J. C. SWANSON, C. A. LINDEN & C. A. CARLSON.

ELECTRIC WELDING MACHINE.

APPLICATION FILED FEB. 10, 1913.

1,079,073. Patented Nov. 18, 1913.

2 SHEETS—SHEET 1.

Fig 1

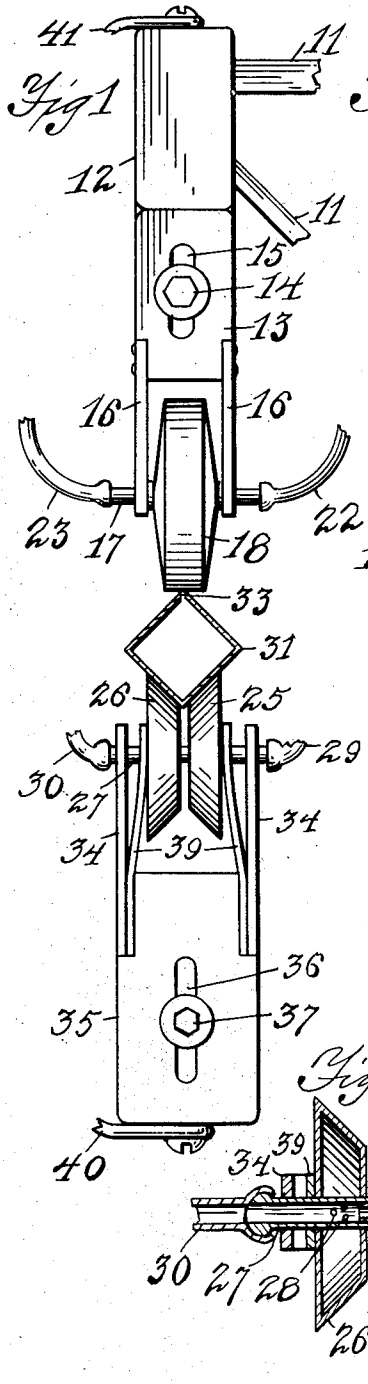


Fig 2

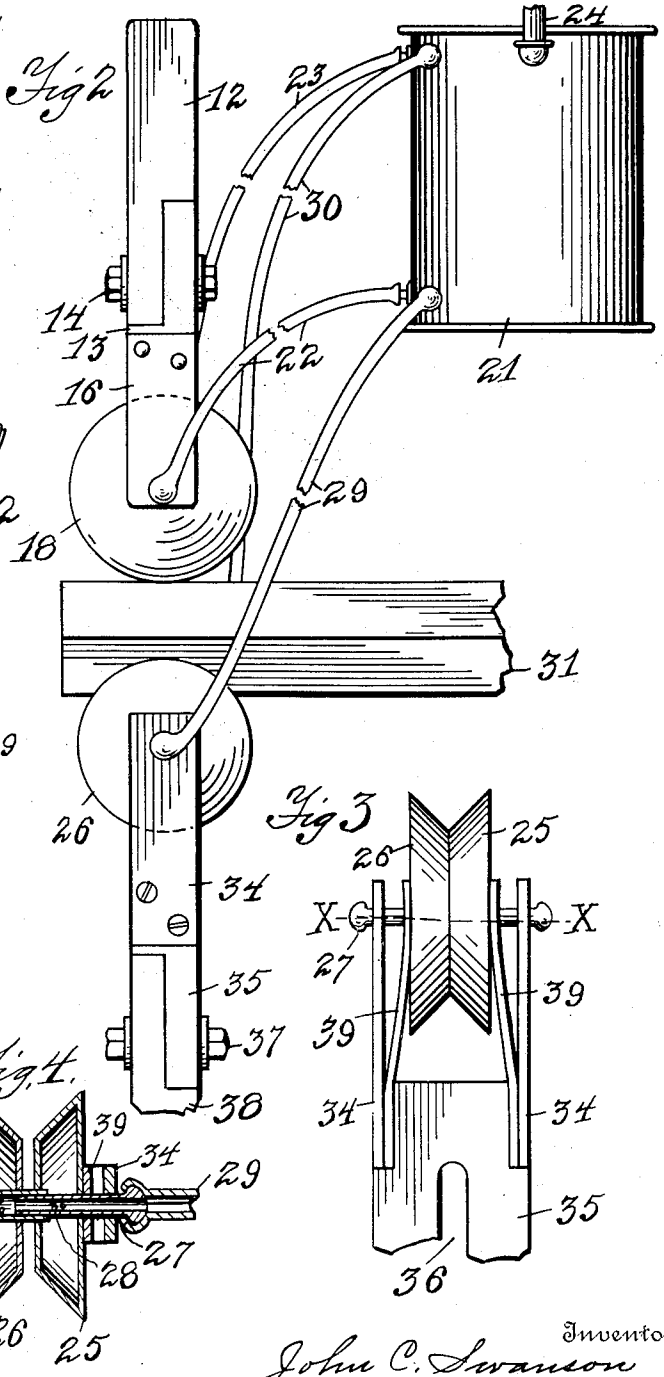


Fig 3

Fig 4.

Witnesses

Arthur C. Morse

H. A. Sandberg

Inventors

John C. Swanson

Charles A Linden

Carl Alvin Carlson

By J. Arthur Baldwin.

Attorney

J. C. SWANSON, C. A. LINDEN & C. A. CARLSON.

ELECTRIC WELDING MACHINE.

APPLICATION FILED FEB. 10, 1913.

1,079,073.

Patented Nov. 18, 1913.

2 SHEETS—SHEET 2.

Fig. 5

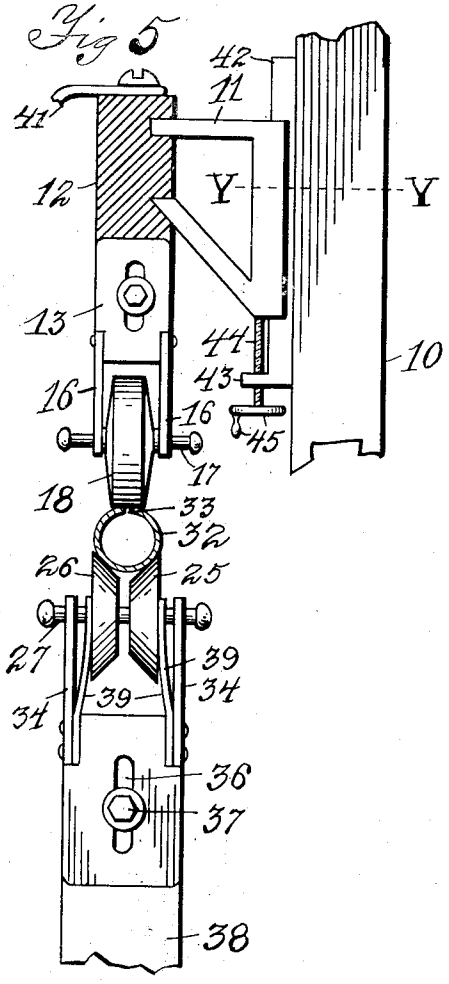


Fig. 7.

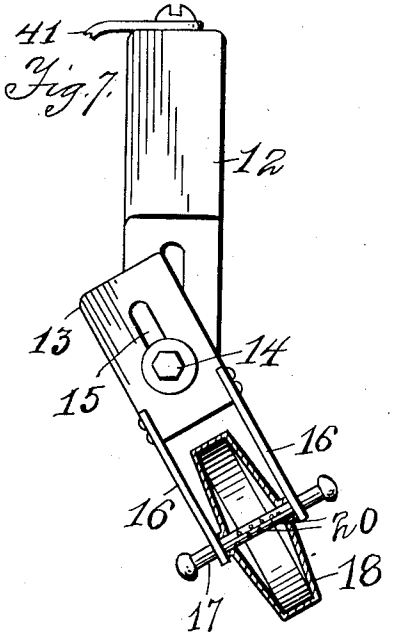


Fig. 8.

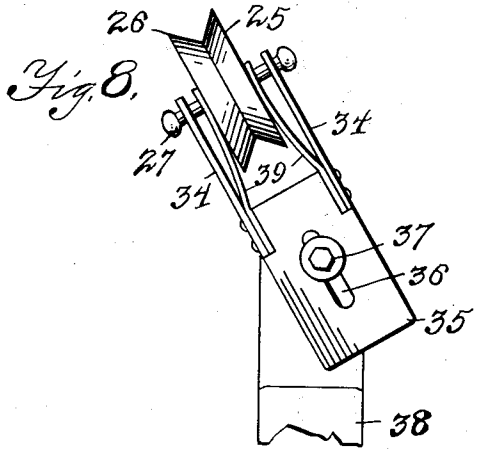


Fig. 6.

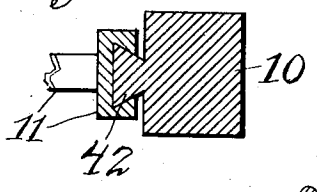
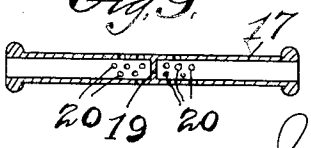


Fig. 9.



Witnesses

Arthur O. Morse

H. A. Sandberg

Inventors

John C. Swanson

Charles A. Linden

Carl Alvin Carlson

By S. Arthur Baldwin.

Attorney

UNITED STATES PATENT OFFICE.

JOHN C. SWANSON, CHARLES A. LINDEN, AND CARL ALVIN CARLSON, OF JAMESTOWN, NEW YORK.

ELECTRIC WELDING-MACHINE.

1,079,073. Specification of Letters Patent. Patented Nov. 18, 1913.

Application filed February 10, 1913. Serial No. 747,241.

To all whom it may concern:

Be it known that we, JOHN C. SWANSON, CHARLES A. LINDEN, and CARL ALVIN CARLSON, citizens of the United States, residing at the city of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Electric Welding-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to machines for welding by electricity, and the object of our improvement is to provide a welding machine having wheel electrodes through which the electric current may be passed without over-heating said wheel electrodes; also to provide a two-part wheel electrode to be used in combination with a wheel electrode in passing the current to the joint to be welded; and the invention consists in the construction and combination of the parts as shown in this specification and the accompanying drawings and pointed out in the claims.

In the drawings, Figure 1 is an elevation of the upper and under wheel electrodes and their supporting parts with a square tube therebetween which is supported by the lower divided wheel electrode, the fluid connection to the hollow wheel electrodes being also shown; and Fig. 2 is a side elevation of the same showing the tank for the water or other fluid used in cooling the wheel electrodes and the connection to the same. Fig. 3 is an elevation of the divided wheel electrode in the closed position, that is, when not sprung apart in clamping some object; and Fig. 4 is a sectional view of the same at line X X in Fig. 3, showing the arrangement of the parts. Fig. 5 is a side elevation of the upper and lower wheel electrodes and showing the manner of adjusting the same; and Fig. 6 is a sectional view at line Y Y in Fig. 5, showing the dovetail shaped track support for the supporting bracket upon which it is slidably mounted. Fig. 7 is an elevation of the undivided hollow wheel electrode with the wheel in section, showing the same tipped to one side to permit the expulsion of the air from said wheel in filling it with the cooling liquid under pressure; and Fig. 8 is a similar view of the divided electrode, the wheels not being shown in section. Fig. 9 is a sectional view of the tubular journal for the single or undivided wheel electrode, showing the partition therein and the holes for the liquid to pass out of and into said tube.

Like numerals of reference refer to the corresponding parts in the several views.

The numeral 10 designates the supporting standard for the supporting bracket 11 for the heavy copper bar connection 12 to which the plate 13 is pivotally attached at 14 by a suitable screw bolt extending into the bar 12 through the slot 15, the plates 16 supporting the tubular journal 17 upon which the wheel electrode 18 is mounted between the plates 16.

The wheel electrode 18 is hollow, as shown in section in Fig. 7, and the journal 17 is hollow, as shown in section in Fig. 9, and preferably has a division 19 midway of its length within the electrode 18 with small perforations or openings 20 each side of the division 19 so that when the liquid enters the tube 17 under pressure it is forced out of the openings 20 on that side of the division 19 at which it has entered the tube 17 and fills the interior of the hollow electrode 18 and is then forced out through the holes 20 on the opposite side of the division 19 from which it has entered the electrode 18.

A suitable tank 21 is provided for the liquid and the connecting tube 22 through which the liquid enters the tube 17 preferably is attached to the tank 21 near its bottom, while the tube 23 through which the water is forced out from the electrode 18 passes to the upper end of the tank 21 to thereby provide a system of circulation for the fluid. The tank 21 has a suitable supply pipe 24. The tubes 22 and 23 are attached to the tube 17 at each end by ball and socket joints so that said tube 17 can turn freely within the ends of the tubes 22 and 23 without leakage, and thereby permitting the electrode 18 to be fixedly attached to the tube 17 and said tube 17 to turn with the electrode 18. This also allows the tubes 22 and 23 to be flexible and to assume any desirable position so long as they connect the tube 17 to the tank 21. The other electrode, usually the lower as to position, is preferably a divided electrode, that is having two parts 25 and 26 which are beveled or have inclined surfaces toward one another so as to receive therebetween a square or round tube or article to

be welded, as shown in Figs. 1, 2 and 5. The two parts 25 and 26 are made hollow as shown in section in Fig. 4 and have a tubular journal 27 which is preferably made in two parts which shut into or telescope one another thereby permitting the two parts 25 and 26 to move to and from one another without leakage or the uncovering of the holes 28 in the two parts of the tube 27. The ends of the two-part tubular bearing 27 have ball and socket joint connection with the tubes 29 and 30 which connect to the upper and lower ends of the tank 21 the same as tubes 22 and 23. It is apparent by the separation of the two parts 25 and 26 the opposite electric current from that passing through the wheel electrode 18 will pass through each of the two parts 25 and 26 to the opposite sides of the article to be welded, passing through the metal of said article which may be a tube 31 or 32, to the joint 33 to be united by welding.

The two electrodes 25 and 26 on the tubular bearing 27 are supported on connecting plates 34 at each side which connect to a plate 35 which has a slot 36 and screw bolt 37 connection to the connecting bar 38, the same as the connection for wheel electrode 18. A pair of leaf springs 39 are provided inside of plates 34 bearing against the outer, sides of the two parts 25 and 26 to normally press the same together, as shown in Fig. 3, so that when the article, as for example a piece of tubing is pressed in between the two parts 25 and 26, they will clamp and hold the same firmly in position even while said tube is passing over said wheel electrode as in welding a continuous seam on the same.

It is apparent that it would be extremely difficult to force the air out of either the wheel electrode 18 or the parts 25 and 26 by the force of the liquid pressure from the tank 21 if the wheels were in their vertical position, as shown in Figs. 1, 2 and 5. Accordingly the connective plates 13 and 35 are adjustably and pivotally attached to their connective bars so that said wheel electrodes 18 and 25 and 26 may be turned sidewise, as shown in Figs. 7 and 8, thereby permitting the air to pass or be forced out of said wheel electrodes and stopping all pounding from the air and permitting the full force of the cooling fluid to pass into and out of said wheel electrode. As soon as the air has been forced out, which is practically instantaneous, the wheel electrodes are turned back to the vertical position and firmly secured in place. This connection also permits the use of the wheel electrodes at different angles in welding.

The electric current is preferably connected to the blocks 12 and 35 by means of suitable cables 40 and 41. In order to adjust the supporting bracket 11 a suitable track or dovetail shaped rail 42 is provided having a lug 43 extending out therefrom at the lower end with a screw 44 therethrough bearing on the lower end of the bracket 11. A crank wheel 45 is provided on the lower end of the screw 44 to rapidly raise or lower the bracket 11.

We claim as new:

1. In an electric welding machine, a hollow wheel electrode, tubular connection to said wheel electrode admitting liquid to and taking it from said wheel electrode, and means for turning said wheel on its side to expel the air therefrom.

2. In an electric welding machine, a hollow wheel electrode, a tubular journal for said wheel having holes within the hollow thereof, tubular connection to the ends of said tubular journal, connective plates revolubly supporting said tubular journal, and pivotal attachment for said connective plates permitting said wheel electrode to be turned on its side, substantially as and for the purpose specified.

3. In an electric welding machine, a hollow wheel electrode, a tubular journal for said wheel electrode having holes admitting liquid to the interior of said wheel, and connecting tubes attached to each end of said tubular journal by ball and socket joints to permit the free rotation and inclination of said tubular journal.

4. In an electric welding machine, a wheel electrode consisting of two hollow parts, tubular journals for said hollow parts having holes through the sides of said tubular journals to admit liquid under pressure to the interior of said hollow parts, suitable electric connection to said parts of said wheel electrode, suitable tubular connection to said tubular journal, and means for moving said hollow parts to and from one another.

5. In an electric welding machine, a hollow wheel electrode composed of two parts, a telescoping tubular journal in two parts for the two parts of the hollow wheel electrode, said parts of said journal having openings therethrough to admit liquid under pressure to the interior of both of said parts of said hollow electrode, tubular connection to the parts of said tubular journal, electric connection to said hollow wheel electrode, and resilient pressure on the exterior of said hollow parts of said wheel electrode to press said parts normally toward one another, substantially as and for the purpose specified.

6. An electric welding machine comprising an upper hollow electrode, tubular connection to said hollow electrode permitting the passage of liquid under force therethrough, an under hollow wheel electrode in two parts resiliently pressed toward one another to permit separation under pressure, tubular connection to both of said hollow parts of said under electrode permitting the

passing of liquid under force therethrough, the peripheries of said parts inclined toward one another to hold and press an article against said upper electrode, substantially as and for the purpose specified.

7. In an electric welding machine, a hollow wheel electrode, a tubular journal for said wheel electrode having holes to pass liquid under force through said wheel electrode, suitable tubular connection to the ends of said tubular journal allowing the rotation of said wheel electrode, connective plates revolubly supporting said tubular journal each side of said wheel electrode, said connective plates attached to each side of a slotted plate, said slotted plates pivotally connected to a connective bar, a bracket attached to said connective bar, a suitable track for said bracket to hold the same in line, and a crank and screw adjustment for said bracket, substantially as and for the purpose specified.

In testimony whereof we have affixed our signatures in the presence of two witnesses.

JOHN C. SWANSON.
CHARLES A. LINDEN.
CARL ALVIN CARLSON.

Witnesses:
H. A. SANDBERG,
ARTHUR O. MORSE.