No. 613,156. Patented Oct. 25, 1898.

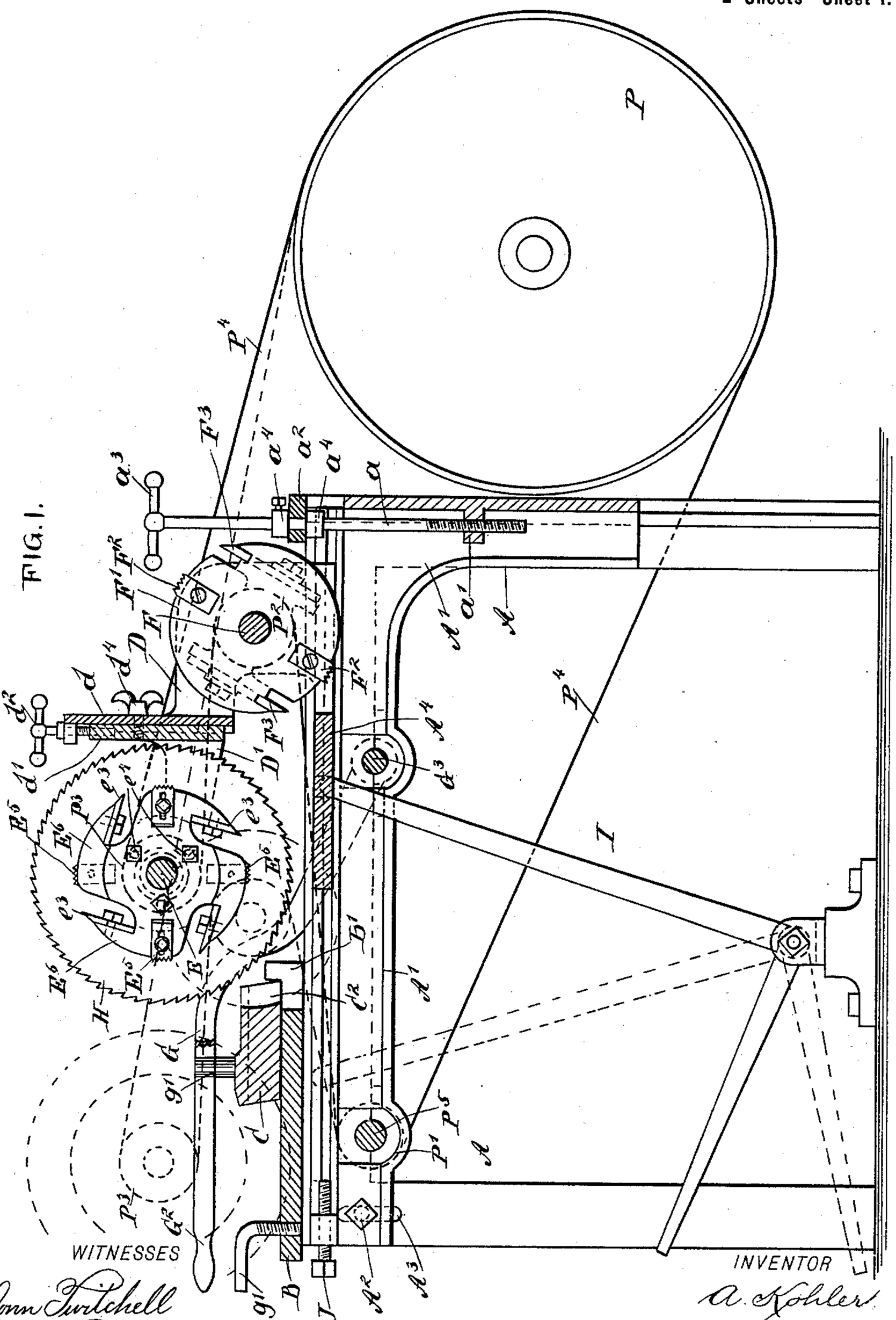
A. KOHLER.

DADOING AND TENONING MACHINE.

(Application filed Sept. 23, 1897.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.



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(No Model.) 2 Sheets—Sheet 2

FIG. 2.

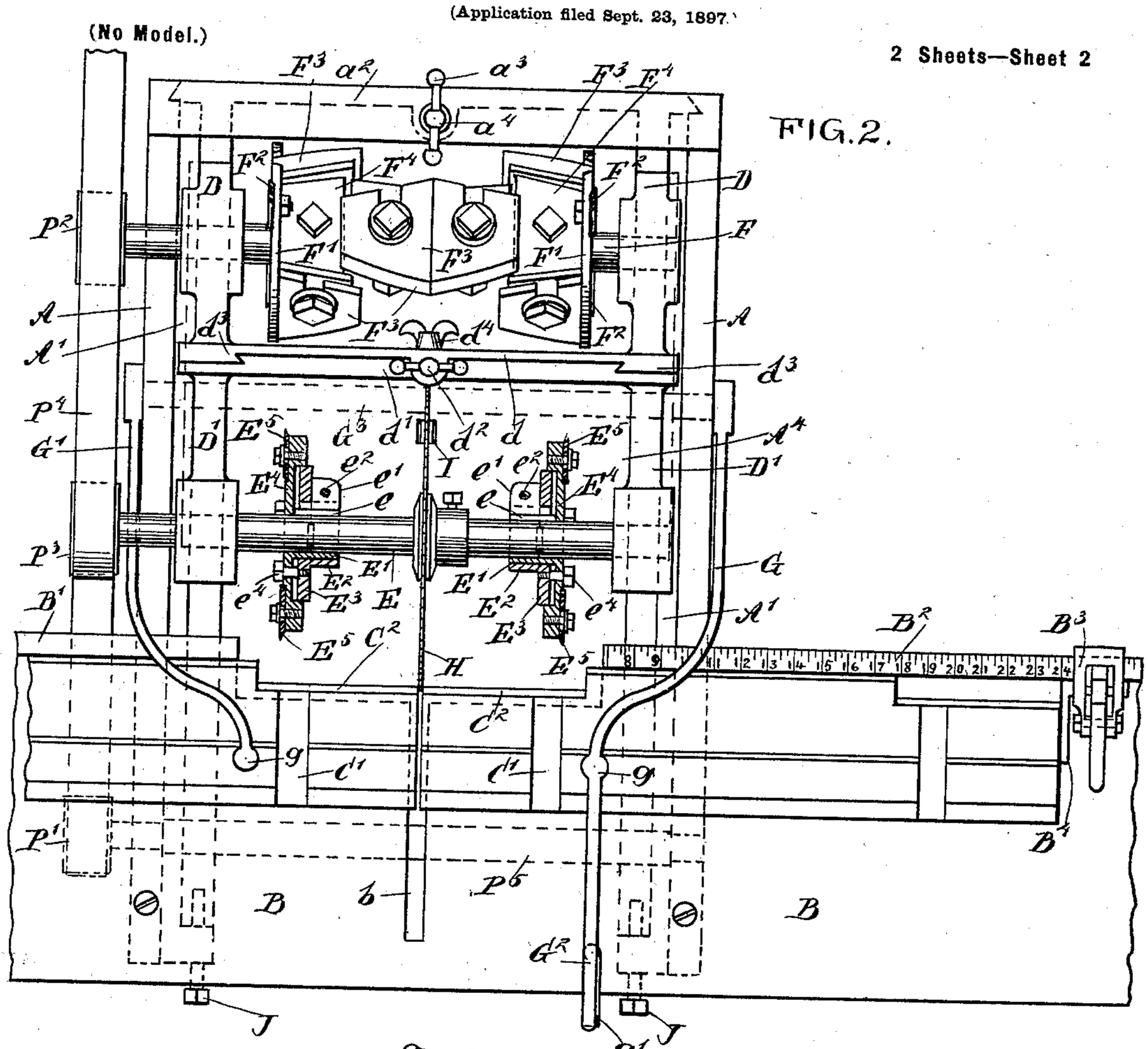
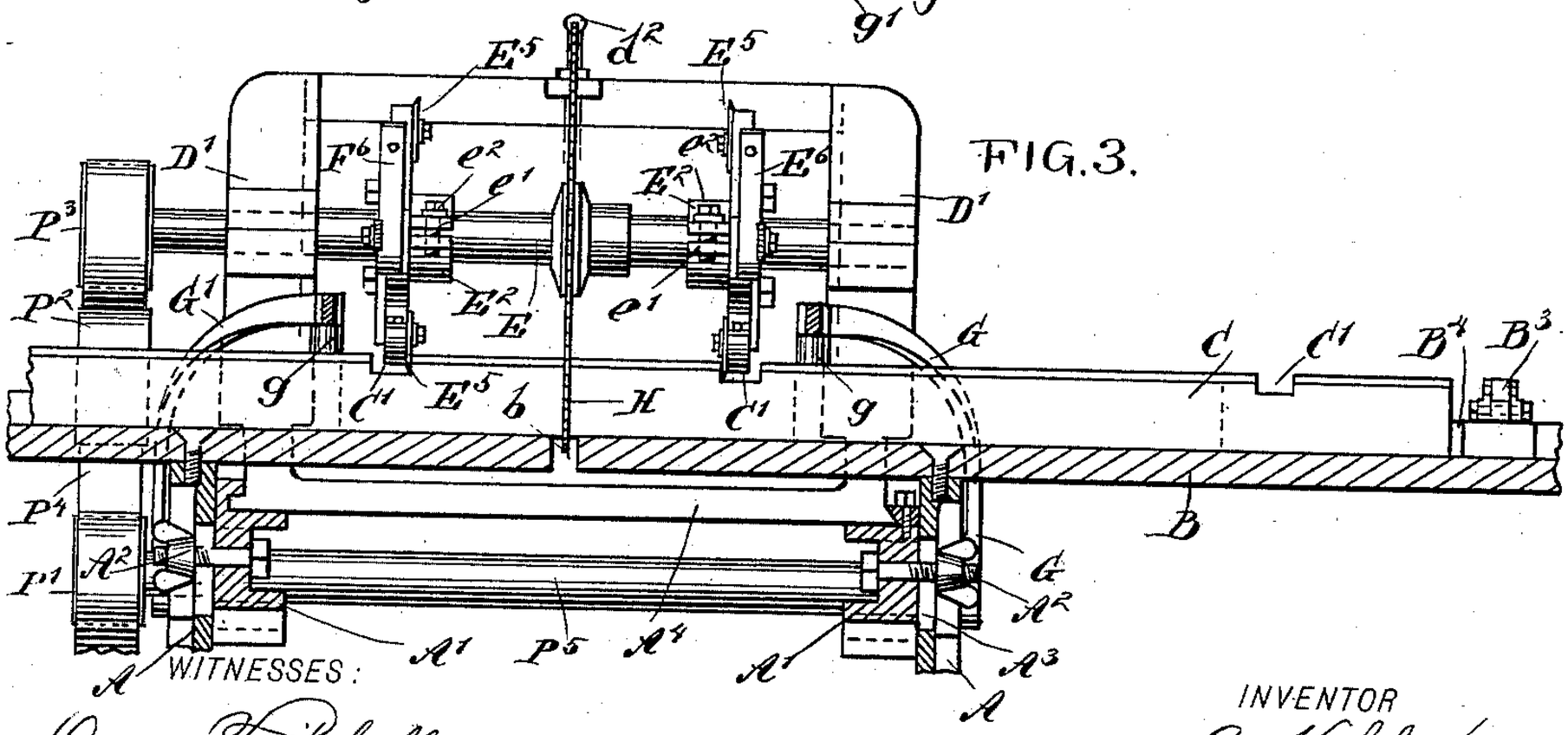


FIG. 3.



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ALOIS KOHLER, OF NEW YORK, N. Y.

DADOING AND TENONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 613,156, dated October 25, 1898.

Application filed September 23, 1897. Serial No. 652,738. (No model.)

To all whom it may concern:

Be it known that I, ALOIS KOHLER, of New York city, in the county and State of New York, have invented a new and Improved Combined Dadoing and Tenoning Machine, of which the following is a full, clear, and exact description.

My invention relates to certain improvements in machines intended for producing rapidly and at small cost certain parts of framing for door and window casings.

The invention consists of a frame slidable upon the main frame of the machine and carrying two shafts, one provided with the dado-heads and a cut-off saw between said heads, and the other provided with the tenoning-heads, said frame being movable toward and away from the stock, which is placed upon a fixed table.

The invention further comprises certain improved details of construction which will be hereinafter described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation taken through the machine at a point outside the first cutter-head. Fig. 2 is a top plan view of the machine, the dado-heads being shown in section; and Fig. 3 is a sectional elevation taken through the table upon which the work is placed.

The main supporting-frame A of the machine is made in any suitable shape, so as to furnish a firm support for the operating mechanism. Upon the side of this frame next to the operator is fixed a table B, which is provided with a projecting rib or flange B′ upon the side next to the cutters and acting as a stop to accurately position the stock in one direction. This table is provided with a scale B^2, upon which is located a stop B^4, fastened thereto by any suitable locking mechanism, as B^3. This scale is laid out in such a manner that the length of the stock between the stop and the cut-off saw H will correspond with the reading of the scale at the stop. The rib B′ upon the inside of the table is cut away at the point where the cutter-heads operate. The table is also provided with a cross-slot *b*, adapted to receive the edge of the cut-off saw.

A second or adjusting frame A′ is fixed upon the main supporting-frame in such a manner that it may be adjusted in elevation within certain limits. The frame is secured at one end to the main frame by means of slots A^3 and clamping-bolts A^2. The other end of this adjusting-frame A′ is supported and adjusted by means of the threaded rod *a*, which is provided with collars a^4, located upon opposite sides of a bar a^2, forming a part of or secured to the main supporting-frame. The rod *a* passes through a lug *a′* upon the frame A′, and said rod has a hand wheel or bar a^3 upon its upper end, by which it may be readily turned to adjust the position of the frame. The frame A′ is provided upon its inner surface with grooves forming guideways for receiving the outer edges of the reciprocating frame A^4, as clearly shown in Fig. 3.

The frame A^4 consists of two parts, a base having the arms D extending upward therefrom at each side of the machine and furnishing the bearings for the ends of the shaft F. This base has a cross plate or bar *d* supported from the arms D, the face of which plate or bar is vertical and which is provided with guideways d^3, adapted to receive the guides upon the complementary face of the bar or plate *d′*, forming a part of the outer section of the overhanging frame. This outer section D′ is thus capable of movement vertically upon the base-section D. A threaded bar d^2 passes through a lug upon the cross-plate *d* and enters the cross-plate *d′* of the outer section D′, thus making it possible to positively and readily adjust the outer section relatively to the base. The two parts are clamped together when adjusted by means of the clamping-bolt d^4.

The outer section D′ carries a shaft E, upon which are mounted the two dado-heads and the cut-off saw. These dado-heads are each formed of two disks E^3 and E^4, each of which is provided with sleeves E′ E^2, surrounding the shaft. The sleeve E′, which is connected to the disk E^4, lies within the sleeve E^2, which is connected to the disk E^3. Both of these sleeves are split upon one side, as shown at *e*. The outer sleeve is provided with two ears *e′*, through which passes a clamping-bolt e^2. By

this means the two disks may be clamped together and also upon the shaft E. The disks are each provided with two scoring-cutters E^5, placed opposite each other, and cutter-blades e^3. The cutter-blades e^3 upon one disk overlap the cutter-blades upon the other disk, thus making it possible to adjust the two disks toward or away from each other and vary in this manner the width of the dado or groove cut in the stock.

For the class of work for which this machine is especially designed the width of the groove or dado will usually be one of two standard widths. The head will be so formed that the width of groove cut will correspond to the narrower of these two widths when the sides of the two disks are in direct contact. The heads will be provided with a limiting-stop, which will permit the disks to be separated to such a distance that the cutters will cut the larger of the standard widths. This stop consists of a bolt e^4, which passes through one of the disks and screws into the other and upon its outer end is provided with a jam-nut or head which prevents the separation of the disk beyond a certain point. By this means the head may be readily set in either of the two positions in which it is used very quickly and without measuring and with a certainty that the adjustment is correct.

The shaft E is provided with a cut-off saw H, located centrally of the machine. The dado-heads are each located at the same distance from the saw, the distance being such as to form the dado at the proper distance from the end of the piece operated on. The shaft F, which carries the tenoning-heads, is at a lower elevation and at the rear of the shaft E, which carries the dado-heads and the cut-off saw. The tenoning-heads may be constructed in any manner common for such heads. As shown in the drawings, these heads each consist of a disk F′, which carries the scoring-cutters F^2, and a body F^4, upon which is mounted the cutter-blades F^3.

A bell-crank lever I is pivoted at its bend to a bracket mounted upon the lower part of the machine or fastened to the floor. One arm of this lever I projects to a point where it may be conveniently engaged by the foot of the operator. The other arm extends upwardly and passes through a hole or slot in the body of the base A^4 of the reciprocating frame. By pressing upon the treadle end of the lever I the entire frame will thus be moved forward, sliding in its ways.

The shafts E and F are driven from a pulley P, located upon the rear of the machine or in any suitable position. The belt P^4 from this pulley passes about an idler P′, mounted upon a shaft P^5, located beneath the table B. From this idler the belt passes around a pulley P^2, mounted upon the shaft F, which carries the tenoning-heads, and from this pulley passes to and about a pulley P^3, mounted upon the shaft which carries the dado-heads and cut-off saw, and from this latter pulley back to the pulley P. This arrangement of belts in connection with an idler is that which is common where the shafts driven are to move bodily in a lateral direction as well as to rotate. This arrangement secures the proper rotation of the shafts and enables the length of the belt to be maintained constant, notwithstanding the reciprocation of the shafts.

Holding-down levers G and G′ are provided, which are adapted to engage the upper surface of the stock and hold it securely in position while being operated upon. These levers extend from each side of the machine and are connected at one end to a cross-shaft G^3, so that both levers may be operated by grasping either one. The lever G is, however, provided with an extension G^2, which makes it more convenient for the use of the operator than if it were shorter. Both levers are provided with bearing-blocks g, which preferably consist of rubber or some similar material which will firmly engage and hold the stock without marring it.

The table B is also provided with an upwardly-extending rod g', forming a handle, which may be grasped by the operator at the same time as the handle G^2 of the holding-down lever, the object being to enable the operator to hold this lever firmly down in place by gripping the two together instead of making it necessary at all times to bear his weight upon the lever. Upon the forward side of the main frame are placed two set-screws J, which form stops against which the forward end of the reciprocating frame carrying the cutter-heads will contact.

In using the device the lever I is pressed downward until the reciprocating frame has been carried forward to a contact with the stops J. These stops will be adjusted to correspond with the work to be done and will thus insure that the work is all of the same size.

The operation of my device is as follows: A piece of lumber C of the proper size for forming the manufactured product is brought to the machine and placed in contact with the flange B′. The end of this piece should at the beginning pass a little beyond the cut-off saw H. The holding-down levers are then brought down upon the stock. The lever I is then depressed, driving forward both of the shafts with their cutter-heads. The dadoing-heads and the cut-off saw travel entirely beyond the stock, forming the grooves C′ in the upper surface of the stock and trimming the ends. The tenoning-heads being located slightly below the dadoing-heads engage the edge of the stock and cut out the recess C^2. The reciprocating frame is then allowed to slide back to its normal position, as shown in Fig. 2. The stock B^4 having been adjusted to correspond with the length of the finished product, the stock is then slid along upon the table until its end contacts with the stop B^4. The holding-down levers are

then engaged with the stock again and the reciprocating frame brought forward. The operation of the cutter-heads upon the stock is exactly as previously described, excepting that in this case both cutter-heads operate, forming the dado and tenon upon one end of two separate pieces, the cut-off saw operating to sever the two pieces.

This device makes a compact and readily-operated machine which may be set so that absolute accuracy and uniformity of the work may be guaranteed and yet be operated by ordinary labor.

The construction shown in the drawings, in which the dado-heads are placed above the work, secures certain results which would not be obtained were the dado-heads placed below the work. One of these results is that the surface of the work which will be exposed when in use is up and visible to the operator while being operated upon. By reason of this it will be possible at times to avoid knots or other blemishes in the stock which otherwise might not be seen during the process of manufacture and which thus might be left in such a position that they would be exposed in the finished product. In consequence of this a better class of work is possible.

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

1. A combined dadoing and tenoning machine, comprising a fixed work-holding table having positioning-stops thereon, an overhanging frame mounted to slide in guides, a shaft journaled in the outer end of said frame and having two revolving cutter-heads thereon adapted to groove the upper surface of the work, a cut-off saw between the heads, a shaft journaled in the base of said frame and having a revolving cutter-head thereon with its center corresponding with the line of the saw and adapted to engage the edge of the work, means for rotating said shafts, and means for reciprocating said frame toward and away from the work.

2. A combined dadoing and tenoning machine, comprising a fixed work-holding table having positioning-stops thereon, an overhanging frame mounted to slide in guides, a shaft journaled in the outer end of the frame and having two cutter-heads thereon, a shaft journaled in the base of said frame at a lower level than the first shaft and having cutter-heads thereon, means for rotating said shafts, means for vertically adjusting the base-section of the overhanging frame relative to the work-table, and means for reciprocating said frame toward and away from the work.

3. A combined dadoing and tenoning machine, comprising a fixed work-holding table having positioning-stops thereon, an overhanging frame formed in two parts, one of which is adjustably mounted upon vertical guides on the main frame, and the other is adjustably mounted upon vertical guides on the first part, a laterally-extending shaft journaled in the outer overhanging portion of said frame and having thereon two cutter-heads and a cut-off saw between said heads, and a parallel shaft journaled in the base-section of said frame having cutter-heads thereon, said base-section and the supporting-frame having guides whereby the heads may be brought to the work, substantially as described.

4. A dado-head, comprising two plates or disks, each provided with a portion of the cutters and movable upon their shaft relative to each other, fixed stops carried by said heads and limiting said adjustments in each direction, concentric split sleeves on said disks and surrounding the shaft, the outer sleeve having flanges on each side of the split, and a bolt passing through said flanges for tightening the sleeves.

5. A dado-head, comprising two plates or disks, each provided with a portion of the cutters, concentric split sleeves on said disks and surrounding the shaft, the outer sleeve having flanges on each side of the split, and means for drawing the sleeves together.

6. A combined dadoing and tenoning machine, comprising a supporting-frame, a fixed work-holding table, a frame having guideways therein and adjustable vertically upon the supporting-frame, and a reciprocating frame having guides fitting said ways and carrying the cutter-heads.

7. A combined dadoing and tenoning machine, comprising a supporting-frame, a fixed work-holding table, a frame having guideways therein, one end thereof being supported on the main frame by vertical slots and bolts and the other end by a threaded bolt and hand-wheel, and a reciprocating frame having guides fitting said ways and carrying the cutter-heads.

8. A combined dadoing and tenoning machine, comprising a supporting-frame, a vertically-adjustable frame therein having horizontal guideways, an overhanging frame formed in two parts, the guideway or overhanging end and the base both carrying cutter-heads, the base-section having guides fiting the ways in the vertically-adjustable frame, one of the parts of the overhanging frame having vertical guides and the other having guideways embracing the guides, and positive moving and clamping means mounted thereon.

9. A combined dadoing and tenoning machine, comprising a main supporting-frame, a reciprocable overhanging frame thereon formed in two parts, an outer or overhanging end and a base-section, both parts carrying cutter-heads adapted to engage respectively the top and edge surfaces of the work, one of said parts having vertical guides and the other having guideways embracing the guides, a threaded bolt engaging both parts to adjust them, a clamping-bolt to secure them in adjustment, and means for adjusting the elevation of the base-section relative to the main frame.

10. A combined dadoing and tenoning machine, comprising a supporting-frame carrying a fixed work-table, an adjusting-frame having horizontal guideways therein and adjustable vertically in the main frame, a reciprocable frame formed in two parts and slidable in said guideways, the outer or overhanging end carrying the dado-heads and the base carrying the tenoning-heads, one of said parts having vertical guides, and the other having guideways embracing the guides, and positive moving and clamping means mounted thereon.

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