

(No Model.)

2 Sheets—Sheet 1.

F. WHEELER.
MAT CUTTING MACHINE.

No. 513,851.

Patented Jan. 30, 1894.

Fig. 1.

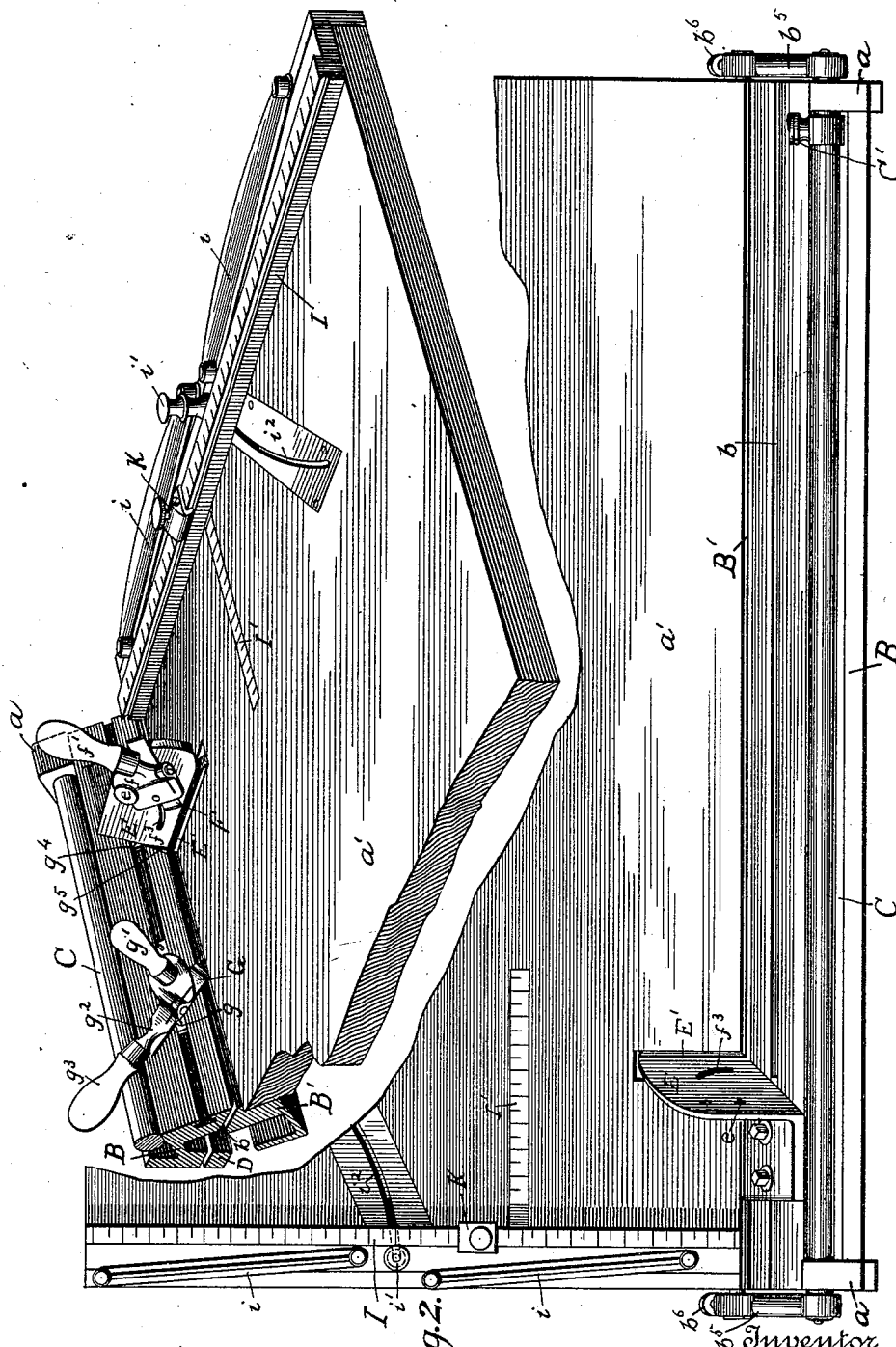


Fig. 2.

Witnesses
Raymond Barnes.
F. M. Goodykoontz

Inventor
Frank Wheeler
by *Arthur W. Harrison.*
Attorney

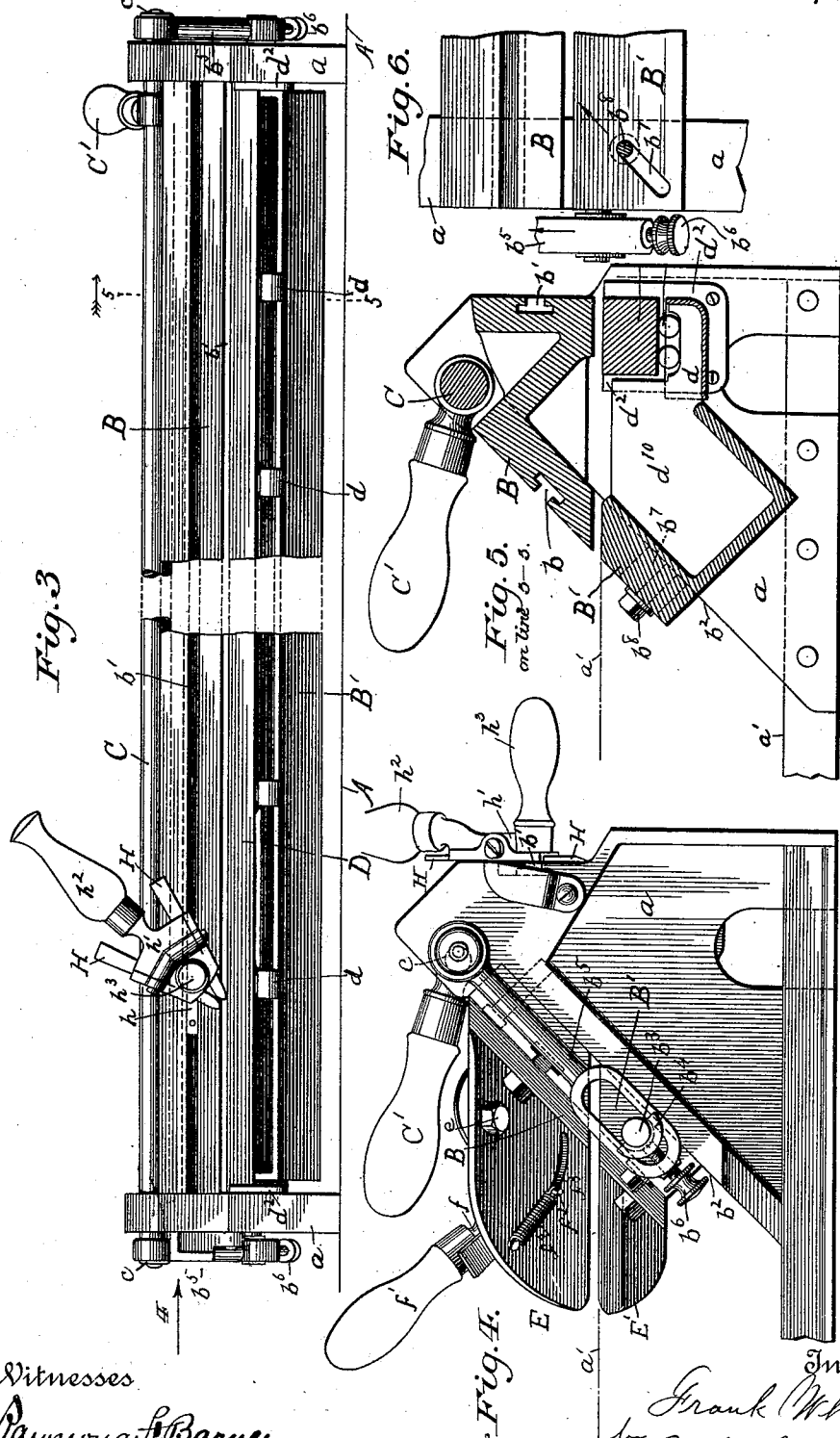
(No Model.)

2 Sheets—Sheet 2.

F. WHEELER.
MAT CUTTING MACHINE.

No. 513,851.

Patented Jan. 30, 1894



Witnesses

Raymond Barnes.

F. M. Goodykoontz

Inventor
Frank Wheeler
by Arthur W. Harrison
Attorney

UNITED STATES PATENT OFFICE.

FRANK WHEELER, OF MERIDEN, CONNECTICUT.

MAT-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 513,851, dated January 30, 1894.

Application filed December 3, 1892. Serial No. 453,956. (No model.)

To all whom it may concern:

Be it known that I, FRANK WHEELER, of Meriden, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Mat-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of said invention, 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 machines for cutting mats or beveling, by a knife or knives movable in a straight line and in an inclined position.

The object of my invention is to produce a machine by means of which a clean miter or corner may be cut, and without moving or re-clamping the cardboard; and it is the further object of my invention to improve the details of mechanism as hereinafter described.

To these ends my invention consists in the construction and combination of parts as hereinafter described and claimed.

In the accompanying drawings, Figure 1— is a perspective view showing the position of the mitering knives and with one end of the table and clamping jaws broken away. Fig. 2— is a plan view of the machine with a portion of the table broken out. Fig. 3— is a rear elevation of the clamping jaws and showing the squaring knife in position. Fig. 4— is an end elevation of the clamping jaws looking in the direction of the arrow in Fig. 3. Fig. 5— is a section on line 5—5 of Fig. 3 and looking to the right; and Fig. 6— is a detail showing one end of the clamping jaws, and a portion of one of the frame uprights.

Similar reference letters indicate like parts in all the views.

In the ensuing description, I will refer to the front of the machine as that which is in front in Fig. 1, and since the operator is supposed to stand on the side of the machine nearest the clamping jaws it is to be supposed that his position will be at the rear.

A, in Fig. 3, represents the upper surface of a frame (not shown), at each end of which is an upright *a*, and to which is also secured the operating table *a'*. Extending from one upright *a* to the other, and suitably secured thereto as by bolts, is the upper jaw B which

is preferably formed by a skeleton casting as indicated in Figs. 1 and 5. The front face of the jaw B has an angle of forty-five degrees from the horizontal, is planed smooth and is provided with a longitudinal dove-tailed groove *b*; the rear face of this jaw is vertical and is provided with a dove-tailed groove *b'*. Below the jaw B is a lower movable jaw B' which is also formed by a skeleton casting and at its ends projects over the inclined faces *b''* of the upright *a*, so that it may rise and fall but with its front face in the same plane with that of the jaw B. The front and rear walls of the jaw casting B' are preferably connected at intervals by webs, as indicated at *d*¹⁰ in Fig. 5.

The means for clamping the paste-board or other suitable material between the two jaws is as follows:—Each end of the jaw B' is provided with a pin *b''* which rests upon a bearing *b''*, which is adjustable in a slot of a link *b''* by means of an adjusting screw *b''*. Mounted in bearings in the uprights *a* is a shaft C each end of which is turned to form an eccentric *c* (shown by dotted lines in Fig. 4) to which is fitted the upper end of the link *b''*. A handle C' is secured to the shaft C by means of a set screw or other suitable construction and may be set at any desired position along the length of the shaft to suit the convenience of the operator. These parts are so connected that when the handle C' is in the position shown in Figs. 4 and 5, it rests upon the portion of the upper jaw which is in front of the upper shaft and permits the lower jaw to remain open; and when moved so as to rotate the shaft until the handle rests upon the edge of the jaw B at the rear of the shaft, the lower jaw is lifted so as to firmly clamp the material against the upper jaw. By means of the adjusting screws *b''* the operative length of the links will be so determined as that when the handle is turned over to the rear, the eccentric *c*, will be turned to a position slightly beyond the dead center.

Referring to Figs. 5 and 6, *b''* indicates an inclined slot formed in front of the movable jaw at one end thereof and *b''* is a guide pin secured to the upright *a* and projecting through said slot. It will be understood that at the other end of the machine is another slot and pin. The object of this construction

is to give the lower jaw an endwise movement during its rise and fall, for the purpose hereinafter described.

Projecting from the rear of the movable jaw or from the webs d^{10} as indicated in Fig. 5 are several arms d the upper surfaces of which are hollowed out to receive anti-friction rollers d' on which rests the supplemental jaw D which is vertically guided by means of guides d^2 formed on the inner surface of the uprights a . The rear face of this supplemental jaw D is finished parallel with the rear face of the upper jaw B. The object of this construction of the lower jaw in two portions or parts as just described, is as follows: It is essential that the front face of the lower jaw shall move in the same plane or on the same angle as the front face of the upper jaw, in order to properly clamp material of different thicknesses for the proper operation of the knife which moves across both clamping surfaces. It will be readily understood that if the front face of the movable jaw should move vertically, it would be so far removed from the path of travel of the knife when cutting thick material, that it would not properly support the lower surface of such material. With the lower jaw having the inclined movement described, it will be obvious that the rear clamping portion must move in a vertical plane in order that it may properly clamp the material without danger of projecting beyond the path of travel of the rear trimming or squaring knife which also operates across the faces of both jaws.

Near one end of the machine, there is, bolted or otherwise secured to the front face of the lower jaw, or integral therewith, a jaw E' at a right angle to the jaw B' ; and above it, similarly secured or integral with the upper jaw, a jaw E , the faces of these two angular jaws being inclined as shown in Fig. 1 and in the same plane with each other.

Pivoted at e to the jaw E , is an arm f having a handle f' and having a stud f^2 , projecting rearwardly through the arc-shaped slot f^3 formed in the jaw E ; a spring f^4 connects the stud f^2 with a pin projecting from the rear of the jaw E , said spring serving to normally keep the arm f and the knife F , which is clamped therein, in the position shown in Fig. 1.

In order that the lower angular jaw E' may have the same movement relatively to the face of the upper jaw B , said jaw B' , which carries the jaw E' is given an endwise movement caused by the inclined slots b^7 and their guide pins hereinbefore described.

g is a slide fitted in the groove b in the jaw B so as to slide freely therein. Pivoted to this slide, by means of a screw (not shown) projecting from the center of the handle g' is an arm g^2 having at its end a handle g^3 and in the arm g^2 is clamped by any suitable means a beveling knife G the cutting edge of which, when in position shown in Fig. 1, extends angularly across the space between the two jaws

and slightly overlaps both jaws so that when it is moved in a direction toward the knife F , it will cut, with a shearing action, through the material. A stop g^4 (see Fig. 1), is secured in the groove b so that when the end of the slide g strikes said slot, the edge of the knife will have cut the material to the point at which an intersecting cut may have been produced by the knife F . At the meeting angle of the jaws, I preferably cut away, as at g^5 in Fig. 1, in order that the cutting edges of the two knives may pass through the material slightly without risk of dulling them.

h is a slide freely movable in the dovetailed groove b' formed in the rear of the upper jaw B. Pivoted to said slide is an arm h' having a handle h^2 and having clamped therein two knives H , the object of which will be hereinafter described. The handle h^3 is secured to the slide outside of the arm h' and in line with its pivot.

A parallel rule or guide I , is mounted at one end of the table a' and connected thereto by links i and may be adjusted at different positions from the end thereof by means of a clamping screw i' passing through the gage and through an arc-shaped slot i^2 in the table and into a nut (not shown) on the under side thereof. At a right angle to the gage I is a gage I' flush with the upper surface of the table. With the inclined jaws at the angle shown, the bevel produced by the knives F and G , will be about forty-five degrees, this being the preferable or customary angle, but it will be readily understood that the angle might vary therefrom.

The object of the anti-friction rollers d' carried by the arms d is to obviate a tendency of the said arms to spring the supplemental lower jaw d outward, in the clamping operation.

K indicates a gage or stop, adjustable along the gage I , for the purpose hereinafter described.

The operation of my machine may be as follows: To trim or square a mat or cardboard, one edge will be placed against the gage I , and with one corner against the stop K , the latter determining the length of that edge of the material to the edge that is to be trimmed which passes between the jaws and projects beyond the rear face thereof, it being understood that the knife G will be turned from the position shown in Fig. 1 so that its cutting edge will be above the clamping edges of the slide, a suitable stop being provided to prevent the knife from turning over so far that its handle g^3 would interfere. The operator now clamps the cardboard firmly by operating the shaft handle C' . Then by grasping the handle h^2 of the squaring knife, he tilts it so as to bring one of the knives H into proper position and with the other hand grasping the handle h^3 moves the knife along to cut the material. If, in this movement, the material has not been cut through, he simply tilts the handle so as to bring the other knife

H into position so as to further cut the material on the return movement. The other side of the mat will be trimmed in the same way. In cutting out the mat, one edge of the material will be placed against the gage I, which will be adjusted at the proper distance along the gage I' so that the desired margin may be once marked with the point of a lead pencil, opposite the end of the gage I'. The card will then be turned one quarter around, its edge placed against the gage I, and slipped between the clamping edges until the dot on the card is even with the edge of the jaw B. The card will now be clamped firmly by the means described and the knife F will be operated and will produce a short cut in the card at the same distance from the edge, that the dot referred to, is from the other edge of the cardboard. The clamp will now be loosened and the card again given one-quarter turn and the short cut which has been made will be brought even with the edge of the upper jaw instead of where the dot was produced; then the card will be clamped again and one short cut made with the knife F. The knife G will now be inserted into the first short cut made, and will be pushed along to intersect the second short cut which has just been made. This produces the first corner. By now loosening the clamp, giving the card one-quarter turn and bring the second short cut into the line of the upper jaw, again clamping the card, then making the third short cut with the knife F, and the second long cut with the knife G, the second corner will be produced. These operations will be repeated until the entire mat or beveled card is finished.

Having thus described the nature of my invention and explained a means for carrying it into effect, although without attempting to set forth all of the forms in which it may be embodied or all the modes of its employment, I declare that what I claim is—

1. In a mat cutting machine, the combination with a fixed jaw having an angular projection therefrom, with a movable jaw having an angular projection parallel with that from the fixed jaw, and cutters for operating upon the material clamped between the said jaws, said cutters being arranged at an angle to each other, for the purpose set forth.

2. In a mat cutting machine, the combination with a fixed jaw having an angular projection therefrom, with a movable jaw having an angular projection parallel with that from the fixed jaw, thus forming a main clamp and an angular clamp and a knife movably connected with the main clamp and another knife movably connected with the angular clamp, for the purpose set forth.

3. In a mat cutting machine, the combination with main clamping jaws, and a knife carrying slide fitted thereto, of short clamping jaws projecting at a right angle from the

main clamping jaws and a knife pivoted to the latter, substantially as described.

4. In a mat cutting machine, the combination with main clamping jaws and a knife carrying slide fitted thereto, of short clamping jaws projecting at a right angle from the main jaws, a knife pivoted thereto, and a spring for holding said knife in an elevated position, substantially as described.

5. In a mat cutting machine comprising in its construction a main clamp and an angular clamp carried thereby, the combination with the upper jaw E of the angular clamp having an arc-shaped slot, of the arm f pivoted to the jaw, and having a stud extending through said slot and having a handle, and the spring f⁴ connected with the said stud and with the jaw, substantially as described.

6. In a mat cutting machine the combination with a fixed jaw, having an inclined face and a vertical face, of a movable jaw having an inclined face and arms projecting from the rear thereof, a supplemental jaw resting upon said arms, and means for raising and lowering the movable jaw, and means for guiding the supplemental jaw in a vertical path, for the purpose set forth.

7. In a mat cutting machine, the combination with a fixed jaw having an inclined face and a vertical face, of a movable jaw having an inclined face and arms projecting from the rear thereof, anti-friction rollers carried by said arms, a supplemental jaw resting upon said rollers, means for clamping the movable jaw against the fixed jaw, inclined guides for the main movable jaw, and vertical guides for the supplemental movable jaw, substantially as described.

8. In a mat cutting machine, the combination with a main fixed jaw having an angular jaw projecting therefrom, the face of each of said jaws being inclined, of a movable jaw having an angular jaw projecting therefrom, means for clamping the movable jaws toward the fixed jaws, and guides for guiding the movable jaws in an inclined direction rearwardly and laterally, substantially as described.

9. In a mat cutting machine, the combination with the uprights a having inclined surfaces and having a fixed upper jaw provided with a short angular projection therefrom, of a lower movable jaw fitted to slide on the inclined surfaces of the uprights and having a short angular projection therefrom and also having inclined slots b⁷, guide-pins b⁸ projecting from the uprights through said inclined slots and means for lifting the lower jaw, the faces of both jaws being inclined parallel with the inclined surfaces of the uprights a substantially as described.

10. In a mat cutting machine, the combination with the upper fixed jaw, the uprights a, the shaft C mounted therein and having an eccentric at each end thereof, the lower movable jaw having a projection at each end, the

links b' fitted to the eccentrics and carrying the adjusting screws b^6 , and bearings fitted to the projections from the movable jaw and adjustable by means of said screws, substantially as described.

11. In a mat cutting machine, the combination with one of the jaws thereof, of a slide carried by said jaw, an arm pivotally connected with said slide and having a handle, and two knives arranged at an angle to each other and separately clamped and adjustable in said arm, substantially as described.

12. In a mat cutting machine, the combination with main clamping jaws and supple-

mental clamping jaws arranged at an angle thereto and each clamp having a cutting knife connected thereto, a table flush with the space between the clamping jaws, a parallel gage carried by said table and a gage set into said table at a right angle with the parallel gage, for the purpose set forth.

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

FRANK WHEELER.

Witnesses:

J. S. NORTON, Jr.,
C. H. WOOD.