

No. 640,500.

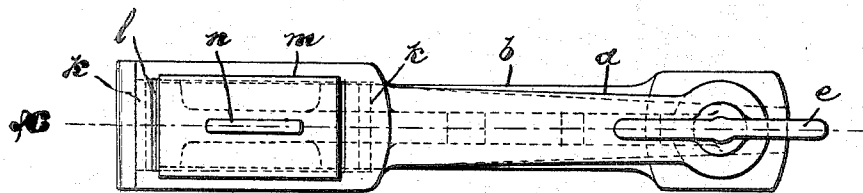
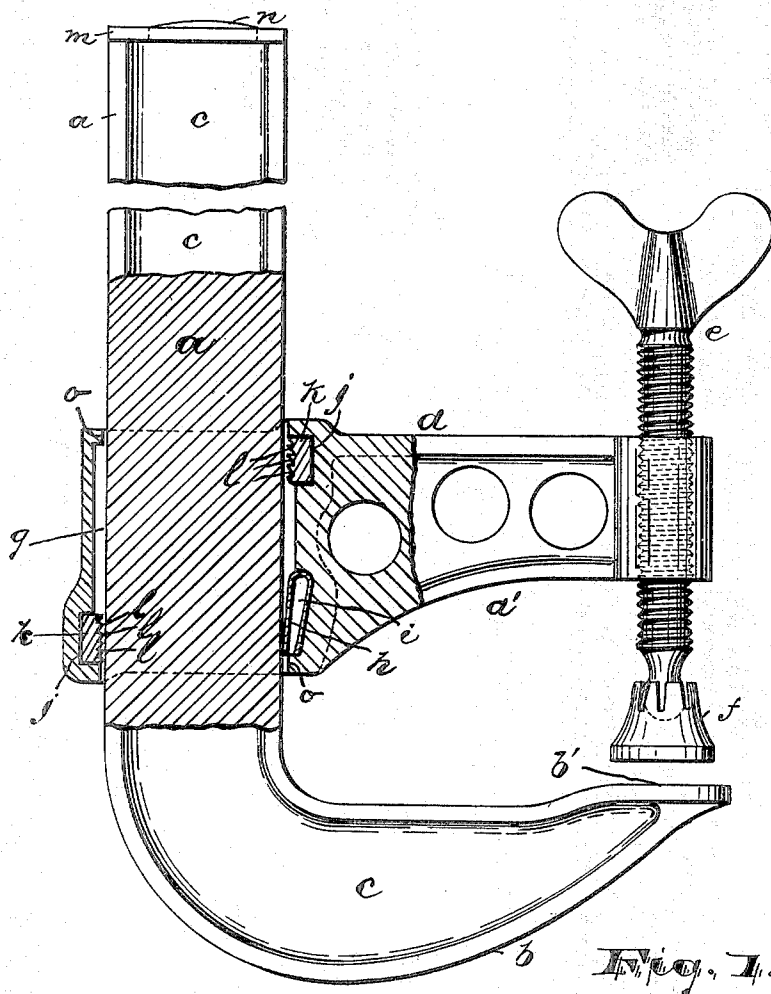
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J. L. TAYLOR.

CLAMP.

(Application filed Aug. 23, 1899.)

(No Model.)



WITNESSES:

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CLAMP.

SPECIFICATION forming part of Letters Patent No. 640,500, dated January 2, 1900.

Application filed August 23, 1899. Serial No. 728,178. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. TAYLOR, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of clamps in which a longitudinal bar is provided with a sliding jaw adjustable upon the said bar and carrying a screw working in said jaw parallel to the bar to cooperate with another jaw; and more particularly the invention relates to the means for adjusting said sliding jaw upon the longitudinal bar, the objects of the present invention being to diffuse the strain at the points of contact of the movable jaw with the bar over a surface sufficient to prevent injury to the bar, to prevent a cutting, wearing, or otherwise weakening of the bar, and thus to enable a greater strain to be brought upon the tool without damaging the same, to provide a construction by which the points of engagement of the movable jaw with the bar may be readily renewed, if desired, and to secure other advantages and results, some of which may be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved clamp herein described and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the views, Figure 1 is a side view of my improved clamp, partly in central section, on line *x*, Fig. 2; and Fig. 2 is an end view of the same.

In said drawings, *a* indicates the longitudinal bar of my clamp, which bar is made of malleable iron and at one end is given an edgewise bend at right angles in the opera-

tion of casting to provide the fixed arm *b* of the clamp. Said longitudinal bar *a* and fixed arm *b* are at their sides preferably recessed, as at *c*, to secure increased lightness of weight, and at its inner edge the arm *b* is suitably faced, as at *b'*, to receive against itself the piece of work being clamped. Upon said bar *a* the adjustable jaw *d* is adapted to slide, said jaw being provided near one end with a transverse rectangular perforation *g*, receiving said bar. Said jaw *d* projects outward from the longitudinal bar *a* substantially parallel to the fixed arm *b* and at its outer end is provided with a threaded perforation or socket in which a thumb-screw *e* works longitudinally in a position parallel to the bar *a*. At its forward end said screw carries a flat-faced head *f*, adapted to cooperate with the face of the fixed arm *b* and impinge against the work held therebetween. Said head *f* is secured to the screw *e* by a ball-and-socket joint of any suitable form, and the edge of the jaw *d* next to the fixed arm *b* is curved backward toward its outer end, so that when the screw *e* is withdrawn as far as possible into the threaded socket the face of the head *f* will lie in substantially the same plane with the front edge of the base of the movable jaw.

It will be understood that the jaw *d* is adapted to be slid freely along the bar *a* when in normal position, as shown in Fig. 1, and the said jaw can thus be slid up against a piece of work placed in the clamp. The screw *e* is then tightened, and the reaction forces the outer or screw-carrying end of the jaw rearward, causing the wall of the perforation *g* which is nearest the screw-carrying end of the jaw to engage the bar at the rear end of the perforation or end farthest from the fixed arm *b*, while at the forward end of the perforation the outer wall or wall farthest from the screw-carrying end of the jaw engages said bar. This gripping action of the jaw upon the bar is common in clamps and will be understood without further description.

Having thus briefly described those parts of my clamp which are of ordinary construction, I will now proceed to set forth in detail the means I employ for obtaining adjustment of the movable jaw upon the longitudinal bar

and in which means my invention more particularly inheres.

At each opposite point of engagement of the walls of the perforation *g* against the bar *a* in gripping said bar I provide in the interior wall of the perforation a transverse recess or pocket *j*, preferably extending from side to side of the perforation and sunk perpendicularly into said wall. Said pockets are formed in casting, one at the rear end of the perforation in the inner wall, or wall nearest the screw-carrying end of the jaw, and the other on the opposite or outer wall of the perforation near its forward end. These pockets are preferably rectangular in shape, and each is placed a little in or back from the end of the wall in which it is situated, so as to be closed on all four sides and open only against the bar *a*. In each of said pockets *g* is placed a block *k*, adapted to fit therein without undue looseness and yet capable of dropping out by its own weight or being easily removed. Said block rests at its base directly upon the bottom of the pocket *g*, and the outer face of the block is provided with a series of teeth *l*, which are preferably slightly inclined in the direction in which it is desired to prevent the jaw from sliding when clamping with the tool after said jaw has been adjusted. Said toothed surface of the block *k* lies close to the edge of the bar *a* when the parts are in loosened relation to one another, but does not grip the bar, and thus the jaw may be freely slid upon the bar. As soon, however, as the screw *e* is tightened up against a piece of work and the perforation *g* changed in relative position to the bar *a* the teeth *l* are pressed against the said bar *a* and engage the same to prevent a slipping of the jaw backward, as will be hereinafter more fully described.

The teeth *l* do not sink into the bar *a*, since by so doing the bar would be injuriously weakened, so that it would be liable to break, but a multiplicity or series of teeth is provided, so that a greater surface of contact is secured and a deep penetration avoided. No one tooth cuts into the bar *a* to any appreciable extent, but the combined effect of the entire series is to obtain as great or greater frictional holding power than would be obtained by a single tooth sunk into the bar *a*. Also the strain, which in the case of a single tooth would be concentrated upon a single point of the bar, is by my construction diffused over a considerable area of the bar through the series of teeth and danger of breaking the bar obviated. Furthermore, by reason of the toothed blocks *k* employed I am able to remove the teeth from my clamp at any time to repair or renew them, and this removal is very readily and easily accomplished since the said blocks are not fastened in their pockets, but lie loosely therein, so that as soon as the bar *a* is drawn out of the perforation *g* the blocks fall out of their pockets. When the parts are in operative relation, however, the blocks are held in their pockets

by the bar *a*, against which they act. Any injury to the teeth in my clamp is therefore very readily remedied.

An end plate *m*, held at the extremity of the bar *a* upon a slightly-riveted stud *n* or equivalent holding means, serves as a stop to prevent the jaw slipping off said end of the bar inadvertently.

In the practical construction of my clamp the perforation *g* is formed perpendicular to the length of the jaw *d*, and said perforation is made slightly wider than the bar *a* in edge-wise direction, say about one-sixteenth of an inch. The opposite blocks *k k*, when placed in their pockets, are then allowed to project at their toothed surfaces a very little beyond the plane of the wall of the perforation, say about one thirty-second of an inch. Thus when the screw-carrying end of the jaw *d* is pressed forward, so that the jaw forms an acute angle with the bar, the smooth ends *o o* of the perforation-walls strike the bar and a free sliding of the jaw is permitted. Let the screw *e* be tightened against a piece of work, however, and the screw-carrying end of the jaw *d* is thrown backward until the blocks *k k* engage opposite edges of the bar *a* and grip the same, and from the foregoing description it will be seen that when this occurs the jaw *d* stands in perpendicular relation to the bar *a* and an accurate and true holding of the work is attained.

A bent spring *h* is let into a recess *i* in the wall of the perforation *g* at a point opposite one of the blocks *k*, and this spring bears against the bar and holds the jaw at whatever point it is left upon the bar, so that positive movement upon said bar is secured. Under normal conditions, therefore, the jaw engages the bar *a* through the block *k* on one side and the spring *h* on the other side and will remain stationary upon the bar wherever left. This normal position is an intermediate position relative to the bar, and the easiest sliding of the jaw is obtained by tipping the screw-carrying end of the jaw forward, while, on the other hand, if the said end is tipped backward the jaw will firmly grip the bar.

It will be evident that my invention is equally applicable to clamps having two movable jaws sliding on a straight bar devoid of a fixed arm, and I do not wish to be understood as at all limiting myself by showing in my drawings a clamp with one fixed and one movable arm.

Having thus described my invention, what I claim as new is—

1. In a clamp, the combination with a bar of an adjustable jaw transversely apertured to receive said bar and sliding thereon, the inner wall of said aperture having a recess or pocket closed on all sides and opening into the aperture, and a removable plate lying in said pocket and at its outer face presenting to the bar a series of teeth while the entire inner face engages the seat formed by the bottom of the pocket, whereby the least di-

mension of the plate is enabled to be perpendicular to the toothed surface and maximum stability secured, substantially as set forth.

2. In a clamp, the combination with a bar, 5 of an adjustable jaw transversely apertured near one end to receive said bar and sliding thereon, the inner wall of said aperture being provided with a recess or pocket closed on all sides and opening against the bar, 10 and a friction-plate lying in said pocket with such a degree of looseness as will permit it to drop out by its own weight when the jaw is detached from the bar, said friction-plate

presenting to the bar a series of teeth and having its entire base in contact with the solid 15 seat forward formed by the pocket, the projection of every point of the face of the plate upon the plane of the base falling within said base, substantially as set forth.

In testimony that I claim the foregoing I 20 have hereunto set my hand this 14th day of August, 1899.

JAMES L. TAYLOR.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.