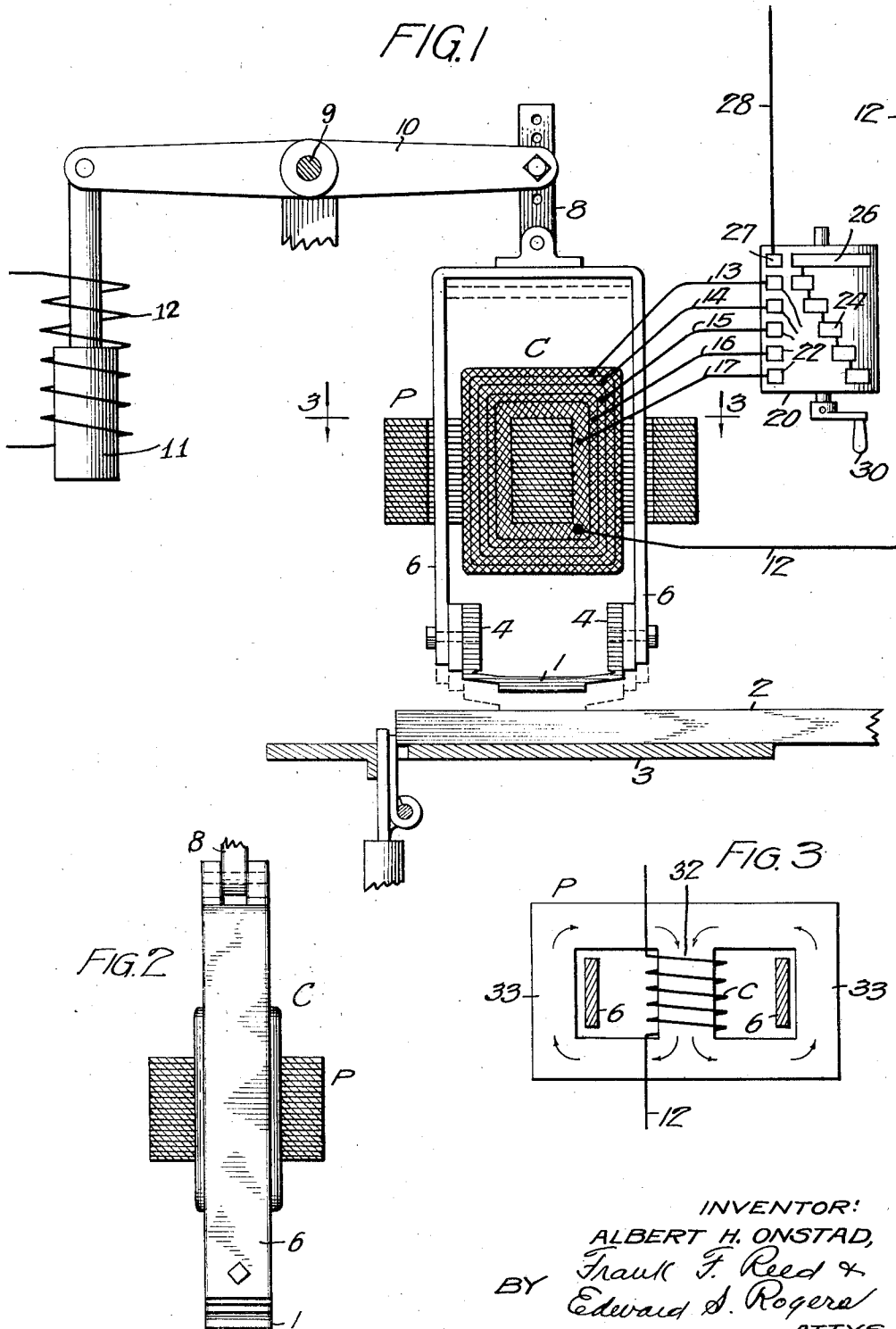


A. H. ONSTAD.
ELECTRICALLY HEATED BRANDING DIE.
APPLICATION FILED JAN. 10, 1921.

1,413,053.

Patented Apr. 18, 1922.



UNITED STATES PATENT OFFICE.

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ELECTRICALLY-HEATED BRANDING DIE.

1,413,053.

Specification of Letters Patent. Patented Apr. 18, 1922.

Original application filed February 16, 1920, Serial No. 358,959. Divided and this application filed January 10, 1921. Serial No. 436,069.

To all whom it may concern:

Be it known that I, ALBERT H. ONSTAD, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a certain new and useful Improvement in Electrically-Heated Branding Dies, of which the following is a specification.

My invention relates to electrically heated branding dies, and the general object of the invention is to provide a simple and efficient construction for heating the die on the induction principle. One of the contributory objects of the invention is to provide a construction by which the induction principle may be used for heating a die, at the same time avoiding the need of moving the entire weight of the apparatus by which the current is induced. Another object of the invention is to take advantage of the difference in coefficients of resistivity of different metals for confining the heat to the exact portion of the apparatus where it is needed.

I accomplish my objects by the mechanism illustrated in the accompanying drawings in which

Figure 1 is a side elevation, partly in section, showing in more or less diagrammatic form, apparatus embodying my invention, and parts associated therewith.

Figure 2 is an elevation looking from the edge of the apparatus and showing the primary and secondary by which the branding portion is heated.

Figure 3 is a diagram showing a section of the apparatus on the line 3—3, Figure 1.

Like numerals denote like parts throughout the several views.

The present case is a division from my co-pending application for branding machine filed February 16, 1920, Serial No. 358,959, issued March 1, 1921 as Patent No. 1,369,934.

In the particular form shown in the drawings the branding die 1 is adapted to burn an impression in a piece of timber 2 which may be supported upon the table 3 beneath the die, as explained in the divisional case. The die itself is of iron or other metal having a relatively high resistivity or specific resistance and has end pieces 4 of considerable thickness by which it may be securely bolted to the lower ends of a bar 6. This bar is in the form of an inverted U, and together with the die forms a closed loop or

circuit constituting a secondary induction coil. By preference this bar is of comparatively large cross section and formed of copper or other conductor of low specific resistance. It is adapted to be moved vertically by means of a link 8 attached to a lever 10 or other suitable type of actuating mechanism. In the case illustrated, the lever is mounted on a stationary fulcrum 9 and is actuated by a plunger 11 working in a coil 12.

Current is induced in the secondary circuit by a primary circuit C composed of a plurality of separate coils typified by *c* in Figure 3. One end of each coil is energized through a common conductor 12 while the other end is energized through individual conductors or leads 13, 14, 15, 16 and 17 which lead to a drum controller 20. This controller has a set of contacts 22 which connect individually with the conductors 13 to 17 and a set of contacts 24 arranged in echelon for cooperating with the contact 22. The contacts 24 are all electrically connected to a bus 26 which is adapted to engage and cooperate with a contact 27 electrically connected to a supply conductor 28. As drum controllers are well known it is sufficient to say that the operator by manipulating the controller handle 30 may control the number of inducing coils in the circuit. The conductors 12, 28 are connected to any suitable source of alternating current.

To promote induction, coils C are provided with core plates or laminations P. It will be noted that the central section 32 of the laminations is surrounded by and hence may form a support for the coils C while the legs of the bar 6 pass to the outside of the coil but inside of the outer section 33 of the laminations. Hence, the bar or secondary circuit is free to move independently of the stationary coils and core.

In operation, the attendant manipulates the controller 20 in such manner as to close the connection between the supply conductor 12, 28 and such number of coils C as may be necessary to produce the degree of heating required. As the current is alternating current, the pulsations in the coils induce magnetic fluxes of alternating direction in the laminations P and this induces alternating current in the secondary circuit. As the bar 6 is of low resistance the induced cur-

rent will produce practically no heating effect in it, but as the die is of higher specific resistance the passage of the current through it will heat it to the temperature necessary for branding. When the die is heated to the proper temperature it is lowered onto the boards or other objects to be branded. After the impression has been burned into the object the die is raised. This may be accomplished manually or mechanically. Suitable mechanism is described in my aforesaid patent.

It will be observed that as a result of my construction the die and the rest of the secondary circuit may be raised and lowered without the necessity of raising and lowering the heavy coils or their core plates P. This reduces the weight of the movable parts and has another advantage in that the leads 13 to 17 do not have to be flexed for each movement of the die. In other words, a permanent, rigid connection may be made between the coils and the stationary contacts 22 of the drum controller. Another advantage of this construction is that there is no waste of electrical energy, practically speaking, because the heat is confined to the particular portion of the secondary circuit which must be heated for the act of branding.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An electrically heated branding die having a primary and a secondary circuit, the secondary circuit including the die and being movable relatively to the primary circuit whereby the die may be moved toward and from the work without moving the primary circuit.

2. An electrically heated die having a primary and a secondary circuit, the primary circuit being stationary and the secondary circuit being movable within the field of the primary circuit whereby the secondary cir-

cuit may be moved toward and from the work without moving the primary circuit, the secondary circuit having a section of high resistance for heating the die proper.

3. In combination, a branding die of conductive material, a U-shaped conductor of low resistance connected therewith to form, in association with it, the secondary circuit of a transformer, a core having an aperture for accommodating the parallel portions of the U-shaped conductor, whereby said conductor may be reciprocated without moving the core, and a winding around said core, said winding forming the primary circuit of a transformer.

4. An electrically heated die having a stationary primary circuit and a movable secondary circuit, the latter consisting of one section of low specific resistance and another section of high specific resistance, the section of high resistance having the die markings sunk in it and the section of low resistance having two parallel limbs, and a core frame for the primary circuit having apertures in it for accommodating the parallel limbs of the secondary circuit to permit the latter to move within the field of the primary circuit.

5. An electrically heated die having a stationary primary circuit and a movable secondary circuit, the latter consisting of one section of low specific resistance and another section of high specific resistance, the section of high resistance having the die markings sunk in it and the section of low resistance having two parallel limbs, and a core frame for the primary circuit having apertures for accommodating the parallel limbs of the secondary circuit to permit the latter to move within the field of the primary circuit.

In witness whereof, I hereunto subscribe my name.

ALBERT H. ONSTAD.