No. 676,957. Patented June 25, 1901.

C. J. L. MEYER.

MACHINE FOR TRUING LUMBER.

(Application filed Aug. 22, 1898.)

(No Model.) 5 Sheets—Sheet 1.

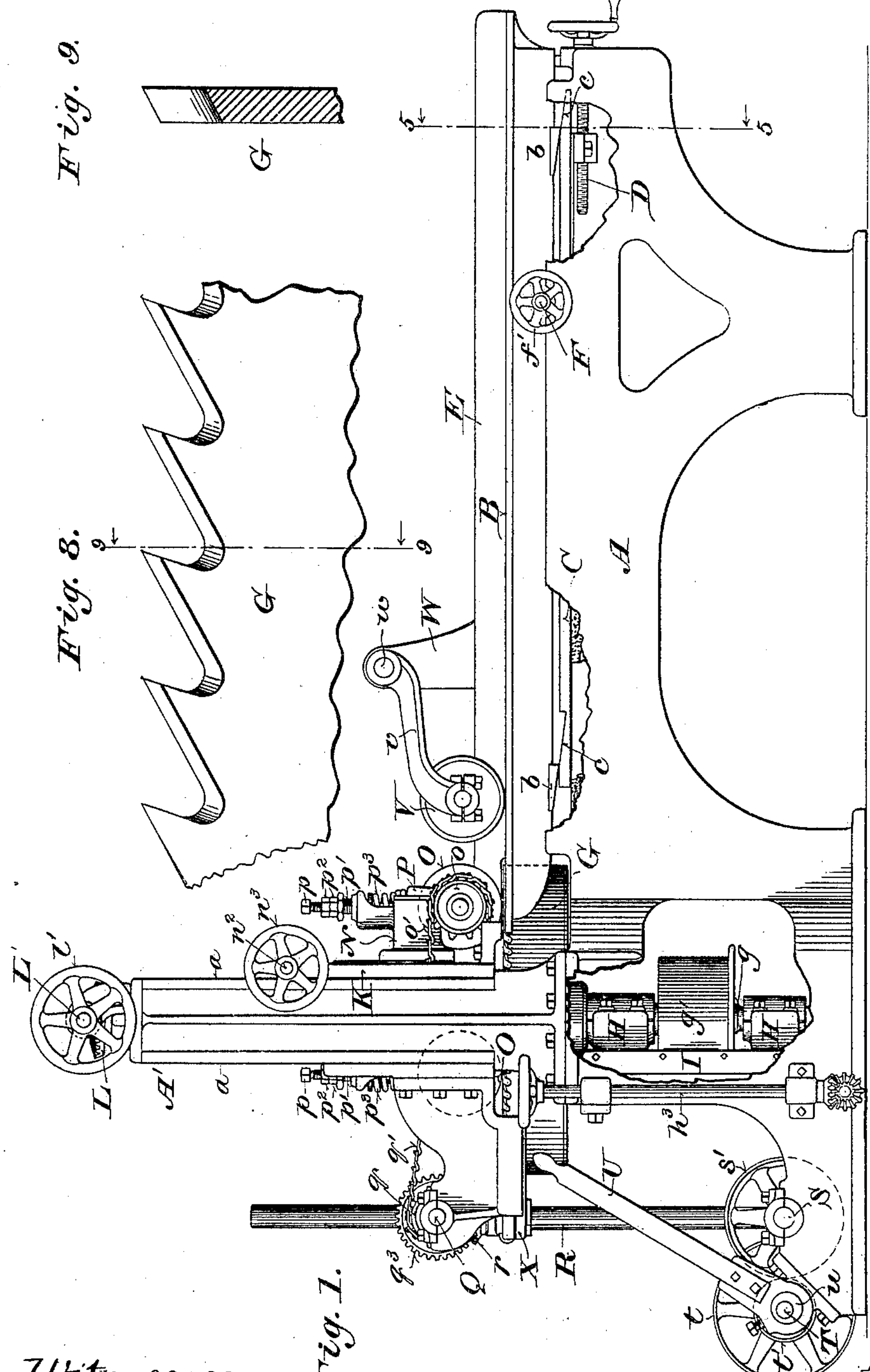

Fig. 9.

Fig. 8.

Fig. 1.

Witnessess.

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C. A. Ebert.

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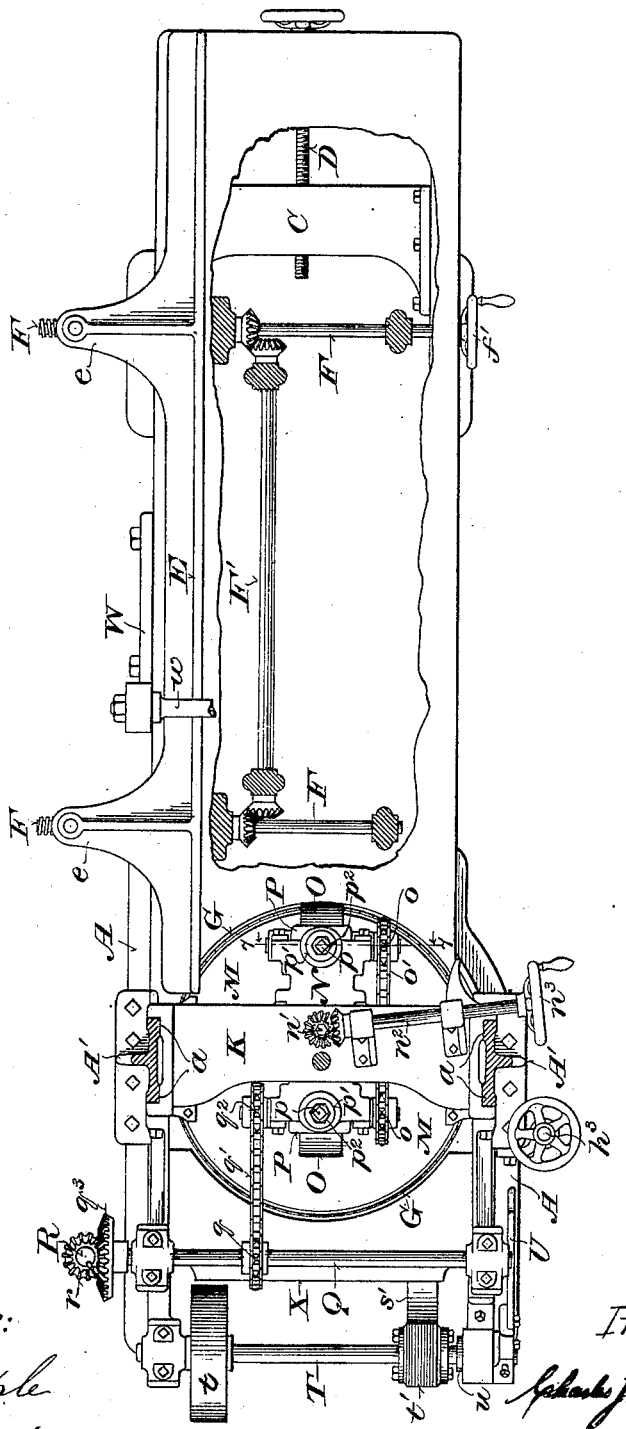
(No Model.) (Application filed Aug. 22, 1898.) 5 Sheets—Sheet 2.

Fig. 2.



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5 Sheets—Sheet 3.

Fig. 3.

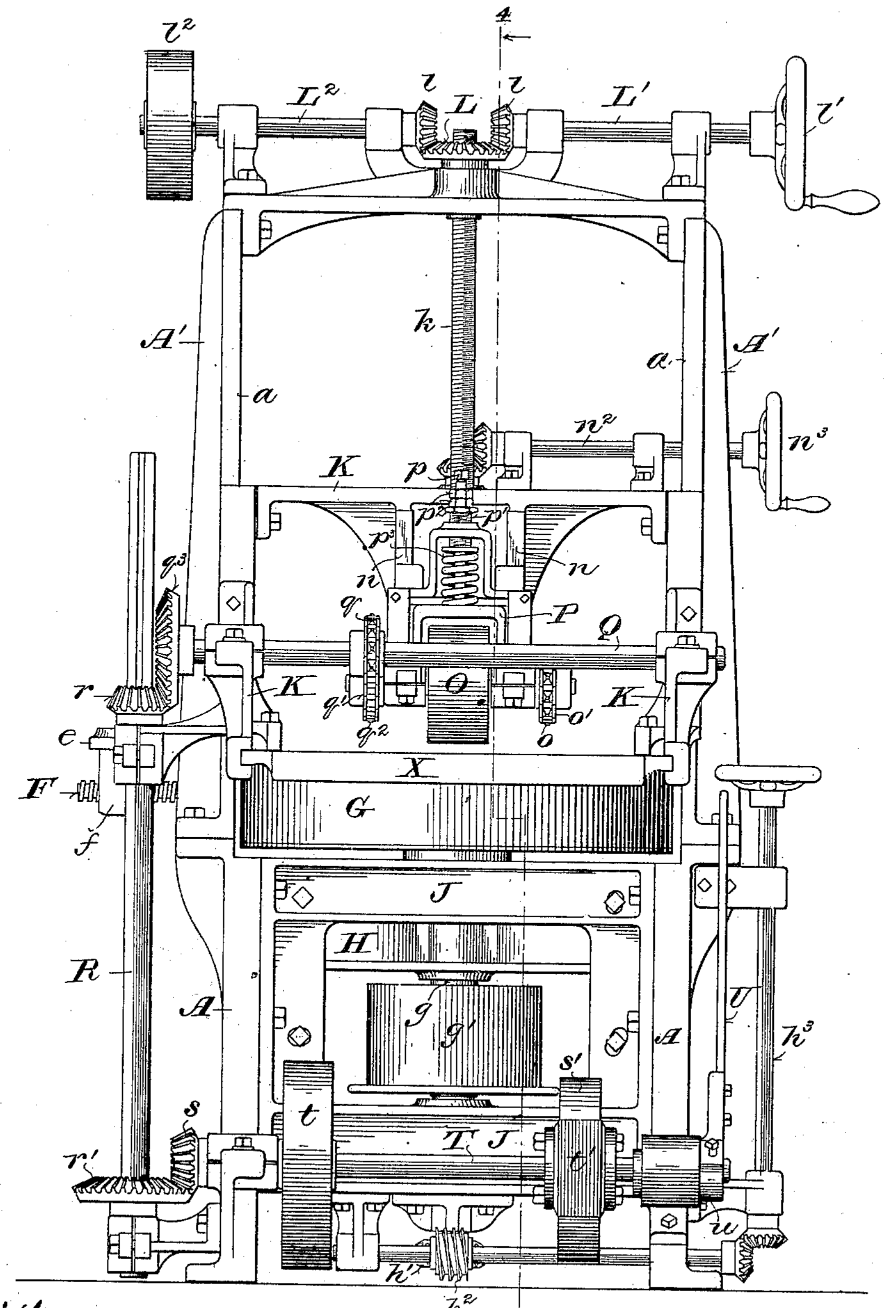

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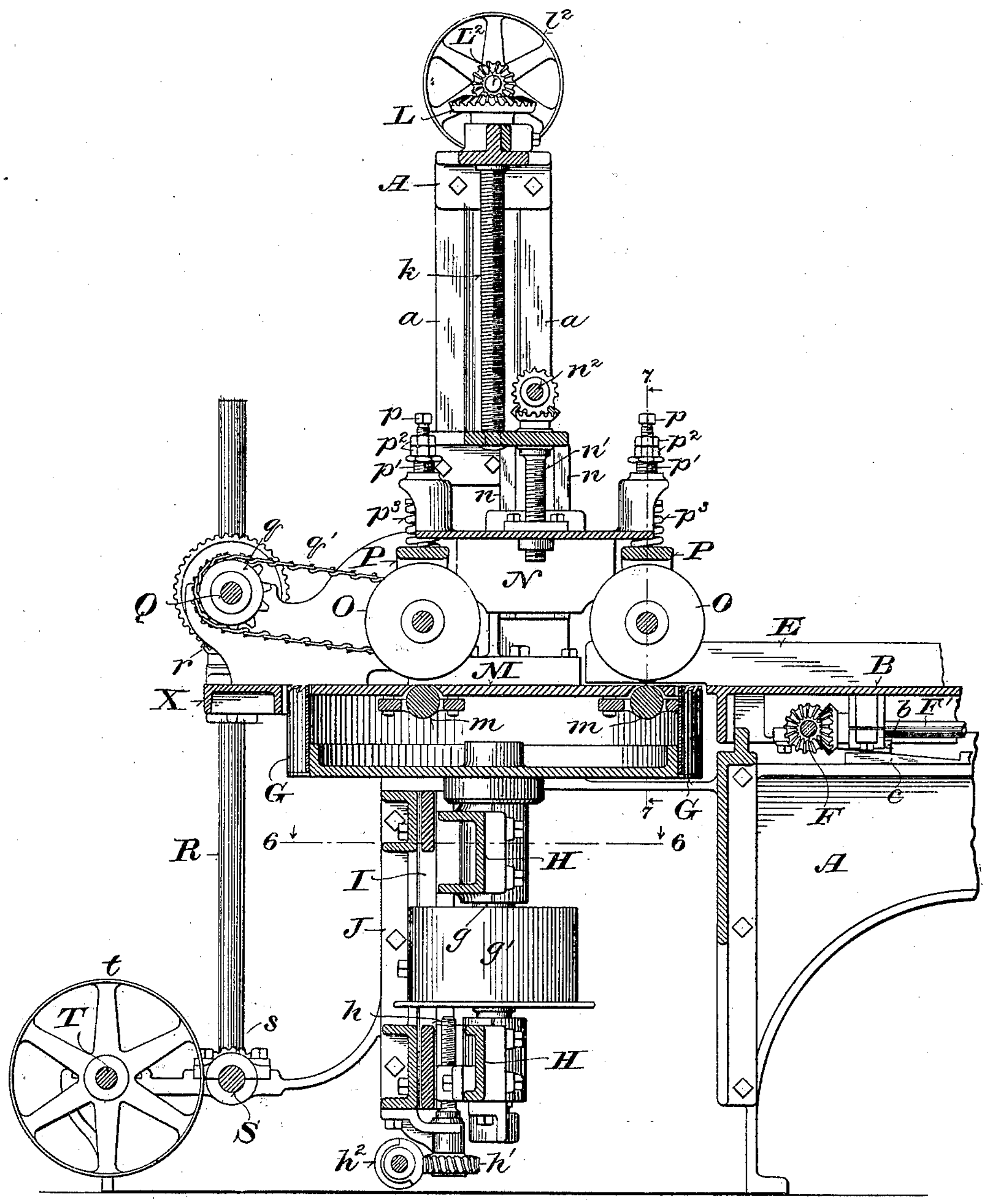
Fig. 4.



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5 Sheets—Sheet 5.

Fig. 5.

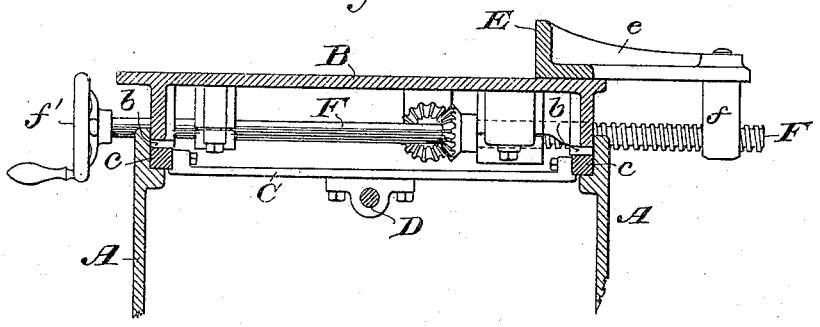


Fig. 6.

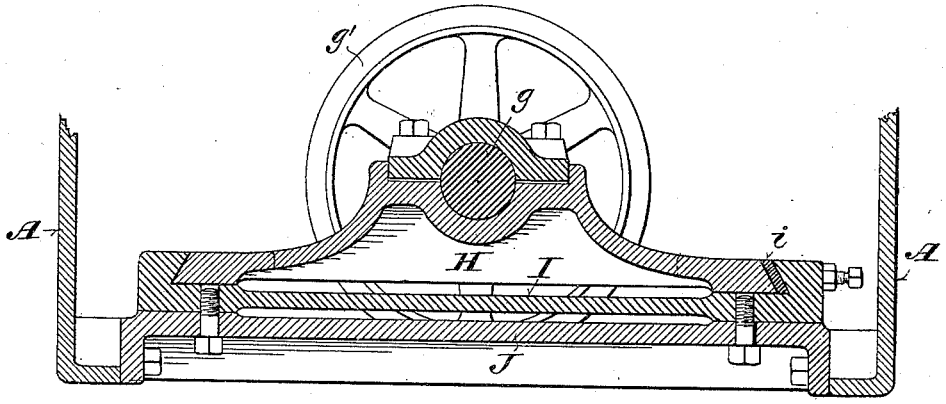
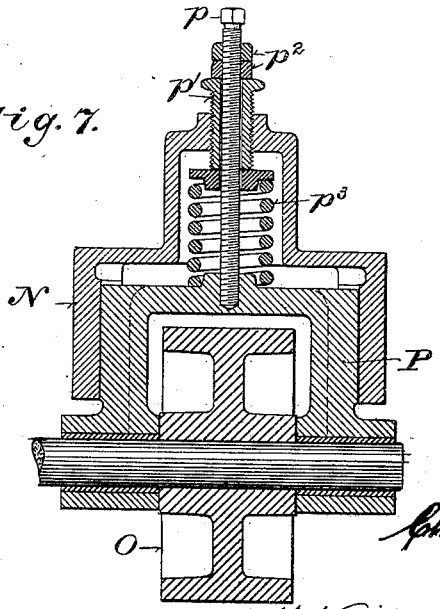


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES J. L. MEYER, OF CHICAGO, ILLINOIS.

MACHINE FOR TRUING LUMBER.

SPECIFICATION forming part of Letters Patent No. 676,957, dated June 25, 1901.

Application filed August 22, 1898. Serial No. 689,220. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. L. MEYER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Truing Lumber, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The main objects of my invention are to take the wind out of lumber, particularly hard wood, and give it a true surface, and to do this rapidly, economically, and without danger to workmen.

It consists of certain novel features of construction and combinations of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a plan view of the same, certain parts being broken away and shown in horizontal section. Fig. 3 is an end elevation as viewed from the left with reference to Figs. 1 and 2. Fig. 4 is a vertical longitudinal section on the line 4 4, Fig. 3, of a part of the machine. Fig. 5 is a vertical cross-section on the line 5 5, Fig. 1. Fig. 6 is an enlarged horizontal section on the line 6 6, Fig. 4. Fig. 7 is an enlarged vertical section on the line 7 7, Fig. 2, of the roller-frame and one of the feed-rollers; and Figs. 8 and 9 are detail views, on a greatly-enlarged scale, of the planing-saw, Fig. 8 being a side elevation of a portion of the saw-blade and Fig. 9 a cross-section on the line 9 9, Fig. 8.

Referring to Figs. 1 to 4, inclusive, A designates the main frame of the machine, which is provided with a vertically-adjustable horizontal work-supporting bed B. It is formed or provided on the sides and ends with depending flanges which engage with upwardly-projecting parts of the frame, and thus guide and hold the bed in place.

C is a sliding frame which has horizontal bearings on the sides of frame A, as shown in Fig. 5, and is provided with wedges or inclines *c c*, upon which rest wedges or inclines *b b* on the side flanges of the bed, as shown in Fig. 1. D is a screw which engages one end of said frame C and has a bearing in the end of the main frame A for moving said frame C longitudinally and raising or lowering the bed B.

E is a guide mounted upon the bed B lengthwise of the machine and provided with arms or brackets *e e*, which project over the back side of the machine.

F F are screw-shafts supported in bearings on the under side of the bed transversely thereto and threaded at their rear ends in nuts *f* on the under sides of the bracket *e*, as shown in Fig. 5. The two screw-shafts are connected by a longitudinal shaft F′, which is provided at the ends with bevel-gears meshing with similar gears on said screw-shafts, as shown in Fig. 2. One of the screw-shafts is extended and provided on the front side of the machine with a crank or hand wheel *f′*, by means of which both screw-shafts are simultaneously turned, and the guide E is moved forward or backward equally at both ends.

G is a cylindrical truing or planing saw mounted upon the upper end of a vertically-disposed arbor *g*. It is formed on its upper edge with teeth which are beveled outwardly and downwardly, as shown in Figs. 8 and 9. The arbor *g* is supported in boxes or bearings on a frame H, which is adjustable vertically in ways on a plate or frame I, as shown in Fig. 6. One of these ways is provided with a gib *i* for taking up wear or play. The plate or frame I is adjustably attached to a cross piece or frame J, which is in turn adjustably attached to the sides of the main frame, so that the saw-arbor is capable of angular adjustment both lengthwise and crosswise of the machine. The bolt-holes through which the cross-frame J is attached to the sides of the main frame A are slightly enlarged or elongated to allow said cross-frame to be slightly tipped or inclined in either direction from a perpendicular when the bolts by which it is held in place are loosened and the bolt-holes in the cross piece or frame J, through which the plate I is secured thereto, are also enlarged or elongated, as indicated in Fig. 3, so as to permit said plate I, with its ways, to be tipped or inclined slightly in either direction from a perpendicular. The former adjustment is for the purpose of elevating the

teeth on the front side of the saw slightly above the teeth on the back side with reference to the bed B, so that the work will clear the teeth on the back side of the saw, and thereby cause the work to be done entirely by the teeth on the front side of the saw. The latter adjustment is for the purpose of leveling the saw crosswise with reference to the bed B.

h is a vertical screw engaging a nut on the saw-frame H and having a bearing on or attached to the cross-frame J. It is provided at its lower end with a worm-gear *h'*, which is engaged by a worm h^2 on a horizontal shaft which extends to the front side of the machine and is connected by bevel-gears with an upright shaft h^3, provided at its upper end, within convenient reach of the attendant or operator, with a crank or hand wheel, as shown in Figs. 3 and 4. By means of the mechanism last described the saw may be easily and accurately adjusted vertically, and it is held rigidly in place when adjusted by the worm h^2, which prevents the screw *h* from turning.

The saw-arbor *g* is provided between its bearings with a pulley *g'*, by means of which it is driven.

K is a frame or slide movable up and down on vertical ways *a a* on standards A' A' on each side of the main frame opposite the saw. *k* is a screw fastened at its lower end to said slide and extending upwardly therefrom through and threaded in the hub of a bevel gear L, which has a bearing in a cross-piece carried by the upper ends of the standards A'. L' is a horizontal shaft carried by said cross-piece and provided at its inner end with a bevel gear or pinion *l*, which meshes with the gear L, and at its outer end with a crank or hand wheel *l'*. L^2 is a like horizontal shaft carried by the opposite end of said cross-piece and provided in like manner at its inner end with a bevel gear or pinion *l*, meshing with the opposite side of the gear L, and at its outer end with a pulley l^2, through which the slide K may be raised and lowered by power taken from any conveniently-located counter-shaft or driving-pulley.

The machine may be provided with either or both of the power or manually operated connections above mentioned for turning the gear L and raising or lowering the slide K.

To the lower part of the slide K on each side of the machine is attached a circular horizontal guide-plate M, fitted loosely inside of the saw G, as shown in Figs. 2 and 4. This guide-plate is provided on the under side with idle rollers *m m*, arranged crosswise of the machine and projecting through openings in said plate slightly above its upper face, so as to facilitate the passage of lumber over said plate, which prevents it from sagging inside of the saw.

N is a roller-frame adjustable vertically on ways *n n* on the slide K. *n'* is a screw threaded in said roller-frame and having a bearing in the slide K. It is provided at its upper end with a bevel-gear, which is engaged by a similar gear on the inner or rear end of a short horizontal shaft n^2, carried by the slide K and provided at its front end within easy reach of the attendant with a crank or hand wheel n^3, as shown in Figs. 2 and 3.

O O are feed-rollers journaled in and carried by inverted-**U**-shaped yokes P P, which are each yieldingly and adjustably connected with the roller-frame N, as shown in Fig. 7, by means of a screw *p*, threaded centrally in the upper part of the yoke and passing upwardly therefrom loosely through a hollow screw *p'*, which is externally threaded in the roller-frame, nuts p^2 on the screw *p* above the screw *p'*, and a spring p^3, interposed between the yoke P and a washer, against which the lower end of the screw *p'* abuts. Each of the feed-rollers, which is carried directly above and parallel with one of the rollers *m* in the guide-plate M, is allowed to yield upwardly independently of the other against the tension of the spring p^3, and either may be adjusted vertically independently of the other by means of the hollow screw *p'*. The tension of the spring p^3 may also be adjusted by turning the nuts p^2 up or down upon the screw *p*. The shafts of the two feed-rollers are provided at one end with sprocket-wheels *o o*, which are connected by a chain belt *o'*, as shown in Fig. 2.

Q is a shaft carried by the slide K, parallel with the feed-rollers O. It is provided with a sprocket-wheel *q*, which is connected by a chain belt *q'* with a sprocket-wheel q^2 on the shaft of the adjacent roller, as shown in Figs. 2 and 4. It is also provided at its rear end with a bevel-gear q^3, meshing with a similar gear or pinion *r*, which is journaled in a bearing formed or provided therefor in a part of the slide K.

R is an upright shaft passing loosely through the gear or pinion *r*, but prevented from turning therein by a spline, key, or feather, as shown in Figs. 2 and 3. At or near its lower end the shaft R is provided with a bevel-gear *r'*, which meshes with a similar gear or pinion *s* on a horizontal cross-shaft S.

T is a driving-shaft carried by bearings in the main frame substantially parallel with the shaft S and provided with a pulley *t*, by which it is driven from any convenient source. It is also provided with a paper or other suitable friction driving-wheel *t'*, which is adapted to be moved into and out of engagement with a friction-wheel *s'* on the shaft S. The front end of the shaft T, next to its friction-driver *t'*, is supported in an eccentric sleeve or box *u*, to which is attached a lever U, as shown in Fig. 1, for throwing said friction-driver *t'* into and out of contact with the friction-wheel *s'*.

V is a presser-roller carried over the bed B, adjacent to the saw, by one end of a vertically-swinging arm or frame *v*, which is pivoted or hinged at its opposite and upper end to an overhanging cross-rod *w*, supported at

its rear end by a bracket W, attached to the back side of bed B.

X is a leaf or plate supported at its ends in horizontal grooves or ways in the slide K at a level with the guide-plate M for the purpose of supporting the lumber as it leaves the saw and passes out of the machine. It is readily removable from the slide K, and when it is withdrawn and said slide, with the feed-rollers and their driving connections, is raised the saw G can be readily detached and removed from the machine for sharpening or repairs or for the substitution of another saw. Both the bed B and the leaf X are shaped adjacent to the saw to conform therewith, as shown in Fig. 2.

The machine operates as follows: The lumber to be straightened and trued is placed on the bed B against the guide E and shoved endwise underneath the presser-roller V until it is caught by the first feed-roller O. It is allowed to rest loosely on the bed B, so that the natural wind therein will not be pressed out, but will be taken out by the saw as the lumber passes over it and is firmly pressed down by the feed-rollers O against the rollers m in the guide-plate M, and thereby held in place adjacent to the cutting edge of the saw. The feed-rollers being comparatively short and the guide E being adjusted, so as to cause them to bear on the lumber approximately in the center, the saw will make a cut varying in depth according to the wind and inequalities in the under surface of the lumber, thus tending to take out the wind and inequalities and to produce a true plane. The saw is accurately leveled crosswise by the angular adjustment of the plate I and its ways on the cross piece or frame J, and it is adjusted so that its teeth on the side toward the delivery end of the machine will run just below the upper faces of the guide-plate M and leaf X, and thus clear the lumber passing over it, while the teeth on the opposite side next to the bed B will project slightly above the guide-plate M approximately on a level with the upper sides of the rollers m. This adjustment is made by first lowering the plate M into its normal or working position, where it is preferably supported at the ends by the main frame A, and then raising or lowering the saw by means of the adjusting-screw h and its operating connections, the desired inclination being given to the saw and its arbor by the angular adjustment of the cross piece or frame J between the sides of the main frame. When the foregoing adjustments have been properly made, the bed B is raised or lowered by means of the adjusting-screw D, so as to cause the saw to make a cut of the desired depth, according to the condition of the lumber, a slight or shallow cut being made when it is only slightly irregular or out of true and a deeper cut being made when it is more winding, irregular, or out of true. The feed-rollers are raised or lowered simultaneously, according to the thickness of the lumber, by means of the screw n' and its operating connections hereinbefore described, and each roller is adjusted independently of the other by means of the associated hollow or tubular screw p'. The tension of the springs p^3 is adjusted to cause the feed-rollers to press with greater or less force upon the lumber by means of the nuts p^2 on the screws p.

A saw from thirty to thirty-four inches in diameter, having a blade about one-quarter of an inch thick and about one hundred teeth inclined or beveled at the points about one-eighth of an inch, is suitable for general use, although these dimensions may be varied. Such a saw may be run at the rate of about one thousand revolutions per minute and the lumber fed thereto at about the rate of one hundred feet per minute. This would cause each tooth to cut in advance of the adjacent tooth about one eighty-third of an inch. While the lumber is thus very rapidly fed through the machine, it is at the same time accurately and smoothly trued and dressed, and under ordinary conditions the surface left by the truing-saw is sufficiently smooth to be finished on a sanding-machine without further planing.

I do not wish to be understood as limiting myself to the exact details of construction herein shown and described except in respect to the specific claims therefor, as they may be variously modified within the spirit and intended scope of my invention.

Although for reasons above explained a planing-saw of the construction shown and described is preferably employed, the advantages of other novel features of construction and arrangement of parts embodied in my machine may be secured in connection with other forms of rotary planing or truing cutters when such cutters are employed in substantially the same relation to other parts of the machine.

I claim—

1. In a machine for truing lumber the combination with a suitable frame provided with a vertically-adjustable slide, of a planer-head mounted upon the upper end of a vertical arbor and having cutting edges on its upper side, a horizontal guide-plate carried by said slide inside of the cutting edges of the planer-head and a feed-roller also carried by said slide above said guide-plate, substantially as and for the purposes set forth.

2. In a machine for truing lumber the combination with a suitable frame, of a planer-head mounted therein upon the upper end of a vertical arbor and having cutting edges on its upper side, a slide carried by vertical ways on said frame, means for raising and lowering said slide, a roller-frame carried by vertical ways on said slide, and provided with vertically-yielding feed-rollers above the planer-head, means for adjusting said roller-frame vertically on said slide, and a horizontal guide-plate adapted to be carried by said slide inside of the cutting edges of the planer-

head below the feed-rollers, substantially as and for the purposes set forth.

3. In a machine for truing lumber the combination with a suitable frame provided with a vertically-movable slide, of a planer-head mounted upon a vertical arbor and having cutting edges on its upper side, a vertically-yielding feed-roller carried by said slide above the planer-head, a horizontal shaft also carried by said slide parallel with the roller-shaft and connected therewith by a chain belt and sprocket-wheels, a vertical power-transmitting shaft passing loosely through and having a sliding connection with a bevel-gear which is carried by said slide in mesh with a bevel-gear on said horizontal shaft, substantially as and for the purposes set forth.

4. In a machine for truing lumber the combination with a main frame provided with a horizontal work-supporting bed, of an upright cross-frame adjustably attached to the main frame so as to be tipped lengthwise thereof, and provided with vertically-disposed ways adjustably attached thereto so as to be tipped crosswise of the main frame, a planer-frame mounted upon said ways and provided with vertically-disposed bearings for the planer-arbor, a planer-head mounted upon the upper end of said arbor and having cutting edges on its upper side, a screw for adjusting the planer-frame vertically and a shaft provided with a worm engaging a worm-gear on said screw for turning the same and locking it in place, substantially as and for the purposes set forth.

5. In a machine for truing lumber the combination with the main frame provided with a horizontal work-supporting bed, and with vertically-disposed ways capable of angular adjustment both lengthwise and crosswise of the machine, of a planer-frame mounted upon said ways and provided with a vertically-disposed arbor, and a planer-head mounted upon the upper end of said arbor and having cutting edges on its upper side, substantially as and for the purposes set forth.

6. In a machine for truing lumber the combination with a main frame provided with a horizontal work-supporting bed, of a vertically-adjustable planer-frame provided with a vertically-disposed arbor, a planer-head mounted upon the upper end of said arbor and provided with cutting edges on its upper side, a vertical screw engaging a nut on said planer-frame and having a bearing in a part of the main frame, a horizontal shaft provided with a worm engaging a worm-gear on said screw, and an upright shaft connected at its lower end with said horizontal shaft by bevel-gears and provided at its upper end within easy reach of the attendant with means for turning it, substantially as and for the purposes set forth.

7. In a machine for truing lumber the combination with a suitable frame provided with a horizontal work-supporting bed, of a planer-head mounted upon the upper end of a vertical arbor and having cutting edges on its upper side, a vertically-movable slide above the saw, means for raising and lowering said slide, a guide carried by said slide inside of the cutting edges of the planer-head, a roller-frame adjustable vertically on said slide and provided with one or more feed-rollers arranged above and transversely to said guide, a screw engaging said roller-frame and having a bearing in said slide, and a crank-shaft carried by said slide and connected by gears with said screw for turning it, substantially as and for the purposes set forth.

8. In a machine for truing lumber the combination with a suitable frame provided with a horizontal work-supporting bed, of a planer-head mounted upon the upper end of an upright arbor and provided on its upper side with cutting edges, a vertically-movable slide above the planer-head, means for raising and lowering said slide, a guide carried by said slide within the cutting edges of the planer-head, a vertically-adjustable roller-frame carried by said slide above said guide, means for adjusting said roller-frame vertically on said slide, feed-rollers having vertically-yielding bearings in said roller-frame and means for driving said rollers, substantially as and for the purposes set forth.

9. In a machine for truing lumber the combination with a suitable frame provided with a horizontal work-supporting bed, of a planer-head mounted on the upper end of a vertical arbor, a vertically-movable slide overhanging said planer-head, a guide carried by said slide above the planer-head within its cutting edges, a roller-frame mounted and vertically adjustable in said slide above said guide, a feed-roller, a yoke provided with bearings for said roller, a tubular screw externally threaded in the roller-frame, a screw secured at its lower end to said yoke and passing loosely through said tubular screw and provided above it with an adjusting-nut, and a spiral spring interposed between said yoke and the lower end of said tubular screw, substantially as and for the purposes set forth.

10. In a machine for truing lumber the combination with a suitable frame provided with a horizontal bed, of a planer-head mounted upon the upper end of a vertical arbor and having cutting edges on its upper side, a vertically-movable slide mounted on ways rising from the sides of the frame on opposite sides of the planer-head, means for raising and lowering said slide, a guide carried by said slide above said planer-head within its cutting edges, a vertically-adjustable roller-frame carried by said slide, vertically and independently yielding feed-rollers carried by said roller-frame over said guide and connected with each other by a chain belt and sprocket-wheels, and a power-transmitting shaft connected by a chain belt and sprocket-wheels with one of the roller-shafts, whereby either or both of the feed-rollers is allowed to rise and fall without effect on their driving

connections, substantially as and for the purposes set forth.

11. In a machine for truing lumber, the combination with a suitable frame provided with a horizontal bed at the receiving end of the machine, of a rotary planer mounted on the upper end of an upright arbor, a vertically-movable slide mounted on ways rising from said frame on opposite sides of the planer, and a detachable leaf carried in a horizontal position by said slide on the delivery side of the saw, substantially as and for the purposes set forth.

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

CHARLES J. L. MEYER.

Witnesses:
H. P. MEYER,
CHAS. F. MURPHEY.