

(No Model.)

E. CONLEY.
BEATING ENGINE FOR PAPER PULP.

No. 407,641.

Patented July 23, 1889.

Fig. 7.

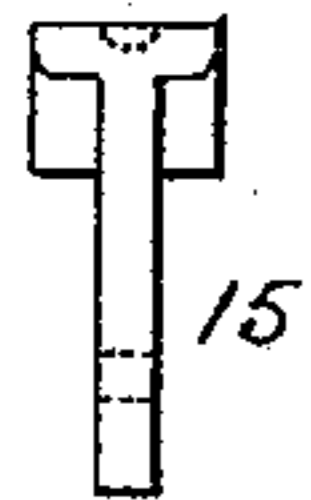


Fig. 6.

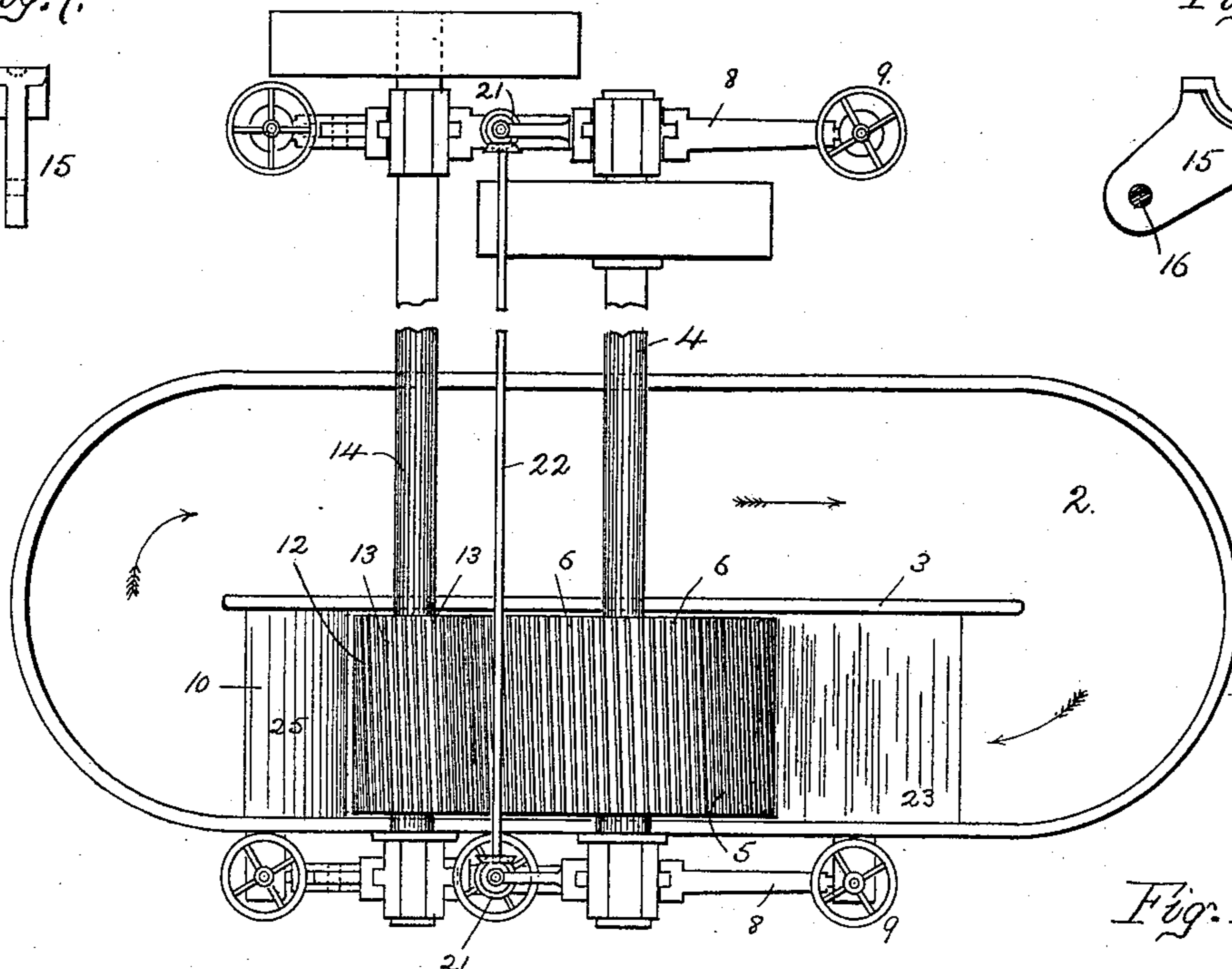
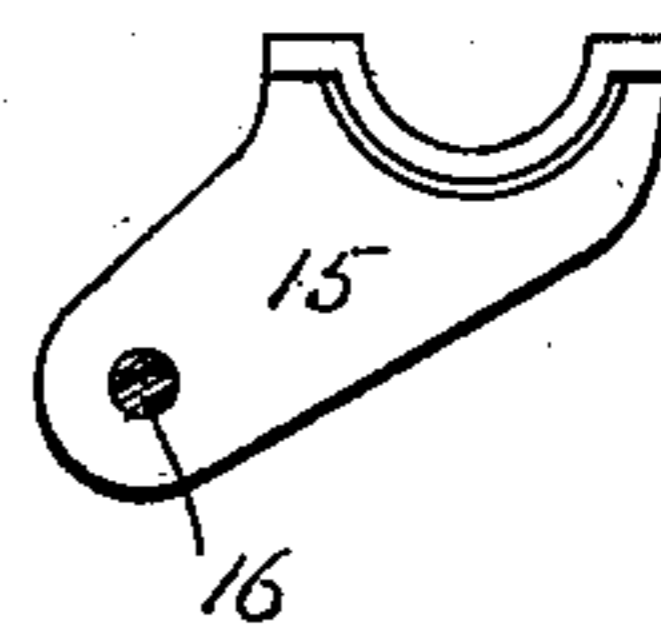


Fig. 1.

Fig. 2.

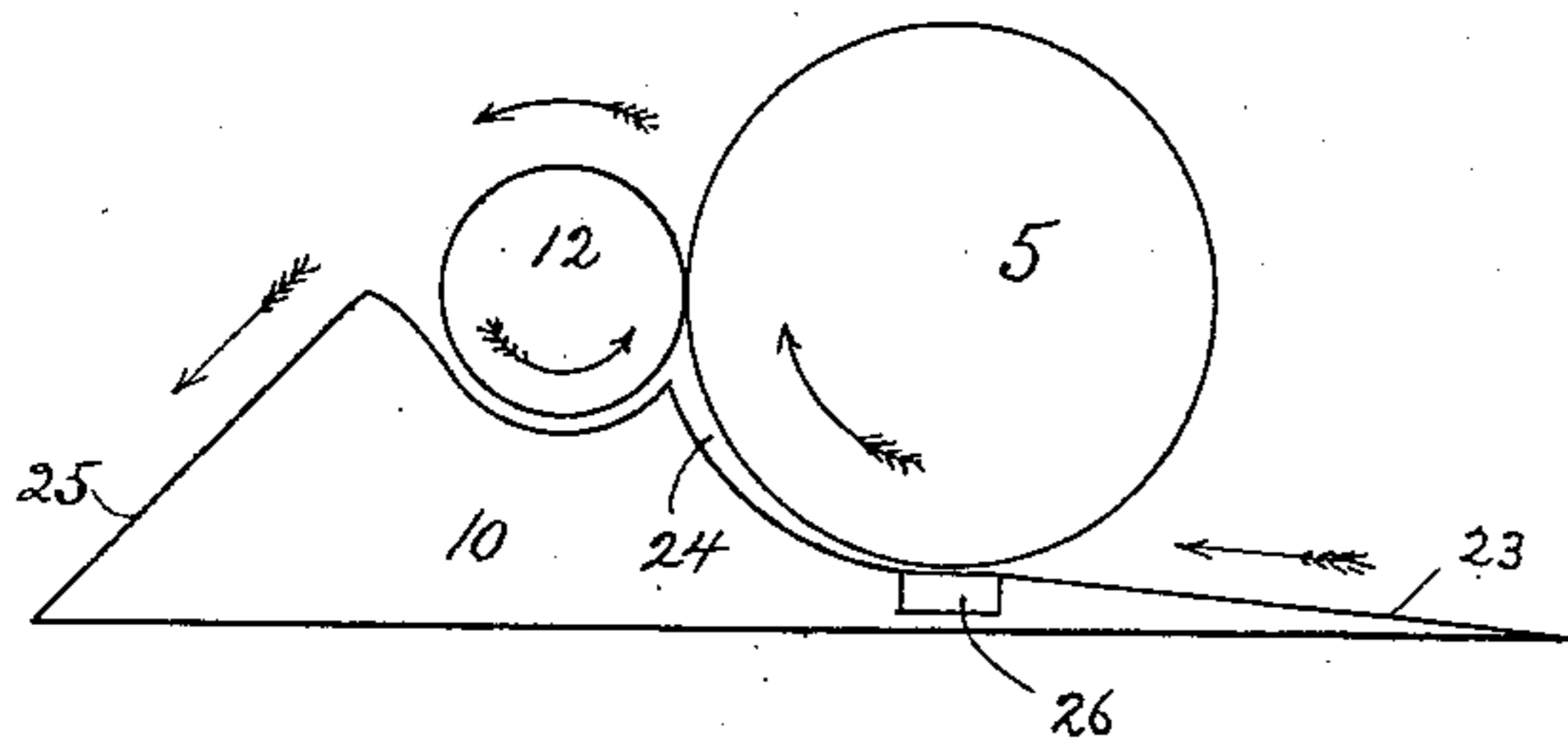
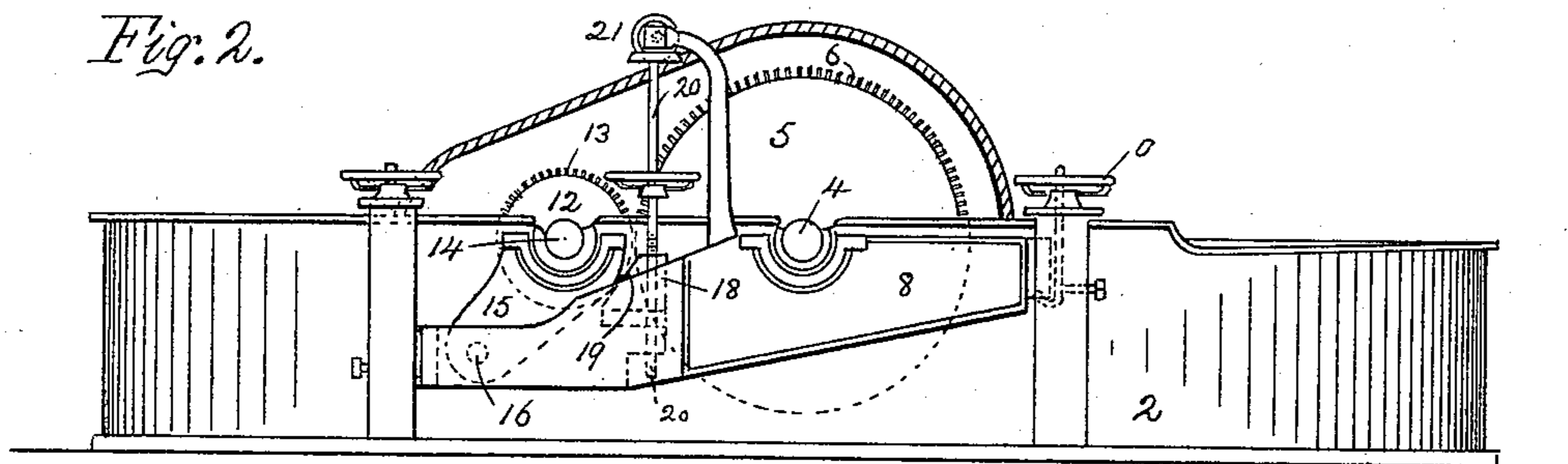


Fig. 3.



Fig. 4.

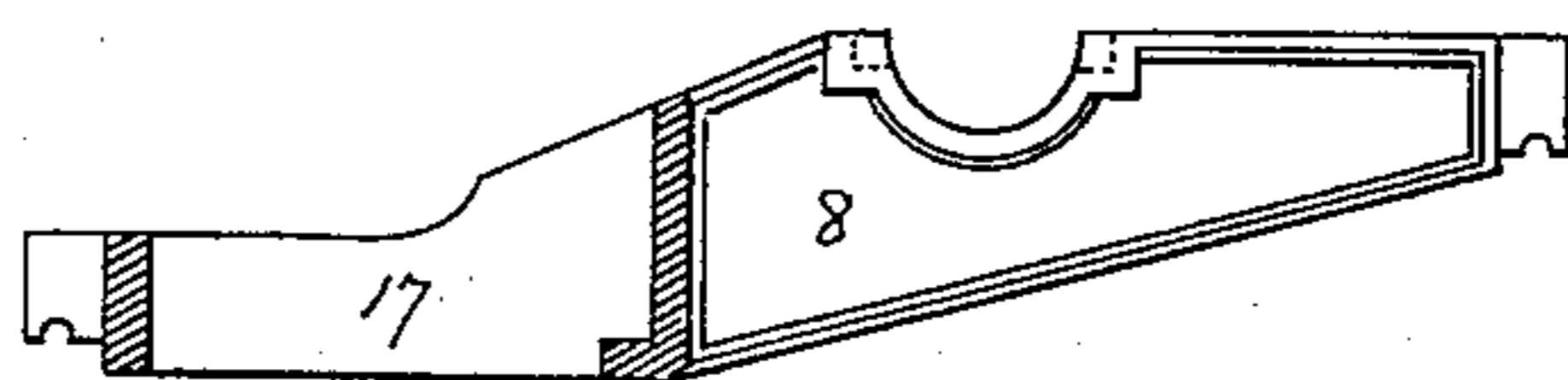


Fig. 5.

Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD CONLEY, OF BOSTON, MASSACHUSETTS.

BEATING-ENGINE FOR PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 407,641, dated July 23, 1889.

Application filed January 20, 1888. Serial No. 261,372. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CONLEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Beating-Engines for Paper-Pulp; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to beating-engines employed in making "paper-pulp," so called—that is, reducing the fibrous material of which said pulp is composed to a finely-comminuted mass, to render it fit to be introduced upon a paper-making machine.

The said invention consists in the construction and combination of parts, hereinafter set forth and claimed.

The drawings represent, in Figure 1 a plan, and Fig. 2 a side elevation, of a beating-engine containing my improvements. Fig. 3 is a diagram of the revolving bed-roll, grinding-roll, and back-fall. Figs. 4 and 5 are respectively a plan and an elevation of the lighter-beam. Figs. 6 and 7 are respectively an elevation and end view of the movable journal, which supports the shafts of the revolving bed-roll.

In said drawings, 2 represents the tub of a beating-engine, of the usual form and construction, having the longitudinal partition or mid-feather 3. Transversely disposed and extending across the tub is the shaft 4, upon which is secured a cylindrical grinding-roll 5, which, as usual, is peripherally armed with knives 6 6. The latter are arranged parallel with each other, but obliquely upon the face of said grinding-roll, as shown in Fig. 1. The shaft 4 is adjustably mounted upon "lighter-beams" 8 8, so called, secured to posts at the same end, but on opposite sides exteriorly of the tub, and are adapted to be raised or lowered by hand-screws 9 9 at their free ends, as occasion may require. To the rear of and beneath this revolving roll is located the back-fall 10, which extends somewhat farther to the rear than usual, and is adapted to co-operate with a bed-roll 12, disposed above it. This re-

volving bed-roll is furnished with knives 10, similarly and obliquely arranged upon its face, as on the grinding-roll, but so disposed that when the bed-roll is actively employed, in conjunction with the grinding-roll, the individual knives in each series shall move obliquely across in their passage by each other to produce a shearing action. Moreover, this roll is mounted upon a driving-shaft 14, parallel with and in the same horizontal plane as the shaft 4. Preferably this revolving bed-roll is of less diameter than the roll 5, and is mounted in bearings in arms 15 15, pivoted to the lighter-beams at 16 16. To permit swinging movement of these arms 15 vertically, I have longitudinally slotted at 17 the lighter-beams and inserted said arms 15 therein; hence the bed-roll is adjustable with respect to the periphery of the revolving roll, whereby the fineness of the pulp can be regulated, as is desired.

The adjusting mechanism for the bed-roll further consists of the movable interiorly-screw-threaded sleeves or nuts 18 18, having the side 19, contiguous to the free end of the swinging journals, beveled, as shown. Said sleeves are movable vertically upon upright screw-threaded rods 20 20, mounted in and secured to the lighter-beams. Simultaneous and equal travel of said sleeves is obtained by means of two pairs of interconnecting miter-gears 21 21 and an actuating-rod 22.

The operation of this beating-engine is as follows: The bed-roll 12 and grinding-roll 5 being rotated, as indicated by arrows in Fig. 3, fibrous material mixed with a certain amount of water is furnished, and the mass of stock and liquid is caused by the suction of the roll to advance up the front incline 23 beneath said roll, and is gradually impelled along the passage 24, created by the divergence of the back-fall from the grinding-roll in that part adjacent to the latter; thence it is carried upward until it meets with the bed-roll 12, rotating oppositely, and is then passed between the knives of the latter and those of the roll, where a drawing and reducing action is produced by the differential movement in the two sets of knives. Further disintegration of the material is accomplished by the two sets of knives 6 6 13 13, passing obliquely across each other. The stock, having been subjected to this action, then passes off and falls over upon

the rear inclined surface 25 of the back-fall, and is thus kept circulating continuously around the mid-feather beneath the roll, and thence between the latter and the bed-plate.

5 By this operation successively and continuously repeated the fibrous material is reduced to pulp. A fixed block 26 may be employed to partially break up masses of stock prior to their treatment between the revolving bed-
10 plate and grinding-roll. A prominent advantage in this arrangement—viz., having a revolving bed-roll—is that the difference in the circumferential speed of the two sets of knives may be varied mechanically and the drawing
15 action upon the stock increased. Thus the efficiency of the engine is augmented, while the pulp produced is of better quality, due to the peculiar drawing action created by the revolving bed-roll.

20 I do not desire to be limited to the precise mechanical construction herein shown as to the manner of mounting or adjusting the revolving bed-roll with respect to the grinding-roll, nor to the particular class of beating-engines, as herein shown, in which the stock is

circulated in horizontal planes, as my invention is equally applicable to beating-engines in which the stock is circulated in vertical planes.

What I claim is—

1. The combination of the tub 2, the grinding-roll 5, the lighter-beams 8 8, slotted at 17, a revolving bed-roll 12, and swinging arms 15 15, disposed in said slots, as and for purposes set forth.

2. In beating-engines for paper-pulp, a vertically - adjustable grinding - roll 5, lighter-beams 8 8, and the tub 2, having a mid-feather 3 and back-fall 10, combined with a revolving bed-roll 12, pivotal arms 15 15, and the movable sleeve-nuts 18 18, with their operating
40 mechanism by which the bed-plate is adjusted toward or away from the grinding-roll, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD CONLEY.

Witnesses:

H. E. LODGE,
F. N. WALES.