No. 685,018. Patented Oct. 22, 1901.

J. UNSER.

WOOD CHIPPER AND CRUSHER.

(Application filed May 27, 1901.)

(No Model.)

Fig. 2

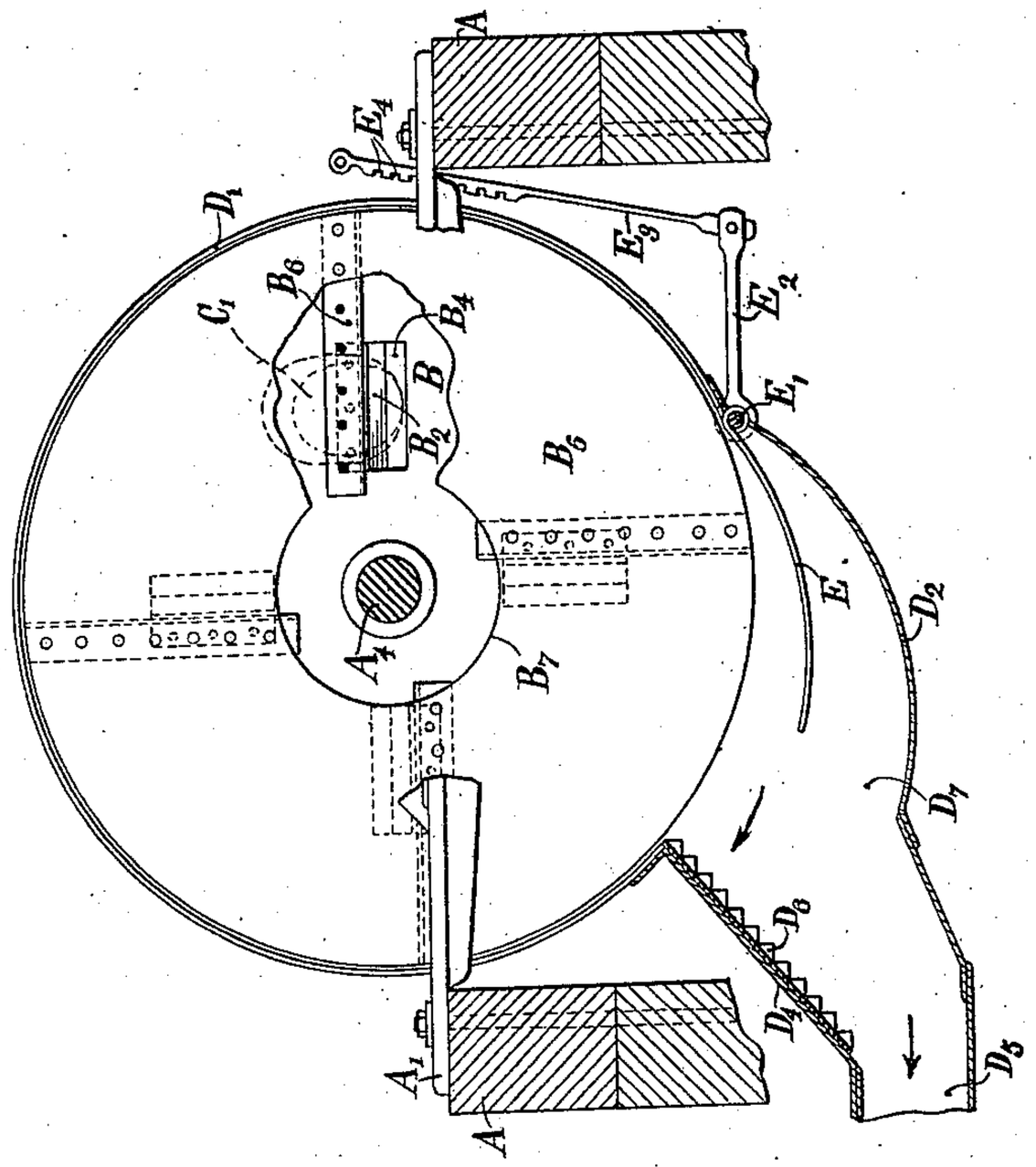
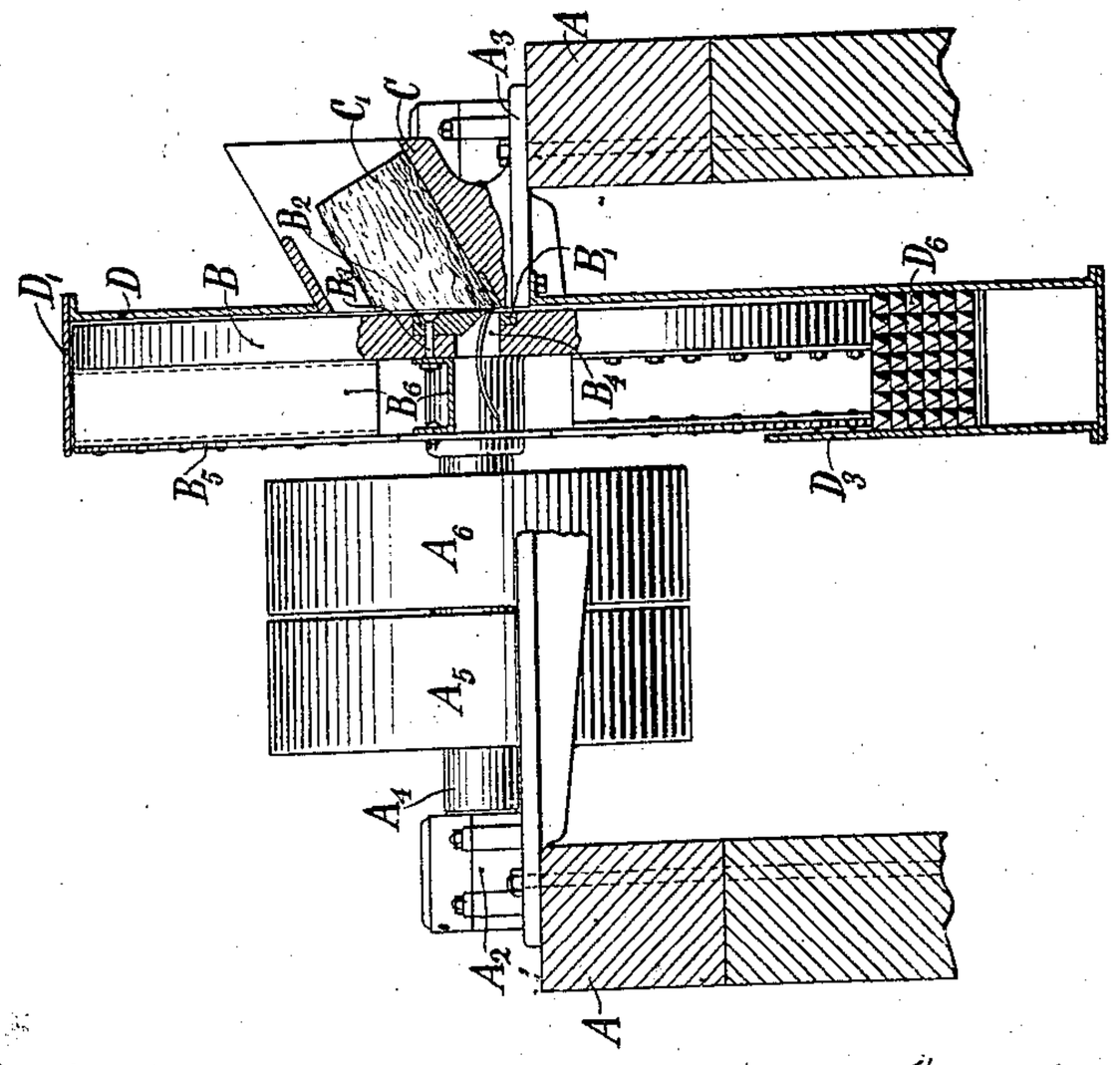


Fig. 1



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UNITED STATES PATENT OFFICE.

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WOOD CHIPPER AND CRUSHER.

SPECIFICATION forming part of Letters Patent No. 685,018, dated October 22, 1901.

Application filed May 27, 1901. Serial No. 62,025. (No model.)

To all whom it may concern:

Be it known that I, JOHN UNSER, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Wood Chippers and Crushers, of which the following is a specification, reference being had to the accompanying drawings, in which similar parts are designated in both views by the same reference characters.

My invention relates to machines for disintegration of wood for paper manufacture, in which the wood is first divided into chips transversely of the grain of the wood and these chips thereafter broken up, so that the particles of wood are sufficiently fine for subsequent treatment.

Figure 1 of the drawings is a sectional view substantially along the axis of the machine, parts of the machine being shown in elevation. Fig. 2 is substantially a side elevation of the machine, parts of the same being broken away to more clearly show the construction.

Upon a suitable heavy foundation A, which substantially incloses the machine, the framing-pieces A', A^2, and A^3 are bolted. Suitable bearings in the framing-pieces A^2 and A^3 support a heavy shaft A^4, upon which are mounted suitable fast and loose pulleys A^5 and A^6. There is also secured fast to this shaft A^4 the heavy chipper-disk B. This chipper-disk is provided with a number of suitable openings B^4, extending radially of the disk, as is clearly shown in Fig. 2, the outer side of these openings being faced, if desired, with a suitable steel facing-block B'. Secured to the disk adjacent each of these openings is the chipper-knife B^2, bolted securely to the disk by a number of bolts B^3, which support the operating edge of each of these knives parallel to the disk and project a slight distance beyond the surface of the same. On the opposite side of the disk a series of channel-irons B^6, the same in number as the chipper-knives, are securely bolted, and to the outer side of these channel-irons, which are arranged radially, as shown, is bolted a metal plate B^5, the channel-irons B^6 being arranged just to the rear of the openings B^4 as the disk revolves in its normal operation. A suitable central opening B^7 is cut in this disk B^5, so as to allow access of air to the pockets formed between the channel-irons B^6 and the parallel disks B and B^5.

The compound rotating disk is mounted in a cylindrical casing D', which extends about the periphery of the disk and is close to the edge of the same except at the bottom of the disk, as is shown in Fig. 2, where a suitable extension or disintegrating-chamber D^7 is formed by the plates D^2 and D^4, connecting with the casing D'. This disintegrating-chamber D^7 is connected with a pneumatic conveying-conduit D^5. To the upper side of this disintegrating-chamber there is attached to the chamber-wall D^4 the corrugated or roughened plate D^6, which may be of any desired construction formed with suitable grooves or corrugations, but which I prefer to form with a series of pyramidal projections, as shown in Fig. 1. Just below the chipper-disk there is arranged in this disintegrating-chamber the adjustable guide-plate E, which is rigidly attached to the shaft E', mounted in suitable bearings and to which is attached the lever E^2. The adjusting-rod E^3 is pivoted to this lever and is adapted to be fastened in any desired position by locking means which engages any one of a series of locking-recesses E^4 in the upper part of said rod.

It will be noticed, of course, that the side plate D, secured to the framing member A^3, serves to support the disintegrating-chamber and the casing D', while the plate D^3 serves to close the opposite side of the disintegrating-chamber and projects upward sufficiently to make such casing practically air-tight. To the framing member A^3 is secured the guide-trough C, in which the wood in the form of logs C' or otherwise is fed downward into contact with the chipper-disk in any desired manner, as is well known in this art.

The operation of my device is as follows: A log C' is fed up to the chipper-disk while

the said disk is rotated at a rapid rate by the driving-pulley A^5, the chipping-knives B^2 projecting slightly from the surface of the disk to remove a chip from the end of the log C'. These chips pass through the openings B^4 into the chambers formed by the radial channel-irons B^6 in connection with the two rotary disks. The centrifugal force acting upon these chips tends to throw them outward; but the outward movement of the chips is limited by the inclosing casing B', which is supported sufficiently close to the periphery of the disks so that the chips cannot escape until the disintegrating-chamber D^7 is reached. At that point the chips are thrown tangentially from the chamber and, guided as far as necessary by the plate E, are thrown violently against the disintegrating-plate D^6, where they are thoroughly broken up. The pieces are carried forward through the pneumatic conduit D^5 by the blast of air, which, entering the central opening B^7 in the disk B^5, is constantly driven into the disintegrating-chamber by the fan action of the division-pieces or channel-irons B^6. The exact position of the disintegrating-plate D^6 may be varied according to circumstances, and it may be inclined at a different angle relative to the periphery of the disks at this point, so that the chips will impinge upon this plate with more or less force. Instead of the exact construction which I have shown for securing the chambers in the chipper-disk any other suitable arrangement might be used. For instance, channels might be formed adjacent each one of the openings B^4 and communicating with the central opening B^7 and also with the periphery by a disk of any desired shape. These channels might be formed of rectangular or circular cross-section and might be conveniently constructed by bolting heavy tubes of the desired shape to the chipper-disk B.

I do not wish to be limited to the exact construction of chipper-disk which I have disclosed. The knives might be arranged in a revoluble disk in a different way from that which I have disclosed, as is well known in this art. Indeed, the chips might be formed from the material in any way and by any mechanism and might be thereafter disintegrated by the centrifugal action which I employ.

It is of course understood that parts of my invention might be used apart from the rest and that it is not necessary to employ all of the device which I have shown in the drawings and described. The exact scope of my invention will be pointed out in the appended claims.

What is claimed as new is—

1. Means for cutting chips of wood or similar material and means to centrifugally throw said chips against a disintegrating-surface to disintegrate said chips.

2. Means to separate fragile material into thin layers and means to throw said layers of material against a disintegrating-surface to suitably disintegrate said layers of material.

3. A revoluble chipper-disk and means to throw the chips of material produced thereby against a disintegrating-plate to disintegrate said chips.

4. A revoluble chipper-disk, and means in connection therewith to throw the chips produced thereby through the centrifugal force of the same against a disintegrating-plate to disintegrate said chips.

5. A chipper-disk, knives secured to said disk, openings through said disk adjacent said knives, chambers arranged on said disk adjacent said openings and means whereby the chips produced by said chipper-disk are thrown by centrifugal force from said chambers against a disintegrating-plate.

6. A revoluble chipper-disk, knives secured to said disk, to divide material into chips, channels formed on said disk communicating with said knives and means whereby said chips of material are thrown from said channels against a disintegrating-surface.

7. A compound chipper-disk composed of a disk, radial knives secured to said disk, openings in said disk adjacent said knives, radial partitions secured to said disk adjacent said openings, a plate secured to said partitions having a central aperture therein, a casing inclosing said compound chipper-disk and a disintegrating-chamber formed in said casing adjacent the said chipper-disk, a disintegrating-plate secured to one side of said chamber and a pneumatic passage leading out of said chamber.

8. A feeding-trough along which material is adapted to be fed, a chipper-disk revolubly supported adjacent said trough to divide said material into chips, knives secured to said disk adjacent to move into contact with said material, openings adjacent said knives, radial partitions secured to said disk adjacent said openings, a centrally-peforated plate secured to said partitions, a circular casing closely inclosing said disk and plate, a disintegrating-chamber formed in the lower part of said casing, a disintegrating-plate supported on one wall of said casing against which the chips of material are adapted to be thrown by the centrifugal force of said chips, a pneumatic conveyer communicating with said disintegrating-chamber through which the disintegrated chips are adaped to be forced by the blast set up by said partitions and said disk and plate and an adjustable guide-plate pivotally supported in said disintegrating-chamber to guide the chips as they are thrown against said disintegrating-plate.

9. A revoluble disk, channels thereon extending in a substantially radial direction and a disintegrating-surface coacting with

said disk so that fragile material fed into said channels is thrown by centrifugal force against said surface so as to disintegrate the same thereby.

10. A disintegrating-surface of suitably-roughened material, a revoluble disk having radial channels formed therein to throw material from said channels by centrifugal force against said disintegrating-surface to disintegrate such material against such surface.

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Witnesses:
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