Jan. 1, 1924 1,479,127

H. CADWALLADER, JR

MACHINE CLAMP

Filed March 15, 1921

Fig. 1.

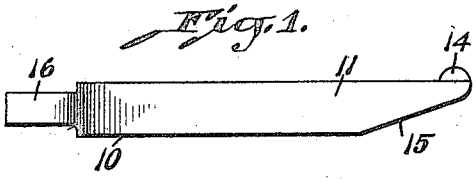


Fig. 2.

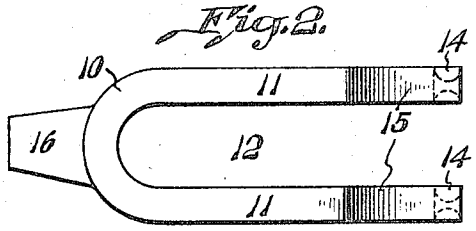


Fig. 3.

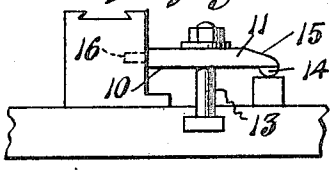
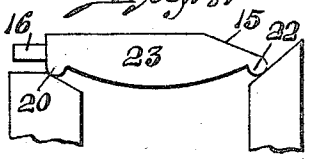


Fig. 7.



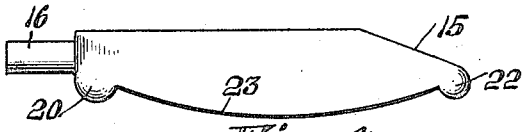


Fig. 4.

Fig. 5.

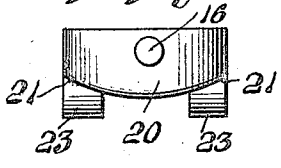
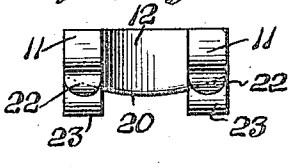


Fig. 6.



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UNITED STATES PATENT OFFICE.

HARRY CADWALLADER, JR., OF PHILADELPHIA, PENNSYLVANIA.

MACHINE CLAMP.

Application filed March 15, 1921. Serial No. 452,558.

To all whom it may concern:

Be it known that I, HARRY CADWALLADER, Jr., a citizen of the United States, and a resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machine Clamps, of which the following is a specification.

The present application is a continuation in part of application filed March 13, 1919, Serial No. 282,453 now Patent 1,376,077, Apr. 26, 1921, as to all matter common to the two applications.

Some of the objects of the present invention are to provide a clamp for machine shop practice to hold a piece of work in a rigid fixed position upon a support; to provide clamping means arranged to direct the applied force substantially at right angles to the face of the work engaged by the clamp; to provide clamping means which acts to self-adjust the clamp to the work; to provide a clamp arranged to co-act with work material which is not provided with lugs or flanges capable of being engaged by a clamp; and to provide other improvements as will hereinafter appear.

In the accompanying drawings Fig. 1 represents a side elevation of an end clamp embodying one form of the present invention; Fig. 2 represents a bottom plan of the same; Fig. 3 represents the clamp of Fig. 1 in an operative position; Fig. 4 represents a side elevation of another form of the invention; Fig. 5 represents an elevation of one end of the clamp shown in Fig. 3; Fig. 6 represents an elevation of the other end of the clamp shown in Fig. 3; and Fig. 7 represents the clamp of Fig. 4 in an operative position.

Referring to the drawings, the form of the invention shown in Figs. 1 and 2 consists of a body 10 formed of material designed to withstand bending, shearing or other stresses or strains and generally of a character to stand up under the rough use of a machine shop. The body 10 in this construction is of bifurcated form providing two substantially parallel legs 11 which provide an open ended slot 12 between them through which a suitable bolt 13 or other clamping means can be passed to rigidly secure the body 10 to the supporting table to clamp the work rigidly in place. The elongated slot 12 permits a desirable range of adjustment for the clamping bolt 13.

To provide self-adjusting means whereby the clamping body 10 automatically seats upon the work in a manner to direct the applied force substantially at right angles to the work, the legs 11 are respectively provided with rounded projections 14 which act as gripping jaws engaging the work or a support. These projections 14 serve effectively upon an inclined or an irregular surface equally as well as upon a plane surface because the curved face permits the point of application to automatically shift under the different conditions. Preferably the opposite face of each of the legs 11 is bevelled as indicated at 15 so that the gripping ends have a dimension readily adapting them to restricted locations.

For supporting the other end of the body 10, a lug or stem 16 is formed integral with the body 10 and is arranged to be inserted in a hole 17 in the work or a support, drilled for the purpose, or in any convenient recess or other location. When the work has projecting ledges or flanges the lug 16 can be seated directly thereon as will be understood.

In Figs. 4, 5 and 6 another form of the invention is shown wherein the end of the clamp body 10 which carries the lug 16 is provided with a transverse boss or rib 20 extending substantially the width of the body 10. This rib 20 is symmetrically curved from end to end, as shown in Fig. 5, to provide a contour by which the body 10 is self-adjusting about its longitudinal axis when seated upon the work to be clamped or upon a support. Furthermore, this curved contact surface is rounded laterally, as shown in Fig. 4, to provide means for causing the body 10 to assume such a position as to direct the applied face substantially at right angles to the work or the support. This rib 20 therefore serves to provide a maximum contact surface for clamping purposes, insures vertical pressure at all times, and gives a bearing surface which is effective substantially regardless of the angularity of the work. In this form of the invention the body 10 likewise is of bifurcated form having the legs 21 and rounded end projections 22 upon each as previously described.

As a means for reinforcing the body to prevent fractures adjacent the points of contact or other portions of the legs when under stress, each leg is formed with a de-

pending flange 23 which increases in depth of both ends of the clamp body, thus building up the mid-section of the legs 21 to resist stresses and distribute them through the metal instead of acting as a direct shear.

From the foregoing it will be evident that at one end of the body 10, the projections 22 are tangent to a plane parallel to the bottom of the body, while at the other end of the body the transverse curved rib 20 allows the body 10 to oscillate so that the parallel projections 22 can seat properly upon the work.

The clamp of the present invention is arranged under all working conditions to rigidly hold the work without slipping and when used with work at an angle is very effective because the rounded jaws can grip the work rigidly, which is not the case where a clamp with a sharp corner is employed.

Although but two of the many forms in which this invention may be embodied are shown, it is to be understood that the invention is not limited to any specific construction but might be applied in various forms without departing from the spirit of the invention or the scope of the appended claims.

Having thus described my invention, I claim:

1. In a clamp for machine work, the combination of a body of substantially U-shape forming a pair of jaws, each jaw having a rounded gripping surface, a lug axially disposed at the opposite end of said body from said jaws and arranged to be inserted in an opening formed in the material to be clamped, and means to clamp said body in operative position.

2. In a clamp for machine work, the combination of a body of substantially U-shape forming a pair of jaws, a lug axially disposed at the opposite end of said body from said jaws and arranged to be inserted in an opening formed in the material to be clamped, means to clamp said body in operative position, and self-adjusting means for each jaw.

3. In a clamp, a body, a rounded projection formed at one end portion of said body for engaging the work or a support, a transversely rounded rib at the other end portion of said body, also for engaging the work or a support, said rib having its contact face curved, and means to clamp said body with said projection and rib engaging the work or a support.

4. In a clamp, a body, rounded projections formed at one end portion of said body the outer contact faces thereof lying in a plane parallel to the bottom of said body, a transverse rounded rib at the other end portion of said body, said rib having its contact face curved from end to end of said rib; and means to clamp said body with said projections and rib engaging the work or a support.

5. In a clamp, a body, rounded projections formed at one end portion of said body, said projections being arranged to simultaneously contact with a surface, a transverse rounded rib at the other end portion of said body, depending flanges respectively at opposite sides of said clamp, and means to clamp said body with said projections and rib engaging the work or a support.

6. In a clamp, a body, rounded projections formed at one end portion of said body, said projections being arranged to simultaneously contact with a surface, a transverse rounded rib at the other end portion of said body, depending flanges respectively at opposite sides of said clamp, said flanges being greatest in depth at mid-section, and means to clamp said body with said projections and rib engaging the work or a support.

Signed at Philadelphia, in the county of Philadelphia, and State of Pennsylvania, this 8th day of March, 1921.

HARRY CADWALLADER, JR.