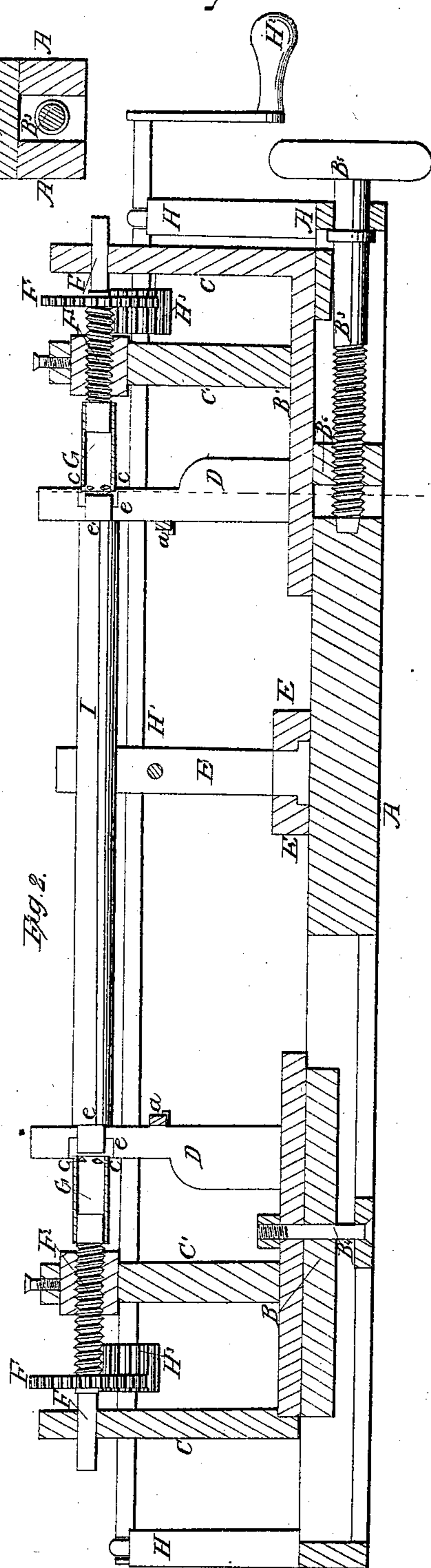
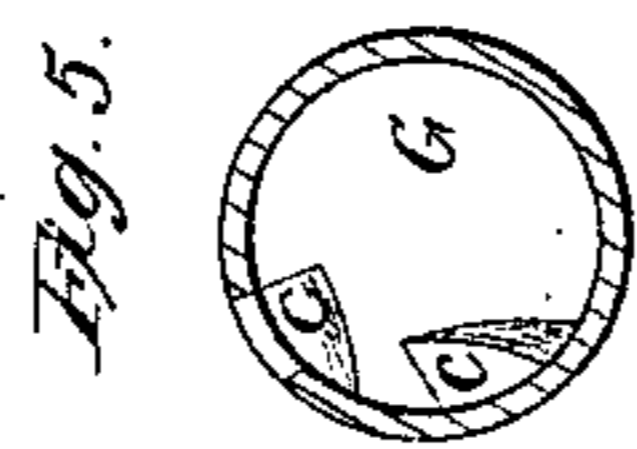
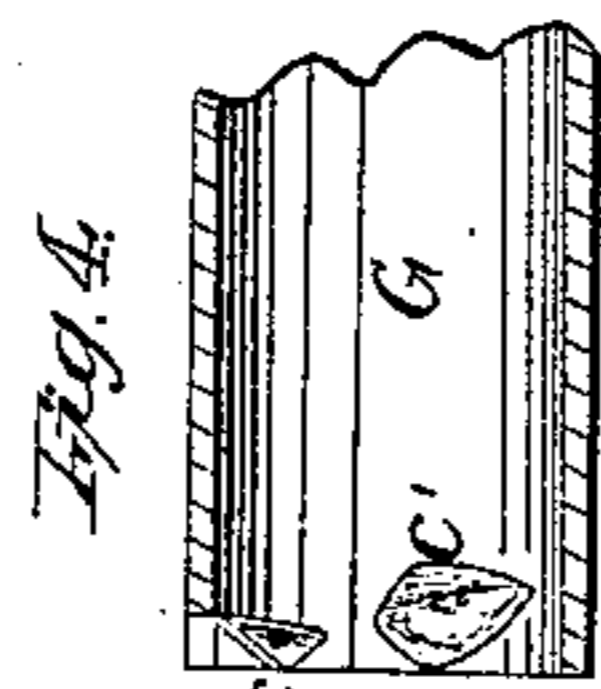
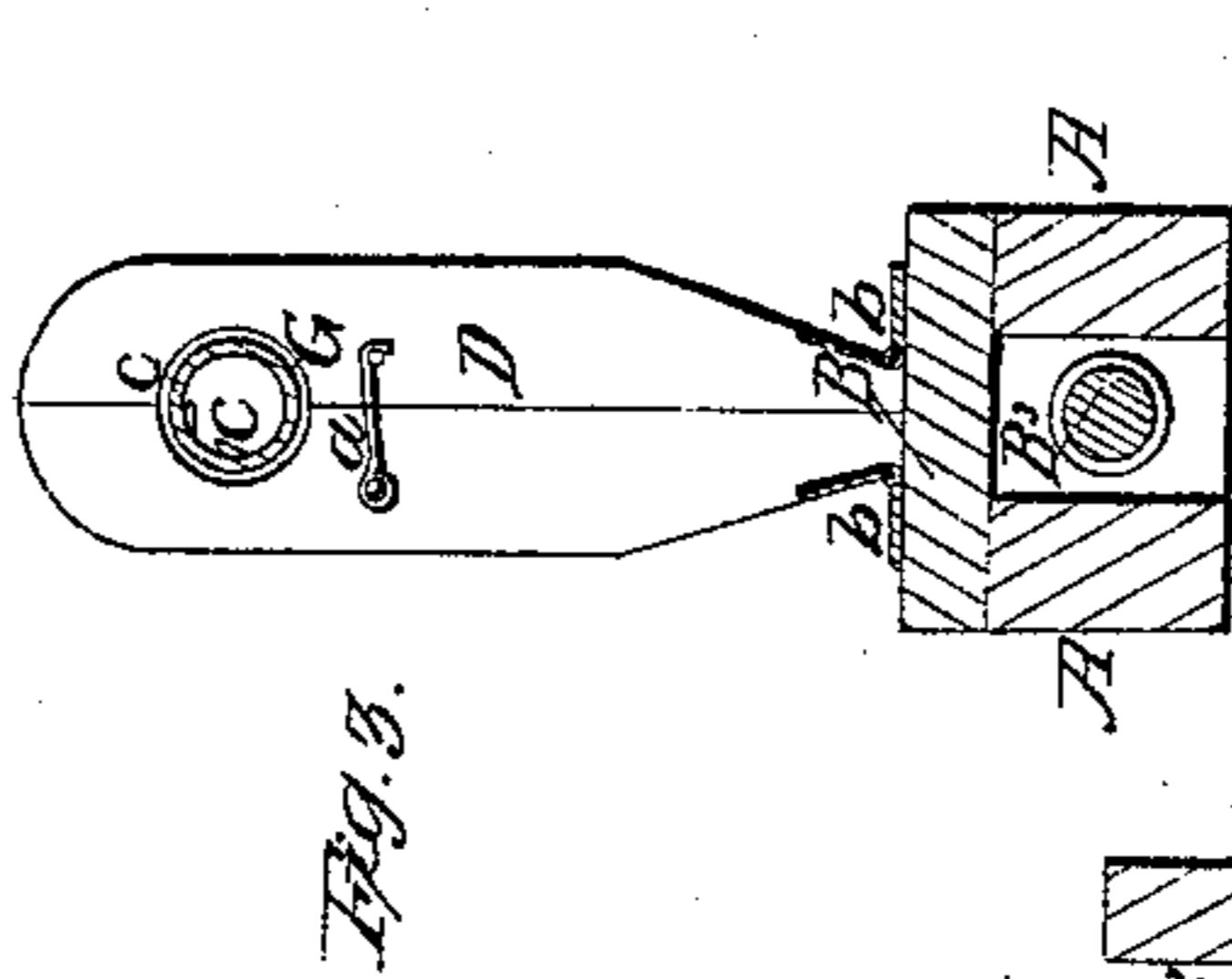
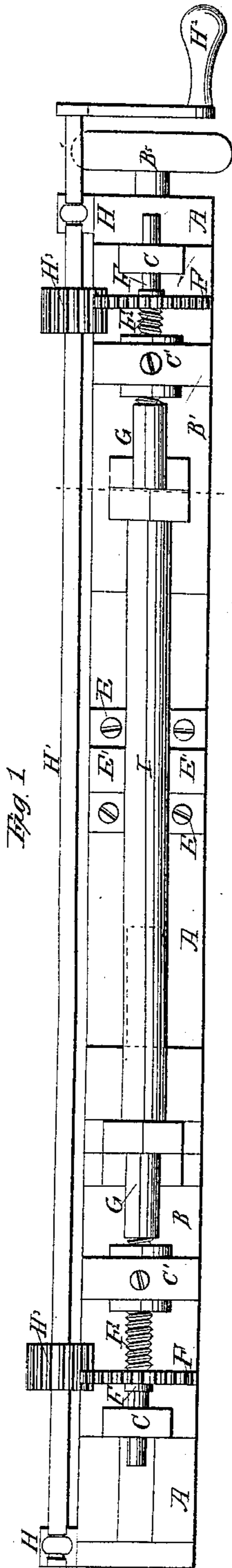


S. Lewis

Making Wooden Screws

No. 5,812.

Patented Sep. 26, 1848.



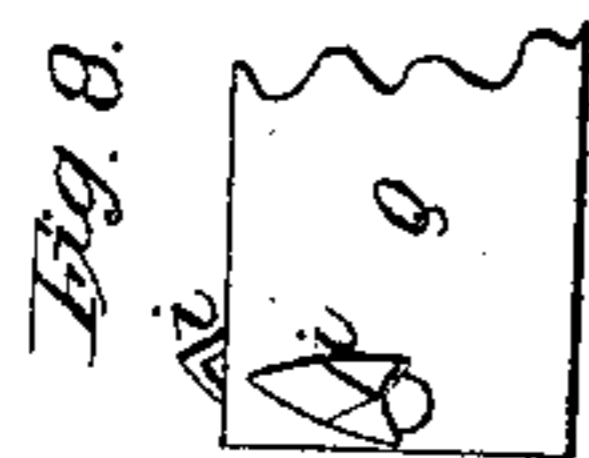
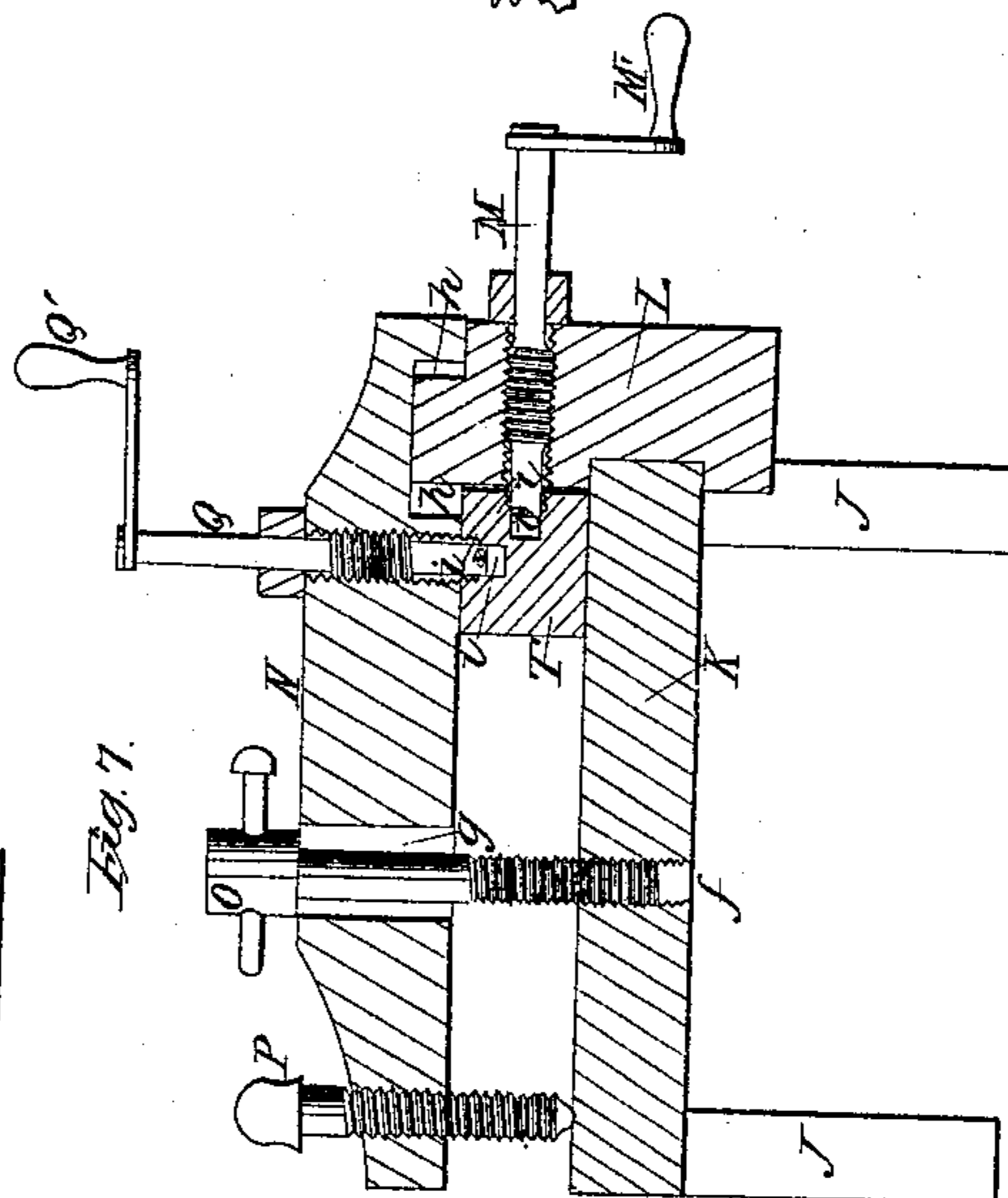
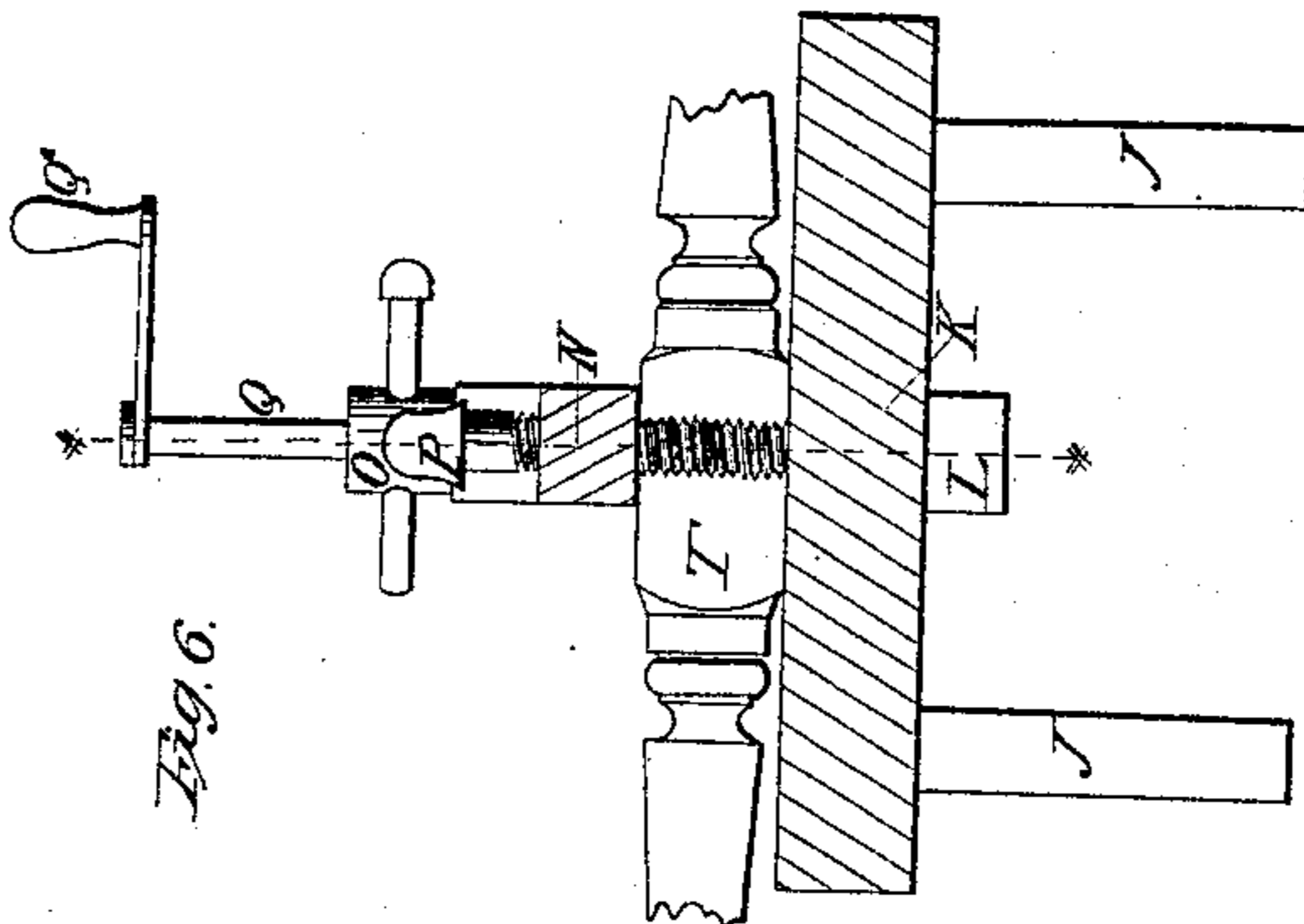
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UNITED STATES PATENT OFFICE.

SPENCER LEWIS, OF TIFFIN, OHIO.

IMPROVEMENT IN CUTTING SCREWS ON RAILS OF BEDSTEADS.

Specification forming part of Letters Patent No. 5,812, dated September 26, 1848.

To all whom it may concern:

Be it known that I, SPENCER LEWIS, of Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Machinery for Cutting Screws on Rails and in Posts of Bedsteads, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, of which—

Figure 1 is a top view of the machine for cutting screws on the tenons of the rail, showing the several parts in connection. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical transverse section through the line $x x$. Fig. 4 is a longitudinal section through the middle of the tube in which the cutters are held. Fig. 5 is an end view of the same. Fig. 6 is an end elevation of the machine for cutting the screws in the posts. Fig. 7 is a vertical longitudinal section of the same, taken through the line $Y Y$ of Fig. 6. Fig. 8 is an enlarged view of the end of the mandrel, showing the cutters affixed thereto.

When the same parts occur in the different figures they are designated by the same letters of reference.

The most difficult point in the construction of bedsteads fastened by screws cut on the tenons of the rail and in the mortises of the posts has heretofore been to cut the thread of the screw up to the shoulder of the tenon on the rail. This object, never heretofore effected by a screw-cutting machine, is fully accomplished by my invention, which is simply a cutter of a peculiar form arranged even with the open end of the common tubular cutter-holder in advance of the ordinary cutter, being, together with the ordinary cutter, secured in the usual manner to the interior surface of the tube. Thus my invention effects a very important result by the most simple means. I have also made other improvements which greatly facilitate the manufacture of bedsteads, which consist in the combination and arrangements of the several parts of the machine by which the right and left screws are cut simultaneously on the respective ends of the rail, and likewise in the combination and arrangement of cutters, mandrels, and clamps, by which the female screws are cut in the mortises in the adjacent sides of the

posts by clamping it but once and without varying its position, whereas by all the different modes heretofore practiced the position of the post had to be changed and it is necessary to clamp it twice.

To those who are acquainted with the subject a comparison of my machine with others that have been made for the same purpose will demonstrate the fact that by means of my invention bedstead-fastenings are made more durable and accurate, and at the same time that they are made cheaper than they can be made by any other means.

A, Figs. 1 and 2, is the base or platform of the machine for cutting the screws on the tenons of the rails. This platform is made of plank of an oblong rectangular form and of any suitable dimensions. In each end of the platform a vertical slit is made for a guide for the carriages which slide upon it. In one of the slits or mortises the screw B^3 is placed. It turns in boxes formed in either end of the mortise. On the outer end of the screw the hand-wheel B^5 is secured. This screw is for the purpose of adjusting the carriage B' , to which it is connected by a female screw formed in the stud B^6 , which projects from the lower side of the carriage. Upon the platform the carriages $B B'$ are placed. They may be moved longitudinally toward or from each other for the purpose of being adapted to cutting the screws on rails of different lengths. The carriage B , when adjusted, is secured in its position by the screw-bolt B^4 , and the carriage B' is both adjusted and secured in its position by the screw B^3 . Upon the carriages the standards $C C' C' C'$ and the clamps $D D$ are erected. The standards $C C$ have boxes formed in their upper ends, in which the outer ends of the mandrels $F F$ turn. On the upper ends of the standards $C' C'$ female screws are formed corresponding to the male screws F^2 of the mandrels which turn in them. The mandrels F are made of any suitable material and dimensions, having cog-wheels F' secured to them, by which they are returned. Lead-screws F^2 , corresponding in pitch with the thread required to be cut on the tenon of the rail, are formed on the central part of them, and metallic tubes G , to hold the cutters, are secured on their inner ends. These tubes correspond in internal diameter with the external diame-

ter of the tenons, which, during the operation of having the screws cut on them, pass into the tubes.

The cutters c c' , Figs. 2, 4, and 5, are secured to the inner surface of the tube in the line of the thread of the screw in any convenient and substantial manner, the cutter c being even with the outer end of the tube and of course in advance of the cutter c' . The cutter c' , in external form, resembles an oblique three-sided pyramid, having one side perpendicular to its base, which is the usual form of cutters for making the triangular threads of screws. The vertical side is of the form of an isosceles triangle, and on its sides are formed the cutting-edges.

The cutter c , which I shall call "a semi-cutter," corresponds in magnitude and form with half of the cutter c' divided by a plane passing through it vertically, through and at right angles to its perpendicular side. The cutting-edges of this cutter form a right-angled triangle the perpendicular of which is placed even with the outer end of the tube and on the center line of the thread of the screw on the interior of the tube, which of course corresponds with the space between the threads of the screw on the tenon. The cutting-edges of both these cutters are of the usual form, as are also the apertures in the side of the tube through which the chips or shavings pass from the cutters. The semi-cutter is made and arranged as above described for the purpose of cutting a semi-thread on the tenon adjacent to the shoulder where there is not space sufficient for a full thread, and thus making the screw of the tenon accurately corresponding to the female screw in the post, so that when the post and rail are screwed together the joint between them shall be close and accurate.

The clamps D D are each composed of two jaws held together by the hooks a a and joined to the carriages by hinges b b , Fig. 3. These clamps are for the purpose of holding the rail at the required elevation to bring the tenons concentric with the circle in which the cutters revolve and to hold it firm and rigid during the action of the cutters in starting the thread.

Near the center of the platform A , Fig. 2, the transverse guides E E are placed, in which the clamp E' slides. This clamp is for the purpose of embracing the rail and firmly holding it, so that it may not turn during the operation of cutting the screws on its tenons.

The standards H H are secured to the platform A . On their upper ends boxes are formed in which the shaft H' turns, on which is secured the cog-wheels H^3 H^3 , which gear into the wheels F' F' of the mandrels. The shaft H' is turned by the winch H^2 , which is secured to its end. The two wheels H^3 H^3 are both of the same diameter, as are also the two wheels F' F' , and the whole four wheels have cogs of the same pitch and turn simultaneously.

The operation of this portion of the machine is as follows: The standards being adjusted to the length of the rail by means of the set-screw B^3 and the clamp-screw B^4 , the rail is then secured in the clamps E' and D D . The attendant now lays hold of the handle of the winch H^2 and turns it, which turns the shaft H' , the wheels, and the mandrels and cutters which are connected with it. The screws on the mandrels cause them to move longitudinally when turned, advancing the cutters simultaneously upon both ends of the tenons, cutting the threads of the screw on the same as they progress, the tubes advancing as fast as the thread is cut over the tenon. When the cutter has progressed on the tenon to the shoulders e e of the clamps D D , the hooks a a are unloosed and the clamps opened entirely clear from the rail, in order that the cutters may progress to the shoulder of the tenons, the tubes now holding the ends of the rail instead of the clamps. When the cutters have been turned up to the shoulders e' e' of the tenons, the motion of the winch is reversed, which withdraws the cutters from the tenons. The screw is now completed, and the clamp E' being loosened the rail is taken out to make way for another.

The machine for cutting the female screws in the mortises of the posts to correspond with the male screws on the tenons of the rails is composed of a bench K , Figs. 6 and 7, made of stout plank and of any convenient form and dimensions. This bench is supported by the legs J . To one end of the bench is secured firmly the block L , which supports the horizontal screw-mandrel M , and in which is made the female screw in which said mandrel turns. N is the clamp-head, which is adjustable to adapt it to the cutting of screws in the mortises of posts of different sizes. One end of the head rests upon the block L . The other is supported by the set-screw P . It is held firmly against the post T , Fig. 6, clamping the same tightly upon the bench J by the screw O , which passes through an oblong mortise g , the lower end of which screw turns in a female screw f in the bench K . Through the end of the head adjacent to the block L a screw-mandrel Q passes down, turning in a female screw formed in said head. The mandrel Q stands at right angles to the mandrel M . The notch h and mortise g are respectively of sufficient length to admit of the adjustment of the head, so as to cut the screws in the mortises of posts of all sizes from the largest to the smallest. To the outer ends of the mandrels the winches Q' and M' are respectively secured. By these winches the mandrels are turned. To the inner end of each of the mandrels two cutters i i are secured. These cutters correspond in shape and magnitude with the cutter c' , Figs. 4 and 5, and are placed upon opposite sides of the mandrels in the line of the helix formed by the thread of the screw. The screw on the central part of the mandrels which turn in

the head and in the block L corresponds in pitch with the screw on the mandrels F, Figs. 1 and 2.

The operation of cutting the female screws in the posts is performed as follows: The mortises being bored in the post, it is clamped on the bench in the position seen at T, Fig. 6, the mortises being placed concentric with the ends of the mandrels Q M. Preparatory to clamping the post the mandrels are turned back until their inner ends are within the face of the head and the block L. The post is now laid in its proper position, the end of the head resting upon it. The set-screw P is then turned until the head is rendered parallel to the top of the bench. The screw O is next turned down, which brings the head tight upon the post, which it holds with a firm grip. The attendant now lays hold of the winch M' and turns it, which causes the mandrel M to turn, and as it turns it is advanced by the lead-screw upon it, and as it advances the cutters are moved forward into the mortise penetrating the wood on its concave surface and cutting out the screw. When the cutters have reached the bottom of the mortise, the motion of the winch is reversed, which withdraws them out of the mortise in which the screw is now completed. The mandrel Q, with its cutters, is now in like manner caused to cut the screw in the mortise of the adjacent side of the post, which being done the screws in the post are completed. By this arrangement the screws are cut in the post without altering its position from the time it is clamped on the bench until the operation is complete. Thus not only is much labor saved but the liability to the error of cutting the screw with the wrong thread is entirely removed. This accident in consequence of

the workmen being careless or confused happens very frequently, and as the post is thereby irreparably spoiled it occasions considerable loss.

I do not claim cutting screws on the tenons of rails of bedsteads by means of a V-shaped cutter fixed in a tubular holder; nor do I claim cutting the right-and-left screw on the tenons simultaneously; nor do I claim cutting the screw in the post clamped in a frame or to a bench by means of a V-shaped cutter fixed to the outside or periphery of a holder, as these results have been produced by other means; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The combination and arrangement herein described of the half or sectional cutter *c*, secured on the end of the inner surface of the tubular holder; with the entire cutter *c'*, also secured to the inner surface of the holder for the purpose of cutting a sectional thread adjacent to the shoulder of the tenon on the end of the rail corresponding to the sectional thread cut on the outer end of the female screw in the post, so that the rail having a square shoulder and the thread of the screw cut on the entire length of the tenon may be screwed up tight against the face of the post, forming a close and perfect joint, which cannot be effected by any other machine in use or known.

In testimony whereof I have hereunto signed my name before two subscribing witnesses this 13th day of September, A. D. 1847.

SPENCER LEWIS.

Witnesses:

WM. P. ELLIOT,
A. E. H. JOHNSON.