(No Model.)

D. R. EDWARDS.

WOOD CUTTING MACHINE.

No. 524,274. Patented Aug. 7, 1894.

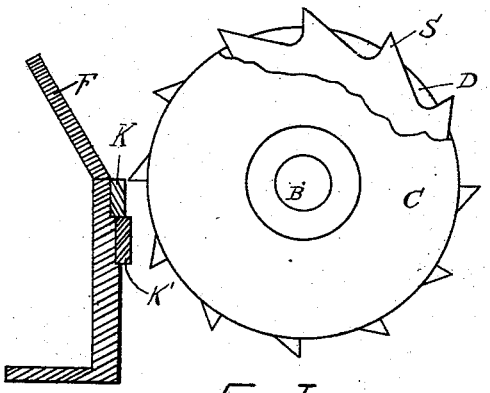

Fig I.

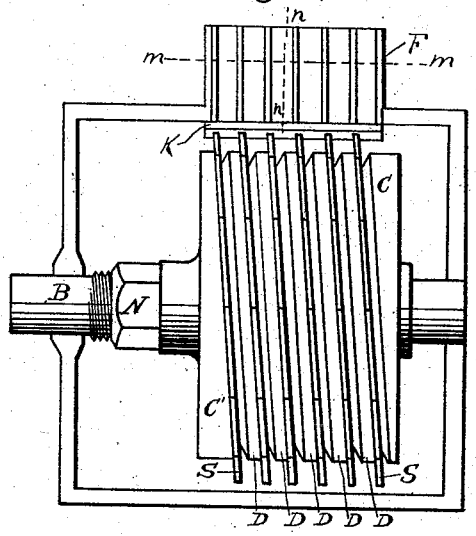

Fig II.

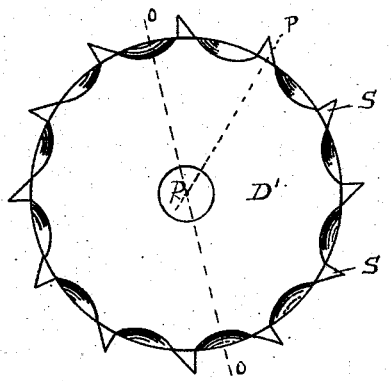

Fig IV.

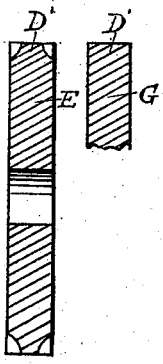

Fig V.

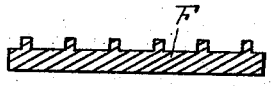

Fig VI.

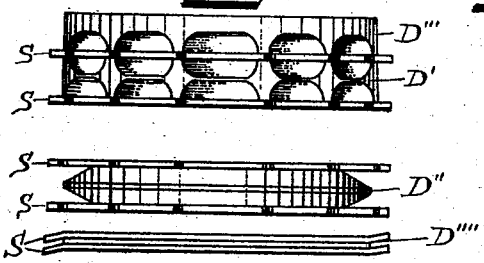

Fig III.

WITNESSES:

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BY

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UNITED STATES PATENT OFFICE.

DANIEL R. EDWARDS, OF SAGINAW, MICHIGAN.

WOOD-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,274, dated August 7, 1894.

Application filed February 19, 1894. Serial No. 500,638. (No model.)

To all whom it may concern:

Be it known that I, DANIEL R. EDWARDS, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Wood-Cutting Machines; 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.

My invention relates to improvements in machines for cutting wood, consisting of a frame supporting a revolving cylinder carrying saws, in conjunction with a spout for receiving the material to be cut, and a throat plate or bed knives upon which the material rests while being cut.

My invention is somewhat similar in construction, and used for similar purposes to the machine described in United States Letters Patent issued September 7, 1886, No. 348,768, and June 19, 1888, No. 384,704, and April 29, 1890, No. 426,946.

The objects of my invention are to provide an improved arrangement for the cutting cylinder by substituting saws instead of knives, and arranging them in a novel manner in connection with the collars by which they are held. Also to provide improved forms of collars, and an improved form of feed plate or spout upon which the material to be cut is fed. The other machines of this class, heretofore used and described in patents above cited, have wide knives and cut chips of more uniform shape, while this improved machine, while cutting against the side of the grain of the wood, in which method it is intended principally to be used, tears the wood into shreds, making the chips very superior for many purposes.

In the drawings, Figure I, is an end elevation of the cylinder, composed of collars, disks, and saws, showing also a cross section of the bed knives and front end of the frame which supports the revolving cylinder. Fig. II, is a top view of the cylinder with its shaft and a portion of the frame, showing also a feed spout and bed knives. Fig. III, shows the top view of different forms of disks which may be placed between the saws. Fig. IV, is a side elevation of one form of disk with saws. Fig. V, shows cross section through the disk shown in Fig. IV, and Fig. VI, shows a cross section of the feed spout or plate shown in Figs. I, and II.

The cutting cylinder A, in Fig. II, is composed of the collar C, fastened to the shaft B, and another collar C′, loose on the shaft, the saws S, and the disks D, between the saws, the whole being clamped against the collar C, by means of the nut N, screwed on the shaft B. The collars C, and C′, having their inner faces of parallel plane surfaces not at right angles with the center of the shaft B, thus tipping all the disks D, and saws S, to the same angle, thereby causing different teeth of the saws S, to cut in separate planes of revolution, so that in operation the saws cut across the whole surface of the pieces being operated upon.

The disks D, are made somewhat smaller than the diameter of the saws S, and one corner of the disks is cut away, as shown in Fig. II, or both corners may be cut away as shown in D″ of Fig. III. This is done in order that the chips cut may not fill up under the teeth of the saws, but by the expanded opening a good clearance is given for them.

Another form of disk is shown by D′, Fig. IV, and Fig. III. In this form of disk the corners are not cut away throughout the whole circumference, but only portions are cut out in the corners of the disks, in places corresponding to the gullets between the teeth of the saws. These cavities serve the same purpose of affording a clearance for the chips and may be made only in one side of the disk, instead of both sides, as shown by D‴.

In all the forms of the disks either D, or D′, or D″ the outer circumference forms the surface against which the sticks to be cut strike as they slide down the feed spout F, and the distance which the teeth of the saws S, project beyond the circumference of the disks D, D′, or D″ determines the coarseness of the chips to be cut.

The shape of the disk D′ is further shown in Fig. V, in which E, is a section of the disk through the line O O, and G, is a section of the disk through the line P—P.

When narrow sticks are presented endwise to the cylinder A, they sometimes get between the saws and are moved laterally to and fro by the saws without being cut. To obviate this feed spout F, in Figs. I, and II, is arranged with small ribs or corrugations on the upper surface, as shown in Fig. II, and in Fig. VI, which shows a cross section on the line *m. m.* of Fig. II; the cross section in Fig. I, being on the line *n. n.*

In operation, it is the intention when the saws S wear smaller to make the collars C, and C′, and the disks D′ and D″ smaller, or smaller disks may be substituted for those which are too large, and with the disks D′ it is the intention to have two or more sizes so that smaller ones may be used successively as the saws wear away.

Instead of the ordinary form of solid tooth saws as shown, any ordinary form of inserted tooth saws may be used, and thus obviate the difficulty of the wearing away of the saws, and the necessity of reducing the size of the disks and collars.

When the material to be cut slides down the incline surface of the feed spout F, of Fig. I, it rests on the corner of the hardened steel bed knife K, and is cut off by the saws S. Another bed knife K′ can be used which will serve the purpose of cutting the material finer than when only one is used.

I am aware that in machines used for other purposes it is customary to have the saws clamped between the collars whose faces are not square with the axis of revolution, but any ordinary arrangement where the collars and the disks are much smaller than the diameter of the saws would not work in this machine. If the saws project considerably beyond the circumference of the collars and the disks, say one or more inches, the sticks to be cut, which fall by gravity down the inclined feed plate, would not stop until they had fallen against the disks, which would result either in the breaking of the saws, or the chips would be too coarse, and if the pieces which were to be cut were smaller than the distance between the saws, and should strike endwise between them, the saws would pull them through, breaking them in quite long pieces instead of cutting them into chips of the proper size, so that it is quite essential for the proper operation of the machine that the collars and disks be nearly as large as the saws.

In practice it is customary to have the teeth of the saws project from about one-eighth to one-half of an inch, depending on the kind of material to be cut, and the desired coarseness of the chips; and as the space between the disks immediately in front of the saw teeth would become clogged by accumulation of small chips, it is quite essential that the collars be constructed to afford clearance for the chips in the method above described.

It is my intention to use any ordinary frame and bearings to support the cylinder A, by its shaft B, and the frame being similar in construction to those shown in the patents above cited,—the cylinder A, having a cover over it similar to those machines.

I do not claim as new the bed knives K, and K′, or the inclined feed spout shown in F, of Fig. I, my invention in that part being confined simply to the ribs or corrugations of the feed spout, as shown in Figs. VI, and II.

It is obvious, of course, that any number of saws and disks can be used, making the cylinder long enough to admit sticks full length sidewise against the cylinder; and the disks be of any thickness suitable, their angle of inclination with the axis being determined according to their thickness, so that the saws may cut across the whole surface.

While I prefer the construction above described, it is obvious that by using very thin disks, about the thickness of the saws, thus increasing largely the number of both disks and saws, and having the disks entirely plain on their outer circumference, and almost as large in diameter as the saws, that the machines would operate practically in the same manner and equally as well. If, when thus constructed, each alternate tooth in the saws should be bent sidewise as shown at D″″, Fig. III, or set in opposite directions to the extent equal to one half the thickness of the disks, so that the teeth when thus set in all the saws would cover all the disks, it is obvious that the saws might revolve in planes at right angles with the axis of revolution and still cut across the whole surface of the piece being operated upon; so that I do not wish to confine my invention to the use of saws which are not set square with the axis of revolution.

It is also obvious that the disks between the saws could be made extremely thin, or be entirely omitted, and the whole cutting cylinder be composed of saws tightly clamped together. This arrangement would also be equally effective in cutting the wood into chips. And so while I may use this arrangement in machines of small capacity, where the cutting cylinders are short, and consequently the number of saws would be small, in larger machines the increased cost of the increased number of saws would lead me to prefer to fill up between the saws with disks, as before described.

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

1. In a machine for cutting wood, a frame supporting a revolving cylinder composed of two collars clamping between them saws and disks, one or both of the corners of the disks adjacent to the saws being cut away for the clearance of the chips, substantially as described.

2. In a machine for cutting wood the combination with a frame and an inclined feed spout having on its upper surface ribs or corrugations, of a revolving cylinder journaled in the frame consisting of collars and disks

and saws between the disks clamped together by collars, substantially as and for the purpose set forth.

3. In a machine for cutting wood the combination with a frame having an inclined feed spout upon the upper surface of which are ribs or corrugations in the line of the feed, of a revolving cylinder composed of a series of saws and disks between the saws, the saws and disks clamped between collars whose inner surfaces are parallel planes and not at right angles with the axis of revolution of the cylinder, substantially as and for the purpose set forth.

4. In a machine for cutting wood, the combination of a frame supporting a revolving cylinder composed of two collars clamping between them saws and disks, the disks having cavities in their outer edges corresponding and adjacent to the cavities between the teeth of the saws, for the clearance of the chips, substantially as described.

5. In a machine for cutting wood, the combination of a frame supporting a revolving cylinder, composed of two collars clamping between them saws and disks, the disks having cavities in their outer edges corresponding and adjacent to the cavities between the teeth of the saws for the clearance of chips, in combination with an inclined feed spout, and one or more bed knives, substantially as described.

6. In a machine for cutting wood, the combination of a frame supporting a revolving cylinder composed of two collars with their inner surfaces consisting of planes parallel but not at right angles with the axis of revolution, and clamping between them saws and disks, the disks having cavities in their outer edges corresponding and adjacent to the cavities between the teeth of the saws, for the clearance of chips, substantially as described.

7. In a machine for cutting wood, the combination of a frame supporting a revolving cylinder composed of two collars with their inner surfaces consisting of planes parallel but not at right angles with the axis of revolution, and clamping between them saws and disks, the disks having cavities in their outer surfaces corresponding and adjacent to the cavities between the teeth of the saws, for the clearance of chips, with an inclined feed spout and one or more bed knives, substantially as described.

8. In a machine for cutting wood, a frame having an inclined feed spout, and carrying a revolving cylinder composed of two collars clamping between them saws and disks, the disks extending to partly inclose the teeth of the saws, substantially as described.

9. In a machine for cutting wood, a frame having an inclined feed spout, and carrying a revolving cylinder composed of two collars clamping between them disks and saws, the teeth of the saws being bent so as to entirely cover the disks, substantially as described.

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

DANIEL R. EDWARDS.

Witnesses:
JOHN Q. ANDERSON,
NINA J. DAVIDSON.