

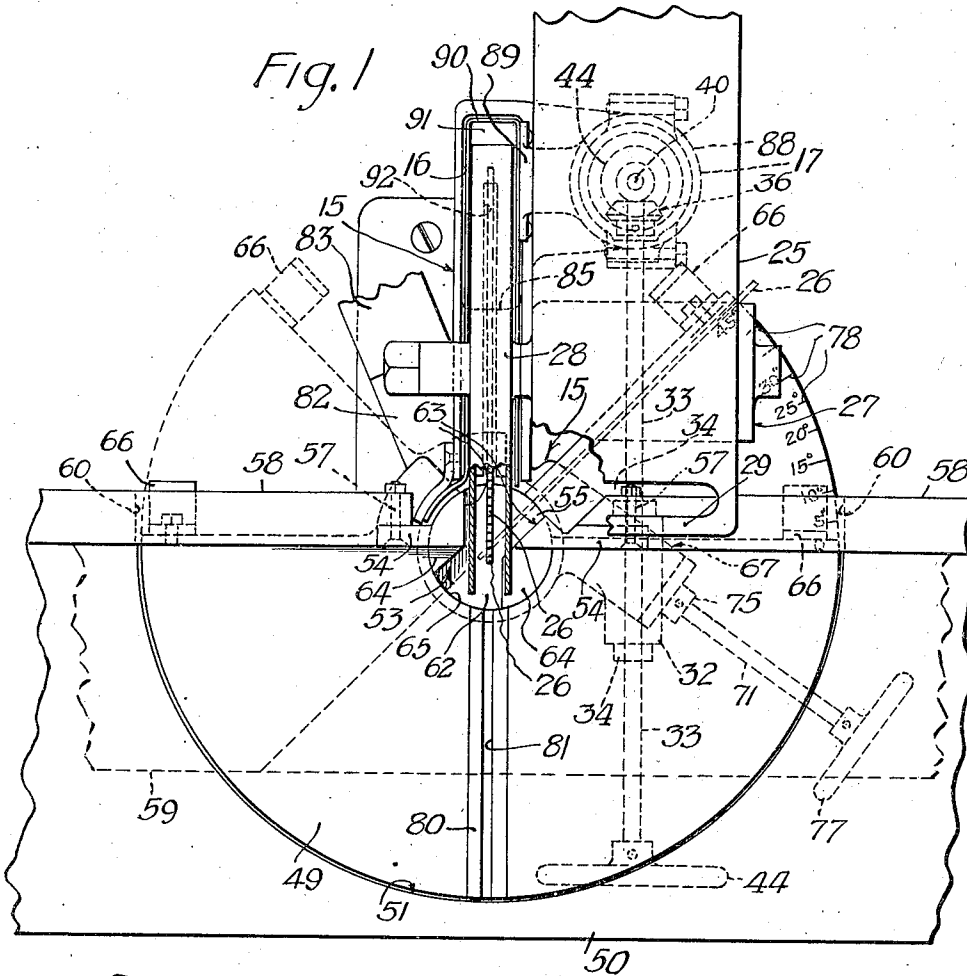
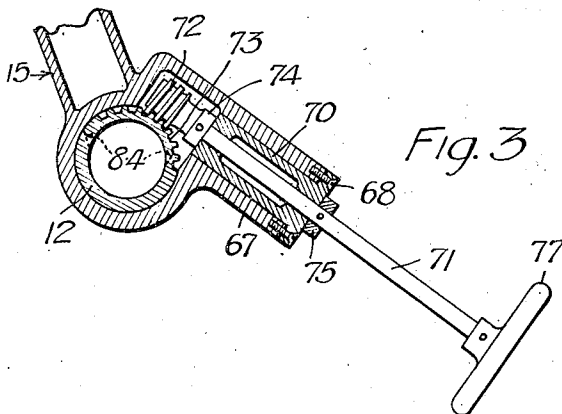
Jan. 8, 1929.

1,697,873

H. E. LAMBERT
MATERIAL WORKING MACHINE

Filed May 29, 1926

2 Sheets-Sheet 1



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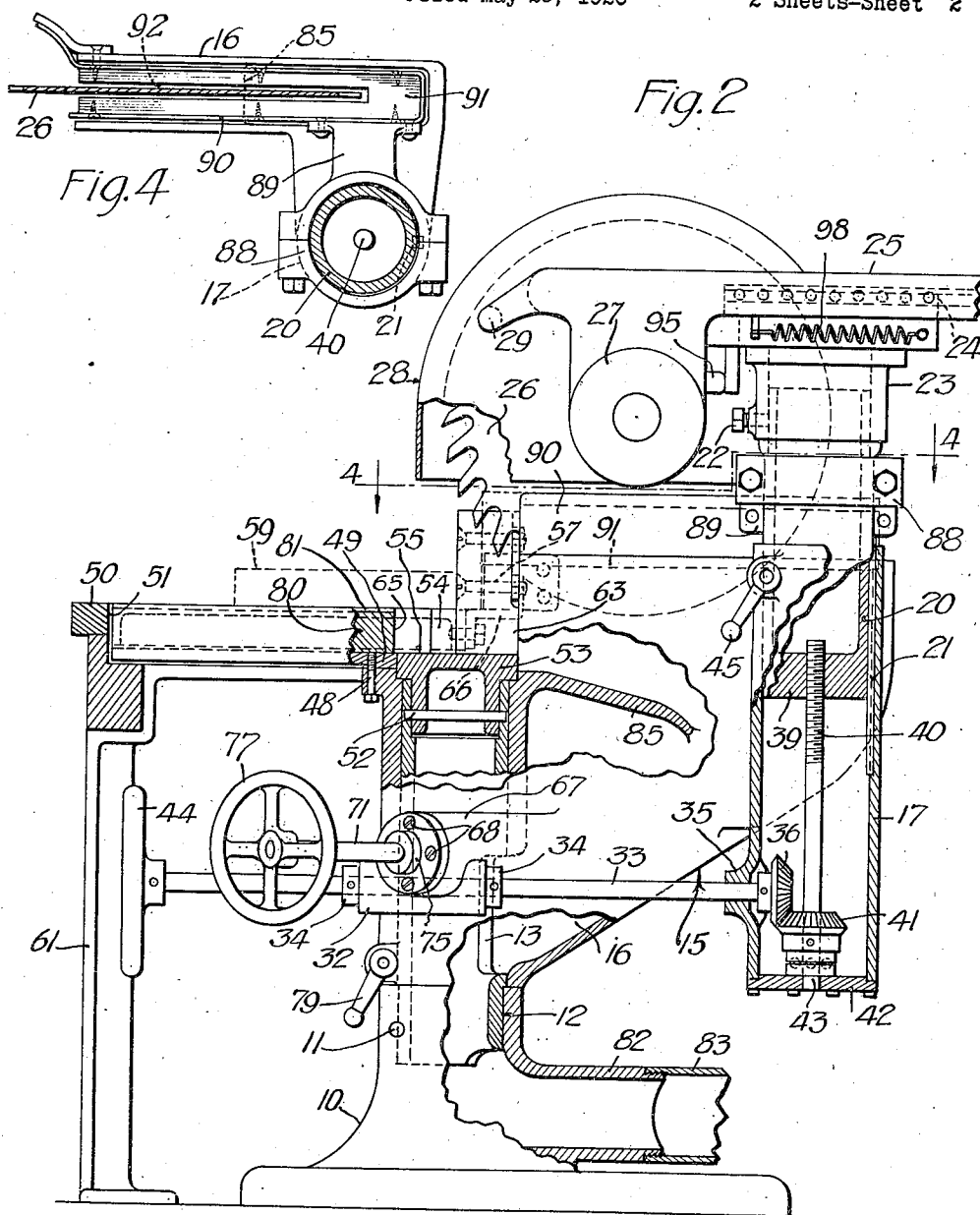
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UNITED STATES PATENT OFFICE.

HARRY EDWARD LAMBERT, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MATERIAL-WORKING MACHINE.

Application filed May 28, 1926. Serial No. 112,468.

This invention relates to material working machines, and more particularly to material sawing machines.

The primary object of this invention is to provide a material cutting machine of a construction embodying the advantages of simplicity and facility of adjustment for the cutting of material at various angles.

In accordance with the preferred embodiment of this invention as applied to a wood sawing machine, there is provided a circular rotary saw supported upon a horizontally reciprocable carriage whereby it may be moved into and out of engagement with the material to be sawed, the carriage being mounted upon a column in turn secured to a bracket which is rotatably secured to a stationary column attached to the base of the machine. Also secured to turn with the bracket is a sector shaped plate, provided with a plurality of marks disposed at various angles to facilitate the setting of the saw at the desired angle, the plate being flush with and spanning an opening in a work supporting table. Means operatively associated with the stationary column and revolvable carriage serves to rotate the bracket and consequently in unison therewith the saw and plate, about an axis central to the stationary column and the plate so that the point of engagement of the saw with the material is the same irrespective of its angular position.

Other objects and advantages of this invention will more fully appear from the accompanying detailed description taken in connection with the accompanying drawings, in which

Fig. 1 is a fragmentary plan view of a wood sawing machine embodying the features of this invention;

Fig. 2 is a side view thereof partly in section;

Fig. 3 is a central horizontal sectional view of the means for angularly adjusting the saw and sector plate relative to the work, and

Fig. 4 is a fragmentary sectional view taken on the line 4-4 of Fig. 2.

Referring now to the drawings in detail and particularly to Fig. 2, at 10 is shown the base of the machine to which is affixed as indicated at 11 a hollow column 12 provided with an opening 13 in its wall at a point immediately above the top surface of the base 10, the purpose of which will be made apparent

as this description progresses. Rotatably journaled upon the stationary column 12 and resting at its lower surface upon the base 10 is a supporting bracket 15 which as clearly indicated in Fig. 1 is provided with a rearwardly extending hollow housing 16 centrally disposed with respect to its axis. Integral with the housing 16 adjacent the rear end thereof and extending at right angles thereto is a depending sleeve portion 17 within which is reciprocally mounted a cup-shaped column 20, the column 20 being splined to the sleeve portion 17 as indicated at 21 to prevent relative rotation therebetween. Secured to the upper end of the reciprocable column 20 as indicated at 22 is a cap member 23 carrying longitudinal ways 24 (dotted outline Fig. 2) for supporting and guiding a reciprocable saw carriage 25, the saw being indicated at 26 and directly connected to a motor 27, the housing of which is formed integral with the carriage 25. Also carried upon the carriage 25 is a guard 28 for the saw 26 and indicated at 29 is a handle by which an operator may draw the carriage forward during the operation of sawing material, the carriage being returned to its normal position as shown in the drawings by a tension spring 98 operatively connected at opposite ends to the carriage and cap member 23, respectively.

The means for adjusting the saw vertically to provide for varying diameters of the saw caused by sharpening or grinding will now be described. Rotatably journaled in a horizontal bearing boss 32 formed upon the bracket 15 is a shaft 33 which is retained from longitudinal movement in the bearing boss 32 by a pair of collars 34-34 disposed around the shaft at opposite ends of the boss 32. The right hand end of the shaft 33 as viewed in Fig. 2 extends through a suitable bearing boss 35 formed upon the depending sleeve 17 and into the bore thereof and supports a bevel pinion 36. Extending axially through a bottom wall 39 of the reciprocal column 20 is a screw threaded shaft 40, the lower end thereof supporting a bevel pinion 41 which meshes with the bevel pinion 36. The extreme lower end of the shaft 40 is suitably journaled in a bottom plate 42 of the sleeve 17 as indicated at 43. The left hand end of the shaft 33 has affixed thereto a hand wheel 44, and it will be apparent that by rotating the wheel 44 that

the shaft 40 will be rotated and through the threaded end thereof engaging the bottom wall 39 of the column 20, the latter will be moved upwardly or downwardly depending upon the direction of rotation of the hand wheel 44, and thus the carriage 25 and saw 26 will be given a similar movement, as hereinbefore described through the spline 21. The sleeve 17 is split at its upper end and adapted to be contracted upon the column 20 after the saw has been adjusted to the desired vertical position by a suitable clamping device indicated at 45.

Carried upon an upper flanged end of the axial portion of the rotatable bracket 15 and secured thereto by a plurality of screws 48-48, one of which is indicated in Fig. 2 is a sector-shaped plate 49. The upper surface of the plate 49 is positioned flush with the upper surface of and consequently forms a continuation of a work supporting table 50, the table being provided with an arch-shaped opening 51 providing sufficient clearance for the periphery of the plate 49, the plate being adapted to be rotated therein in a manner hereinafter to be described. Secured to the upper end of the stationary hollow column 12 as indicated at 52 is a work table support 53 provided with horizontally and oppositely extending arms 54 rising from a horizontal central surface 55 thereof, which surface is disposed below the sector-shaped plate 49. The arms 54 are secured as shown at 57 to vertically rising flange portions 58 suitably secured to the rear side of the work table 50, the flange portion 58 serving as a stop or rest against which the board to be sawed and indicated at 59 (dotted outline) is positioned, the rear side of the board 59 and front side of the portions 58 coinciding with the axis of the rotatable bracket 15. The flange portions 58 of the table 50 are provided with suitable slots 60 to permit the movement of the plate 49 during its angular adjustment. The table 50 at its front edge rests upon a plurality of standards 61, one of which is indicated on Fig. 2. As shown in Fig. 1, a space 62 is provided between the arms 54 with the opposed vertical faces 63 thereof disposed relative to each other at an angle of 45° which permits the saw 26 to be rotated 45° in a clockwise direction from its normal position shown in which it lies parallel to the face 63 of the left hand arm 54, which movement will be described in greater detail hereinafter. Extending forward from the front face of each arm 54 and disposed flush with the sector plate 49 and work table 50 are bearing portions 64, which during the rotation of the plate 49 slide upon the vertical circular wall of a centrally disposed opening 65 formed in the plate 49. Attached to vertical faces of the plate 49 near the periphery thereof are angle plates 66, one arm

of which as clearly indicated in Fig. 1 serve as stops to limit the movement of the plate to a 45° rotation.

With this description it will be apparent that the saw 26 and the sector plate 49 will be rotated in unison when the bracket 15 is rotated upon the stationary column 12, the saw being independently movable in a horizontal direction, due to the reciprocally mounted carriage 25, at any angular adjustment of the saw, as hereinbefore described.

The means for angularly adjusting the saw 26 for use when executing bevel or diagonal crosscut work upon the board 59 will now be described. Referring particularly to Fig. 3, the bracket 15 is provided with a sleeve-like portion 67 at one side of the axial portion and mounted within the bore thereof and affixed thereto as shown at 68 is a sleeve forming a journal for a shaft 71. Secured to the inner end of the shaft 71 is a left hand worm 72 which meshes with similar gearing 73 provided upon the stationary column 12 for a suitable distance around the periphery. A collar-like portion 74 upon the worm 72 and a collar 75 upon the shaft 71 which engage the inner and outer ends of the sleeve 70, respectively, serve to retain the shaft 71 and attached worm 72 in a correct longitudinal position upon the sleeve 70. Affixed to the shaft 71 is a hand wheel 77 and it will be apparent that by rotating the wheel 77 the bracket 15 will be rotated upon the stationary column 12 due to the engagement of the worm 72 with the gearing 73 formed upon the column 12, and consequently the saw 26 and sector plate 49 will also rotate therewith. To facilitate the adjustment of the saw 26 to the desired angle the top surface of the plate 49 is provided with a plurality of equally spaced marks 78 indicating varying angles of sawing within an arc of 45°. Upon adjusting the saw to the desired angle the bracket 16 may be clamped to the stationary column 12 by operating a clamping device 79 similar to the clamping device 45 associated with the sleeve 17. An angular position of the saw 26 and plate 49 is indicated in dotted outline in Fig. 1, other associated movable parts not being shown in dotted outline for the sake of simplicity. Within a depression formed in the top surface of the plate 49 and set flush therewith is a wooden insert 80 provided with a shallow groove 81 into which the saw 26 extends and along which the saw 26 travels during a reciprocal movement across the plate 49. The purpose of the groove 81 is to insure that the saw edge extends below the upper surface of the table thereby sawing through the board 59 while the wooden insert is for the purpose of preventing the rotating saw 26 from striking the metal plate 49 if for any reason the side play of the saw should become excessive.

The saw dust or other waste material is re-

moved by air suction during the operation of the machine in the following manner. The base 10 near the bottom of its axial portion is provided with a rearwardly extending pipe-like portion 82 which is connected by a pipe 83 with a suitable source (not shown) of air suction. As hereinbefore described the stationary hollow column 12 is provided with an opening 13 in its wall which connects the rearwardly extending hollow housing 16 with the hollow column 12 which in turn connects with the hollow of the base 10. The opening 13 extends around the column 12 for a suitable distance so as to provide an outlet for the housing 16 at any angular position thereof within its range of movement as indicated by the numeral 84 (Fig. 3). An angularly disposed web 85 is formed on the housing 16 extending from side to side thereof as shown in Fig. 4 to facilitate the movement of the saw dust by the action of gravity and suction from the top of the housing to the opening 13 in the stationary column 12. Clamped to the reciprocal column 20 intermediate the lower end of the cap member 23 and the top of the bracket 15 is a split collar 88 provided with an arm 89 having affixed thereto a sheet metal guard 90, the lower edge thereof extending into the hollow housing 16 of the bracket 15 and its upper edge adjacent the lower edge of the guard 28 (Fig. 2). Suitably secured within the guard 90 is a wooden insert 91 provided with slot 92 of sufficient width for the saw 26. It will be apparent due to the telescoping action between the walls of the housing 16 and the sheet metal guard 90 and the fixed space between the adjacent edges of the guards 28 and 90 that the saw 26 is effectively guarded on two sides and at the rear thereof. Also that the opening in the hollow housing 16 into which the saw 26 extends is reduced to a minimum by the guard 90 and wooden insert 91 thereby facilitating the removal by air suction of the saw dust as will be clearly understood. By the construction herein described the saw dust passes into the bore of the stationary column 12, and thence into the pipe 83 fixed thereto thereby eliminating the necessity of a flexible connection as would be necessary if the pipe 83 was attached to the rotatable housing 16.

In the operation of the machine constructed as described, the board 59 indicated in dotted outline to be sawed is placed upon the table 50 with its rear edge against the vertical flange portions 58 thereof, and if it is to be sawed at an angle the saw 26 is angularly adjusted in the manner hereinbefore described by rotating the hand wheel 77. The bracket 15 will consequently be rotated about an axis coincident with the stationary column 12 and the sector plate 49, the forward edge of the saw as viewed in Fig. 1 remaining the same irrespective of the angle at which the board is to be sawed, the bracket 16 being clamped

in its adjusted position thereafter by operating the device 79. The saw 26 as hereinbefore described may be adjusted for vertical position by rotating the hand wheel 44 and thereafter clamped in its adjusted position by operating the device 45. The saw is then caused to revolve by closing the circuit to the motor 27 and drawn forward across the board 59 by the operator grasping the handle 29 of the carriage 25, the carriage thereafter returning to its normal position as shown by spring action as hereinbefore described, a rubber bumper being indicated at 95 to absorb the shock of the carriage upon returning to its normal position.

What is claimed is:

1. In a material cutting machine, a frame having a hollow stationary pivotal portion, an arm journaled thereon having an end bearing on the frame and provided with a hollow portion having inlet and egress openings, a cutter operatively mounted upon the arm with its cutting edge associated with the inlet opening, the pivotal portion of the frame provided with an opening so formed that the egress opening of the arm is at all times in communication therewith irrespective of the angular position of the arm upon the frame, a material supporting member associated with the frame, means for operating the cutter, and a source of air suction operatively connected to the hollow stationary pivotal portion of the frame for withdrawing waste material formed during the cutting operation from the hollow portion of the arm.

2. In a material cutting machine, a frame having a hollow stationary pivotal portion, an arm journaled thereon having an end bearing on the frame and provided with a hollow portion having inlet and egress openings, means positioned within the hollow of the arm intermediate the inlet and egress openings for restricting the passage therebetween, a cutter operatively mounted upon the arm with its cutting edge associated with the inlet opening, the pivotal portion of the frame provided with an opening so formed that the egress opening of the arm is at all times in communication therewith irrespective of the angular position of the arm upon the frame, a material supporting member associated with the frame, means for operating the cutter, and a source of air suction operatively connected to the hollow stationary pivotal portion of the frame for withdrawing waste material formed during the cutting operation from the hollow portion of the arm.

3. In a material sawing machine, a column frame constituting a vertical pivot, an arm pivotally carried thereon, a vertically disposed rotary saw reciprocally carried in a slide upon the arm, means for locating the work so that the cutting edge is coincident with the pivotal axis of the arm when the saw is at the initial point of its engagement with

the work to be cut, the arm and saw movable horizontally about the vertical axis of the arm; means for retracting the saw, a work supporting member fixed to the arm, and
5 means for simultaneously adjusting the arm supporting the saw and the work supporting member about the pivot to vary the angular position of the saw.

4. In a material sawing machine, a column
10 frame constituting a vertical pivot, an arm pivotally carried thereon, a vertically disposed rotary saw reciprocally carried in a slide upon the arm, the arm and saw movable horizontally about the vertical axis of
15 the arm, means for retracting the saw, a work supporting member fixed to the arm, and means for simultaneously adjusting the arm supporting the saw and the work supporting member about the pivot to vary the
20 angular position of the saw.

5. In a material cutting machine, a frame constituting a vertical pivot and having a hollow column with gear teeth upon a peripheral portion, a horizontal slide, a pivoted support for the slide carried by the frame, a cutter reciprocally supported in the slide, means
25 for locating the work so that the working edge of the cutter is coincident with the piv-

otal point when at the initial point of its engagement with the work to be cut, a gear
30 journaled upon the cutter support and operatively engaging the teeth upon the frame, a work supporting member rotatably associated with the frame, and means for rotating
35 the gear upon the cutter support for adjusting the cutter support about the pivotal point to vary the angular position of the cutter.

6. In a material cutting machine, a base having a hollow column comprising a stationary tubular member secured in and extending upwardly above the base, a frame
40 journaled on the tubular member and having an end bearing on the base, a cutter, an arm carried by the frame for supporting the cutter, a material supporting member fastened to the frame, means secured to the stationary tubular member for positioning the material on the material supporting member, and means for adjusting the arm carrying
45 the cutter and the work supporting member about the pivotal point to vary the angular position of the cutter.

In witness whereof, I hereunto subscribe my name this 22nd day of May A. D. 1926.

HARRY EDWARD LAMBERT.