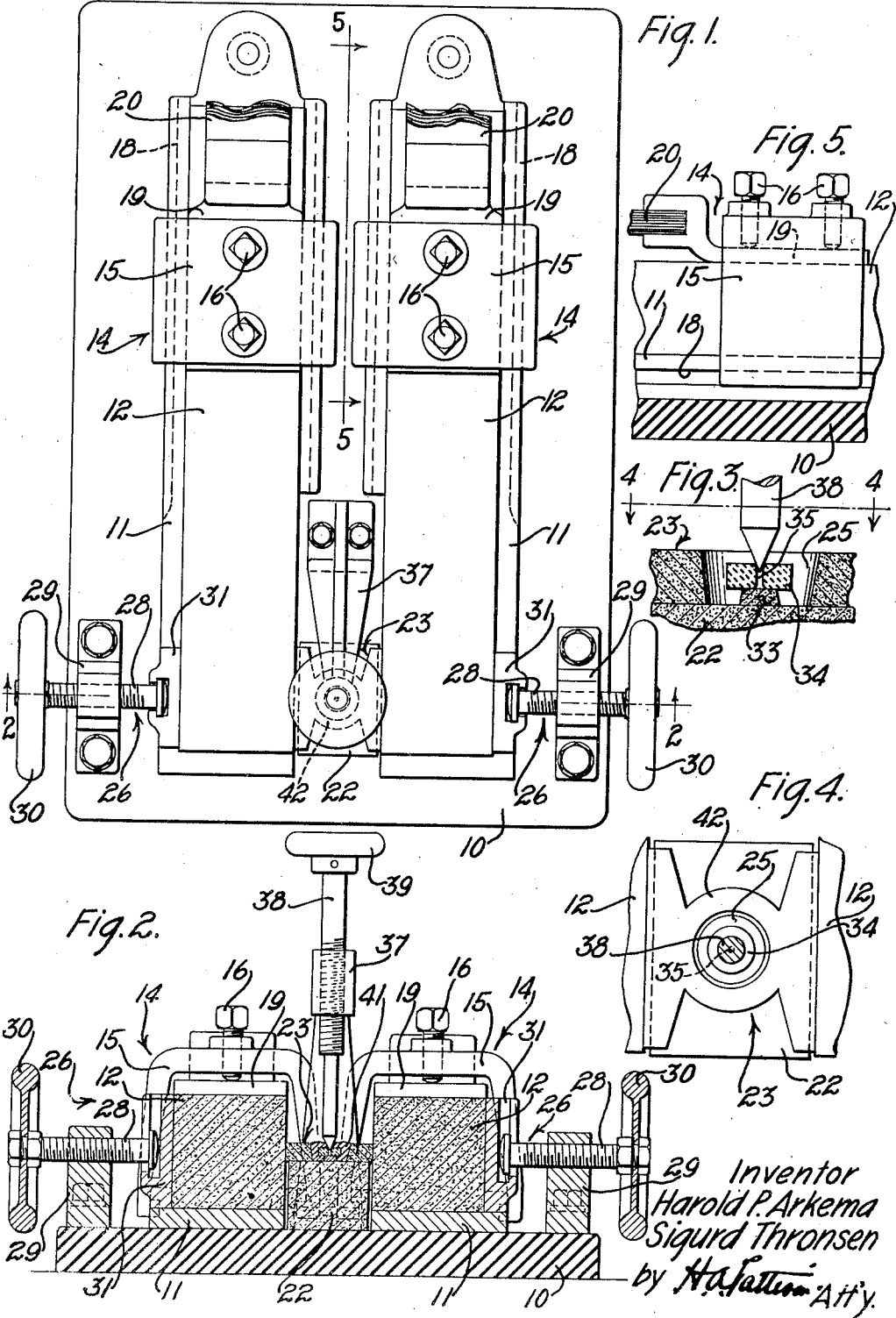


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METHOD OF MOUNTING DIES

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METHOD OF MOUNTING DIES.

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This invention relates to methods of mounting dies, and more particularly to methods of mounting diamond wire drawing dies.

In the art of wire drawing it has been the practice in some instances to mount a wire drawing member such as a diamond die by casting suitable supporting material around the die and thereby rendering it readily adaptable for attachment to a wire drawing machine. Experience in this particular art has shown that care must be exercised in casting molten material about a diamond die in order to prevent the cracking of the die due to the heat from the molten material. Voids or interstices are sometimes present upon the surfaces of the dies, which are to be mounted, and in the event that such voids are present, it is very desirable that the material be cast around the die so as to completely fill any of such voids or interstices. If the material cast does not completely cover and make contact with the surface of the dies in the manner mentioned, the support or mounting may not be of sufficient rigidity to effectively retain the die in the proper fixed position to withstand the stresses occasioned during the drawing of the wire therethrough.

The object of this invention is to provide simple and effective methods of securely mounting a die in a holder therefor.

In accordance with the general features of the invention, one embodiment thereof is represented by an apparatus whereby the improved method for mounting dies may be practiced, which includes a heating element comprised of electrical current conducting material, such as carbon, in contact with the terminals of a pair of carbon conductors which are connected with a suitable source of supply and are designed to carry current of high amperage. Means is provided whereby a diamond die may be properly positioned within a cavity or mold of the heating element and suitable mounting or supporting material such as particles of a nickel-iron alloy may be introduced within the cavity around the die. Current supplied from the source will raise the temperature of the heating element sufficiently to fuse the material within the mold after which the current is disconnected, the molten material encasing the die permitted to cool slowly completing the mounting of the die.

These and other objects will be apparent

from the following detailed description when considered in connection with the accompanying drawings, wherein

Fig. 1 is a plan view of an apparatus embodying features of the invention and whereby the improved method of mounting may be effectively practiced;

Fig. 2 is a transverse vertical section of the apparatus taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary vertical section of the heating element as disclosed in Fig. 2, disclosing a diamond die positioned within the mold thereof, said mold being shown without a charge of mounting material;

Fig. 4 is a horizontal fragmentary section taken on the line 4—4 of Fig. 3, disclosing a plan view of the heating element, and

Fig. 5 is a detailed sectional view taken on the line 5—5 of Fig. 1 disclosing a terminal clamping member.

Referring now to the accompanying drawings wherein like numerals have been employed to designate similar parts throughout the various disclosures, it will be observed that the apparatus includes a rectangular base plate 10 comprised of suitable insulating material. Suitably mounted upon the upper surface of the base plate 10 are a pair of parallel support bars 11 which are channeled to receive companion carbon conductor blocks 12. These conductor blocks 12 are seated within the channeled portions of the support bars 11 and are secured in position by means of clamping means 14 comprising an inverted U-shaped member 15 and a pair of tightening screws 16. The lower extremities of the U-shaped members 15 are slidably mounted within ways 18 formed along the sides of the support bars 11. By tightening the screws 16 against the surface of a metallic plate 19 (Fig. 2) which rests upon the upper surface of each of the carbon blocks 12, the blocks may be effectively secured against longitudinal displacement. These plates 19 are connected with the terminal of suitable conductors 20 which are connected with any suitable source of electrical current supply (not shown).

Interposed between the forward extremities of the carbon blocks 12 and resting upon the base plate 10 is a carbon support block 22 for a carbon resistor or heating element

23. This heating element is provided with a cavity or mold 25 and the opposite sides of the heating element are designed to be engaged by and clamped between the opposed adjacent surfaces of the forward extremities of the carbon blocks 12 by clamping devices 26. Each clamping device 26 includes a screw member 28 threaded through a bracket 29 suitably mounted upon the base plate 10. The outer extremity of each screw 28 supports a hand wheel 30 and the inner extremity thereof supports a head 31 slidably mounted thereon. Upon turning the hand wheel 30 after the heating element 23 has been positioned upon the carbon support block 22, the heads 31 engage with the outer sides of the adjacent carbon blocks 12 and move said carbon blocks together sufficiently to positively engage with the sides of the heating element.

Subsequent to the clamping of the heating element 23 between the carbon blocks 12 a carbon pedestal 33 may be placed within the cavity 25 centrally thereof upon the upper surface of the carbon support block 22. A diamond or diamond die 34 (Fig. 3) having a central bore 35 may then be placed upon the positioned carbon pedestal 33. A bracket 37 secured to the base plate 10 provides a mounting for a vertical centering element 38 threaded therein. By turning a hand wheel 39 at the upper end of the centering element 38 the lower pointed extremity thereof may be moved into the bore 35 of the positioned die 34, thereby rigidly securing the die within the central portion of the cavity 25.

Having thus been secured in position within the cavity 25 the die 34 may be surrounded by finely divided particles of mounting material 41 (Fig. 2). It has been found by experimentation that a nickel-iron alloy comprising preferably not more than 7% nickel provides a very satisfactory mounting for diamond dies and this alloy in the form of particles may be readily placed within the cavity 25. Closing the electrical circuit containing the carbon blocks 12 and the mold member 23 by any suitable switch (not shown) permits a current flow of high amperage through the heating element 23, thereby heating the element sufficiently to fuse the mounting material 41 within the cavity 25. Melting the nickel-iron mounting material about the die 34 in this manner causes any voids or interstices which may be present upon the surface of the die to be filled completely by the molten material. The current flow through the element 23 need only be of very short duration and after the mounting material 41 has been completely fused and cast about the die 34 in the form of a mantle it is allowed to cool slowly in order to insure against cracking and to prevent rapid oxidation of the carbon heating

element 23. The centering element 38 may now be disengaged from the die 34 and the clamping devices 26 may be actuated to release the heating element 23. The solidified mounting material 41 may be readily removed from the heating element 23 and the element may again be replaced in position upon the support block 22 and clamped in position to receive another unmounted die. It will be noted that the heating element 23 is formed (Fig. 4) with arcuate portions 42 which partially encircle the mold 25 and by this construction the heat generated by the current flow through these arcuate portions is effectively concentrated about the mounting material 41 placed within the mold 25. After the mounting material 41 has been allowed to cool and is removed from the heating element 23 the mounted die may be trimmed or machined and subsequently attached in any suitable manner to a wire drawing machine.

It is to be understood that by practicing this improved method of mounting dies, no pressure need be applied to the mounting material subsequent to its being fused, as has heretofore been the practice in some instances, for the purpose of preventing the formation of air holes or voids within the mounting material adjacent to the die. Fusing the material in position around the die 34 causes any gases which may be present to be positively driven off and when the mounting material solidifies, the covered portion of the die will be in direct contact with the material, thereby presenting a very firm mounting or mantle.

Although the invention as herein illustrated and described is particularly well adapted for use in connection with the mounting of wire drawing dies, it should be understood that the novel features thereof are capable of other applications and should be limited only by the scope of the appended claims.

What is claimed is:

1. A method of mounting dies, which consists in positioning a die, placing portions of mounting material adjacent the positioned drawing die, and fusing the portions into an integral mantle around the die.

2. A method of mounting dies, which consists in associating a die and portions of mounting material with an electrical current conducting medium, and applying an electrical current to heat the conducting medium and fuse the portions of mounting material to form an integral mantle around the die.

3. A method of mounting dies, which consists in supporting a die within a cavity of an electrical current conducting medium, placing portions of mounting material adjacent the die, and applying an electrical current to heat the conducting medium and fuse the portions of mounting material to form an integral mantle around the drawing die.

4. A method of mounting bored dies, which consists in positioning a die and contemporaneously closing the bore ends thereof, placing portions of mounting material adjacent the positioned die, and fusing the portions to form an integral mantle around the die with an opening at each end of the die bore.

5. A method of mounting bored dies, which consists in positioning a die within a cavity of an electrical current conductor and contemporaneously closing the bore ends, placing portions of mounting material within the cavity, and applying an electrical current to heat the conductor and fuse the portions to form an integral mantle around the die.

6. A method of mounting dies, which con-

sists in positioning a die within a heat conveying medium, placing finely divided particles of mounting material adjacent the die, and heating the heat conveying medium to fuse the positioned particles into an integral mantle around the die.

7. A method of mounting dies, which consists in positioning a die, placing portions of mounting material adjacent the positioned die, and simultaneously heating the die and the portions of mounting material to fuse the portions into an integral mantle around the die.

In witness whereof, we hereunto subscribe our names this 6th day of July A. D., 1926.

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