindle *r* so as to wind or unwind the cord upon or from it the forward end of the chute may be raised or lowered to vary the inclination of the chute, and allow the speed at which it conducts the material to be disintegrated into the hopper E.

A rod, O, pivotally connected at one end by a pin or screw to the lever K, and at the other end by a like device to the projection from the front or open end of the chute, transmits from the lever to the chute a lateral vibratory motion. A spiral spring, P, extending from the chute to the hopper E, prevents the chute from being thrust upwardly to an undesirable extent by the rod O.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A pair of burrs severally having a dress comprising groups of grooves *d*, one of each group being radial and the others of each group being parallel therewith, and rows of cavities *e* of semi-cylindric shape arranged in the same plane with and beyond the outer ends of the groups of grooves, and having their flat sides or walls in radial lines, the dress of the two burrs being reversed, substantially as specified.

2. A pair of chilled cast-iron burrs severally having a dress comprising groups of grooves *d*, one of each group being radial and the others of each group being parallel therewith, and rows of cavities *e* of semi-cylindrical shape arranged in the same plane with and beyond the outer ends of the grooves, and having their flat sides or walls in radial lines, the dress of the two burrs being reversed, substantially as specified.

3. The combination, in a disintegrating-machine, of a case, a stationary burr having an opening through it and affixed to the case, a rotary burr, a longitudinally-adjustable shaft, a hopper at the side of the case, a conveyer arranged on the shaft between the rotary burr and the said hopper, and a spring abutting against the hopper and extending into a cavity in the conveyer, and a screw at the end of the shaft opposing the force of the spring, substantially as specified.

4. The combination, in a disintegrating-machine, of a case, C, a stationary burr, A, affixed thereto, a rotary burr, B, a shaft, D, on which the latter is affixed, a hopper, E, at the side of the case C, a conveyer, F, a spring,

G, abutting against the hopper and extending into a cavity in the conveyer, a screw, *j*, and a washer, *h*, between a block actuated by the screw, and the adjacent end of the said shaft D, substantially as specified.

5. The combination of the case C, the burr A, affixed thereto, the rotary burr B, the shaft D, which carries the latter, the pulley D<sup>2</sup> on the shaft D, the shaft L, the pulley L<sup>2</sup> on the shaft L, the belt H, the chute N, the lever K, vibrated from the shaft L, and the rod O, substantially as specified.

6. The herein-described machine, comprising a shaft, D, a stationary and a rotary burr, a hopper, a chute for conducting material to the hopper, a pulley, D<sup>2</sup>, on the shaft D, a sieve, J, a lever, K, for imparting motion to the sieve, the shaft L, transmitting motion to the lever, a pulley, L<sup>2</sup>, on the shaft L, and the belt H, transmitting motion from the pulley D<sup>2</sup> to the pulley L<sup>2</sup>, substantially as specified.

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