(No Model.)

H. LEMP.

ELECTRIC WELDING CLAMP.

No. 434,450. Patented Aug. 19, 1890.

Fig. 1.

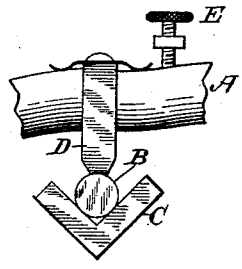


Fig. 2.

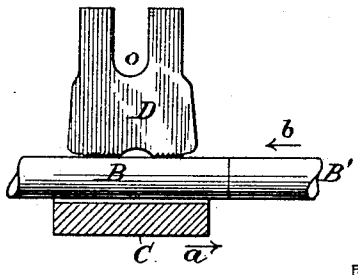


Fig. 3.



Fig. 4.

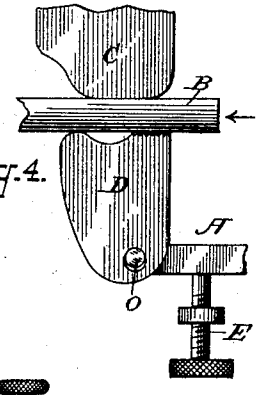


Fig. 5.

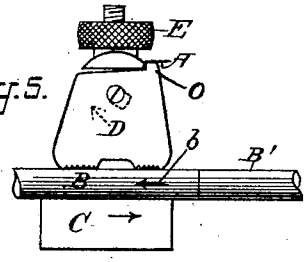


Fig. 6.

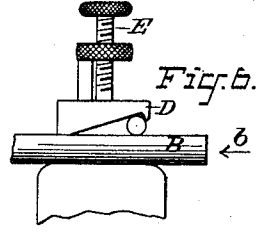


Fig. 7.

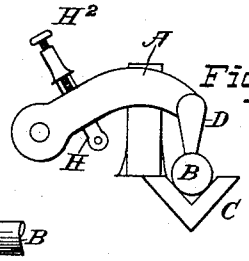


Fig. 8.

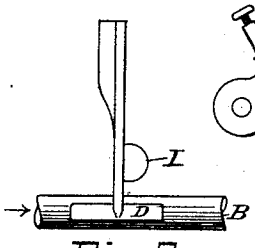
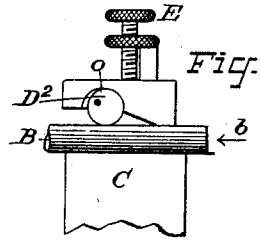


Fig. 9.



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HERMANN LEMP, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON ELECTRIC WELDING COMPANY, OF MAINE.

ELECTRIC-WELDING CLAMP.

SPECIFICATION forming part of Letters Patent No. 434,450, dated August 19, 1890.

Application filed March 29, 1890. Serial No. 345,841. (No model.)

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Electric-Welding Clamps, of which the following is a specification.

My invention relates to apparatus for welding, upsetting, or other metal-working operations in which electricity is employed as the heating agent, and in which provision is made for holding the piece or pieces of metal to be operated upon and for moving the clamps or holding devices toward one another. In apparatus of this kind the holding devices must be of such a nature as to hold the work firmly and prevent it from slipping longitudinally in the clamps when the end pressure is applied, as in electric welding. It is also extremely desirable that the devices should be capable of easy and quick manipulation. Heretofore in clamping devices for electric welding and other similar metal-working operations wherein the clamp or clamps have a longitudinal movement provision has only been made for holding the clamps down upon the work by means of laterally-acting screws, levers, or other pressure devices operated by hand, the strength used in tightening such devices determining the security with which the work shall be held against slipping longitudinally.

My present invention consists in the combination, with the clamps or clamping devices having the usual provision of screws, levers, or other means for applying the initial lateral pressure, of clamping-jaws suitably constructed in any desired way to tighten themselves automatically on endwise movement of the work held in the clamp. By this construction it only becomes necessary to apply a small amount of initial pressure by means of the screw, lever, or other device that applies the lateral pressure, and no special attention need be given to the operation of such devices, since the application of the longitudinal pressure which moves the clamp bed or slide toward the opposite one with the work in place will cause the jaw to tighten and lock upon the work and effectually hold the same in place.

In carrying out my invention I may construct or mount the jaw in any desired way to clamp or bind upon the work when the latter moves longitudinally under the clamp, and very many constructions and ways of mounting the clamping-jaws will readily occur to mechanicians as suitable for the purpose.

The initial clamping devices may also be modified at will, my invention consisting, essentially, in the combination, as before stated, of the devices for applying the initial lateral pressure to the jaws, which are themselves constructed to tighten automatically on endwise pressure.

In the accompanying drawings I have illustrated the various modifications or forms of my invention.

Figure 1 shows in end elevation the parts of one form of apparatus embodying the invention. Fig. 2 is a side elevation of a part of the apparatus, the clamp-bed on which the work rests being shown in section. Fig. 3 is a detail of construction. Figs. 4, 5, and 6 illustrate in side elevation other forms of the invention. Fig. 7 is an end elevation, and Fig. 8 a plan of another form. Fig. 9 shows in side elevation still another modification.

In Fig. 1 B indicates a piece of metal, as a rod or wire, which is held down upon a V-shaped bed or rest, as C, by means of a clamping-jaw D. The clamping-jaw D may be supported in any desired manner—as, for instance, upon an arm A, which has a reduced or spindle-shaped portion, as indicated in Fig. 3, which is embraced by two arms at the upper end of the clamp-jaw, and around which said jaw may turn. The jaw is preferably spring-supported upon the arm A, as indicated in Fig. 1. The arm is the usual clamp-supporting arm of an electric-welding apparatus, and may be pivoted or mounted in the usual or in any desired way. In connection with it is employed the usual tightening device—as, for instance, a screw E—as indicated in Fig. 1, which bears upon the arm A, and is adapted to bring the jaw D down upon the work with

the desired initial pressure. Heretofore the force applied to said device E has determined the strength with which the work shall be held in the clamp against longitudinal movement when pressure or force is applied so as to move the whole clamping apparatus in a longitudinal direction coinciding with the longitudinal axis of the work and toward the opposite clamping device.

In an apparatus constructed as shown in Figs. 1, 2, and 3 the jaw D is brought down onto the work with a moderate pressure and secured by the device E or any other suitable means. Now, if upon movement of the jaw and the rod B in the direction, say, of the arrow *a*, Fig. 2, so as to bring the rod B against an opposite rod B′, to which it is to be welded, or to cause in any other metal-working operation an endwise pressure that will tend to make the rod B slip longitudinally endwise in the direction of the arrow *b*, as in Figs. 2 and 5, the jaw D will, should any slip of B on C take place, turn around upon O as a center, where it engages with the arm A, and in describing at its clamping-edge an arc whose radius is greater than the perpendicular line from B to O will force the bar B or other work down more firmly on its bed, and will serve to hold it against further movement.

In Fig. 4 the jaw D is of a little different shape, and is mounted on the lever or other support A by means of a pin *o*, on which it is adapted to work loosely. C indicates the bed or abutment, between which and jaw D the work B is held. Here, as before, the jaw being set against the bar by moderate pressure exerted by device E, any pressure in the direction to cause the work B to slide on abutment C will cause the jaw D to bind more firmly and hold the work fixed against the abutment C.

In Fig. 5 the jaw D is shown mounted loosely on a screw, and the initial clamping device is a thumb-nut E, engaging with a screw-threaded spindle that works down through the arm A and supports the screw on which the jaw is pivoted. A few turns of the thumb-nut E will apply the initial pressure sufficient to hold the jaw D upon the work with sufficient force until the endwise or longitudinal pressure, in the direction of the arrow *b* will cause the jaw to turn on O as a center and hold the bar securely.

In Fig. 6 I have shown the automatic clamping-action as secured by the well-known device of a wedge-action produced by a roller, as D, sliding under an inclined surface formed on the lower side of the clamping-jaw. In this form, as before, the screw E is set down to occupy the position shown, so as to produce the initial lateral pressure, while if the work slips in the direction of the arrow *b* through pressure applied longitudinally the ball will be carried under the wedge or inclined surface and gripped more tightly. Instead of a ball or roller, a sliding block might obviously be used.

In Fig. 7 the jaw D is carried by a piece of elastic metal, which is rather thin in a longitudinal plane, but thick in a vertical plane, so that the jaw D may tilt on longitudinal movement, the plate A being adapted to twist slightly and allowing such tilting. The plate or lever is thickened at its pivotal point, as indicated, to re-enforce it and make it rigid at such point. The initial pressure is given by means of another lever H, which carries a screw H^2, the end of which rides on the upper cam-surface of the plate or lever A. The force with which said lever is moved over toward the work and the screw H^2 is set down determines the initial pressure, while longitudinal pressure moving the work B will cause the jaw to tilt and automatically increase the pressure, so as to effectually hold the work against slipping in the welding or other metal-working operation. The arm A, being rather wide in a vertical direction, effectually resists any tendency to forward movement produced when the jaw tilts. A stop I, applied, as shown, close up to the lever A, may be used to prevent excessive bending or twisting.

In Fig. 9 the automatic clamping-action by the longitudinal movement is obtained by providing the clamping-jaw with a roller or dog pivoted eccentrically on the jaw, as shown. The operation of the device on movement of B in the direction of the arrow *b* is obvious. The initial pressure is applied by any desired device, as desired, as by the screw E, and the automatic tightening or binding by longitudinal movement is obtained by means of the roller D^2 on the clamping-jaw.

What I claim as my invention is—

1. In an electric metal-working apparatus, the combination, substantially as described, with the clamping devices having means for applying initial lateral pressure to the work, of a clamp-jaw adapted to tighten automatically on endwise movement of the work under it.

2. In an electric metal-working apparatus, a clamping device embodying, in combination, a clamping-screw or its equivalent, as described, for applying initial lateral pressure to the work by the holding devices, and a clamp-jaw adapted to tighten automatically upon the work on endwise movement of the latter under the jaw.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 26th day of March, A. D. 1890.

HERMANN LEMP.

Witnesses:
JOHN W. GIBBONEY,
E. W. RICE, Jr.