H. W. HIGLEY.

Improvement in Apparatus for Making Paper-Pulp from Wood.

No. 130,803. Patented Aug. 27, 1872

Fig. 1.

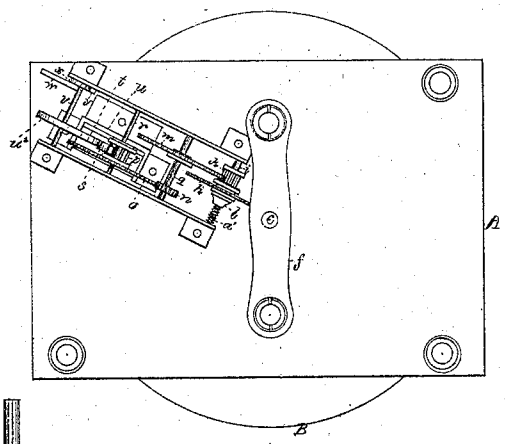


Fig. 2.

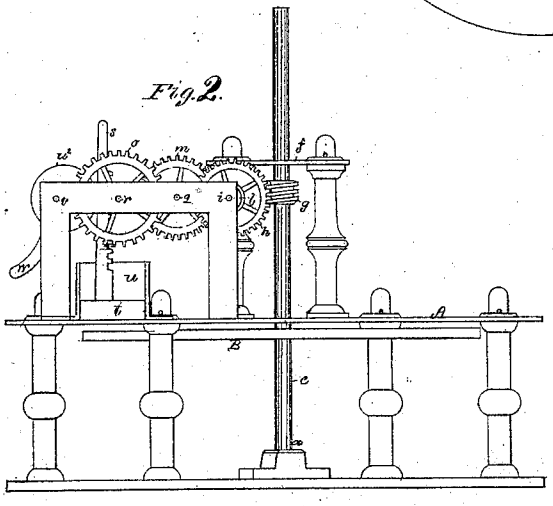


Fig. 4.

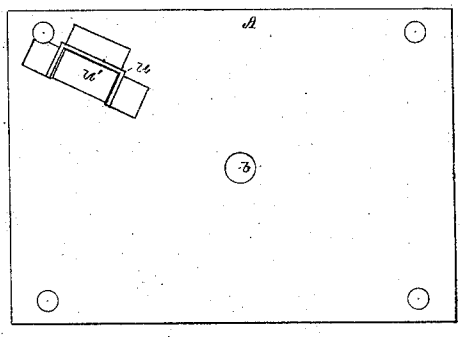


Fig. 3.

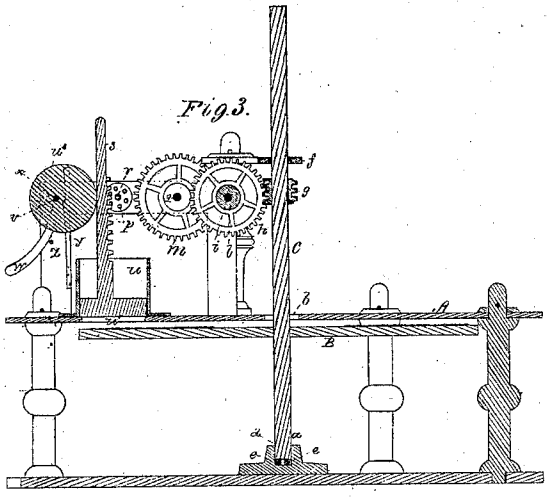
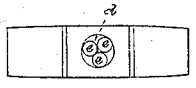


Fig. 5.



Witnesses.

S. N. Piper

L. N. Möller.

H. W. Higley.

by his attorney.

N. N. Lady

UNITED STATES PATENT OFFICE.

HORACE WARREN HIGLEY, OF CURTISVILLE, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR MAKING PAPER-PULP FROM WOOD.

Specification forming part of Letters Patent No. **130,803**, dated August 27, 1872.

To all persons to whom these presents may come:

Be it known that I, HORACE WARREN HIGLEY, of Curtisville, of the town of Stockbridge, of the county of Berkshire and State of Massachusetts, have invented a new and useful or Improved Machine for Reducing Wood for its Conversion into Paper-Pulp; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 is a top view; Fig. 2, a side elevation; and Fig. 3, a vertical section of the machine, it being taken diagonally or obliquely of the frame in order to exhibit the presser and the block-receiver. Fig. 4 is a top view of the upper plate of the frame, showing the hole u^1 thereof for reception of the block, and representing such hole as arranged a little out of range with the center of the plate or shaft of the grinder, the purpose of such disposition of the hole being to retain against the block the water used in grinding or reducing it, or prevent in a measure such water from being thrown from the block by centrifugal force.

My improvement consists in substituting for the weights and springs used for the same purpose in the ordinary wood-reducing machines the device, hereinafter described, for forcing a block of wood down upon a grinding wheel or disk, the same consisting of a positive train of gears, constructed, arranged, and regulated as specified, and operated by connection with the shaft of the grinding-wheel, all as hereinafter more particularly set forth.

In the drawing, A denotes the frame or table of the machine, its top being provided at its center with a hole, *b*, to receive the vertical shaft *c* of the grinding-wheel B, which is a metallic disk, having a coating of sand, emery, or other suitable reducing material applied and fixed to its upper face. The lower end of the shaft *a* enters a cylindrical step, *d*, and rests on three balls or spheres, *e e e*, (see Fig. 5, which is a top view of the step,) placed within its step or on its bottom. The step being filled or partially filled with oil the balls will be more or less immersed therein and will turn with the shaft and cause it to run with little friction. The shaft, duly supported by a bearing in a cross-bar, *f*, has a screw or worm, *g*, fixed on it. This screw engages with a gear, *h*, which revolves on a horizontal shaft, *i*, provided with a lantern-pinion, *k*, the gear *h* being forced up against one head of such pinion by a friction-nut, *l*, screwed on a screw, *a'*, formed on the shaft *i*. The purpose of the nut and its screw is to enable the gear to revolve upon and independently of the shaft, so as to prevent accident or breakage of the train or its teeth, during the feeding of the block of wood downward and to insure the depression of the block in proportion to the ability of the grinding-wheel to reduce it. Connected with the pinion *k* is a train, *m n o p*, of gears, fixed on two shafts, *q r*, arranged in the frame as represented. An upright toothed rack, *s*, engages with the last gear *p* of the train and extends up from a head or presser, *t*, arranged within an open guide or block-receiving chamber, *u*, raised on the table top and above its block-opening u^1, in manner as shown. The rack-bar is kept in engagement with the gear *p* by an eccentric, u^2, fixed on a shaft, *v*, provided with a handle or arm, *w*. A notched wheel, *x*, fixed on the said shaft, operates with a spring-catch, *y*, all being as represented in the drawing.

By forcing the arm *w* down to a stop, *z*, the eccentric will be brought into a position to allow of the engagement of the rack with its gear, the arm being held down by the action of the spring-catch on the wheel *x*. By raising the arm the rack may be disengaged with the pinion.

When this machine is in use water is to flow upon the grinding-wheel through the hole at the center of the table top. The block of wood to be reduced is to be laid in the receiving-chamber so as to extend through the aperture u^1 at its bottom and rest upon the grinding-wheel. The presser is to be let down upon the block and the racks put in engagement with its pinion. On putting the grinding-wheel in revolution, by power suitably applied to its shaft, the block will be steadily forced downward until it may have been thoroughly ground up or reduced to pulp, the pressure on the block depending on the amount of friction generated by the friction-nut.

I make no claim to anything, arrangement, or combination of devices as shown or described in the patent No. 59,042 granted October 23, 1866, to Hand F. Marx. I do not use a band-wheel and weight in connection with a rack

and pinion for actuating the presser, as I employ for actuating the rack of the presser a positive train of gears, and have one of such gears to run loosely on its arbor, and to be held thereto by friction devices—viz., the nut *l* and the screw *a'*—the train being actuated by a worm-gear.

I therefore claim—

1. The arrangement and combination of the friction-nut *l* and its screw *a'* with the presser, its rack *s*, and operating train, as specified, such being arranged with a grinding-wheel, as set forth.

2. I claim the arrangement of the block-receiving aperture a^1—viz., so as to range a little aside of the grinding-wheel shaft—in manner as represented, and for the purpose as described.

3. I also claim the combination and arrangement of the eccentric a^2, the shaft *v*, the arm *w*, the stop *z*, the catch-wheel *x*, and spring-catch *y*, and their combination and arrangement with the presser *t* and its rack-bar *s*, the grinding-wheel B, its shaft, and the friction-nut *l* and screw *a'*, the worm *g*, and the train of gears *h k m n o p*, all as set forth.

HORACE WARREN HIGLEY.

Witnesses:

R. H. EDDY,

J. R. SNOW.