(No Model.) 2 Sheets—Sheet 1.

C. L. MERRILL.

MACHINE FOR CUTTING VENEERS.

No. 384,057. Patented June 5, 1888.

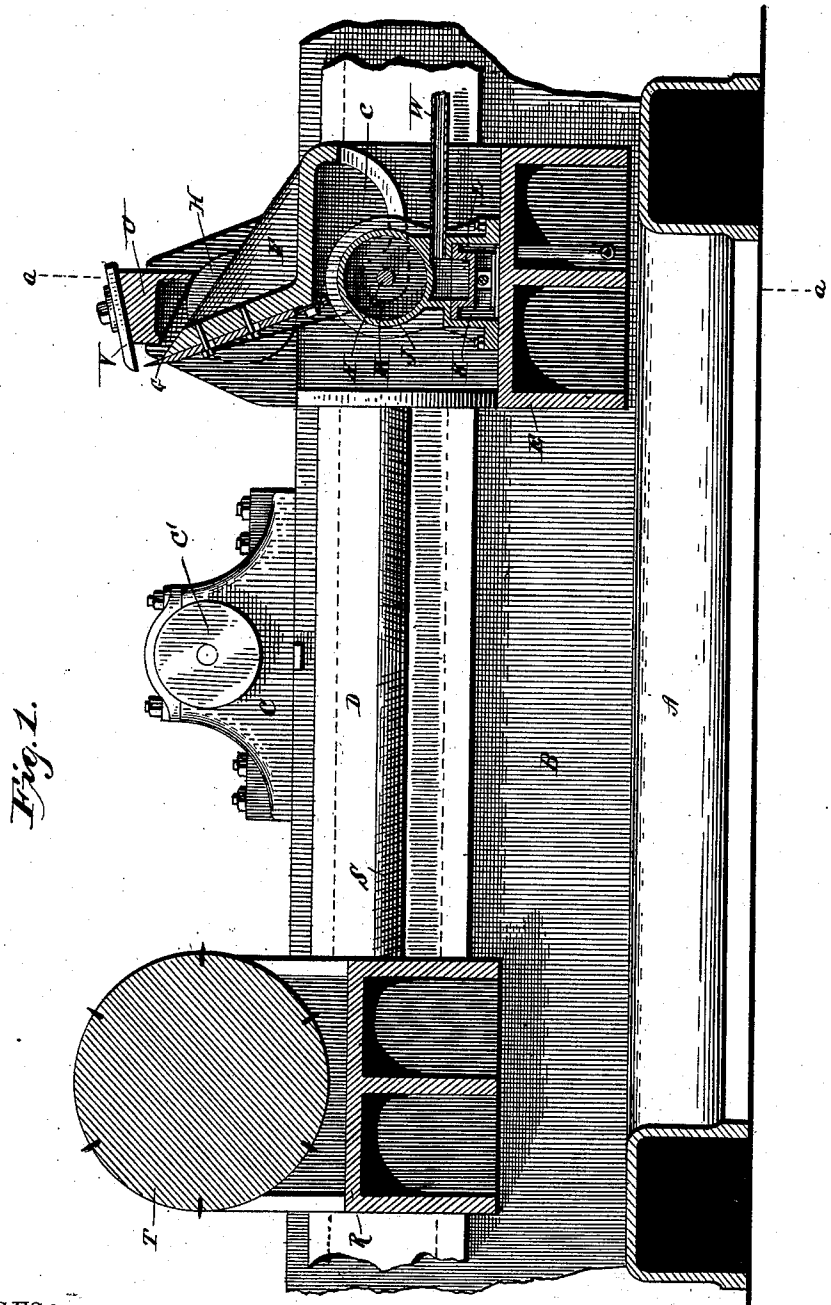


Fig. 1.

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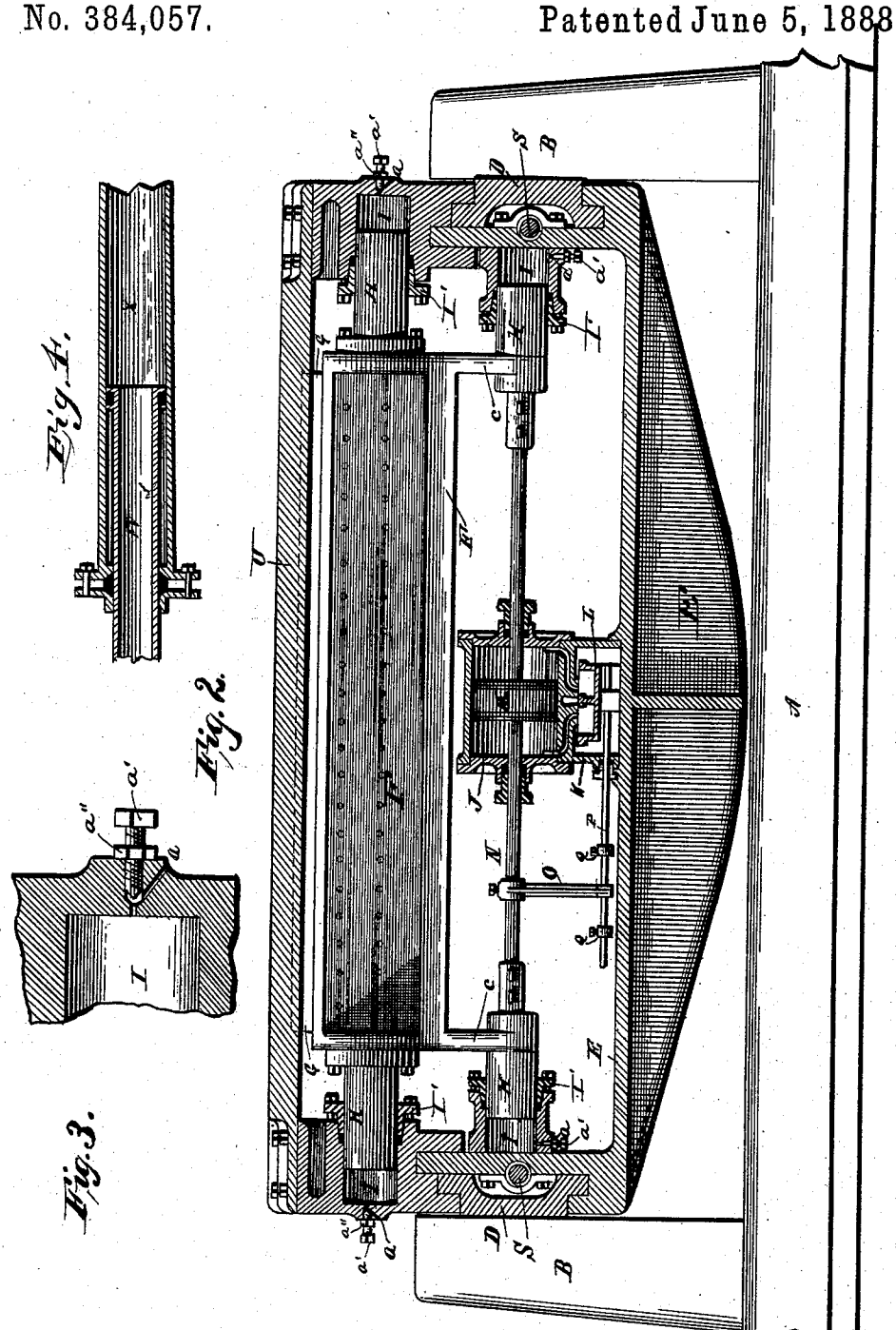
N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. L. MERRILL.

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UNITED STATES PATENT OFFICE.

CHARLES L. MERRILL, OF INDIANAPOLIS, INDIANA.

MACHINE FOR CUTTING VENEERS.

SPECIFICATION forming part of Letters Patent No. 384,057, dated June 5, 1888.

Application filed March 3, 1888. Serial No. 266,082. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. MERRILL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Machines for Cutting Veneers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to certain new and useful improvements in machines for cutting veneers, thin box-lumber, &c.; and it relates particularly to that class or character of machines in which the veneer is cut from a revolving log into a continuous sheet by means of a reciprocating knife, the said knife being mounted upon a table which is adapted to be advanced toward the revolving log at a rate corresponding to the thickness of the veneer being cut therefrom, as will hereinafter more fully appear.

The invention has for its objects, essentially, to so improve the mechanism for reciprocating the knife while the same is in contact with and cutting from the revolving log that there will be no jar or lateral vibration of the knife whatever, the knife being given a rapid, smooth, and perfectly true reciprocatory movement, whereby the veneers cut by this class of machines will be much improved, and will be perfectly free from all blemishes and shatters on both of their surfaces. Another object I have in view is to so construct the knife-reciprocating mechanism that it will be under perfect control of the operator, enabling him to stop and start the knife instantly and altogether independently of the machinery for revolving the log and advancing the knife-table, and to vary the speed of the knife according as the diameter of the log decreases, as will presently appear.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a transverse sectional view of a machine for cutting veneers, only so much of the machine being shown as is necessary to clearly illustrate the application of my invention to it; Fig. 2, a sectional view on the line *a a* of Fig. 1. Fig. 3 is a detail sectional view of the adjustable air-passages of the air-chambers, and Fig. 4 a detail view of the pipes for conveying steam to cylinder mounted upon the traveling table.

In the drawings, the letter A designates the bed-plate of the machine, and B the supports for the machinery and ways, these supports being mounted upon and firmly bolted to the said bed-plate. Upon the supports B are bolted the usual pillow-blocks, C, for the support of the usual spindles, and chucks C′, which revolve the log. To the inner sides of the supports B are firmly bolted or otherwise secured the flanged ways D, and upon these ways is adapted to travel the knife-table E, the ends of the table embracing the ways, as shown. Upon the traveling table is mounted the reciprocating knife-frame and the mechanism for reciprocating it, which will now be described.

The knife-frame proper is designated by the letter F, and is constructed in any approved manner, the knife G being adjustably bolted to its inner face in the usual manner, so that the knife will be approximately tangential to the periphery of the revolving log.

The reciprocating knife-frame is supported in a perfectly-horizontal position upon the traveling table by means of trunnions or plungers H, secured to or formed on the ends of the knife-frame and working in air chambers or cylinders I, bolted upon or otherwise secured to the ends of the knife-table. The plungers on the knife-frame fit snugly in the air-chambers and are made air-tight by means of adjustable packing-glands I′, which surround the plungers and are bolted to the said chambers, as shown. Each one of the air-chambers is provided with an air-passage, *a*, the area of which may be varied by means of an adjusting-screw, *a′*, as clearly shown in Fig. 3 of the drawings.

The letter *a* designates a binding-nut upon the screw *a′*, to prevent the same from turning when once set.

The object of these air chambers or cylinders is to assist in running the knife smoothly and truly without the slightest jar or lateral vibration to the knife, it being evident that the portion of the air that is unable to escape from the air-chambers through the air-passages will be compressed at every reciprocation of the knife-frame, and thereby serve to

cushion the same. By means of the adjustable openings in the rear ends of the air-chambers, it will be obvious, the ingress and egress of air to the chambers may be regulated, whereby the operator will be enabled to vary the resistance offered to the knife-frame by the air-chambers.

The knife-frame is reciprocated by means of a small air, gas, or steam engine, (preferably the latter,) which is mounted upon and travels with the traveling table.

The letter J designates a steam-cylinder bolted securely to the traveling table, and provided with a steam-chest, K, in which works a slide-valve, L, which controls the admission of steam to the cylinder, all of these parts being practically the same in construction as in the ordinary steam-engine.

M designates the piston of the cylinder, which is attached securely to a piston-rod, N, the latter extending out through stuffing-boxes in both heads of the cylinder and attached to arms *c c* on the opposite ends of the knife-frame, as shown. Secured adjustably on the piston-rod is a downwardly-extending arm, O, through an eye in the end of which passes the stem P of the slide-valve. On each side of the arm O on the valve-stem is adjustably secured stops Q Q, against which the said arm O impinges when the piston-rod is reciprocated. By means of these adjustable stops and arm, it is obvious, the slide-valve in the steam-chest may be operated at the proper time to admit steam to the cylinder to move the piston. It is also obvious that the slide-valve may be operated in any of the well-known or approved ways. Therefore I do not wish to confine myself to the means herein shown for operating the valve.

The letter R designates the usual back-roller carriage or table, which is mounted on the ways D and connected to and operated simultaneously with the knife-table by means of the usual right and left leading-screws, S. Upon the table R is journaled the usual back roller, T, provided with knives in its periphery, which make incisions in the log as it revolves.

The letter U designates a bar or brace bolted to the traveling table and extending across the top of the same parallel with the knife, this bar having bolted to it the cutters or scorers V.

The letter W designates the pipe which conveys steam to the cylinder on the traveling table. This steam-pipe may be connected to the stationary steam-conducting pipe X in any suitable manner—such, for instance, as that shown in Fig. 4, wherein it is inserted in the said steam-pipe X and reciprocates therein as the traveling table reciprocates—both pipes being provided with suitable packings to prevent the escape of steam.

In this class of machines it has heretofore been attempted to reciprocate the knife-frame by means of eccentrics, pitman-rods, cranks, &c.; but this method has been found to be impracticable, the principal reason being that on account of the rapid and continuous movement of the knife the loose connections, pins, &c., soon become so worn and loose that the movement of the knife will be so irregular and untrue that it is utterly impossible to cut a veneer free from checks and rough places. It is therefore the special object of my invention to remedy this fatal defect in this class of machines, and I accomplish this object by the means herein shown and described. By the means I employ for operating the knife-frame there will be no parts to become speedily loose from wear, as the piston-rod at both of its ends is rigidly connected to the knife-frame, thus insuring at all times a perfectly steady and true movement of the knife and the production of a veneer that will be entirely free from blemishes, shatters, and checks. Another advantage in operating the knife-frame in this manner is, that it will be entirely independent of the rest of the mechanism of the machine, thus enabling the operator to increase or diminish the speed of the knife at will—a result not accomplished by any other machine that I am aware of. This advantage is of paramount importance, since it is necessary, to insure a perfect veneer, that the speed of the knife should be decreased as the log becomes smaller.

In order to assist the air-cylinders in cushioning the knife-frame, the slide-valve is so adjusted that live steam is let into the cylinder behind the piston just before it reaches the end of its full stroke, the live steam thus let in serving to effectually cushion the knife-frame, prevent all jar, &c. The advantage of thus cushioning the knife-frame in its reciprocatory movements will be obvious, particularly in heavy machines.

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

1. The combination of the supports, ways, the knife-table traveling upon the said ways, a reciprocating knife-frame mounted in bearings in the said knife-table, a knife secured upon the knife-frame, a piston-rod connected to the said reciprocating knife-frame, a piston upon the piston-rod, and a cylinder in which the said piston works, this cylinder being mounted upon the traveling knife-table, substantially as herein described.

2. The combination of the traveling knife-table, the reciprocating knife-frame mounted thereon, the knife secured to this frame, the piston-rod rigidly connected at both of its ends to the knife-frame, a piston on the rod, and a cylinder in which the piston works, the said cylinder being mounted on the traveling carriage, whereby the knife is given a smooth and true reciprocating movement as the knife-table advances.

3. The combination of the traveling knife-table, the reciprocating knife-frame mounted thereon, the knife on the knife-frame, the piston-rod rigidly secured to the said reciprocating knife-frame, the piston on this rod, the cylinder in which the piston works, this cylin-

der being mounted upon the traveling carriage, the steam-chest and slide-valve therein, the latter being provided with a stem, the adjustable stops on this stem, and the adjustable arm on the piston-rod, as and for the purpose specified.

4. The combination, with the knife-table and the air-cylinders secured thereon, of the reciprocating knife-frame provided with plungers or pistons which work in the said air-cylinders, the knife secured to the knife-frame, and means for reciprocating the said knife-frame.

5. The combination, with the knife-table and the air-cylinders thereon, the latter being provided with adjustable openings, of the knife-frame provided with plungers or pistons which work in the said air-cylinders, the knife secured to the knife-frame, and means for reciprocating the knife-frame.

6. In a veneer-cutter, the combination, with the traveling knife-table and the air cylinders or chambers thereon, of the knife-frame provided with pistons or plungers working in the said air-cylinders, a knife on the frame, a piston-rod rigidly connected at both of its ends to the said knife-frame, a piston on this rod, and a cylinder in which this piston works, the said cylinder being mounted upon the traveling knife-table, as and for the purposes set forth.

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

CHARLES L. MERRILL.

Witnesses:

T. R. BELL,

EUGENE BRETNEY.