May 15, 1928. 1,670,183

J. S. BECK

BEATER

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Fig. 1.

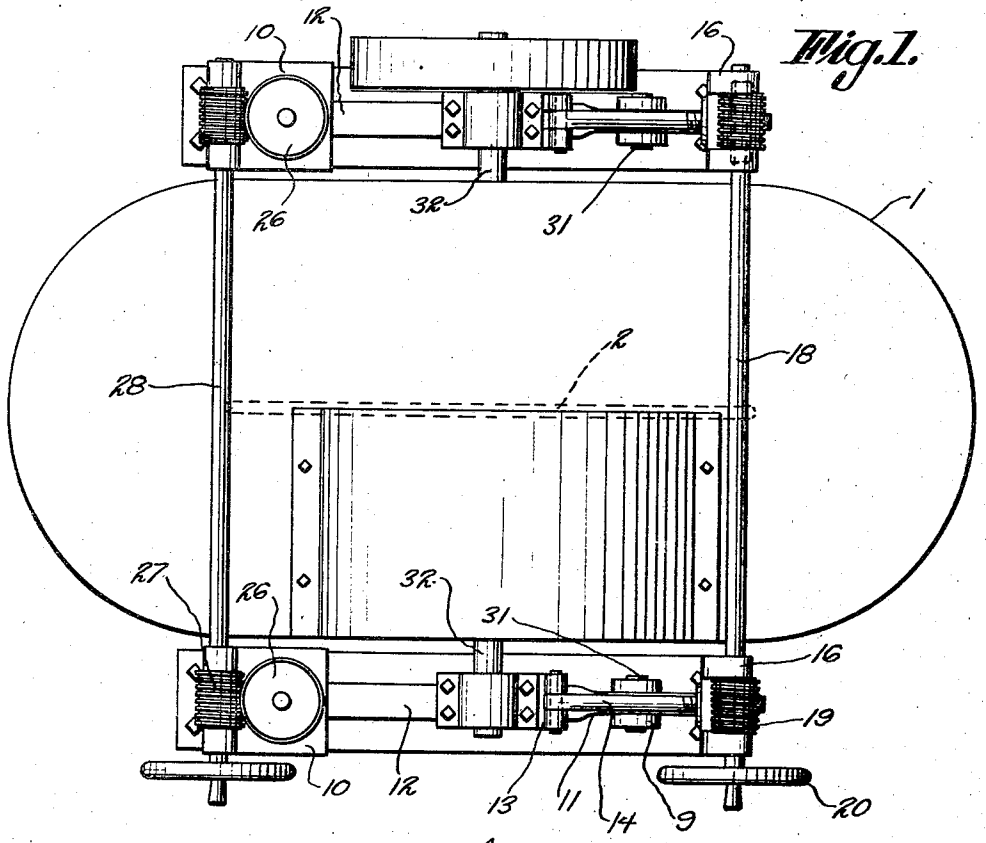
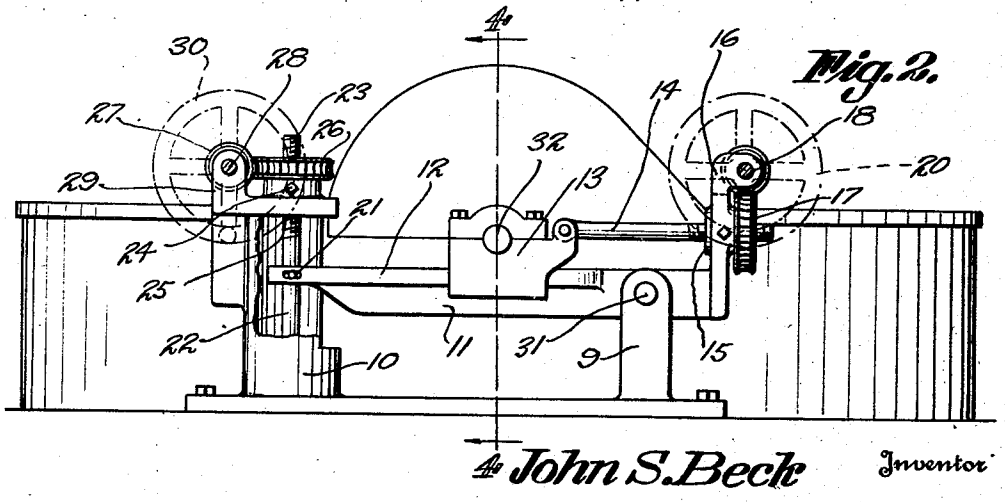


Fig. 2.



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Fig. 3.

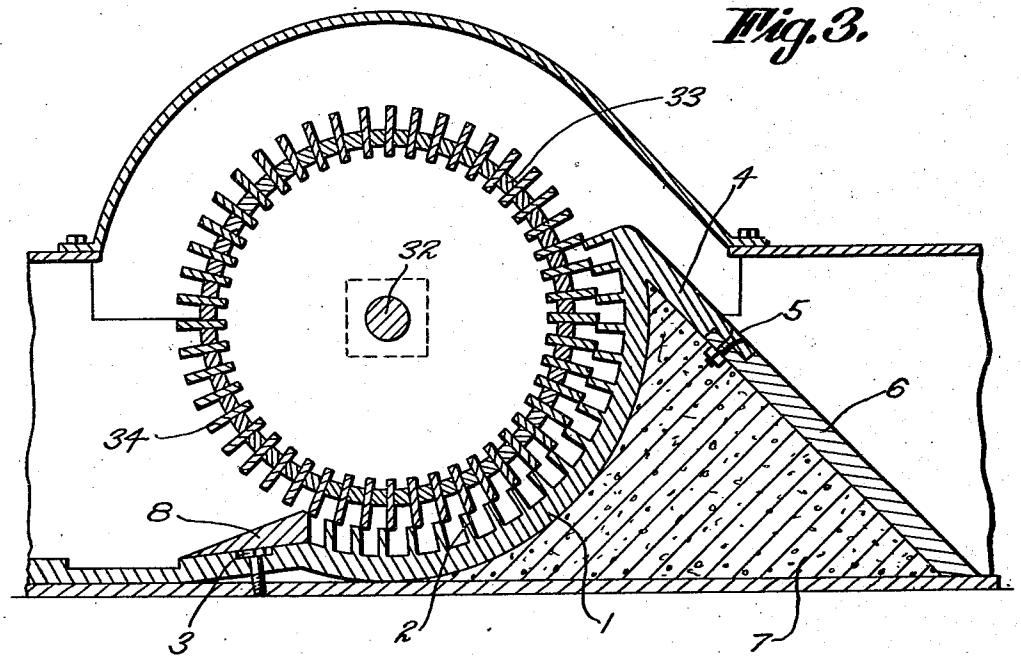
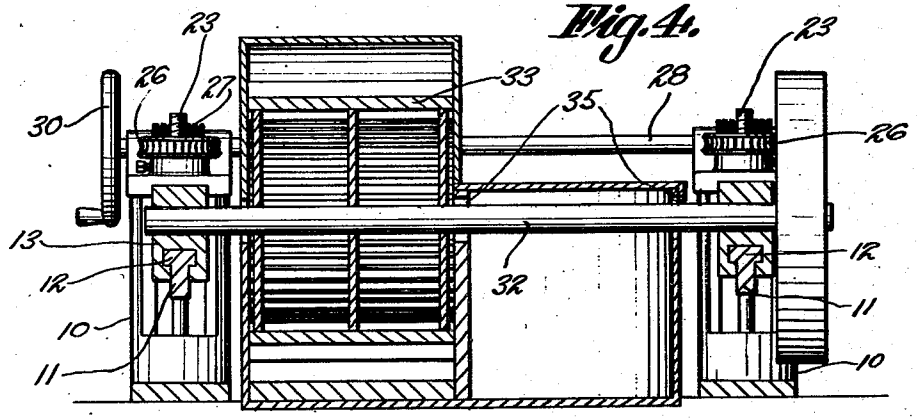


Fig. 4.



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Patented May 15, 1928. 1,670,183

UNITED STATES PATENT OFFICE.

JOHN SIMPSON BECK, OF MANVILLE, NEW JERSEY.

BEATER.

Application filed July 5, 1927. Serial No. 203,475.

This invention relates to beaters such as used in the manufacture of paper and the like, one of the objects being to provide a beater of the back-fall type utilizing a stationary concave of increased capacity, there being combined with this concave a beating cylinder which can be adjusted relative to the concave in any direction, thus to compensate for wear and maintain the cooperating parts at maximum efficiency.

A further object is to mount the beating cylinder in a novel manner so that the desired adjustment thereof can be effected readily.

With the foregoing and other objects which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings,

Figure 1 is a plan view of the structure constituting the present invention.

Figure 2 is a side elevation thereof.

Figure 3 is an enlarged vertical section through the beater cylinder, its concave and adjacent parts.

Figure 4 is a section on line 4—4, Figure 2.

Referring to the figures by characters of reference 1 designates a trough or tub of the usual shape and size provided with a central partition 2 at one side of which is located the beating cylinder and concave constituting the present invention. As shown particularly in Figure 3 the concave can be cast in a single piece of hard steel, this concave 1 being formed with integral blades 2 disposed radially on the concave surface and of uniform height. When formed in a single casting the concave has a bottom extension 3 at the lower end thereof while the upper end of the concave has an inclined apron 4 integral therewith. This apron is adapted to be bolted as at 5 to an inclined plate 6, the space below the apron and plate and back of the concave being filled with concrete as shown at 7. An inclined block 8 can be arranged on the extension 3 for directing the fibrous material or pulp upwardly to the proper level to pass over the blades. It is to be understood that if preferred the concave can be built up in the customary manner instead of casting it in one piece with the blades. A built-up concave is so well known in the art that it has not been deemed necessary to describe or illustrate the same in detail. It need only be stated that it is formed of blades interposed between wooden strips, the parts being held firmly together by suitable means provided for that purpose.

Heretofore concaves have been made with the blades located solely in a small cluster at the bottom portion thereof. In the present instance the series of blades is extended from the bottom to the top of the concave thereby greatly increasing the capacity of the beater and consequently reducing the cost of producing the pulp.

As it is essential that the cylinder be adjusted relative to all of the blades of the concave, it has been necessary to provide a cylinder which can be adjusted both horizontally and vertically or substantially vertically. For this purpose there is provided at each side of the trough or tub a pair of standards 9 and 10. Fulcrumed in the standard 9 is a lever 11 having a guideway 12 on which is slidably mounted a bearing 13. To this bearing is connected a threaded rod 14 engaging a nut 15 mounted for rotation in an arm 16 extending upwardly from the lever. A worm gear 17 is secured to the nut 15 and rotates therewith, any suitable means being employed for holding the nut against longitudinal movement. A transverse shaft 18 extends across the trough or tub and is journaled at its ends in the arms 16 at the two sides of the machine. Worms 19 are carried by the end portions of this shaft and mesh with the respective gears 17. A hand wheel 20 or the like can be provided for rotating shaft 18 and it will be apparent that when this shaft is rotated the two rods 14 will be moved longitudinally simultaneously so as to shift the bearings 13 in either direction along the guideways 12.

Those ends of the levers 11 remote from the arms 16 are pivotally and slidably connected as at 21 to rods 22 supported in the standards 10. The upper ends of these rods are screw threaded as at 23 and are slidably mounted, any suitable means being provided for holding each rod against rotation. For

example a screw 24 can be extended into a keyway 25 in the rod. A nut in the form of a worm gear 26 engages the threaded portion 23 of each rod and these worm gears mesh with worms 27 carried by the end portions of a transverse shaft 28 journaled in brackets 29 at the upper ends of standards 10. A hand wheel 30 or the like may be attached to the shaft 28 to facilitate rotation thereof whereby the two rods 23 can be simultaneously raised or lowered, thereby to raise or lower the levers 11 about their pivots 31.

Secured to the shaft 32 which is journaled in the bearings 13 is a beater 33 of the usual or any preferred construction, the blades 34 of this cylindrical beater being adapted to work close to the edges of the blades 2 and being radially disposed as ordinarily.

For the purpose of permitting the various adjustments of the shaft 32, openings 35 are formed in the walls and partition of the trough or tub.

The beater rotates at a high speed in the usual way so that the pulp will be carried upwardly thereby over the blades of the concave and flow downwardly over the backfall. A continuous circulation of the pulp will thus be set up and the same will be quickly reduced or ground to the desired consistency. By mounting shaft 32 in the manner described the cylinder can be adjusted relative to all of the blades of the concave, thereby to compensate for wear and insure a much more extensive and efficient cutting and grinding action than would be possible with the use of a concave such as ordinarily employed wherein a small cluster of blades is located beneath the cylinder.

What is claimed is:

1. In a machine of the class described the combination with a trough, of a concave fixedly mounted therein having a backfall, blades extending transversely of the concave and arranged in a series extending from the top to the bottom of the concave, a cylinder mounted for rotation, and separate means for adjusting the cylinder horizontally and upwardly and downwardly relative to the concave.

2. In a machine of the class described the combination with a concave having a series of blades extending from the bottom to the top thereof, of levers pivotally mounted at opposite sides of the concave, bearings slidable longitudinally of the levers, a shaft journaled therein, a beater cylinder rotatable with the shaft, means for simultaneously shifting the bearings in either of two directions to adjust the cylinder relative to the concave, and means for simultaneously swinging the levers in either of two directions to adjust the cylinder relative to the concave.

3. In a machine of the class described a stationary concave having a backfall, said concave including a series of blades extending from the bottom to the top thereof and an inclined apron extending from the top of the concave, said apron, concave and blades being formed in a single casting, and a beater cylinder cooperating with and adjustable relative to the concave.

4. In a machine of the class described a trough, a concave fixedly mounted therein having a series of blades extending from the bottom to the top thereof and an inclined apron extending from the top of the concave, said apron, concave and blades being formed in a single casting, an inclined plate secured to the apron and cooperating therewith to provide a backfall, a filling between the concave and backfall, and a beater cylinder cooperating with and adjustable relative to the concave.

5. In a machine of the class described a trough, a concave therein, an inclined apron extending from the top of the concave, and inclined plates secured to the apron and cooperating therewith to provide a backfall, and a beater cylinder cooperating with the concave.

6. In a machine of the class described a trough, a concave therein, an inclined apron extending from the top of the concave, said apron and concave being formed in a single casting, an inclined plate secured to the apron and cooperating therewith to provide a backfall, and a beater cylinder cooperating with the concave.

7. In a machine of the class described the combination with a trough, of a concave therein having a backfall, blades extending transversely of the concave, a cylinder mounted for rotation, and means for varying the relative positions of the cylinder and concave.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOHN SIMPSON BECK.