T. E. MURRAY.

APPARATUS FOR ELECTRIC WELDING.

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1,177,260. Patented Mar. 28, 1916.

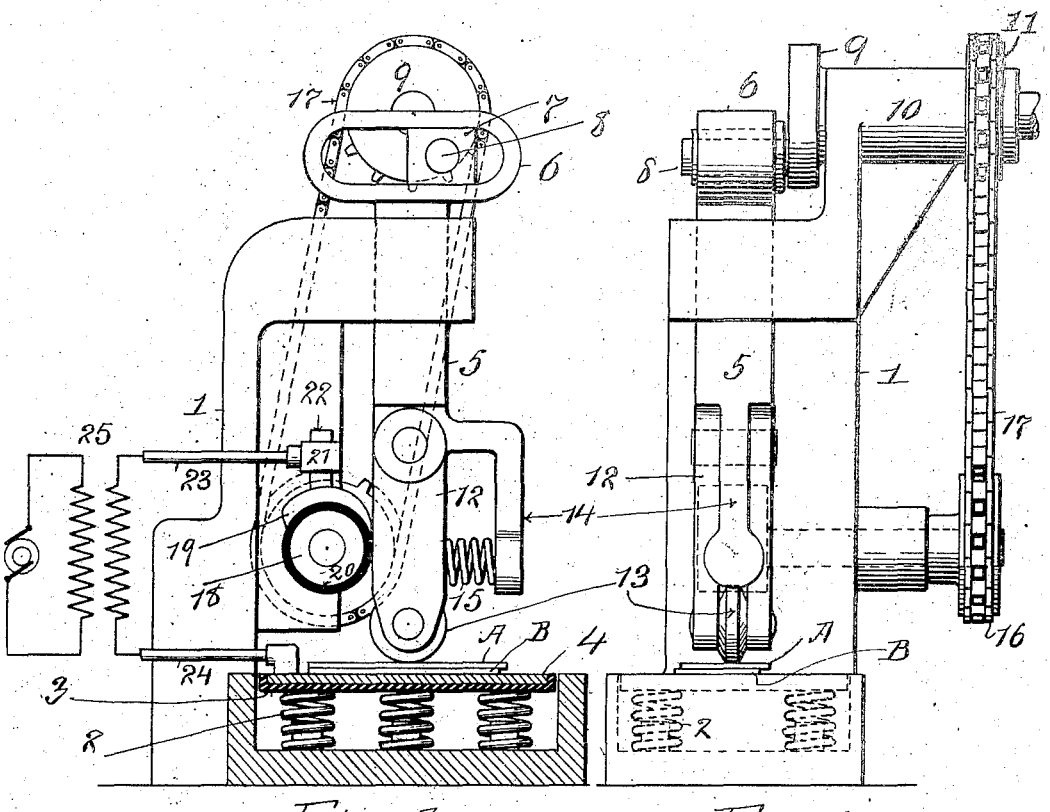

Fig. 1. Fig. 2.

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APPARATUS FOR ELECTRIC WELDING.

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Application filed November 17, 1915. Serial No. 61,895.

To all whom it may concern:

Be it known that I, THOMAS E. MURRAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Apparatus for Electric Welding, of which the following is a specification.

The invention is a method of and an apparatus for electric welding. Spot-welding, so called, joins together lapped surfaces by means of separated welds. The strength of the current used at each spot so welded then depends upon the whole area of the spot, and is obviously greater as the spot area increases. Instead of sending the current through the whole spot area, my invention causes it to pass through small fractions of that area successively, thus centering the energy at given instants upon such small fractions, and effecting a large saving in the maximum power required.

In the accompanying drawings—Figure 1 is a side elevation of my electric welding machine, and Fig. 2 is an end elevation thereof.

Similar numbers of reference indicate like parts.

1 is the standard, having in its base a recess with upward projections receiving the helical springs 2. A plate 3 of insulating material rests on said springs and carries the metal plate 4 which supports the two plates A, B to be welded. A plunger 5 vertically sliding in the horizontal arm of standard 1 has at its upper end a horizontally slotted cross head 6, in which is the sliding block 7 of a crank pin 8 on pulley 9. The shaft of pulley 9 is journaled in a sleeve 10 on said standard arm and carries a sprocket pulley 11. Pivoted at its upper end to plunger 5 is a bifurcated swinging support 12 which carries the metal roller 13. On plunger 5 is a downwardly depending fixed arm 14, between which and support 12 is a helical spring 15.

Journaled in standard 1 is a shaft which carries a sprocket pulley 16, over which passes the sprocket chain 17 which also engages with sprocket 11. On said shaft is a pulley 18 having a metal cam projection 19 insulated from said pulley by an interposed sleeve 20 of insulating material. On the standard 1 and above cam 19 is a metal block 21, in which slides vertically a metal bar 22 which bears on said cam. From the block 21 extends a horizontal pipe 23. A similar horizontal pipe 24 is secured to the plate 4. By leads passing through pipes 23 and 24 the plate 4 and block 21 are connected to the secondary terminals of the transformer 25, the primary of which is connected to the source of welding current. As the cam 19 makes contact with the swinging support 12, a circuit is formed through said support, roller 13, the objects A, B to be welded, plate 4 and the secondary of the transformer 25.

The operation is as follows: The plates A, B to be welded being placed upon plate 4, the rotation of pulley 9 causes the plunger 5 to move downwardly, thus pressing the roller upon said plates against the resiliency of springs 2. Simultaneously through the sprocket mechanism described the cam 19 is caused to act upon the swinging support 12 to move it against the resiliency of spring 15, and so cause the roller 13 to move over the plates A, B for a short distance determined by the throw of said cam. As the roller 13 so moves, circuit is established through plates A, B, and the weld is produced. Simultaneously with the cam 19 running out of contact with the support 12 the plunger 5 is lifted, so raising the roller 13 and the welding current is broken an instant before the roller rises. The support 12 is then swung back to normal position by the expansion of helical spring 15. During this rearward movement of support 12, the plates A, B are moved to a new position on plate 4, and the foregoing operation is repeated to produce another welded spot, and this continues until as many welded spots are produced as may be deemed necessary to unite the lapped plates.

It will be obvious that the contact region of roller 13 and plate A is of very small area, and that as the roller moves over the plate this area remains constant. The width of the welded area will depend upon the length of the operating face of the roller, preferably made short by beveling the edges of said roller, as shown in Fig. 2, and the length of said area will depend upon the movement of the swinging support 12 due to cam 19.

From the foregoing it will be seen that my machine does not make a long continuous welded seam, but a spot in successive small

fractions of its total area, the plates being united, as before, by a multiplicity of such welded spots.

I claim:

1. An electrical welding apparatus, comprising a fixed electrode, a cylindrical roller electrode having a smooth periphery, means for moving said roller electrode into contact with the surface of one of the bodies to be welded disposed between said electrodes, and means for moving said roller electrode over the surface of said body and for closing circuit to said electrode.

2. An electrical welding apparatus, comprising a fixed electrode, a cylindrical roller electrode having a smooth periphery, means for moving said roller over and in contact with the surface of one of the bodies to be welded disposed between said electrodes, means for first pressing said roller against said body and then removing said roller electrode from contact with said body, and means for retracting said roller to normal position while so removed.

3. An electrical welding apparatus, comprising a fixed electrode, a roller electrode, means for moving said roller electrode into contact with one of the bodies to be welded and then removing said roller from contact after circuit has been broken, and means for moving said roller over said body and for breaking circuit to said electrodes when said roller shall have reached the end of its path.

4. An electrical welding apparatus, comprising a fixed electrode, a cylindrical roller electrode having a smooth periphery, means for moving said roller into contact with the surface of one of the bodies to be welded disposed between said electrodes and for removing said roller from contact after circuit has been broken, means for moving said roller over said body and for establishing circuit through said electrodes during said movement of said roller and for breaking circuit when said movement is completed, and means for retracting said roller to normal position while so removed.

5. An electrical welding apparatus, comprising two electrodes receiving between them the lapped objects to be welded, one of said electrodes being a roller, a swinging support wherein said roller is journaled, a plunger carrying said support, means for moving said plunger longitudinally to press said roller upon one of said objects, and means for swinging said support to move said roller along the surface of said object.

6. An electrical welding apparatus, comprising two electrodes receiving between them the lapped objects to be welded, one of said electrodes being a roller, a swinging support wherein said roller is journaled, a plunger carrying said support, means for moving said plunger longitudinally to press said roller upon one of said objects, means for swinging said support to move said roller along the surface of said object, and a retracting spring for said support.

7. An electrical welding apparatus, comprising two electrodes receiving between them the lapped objects to be welded, one of said electrodes being a roller, a swinging support wherein said roller is journaled, a plunger carrying said support, means for moving said plunger longitudinally to press said roller upon one of said objects, and a rotary cam bearing upon said support and operating to swing the same to move said roller over the surface of said object.

8. An electrical welding machine, comprising two electrodes receiving between them the lapped objects to be welded, one of said electrodes being a flat plate and the other electrode being a roller, springs supporting said plate, a swinging support wherein said roller is journaled, a plunger carrying said support, means for moving said plunger longitudinally to press said roller upon one of said objects, and means for swinging said support to move said roller along the surface of said object.

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

THOMAS E. MURRAY.

Witnesses:

GERTRUDE T. PORTER.

MAY T. MCGARRY.