J. A. HEANY.

TIMING APPARATUS FOR ELECTRIC WELDERS.

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1,183,196. Patented May 16, 1916.

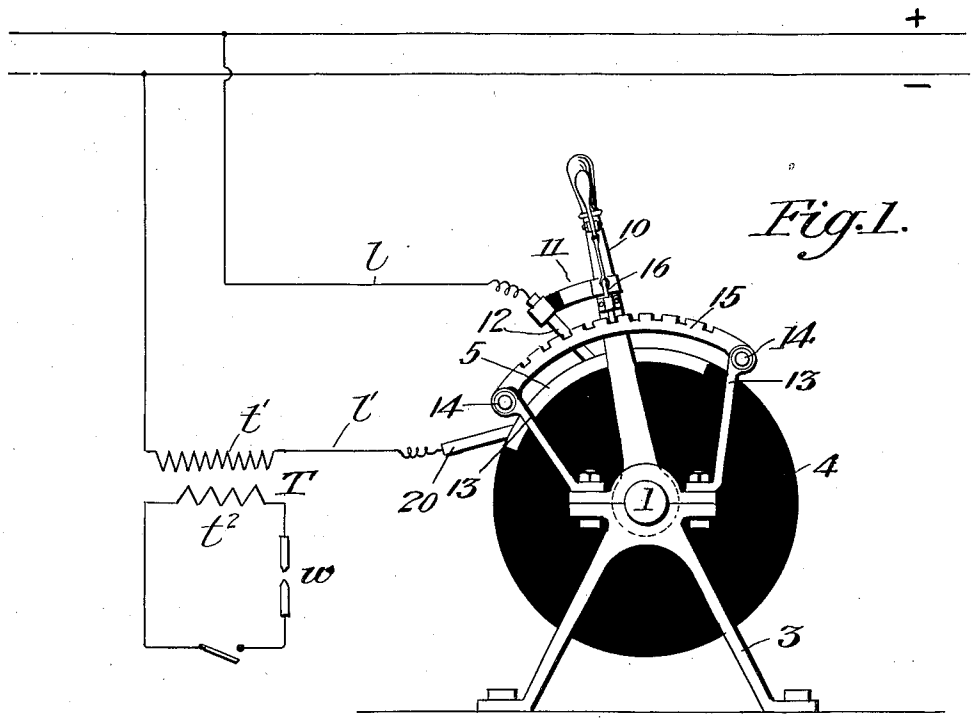


Fig. 1.

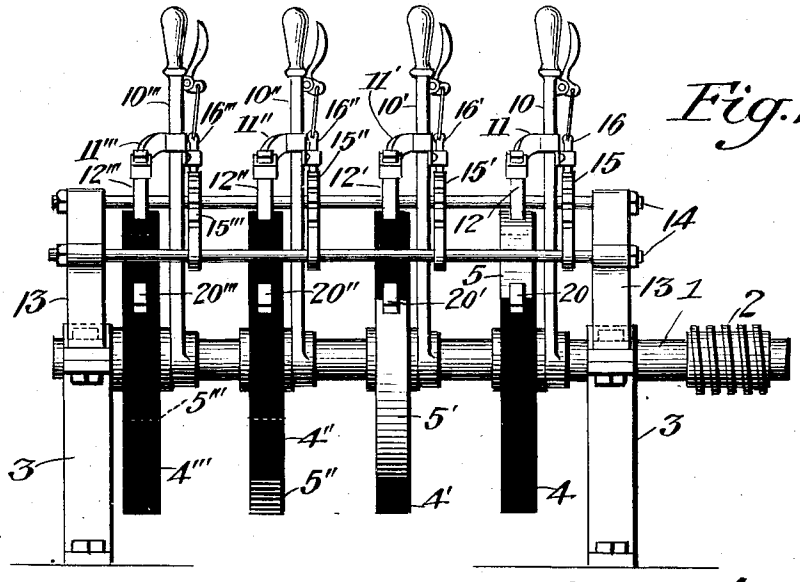


Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

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TIMING APPARATUS FOR ELECTRIC WELDERS.

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Application filed March 2, 1914. Serial No. 822,103.

To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, residing in the city of Washington, District of Columbia, have invented certain new and useful Improvements in Timing Apparatus for Electric Welders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to timing mechanism for a plurality of electric welders and has for its object to provide a simple and efficient apparatus whereby the period of current flow to all or any of the welders may be accurately regulated, and by means of which the current may be distributed to the welders successively so as to avoid excessive loads on the line and on the generating plant, which would ensue if a number of welding machines were operated simultaneously.

The invention is illustrated in the accompanying drawings, in which,

Figure 1 is an end elevation of a simple form of apparatus involving the invention. Fig. 2 is a side elevation of the same.

In order to avoid needless multiplication of circuits and machine parts, the apparatus is illustrated as applied to a plant employing four welding machines, which may be operated under the same time intervals of current flow or which may be individually operated with widely varying time periods. In each case, however, the apparatus is designed to close the circuits to the welders successively so that no two welders or groups of welders receive current at the same time.

Referring to the drawings, 1 indicates a shaft journaled in bearing brackets 3 and rotated by means of a worm 2, which is driven at any desired rate of speed by a worm wheel, not shown. Fixed to the shaft 1 is a series of disks 4, 4′, 4″, 4‴, preferably made of insulating material, and each having on its peripheral edge a segment of conducting material 5, 5′, etc., preferably of copper or other good metallic conductor. The disks are so secured to the shaft that the respective conductor segments 5, 5′, etc., are preferably spaced or angularly displaced in successive order so that the segments pass into and out of engagement with coöperating brushes, successively. For example, when segment 5 passes out of engagement with its engaging brushes, segment 5′ is ready to pass into engagement with its corresponding brushes and after said segment 5 passes from under its brushes, segment 5″ is passing into engagement with its brushes and so on.

Secured in coöperative relation to the peripheral edges of the disks 4, 4′, etc., are a series of stationary brushes 20, 20′, 20″, etc., and also a series of peripherally adjustable brushes 12, 12′, 12″, etc., each of said adjustable brushes being carried in a suitable holder 11, 11′, etc., and each of said holders is attached to a handle 10, 10′, etc., mounted on the shaft 1 adjacent the corresponding disks 4, 4′, etc. Each handle 10 and its corresponding adjustable brush 12 is locked in the desired adjusted position by means of a latch such as 16 controlled by a hand piece and coöperating with a segmental rack as 15, which is carried by longitudinal bars 14, mounted in brackets 13 disposed at each end of the machine and bolted to the journal brackets 3, as indicated. The handles 10, 10′, etc., are each separately adjustable so that each brush, such as 12, can be adjusted toward and from its coöperating brush, such as 20, and thereby vary the period of time during which current will flow from brush to brush through the coöperating segment, such as 5. By adjusting brush 12, for example, toward its coöperating brush 20, it will be apparent that the period of time of current flow from brush 12 to brush 20 through segment 5, while the latter is in engagement with both brushes will be increased, and similarly by adjusting said brush 12 away from brush 20, the time period of current flow will be decreased. If for example, the brush 12 is so adjusted that the distance between the same and brush 20 is practically the length of the segment 5, it will be apparent that the closure of the circuit by way of leads l and l', from the mains, will be exceedingly brief and may be made practically momentary. Furthermore, if the brushes be brought quite close together, it will be seen that the circuit from and to the mains by way of leads l, l' may be closed through the brushes and the segment 5 for practically the entire time required for said segment to pass completely under the brushes. It will thus be seen that the range of adjustment is such that the period of current flow controlled by each of the disks 4, 4′, etc., may be varied within

wide limits sufficient to include the effective operating periods of any standard welding apparatus.

To each of the brushes 12, 12′, etc., there is connected a lead such as l connecting the same with one side of a supply line, and to each of the brushes 20, 20′, etc., there is connected a lead l' which passes by way of the primary t' of the transformer of a welding machine to the other side of the supply circuit. In Fig. 1, there is shown in diagram circuit connections between one of the timing elements and a single welding machine w, of which t indicates the primary and t^2 the secondary of said transformer. Obviously, said welder may be of any standard or desired type which is adapted to be operated periodically to effect successive welds. It will be understood that each set of brushes is similarly connected to the respective mains and through the primary of an individual welder transformer.

In operating the apparatus as described, the shaft 1 is driven at a predetermined regular speed which causes the disks 4 to rotate and bring the conductor segments 5 under the coöperating brushes 12, 20 successively, as hereinbefore explained, so that current is supplied to the welding machines successively and intermittently. For example, as illustrated in Figs. 1 and 2, current is being supplied by segment 5 to its associated welding machine and the current so supplied will be interrupted as soon as the lower edge of segment 5 passes out of engagement with brush 20. Shortly thereafter segment 5′ passes into engagement with brushes 20′ and 12′ respectively, thereby closing the circuit to the second welder in the series. This operation is repeated with the succeeding circuit closing devices including segments 5″, brushes 20″ and 12″, and segment 5‴, brushes 20‴ and 12‴, so that circuits of the individual welding machines are closed successively and separately, and no two welding machines or, at least, no two groups of welding machines receive current at the same time. The operations just described are cyclical and enable each welding machine or group of welding machines to be operated in regular predetermined order and at regular intervals.

As hereinbefore indicated, each of the brushes 12 can be adjusted toward and from each coöperating brush 20 by the handle 10 and locked in the desired adjusted position by means of the latch 16 engaging the notched sector bar 15 coöperating therewith. By adjusting the individual brushes 12, 12′, etc., toward or from their coöperating brushes 20, 20′, etc., the periods of time during which the circuit from the mains will be closed to the individual welders, can be accurately and absolutely fixed, so that all of the welders may operate under the same time interval of current flow, or each welder or group of welders may be operated during separate and different periods of current flow.

It will be understood, of course, that the particular form of the apparatus illustrated is merely exemplary, and that therefore the timing apparatus may be varied widely as to its construction and relative arrangement of parts without departing from the substantive invention.

What I claim is:—

1. The combination with a plurality of electric welding machines, of a plurality of timing mechanisms, one for each machine, each timing mechanism comprising a rotary device having peripherally spaced conductor segments, relatively movable brushes coöperating with each segment to vary the period of current flow in the respective segments, and circuits connecting each set of brushes with a welding machine, said timing mechanisms being so arranged as to distribute current to the welding machines successively and non-concurrently.

2. The combination with a plurality of electric welding machines, of a plurality of timing mechanisms, one for each machine, each timing mechanism comprising a rotary device having axially and peripherally spaced conductor segments thereon, a pair of brushes coöperating with each segment, means to adjust the brushes of each pair toward and from each other to vary the period of current flow in the respective segments, and circuits connecting each pair of brushes with a welding mechanism, said timing mechanisms being so arranged as to distribute current to the welding machines successively and non-concurrently.

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

JOHN ALLEN HEANY.

Witnesses:
FRED. B. MACLAREN,
GUY WEBSTER.