

No. 616,728.

Patented Dec. 27, 1898.

A. W. PRIEST.
PULP GRINDER.

(Application filed Sept. 21, 1897.)

(No Model.)

3 Sheets—Sheet 1.

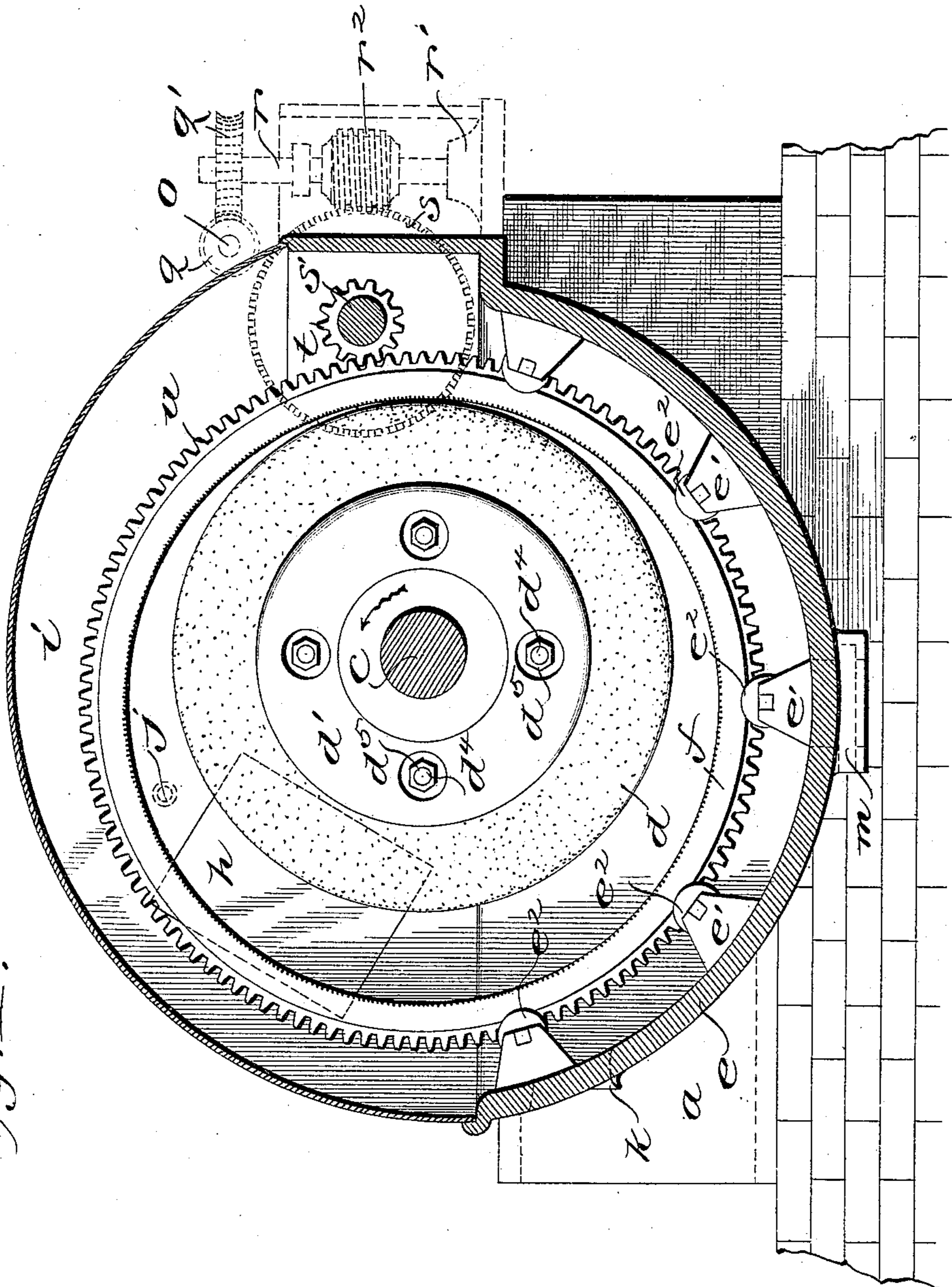


Fig. 1.

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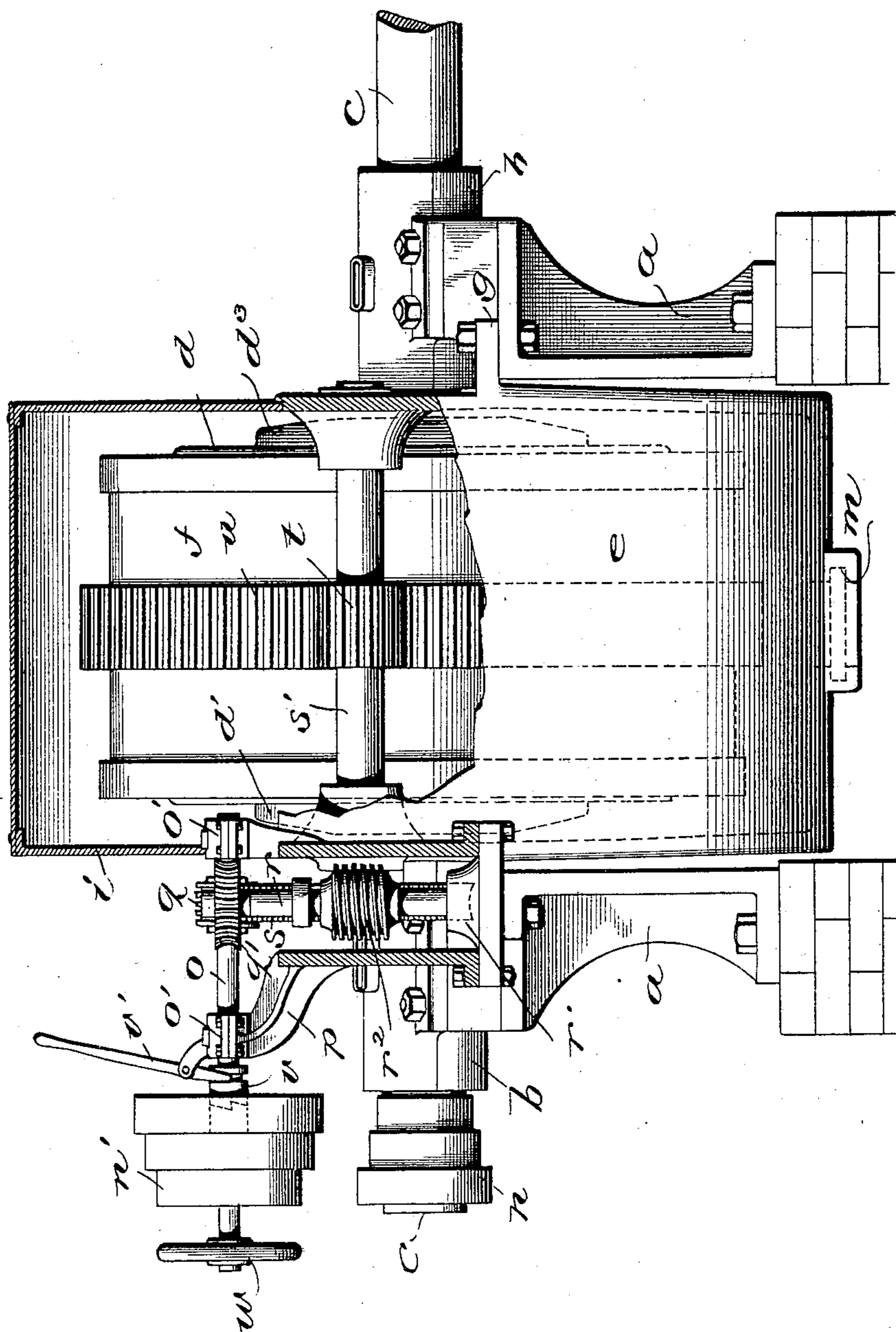
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(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

ALBERT W. PRIEST, OF KAUKAUNA, WISCONSIN.

PULP-GRINDER.

SPECIFICATION forming part of Letters Patent No. 616,728, dated December 27, 1898.

Application filed September 21, 1897. Serial No. 652,429. (No model.)

To all whom it may concern:

Be it known that I, ALBERT W. PRIEST, a citizen of the United States, residing at Kaukauna, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Pulp-Grinders; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to machines for grinding wood into pulp for subsequent use in paper manufacture; and the objects are to provide a machine which shall occupy a comparatively small space and yet shall do fully as effective work as a large machine, to provide a continuous feed and a large grinding-surface for the size of the stone employed, and to provide an adjustment whereby the wear of the stone is compensated for and grinding of the wood is insured.

To the above ends the invention consists in a number of novel features of construction and arrangements of parts herein recited, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation in section of the machine; Fig. 2, a front elevation in section with part of the casing broken away to better disclose the parts beneath; and Fig. 3, a view, partly in plan and partly in section, of the machine.

The reference-letter *a* designates standards erected and secured upon a suitable base or foundation and supporting bearings *b* for a shaft *c*, which extends across between the standards and carries the grinding-stone *d*. The latter is clamped between a flange *d'* on one end of a sleeve *d''*, extending through the stone, and a flange *d'''*, fitting on the opposite end of the sleeve, bolts *d''''* being passed through holes in the stone and through the flanges and the heads of the bolts bearing against one flange, while nuts *d''''''* on the bolts bear against the other flange. The sleeve is suitably keyed to the shaft, so that the stone will rotate with the latter, and said shaft is extended beyond one of its bearings for con-

nection with the source of power which is to drive it.

A vat or pan *e*, preferably of semicircular form, is arranged between the standards *a* and embraces the lower portion of the stone, and said vat has in its inner side a series of bearings *e'* for rollers *e''*, forming a circular way or track which, it is to be noticed, is eccentric to the stone. There are preferably two rows or series of these rollers, as clearly shown in Fig. 3, and they constitute bearings for a ring *f*, which surrounds the stone and is serrated, roughened, or otherwise formed or provided on its inner surface for feeding purposes. This feed-ring is eccentric to the stone and is intended to maintain an adjustment to keep its inner surface at one point in as close proximity as possible to the stone, so that all of the wood carried against the stone by the ring will be reduced to pulp. In order to insure this relation of parts, notwithstanding the wearing of the stone, I provide the following adjustment: The vat is formed with ears or flanges *g*, which project over and rest upon the tops of the standards *a*, and these flanges are slotted, as shown at *g'* in Fig. 3. Clamping-bolts *g''* pass through the slots and through the top flanges of the standards and are equipped with nuts *g'''*. The slots allow sufficient movement of the vat and feed-ring relative to the stone to compensate for wear of the same. The preferred arrangement in practice where the stone wears through five inches of its radius is to allow for a movement of the vat through half that distance to compensate for two and one-half inches of the wear, and then the vat is moved back to its initial position and a lining two and one-half inches thick is inserted in the feed-ring.

The feed-ring and stone are driven in the same direction, as indicated by arrows in Fig. 1, and by the engagement of the serrated inner surface of the ring with the pieces of wood introduced between the ring and the stone a continuous feed of the wood against the stone is maintained. The pieces of wood are introduced through a door *h* in one side of the casing *i*, rising from the vat, and a pipe *j* enters that side of the casing to conduct the necessary supply of liquid thereinto. The pulp flows out of a spout *k*, located in a suit-

able part of the vat, and the latter may be drained through a washout-opening *m* in its bottom, having a suitable closure or stopper. The feed-ring is of course driven at a very
5 much reduced speed as compared with the stone.

The gearing for transmitting motion from the shaft *c* to the feed-ring is of the following description: A cone-pulley *n* on the said
10 shaft is connected by a belt with the cone-pulley *n'* on a shaft *o*, journaled in bearings *o'* on a standard *p* erected on the vat. The shaft *o* carries a worm *q*, which meshes with a worm-wheel *q'* on a vertical shaft *r*, stepped
15 in a bearing *r'* on the vat and carrying a worm *r²*, in mesh with a worm-wheel *s* on the shaft *s'*, journaled in bearings in opposite sides of the vat and carrying a pinion *t*, in mesh with a gear *u*, formed upon the middle portion of
20 the feed-ring on the outer side of the same. It will readily be seen that through the described gearing the feed-ring will be driven in the same direction as the stone, but at a much lower rate of speed. The cone-pulley
25 *n'* is mounted loosely on the shaft *o* and has a clutch member for engagement with a complementary member in a sleeve *v*, spliced to the shaft and engaged by a shipper-lever *v'*. Said shaft is equipped with a hand-wheel *w*
30 for use whenever it may be desired to move the gearing by hand.

It will be seen that the above-described machine fulfils the objects primarily stated, and its construction is such as to render it very du-
35 rable. It is capable of withstanding a great pressure per square inch exerted in the grinding of the wood between the feed-ring and the stone.

Numerous modifications can of course be
40 made in the construction herein shown without departing from the spirit and scope of the invention, which is defined in the appended claims.

Having thus described my invention, what
45 I claim as new, and desire to secure by Letters Patent, is—

1. A pulp-machine comprising supports, a

vat adjustable on and relative to the supports, a rotary grinder turning in bearings outside of the vat, a rotary feed-ring encircling and
50 eccentric to the grinder, bearings in the vat on which the feed-ring is supported and turns, and means for driving the grinder and feed-ring.

2. A pulp-machine comprising a rotary
55 grinder and a rotary feed-ring encircling and eccentric to the grinder, the motion of the two at the point of nearest proximity being upward, whereby the material is all fed forward at the crushing-point by the motion of
60 the parts and never by gravity, and external supports or bearings for the ring immediately opposite or adjacent to the point where the grinding takes place, whereby to sustain and resist the outward strain at that point.
65

3. A pulp-machine comprising a suitable support, a vat adjustably connected with the support, a grinder revolubly supported in bearings on the support, and a rotary feed-ring movable laterally with the adjustable vat.
70

4. A pulp-machine comprising a vat, a rotary grinder and a feed-ring revolubly supported in the vat, the vat being capable of adjustment with respect to the grinder to compensate for wear.
75

5. The combination in a pulp-machine, of supports, vat, a shaft turning in bearings in the supports, a grinder on said shaft, a feed-ring revolubly supported on bearings in the vat, a rack on the exterior of the ring, a counter-shaft, a pinion thereon which meshes with the teeth of the rack, a worm-wheel on the counter-shaft, a shaft *o*, a worm *q*, a shaft *r*, worm-wheel *q'*, which meshes with worm *q*, on shaft *o*, and provided with a worm *r²*, which
80 meshes with the worm-wheel on the counter-shaft, and means for communicating motion from the grinder-shaft to shaft *o*.

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

ALBERT W. PRIEST.

Witnesses:

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JAMES RITCHIE.