(No Model.)

M. W. DEWEY.

ELECTRIC WELDING APPARATUS.

No. 447,104. Patented Feb. 24, 1891.

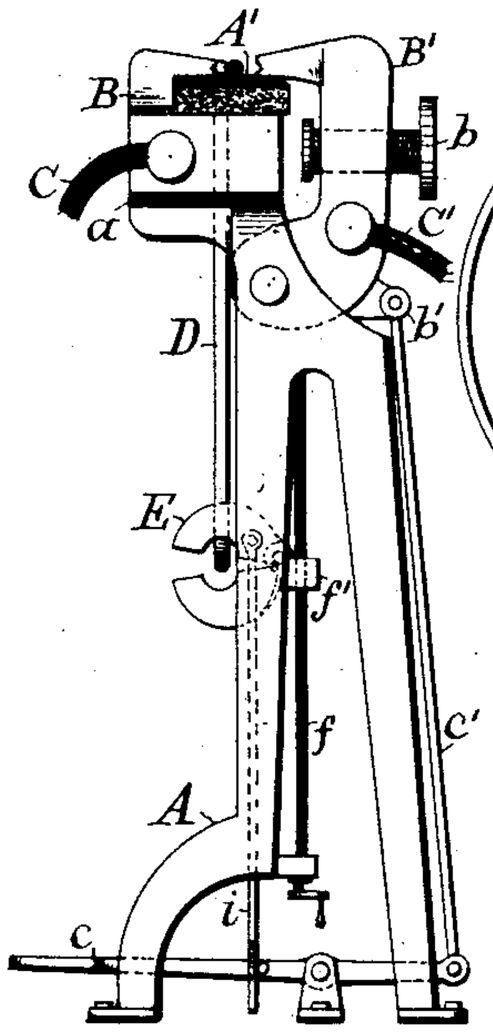


Fig. 1.

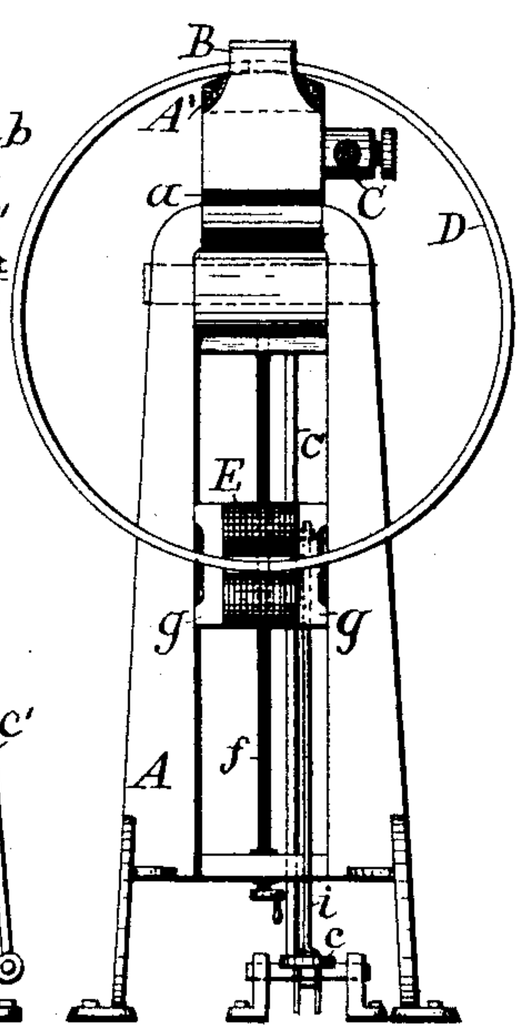


Fig. 2.

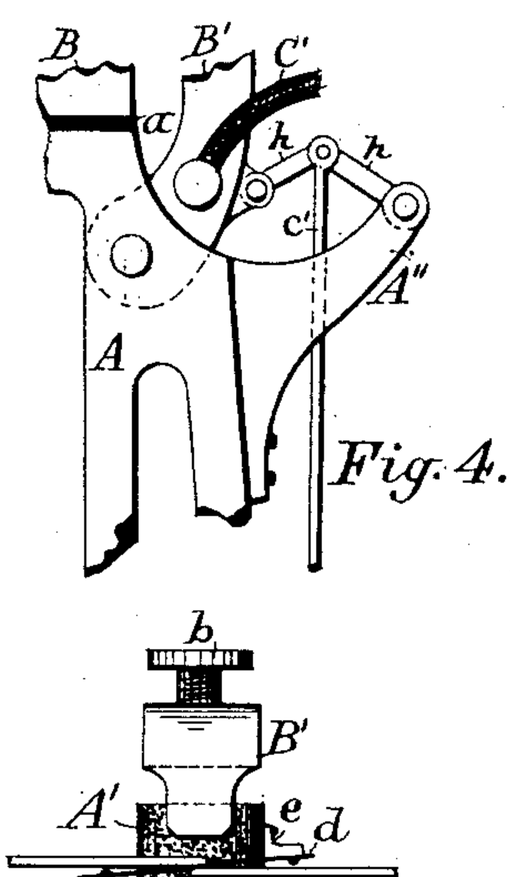


Fig. 4.

Fig. 3.

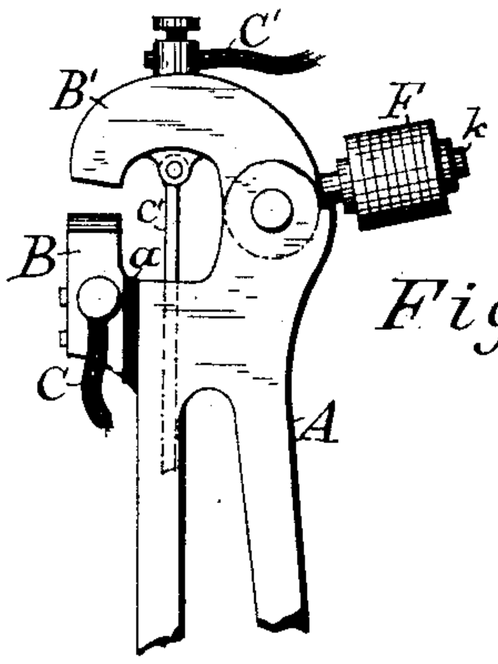
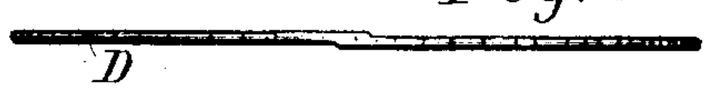


Fig. 5.

Fig. 6.



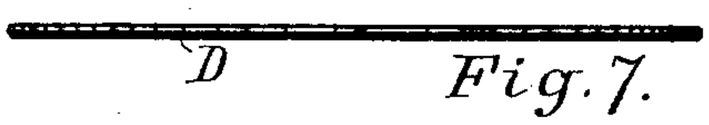


Fig. 7.

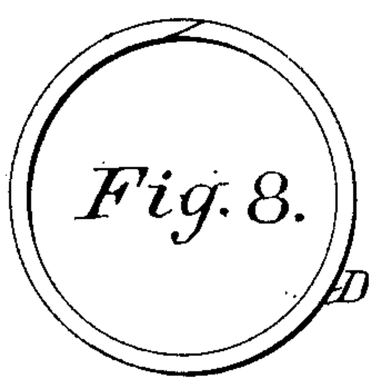


Fig. 8.

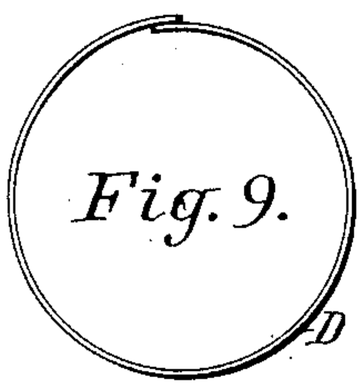


Fig. 9.

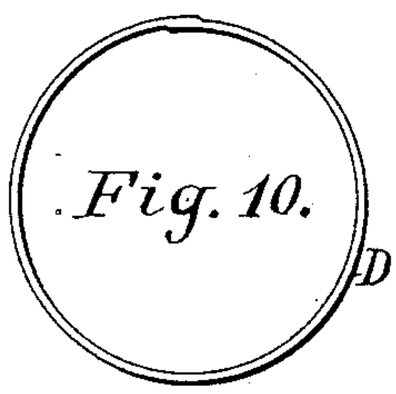


Fig. 10.

WITNESSES:

J. J. Laass.

H. M. Seamans

INVENTOR:

Mark W. Dewey.

By Duell, Laass & Duell,

his ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE DEWEY CORPORATION, OF SAME PLACE.

ELECTRIC-WELDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 447,104, dated February 24, 1891.

Application filed November 1, 1890. Serial No. 370,060. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric-Welding Apparatus, (Case No. 80,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to certain improvements in apparatus for electric welding, and is especially applicable to the heating of curved forms, such as rings, hoops, tires, &c.

The object of my invention is to provide simple and efficient means for rapidly welding the ends of pieces or a ring together, all as hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of an apparatus embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a top view. Figs. 4 and 5 are side elevations of a part of modified forms of apparatus; and Figs. 6 to 10 show rings or hoops with different kinds of lap-joints before and after a union is effected.

Referring specifically to Figs. 1, 2, and 3, A represents a frame or pedestal supporting a single clamp and an insulated table between, but below the jaws thereof.

B is a stationary jaw of the clamp, and B′ is a movable jaw, preferably pivoted to the frame A and movable toward and from the stationary jaw. These jaws are each connected to a terminal of a circuit carrying an electric heating-current. The terminal C is connected with B and the terminal C′ with B′.

a indicates insulation to insulate one jaw from the other.

The table or hoop support A′ is preferably made of slate or fire-brick or other non-conducting heat-resisting substance, and is more or less curved to permit the part of the hoop D where the joint is made to rest upon it between the jaws of the clamp. The jaws are adapted to compress the work laterally to form lap-joints. The faces of the jaws which are brought in contact with the work may be plain or grooved to fit more or less the shape of the work and to make good electrical contact therewith.

Extending through the movable jaw and in a direction toward the base of the stationary jaw is a large screw *b*, forming an adjustable stop and short-circuiting device. The said screw is adapted to approach or recede from the base of the stationary jaw B, and is set or adjusted according to the size or cross-section of the joint. The movable jaw is preferably normally separated from the other jaw by its weight or an auxiliary weight or a spring, to admit the joint to be welded between the jaws easily and freely. When the movable jaw is moved toward the joint and the opposite jaw to effect a welding operation, it first comes in contact with the work to close the circuit therethrough to heat and soften the work, which is performed quickly; then as the pressure with the clamp is continued the pieces or the ends of a piece are forced together to complete the union of the parts. When the joint has been compressed to the desired extent, the enlarged end of the stop-screw *b* comes in contact with the base of the stationary jaw so that further pressure cannot be applied, and so that the current will be short-circuited through the stop *b* and base of stationary jaw B to prevent too much pressure and the work from being burned or kept heated too long. As soon as the jaw B′ is moved as far as the stop will allow the said jaw is allowed to recede from the joint and the work is removed.

In welding the joints of hoops or rings rapidly the hands of the operator are entirely occupied in handling and holding the work. Therefore, in order to operate the clamp or the movable jaw thereof, I connect a suitable treadle *c*, to be operated by the foot, by a rod *c′* with an arm *b′*, projecting from the jaw B′. The treadle *c* is preferably so fulcrumed that when it is depressed by the foot the movable jaw will approach the other.

Fig. 3 shows stops *d d* to limit the length of the lap. These stops may be strips of insulating material, as mica, or high-resisting material, as platinum, supported by brackets *e e* secured to the table A′, and with their free ends extending toward each other and toward the center of the table. The stops may be placed a greater or less distance apart, according to the length of the lap-joint to be

made. Fig. 6 shows such a joint after it is completed. When a joint is made after the ends are tapered, as shown in Fig. 7, such guides will not be necessary.

Referring again to Figs. 1 and 2, E is a well-known counter-electro-motive-force device to be employed when the current passed through the joint is of an alternating character, to prevent said current from short-circuiting through the continuous part of the ring or hoop and heating the same. Said counter-electro-motive-force device is preferably formed of layers of sheet-iron separated by insulating material, and is the same or similar to the device shown and described in patent to Thomson, No. 403,157, dated May 14, 1889. The said counter-electro-motive-force device is adapted to be moved vertically toward and from the table A′ or the pressure devices or clamp. The said device is provided on each side with guides or bearings *g g* to work in the frame A, so that it will be held firmly in place in any position. The device may be raised, lowered, and held by any suitable means, but a screw *f* is preferred, journaled in the frame A at each end and passing through a lug *f′* on said device E. The device E is in two parts, as usual. The parts are hinged together, so that the device may be opened and closed conveniently to admit and remove the ring therefrom. In order that the device E may be normally open and closed when the work is operated upon, which is essential, a rod *i* is connected at one end to the upper part of the device, which is movable toward and from the lower part, and rests or bears with its other end upon the treadle-lever. The end of the said rod resting upon the treadle-lever is bifurcated and arranged so that it will be held in place on said lever and permit the treadle to be depressed more or less after the device E is entirely closed. It will be apparent that the device E is operated simultaneously with the jaw B′; but the former should be closed completely or to the extent desired as soon as the jaws make contact with the work.

Fig. 4 represents how motion may be transmitted from the treadle to the pivoted jaw B′ by means of toggle-arms. Said arms *h h* are jointed together and to and between the jaw B′ and a bracket or arm A″, extending from the back of the frame A upward behind the said jaw. The rod *c′* is connected to the central joint of the toggle and is drawn down by the treadle when it is desired to move the jaw B′ toward the work. With this device greater and increased pressure may be applied to the joint.

Fig. 5 shows a clamp arranged for welding band hoops or hoops made of sheet metal. The joints to be made with this apparatus resemble those shown in Figs. 8 and 9 of the drawings. Fig. 10 indicates the joint shown in Fig. 9 after it has been united and pressed to a certain extent. By applying more pressure to the joint when it is heated the cross-section may be decreased until it is not greater than other portions of the work.

In Fig. 5 an auxiliary weight F is employed to hold the jaws normally open. Said weight or weights are mounted upon an arm *k*, extending back from the jaw B′.

It will be obvious that the apparatus described is particularly adapted not only for welding the joints of band hoops but all kinds of hoops or curved forms, especially those made of round wire.

The ends to be welded together may be united without tapering, as has been clearly shown, or they may be tapered or beveled before they are united in any suitable manner and by any suitable and well-known means.

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

1. In an electric-welding apparatus, the combination of a clamp adapted to compress the work laterally and having one jaw insulated from the other, terminals of an electric circuit connected to said jaws, grooves in the inner faces of said jaws transverse to the line of movement of the movable jaw, and suitable means to apply lateral pressure to the work with said clamp.

2. In an electric-welding apparatus, the combination of a clamp adapted to compress the work laterally and having one jaw insulated from the other, a table or support for the work between but beneath the jaws, terminals of an electric circuit connected to said jaws, and suitable means to apply lateral pressure to the work with said clamp.

3. In an electric-welding apparatus, the combination of a clamp adapted to compress the work laterally and having one jaw insulated from the other, terminals of an electric circuit connected to said jaws, suitable means to apply lateral pressure to the work with said clamp, grooves in the inner faces of said jaws transverse to the line of movement of the movable jaw, and a stop to limit the movement of one of the jaws.

4. In an electric-welding apparatus, the combination of a clamp adapted to compress the work laterally and having one jaw insulated from the other, terminals of an electric circuit connected to said jaws, suitable means to apply lateral pressure to the work with said clamp, and an adjustable stop to limit the movement of one of the jaws.

5. In an electric-welding apparatus, the combination of a clamp adapted to compress the work laterally and having one jaw insulated from the other, terminals of an electric circuit connected to said jaws, suitable means to apply lateral pressure to the work with said clamp, and an automatic adjustable cut-out or short-circuiting device, for the purpose described.

6. The combination, with an electric lap-joint-welding apparatus, of stops for limiting the length of the lap.

7. The combination, with an electric lap-

joint-welding apparatus, of adjustable stops for limiting the length of the lap.

8. In a ring or hoop welding apparatus, a counter-electro-motive-force device supported on the frame of the welding apparatus and adapted to be moved toward and from the pressure devices to accommodate different sizes or diameters of hoops.

9. In a ring or hoop welding apparatus, a counter-electro-motive-force device supported on the frame of the welding apparatus, and means to automatically operate or open and close said device.

10. In a ring or hoop welding apparatus, a counter-electro-motive-force device supported on the frame of the welding apparatus, and means to automatically operate or open and close said device simultaneously with the movement of the pressure devices.

11. In a ring or hoop welding apparatus, a counter-electro-motive-force device supported on the frame of the welding apparatus, and a treadle to operate or open and close said device.

In testimony whereof I have hereunto signed my name this 29th day of October, 1890.

MARK W. DEWEY. [L. S.]

Witnesses:
C. H. DUELL,
H. M. SEAMANS.