

J. OJANGUREN.
TENONING MACHINE.
APPLICATION FILED SEPT. 22, 1909.

952,838.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1

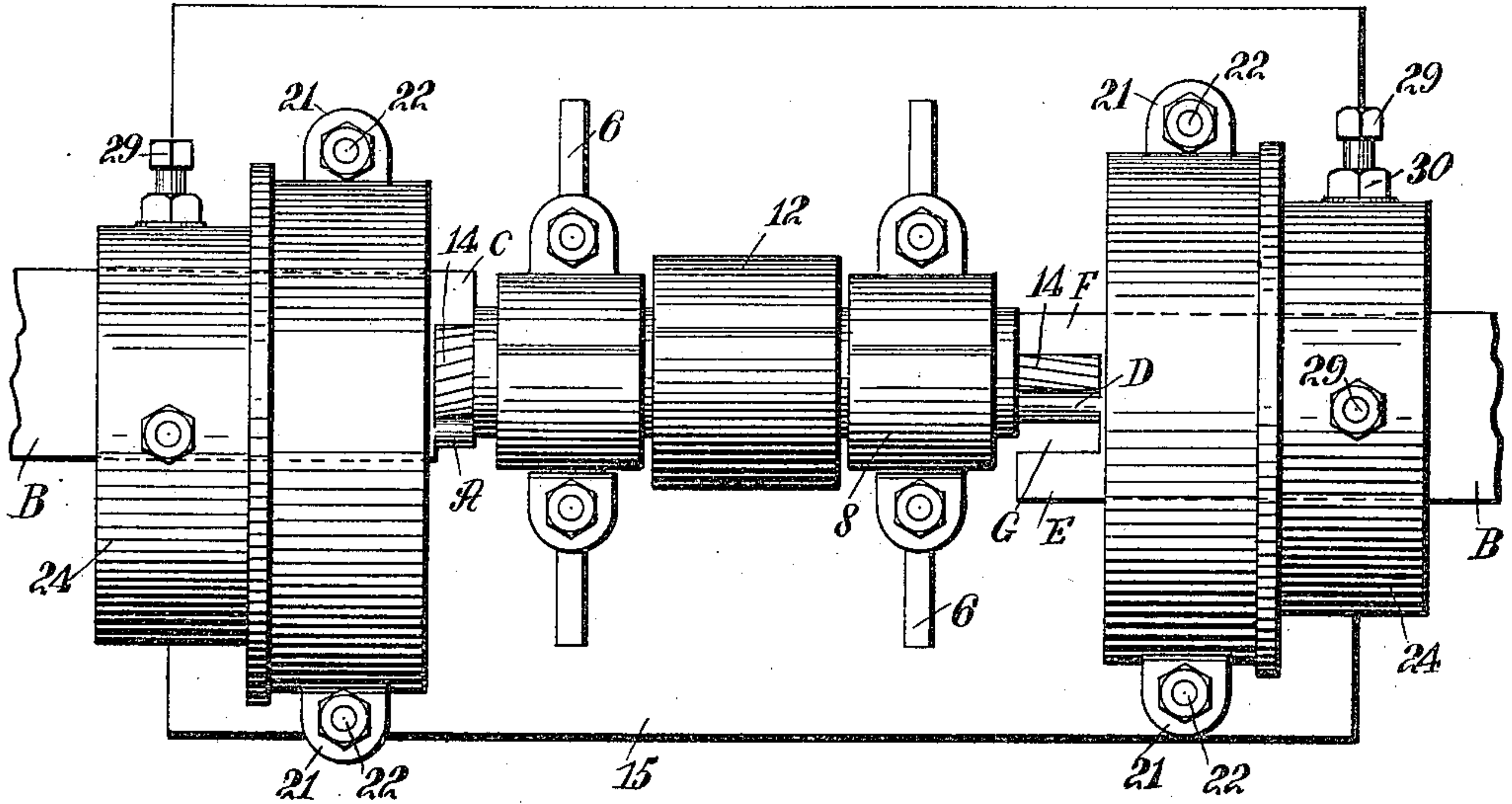
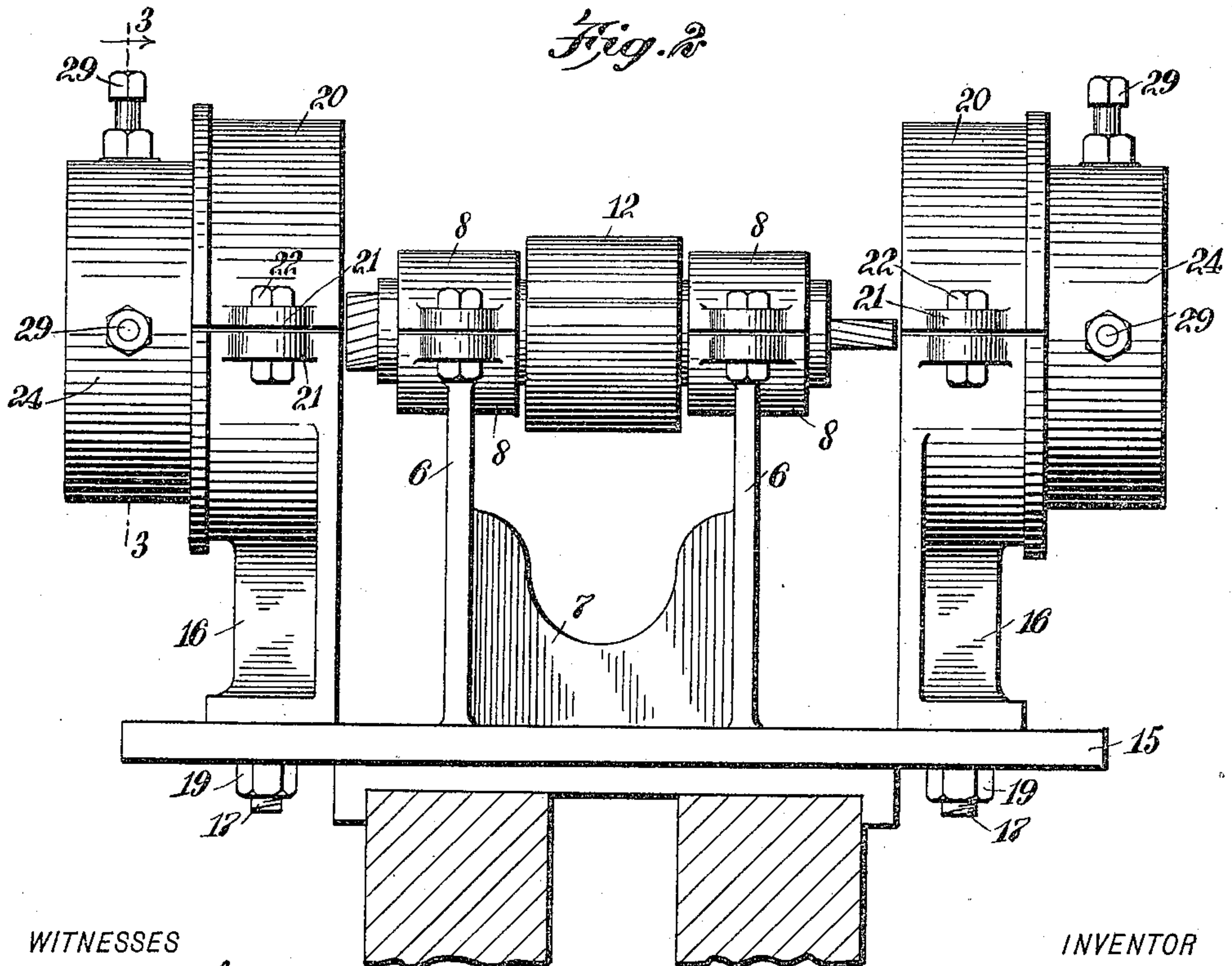


Fig. 2



WITNESSES

J. D. Smith
C. F. Mudock

INVENTOR

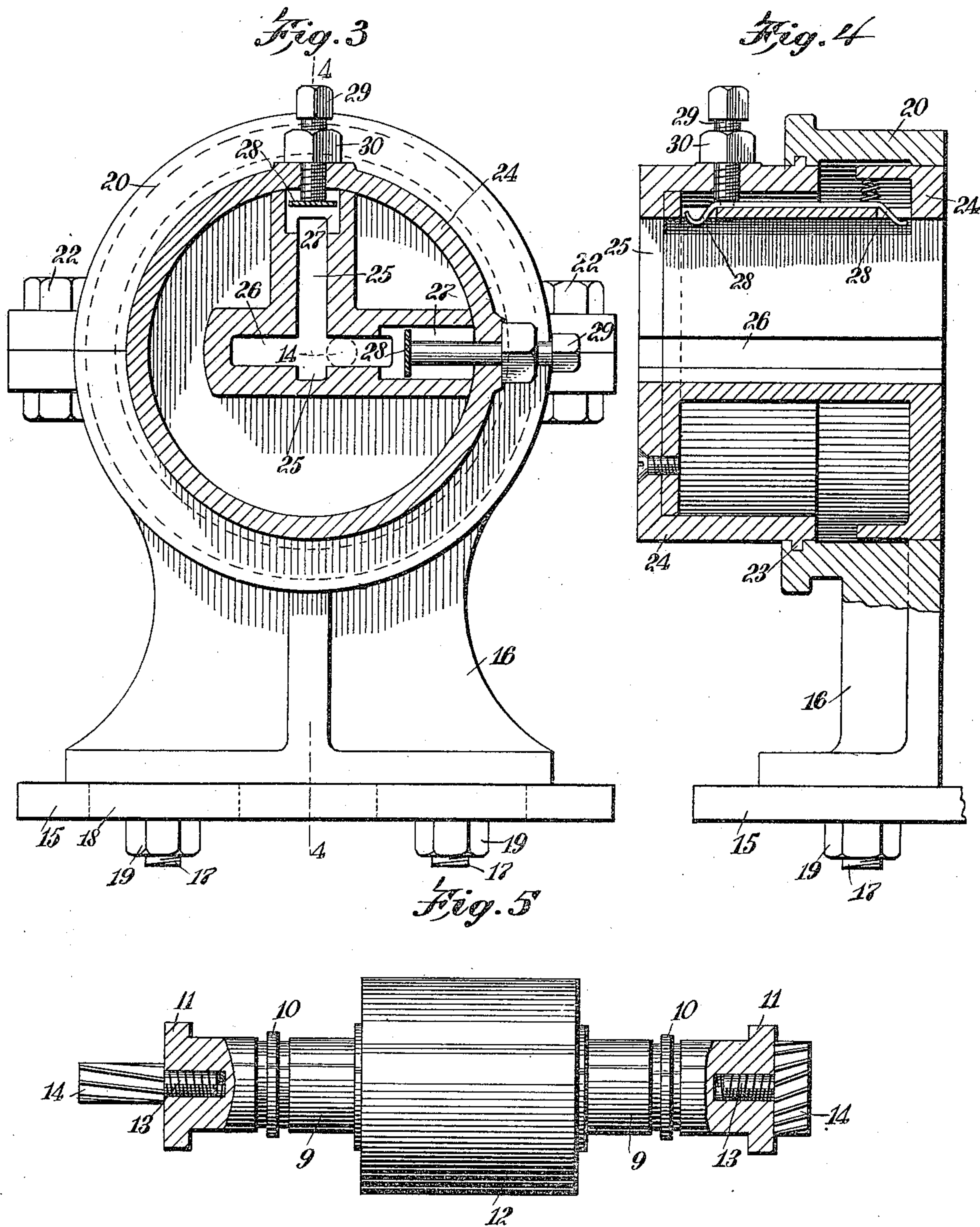
José Ojanguren
BY *Munich*
ATTORNEYS

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J. D. Smith
E. A. M. A. A. A. A.

INVENTOR
José Ojanguren
BY *Mum & Co*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSÉ OJANGUREN, OF HABANA, CUBA.

TENONING-MACHINE.

952,838.

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To all whom it may concern:

Be it known that I, JOSÉ OJANGUREN, a subject of the King of Spain, and a resident of Habana, Cuba, have invented a new and Improved Tenoning-Machine, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide a machine wherein cylindrical tenons may be formed in various positions on the edge of the article; to provide a machine of the character specified wherein various tools adapted to vary the cut may be held in operative positions simultaneously; and to provide a machine peculiarly adapted to form the tenons in the slats of window blinds.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a plan view of a machine constructed in accordance with this invention; Fig. 2 is a side elevation of the same; Fig. 3 is a vertical cross section taken on the line 3—3 in Fig. 2; Fig. 4 is a longitudinal section of the guide head taken on the line 4—4 in Fig. 3; and Fig. 5 is a side view of the cutter arbor employed by me.

The machine, as above stated, is specially designed to form tenons in the ends of slats for window blinds. The two most prevalent types of slats are those wherein is employed a single central tenon, and those wherein are employed two tenons, one at each edge of the slat. A third form of slat is sometimes used wherein there are three tenons, one centrally located and the other two at the edges of the slats. The present machine is adapted to form these tenons quickly and perfectly.

Upon the arms 6, 6 of a pedestal 7, are formed the lower faces of boxes 8, 8. The boxes 8, 8 are of the ordinary tapped type. An arbor shaft 9 is provided with the ordinary dust guards 10, 10. In the ends of the shaft 9 are formed annular flanges 11, 11. The faces of the shaft 9 are trued to form stops for the work during the forming of the tenons. The shaft 9 has fixedly mounted thereon a driving pulley 12 which extends between the boxes 8, 8. In the opposite ends of the shaft 9 are centrally bored

perforations which are tapped to receive screw shanks 13, 13 of the milling cutters 14, 14. The screw threads on the shanks 13, 13 are fixed oppositely each to the other, or the edge of the thread is set back from the direction of rotation in each. The shaft 9 is driven in a constant direction, the thread on each of the cutters being formed so that the rotary strain of the cutting sets the screw up in the shaft at both ends thereof. The arbor shaft 9 is driven at a high rate of speed.

The pedestal 7 is formed integrally with a table 15. The table 15 is bolted to any suitable stand or bench. Pedestals 16, 16 are secured to the table 15 by means of bolts 17, 17, which are extended through slots 18, 18 formed in the table 15. The bolts 18, 18 form guides for sliding the pedestals 16, 16 across the line of extension of the shaft 9. The pedestals 16, 16, when adjusted, are held rigidly in position by nuts 19, 19.

The pedestals 16, 16 are provided with semi-circular caps 20, 20. The caps 20, 20 and the pedestals 16, 16 are provided with extensions 21, 21 through which are passed bolts having nuts 22, 22. When the caps 20, 20 are in position on the pedestals 16, 16, there is formed a ring-like chamber. Within the chamber are formed annular grooves to receive annular flanges 23, 23 formed on the heads 24, 24. The heads 24, 24 are cylindrical in shape and are double ended. The forward and rear ends are connected by means of the walls forming channels 25 and 26. The channels 25 and 26 cross at the center of the heads 24, 24. The channel 26 is extended from each side of the center of the head 24 equally. The channel 25 is extended from the center of the head 24 almost entirely to one side. In each instance the center of the head marks the location of the center of the tenon which will be formed on the slat when placed in either of these channels. The channels 25 and 26 are intended as guides and holders for the slats while the tenons are being cut upon the said slats. For this purpose the said channels are open ended, and have formed in the outer extensions thereof enlarged openings 27, 27, wherein are held spring clamps 28, 28. In the operation of the machine, when the slats are introduced into the channels 25 and 26, they pass under the ends of the clamps 28, 28. The clamps 28, 28 press tightly upon the

slats and thus hold them solidly within the channels 25 and 26. The tension of the clamps 28, 28 may be changed by upsetting screw bolts 29, 29, when the said bolts are
 5 adjusted and locked in position by the lock nuts 30, 30. With the heads thus constructed it will be understood that they are free to turn in the pedestals 16, 16 and the caps 20, 20. The faces of the pedestals 16,
 10 16 and the heads 24, 24 are flush and brought in close alinement with the ends of the cutters 14, 14.

When in operation, the arbor 9, carrying the cutters 14, 14, is rapidly and constantly
 15 revolved, a suitable driving belt being introduced from above or below and passed over the pulley 12. The pedestals 16, 16, carrying the heads 24, 24, are adjusted laterally so that the cutting edges of the cutters
 20 14, 14 form the outer surfaces of the tenons to be formed.

Assuming that the tenon to be cut is centrally disposed on the slats, the operation will be as follows: The operator will insert
 25 the slat through the channel 26. If the pedestal 16 and head 24 have been adjusted with reference to the work to be performed, the channel 26 will, (when the head 24 is revolved so that the said channel is vertically
 30 disposed,) extend parallel with and to one side of the cutter 14. If the tenon is to be of a thickness equal to the thickness of the slat the cutting edge of the cutter 14 will, in this position, just touch the side of the
 35 slat. If the tenon is to have a diameter less than the thickness of the slat the cutter 14 will remove a portion of the slat, forming a groove therein for the cutter until the end of the slat strikes upon the face of the
 40 flanged end 11 of the shaft. In this position the operator grasps the slat and turns the same upon the center of the head 24. In revolving the head 24 about its center, the cutter 14 removes the wood about a central
 45 core or cylindrical tenon. With a complete revolution of the head 24 the wood is removed from the slat about the tenon being formed to the full width of the cutter 14.

I have illustrated in Fig. 1 of the drawings cutters of different widths, being employed to cut different styles of tenons. That shown in the left hand side of the figure is cutting a cylindrical cutter A disposed near the edge of the slat B. As illustrated in the drawings, the head 24 has been
 55 rotated one complete revolution, having turned the tenon A a complete revolution against the cutting edge of the cutter 14. Between the cutter 14 and the other edge of the slat B has been left a squared end C. When the tenon A is completely formed the slat B is withdrawn from the channel 25, which is employed for forming the edge tenons, such as illustrated, and the slat inverted
 60 so that the squared portion C is brought

against the cutting surface of the cutter 14. The head 24 being now revolved, a tenon A is formed upon the other edge of the slat B.

In the right hand side of Fig. 1 is shown the cutter 14 having a reduced diameter, to
 70 be employed in forming three tenons, one centrally disposed, which is shown in the drawings as having been completed. In forming this style of tenon the channel 26 is employed, the pedestal 16 and cap 20 hav-
 75 ing been laterally adjusted so that the outer surface of the tenon D touches the cutting surface of the cutter 14. As the slat B is rotated in the presence of the cutter 14 thus arranged, the wood about either side of the
 80 tenon D is removed, leaving uncut extensions E and F. If from these extensions E and F there are to be formed edged tenons, the channel 25 would be used in the succeeding operations, when the cutter 14 would rest
 85 within the cut away portions G and the extensions E and F successively be rotated upon their own centers against the cutting surface of the cutter 14, forming thereby
 90 perfect tenons identical in size and shape with the tenon D formed in the center.

Where it is desired to form a central tenon without having the outer edge tenons, this is accomplished by using the larger cutter shown on the left of the illustration in
 95 Fig. 1, and adjusting the pedestal 16 so that the larger cutter will aline with the side of the tenon to be formed. When thus arranged, the wood is removed from about the tenon to the outer edges of the slat B,
 100 completing in one operation the forming of the tenon.

It will be understood that the heads 24 may be rotated by forcing the heads around or grasping the heads direct, but in the ma-
 105 jority of instances I turn the heads 24 by means of the slats B. Throughout the cutting the slats B are held immovably and guided by the channels 25 and 26 and the faces of the flanged ends 11, 11 of the
 110 arbor 9.

While I have shown means for adjusting the pedestals 16, 16 and caps 20, 20 laterally, it will be understood that such adjustment is employed only when special work is re-
 115 quired. As a rule the adjustment is fixed, the surface of each cutter alining with the edge of the channels 25 and 26, when placed in a vertical position, as shown by dotted lines in Fig. 3.

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

1. A tenoning machine comprising a plurality of rotary cutters mounted on the same
 120 arbor and extended in opposite directions; a plurality of rotatable guide heads disposed at opposite ends of the said arbor; holding devices adapted to retain the article being handled parallel with the extension of the
 125

said cutters; means for adjusting said heads laterally; means for locking said heads in the adjusted positions; and a driving mechanism for rotating the said arbor.

5 2. A tenoning machine comprising a plurality of rotary cutters mounted on the same arbor, and extended in opposite directions; two heads rotatable on their own axes, the faces whereof are juxtaposed to the ends of
10 said cutters; a channel formed in said heads and extended across the centers thereof to hold the article having formed thereon a tenon; means for adjusting said heads laterally; means for locking the said heads in
15 the adjusted positions; and a driving mechanism for rotating the said arbor.

3. A tenoning machine comprising a plurality of rotary cutters mounted on the same arbor and extended in opposite directions;
20 two heads rotatable on their own axes, the faces whereof are juxtaposed to the ends of said cutters, and the rotary centers whereof are parallel to the rotary centers of said cutters; a plurality of channels formed in the
25 said heads across the centers and extended to both sides thereof, said extensions being unequal in one of the channels and one side of the said channel having fixed relation to the said centers; means for varying the operative side of said channels with relation to
30 the said centers; means for adjusting the said heads laterally; means for locking the said heads in adjusted position; and a driving mechanism for rotating the said arbor.

35 4. A tenoning machine comprising a plurality of rotary cutters mounted on the same arbor and extended in opposite directions; two heads rotatable on their own axes, the faces whereof are juxtaposed to the ends of
40 the said cutters, and the rotary centers whereof are parallel to the rotary centers of the said cutters; a plurality of channels

formed in said heads and closed at the centers thereof to hold the article having a tenon
45 formed thereon, certain of said channels having equal lateral extensions from the said centers, and certain channels having unequal lateral extensions; a driving mechanism for rotating the said arbor; and yielding
50 clamps movably mounted in said channels adapted to hold the article being handled to force the same against the edge of said channel having fixed relation to the center of the said head.

5. A tenoning machine comprising a single arbor having mounted thereon a driving
55 pulley; a standard for supporting said arbor; two cutters extended from the opposite ends of the said arbor; two cylindrical guide heads, the centers whereof are of even height
60 with the center of the said arbor; means for adjusting the said heads laterally; means for locking the said heads in the adjusted position; cylindrical holding members rotatively mounted in said heads and having formed
65 therein a plurality of slots extended across the centers of said members and the one edge whereof has a fixed relation to the said center; certain of said slots having unequal extensions from said centers, and others of said
70 slots having equal extensions from said centers; yielding holding devices mounted in said channels at the sides thereof opposite the sides having fixed relation to the said centers; and a driving mechanism for rotating
75 the said arbor.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSÉ OJANGUREN.

Witnesses:

MANUEL GONZALEZ,
AUGUSTIN ROGERS.