T. E. MURRAY.

APPARATUS FOR ELECTRIC WELDING.

APPLICATION FILED APR. 23, 1915.

1,156,426. Patented Oct. 12, 1915.

2 SHEETS—SHEET 1.

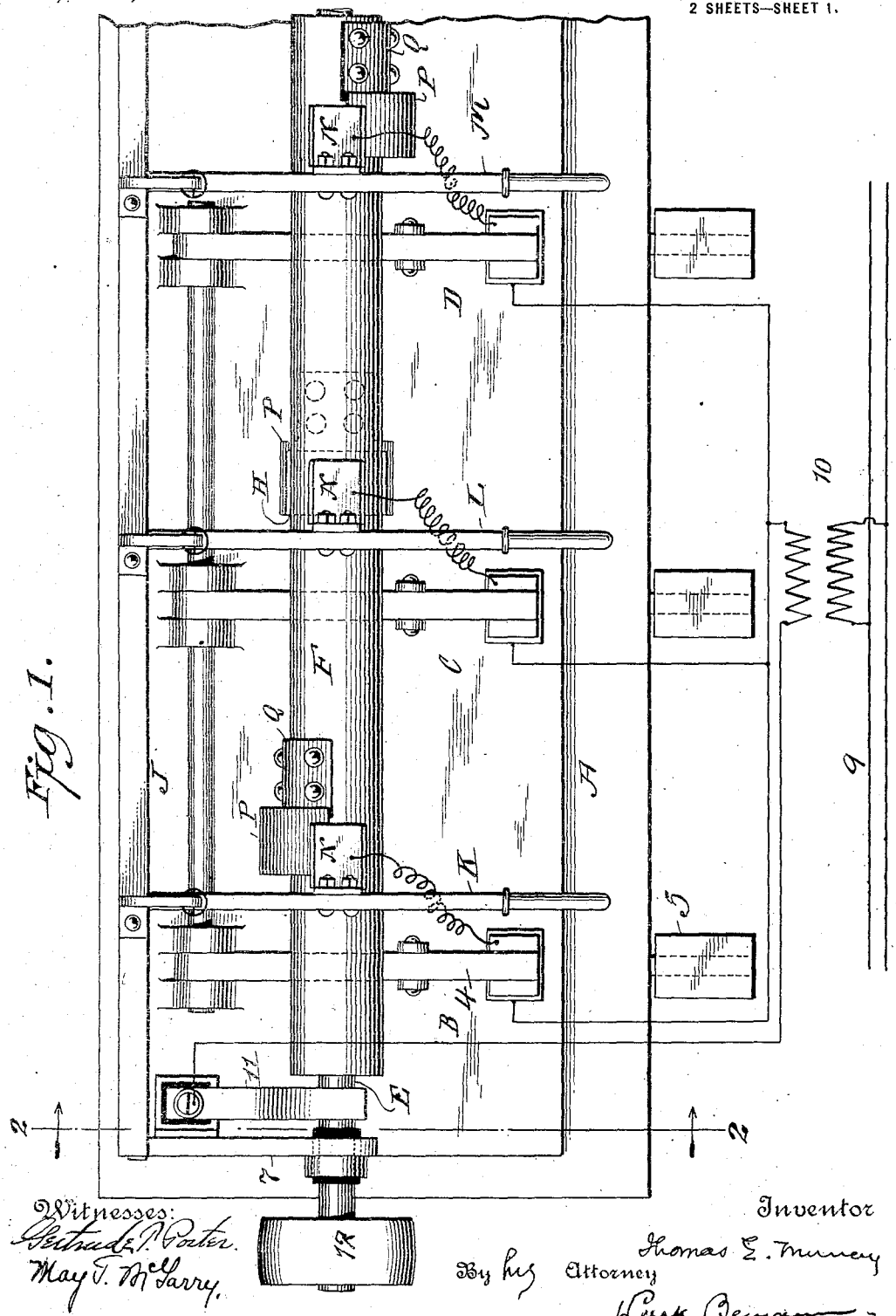


Fig. 1.

Witnesses:
Gertrude T. Porter.
May T. McGarry.

Inventor
Thomas E. Murray
By his Attorney
Frank Benjamin

T. E. MURRAY.

APPARATUS FOR ELECTRIC WELDING.

APPLICATION FILED APR. 23, 1915.

1,156,426.

Patented Oct. 12, 1915.

2 SHEETS—SHEET 2.

Fig. 3.

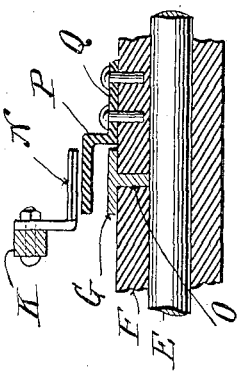
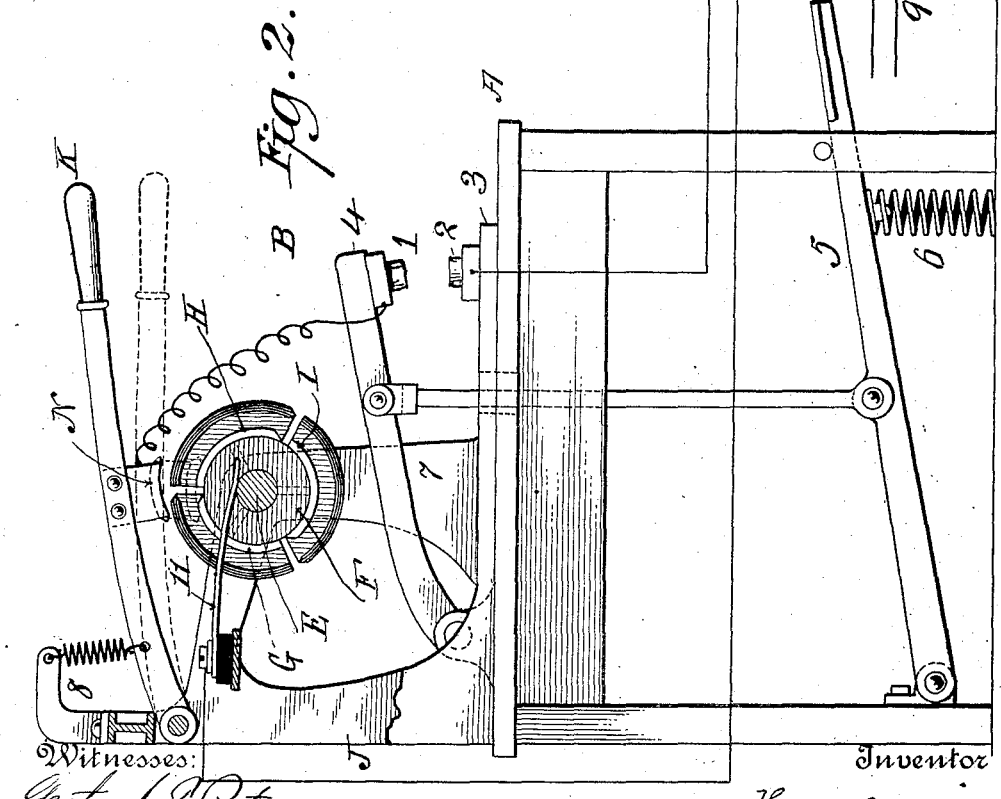


Fig. 2.



Witnesses:
Gertrude T. Porter.
May T. McHarry.

Inventor
Thomas E. Murray
By his Attorney
Paul Benjamin

UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF NEW YORK, N. Y.

APPARATUS FOR ELECTRIC WELDING.

1,156,426. Specification of Letters Patent. Patented Oct. 12, 1915.

Application filed April 23, 1915. Serial No. 23,264.

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 relates to electric welding, and consists in an apparatus whereby a plurality of pairs of bodies may be welded together in succession by a mechanically controlled current of predetermined duration.

In the accompanying drawings, Figure 1 is a plan view of my welding apparatus. Fig. 2 is a section on the line 2, 2 of Fig. 1. Fig. 3 is a longitudinal section of a portion of the shaft carrying the circuit-closing contacts, one of said contacts, the guard therefor and the movable contact controlled by the operator.

Similar numbers and letters of reference indicate like parts.

Upon the table A is placed a succession of devices for holding and bringing into welding contact the bodies to be united. Three of said devices are here shown generally at B, C, D, so that at each device there is a welding station and an operator. The bodies to be united, indicated at 1, 2, are respectively secured in a fixed holder or support 3 and a pivoted arm 4. The arm 4 is connected to a foot treadle 5, by which it may be moved downwardly to carry the body 1 into contact with body 2. A helical spring 6 acting on the treadle 5 normally holds arm 4 in raised position.

Journaled at its ends in brackets 7 on table A is a horizontal shaft E provided with a sleeve F of insulating material. On this sleeve are secured as many contact plates G, H, I as there are welding stations. These plates are placed in proximity to the devices B, C, D and are disposed on the shaft in successive order circumferentially. That is to say, assuming there are three plates G, H, I, as here shown, they are respectively disposed in the three different 120° sectors which together make up the entire circumference.

On the table A is a standard J, to which are pivoted the hand levers K, L, M. Each lever carries an arc-shaped contact plate N. Helical springs connected to said levers and to brackets 8 on standard J normally hold the levers K, L, M in raised position, but when either of said levers K, L or M is moved downward, its contact plate N cooperates with one of the contact plates G, H, I on sleeve F. Each contact plate G, H, I has a web or arm O, Fig. 3, integral with it which extends through sleeve F and makes electrical connection with shaft E. The shaft E is rotated by power applied to the belt pulley 12.

The electrical connections are as follows. The main leads 9 are connected to the primary of the single transformer 10. One terminal of the secondary of said transformer is connected to a spring contact finger 11 which bears on an exposed portion of shaft E, from which the current passes to the several fixed contact plates G, H, I, thence to the plates N on hand levers K, L, M, to the devices B, C, D and joints to be welded, and so back to the other transformer terminal.

It will be obvious that the pairs of bodies to be welded are in parallel circuits, each of which circuits includes the associated contacts respectively formed by plates G, H or I with a plate N; also that but one plate N at a time can be moved into coöperative position with its associated contact G, H, I. Hence as shaft E rotates, the plates G, H, I come into successive coöperation with the plates N on the hand levers K, L, M, and the welding current accordingly is delivered to the devices B, C, D in succession: so that the bodies in device B are first welded, then the bodies in device C and then the bodies in device D, then the bodies in device B again, and so on. As already stated, the number of welding devices B, C, D may be as desired, but preferably it should be such that time is afforded for the operator at any given device, as B, to adjust his pair of bodies to be welded in their holders and move said bodies into contact during the period that the other devices, as C, D, are effecting the welding of the bodies contained in them: so that when his particular contact plate G, H or I comes into position to deliver current at his welding station, his pair of bodies there located will be ready to receive it. In this way, the work goes on continuously, with the greatest economy of time.

With the shaft E rotating at a constant rate of speed, the duration of the welding current will, of course, depend upon the lengths of the contacts G, H, I measured circumferentially around the sleeve F. If these lengths be equal, then at every welding station the duration of the current will be the same. If they be made unequal, the time period of the welding current may be greater or less at any given station.

While it is possible for each operator in turn to move down his hand lever when his contact plate, say G, comes into proper position to coöperate with plate N on said lever, in practice this is difficult to do accurately, and therefore I prefer to construct the device so that the operator cannot himself move his plate N into direct contact with plate G, but can only bring his plate N into contact with the portion of the shaft E not covered by said plate G: so that the actual contact is established by the rotation of the shaft causing plate G to run under plate N. To this end I provide over every plate G, H, I a guard P of insulating material, having a flange Q by which it is secured to sleeve F. Obviously, this guard which completely shields its associated plate G, H or I, prevents the operator from moving his plate N directly into contact with its coöperating plate on sleeve F. But as the shaft E rotates with the plate N held against its periphery, said guard runs over said plate N which then makes contact with plate G, H or I beneath guard P and while in the space between said guard and said plate.

I claim:

1. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a source of welding current, means for switching the whole current from said source into each of said contacting devices and automatically operating means for determining successive time periods during which said switching means may be closed.

2. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a source of welding current, means at each contacting device for switching the whole current from said source into said contacting device, and automatically operating means for determining successive time periods during which said switching means may be closed.

3. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a source of welding current connected in parallel to said devices, and means in each branch circuit for switching the whole current from said source into each of said contacting devices and automatically operating means for determining successive time periods during which said switching means may be closed.

4. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a source of alternating current, a transformer, a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded connected in the secondary circuit of said transformer, and means for closing said secondary circuit to each of said contacting devices and automatically operating means for determining successive time periods during which said circuit-closing means may be operated.

5. An apparatus for electric welding, comprising, at successive stations, a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, means at each station and actuated by an operator at said station for controlling said contacting devices, means for closing circuit through said pairs of bodies, and automatically operating means for determining successive time periods during which said circuit-closing means may be operated.

6. An apparatus for electric welding, comprising a plurality of separately actuated devices for contacting the members of a plurality of pairs of bodies to be welded and operatively related to a circuit to be controlled, means for operating said contacts, and means for securing a certain time interval between the operation of the successive contacts without interfering with the free operation of the individual contacts.

7. An apparatus for electric welding, comprising, at successive stations, a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, and means for closing circuit through the members of each of said pairs successively and for a predetermined time period: the said means for moving said members into contact and the said circuit-closing means at each station being independently operable by an operator at said station.

8. An apparatus for electric welding, comprising a rotary shaft and, in parallel circuit and at successive stations, a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, contacts on said shaft, and contacts respectively coöperating with said shaft contacts: the said means for moving said bodies into welding contact and the said means for closing circuit at said shaft contacts at each station being independently operable by an operator at said station.

9. An apparatus for electric welding, comprising a rotary shaft and, in parallel circuit and at successive stations, a plurality of devices for contacting the members of a

plurality of pairs of bodies to be welded, contacts on said shaft, and contacts movable into proximity to said shaft at a point distant from said shaft contacts and coöperating with said shaft contacts when by the rotation of said shaft circuit is established between them and said shaft contacts: the said means for moving said bodies into welding contact and the said means for moving said contacts into proximity to said shaft being independently operable at each station by an operator at said station.

10. An apparatus for electric welding, comprising a rotary shaft and, in parallel circuit and at successive stations, a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, contacts on said shaft, contacts, each movable into proximity to said shaft at a point distant from said shaft contacts and cooperating with said shaft contacts when by the rotation of said shaft circuit is established between them and said shaft contacts, and a guard on said shaft covering each shaft contact but separated therefrom by a clearance sufficient to permit passage beneath it of said movable contact: the said means for moving said contacts into proximity to said shaft being independently operable at each station by an operator at said station.

11. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a rotary shaft, contacts thereon, a plurality of pivoted levers, and contacts on said levers respectively cooperating with said shaft contacts: the said shaft contacts coöperating with said lever contacts successively to close circuit through said pairs.

12. An apparatus for electric welding, comprising a plurality of devices for contacting the members of a plurality of pairs of bodies to be welded, a rotary shaft, contacts thereon, a plurality of pivoted levers, contacts on said levers respectively coöperating with said shaft contacts, and guard plates laterally supported on said shaft and covering said shaft contacts, there being a clearance between the said guard plates and said shaft contacts for the passage of said lever contacts, and the said shaft contacts coöperating with said lever contacts during said passage successively to close circuit through said pairs.

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

THOMAS E. MURRAY.

Witnesses:

GERTRUDE P. PORTER,

MAY T. MCGARRY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."