

(No Model.)

2 Sheets—Sheet 1.

W. MERRILL.  
WOOD CUTTING MACHINE.

No. 526,043.

Patented Sept. 18, 1894.

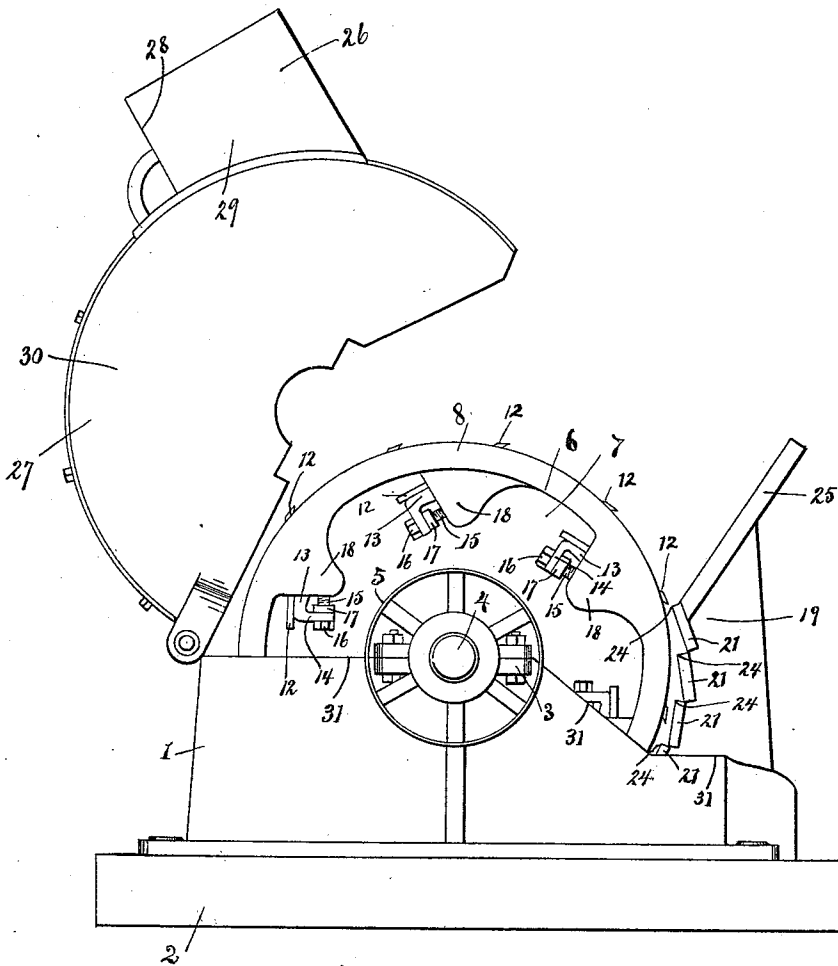


Fig. 1.

Attest.  
J. P. Becklissinger.  
C. F. Flues.

Inventor  
William Merrill  
By Jas E Thomas Atty.

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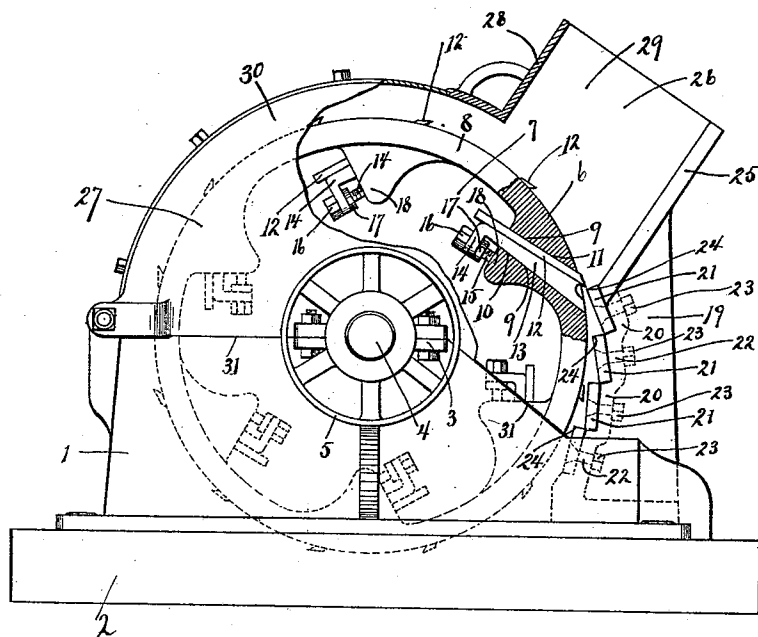


Fig. 2

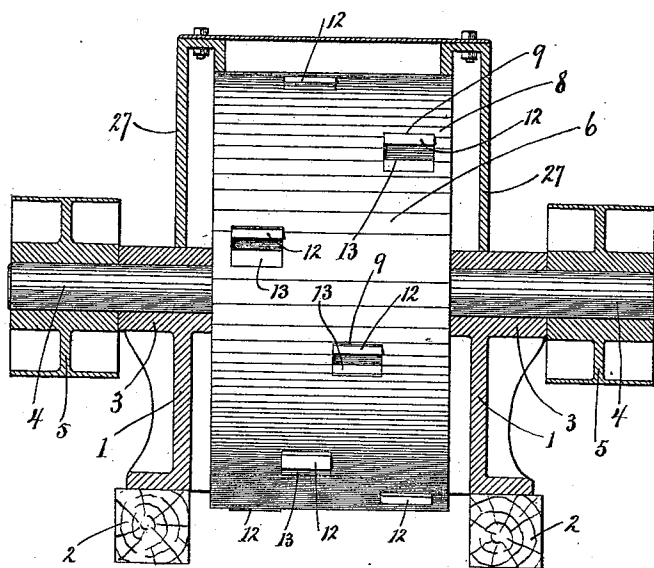


Fig. 3.

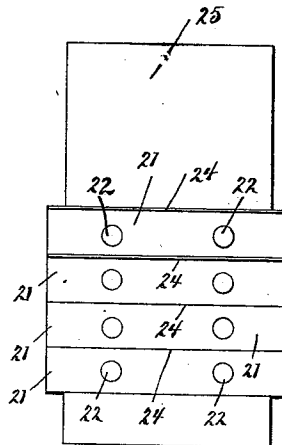


Fig. 4.

Attest  
J. T. Becklissinger.  
C. F. Flues.

Inventor.  
William Merrill  
By Jas. C. Thomas Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM MERRILL, OF SAGINAW, MICHIGAN, ASSIGNOR OF ONE-HALF TO  
SYLVANIS S. MITTS, OF SAME PLACE.

## WOOD-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,043, dated September 18, 1894.

Application filed November 28, 1892. Serial No. 453,386. (No model.)

### *To all whom it may concern:*

Be it known that I, WILLIAM MERRILL, a citizen of the United States, residing at Saginaw, (East Side,) in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Wood-Cutting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in wood cutting machines of the class used for cutting wood, particularly refuse of mills, &c., into short lengths or fine pieces, and the invention pertains more particularly to improvements in the wood cutting machines described and claimed in Letters-Patent issued to E. G. Pake, September 7, 1886, and to myself June 19, 1888, No. 384,704, and the object of the invention is to provide a machine for  
20 cutting wood into short lengths or fine pieces with a wheel in which a series of knives is so arranged in its periphery that each knife will cut over a portion only of the transverse dimension of the throat or feeding aperture, whereby the strain upon the wheel is greatly  
25 lessened and a steady and more even cutting action is obtained.

Another object is to provide a machine having a wheel provided on its periphery with a series of projecting knife edges for cutting  
30 wood into short lengths, with a series of throat plates or cutting edges arranged successively in close proximity to the concave line of travel of the knife edges, whereby  
35 each succeeding plate or edge will assist in reducing the cuttings to a smaller and finer dimension until the material is reduced to cuttings which are capable of being carried in conveyers without liability of clogging the same or which are capable of being drawn  
40 through pipes by an exhaust fan for conveying and boiler furnace feeding.

Another object of the invention is to provide an improved form of feed spout and wheel cover which will afford more convenient access to the edges of the throat plates and to the knives in the wheel, and enable the easy removal of the wheel from the casing when required.

50 My invention consists in a wheel carrying knives with their edges projecting from its

periphery and revolving in close proximity to a series of stationary throat plates, and also in the combination, arrangement, and construction of the several parts and devices assembled, and in the operation and action of the same as I shall hereinafter more fully describe and which will also be specifically pointed out in the claims of this specification.

My invention is illustrated in the accompanying drawings, in which—

Figure 1. is a side view in elevation of my improved machine with the cover thrown back for exposing the wheel. Fig. 2., represents a side elevation partly in section of my improved wood cutting machine. Fig. 3., is a vertical central section of the same, and showing the face of the wheel. Fig. 4., is a view of the face of the series of throat plates detached.

1, represents the lower stationary portion of a frame which rests on a convenient foundation 2, and is provided with boxes 3, on the upper portion of its sides, and in these boxes is journaled a shaft 4, carrying pulleys 5, on its outer ends, while on the central portion of the shaft between the journals is mounted a wheel 6. This wheel is provided with a centrally located web 7, and with a rim 8, which projects on each side of the web, and through this web is arranged a series of openings 9, which have a suitable pitch toward the line of motion of the wheel, and are also provided on their front sides with a wall 10, inclining inwardly toward the rear wall 11, so as to form an opening of greater dimension at its outer than at its inner end, and 12, are knives of a chisel form resting against the wall 11, and with their edges projecting beyond the peripheral face of the wheel to the required distance, and 13, are keys of a suitable taper to fit the openings in front of the knives. Each key is provided on its inner end which projects beyond the opening, with an outwardly turned end portion 14, through which is passed a bolt 15, having on its outer portion a head 16, while on the inner side of the portion 14, the bolt is provided with a collar 17, and with a threaded end which is passed into a threaded opening in the reinforcement 18, projecting inwardly from the rim 8, so that as the bolt is turned in the proper direction the wedge or key is drawn inwardly

and tightened upon the knife so as to firmly fix and retain the knife in position.

The openings 9, are of a transverse dimension to extend only over a portion of the rim and are located so that each succeeding knife will cut over a different space from that traversed by the knife coming before or after, so that two or more knives will be required to cover the full width of the wheel.

The front portion 19, of the wheel casing is provided with a series of transverse steps 20, arranged in a concave form corresponding to the periphery of the wheel and in these steps a series of throat plates 21, is secured by bolts 22, which pass through the plates and the portion 19, and are held in position by nuts 23, with their upper inner edges 24, just clearing the projecting cutting edges of the knives 12.

Above the portion 19, an upwardly inclined outwardly projecting shelf 25, is provided which forms the bottom of a spout 26, for feeding the material to the machine, and at the rear transverse portion of the casing 1, is hinged the rear end of a cover 27, which is of a suitable contour to cover the wheel and form the upper portion of the casing proper, and is provided on its front end with an outwardly projecting upper side 28, and with lateral sides 29, which, when the cover is in position for work, fit upon the lateral edges of the shelf or bottom 25, to form the spout 26, before mentioned.

The lateral sides 30, of the cover are so arranged as to reach downwardly to the center of the shaft 4, and have their lower edges arranged to fit over the boxes 3, and have their forward portions extended downwardly beside front portion 19, to fill out the sides of the casing to the line 31, shown in Fig. 1, so that when the cover is lifted it turns upon its hinge and the entire upper portion of the wheel, the boxes, and spout as well as the lateral sides of the throat plates 21, are exposed to full view to enable the wheel knives to be taken out with great ease for grinding and to be properly adjusted for cutting to the best advantage, and also allows the throat plates to be removed for refitting and sharpening without trouble or loss of time, and provides for the easy removal of the wheel.

When the cover is in position over the lower casing, motion is imparted by belts from some suitable source of power to revolve the wheel with the cutters passing downwardly over the throat plates, and the material such as wood of any ordinary length, saw mill or other refuse of a like nature, is passed into the spout above the upper throat plate of the series and against the periphery of the wheel, and the revolving cutters then coming in contact therewith, short pieces are cut off and carried below, each knife reaching over a portion only of the width of the spout, so that only a narrow section of wood is severed by a single knife while the next succeeding knife removes another section beside

the one cut off before, so that while pieces of considerable width may be fed into the spout, each knife makes its cut of a small section only, while the whole series of knives traverse the entire width of the piece and remove the cuttings without making a broad and entire cut of the whole, and thereby producing a great strain and jar upon the machine, and jerk upon the material.

While operating upon material of considerable length, and which from its form is more conveniently presented endwise to the knives, the upper throat plate is sufficient to cut the pieces to coarse chips but when the cuttings are required to be finer or when material of short lengths, such as shingle refuse, &c., is fed into the spout, long slivers are liable to be cut and carried down, and when the series of throat plates is used the coarse chip or long sliver which passes the first plate is caught by the next succeeding plate and again reduced in dimension, and again by the next plate, and so on until the cuttings are reduced to the desired degree of fineness, to be readily drawn through pipes by an exhaust fan, or to be easily carried by conveyers without liability of clogging and stopping the machinery.

Of course it will be understood that while I have illustrated the series of throat plates as applied to a wheel having a series of knives each extending only over a portion of the transverse dimension of the periphery of the wheel, I do not limit my invention to this construction of the wheel as any form of wheel or cutters desired may be used with substantially the same effect as far as the throat plates are concerned, as a wheel having the knives extending entirely across, or in a V form, like the device shown in the patent to Pake before mentioned would operate the same, as to cutting fine product, the form of the throat plates being arranged to conform to the shape of the wheel knives. It will also be noticed that the advantage of this improvement is very great as with the common Pake machine before mentioned, the product is not sufficiently fine to admit of its being successfully transferred by air blast devices and when fine material like shingle refuse is passed through; a portion thereof is divided lengthwise having the product containing long slivers which are liable to clog conveyers and cause great delay and trouble whereas by the extra throat plates these slivers leave the machine in a finely divided state, and present no impediment to conveyers of the ordinary kinds, either chain or air blast, besides making the product in a form which renders it easy of consumption in the refuse burner or in a condition to be fed by air blast to the boiler furnace of the manufactory.

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

1. In a wood cutting machine consisting of a revolving cylinder carrying knives, and a

frame for supporting the cylinder, the steps 20 arranged to hold the throat plates 21 at equal distances from the cylinder substantially as described.

5 2. In a wood cutting machine of the class described, a frame having the steps 20, and the throat plates, 21, in combination with a cover hinged at one end to the frame, and having its opposite end supported by the projecting shelf, 25, arranged substantially as described.

10 3. In a wood cutting machine of the class described, a supporting frame having the steps, 20, the throat plates, 21 combined with the projecting shelf, 25, forming the bottom of the feed spout substantially as described.

15 4. In a wood cutting machine of the class described, the combination of a revolving cylinder carrying knives, a hinged cover, and a supporting frame having the throat plates, 21, supported in the steps, 20, arranged in the manner and for the purpose set forth.

5. In a wood cutting machine of the class described, the combination of a knife bearing cylinder, a cylinder cover, and a supporting frame having the projecting shelf, 25, the steps, 20, and the throat plates, 21, arranged substantially in the manner and for the purpose set forth.

6. In a wood cutting machine of the class described a supporting frame, having the steps, 20, and the throat plates 21, in combination with the projecting shelf, 25, and the hinged cover having a projecting feed spout, with the lower edges of the feed spout abutting against the projecting shelf 25, substantially in the manner, and for the purpose set forth.

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

WILLIAM MERRILL.

Witnesses:

G. PURSEL THOMAS,  
JAS. E. THOMAS.