C. L. MATTISON.

BELT SANDING MACHINE.

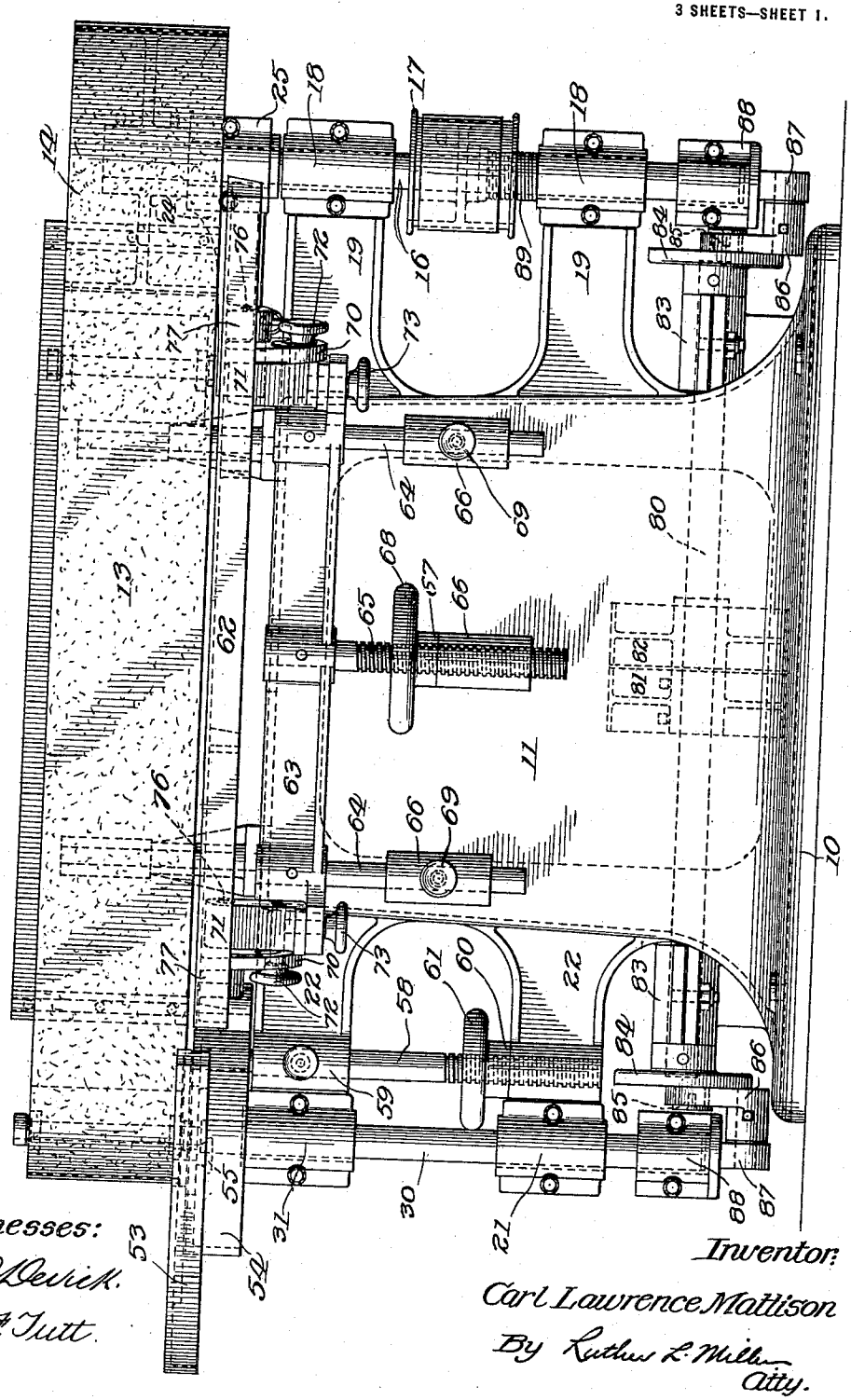
APPLICATION FILED JULY 18, 1913.

1,189,715.

Patented July 4, 1916.

3 SHEETS—SHEET 1.

FIG. 1.



Witnesses:

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Inventor:

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3 SHEETS—SHEET 2.

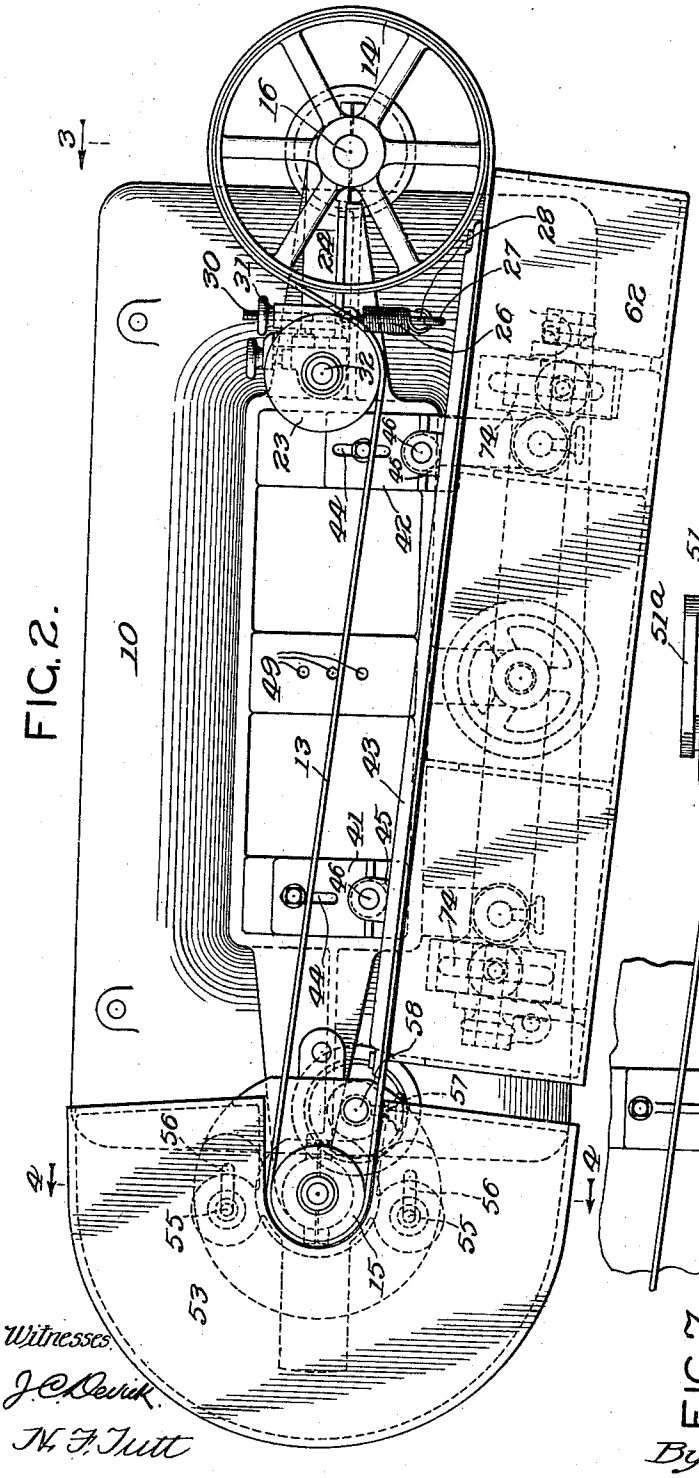


FIG. 2.

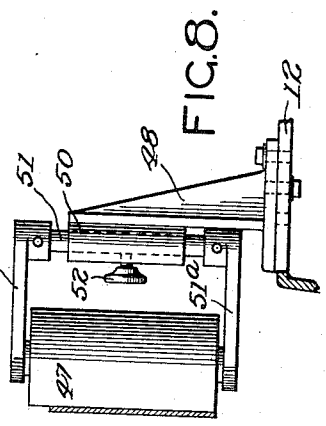


FIG. 8.

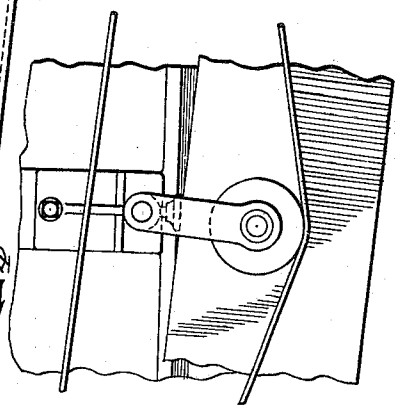


FIG. 7.

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3 SHEETS—SHEET 3.

FIG. 3.

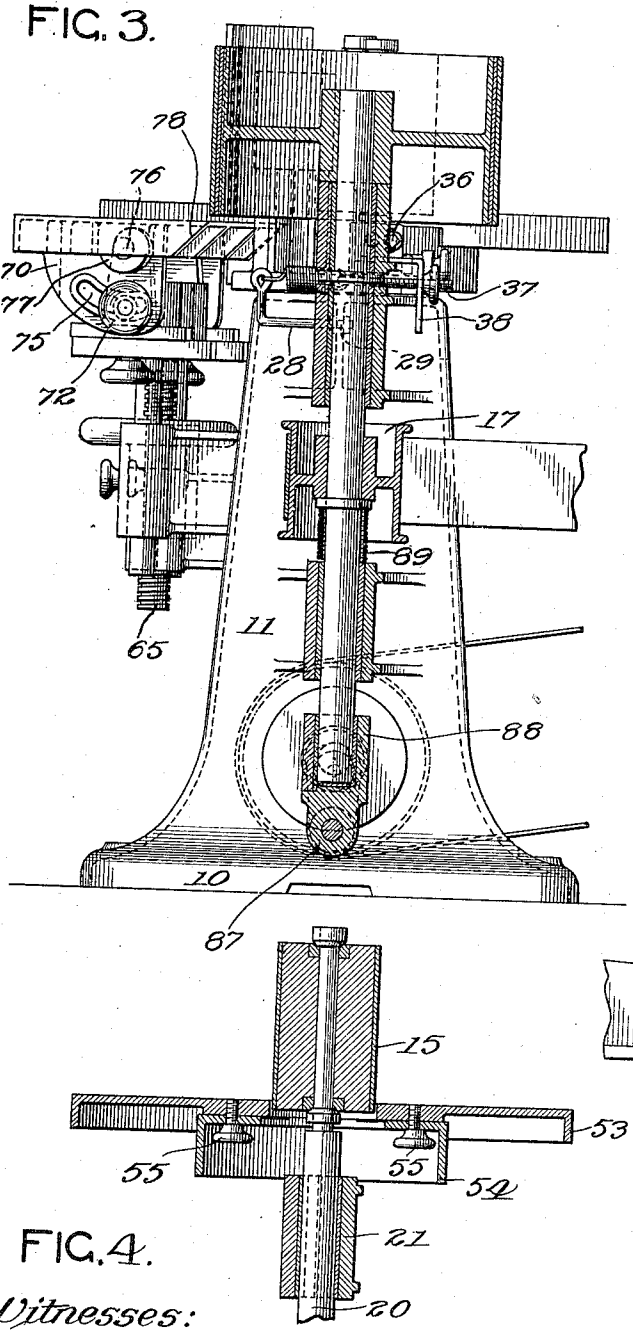


FIG. 5.

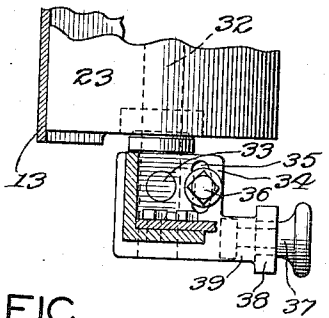


FIG.

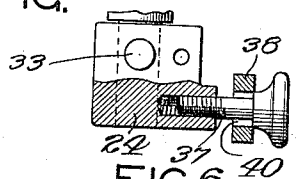


FIG. 6.

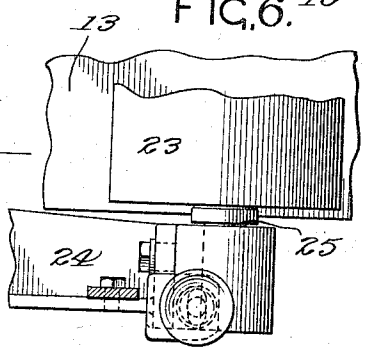


FIG. 4.

Witnesses:

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UNITED STATES PATENT OFFICE.

CARL LAWRENCE MATTISON, OF BELOIT, WISCONSIN, ASSIGNOR TO C. MATTISON MACHINE WORKS, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

BELT SANDING-MACHINE.

1,189,715. Specification of Letters Patent. Patented July 4, 1916.

Application filed July 18, 1913. Serial No. 779,666.

To all whom it may concern:

Be it known that I, CARL LAWRENCE MATTISON, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Belt Sanding-Machines, of which the following is a specification.

This invention relates to belt sanding machines, and particularly to that class of machines which has for its object the sanding of straight or variously curved surfaces, such as the edges of various furniture parts.

One of the objects of the invention is to produce a machine arranged so that the curvature of the sanding belt may be conveniently and quickly adjusted to meet the needs of the surfaces that are to be smoothed.

A further object of the invention is to provide a table for the machine suitable for supporting the work, and which may be conveniently adjusted not only vertically and horizontally but also so as to incline the table at various angles to the belt within certain limits.

Other objects of the invention will be apparent from a consideration of the accompanying drawings and the following description.

Figure 1 of the drawings is a side elevation of a machine which embodies the features of my invention. Fig. 2 is a plan view of the machine. Fig. 3 is a vertical sectional view of the machine along the line 3—3 of Fig. 2. Fig. 4 is a fragmental vertical section view along the line 4—4 of Fig. 2. Figs. 5 and 6 are enlarged fragmental views of the means which I have shown in this instance for maintaining uniform the tension of the belt throughout its entire width. Figs. 7 and 8 are fragmental views of means for varying the curvature of certain portions of the sanding belt. Fig. 9 is a detail view of the means for tilting one of the belt pulleys.

The frame of the machine comprises in general the base portion 10 and the upright or supporting portion 11. The sanding belt 13 runs about its driving pulley 14 and the idle pulley 15. The belt-driving pulley 14 is fixed to a shaft 16 which is journaled in bearings 18 supported by brackets 19 which are attached to the frame of the machine. A pulley 17 fixed to the shaft 16 is operated, by means of suitable belting, by the driving power. The idle pulley 15 is mounted on a shaft 20 which is journaled in bearings 21 supported by brackets 22 which are attached to the frame of the machine.

A belt-tightening pulley 23 is mounted, in the manner to be hereinafter described, on a bracket 24. The bracket 24 is rotatably supported by the vertical shaft 16 by means of bearings 25 fixed to the bracket. Pressure of the pulley 23 against the belt is provided for by means of a spring 26. One end of this spring is attached to an eye 27 of a bolt 28 which is fixed at the point 29 to the frame of the machine, while the other end of the spring is attached to the eye of a bolt 30 which is adjustably mounted in the bracket 24. The spring 26 thus constantly tends to press the tightening pulley 23 against the belt, and by turning the nut 31 the tension of the spring may be adjusted. By these means not only will the belt be maintained sufficiently tight, but also the belt will accommodate itself to different sizes of idle pulleys and various positions of such pulleys.

I have also provided the following means for tilting the pulley 23 so as to keep the belt on the pulley and to maintain the tension of the belt uniform throughout its entire width; or, if desired, to tighten one side of the belt more than the other. The shaft 32, upon which the pulley 23 is rotatably mounted, is supported by a tilting block 34 attached to the bracket 24 by a pivot 33. Passing through a slot 35 in the block 34 is a bolt 36 which screws into the bracket

24. When this bolt 36 is loose, the tilting block 34 may be rotated on the pivot 33 so as to tilt the pulley 23 in the manner desired. The tilting block may be then fixed in its position by tightening the bolt 36. However, in order to more conveniently and more accurately adjust the tilting of the pulley 23, I have provided tilting means comprising the thumb bolt 37 which passes through the arm 38 of a lug 39 fixed to the bracket 24, and screwed into the tilting block 34. This bolt 37 passes through a slot 40 in the arm 38 so as to allow freedom of motion between the arm and the tilting block. When the thumb bolt 37 is loosened and bolt 37 is screwed inwardly, the lower end of the block, together with the pulley 23, is tilted inwardly toward the belt. On the other hand, when the bolt 37 is unscrewed the belt is allowed to tilt the upper end of the pulley 23 outwardly from the belt. When properly adjusted the block is clamped in position by means of the bolt 36.

It will be seen that by means of the pulley 23 and its accompaniments the belt may be maintained at all times sufficiently tight and of uniform tension throughout its width; and that the adjustability of the tension of the spring, and the tendency of the spring to yield, allows the belt to be varied in its position either by pressure upon it of the work or by variations in the size or position of the idle pulleys.

Any suitable means may be used to provide a backing for the belt at the points opposite which the work is pressed. In this instance I have provided the following: Mounted in the supporting member 11 of the frame are the brackets 41 and 42. These brackets support a plate 43 which lies adjacent to the inner side of that reach of the belt 13 which is to be used; and by reason of the slots 44 the brackets may be moved to any desired position. The plate 43 is attached to the brackets 41 and 42 by means of bosses 45 fixed to the plate and passing over pins 46 fixed to the brackets. When it is desired to remove this plate it is necessary only to raise it off the pins 46. If it is desired to impart to this central portion of the belt a curved surface, the plate 43 may be removed and an idle pulley 47 may be placed in position. This pulley is attached, as shown in Fig. 8, to a bracket 48, and this bracket may be attached by means of a bolt extending through any one of the holes 49 in the frame. The pulley 47 is attached to the bracket by means of the boss 50 fixed to the bracket and the pin 51 fixed to the arms 51^a which support the pulley 47. A thumb screw 52 is adapted to lock the pin 51 to hold the pulley in proper position. As indicated in Fig. 7 the position of the pulley with reference to the belt may be varied by rotating the shaft 51 in the boss 50 until the pulley is in the position desired. It may then be locked in position by means of the set screw 52.

In order to further adjust the curvature of the sanding surface to certain classes of work, the idle pulley 15 may be removed and a smaller pulley substituted therefor.

I have provided with the machine tables for supporting the work which is being operated upon; and have provided means for adjusting the elevation of these tables or their position horizontally with reference to the sanding surface. The machine is adapted for sanding either simultaneously or alternately pieces that are straight or of small curvature, and pieces of great curvature. The tables and adjusting means for these two classes of work are entirely independent of each other, so that one workman will in no way interfere with the other workman.

The smoothing of surfaces with short radii of curvature is carried on against the idle pulley 15. The table which is to support this work comprises an approximately semi-circular plate 53 encircling the lower end of the idle pulley 15. This plate is supported upon the circular member 54 and is attached thereto by means of the bolts 55 which pass through slots 56 in the member 54 and screw into the lower surface of the plate 53. When the pulley 15 is changed in size, the plate 53 may be shifted in position to accommodate it to the size of the pulley; and if the pulley is materially smaller than the opening in the plate 53, the plate may be first slipped inwardly until the surface of the opening is adjacent to the belt, and the plate may then be rotated counter-clockwise, as may be necessary, until the portion 57 of the table is adjacent to the belt. In this manner the greatest belt reach possible will be accommodated by the table.

In order to adjust vertically the position of the table 53 I have provided a vertical shaft 58. This shaft passes upwardly through bearings 59 in the bracket 22, and the upper end of the shaft is fixed to the member 54. The lower end of the shaft 58 presses downwardly and is threaded into a nut 60 which is supported in the bracket 22. By means of a hand wheel 61 this nut may be rotated, and the elevation of the shaft 58, and hence of the member 54 and the table 53, may be adjusted.

The sanding of straight surfaces or surfaces having large radii of curvature is carried on at that portion of the belt which is adjacent to the plate 43 or to the idle pulley 47. A table 62 is provided for the accommodation of

such work. This table is attached, in the manner hereinafter to be described, to a beam 63. Said beam is supported by means of rods 64 and the screw 65 which pass through bosses 66 fixed to the frame of the machine. The screw 65 is threaded into a nut 67 which rests upon the central boss 66. This nut may be rotated by means of the hand wheel 68, and the rotation of the nut elevates or lowers the table 62. When the table has been raised to the desired position, it is locked in position by means of the thumb screws 69 acting on the rods 64. By these means the table 62 may be adjusted to the desired elevation.

The table 62 is attached to the beam 63 in the following manner: Lugs 70 project downwardly from the table and are adjacent to blocks 71 which are attached to the beam 63, and thumb screws 72 clamp the lugs 70 firmly to the blocks 71. These lugs and blocks, however, provide means for horizontal and tilting adjustment of the table 62.

The horizontal adjustment of the table is provided for in the following manner: The blocks 71 are attached to the beam 63 by means of thumb screws 73 which pass through slots 74 (Fig. 2) in the beam 63 and which screw into blocks and hence the table 62 may be moved horizontally to the position desired.

Means for adjusting the inclination of the table is provided for in the following manner: The thumb screws 72 pass through slots 75 in the lugs 70, and when the thumb screws 72 are loosened, the table 62 may be rotated upon pivots 76 which pass through the blocks 71, the lugs 70 and the bosses 77 fixed to the lugs 70. When tilted to the proper inclination, the table 62 is locked in position by means of the thumb screws 72. The inner edge 78 of the table 62 is beveled, as indicated in Fig. 3, so that when the outer edge of the table is inclined downwardly, the upper portion of the inner edge of the table may be pushed forward adjacent to the belt.

It has been found desirable with sanding machines of this nature to oscillate the sanding surface transversely of the work. This presents new surfaces constantly to the work and prevents unevenness in the wear of the abrasive surfaces. For this reason I have provided the following means for oscillating the belt vertically while it is in operation. A shaft 80, suitably operated by means of the tight and loose pulleys 81 and 82, is journaled in the bearings 83 fixed to the lower portion of the frame of the machine. Disks 84 are fixed non-rotatably to the ends of the shaft 80, and projecting from each of these disks is a crank pin 85. Each of these crank pins oscillates vertically an arm 86, which arm in turn, by means of downwardly projecting lug 87, reciprocates vertically the box 88 which supports the lower end of the shaft 20 or 16. By these means when the shaft 80 is rotated the shafts 20 and 16 are oscillated vertically, carrying with them the pulleys 14 and 15, and thus the belt 13. As the pulleys 14 and 17, fixed to the shaft 16, materially increase the weight acting on that shaft, and hence on the supporting box 88, with reference to the weight on the corresponding box 88 at the other end of the shaft 80, it has been found desirable to provide means for equalizing the weight on the two boxes 88. The means which I have provided for this purpose comprise a spring 89 encircling the shaft 16, and compressed between the lower bearing 18 and the pulley 17, acting upwardly on the shaft 16, is approximately sufficient to overcome the weight of the pulley 17 and the excess weight of the pulley 14 with reference to the pulley 15. This spring, however, yields sufficiently to allow the shaft 16 to oscillate freely up and down within the required limits as the shaft 80 rotates.

While I have described with some particularity the various details of the machine which I have illustrated herein as an exemplification of my invention, yet it should be understood that modifications may be made in these details by those skilled in the art without departing from the spirit of the invention as set forth in the following claims.

I claim as my invention:

1. In a belt sanding machine, a framework, a driven shaft vertically and slidably mounted in said framework, a belt-driving pulley fixed to one end of said shaft, an idle shaft vertically and slidably mounted in said framework, an idle pulley fixed to said idle shaft, an abrasive belt supported by said pulleys and operated by said belt-driving pulley, a power-receiving pulley fixed to said driven shaft, yielding means tending to elevate said driven shaft, and means for oscillating vertically both of said shafts.

2. In a belt sanding machine, an abrasive belt, a belt-driving pulley and an idle pulley supporting and operating said belt, a work-holding table partly surrounding said idle pulley, means for adjusting said table horizontally, means for rotating horizontally said table to a limited extent, and means for adjusting said table vertically.

3. In a belt-sanding machine, a sand-belt, a support for the belt, a table support near said belt support, a work-table having an open-end slot through which the belt and the belt-support extend, and an adjustable connection between the table support and

the work table, permitting the latter to be adjusted toward and away from the belt support, and to be swung so as to position one edge of said slot adjacent to the belt.

4. In a belt sanding machine, a framework, a driving pulley and an idle pulley mounted in said framework, an abrasive belt supported and operated by said pulleys, a belt-tightening pulley coacting with said belt, and means for adjusting the longitudinal form of the surface of said abrasive belt, said means comprising a second idle pulley, arms extending from the ends of the axis of said pulley and pivoted to said framework, and means for locking said arms in adjusted position.

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

CARL LAWRENCE MATTISON.

Witnesses:

E. C. NELSON,

CLARK M. JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."