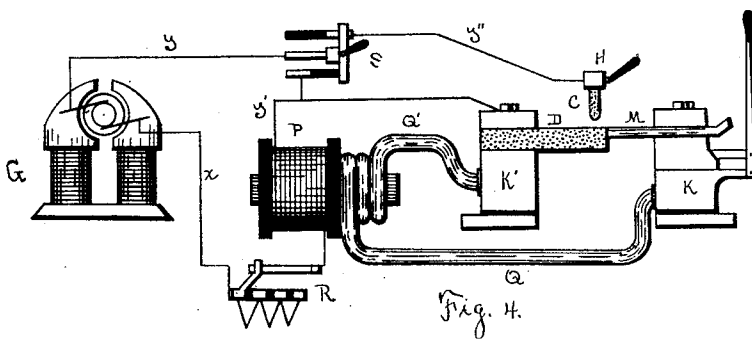
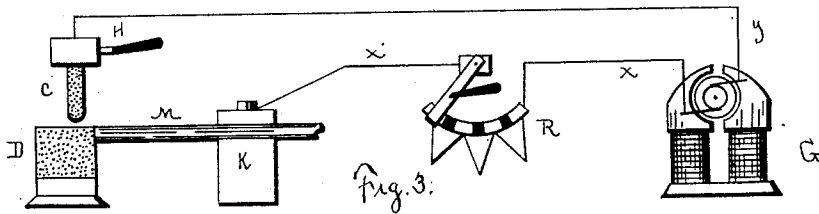
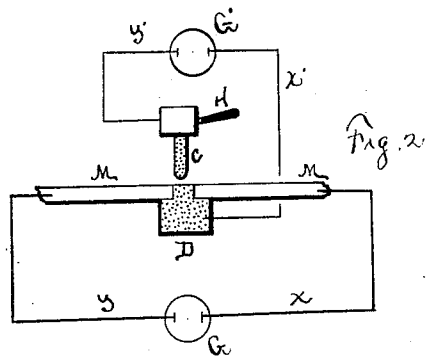
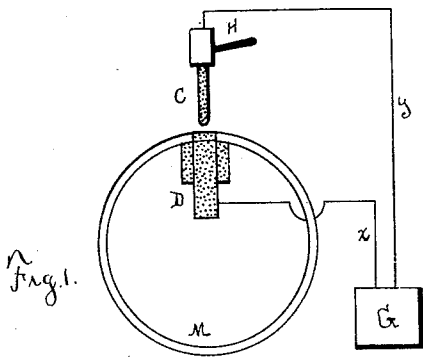


(No Model.)

C. L. COFFIN.
ELECTRIC WELDING OR WORKING OF METALS.

No. 463,487.

Patented Nov. 17, 1891.



Witnesses
Herbert H. Anderson
Cyrus L. Ketchum

Inventor.
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UNITED STATES PATENT OFFICE.

CHARLES L. COFFIN, OF DETROIT, MICHIGAN.

ELECTRIC WELDING OR WORKING OF METALS.

SPECIFICATION forming part of Letters Patent No. 463,487, dated November 17, 1891.

Application filed March 4, 1891. Serial No. 383,801. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. COFFIN, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful
5 Improvement in Welding or Working Metals, of which the following is a specification.

My invention consists of an improved method of welding and working metals electrically, hereinafter fully described and
10 claimed.

In the drawings, Figure 1 is a diagram indicating the manner of carrying my invention into effect. Fig. 2 is a similar view of a modified arrangement of parts. Fig. 3 is a
15 similar view of another modification, and Fig. 4 is a similar view of another modified arrangement.

In all the figures, M represents the material to be operated upon. C and D represent
20 conductors. x and y represent conductors by which conductors D and C are connected with the generator.

In Fig. 1 the material M to be operated upon is shown in the form of a hoop, the ends
25 of which are abutted against the conductor D. The conductor C is provided with an insulating handle H, by which when a current from the generator G is started the conductors C and D may be brought into contact and
30 slightly separated to form a voltaic arc between them, thus raising the conductor D to incandescence and heating the ends of the article M in contact therewith. When sufficient heat has been developed, the article M is removed from the conductor D, its ends
35 brought in contact and the weld completed by pressure, rolling, or hammering, as desired.

In Fig. 2 the ends of the material abut
40 against the conductor D, each of which is connected with the generator G by the conductors x and y . G' represents a second generator, with whose poles the conductors C and D are connected by the conductor $y'x'$. The
45 operation is the same as described in Fig. 1,

plus the heating effect produced by the current from generator G.

In Fig. 3 the material M is held in a clamp K, which is connected with one pole of the generator, and the end of said material to be
50 heated is in contact with conductor D, the current in this place passing to said conductor through the material. The operation is the same as in Fig. 1. R represents a resistance-switch interposed in the conductor x to regu-
55 late the current.

In Fig. 4 the material M, held in a clamp K, is brought in contact with the conductor D, held in clamp K'. P represents a converter
60 or transformer whose primary is connected with the poles of a generator G and whose secondary Q and Q' connects with the clamps K K'. R in this figure represents a resistance-switch. S represents a switch by which
65 the conductor y , connected with one pole of the generator, may be connected through said switch and conductor y'' with the conductor C, so that the conductor D may be heated both by the heating-current and by the arc.
70 The arrangement of this figure is intended for use with an alternating current, which is converted by the transformer P from a current of high tension to one of low tension but large quantity.

What I claim as my invention, and desire
75 to secure by Letters Patent, is—

The herein-described method of welding or working metal electrically, consisting in heating the part to be worked by contact with a
80 conductor through which an electric current is passed and simultaneously springing a voltaic arc between said conductor and another conductor in proximity to said point of contact and welding or working the metal when
85 raised to the desired temperature in any desired manner.

CHARLES L. COFFIN.

Witnesses:

GERTRUDE H. ANDERSON,
GEO. H. LOTHROP.