

J. A. HEANY.
 TIMER FOR ELECTRIC WELDING MACHINES.
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1,050,827.

Patented Jan. 21, 1913

Fig. 1.

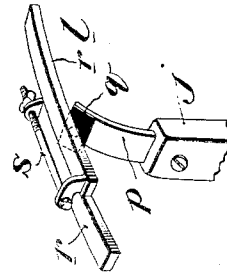
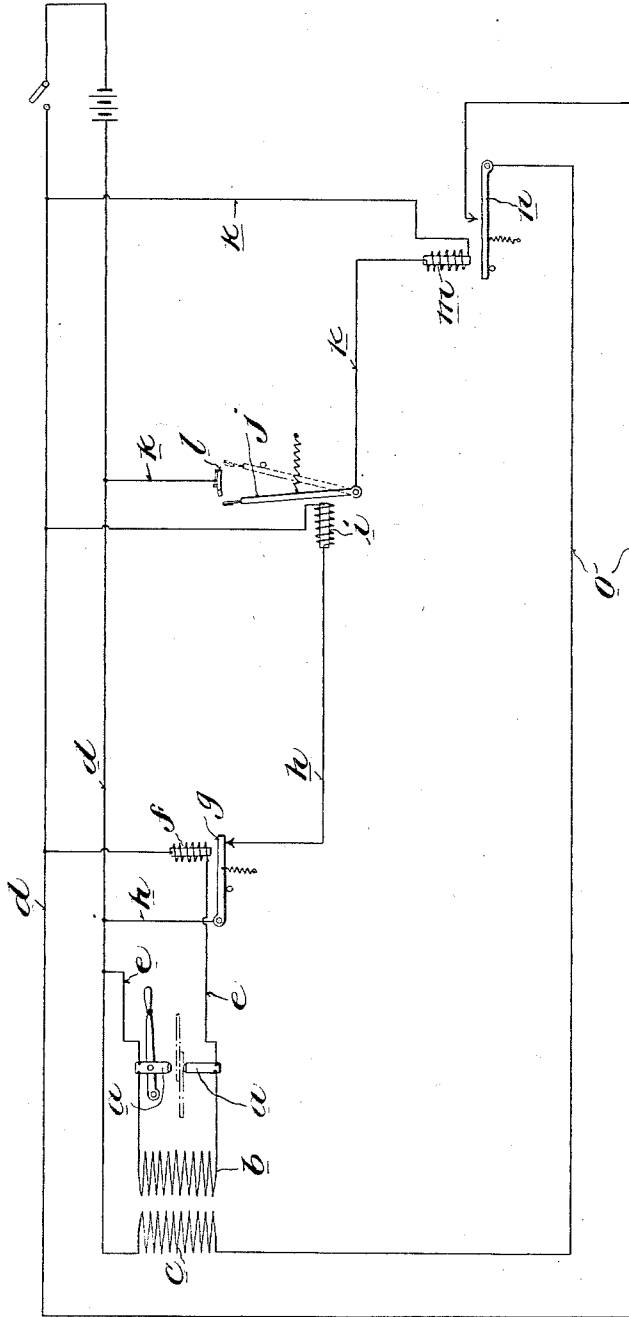


Fig. 2.

Witnesses

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TIMER FOR ELECTRIC WELDING-MACHINES.

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To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in Timers for Electric Welding-Machines, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 represents, in diagram, one system or arrangement for carrying out my invention; and Fig. 2 is a perspective view showing one form of adjustable timing contact.

The object of this invention is to provide simple means for automatically stopping the welding action after it has been started by manually bringing the electrodes together upon the work or the parts of the work together, according to the kind of welding machine the invention is applied to, the means employed for thus stopping the welding action being so constructed that the welding action may be allowed to continue any predetermined length of time within the limits of the apparatus, this length of time being adjusted to the particular character of work the machine is adapted for performing. In this way I eliminate entirely the personal judgment of the operator and thus save greatly in the loss of time and consequently materially increase the speed of the machine.

My invention enables the time during which the welding action continues to be reduced to a point much below that which is humanly possible even though the operator should stop the welding action as quickly as possible after commencing, whereby I am enabled to avoid large heat loss.

My invention further prevents loss resulting from burning at the electrodes.

I have illustrated in the accompanying drawing one manner of carrying out my invention but it will be understood that the spirit of the invention is much broader than the particular construction and arrangement shown and that therefore I may depart therefrom to a large degree without departing from the scope of the claims appended hereto.

In the drawing, *a* designates the two electrodes of a well known type of electric weld-

ing machine; *b* the secondary or low tension side of the usual transformer connected to said electrodes; *c* the primary or high tension side of the transformer. The electrodes and the low tension side *b* are connected to the conductors *d* of the line circuit (which line circuit is of course connected to the usual source of electric energy) by a circuit *e* in which is included a relay *f* whose armature *g* is included in a second relay circuit *h*, this armature *g* being adjusted to normally close the circuit *h*. This relay circuit *h* is connected to the line circuits in the same manner as the relay circuit *e* and included in it is a relay *i*, whose armature *j* is included in a third relay circuit *k* also connected to the line circuit. In one branch of this circuit *k* is included a relay *m* whose armature *n* forms part of the primary or high tension circuit *o*. This armature *n* is adjusted to normally hold this circuit *o* open. In the other branch of the circuit *k* is a contact plate *l* which is so placed that when the armature *j* is released by demagnetization of the relay *i* said armature *j* will swing across the face of said plate *l* and make contact therewith the full length of the plate.

When no current is flowing through the line circuit and the electrodes *a* are separated or adjusted to inactive position, the armature *g* normally closes circuit *h*, armature *j* is normally pulled over to a position beyond and out of contact with plate *l*, and armature *n* is pulled down to normally keep circuit *o* open at that point. When the switch in the line circuit is closed to put the machine in readiness for operation armature *g* remains in its closed position since the inductance in the low tension coil *b* is sufficient to prevent sufficient current passing through relay *f* to actuate said armature, but armature *j* will be attracted to its relay magnet and thus hold circuit *k* open between contact plate *l* and said armature *j*. When armature *j* is thus attracted to its magnet it will contact with plate *l* during its passage over the face thereof and the armature *n* will thus be attracted to the magnet of relay *m* and close circuit *o* of the high tension side of the transformer, but this temporary closing of this circuit *o* cannot produce any derangement of the apparatus, especially in

view of the fact that the operator has not yet brought the electrodes *a* into operative position.

The apparatus will now be in position for a welding operation. After the work is adjusted and the operator moves the electrodes into welding position, the current in the relay circuit *e* will be shunted through the electrodes and the work therebetween and thus cut out the low tension coils *b* of the transformer, whereupon a sufficient electro motor force will be caused to pass through relay *f* to actuate its armature *g* and thus break circuit *h* and release armature *j*. This armature *j* will thereupon sweep across the face of contact plate *l* and come to rest beyond it. During the time the armature *j* is in contact with plate *l* the armature *n* will be attracted by its magnet in relay *m* and thus close circuit *o*, and the closing of this circuit *o* sends the alternating line current through the high tension side of the transformer and thus induces electro motive force in the secondary or low tension side *b*. It will thus be seen that the welding action continues only so long as the armature *j* is in actual contact with the contact plate *l*, since the instant the armature *j* passes off the contact plate *l* the high tension circuit *o* will be broken at *n* and the welding action will cease. Since therefore the time of contact between armature *j* and plate *l* determines the length of time during which the welding action continues, it will be obvious that by varying the proportions of the parts *j* and *l* the time of welding may be greatly varied and even reduced to the utmost minimum. This variation can be perhaps most easily accomplished by varying the length of the plate *l*.

It will be obvious from the foregoing that the timing devices may be greatly varied without departing from the spirit of my invention. In Fig. 2 the timing contact *l* is shown constructed of a pair of bars arranged side by side and rendered adjustable by the use of a threaded bolt *s* connecting lugs at the opposite ends of said bars, whereby the length of the contact may be varied. In this figure is also shown one way in which upon the return stroke of the timing lever *j* I may avoid closing the circuits *h* and *o*; I do this by providing the upper end of the lever *j* with a spring *p* whose upper end wipes the under side of contact *l* as the lever *j* swings back and forth, and on one side of the end of this spring *p* I fasten a block *q* of insulation material, whereby when the lever is attracted by the core of the magnet the insulation *q* will prevent the contact spring *p* from coming in contact with the contact plate *l*.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is—

1. In combination with an electric welding machine embodying a transformer and electrodes, of means automatically operative from the line circuit for stopping the welding action at a predetermined time.

2. In combination with an electric welding machine, of electrically controlled means for determining the length of time during which the welding action continues.

3. In combination with an electric welding machine, of electrically controlled means for determining the length of time during which the welding action continues, said means embodying a pair of contacts one of which is adjustable as to length of contacting surface.

4. In combination with an electric welding machine, of electrical means for stopping the welding action at a predetermined time after the welding action has been started manually, said means embodying a relay circuit connected to the line circuit.

5. In combination with an electric welding machine, of electrical means for stopping the welding action at a predetermined time after the welding action has been started manually, said means embodying a plurality of relay circuits connected to the line circuit.

6. In combination with an electric welding machine, of electrical means for stopping the welding action at a predetermined time after the welding action has been started manually, said means embodying a plurality of relay circuits connected to the line circuit, one of these relay circuits embodying means for automatically closing and opening the high tension circuit of the transformer after the electrodes of the machine are brought into action.

7. In combination with an electric welding machine embodying a line circuit and transformer and welding electrodes, of a relay circuit connecting the line circuit to the electrodes and the low tension side of the transformer, and means whereby when the electrodes are brought into action to commence the welding operation the high tension circuit will be closed and held closed an appreciable length of time and then automatically opened.

8. The combination with an electric welding machine embodying a transformer and electrodes, of electrical means for determining the length of time during which the welding action continues, said means co-operating with the transformer.

9. In combination with an electric welding machine, of means for electrically controlling the time during which the welding action continues, embodying means where-

by the act of mechanically bringing the electrodes into operative position both starts and stops the electric welding action.

5 10. In combination with an electric welding machine, of electrical means for stopping the welding action at a predetermined time after the welding action has been started manually, said means embodying a relay circuit.

10 11. In combination with an electric welding machine, of electrical means for stop-

ping the welding action at a predetermined time after the welding action has been started manually, said means embodying a plurality of relay circuits.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOHN ALLEN HEANY.

Witnesses:

FRED. B. McLAREN,
B. I. BRIDGES.