

No. 722,747.

PATENTED MAR. 17, 1903.

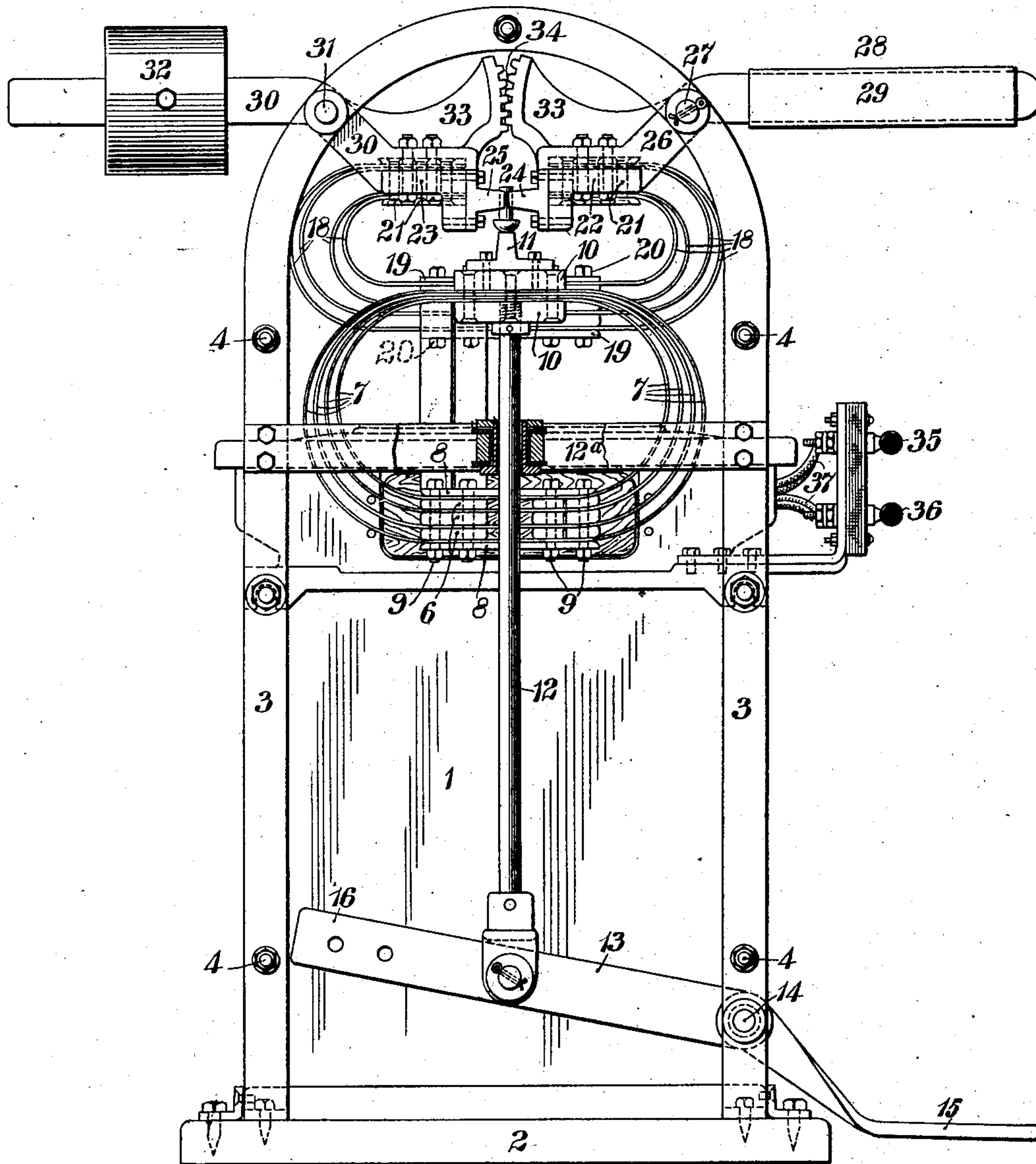
J. S. PECK & K. C. RANDALL.
ELECTRICAL HEATING APPARATUS.

APPLICATION FILED APR. 6, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

C. L. Belcher
Birney Hines

INVENTORS

John S. Peck
& Karl C. Randall

BY

Wiley E. Carr
ATTORNEY.

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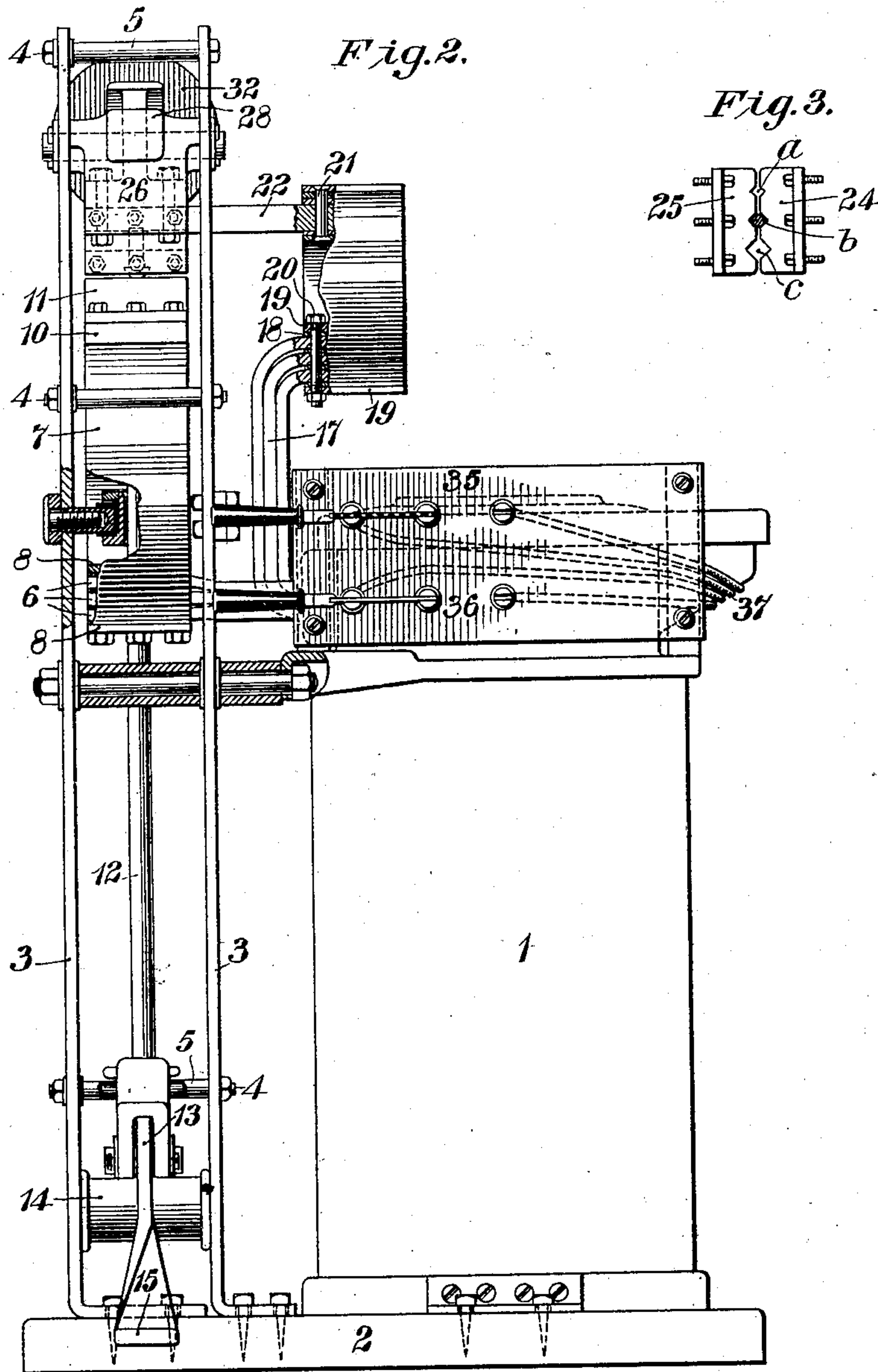
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Wesley E. Carr
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN S. PECK, OF PITTSBURG, AND KARL C. RANDALL, OF WILKINSBURG, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING CO., A CORPORATION OF PENNSYLVANIA.

ELECTRICAL HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 722,747, dated March 17, 1903.

Application filed April 6, 1901. Serial No. 54,710. (No model.)

To all whom it may concern:

Be it known that we, JOHN S. PECK, residing at No. 604 South Dallas street, Pittsburg, and KARL C. RANDALL, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented a new and useful Improvement in Electrical Heating Apparatus, of which the following is a specification.

10 Our invention relates to apparatus for heating metal articles, and has particular reference to apparatus for heating rivets to such temperature as will permit them to be upset, so as to fasten adjacent metal parts together.

15 The object of our invention is to provide a simple and easily-operated apparatus whereby the article to be heated may be securely clamped between the terminals of the source of electricity employed for heating and as readily released when the heating operation is completed. In order to attain this object we have devised the means shown in the accompanying drawings, in which—

25 Figure 1 is a view, mainly in front elevation, but partially in section, of the apparatus embodying our invention. Fig. 2 is a view of the apparatus, mainly in side elevation, parts being, however, broken away and in section. Fig. 3 is a detail plan view of the contact terminal jaws.

30 The intermediate source of electrical energy employed by us is a transformer, the casting 1 for which is shown as mounted upon a suitable base-plate 2. The transformer itself may be of any suitable construction known in the art for transforming the energy derived from a suitable primary generator, so as to give off from its secondary currents of large volume suitable for heating purposes.

35 The gripping contact-terminals and their operating devices, to be hereinafter described, are mounted upon a skeleton framework comprising two inverted-U-shaped standards 3, the lower ends of which are bolted to the base-plate 2. These standards 3 are connected together at suitable intervals by means of bolts 4, on which are mounted spacing-sleeves 5. One of the terminals of the transformer-secondary or, as shown in the drawings, three corresponding terminals 6 extend into the space

between the two uprights 3 and are clamped between four flexible copper strips 7 by means of two plates 8 and a suitable number of bolts 9. The ends of the flexible strips 7 are curved upwardly and inwardly and at 55 their upper ends are brought into close contact with each other and clamped rigidly between two blocks 10. Mounted upon the upper block 10 and in good electrical connection therewith is a removable contact-block 60 11. The lower block 10 is securely connected to the upper end of a rod 12, which is laterally supported by a cross-piece 12^a, and the lower end of the rod is pivotally connected to a lever 13, the latter being pivotally mounted at 14 between two of the uprights 3 and so bent outside the uprights as to constitute a treadle 15 to receive the foot of the operator. The end 16, that projects in the opposite direction from the rod 12, may be 70 weighted, if desired, in order to insure depression of the contact-block 11 except when the lever 13 is positively actuated by the foot of the operator. The other terminal of the transformer-secondary or the set of three terminal strips 17, as here indicated, project a sufficient distance from the transformer to be clamped between flexible copper strips 18 by means of plates 19 and bolts 20, these parts being similar in construction and arrangement to those cooperating with the other transformer-secondary terminals, already described. The copper strips 18 are curved outwardly and then upwardly and inwardly; but instead of being brought together at their 85 free ends the ends of the strips at one side are securely clamped, by means of suitable rivets 21, to an arm 22, and the ends of the strips 18 at the other side are in a similar manner clamped, by means of rivets 21, to an 90 arm 23. The arms 22 and 23 project into the frame between the uprights 3, and their inner ends are respectively provided with removable contact terminal pieces 24 and 25, these terminal pieces together constituting 95 clamping-jaws, and are so formed as to receive and clamp one or more rivets, the head or heads of which rest upon contact-block 11 when the parts of the apparatus are in operative position. As here shown, (see Fig. 3,) 100

the terminal pieces 24 and 25 are respectively provided with recesses or notches *a*, *b*, and *c*, differing in size, so as to adapt the apparatus to the heating of rivets of different diameters.

5 The pieces 24 and 25 are made removable, because of the liability to blistering and burning under the action of the heavy currents employed. The arm 22 is securely supported upon the inner end of a lever 26, which is
10 pivoted at 27 between the uprights 3 at one side. The lever 26 projects outward beyond its pivot to form a handle 28, having a suitable insulating-covering 29. The arm 23 is also securely attached to the inner end of a
15 lever 30, similar in form and dimensions to lever 26 and pivoted at 31 between the uprights 3 at the opposite side of the frame. The portion of the lever 30 that projects beyond the frame is provided with an adjustable weight 32. The levers 26 and 30 are provided with inwardly-projecting arms 33, the
20 faces of which are in the form of gear-segments 34, which mesh with each other, so that as the handle 28 is moved up or down a corresponding movement of the lever 30 will be effected. Different voltages and currents may be needed for heating rivets of different sizes or because of other variations in operating conditions, and these may be obtained
30 by any one of several means known in the art. As shown in the drawings, we effect the desired result by means of two double-throw single-pole switches 35 and 36, leads 37 being brought out from proper points in the lengths
35 of the primary winding of the transformer and connected to the stationary contact-terminals of the two switches, so that the active length of the primary may be varied by proper manipulation of the switch-arms.

40 The apparatus is operated as follows: The handle 28 is raised by the operator against the action of the counterweight 32, thus separating the jaws 24 and 25 sufficiently to permit of the insertion of a rivet, with the head of the rivet resting upon the contact-block
45 11, the operator in the meantime manipulating the block 11 by means of his foot upon the treadle 15 of the lever 13, so as to bring the block 11 to such height as may be necessary in
50 view of the length of the rivet to be heated. It is desirable that the end of the rivet to be upset or headed shall be heated to a less degree than the intermediate portions, and consequently the block 11 is raised by the operator
55 to such position as will insure the engagement of the clamping terminal jaws 24 and 25 at a point somewhat below the upper end of the rivet. When this point is reached, the handle 28 is released, and the weight 32 will
60 force the jaws 24 and 25 toward each other and into engagement with the rivet. Additional pressure may obviously be brought to bear upon the rivet by downward pressure upon the handle 28, if desired. Furthermore,
65 any desired degree of pressure upon the head of the rivet may be secured by manipulation of the treadle 15. It will be seen also that

any upward pressure exerted through the lever 13 and rod 12 upon the head of the rivet will, by reason of the frictional engagement
70 between the sides of the rivet and the jaws 24 and 25, tend to increase the pressure exerted by these jaws upon the sides of the rivet.

It will be understood that the means for operating the contact-block 11 and the means
75 for operating the jaws 24 and 25 may be combined, so that both may be operated either by foot or hand power, and in general that the apparatus may be modified within suitable limits as regards the form, dimensions, and
80 relative location of parts without departing from our invention.

We desire it to be also understood that the clamping contact-terminals may be so constructed as regards form and dimensions as
85 to hold several devices at one time and that the invention is not limited to employment in connection with the heating of rivets, since any other devices which are formed of conducting material may be heated by apparatus
90 constructed in accordance with our invention.

We claim as our invention—

1. In a rivet-heating apparatus, the combination with a source of electrical energy,
95 of a two-part terminal for receiving the body of the rivet, a frame upon which the terminal parts are pivoted so as to normally tend to move toward each other, a single terminal to engage the head of the rivet and means
100 for forcing said single terminal forward to increase the clamping action of the two-part terminal.

2. In a rivet-heating apparatus, the combination with a transformer, of a two-part
105 clamping-terminal, a frame upon which the terminal parts are pivoted so as to normally tend to move toward each other, a single cooperating terminal, flexible conducting-supports for said terminals and means for moving
110 the single terminal forward to increase the clamping action of the two-part terminal.

3. In a rivet-heating apparatus, the combination with a transformer, of a two-part
115 clamping-terminal, a single cooperating terminal, flexible conducting-supports for said terminals, a frame to which the members of the two-part terminal are pivoted so as to normally tend to move toward each other and means supported on said frame for moving
120 the single terminal forward to increase the clamping action of the two-part terminal.

4. In a rivet-heating apparatus, the combination with a transformer, of a two-part
125 terminal and a single terminal for engaging a rivet, flexible supports for the terminals, a frame in which said supports are mounted and to which the members of the two-part terminal are pivoted so as to normally tend to move toward each other and a lever for
130 moving the single terminal forward to increase the clamping action of the two-part terminal.

5. In a rivet-heating apparatus, the com-

5 combination with a transformer, of a two-part
contact-terminal and a single terminal for
engaging a rivet, flexible supports for the ter-
minals, a frame in which said supports are
10 mounted and to which the members of the
two-part terminal are pivoted so as to nor-
mally tend to move toward each other, means
for moving the single terminal forward to in-
crease the clamping action of the two-part
terminal and means for varying the current
supplied by the transformer.

15 6. The combination with a source of elec-
trical energy, of a frame, a two-part terminal
having its members pivoted to the frame,
geared together and weighted so as to nor-
mally tend to move toward each other to clamp
a rivet-shank, a single terminal and means
for moving the same toward the two-part ter-
20 minal to engage the head of a rivet and in-
crease the clamping action of the two-part
terminal.

7. The combination with a source of elec-
trical energy and rivet-clamping terminals
therefor, of a frame having flexible supports
for said terminals and means for moving the 25
terminals into and out of rivet-clamping po-
sitions, one of said terminals comprising two
parts that are pivotally supported, geared to-
gether and weighted so as to normally tend
to move toward each other and the forward 30
movement of the other terminal against a
rivet-head serving to increase the clamping
action of the two-part terminal.

In testimony whereof we have hereunto
subscribed our names this 12th day of Feb- 35
ruary, A. D. 1901.

JOHN S. PECK.
KARL C. RANDALL.

Witnesses:

JAMES B. YOUNG,
BIRNEY HINES.