

(No Model.)

A. FICKETT.  
Wood Pulp Machine.

No. 232,480.

Patented Sept. 21, 1880.

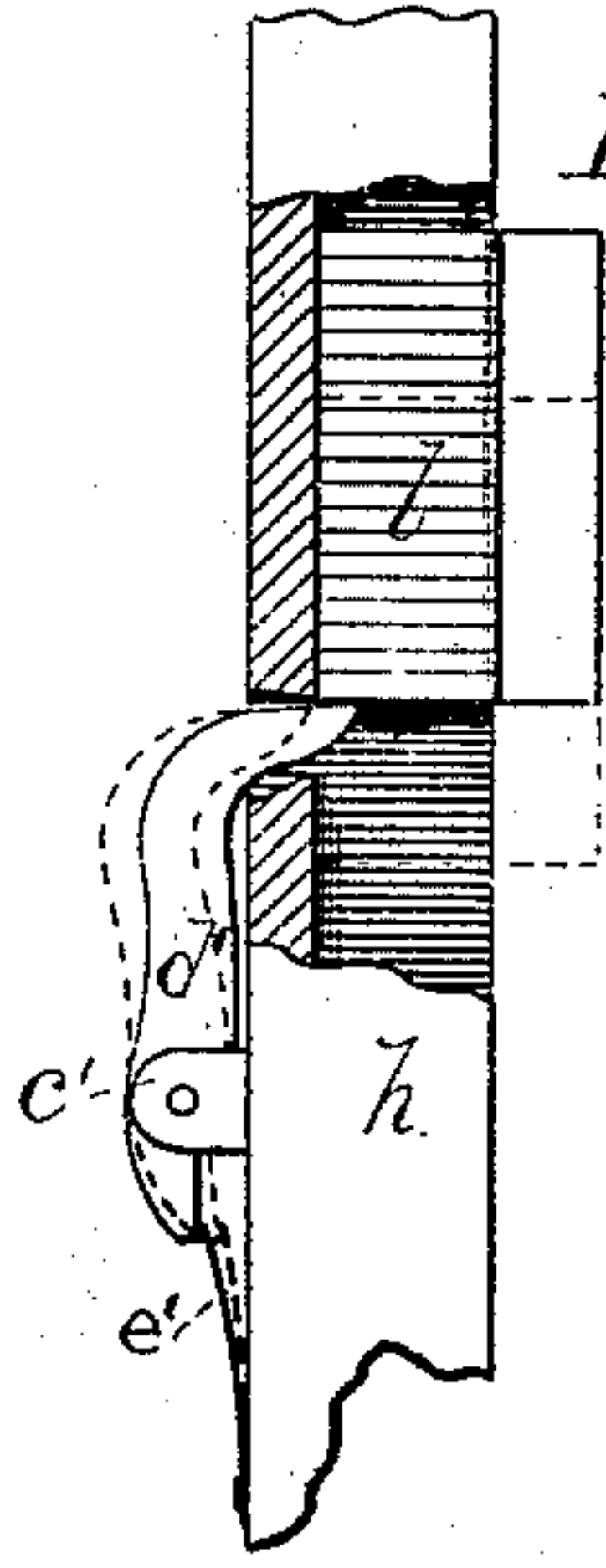


Fig. 5.

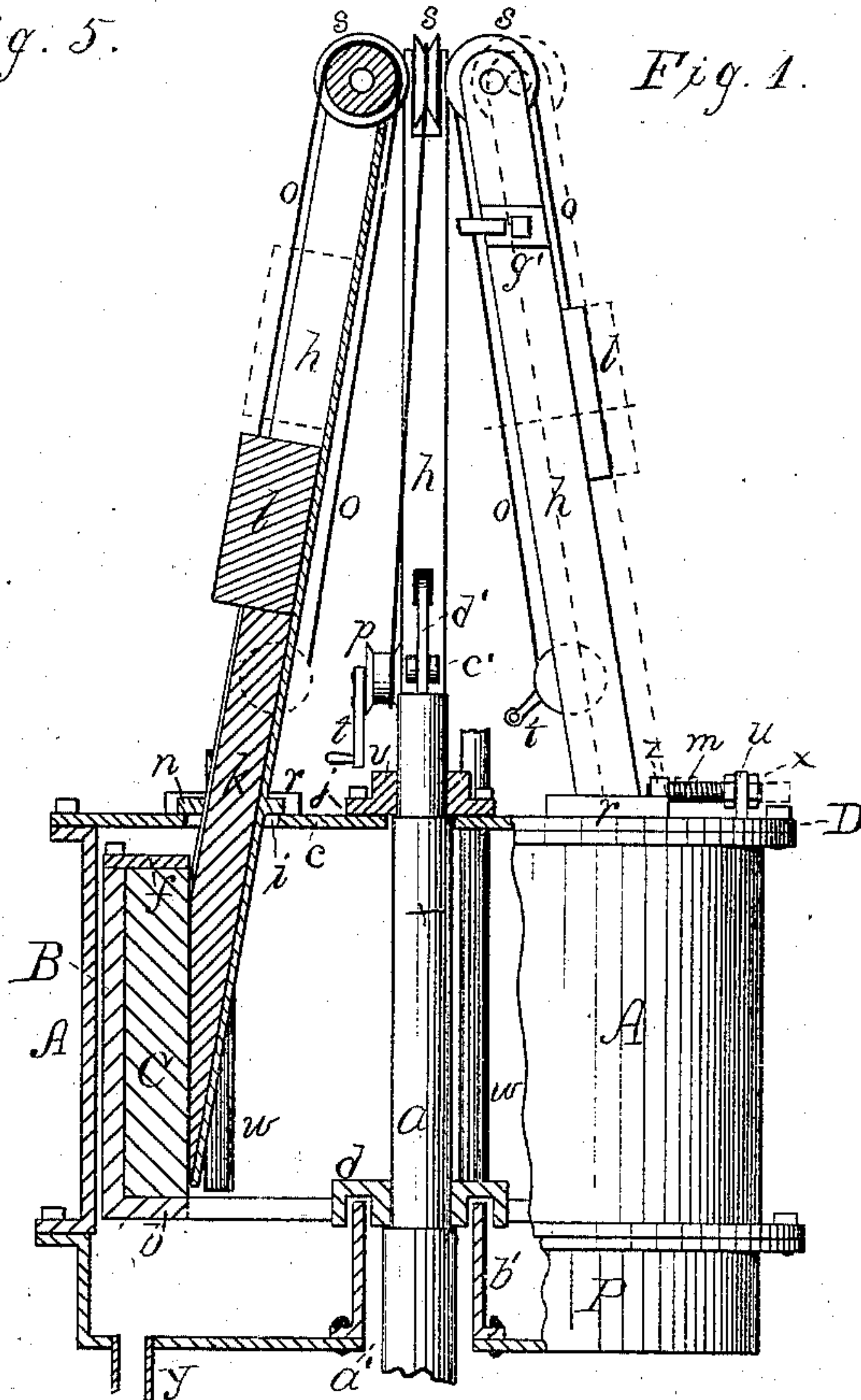


Fig. 1.

Fig. 6.

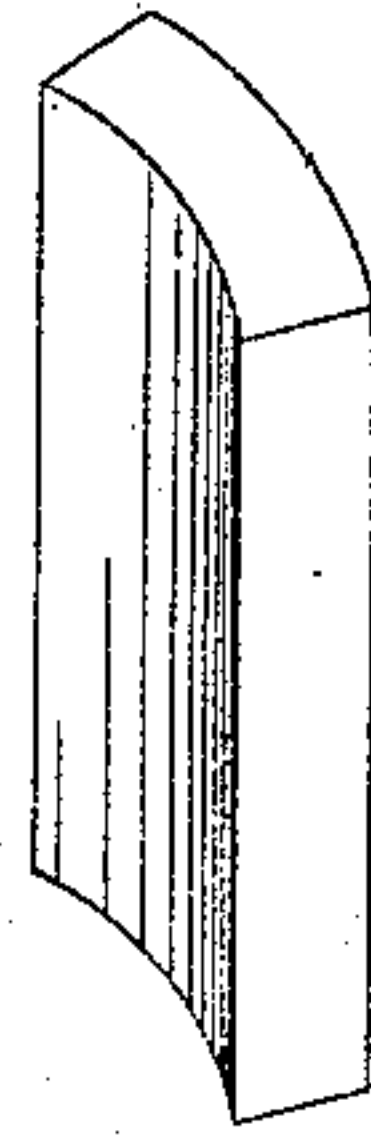


Fig. 2.

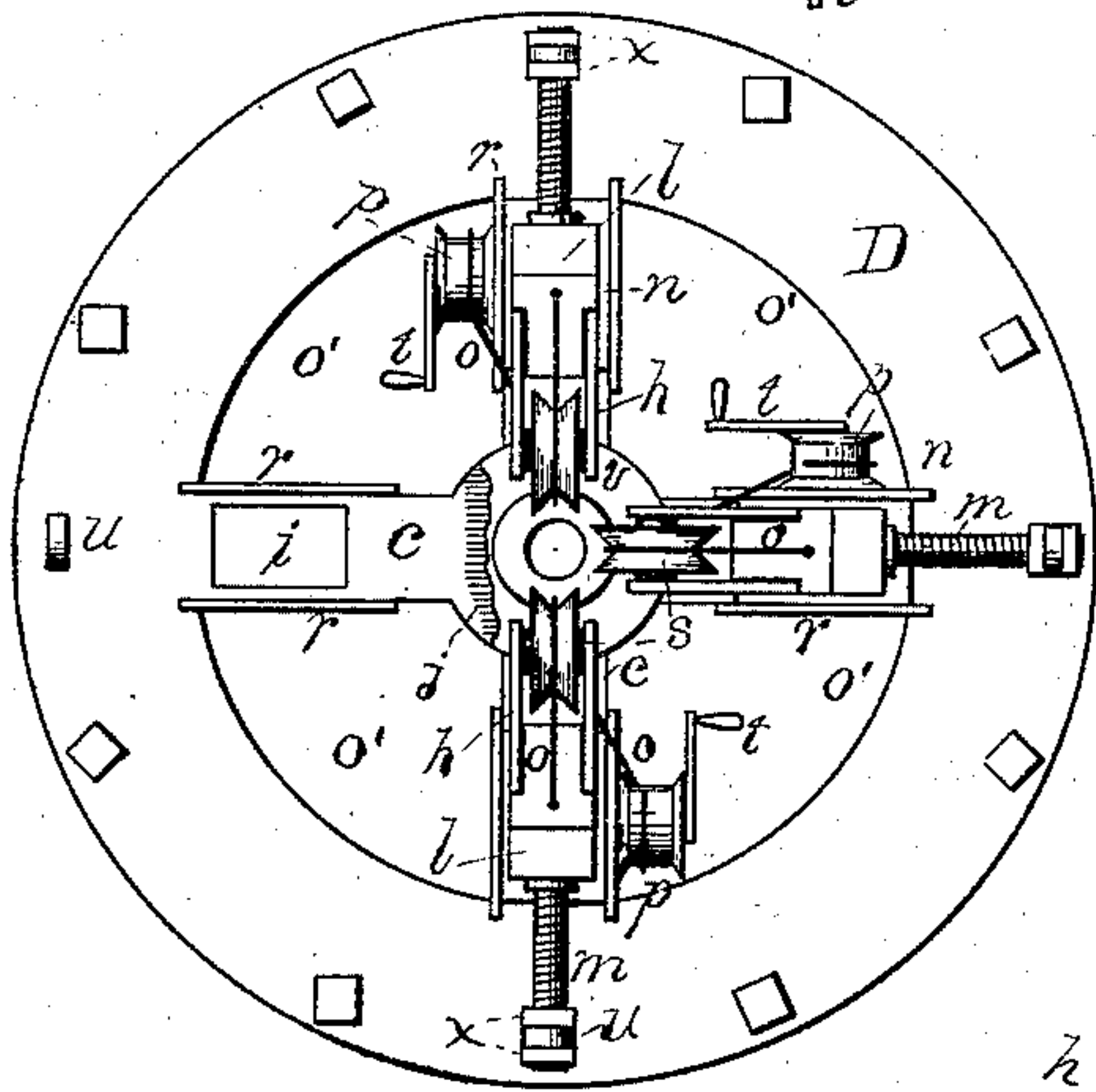


Fig. 3.

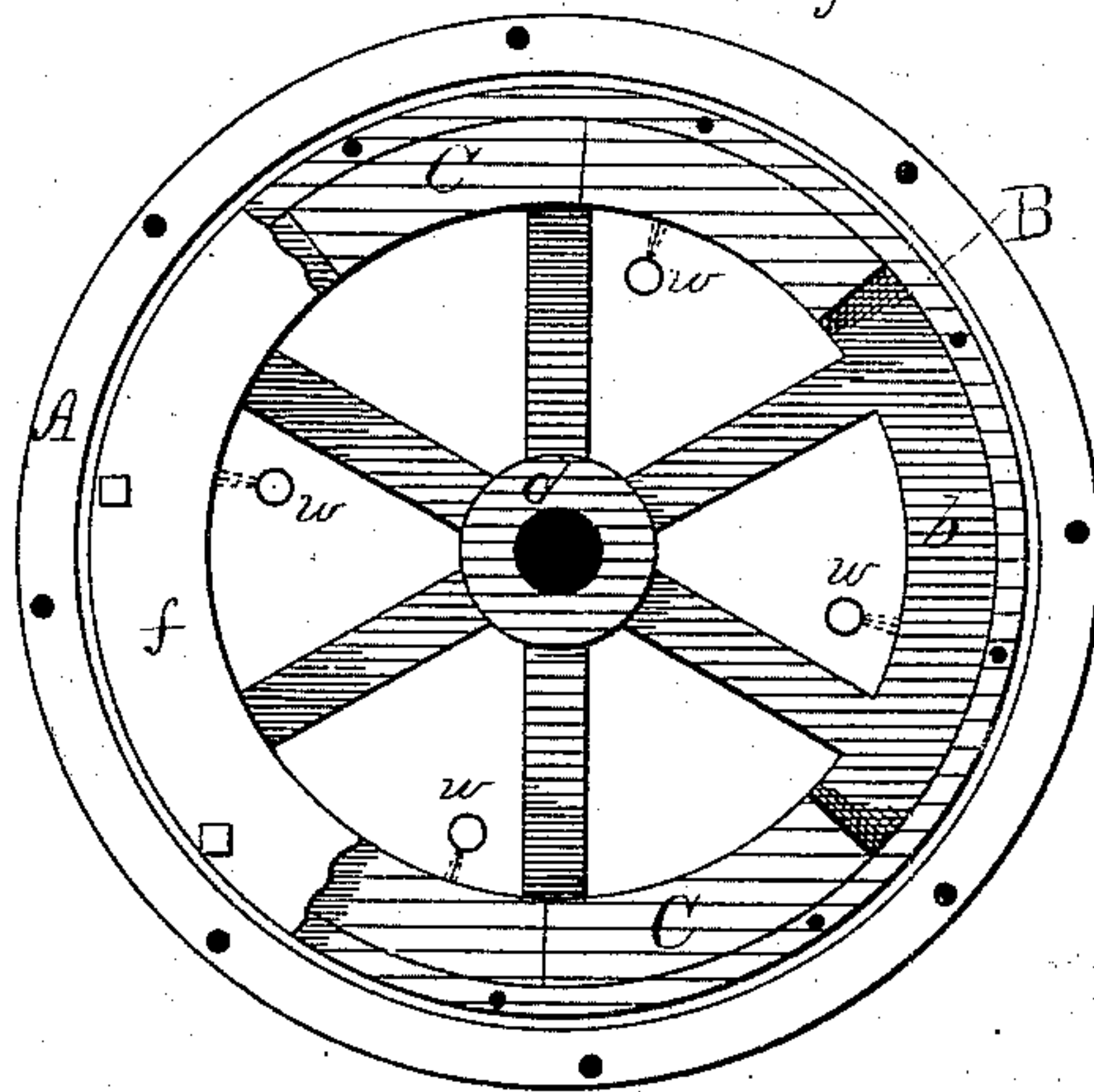


Fig. 4.

Attest:

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# UNITED STATES PATENT OFFICE.

ALBERT FICKETT, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-THIRD  
OF HIS RIGHT TO ALBERT M. HASTINGS, OF SAME PLACE.

## WOOD-PULP MACHINE.

SPECIFICATION forming part of Letters Patent No. 232,480, dated September 21, 1880.

Application filed May 26, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT FICKETT, of Rochester, in the county of Monroe and State of New York, have invented a new and useful  
-5 Improvement in Wood-Pulp Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to the formation of the disintegrating-stone and the manner in which  
10 it is held; to the devices for holding the pieces of wood to be ground and the manner of forcing them against the stone; to the construction of the stock-pan for receiving the disintegrated fiber, and to various details of construction, all of which are fully described hereinafter, and particularly pointed out in the  
15 claims.

Figure 1 of the drawings is a side elevation of my wood-pulp machine, a part of which is  
20 vertically centrally sectioned; Fig. 2, a plan of the same with some of the parts removed; Fig. 3, a plan of the parts within the inclosing-shell, the upper parts having been removed; and Figs. 4, 5, and 6 show details to aid in describing the invention.

A, as lettered, is a cylinder or shell, of iron, having open ends, which may be bolted by one of its flanges to the floor, or it may rest upon a suitable bench or upon legs, the use of which  
30 shell is principally to inclose the disintegrator and other parts and support the upper work of the machine.

B is an inner cylindrical shell, of iron, with open ends, save that at the bottom it is provided with an inwardly-projecting flange, *b*,  
35 having arms reaching to a central hub, *d*. *a* is a vertical spindle, to which the hub *d* is secured.

C is the disintegrating-stone, resting within  
40 the shell B upon the flange *b*, and held to place by a ring, *f*, bolted to the upper edge of the shell.

The shell B, with the stone, is rotated at a proper speed by means of the spindle *a*, and  
45 the pieces of wood to be reduced are held against the inner surface of the stone by means described farther on.

D is a strong annular plate forming a partial head or cover for the shell A, bolted to  
50 the upper flange of the same. This plate has four equal arms, *c*, reaching to a central ring,

*j*, and a collar or hub, *v*, is bolted thereto, which forms a bearing for the upper end of the spindle *a*.

The arms *c* are made sufficiently broad and  
55 slotted at *i* to receive, respectively, four inclined troughs, *h*, in which the strips of wood *k* are placed to be ground. These troughs are rectangular in cross-section, as shown in Fig. 4, each having an open side, which is turned  
60 toward the inner surface of the stone. The lower ends of the troughs are beveled at an angle equal to their inclination, for the purpose of causing them to coincide with the adjacent surface of the stone, the inclination  
65 of the troughs causing the contained strips of wood to be ground partially across the grain.

*l* are weights, T-shaped in cross-section, as shown in Fig. 4, fitting freely within the troughs, which, resting upon the ends of the strips of  
70 wood, force them down against the surface of the stone. The troughs are provided with grooved pulleys *s* at the top, over which cords *o*, attached to the weights, pass, said cords leading thence down to drums *p* at the side of  
75 the troughs, which drums are provided with cranks *t*, by means of which the weights may be raised at will.

The troughs are provided with rectangular  
80 flanges *n*, which cross the troughs obliquely, and, resting upon the respective arms *c*, serve as bases to support the troughs in position. The flanges are fitted between parallel guides or ribs *r*, raised at the edges of the arms *c*, and may be secured to the arms by ordinary  
85 screw-bolts. (Not shown.) These flanges are provided with lugs *z*, bored to receive the respective ends of horizontal adjusting-screws *m*, which are made fast in said lugs, and which  
90 pass through other lugs, *u*, of the plate D, being provided with set-nuts *x* on either side of the lugs, by means of which the troughs may be adjusted to the stone as it wears away, the slots *i* being sufficiently long to admit of such  
95 adjustment.

Spray-pipes *w*, placed vertically within the  
stone, supply its surface with water through small holes in the sides next the stone, the water being projected against the stone near  
100 the troughs above mentioned.

P is a circular stock-pan, placed beneath the stone to receive the liquid pulp or fiber as it



flows from the same, said pulp being drawn off through an opening, *y*, at the bottom.

A tight sleeve, *b'*, is bolted at its flanged end to the bottom of the pan, at the middle thereof, the upper end of which enters an annular groove in the hub *d*, so as to prevent the pulp overflowing. The purpose of the sleeve is to permit the spindle *a* to pass through the pan, which it must of necessity do, a hole, *a'*, being cut through the bottom thereof for the purpose.

I prefer to make up the disintegrating-stone of sections or staves, as shown in Fig. 6, in which case the shell B acts as a hoop to hold the pieces together, and to set said pieces firmly within the shell plaster-of-paris or cement may be used to fill in back of them and next the shell. The texture of the rock from which these disintegrators are cut is apt to lack homogeneousness; strata of varying degrees of hardness run through the same, which cause the stone to wear unevenly and present, after a time, a ridged or streaked surface when made solid or in a single piece.

By bringing together into a stone staves cut from different parts of the rock a grinder may be constructed that will wear more evenly, as the hard and soft spots will be distributed. This is of much importance, as when thus constructed the stones wear much longer and have to be redressed much less frequently.

*d'* are stops for the respective weights *l*. They consist, respectively, of bars of iron hung upon pins between lugs *c*, upon the rear walls or sides of the respective troughs, having their upper ends bent and turned into openings cut through said walls, and projecting within sufficiently to form a rest or stop for the weights, as shown in Fig. 5. Weak springs *e'*, acting upon the lower ends of each of the stops *d'*, keep the upper bent points thrust through the openings in the way of the weights. These stops are partly for the purpose of supporting the weights and holding them off from the ends of the strips of wood during the time the machine may be stopped for any purpose, they being raised above the stops for the purpose. Were the weights allowed to remain upon the ends of the strips of wood while the machine was at rest, the strips would become so firmly pressed against the surface of the stone as to make it difficult to start the same again. The stops are also useful in serving to arrest the weights should a cord break at any time, and prevent them driving down against the strips of wood.

One or more stops may be attached to each trough, suitably located for the purpose for which they are intended. The stops are easily pressed back out of the way when a strip of wood is placed within a trough to be ground.

The troughs may be tied together at the top by any suitable means *g'*, that will not interfere with their lateral adjustment above described.

The sectoral openings *o'* between the arms of the plate D may be closed by some suitable

covers to prevent the water or stock being thrown out thereat by the motion of the stone.

Many advantages attend this construction of wood-grinding machines. For instance, the disintegrator may be run at a much higher rate of speed without danger of bursting from centrifugal force than the disintegrators of other machines. In this machine the stone is incased in a strong iron hoop or retaining-shell, and the displacement of said stone or any of the pieces of which it is composed by its own motion is impossible on account of said shell, which I prefer to make of strong well-riveted boiler-plate.

When the grinding is done upon the exterior or convex surface of a stone, as is the case with other machines, there is no chance to employ a strengthening-hoop upon the outside, and the strength of the stone alone has to be depended upon.

The best of stones are liable to be flawy and defective, and have to be run at comparatively a slow rate of speed on that account. At a too low rate of speed the pulp-fiber produced is apt to be irregular as to fineness and also coarse, larger pieces being torn out of the wood when the stone moves slowly than when it moves more rapidly.

The high rate at which I am enabled to run the stone not only gives me finer and much more uniform fiber, but a vastly-increased production per hour. Again, by grinding upon the inner concave surface of the stone the strips at the parts in contact with the stone become convexed or thickest at the middle, which form gives them strength to resist splitting or slivering until wholly reduced to fiber. When the grinding is done upon the convex side of a cylindrical stone the pieces of wood are hollowed and first cut through at the middle, which allows them to split or sliver, resulting in a great waste of timber.

Strips of wood of any form or size that will enter the troughs may be ground entirely to fiber, placing them in side by side, if necessary, on which account fragments of stock may be used up instead of being wasted.

Where the stones are made of staves they (the staves) are readily packed for shipping, and are much less bulky than when in a single piece. Besides, they may be transported at much less risk of breakage, the solid annular stones being easily broken by rough handling. Again, the staves may be formed from comparatively small fragments of rock at the quarry, while the solid annular stones can only be cut from comparatively large blocks. On this account there is a great saving in raw material by making staves from which to build up the annular stones.

I claim as my invention—

1. The combination of an internally-grinding cylindrical disintegrating-stone made up of sections or staves, the external case or shell, B, for holding said stone, and the driving spindle *a*.

2. The oblique troughs *n*, capable of being



laterally adjusted with reference to the surface of the stone.

5 3. An internally - grinding disintegrating-stone made up of sections or staves suitably held and operated, in combination with oblique adjustable troughs *h*, supported partly above and within said stone, and being provided with weights *l*, substantially as described and shown.

10 4. Safety-stops *d'* for the weights, in combination with the troughs *h*.

5. In combination with a disintegrating-stone, *C*, and flanged troughs *h*, the annular

plate *D*, having arms *c*, provided with slots *i*, and ribs or guides *r*.

6. The shell or hoop *B*, provided with the armed flange *b'* and annularly-grooved hub *d*, as described. 15

7. In combination with a disintegrating-stone, a pan, *p*, provided with a sleeve, *b'*, and an annularly-grooved part, *d*. 20

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Witnesses:

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