

(No Model.)

4 Sheets—Sheet 1.

W. CURTIS.
WOOD PULP MACHINE.

No. 342,075.

Patented May 18, 1886.

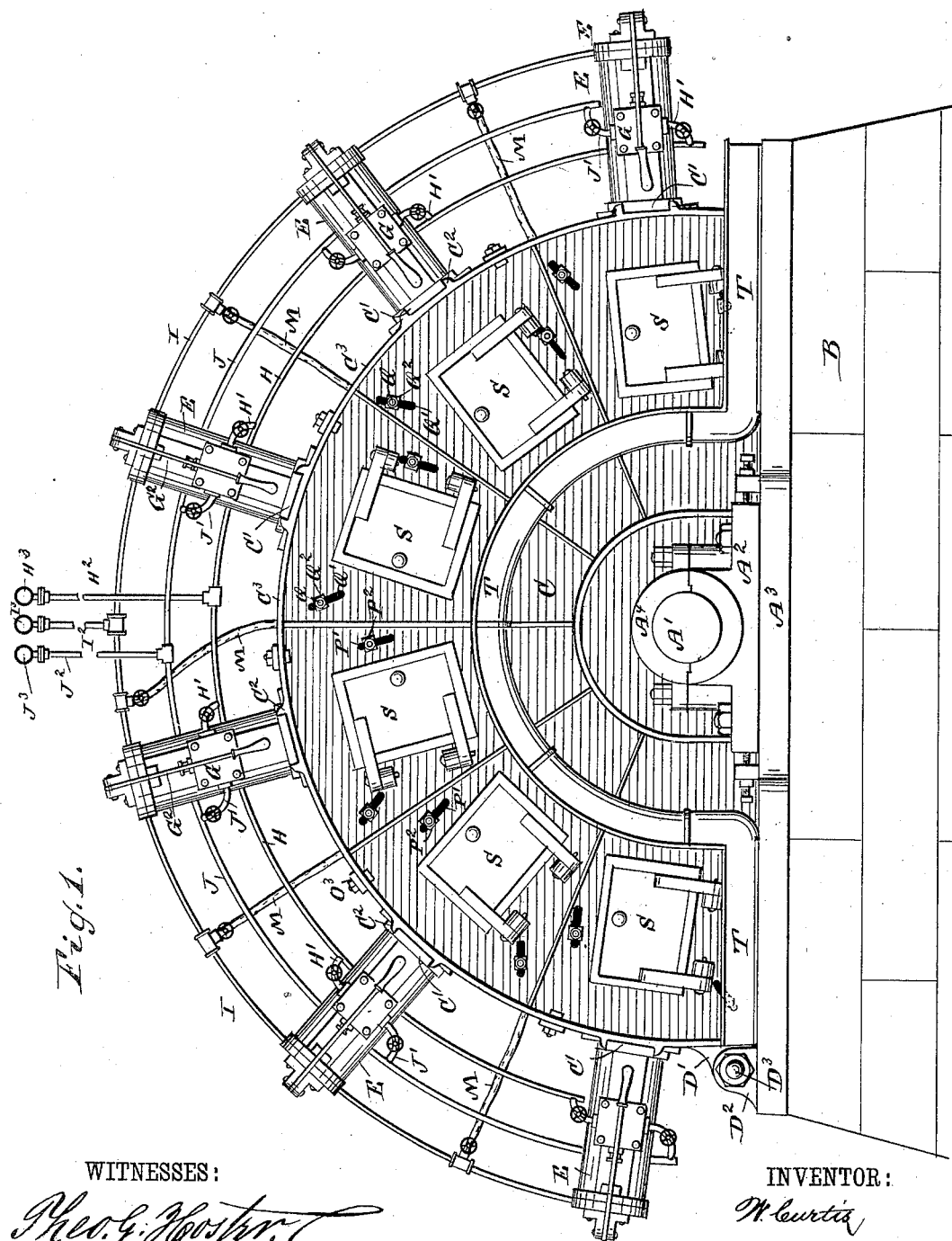


Fig. 1.

WITNESSES :

Rev. G. Hooper.
C. Sedgwick

INVENTOR:

W. Curtis

BY

Munn & Co

ATTORNEYS.

W. CURTIS.
WOOD PULP MACHINE.

No. 342,075.

Patented May 18, 1886.

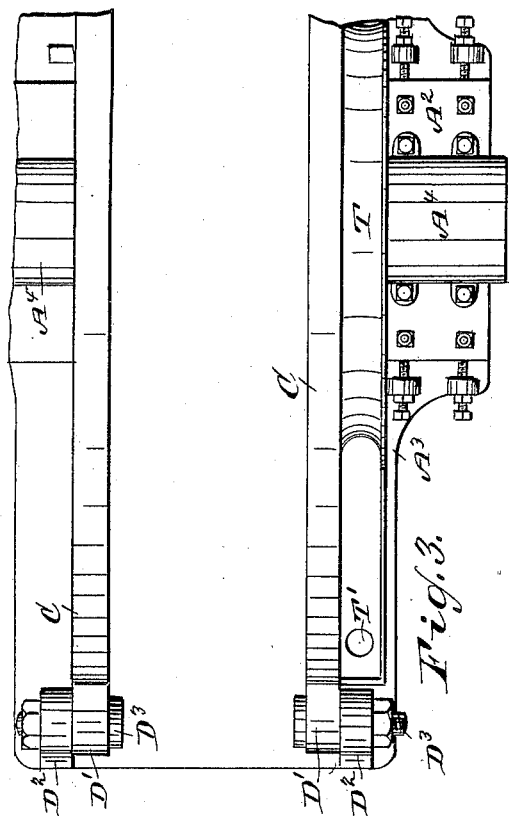


Fig. 3.

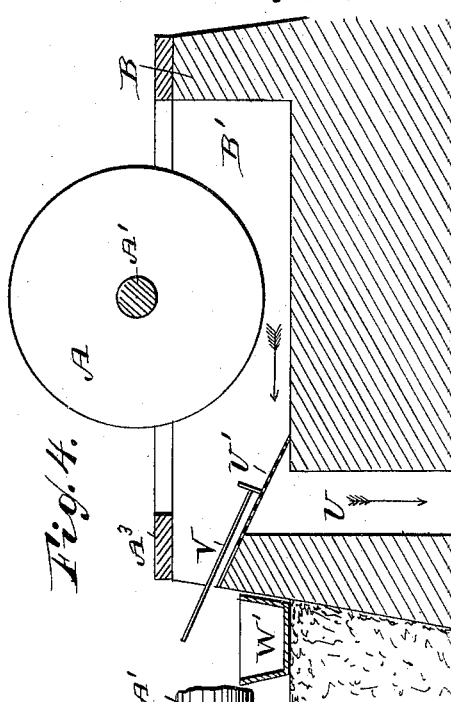


Fig. 4.

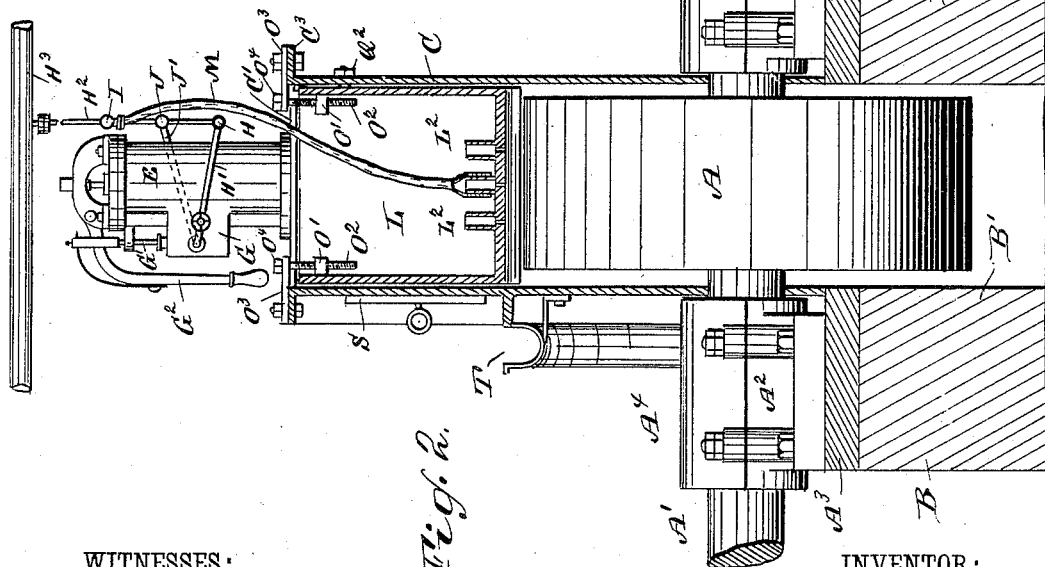


Fig. 2.

WITNESSES:

Theo. G. Norton
C. Sedgwick

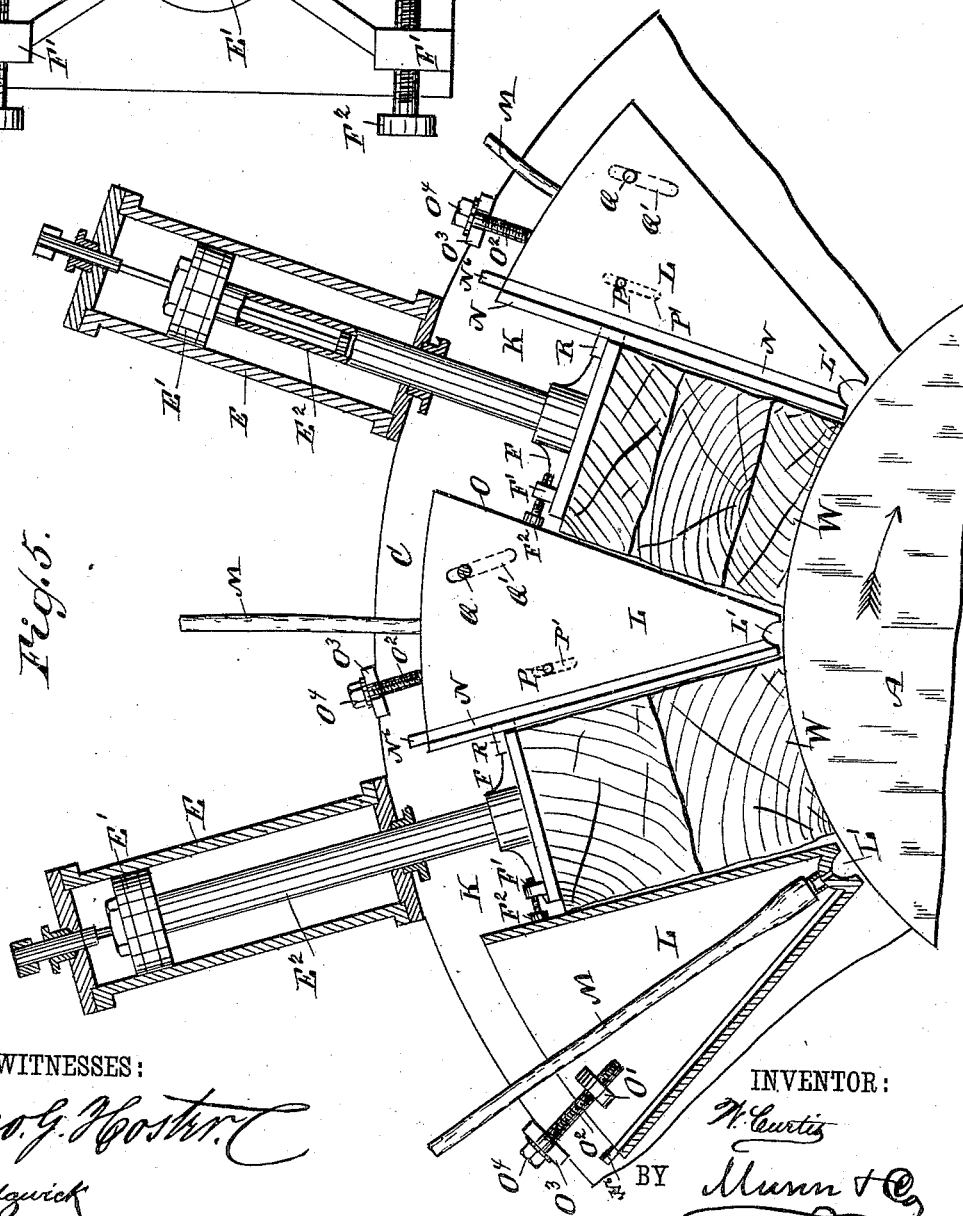
INVENTOR:

W. Curtis
BY *Munn & Co*
ATTORNEYS.

W. CURTIS.
WOOD PULP MACHINE.

No. 342,075.

Patented May 18, 1886.



WITNESSES:

Phoebe G. Foster
C. Sedgwick

INVENTOR:

W. Curtis
Munn & Co.
ATTORNEYS.

(No Model.)

4 Sheets—Sheet 4.

W. CURTIS.
WOOD PULP MACHINE.

No. 342,075.

Patented May 18, 1886.

Fig. 8.

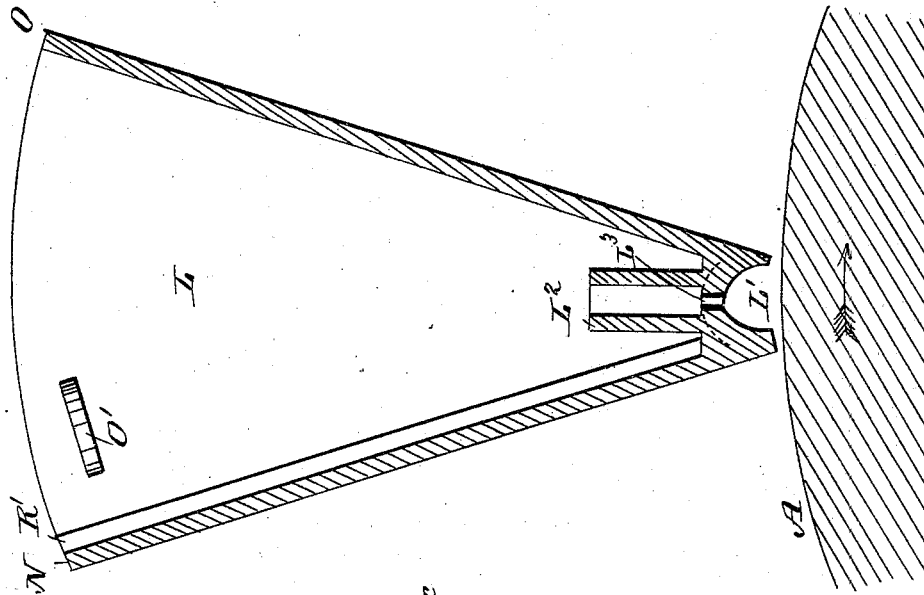
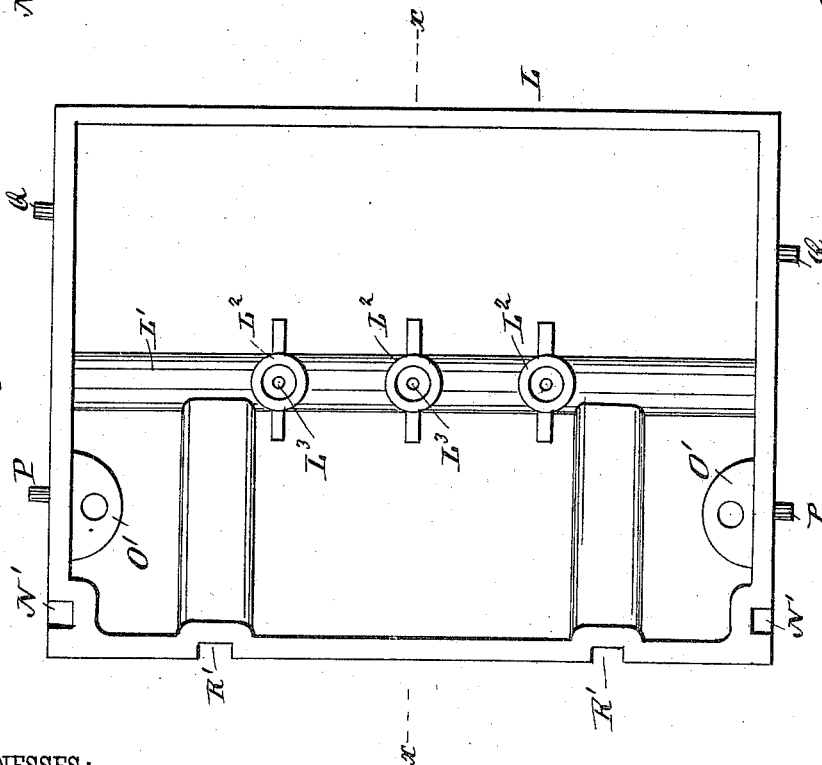


Fig. 7.



WITNESSES:

Pho. G. Hoster.
C. Sedgwick

INVENTOR:

W. Curtis
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WARREN CURTIS, OF CORINTH, NEW YORK.

WOOD-PULP MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,075, dated May 19, 1886.

Application filed December 4, 1885. Serial No. 184,722. (No model.)

To all whom it may concern:

Be it known that I, WARREN CURTIS, of Corinth, Saratoga county, and State of New York, have invented new and useful Improvements in Wood-Pulp Machines, of which the following is a full, clear, and exact description.

This invention relates to certain new and useful improvements in that class of machinery used in making pulp from wood by grinding the wood on a stone; and the object of my invention is to provide a new and improved machine for making such pulp, which machine is so constructed that the wood is pressed against the stone with uniform pressure, the machine is fed very easily and rapidly, no dirt or chips can get into the pulp, the casing of the machine can be raised very easily to renew the stone, and all the parts work very smoothly.

The invention consists in the construction of the casing of the machine, the combination with the same of hydraulic pressing devices for pressing the wood on the stone, and in numerous other constructions and combinations of parts and details, as will be fully described and set forth hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved wood-pulp machine, parts being broken out. Fig. 2 is a cross-sectional elevation of the same. Fig. 3 is a plan view of the side pieces of the casing, parts being broken out. Fig. 4 is a longitudinal sectional elevation of the base on which the stone is mounted, on a smaller scale. Fig. 5 is an enlarged detail longitudinal sectional view of part of the casing, the block-pressers, and the boxes between them. Fig. 6 is an enlarged plan view of one of the followers, the guides for the same being in section. Fig. 7 is an enlarged plan view of one of the boxes between which the pockets for the wood and the followers are formed. Fig. 8 is a cross-sectional view of the same on the line *x x*, Fig. 7.

The stone *A* is mounted on a shaft, *A'*, journaled in the bearings *A''* on the top edges of the base or foundation *B*, formed of two parallel walls, *B'*, between which the lower part of the stone can revolve.

A number of stones are mounted on the same shaft in the manner set forth; but as each machine contains only one stone, only one stone has been shown.

The casing of the machine, which is semicircular, rests upon the base-plate *A'''*, and has two semicircular sides, *C*, which are united at their outer edges by plates *C'*, the end parts of which fit between the lugs *C''* on the rims of the side pieces of the frame or casing, and are held in place by bolts passed through the plates *C'* and the flanges *C''* of the rims. On one end of each semicircular side piece of the frame a hinge-lug, *D'*, is formed, which is adjacent to a hinge-lug, *D''*, on one end of the base-plate *A'''*, and through said hinge-lugs a bolt or pivot, *D'''*, is passed, upon which the entire frame or casing can swing, thus adapting the frame to be swung up from the base until the straight edge is in a vertical position, or at any desired inclination to the base, whereby the stone is exposed, so that it can be dressed or trimmed or lifted out of the foundation entirely in case it is to be replaced by another or any other repairs are to be made. Each bearing *A''* is provided with a top piece, *A'''*, which is bolted on in the usual manner.

On each plate *C'* a cylinder, *E*, is mounted, the longitudinal axis of which is parallel with a radial line from the center of the shaft *A'*, and each cylinder contains a piston, *E'*, to which a piston-rod, *E''*, is secured, which projects down through a stuffing-box in the bottom of the cylinder, and on the lower end of each piston-rod a follower or presser-plate, *F*, is secured, which will be described hereinafter. On one side of each cylinder a valve-box, *G*, is provided, which contains a sliding valve connected with a valve-rod, *G'*, which is operated by a handle-lever, *G''*. Said valve and rod and the details of the piston-rod and mechanism of the same are not to be claimed in detail in this application, as they form the subject-matter of another application which has been filed in the Patent Office.

A water inlet or feed pipe, *H'*, is connected with one side of each valve-box *G*, and a water outlet or exhaust pipe, *J'*, is connected with the opposite side of each valve-box, said pipes *H'* and *J'* being each provided with a ball-valve or other cock, and being connected with the semicircular pipes *H* and *J*, respectively,

said pipes being curved over the top of the casing, and connected by the pipes H^2 and J^2 , respectively, with the pipes H^3 and J^3 , the pipes H^3 serving to conduct water or air and water under pressure to the pipes H , H' , and H^2 , and the pipe J^3 serving to carry off water that leaves the valve-boxes G . As stated, a number of stones are mounted on one shaft, each stone being provided with a casing, and the pipes H^3 and J^3 extend over a number of casings, and are connected with the pipes of each in the manner shown. A third semicircular pipe, I , is provided above the pipe J , and is connected by a pipe, I^2 , with a water-conducting pipe, I^3 , also extending over a series of casings, but shown over only one in the drawings. The pipes H^2 J^2 I^2 are shown broken out in Fig. 1, as the pipes H^3 I^3 J^3 must be so high above the base that when the casing covering the stone is swung up until its straight edge is vertical it can fully clear said pipes H^3 I^3 J^3 .

The casing is divided into as many compartments or pockets, K , for receiving wood as there are cylinders E on the casing—in the case shown six, and this number is preferred. Each presser-plate or follower F mentioned above works in one of said pockets K . To form the above-mentioned pockets I place a series of triangular or wedge-shaped boxes, L , in the casing, the smaller ends of said boxes being at the rim of the stone, and the wider ends at the rim of the casing. Each of said boxes is provided with a groove, L' , in the under surface of the inner smaller end, said groove extending the entire length of said end, and thus being parallel with the axis of the stone. Said groove L' preferably has curved sides, as shown in Fig. 8, but may be made V-shaped, if desired. From the closed smaller end or bottom of said box a series of tubes or necks, L^2 , project upward, of which there are preferably three, and from the lower end of each tube L^2 a bore or aperture, L^3 , extends to the upper part of the groove L' . One tube, L^2 , of each box L is connected by a flexible tube, M , with the pipe I , the couplings uniting the tubes M with the pipe I having ball-valves or other suitable cocks. Water is thus conducted from the pipe I upon the stone, and in order that the water may not be delivered on the stone on one semicircular line the tubes M are connected with different tubes L^2 in the different boxes L . For example, if the middle tube L^2 is connected with the tube M in one box, in the next box the right-hand tube L^2 is connected with a tube M , in the following box the left-hand tube L^2 , and so on. The water is thus delivered over the entire surface of the stone.

The two sides of the boxes L will be described hereinafter as N and O , the side N being known as the "working" side—that is, the side against which the block of wood W is pressed by the stone, which revolves in the direction indicated by the arrow in Fig. 5.

As the stone wears off, the boxes L must be lowered—that is, moved toward the stone; but during such movement the working side N must not be shifted laterally in relation to the longitudinal axis of the adjacent piston-rod E^2 —that is, the working side N of each box is parallel with a radius of the stone, and must always remain parallel to said radius, and the direction of its movements toward and from the stone must always be parallel with the radius. To insure such movement a groove, N' , is provided in each end of each box parallel with and a short distance from the end edge of the working side N , and into the grooves N' the cleats N^6 are passed, which project from the inner sides of the semicircular casing. Screw-bolts P and Q are fixed to and project from the ends of the wedge-shaped boxes through the slots P' and Q' in the sides of the semicircular casing, the two slots of each wedge-shaped box being parallel with one and the same radial line, as shown, and the nuts P^2 and Q^2 being screwed on the outer ends of the said bolts. Said bolts and nuts serve to lock the wedge-shaped boxes firmly and securely in place.

From the inner surface of each end of each box L a lug, O' , projects at the upper end, and through said lug a screw, O^2 , is passed, which is also passed through a forked clip, O^3 , held by bolts on the flange of the casing, and on the upper end of each screw O^2 a head, O^4 , is formed. By turning said screws the boxes L can be moved toward or from the rim of the stone, the movement always being on a line parallel with a radius of the stone. The boxes are so constructed that the distance between the sides N and O of two adjacent boxes will be slightly greater near the stone than at the rim of the casing, so as to prevent binding of the wood. It is evident that as the V-shaped boxes are moved toward the stone the pockets K or spaces between the sides N O of the two adjacent boxes gradually decrease, and to permit of adjusting the followers or presser-plates F , working in said boxes, each presser-plate is provided on its upper surface near the edge facing the side O of a box with lugs F' , in which screws F^2 are held, said screws having heads at their outer ends, which heads face and rest against the sides O of the boxes. On the opposite edge each follower or presser-plate has two guide-lugs, R , which pass into grooves R' in the working sides N of the boxes L . Said guides R and the screws F prevent any twisting or tilting of the follower or presser-plate in the pocket, and thus prevent binding of the piston E^2 . As the space between the sides N O of the boxes decreases, the screws F^2 must be screwed farther into the lugs F' , so that the distance between the outer edges of the guide-lugs R and the heads of the screws F^2 will not be greater than the width of the pocket in which the follower works. For each pocket between two boxes, L , a door, S , is provided in one side of the cas-

ing, to permit of passing the blocks of wood into the pockets. If desired, doors can be provided at both sides of the casing.

As some pulp works through the joints or crevices of the doors, or is washed out by a stream of water, I have provided a groove or gutter, T, on that side of the casing provided with doors and below the doors, said gutter being formed on the base-plate A³, and extending upward on a semicircular line over the shaft A'. The gutter T is provided at each end with an aperture, T', which conducts the pulp, &c., accumulated in said gutter into the cavity or recess in the base or foundation B. As the pulp is immediately caught in the gutter, it cannot come in contact with the grease of the journal-boxes or other movable parts and cannot clog or disturb said parts. From the recess in the foundation B a tube or channel, U, conducts the pulp from the machine into a suitable receptacle, and over the top of said channel an inclined screen, U', is placed, through which all pulp is passed, the chips and other coarser particles being retained by said screen, from which they can be scooped by means of a hoe or other implement, V, into a box or receptacle, W, placed at one end of the foundation or base.

The spaces between the plates C' on which the cylinders E are held are filled in with boards or metal plates, which cover the open ends of the boxes L. The grooves L' are provided in the smaller ends of the boxes L for the purpose of preventing the chips from being carried around by the stone or shutting off the water. The last parts of the blocks of wood usually form chips, which are very apt to be forced between the bottom edges of the wedge-shaped boxes L and the rim of the stone, and thus shut off the water, which, however, is prevented by my improvement, as the chips can pass into the grooves L' and be gradually disintegrated in the same or washed off to the side edges of the stone and then dropped down. This also prevents the chips from passing from one grinding compartment into another.

The operation is as follows: The several followers or presser-plates are raised, the blocks of wood are placed in the pockets, and then water or air and water is admitted to the upper parts of the cylinders E, and, acting on the pistons E', forces them toward the center of the stone, causing the presser-plates to press the wood on the stone. The water required to form the pulp is delivered through the pipes M in the manner set forth. The pulp drops from the stone into the compartment in the base or foundation and flows off through the pipe or channel U. The exhaust-water from the valve-boxes passes off through the exhaust-pipes and can be pumped up again for use a second time.

The special advantages of the machine are, that the stone and the block-pressers are all contained in the casing, the pulp cannot come in contact with the grease or the oily parts, the machine is very compact and occupies but

little space, the casing can be raised very easily to dress or trim the stone or to mount the same, and one or more of the block-pressers can be cut out by simply turning off the water passing into the valve-boxes on the cylinders of said pressers.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A wood-pulp machine having block-pressers held on a semicircular casing hinged at one end, substantially as herein shown and described.

2. A wood-pulp machine constructed with a semicircular casing over the stone, on which block-pressers are held, the casing being hinged at one end and provided with doors in its side, through which the blocks of wood can be placed under the block-pressers, substantially as herein shown and described.

3. In a wood-pulp machine, the combination, with a semicircular casing over the stone, on which block-pressers are held, and which casing has doors in its sides for introducing the blocks, of a gutter below said doors for catching the drip and waste pulp on the outside of the casing, substantially as herein shown and described.

4. In a wood-pulp machine, the combination, with a hinged casing over the stone, of a series of block-pressers on the rim of the casing, pipes curved over the rim of the casing, connected with the several block-pressers and adapted to be raised with said casing, and pipes connecting said curved pipes with the main supply and discharge pipes, substantially as shown and described.

5. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the same, three semicircular pipes extending over the rim of the casing, of which pipes two are connected with the valve-boxes of each presser, and the third is connected with pipes passing down to the stone between each two adjacent pressers, substantially as herein shown and described.

6. In a wood-pulp machine, the combination, with a semicircular casing over the stone, of block-pressers on the rim of the same, and of wedge-shaped boxes within the casing between two adjacent block-pressers, substantially as herein shown and described.

7. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the same, wedge-shaped boxes within the casing between each two adjacent pressers, and pipes for conducting the water to apertures in the bottoms of the wedge-shaped boxes, substantially as herein shown and described.

8. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the same, triangular boxes within the casing and between adjacent pressers, and mechanism for adjusting the boxes a greater or less distance from the stone, substantially as herein shown and described.

9. In a wood-pulp machine, the combina-

tion, with a casing over the stone, of block-pressers on the rim of the same, wedge-shaped boxes within the casing and between the pressers, and screws passed through lugs on the boxes and lugs on the rim of the casing, whereby said boxes can be adjusted a greater or less distance from the stone, substantially as herein shown and described.

10. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the same, and of wedge-shaped boxes within the casing and between adjacent block-pressers, each of said boxes being provided in its lower end with a groove parallel with the axis of the stone, substantially as herein shown and described.

11. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the casing, wedge-shaped boxes within the casing and between adjacent block-pressers, each of said boxes being provided in its lower end with a groove parallel with the axis of the stone, and with apertures extending from the interior of the box to the groove, substantially as herein shown and described.

12. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the rim of the casing, and wedge-shaped boxes within the casing and between the adjacent block-pressers, each of said boxes being provided on its inner end with a groove, and with a series of tubes projecting from the grooved bottom of the box up into the hollow of said box, substantially as herein shown and described.

13. In a wood-pulp machine, the combination, with a casing over the stone, of a series of block-pressers on the rim of the casing, wedge-shaped boxes within the casing between the adjacent block-pressers, which wedge-shaped boxes have longitudinal grooves in their ends, and cleats on the sides of the casing passing into said grooves, said grooves being parallel to the working side of the box, and the cleats being parallel to a radius of the machine, substantially as herein shown and described.

14. In a wood-pulp machine, the combination, with a casing over the stone, of block-pressers on the casing, wedge-shaped boxes between the block-pressers and within the casing, each box being provided with guide-grooves in one side, and presser-plates or followers between each two boxes, which presser-plates or followers have lugs passing into the guide-grooves in said boxes, substantially as herein shown and described.

15. In a wood-pulp machine, the combination, with a casing over the stone, of a series of block-pressers on the casing, presser plates or followers operated by the block-pressing devices, wedge-shaped boxes within the casing and between two adjacent followers, and adjusting-screws held on the followers to project beyond one edge of the same, substantially as herein shown and described.

WARREN CURTIS.

Witnesses:

OSCAR F. GUNZ,
C. SEDGWICK.