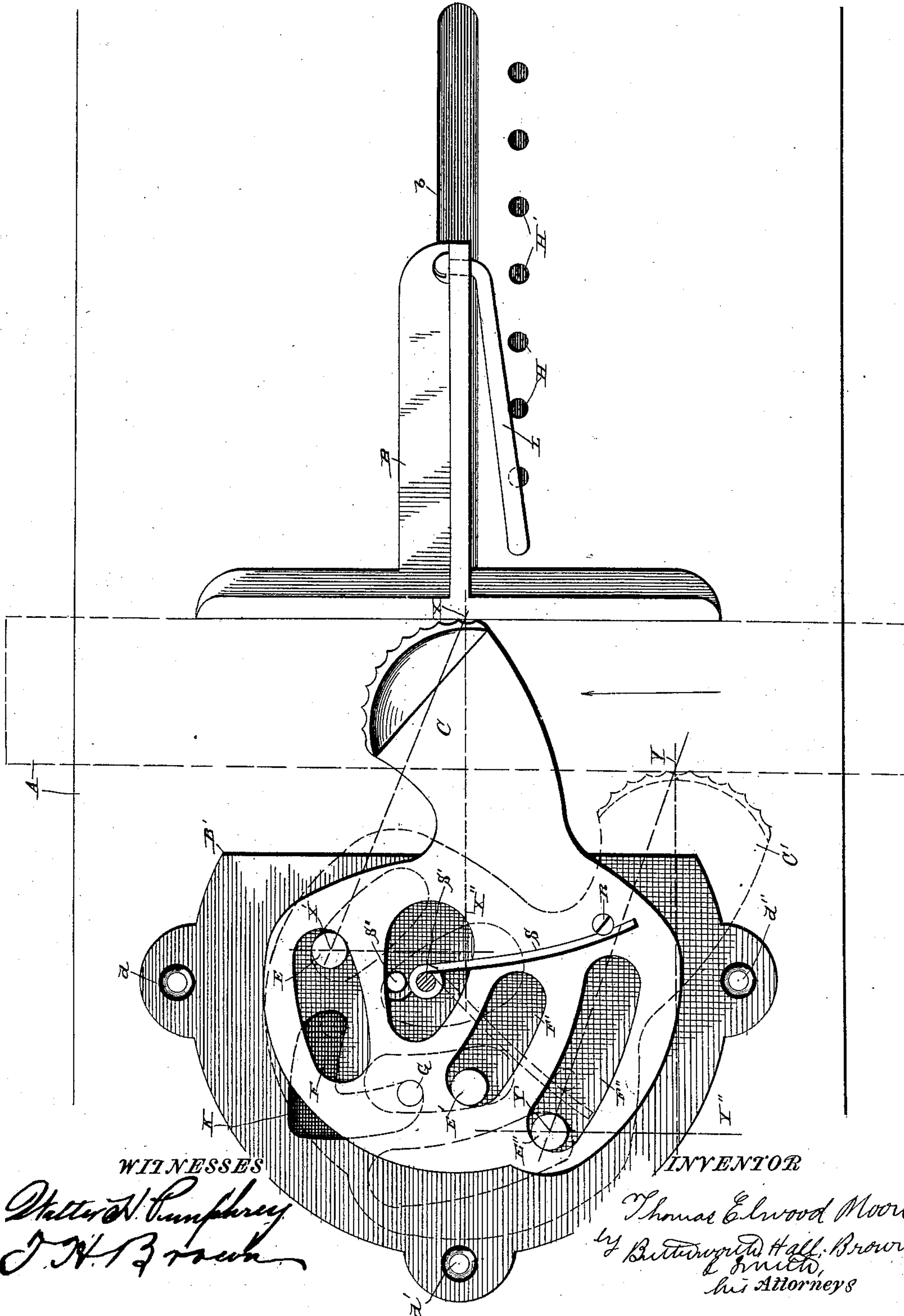


(No Model.)

T. E. MOON.  
AUTOMATIC CLAMP.

No. 432,543.

Patented July 22, 1890.





# UNITED STATES PATENT OFFICE.

THOMAS ELWOOD MOON, OF SABINA, OHIO.

## AUTOMATIC CLAMP.

SPECIFICATION forming part of Letters Patent No. 432,543, dated July 22, 1890.

Application filed February 12, 1890. Serial No. 340,156. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS ELWOOD MOON, a citizen of the United States, residing at Sabina, in the county of Clinton and State of Ohio, have invented certain new and useful Improvements in Automatic Clamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the improved form of automatic clamp to be used preferably in wood-working, such as will be hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a plan view of my clamp.

In planing boards and blocks and similar operations in wood-working much time is lost by the frequent changes which have to be made in the position of the board or block in the vise or clamp in which it is held. Every time that a block which has to be planed on more than one side is turned and every time a long board or piece of work is fed up through the device the clamp or vise has to be opened and then closed again. To obviate this it has been proposed to employ a spring-actuated automatic clamp which shall hold the piece of work in place, but which may be readily opened for a readjustment of the same. The difficulty with clamps of this order has been that while the clamp could be so constructed as to bind the work of a certain thickness and effectually prevent its being forced through the clamp by the action of the cutting-tool, yet when a little larger piece was introduced the jaws were forced open at an angle, so that they would not bind the work-piece and it would slip. If in the effort to overcome this the actuating-spring was made of sufficient power to hold the work in all positions, then it became inconvenient to operate the oscillating jaw. To avoid all these difficulties and produce an automatic clamp which requires but a light spring, and consequently shall be readily adjustable by hand, and will yet positively hold the work within the clamp at all positions, I have designed the apparatus illustrated, in which—

A represents a portion of a plank or board

furnishing a bed-plate to which my automatic-clamp jaws are attached.

B is a stationary clamp, which is yet capable of motion in the slot *b* whenever the catch L is lifted out of one of the holes H H', whereby the adjustment of said normally-stationary clamp B within certain limits is obtainable.

C is the swinging or oscillating jaw of the clamp, which revolves about certain centers E E' E'', which are rigid upon the bed-plate A or the secondary plate B', held to the bed-plate by means of the screws *d d' d''*. In the oscillating jaw C are certain slots or recesses F F' F'', which I have arranged to receive the center-pins E E' E''. The pin G on the clamp enters the slot or recess K, and in a measure controls the movement of the clamp C. The utility of this recess K and pin G is, in connection with the spring S, to prevent the clamp from loosely rattling about on the center-pins E E' E''.

The spring S is mounted on the pins S' S'' or in any equivalent suitable manner and presses against some rigid projection, as R, on the jaw C.

The method of operation of my invention is the following: When there is nothing between the jaws of the clamp, or when if there is a piece of work between them it is of such thinness that the jaw C is at or nearly at the position shown in full lines in the drawings, the spring S holds the said jaw C in this position, its further motion being prevented by the pin G, as shown. When the jaw is forced backward, it revolves upon the center-pin E, bending the spring S. As the partial revolution of the jaw C to the right is continued, however, it is evident that the pin E' will soon come to a bearing in the end of the slot F', and on the further rotation of the jaw C it will rotate about the pin E' as a center. Continued motion will lift the jaw from contact with the pin E' and bring the pin E'' to a bearing in the end of the slot F''. The dotted lines show the jaw in this position at C'. The advantages of this arrangement are obvious when we consider the action of the clamp in binding the work-piece in place by virtue of the thrust given to said work-piece by the cutting-tool. In order to have this binding action sufficient to prevent the mo-



tion of the work-piece, the line passing through the point of contact of the jaw with the work-piece and the center about which the jaw revolves must make a very acute angle with the line perpendicular to the direction in which the work-piece tends to move, as will be seen by the diagrams X X' X'' and Y Y' Y''. This angle is always acute in my construction. If the oscillating jaw C had continued to revolve about one center E, the said angle would have become almost a right angle by the time the clamp reached the position C', and with a slight spring S the clamp would have had no appreciable grip upon the work-piece W, and the latter would have slipped readily through it; but by reason of the change of center the binding effect of the clamp-jaw C is as great in the position C', the limit of its motion, as in the position C, the beginning of its motion. It is evident, of course, that the peculiar arrangement of slots and pins which I have illustrated as the preferred form of my invention is in no way essential to said invention; but the same object may be attained by other means. Thus the pins E E' E'' might bear upon the exterior of the clamp C, said exterior being given the necessary shape to bring about the result of shifting the centers above set out; but such an arrangement is too obvious to need illustration. The advantages of this construction are evident, in that the swinging jaw C, being under the pressure of a light spring only, can be withdrawn by one finger of the operator and the position of the work-piece W changed, and yet, on account of the peculiar construction and action above set forth, said clamp will in any position present a positive resistance to the forcing of the work-piece on through the clamp in the direction of the arrow, and will therefore hold it in position against the thrust of the cutting-tool until the operator is ready to release the clamp.

A further advantage resulting from the construction and easily-understood operation of my invention lies in the fact that the distance from the extremity of the jaw C to the end of the recess F'' is greater than the distance from the end of said jaw to the end of the recess F, so that as thicker pieces are introduced be-

tween the jaws the radius of oscillation of the jaw varies and increases as the thickness of said work-piece increases. The advantage of this of course is that as the work-piece increases in thickness greater force is necessary to drive the tool through it, and the increase of the radius of oscillation of the clamp causes a correspondingly-increased binding effect of the clamp jaws to oppose the increased force applied to the work-piece.

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

1. In a clamp, the combination of the normally stationary jaw and the swinging jaw which oscillates successively about two or more separate and distinct centers, changing its center and radius of oscillation as it swings, as and for the purpose set forth.

2. In a clamp, the combination of the adjustable but normally stationary jaw, the two or more separate and distinct center-pins, and the swinging jaw which oscillates about said pins, changing from one to the other for its center of oscillation as it swings, as and for the purpose set forth.

3. In a clamp, the combination of the adjustable but normally stationary jaw, the two or more separate and distinct center-pins, the swinging jaw which oscillates about said pins, changing from one to the other for its center as it swings, and the spring which operates said swinging jaw, as and for the purpose set forth.

4. In a clamp, the combination of the bed-plate, the normally stationary jaw, the swinging jaw which has slots in certain portions thereof, and pins mounted in the bed-plate and meshing with said slots, so as to furnish a variety of centers for the oscillation of the swinging jaw, together with another pin-and-slot connection between said bed-plate and swinging jaw, which controls the motion of said jaw, substantially as described.

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

THOMAS ELWOOD MOON.

Witnesses:

A. H. MILLS,  
J. H. BURRIS.