S. S. EVELAND.

ELECTRIC RIVETER.

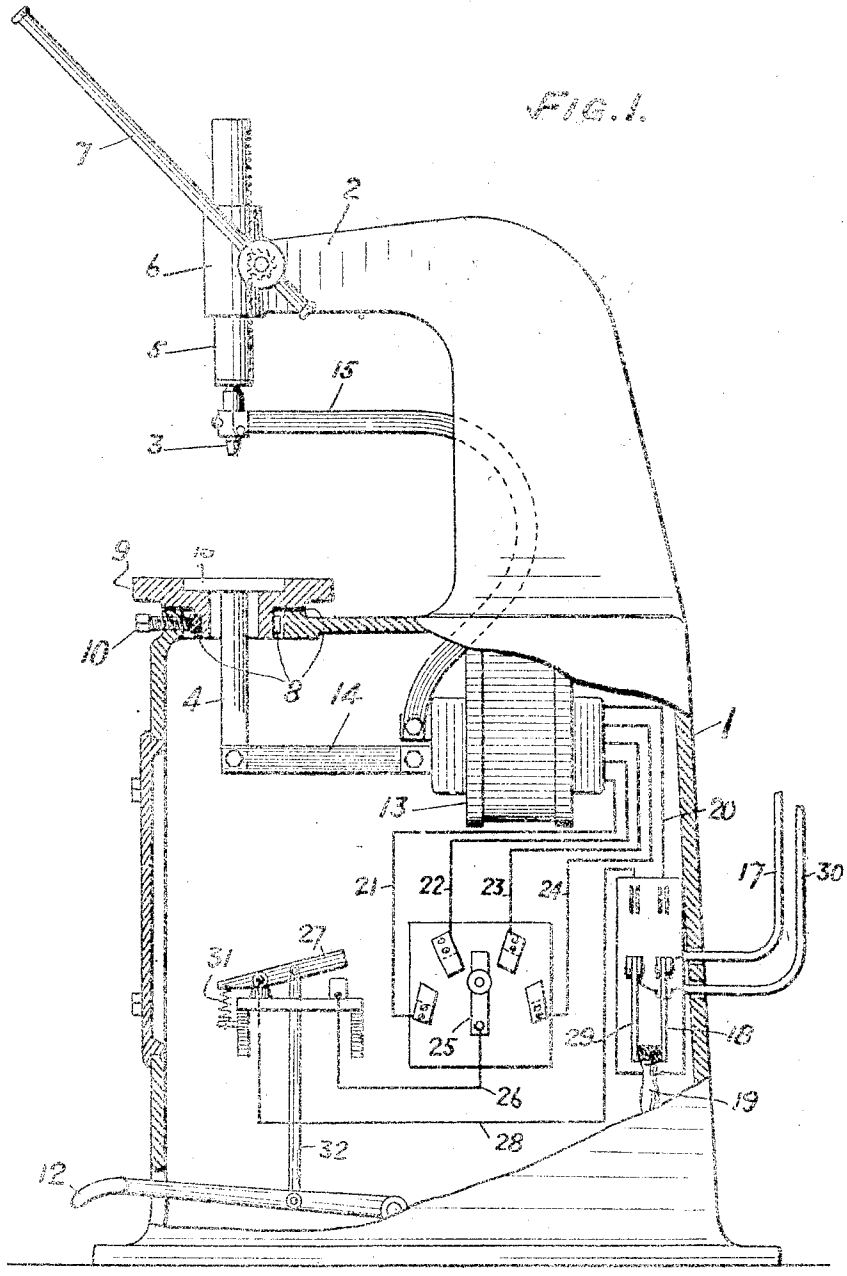
APPLICATION FILED APR. 4, 1913.

1,164,634.

Patented Dec. 21, 1915.

3 SHEETS—SHEET 1.

FIG. 1.



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3 SHEETS—SHEET 2.

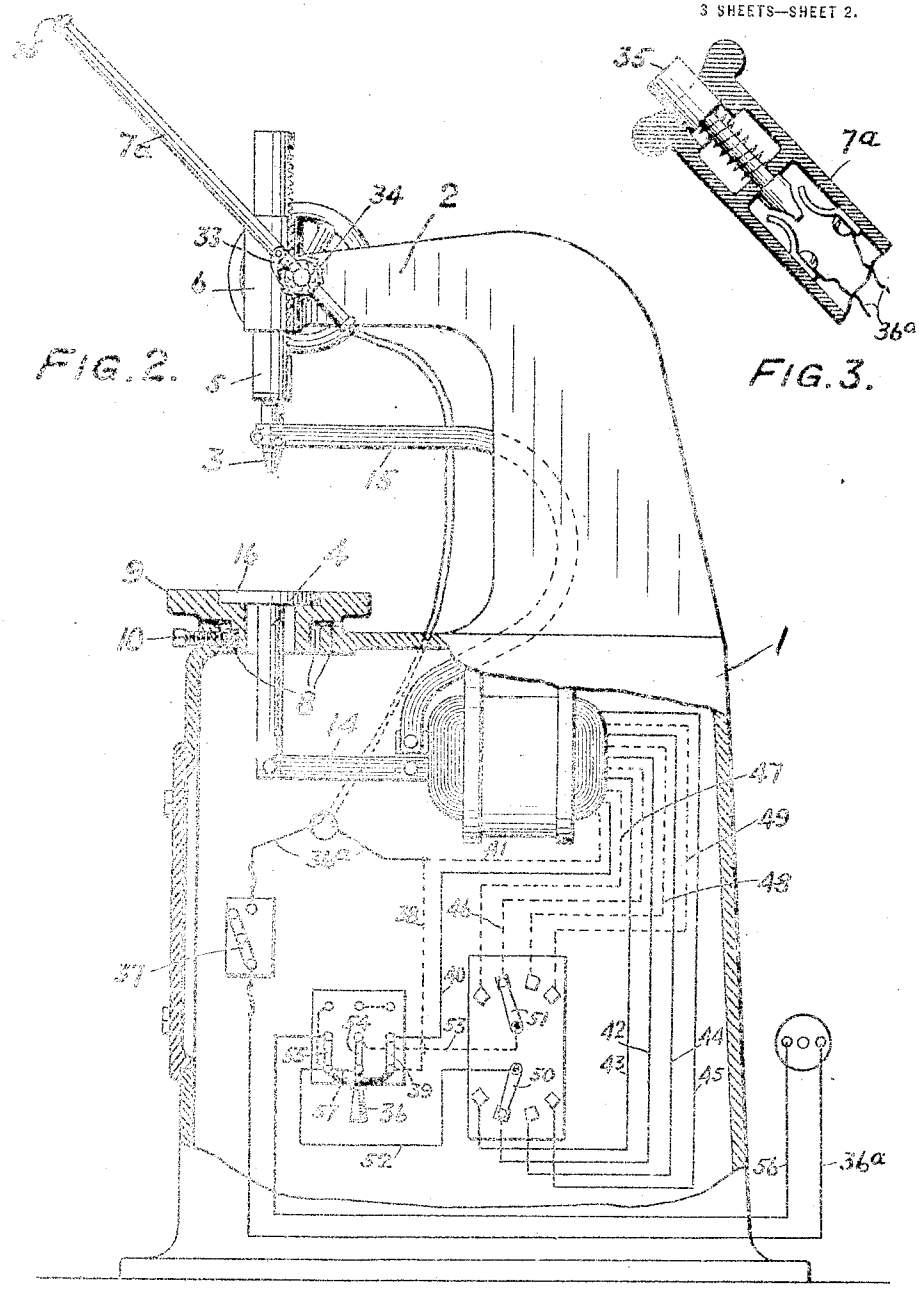


FIG. 2.

FIG. 3.

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3 SHEETS—SHEET 3.

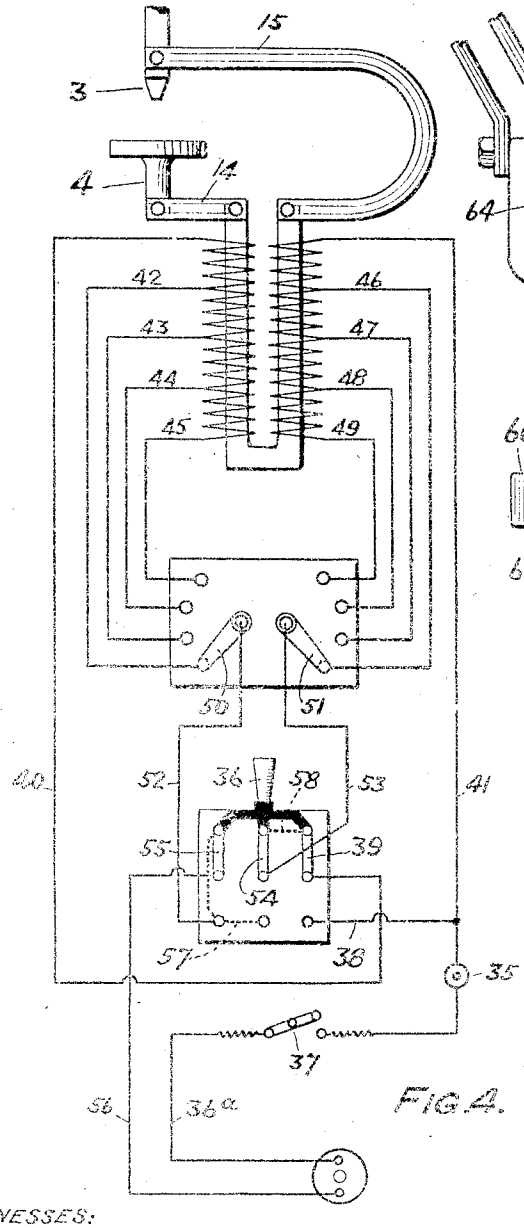


FIG. 4.

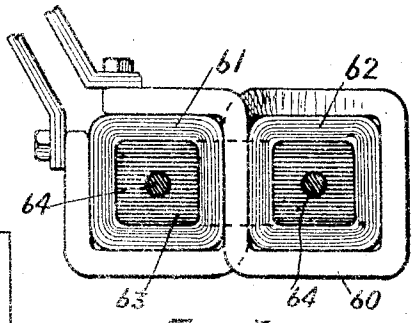


FIG. 5.

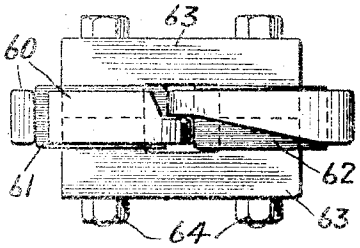


FIG. 6.

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ELECTRIC RIVETER.

1,164,634. Specification of Letters Patent. Patented Dec. 21, 1915.

Application filed April 4, 1913. Serial No. 759,763.

To all whom it may concern:

Be it known that I, SAMUEL S. EVELAND, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Riveters, of which the following is a specification.

Objects of the present invention are to provide a convenient, efficient and satisfactory electric riveter which constitutes in itself a complete shop tool, to provide for applying the riveter to different circuits, such for example as a 110 volt circuit or a 220 volt circuit, which are the circuits practically exclusively in use; to provide for changing the voltage applied to the rivets without substantial loss and with expedition and convenience; to provide for applying current to the rivets by means of simple and convenient switch mechanism; to prevent waste of current, and generally to provide an acceptable, convenient and commercial electric riveter.

The invention will be claimed at the end hereof, but will be first described in connection with the embodiments of it chosen for illustration in the accompanying drawings, in which—

Figure 1, is a side view with parts broken away of a riveter embodying features of the invention and adapted for use in connection with a line circuit of one voltage. Fig. 2, is a similar view illustrating the riveter embodying a modification of the invention and adapted for use in connection with either of two line circuits of different voltage. Fig. 3, is a sectional view, drawn to an enlarged scale, and illustrating a detail of construction. Fig. 4 is a diagrammatic view of the circuits and connections of the machine shown in Fig. 2. Fig. 5, is a top view, partly in section, of a transformer, and Fig. 6, is an elevational view of the same.

In the drawings 1 is a hollow housing or casing provided with an overhanging neck 2. This frame or housing supports the electrodes 3 and 4, between which the rivets are heated and riveted. The electrode 3 is carried by a post 5 working in ways 6 of the neck 2. A rack and pinion operated by a hand lever 7 afford means for raising and lowering the electrode 3 and for applying with comparatively little effort great pressure upon it. The electrode 4 is insulated as at 8 from the housing 1 and is shown as carried by a support 9 detachably connected with the housing 1 by means of set-screw 10.

12, is a foot lever for establishing and disestablishing a circuit through the electrodes. In riveting, the rivet properly inserted in the work is placed between the electrodes which are brought into good contact with the ends of the rivet by turning the handle 7. The foot lever is pushed establishing a circuit between the electrodes and so heating it and continued turning of the handle 7 puts pressure upon the rivet while it is heated and thus heads it and rivets the work. The electrodes 3 and 4 are included in the secondary circuit of the transformer 13, for example, by means of comparatively large conductors 14 and 15, of which the latter is sufficiently flexible to permit of the described movements of the electrode 3.

The electrode 4 is shown as including a flange or projection 16 of dia-magnetic material and the effect of this is to control or limit the magnetic flux in such a way that current is not wasted.

The primary circuit may be said to be by way of 17, through the arm 18 of the switch 19, thence by conductor 20 to one end of the primary circuit of the transformer. At different points in the primary winding of the transformer conductors are led out. As shown four such conductors are taken off and they are numbered 21, 22, 23, and 24. According to the position of the switch arm 25 the circuit is from the primary winding of the transformer through one of the conductors 21, 22, 23 or 24, the switch arm 25, the conductor 26, the switch 27, the conductor 28, the arm 29 of the switch 19 and to the conductor 30. The conductors 17 and 30 may be the line circuit and may for example be of 110 volts. The switch 27 is opened by a spring 31 and closed by the lever 12 through the link connection 32.

From the foregoing description it is evident that the circuit for energizing and de-energizing the electrodes 3 and 4 is interrupted when the switch 27 is opened and is closed when the switch 27 is closed and since the switch 27 is interposed in the primary circuit the current which it breaks and makes is of comparatively low amperage, much lower than the current in the secondary circuit, hence the switch can be of a comparatively simple type. Inasmuch as the effect of shifting the arm 25 is to include a greater or less number of the primary

windings of the transformer in the primary circuit it follows that by shifting the arm 25 the voltage in the secondary circuit can be changed and adjusted and inasmuch as the primary coils or windings of the transformer are cut in and out, current is not wasted as would be the case if a resistance or rheostat were used.

The general arrangement shown in Fig. 2, is as has been described in connection with Fig. 1, except that the hand lever 7^a is provided with a pawl 33 that engages a ratchet on the ratchet wheel 34 on the shaft of the pinion that drives the rack and instead of using a foot lever for making and breaking the primary circuit a push button switch 35 is inserted in the end of the handle 7^a, Fig. 3. Furthermore the machine shown in Fig. 2 is adapted for application to either of two circuits, either a 110 volt circuit or a 220 volt circuit. As shown in Fig. 2 the parts are in position for application to a 110 volt circuit and as shown in Fig 4, the parts are in position for application to a 220 volt circuit.

Referring to Figs. 2 and 4, the position of the three pole switch 36 determines whether the machine is adapted to a 110 volt circuit or to a 220 volt circuit. In the former case the circuit is from 36^a by switch 37 through push button 35 and then it divides, one part going by 38, arm 39 of switch 36, conductor 40 to one end of one of the primary coils of the transformer, the other part goes by 41 to one end of the other primary coil of the transformer, thus the primary coil of the transformer is divided and the two parts are in parallel relation. 42 to 49 are conductors taken off from corresponding points of the windings of the two parts into which the primary coil is divided. Arms 50 and 51 may be connected with like conductors from each coil. As shown the circuit is by 42 and 46 to the arms 50 and 51, thence from the arm 50 through 52 and the switch arm 55 to the conductor 56 and from the arm 51 by conductor 53 through the arm 54 to the conductor 56 by way of the conductor 57 and switch arm 55. It will be understood that the position of the arms 50 and 51 controls the number of coils in each of the divisions of the primary windings that are in circuit, so that by changing the arms the voltage in the secondary circuit is changed, it being understood, of course, that the arms must be connected to corresponding conductors. By using the two divisions of the primary winding in parallel as described, each across a 110 volt circuit, the same result is accomplished as would be accomplished by using the two divisions of the primary winding in series across the 220 volt circuit. In the latter case the circuit is by 36^a, 37, 35, 41, one of the conductors 46 to 49, the arm 51, the conductor 53, the switch arm 54, the conductor 58, the switch arm 39, the conductor 40, the other division of the primary winding, one of the conductors 42 to 45 according to the voltage required in the secondary circuit, the arm 50, the conductor 52, the switch arm 55, and the conductor 56. The two primary coils of the transformer may be arranged as shown in Figs. 5 and 6 and in this case the secondary circuit is formed by a generally figure 8-shaped frame 60 and the primary windings 61 and 62 as well as the frame 60 are clamped between plates 63 by means of bolts 64. The various switches and electrical controlling devices are arranged within the housing so that the device is a complete tool, self-contained and ready for shipment and application to use.

It will be obvious to those skilled in the art that departure may be made in matters of construction and arrangement without departing from the spirit of the invention, hence I do not limit myself to those matters or in any way further than the prior state of the art may require, but

Having thus described the nature and objects of my invention what I claim as new and desire to secure by Letters Patent is:

1. In an electric riveter the combination of a transformer of which the secondary constitutes the riveting circuit and of which the primary comprises a sub-divided winding, connections for interrupting the primary circuit, and connections for putting the sub-divisions of the primary in series and in parallel relation, substantially as described.

2. In an electric riveter the combination with the secondary circuit of a dia-magnetic baffle for interrupting an induced magnetic flux.

3. In an electric riveter the combination of a housing, a support detachably connected therewith, means for insulating the support, and a dia-magnetic plate carried by the support and constituting one of the electrodes, substantially as described.

In testimony whereof I have hereunto signed my name.

SAMUEL S. EVELAND.

Witnesses:

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FRANK E. FRENCH.