June 15, 1926. 1,589,235

E. SCHRÖDER

DEVICE FOR THE LOCAL ANNEALING OF PRESSED PARTS

Filed May 10, 1924

Fig. 1.

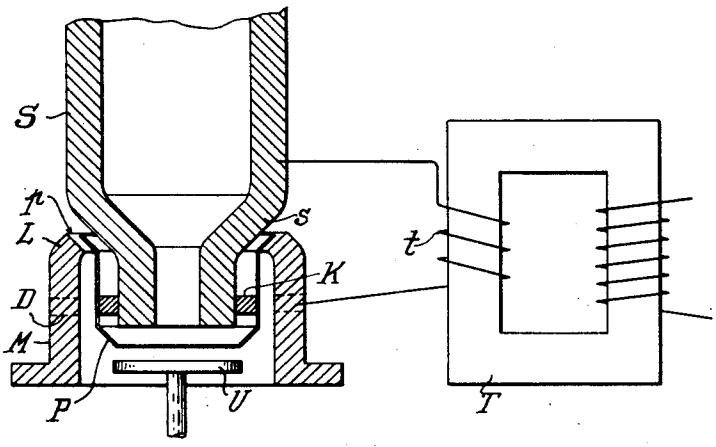
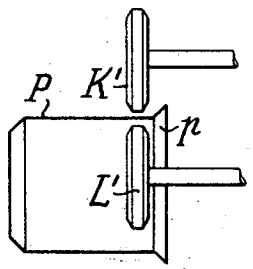


Fig. 2.



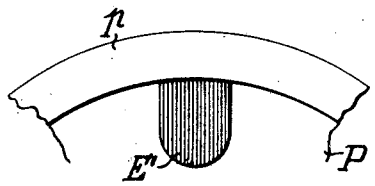


Fig. 5.

Fig. 3.

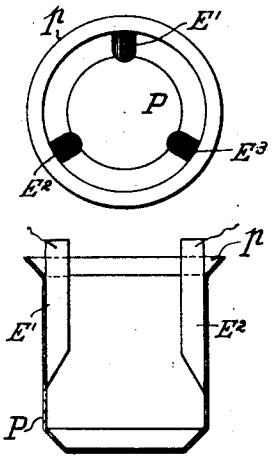


Fig. 4.

INVENTOR.

Edmund Schröder.

By William C. Linton

Atty.

Patented June 15, 1926. 1,589,235

UNITED STATES PATENT OFFICE.

EDMUND SCHRÖDER, OF BERLIN, GERMANY.

DEVICE FOR THE LOCAL ANNEALING OF PRESSED PARTS.

Application filed May 10, 1924, Serial No. 712,412, and in Germany June 4, 1921.

My invention relates to a device by which pressed parts can be annealed locally, and the gist of the invention resides therein that the zone to be heated is switched on to the low-tension circuit of a low-tension transformer in such a manner that the current passes only through the zone to be annealed and this zone is heated to the desired temperature by a high load on its sectional area.

The invention is illustrated by way of example in the accompanying drawing in which Figure 1 is a diagrammatical view, partly in vertical section (left hand part of the figure) and partly in side-view (right hand part of the figure), of one form of the improved device; Figure 2 is a diagrammatical view of a modification, and Figures 3, 4 and 5 show another modification, Fig. 3 being a plan of a pressed iron pot and of some electrodes contacting with it, Fig. 4 being a vertical section through this pot, together with a side-view of two of said electrodes, and Fig. 5 showing a part of the pot-flange, drawn on an enlarged scale.

Referring to Fig. 1, S denotes a patrix which can be moved vertically by any suitable means (not shown), and the lower end of which is encompassed by a ring K which can be adjusted vertically along the reduced part *s* and secured in its adjusted position also by any suitable means (not shown). A simple manner is to provide the patrix-part *s* with an outer screw-thread and the ring K with an inner screw-thread, as can be imagined without an illustration.

The patrix-part *s* and the ring K engage a matrix M, the shape of which, especially at its upper part L, is determined by the shape or kind of the pressed part to be locally annealed. In the example shown in Figure 1 the pressed part to be annealed locally is a pot P having a flange *p* with which it is supported on the correspondingly shaped top-part L of the matrix M.

The low-tension coil *t* of the low-tension transformer T is connected at one end with the patrix S and at the other end with the matrix K. The circuit is completed by the ring K and the pot P. Opposite the flange *p* of the pot the funnel-shaped outer surface of the patrix S is provided with a non-conductive and heat-resisting lining, for instance of asbestos or the like, so that the current cannot spark over between the parts *s* and *p*.

D are inspection-holes provided in the matrix M and serving for observing the condition of the pot P at the zone where it contacts with the ring K.

U is a vertically movable disk by which the pot is lifted out of the matrix when the annealing procedure is finished.

It is suitable to the purpose to cover the matrix with a poor heat conductor in order to prevent losses by radiation.

Supposing, a pot of the kind illustrated in Figure 1 is to be treated, i. e. to be annealed locally, the patrix is raised so much that the pot can be inserted into the matrix until its flange *p* rests on the top L thereof. The next procedure is to shove the pot upon the ring K after this has been so adjusted that it contacts just with that portion of the pot-wall which shall be annealed when the flange *p* touches the matrix-head L. Finally, the primary circuit of the transformer is closed so that the secondary current now circulates through the circuit described, the pot-wall being now heated and annealed around its circumference at that annular place where it contacts with the ring K.

When then the desired temperature has been reached, the patrix is lifted out of the matrix and out of the pot, and this latter is lifted separately by the disk U whereafter it is removed from the annealing device and further treated in the manner desired.

The movable members S and U may be moved manually or mechanically, but also in the latter case it is practical to control the respective devices by hand.

There may be several rings K of different axial thickness in order to permit to vary the breadth of the wall-part of the pot to be annealed, and any ring may be adjusted in height according to the position of the wall-part to be annealed.

In the modification illustrated in Figure 2, the wall-part to be heated and annealed is subjected to the action of two rotary disks K^1 and L^1, of which one is connected with one end of the coil *t*, the other with the other end thereof. The breadth of the disks corresponds to the breadth of the pot-wall part to be annealed, and the disks may be exchangeable for smaller or broader ones,

as the case may be. The rotary motion is applied to one or the other of them, and the pot is rotated between them so that the wall-strip concerned is heated on its entire circumference.

Where three-phase current is at disposal, the modification shown in Figs. 3–5 may be employed. There are in this instance, instead of two rotary disks, three stationary electrodes E^1 E^2 E^3 which are connected with the three wires of the system and contact with the inner wall of the pot P at three equidistant places, the electric connection being, thus, somewhat like the known star-connection. The electrodes are preferably laminated, as shown especially in Figure 5, so that they accommodate themselves better to the inner wall of the pot. I wish it to be understood, however, that it is immaterial whether the three stationary electrodes are arranged inside or outside the pot, or contact with the inner or the outer surface thereof respectively.

The pot is also in this case rotated by pairs of rolls, preferably three pairs arranged in alternation with the electrodes, and any one of the three pairs is connected up to one of the wires of the three-phase system, so that only one third rotation of the pot is required in order to heat or anneal it around its circumference corresponding to the breadth of the respective rolls.

The pot P shown merely by way of example may have any other shape and it may consist of iron, steel, brass, aluminium, or another metal; in fact, the pressed part need not be at any rate a pot, but may be another article of manufacture, and the heating or annealing device is always accommodated to the shape or kind of the respective part or article, as the case may be.

I claim:

1. A device for the local annealing of pressed parts, comprising relatively spaced movable electrodes having electrical connection with a source of low tension electrical energy, and a contact ring carried by one of said electrodes adapted to electrically engage a certain area of a part to be annealed, said part also having electrical engagement with a portion of the opposite electrode.

2. A device for the local annealing of pressed parts, comprising relatively spaced movable electrodes having electrical connection with a source of low tension electrical energy, and a contact ring adjustably carried by and electrically contacting with one of said electrodes adapted to electrically engage a certain area of a part to be annealed, said part being also electrically engaged with the remaining electrode.

3. A device for the local annealing of pressed parts, comprising relatively spaced movable electrodes having electrical connection with a source of low tension electrical energy, and a contact ring adjustable along one of said electrodes adapted to be electrically engaged with a certain area of a part being annealed, said part being electrically connected to the opposite electrode in a manner to confine the annealing heat to the aforesaid area.

4. A device for the local annealing of pressed parts, comprising a patrix having the lower end thereof reduced, a matrix for receiving the reduced end of said patrix therein, said matrix having that portion of the opening therein receiving the reduced end of the patrix formed to receive and support an adjacent portion of a pressed part to be annealed, a contact ring electrically connected to and adjustable over said reduced end of the patrix adapted to electrically contact with a certain area of the pressed part to be annealed, said patrix and said matrix having connection with a source of low tension electrical energy, and means for moving the pressed parts from the matrix subsequently to annealing of the same.

In witness whereof I have hereunto set my hand.

EDMUND SCHRÖDER.