

(No Model.)

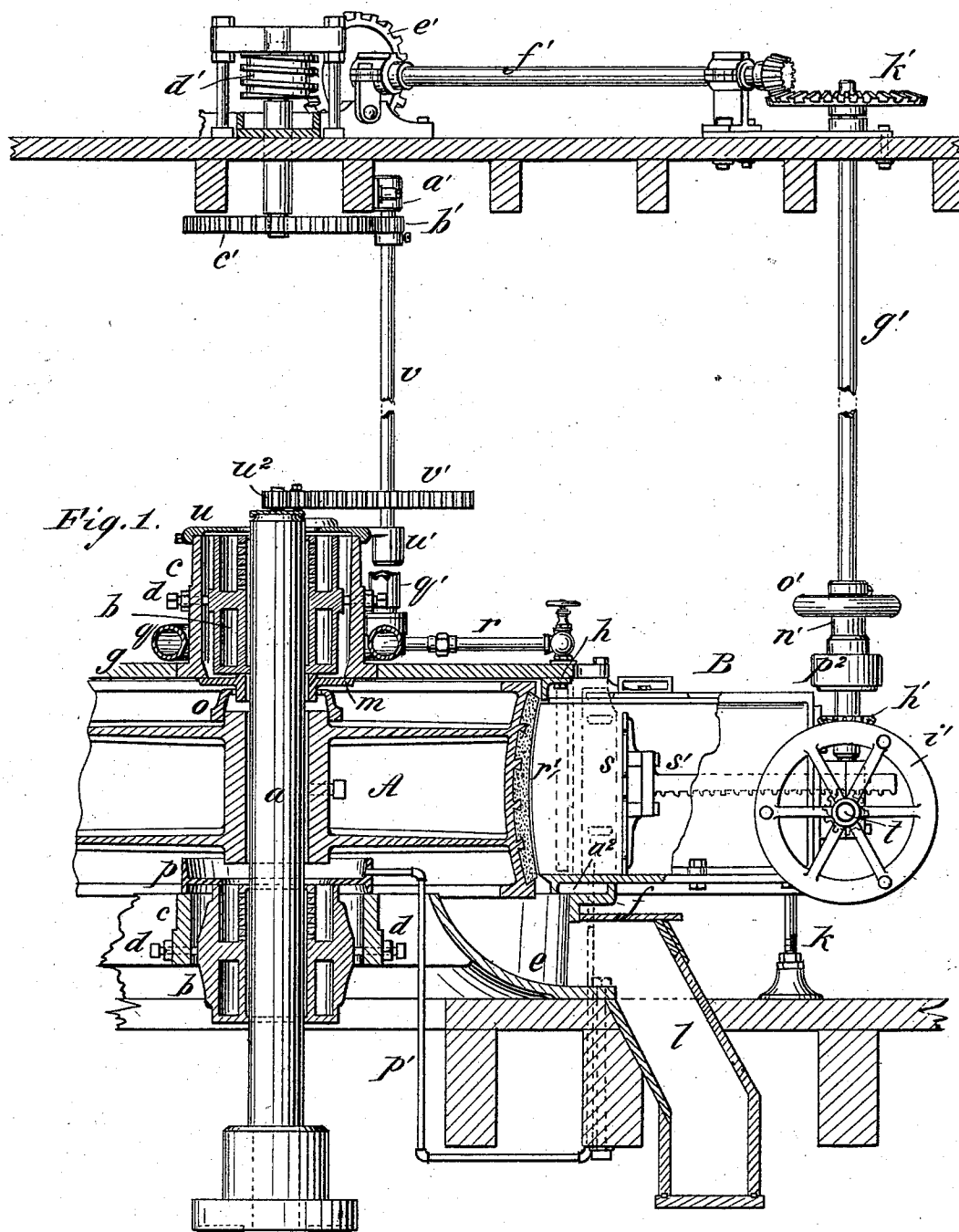
R. CARTMELL & A. BALL.

2 Sheets—Sheet 1.

WOOD PULP MACHINE.

No. 286,902.

Patented Oct. 16, 1883.



WITNESSES:

Norm Twitchell
W. Sedgwick

INVENTOR:

R. Cartmell
A. Ball

BY

Munn & Co

ATTORNEYS.

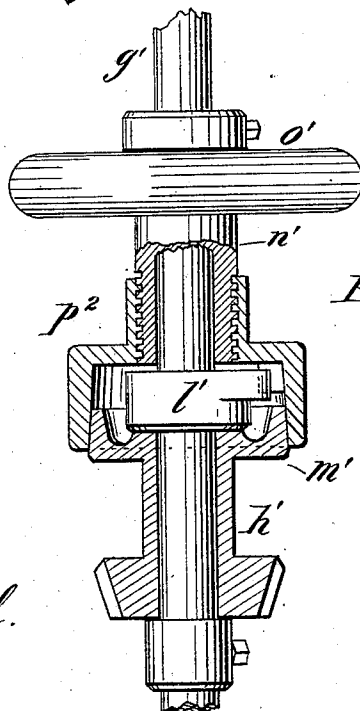
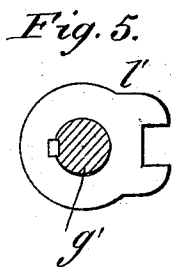
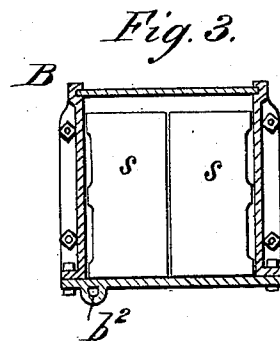
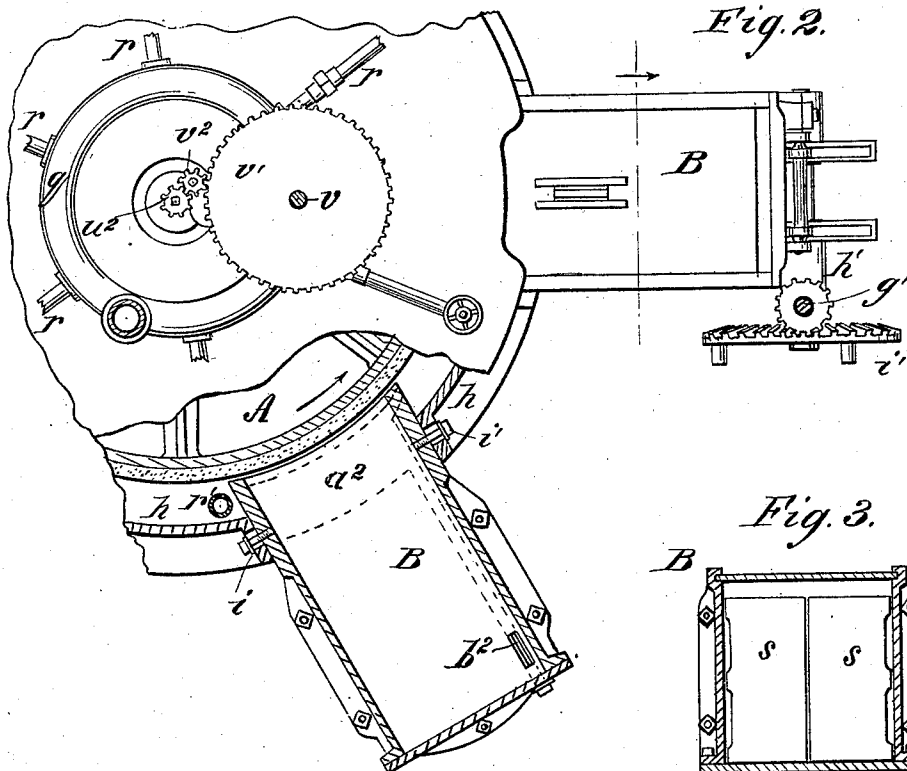
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R. CARTMELL & A. BALL. 2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

ROBINSON CARTMELL, OF MIDDLEBURY, VERMONT, AND ALBERT BALL, OF CLAREMONT, NEW HAMPSHIRE.

WOOD-PULP MACHINE.

SPECIFICATION forming part of Letters Patent No. 286,902, dated October 16, 1883.

Application filed June 9, 1883. (No model.)

To all whom it may concern:

Be it known that we, ROBINSON CARTMELL, of Middlebury, in the county of Addison and State of Vermont, and ALBERT BALL, of Claremont, in the county of Sullivan and State of New Hampshire, have invented a new and Improved Wood-Pulp Machine, of which the following is a full, clear, and exact description.

Our invention relates to machines for grinding wood in the manufacture of pulp, especially to machines of the character shown in Letters Patent granted to R. Cartmell, May 2, 1882, in which the cylindrical casing carrying the grinding cylinder or wheel is provided with radiating chutes or hoppers.

Our invention consists in certain features of construction and arrangement having the object to facilitate the setting up of the machine and its convenient operation, as hereinafter described and claimed.

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 vertical section of a wood-pulp machine of our improved construction. Fig. 2 is a partial plan view, partly in section. Fig. 3 is a cross-section of one of the chutes or hoppers. Figs. 4 and 5 are detail sections of the clutch for operating the feed.

A is the grinding cylinder or wheel, fixed upon a shaft, *a*, that is provided with a clutch beneath the machine for connection of the power. The shaft is supported in bearings *b*, contained in boxes *c* that are formed upon the under and upper sides of the case, the boxes being provided with clamping-bolts *d*, by which the bearings can be properly centered in the boxes.

The construction of the casing is as follows: *e* is the ring-base, that is bolted to the floor, formed in one piece with the lower box *c*, and its supporting-arms, and at the upper and outer edge of the ring *e* is a flange, *f*.

g is the top plate, connected to the flange *f* of the ring-base by segmental plates *h*, which are flanged, so as to be connected by bolts to the top and bottom.

B are the radiating chutes or hoppers or boxes, preferably six in number, and entering

the case at their inner ends between the segmental plates *h*, to which the hoppers are attached by means of bolts *i* passing through slots in the flanges of the segments *h*, so that the hoppers may be adjusted vertically. These hoppers B are supported at their outer ends by means of screw-jacks *k*, which rest upon the floor or other support, so that they sustain the weight of the hoppers and their contents, and they may be used for elevating or depressing the outer ends of the chutes, in order to bring the inner ends in their proper relation to the grinding-wheel. Beneath each hopper the ring-base *e* is provided with a side opening, to which a discharge-chute, *l*, is connected, and passes down through the floor. The upper box *c* is formed with or attached to the top plate, *g*, and its under side opening into the case is covered by a plate, *m*, which is made with a central flanged opening, through which the shaft *a* passes.

To the hub of the wheel A, at its upper side, is attached a beveled or flanged ring, *o*, into which the annular flange of the plate *m* enters. The bearings *b* are hollow or chambered, so as to serve as receptacles for oil, the inner walls of the chambers being apertured to allow the oil to pass between the shafts and bearings. At the opposite sides of the bearings grooves are formed to allow the oil to pass downward and through the flanged aperture of the lower plate, *m*, to the hub of the grinding-wheel, which hub is also grooved, so that the oil may continue to pass down to the lower bearings, *b*, for supplying the latter with oil, this lower bearing being formed hollow in a similar manner to the upper one. The covering-plate *m* and the ring *o* serve to prevent the escape of oil into the casing, where it might become mixed with the pulp, and in order to prevent the oil being thrown out from the lower bearing into the casing, the lower box *c* is fitted with a flanged ring, *p*, the edge of which projects over the lower edge of the wheel hub, so as to collect the oil that may be thrown out by the rotation of the shaft. This ring *p* forms a cup with which a pipe, *p'*, is connected for supplying oil to the lower bearing in case there is not a sufficient quantity coming down from the upper box.

Around the upper box *c* and above the top plate, *g*, is a pipe, *q*, to which a pipe, *q'*, is connected for supplying water, and on the pipes *q* are radial pipes *r* extending to the outer end of the casing and connected to vertical and perforated pipes *r'* that pass downward into the casing, connecting with passages *a² b²* at the bottom of hoppers B, so that the water is supplied to the grinding-wheel and to the hoppers or chutes B, the flow being regulated by a valve or cock. The feed-chutes B are each provided with two followers, *s s*, that are fitted with racks *s'*, extending through the outer ends of the hoppers, where they engage with pinions upon a cross-shaft, *t*, for their operation.

For simultaneous operation of the feed devices in all of the hoppers, we provide the following mechanism: Upon the top box *c* of the machine is a ring-cover, *u*, formed at one side with a step, *u'*, supporting a vertical shaft, *v*, and upon the shaft *v* is a gear-wheel, *v'*, that is connected to a pinion, *u²*, upon the upper end of the shaft *a* through the medium of an intermediate pinion, *v²*. The upper end of the shaft *v* is supported in a box, *d*, which will be preferably bolted to the beams of the floor above; and in order that this shaft *v* may be properly set according to the location and arrangement of the floor-beams, we attach the ring *u*, carrying the step *u'*, to the box *c* by means of set-screws, so that it may be turned on the box to any desired position required to bring the shaft vertical. Upon the upper part of the shaft *v* is a pinion, *b'*, engaging a gear-wheel, *c'*, that is upon a counter-shaft which passes upward through and above the floor. On the upper end of this counter-shaft is a worm, *d'*, engaging worm-wheels *c'*, that are fixed upon horizontal radiating shafts *f'*, there being a shaft *f'* for each chute or hopper B. At the outer end of each hopper B is a vertical shaft, *g'*, supported in a suitable step formed upon the hopper, and provided with a beveled pinion, *h'*, that engages a beveled gear-wheel, *i'*, upon the operating-shaft of the feed mechanism, and upon the upper end of the shaft *g'* is a beveled pinion, *k'*, engaging a pinion upon the horizontal shaft *f*. By this construction and arrangement the shaft *a* operates the worm *d'*, and through the medium of the worm-wheels, the shafts *f' g'*, and the gearing the feed mechanism of all the hoppers is operated. In order to allow the disconnection quickly and readily of the feed of any one of the hoppers, we provide the clutch shown most clearly in Fig. 4. The pinion *h'* is loose upon the shaft, and is formed with a beveled flange, *m'*, around a collar, *l'*, fast on the shaft. Upon the shaft above the collar *l'* is a loose sleeve, *n'*, provided with a hand-wheel, *o'*, and engaging by a screw-thread at its lower end with the hub of an inverted cup, *p²*, that engages with the collar *l'*, so as to rotate therewith. The inner surface of the cup *p²* is beveled and extends in contact with the beveled flange *m'* of the pinion *h'*, so that by turning the sleeve *n'*, by means of its hand-wheel, the cup *p²* is made to engage the flange *m'* by a frictional contact, thereby causing the rotation of the pinion with the shaft. By raising the sleeve *n'*, the parts are disconnected and the feed mechanism thereby stopped, which may be done at any one of the hoppers while the machine is in operation without stopping the feed of the others.

The grinding wheel or cylinder A is made with a concave rim or grinding-surface, which is most effective for producing fine pulp, as it acts to cut across the grain or fibers of the wood.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In wood-pulp machines, the inclosing case consisting of the ring-base *e*, formed with the flange *f*, the top plate, *g*, and the connecting-segments *h*, combined substantially as shown and described.

2. In wood-pulp machines, the combination of the hoppers or chutes B, and the case consisting of the base *e*, the top plate, *g*, and ring-segments *h*, substantially as shown and described.

3. In wood-pulp machines, the adjustable jacks *k*, combined with the radial hoppers B, and the cylindrical case of the machine, substantially as shown and described.

4. In wood-pulp machines, the combination, with the flanged ring *m* and the ring *o*, with the upper box *c*, the grooved bearings *b* and the wheel A, having a grooved hub, substantially as and for the purpose specified.

5. In wood-pulp machines, the combination, with the upper and lower boxes, *c*, of the chambered bearings *b* and the wheel A, having a grooved hub, substantially as described.

6. A flanged ring, *p*, in combination with the wheel A, the shaft *a*, and lower bearings, *b*, as and for the purpose specified.

7. In wood-pulp machines, the combination of the water-supply pipes *q q'*, the radial pipes *r*, and vertical pipes *r'* extending through the casing, substantially as shown and described.

8. In wood-pulp machines, the water-supply pipes *r'*, combined with the hoppers or chutes B, formed with passages *a² b²*, substantially as described.

9. In wood-pulp machines, the adjustable plate *u*, provided with the step *u'*, in combination with the upper box *c* and shaft *a*, as and for the purpose specified.

10. In wood-pulp machines, the combination of the shaft *a*, the vertical shaft *v*, the worm *d'*, the horizontal shaft *f'*, vertical shaft *g'*, and the connecting-gearing, substantially as described, for operating the feed mechanism of the hopper upon the central shaft, as specified.

11. In wood-pulp machines, the combina-

tion of a series of horizontal radiating-shafts operated from the shaft of the grinding-wheel, and connected for operating the feed mechanism of the hoppers, substantially as described.

12. In wood-pulp machines, the combination, with the operating-shafts *t g*, of the feed mechanism, of the clutch consisting of the screw-sleeve *n'*, the cup *p'*, collar *l'*, and pinion *h'*, formed with a beveled flange, *m'*, sub-

stantially as described, for operation as specified.

ROBINSON CARTMELL.
ALBERT BALL.

Witnesses to the signature of R. Cartmell:

JOHN SPENCER,
JOHN G. WELLINGTON.

Witnesses to the signature of Albert Ball:

CHAS. B. RICE,
J. DUNCAN UPHAM.