Dec. 14, 1943. P. A. BEAMAN 2,336,771

DIE HOLDER

Filed June 12, 1942

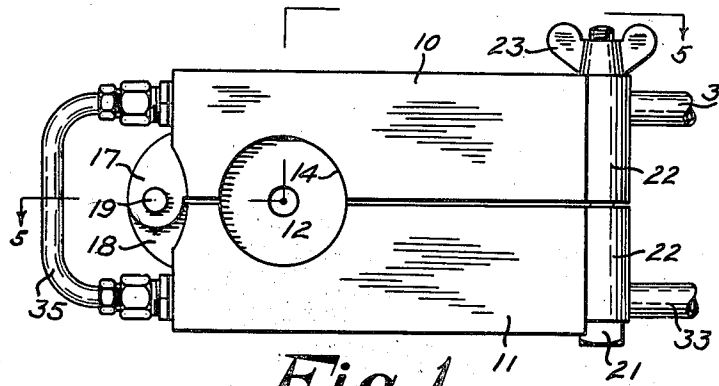


Fig. 1

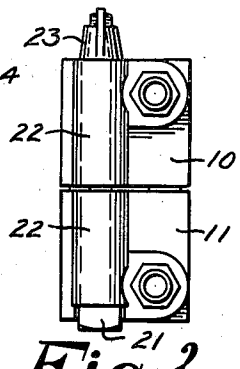


Fig. 2

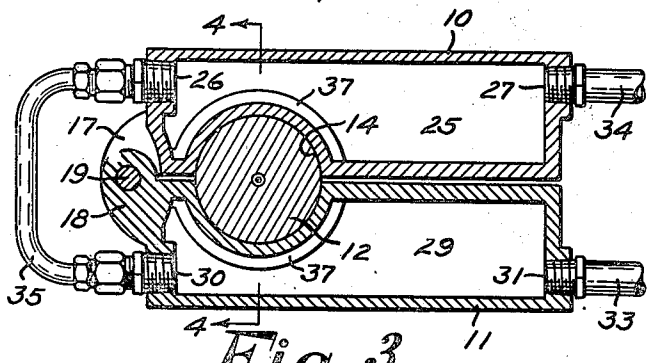


Fig. 3

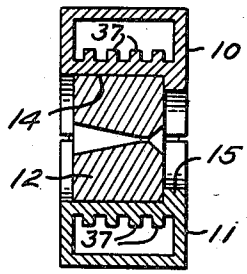


Fig. 4

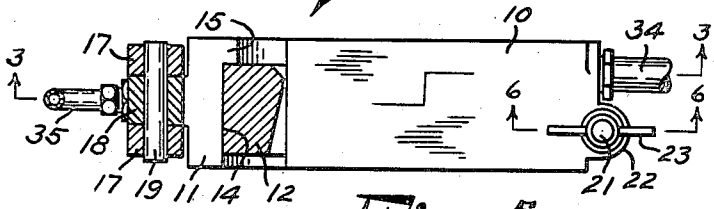


Fig. 5

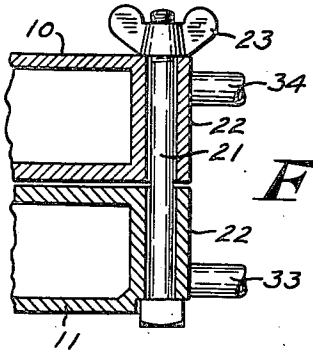


Fig. 6

Inventor

PHINEAS A. BEAMAN

By Albert G. Blodgett

Attorney

Patented Dec. 14, 1943

2,336,771

UNITED STATES PATENT OFFICE

2,336,771

DIE HOLDER

Phineas A. Beaman, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a corporation of Massachusetts

Application June 12, 1942, Serial No. 446,706

8 Claims. (Cl. 205—25)

This invention relates to die holders, and more particularly to an improved device for holding wire-drawing dies and arranged for the circulation of cooling fluid therethrough.

Considerable heat is generated when wire is drawn through a die at high speed, and the desirability of cooling the die under certain conditions has been recognized. In certain die holders heretofore utilized, water is circulated in direct contact with the outer surface of the die. In such constructions great difficulty is encountered in preventing leakage of the water, and this is a very important matter since the wire is lubricated by means of compounds which lose their effectiveness when wet. In certain other die holders the die rests in a recess in a water cooled metal body, with no provision to ensure rapid transfer of heat from the die to the surrounding metal, so that the die is not cooled to the extent desired. Other prior die holders are very difficult and expensive to manufacture.

It is accordingly one object of the invention to provide a fluid cooled die holder which will be free from leakage and capable of withdrawing heat in an efficient manner from an associated die.

It is a further object of the invention to provide a simple and inexpensive fluid cooled die holder which will grip the die firmly and ensure rapid absorption of heat from the die.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended thereto.

Referring to the drawing illustrating one embodiment of the invention and in which like reference numerals indicate like parts,

Fig. 1 is an elevation of a fluid cooled die holder with a die mounted therein;

Fig. 2 is an end view of the device;

Fig. 3 is a section on the line 3—3 of Fig. 5;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 1; and

Fig. 6 is a section on the line 6—6 of Fig. 5.

The embodiment illustrated comprises an upper member 10 and a lower member 11 therebeneath arranged to clamp a cylindrical wire-drawing die 12 between them. These members are rectangular hollow metal castings, preferably of bronze, and their adjacent faces are recessed to form a horizontal cylindrical bore 14 of the proper size to receive the die. An inwardly extending flange 15 is provided at one end of the bore to form a shoulder which will support the die against the pull of the wire traveling therethrough.

The members 10 and 11 are connected at one end by a suitable hinge so that they may swing apart sufficiently to loosen their grip upon the die and allow it to be removed. For this purpose the upper member 10 is provided at one end with a pair of depending spaced lugs 17, and the lower member 11 is provided with a lug 18 which extends upwardly between the lugs 17. A horizontal hinge pin 19 extends through the lugs, this pin preferably having a drive fit in the center lug 18 and being free to turn in the lugs 17. The bore 14 is located somewhat closer to the hinged ends of the castings 10 and 11, and their other ends are connected by a vertical bolt 21 which extends through bosses 22 on the castings. The upper end of this bolt is provided with a wing nut 23. It will be apparent that by tightening the nut 23 the castings can be drawn together and the die will be firmly gripped in the bore 14, thus ensuring rapid transfer of heat from the die to the castings.

The heat which reaches the castings 10 and 11 is absorbed by a stream of cooling fluid, such as water, which flows continuously therethrough. For this purpose the upper casting 10 is shaped to provide a chamber 25 having an inlet opening 26 adjacent the hinged end and an outlet opening 27 adjacent the other end. Similarly the lower casting 11 is shaped to provide a chamber 29 having an outlet opening 30 adjacent the hinged end and an inlet opening 31 adjacent the other end. These four openings are tapped for the reception of pipe connections. A supply pipe 33 is connected to the opening 31, and a discharge pipe 34 is connected to the opening 27. The openings 26 and 30 are connected by a U-shaped conduit 35 preferably formed of soft copper tubing, which is relatively flexible in order to allow a slight movement of the castings about the hinge pin 19. In order to increase the rate of heat transfer to the water, ribs 37 are provided on the outer side of the wall of the bore 14 in each casting.

In operation the die holder will be mounted in any suitable die box, a die 12 will be placed in the bore 14, and the wing nut 23 will be tightened to clamp the castings tightly about the die. Water will be delivered to the chamber 29 from the pipe 33, and then flow through the tube 35 to the chamber 25 and the outlet pipe 34. Heat generated by the wire-drawing process will be absorbed and carried away by the water, thereby

preventing the die from reaching too high a temperature.

It will now be apparent that the invention provides a very simple and inexpensive fluid-cooled die holder. The two principal members 10 and 11 are simple castings which can be manufactured very easily. Each of the chambers 25 and 29 will be formed by a core which can be supported in the foundry mold by core prints at its opposite ends, corresponding with the inlet and outlet openings at opposite ends of the chamber. Very little machine work is required. In fact the only machining operations necessary on these castings are the drilling of the holes for the hinge pin 19 and the bolt 21, the drilling and tapping of the four holes for the pipe connections, and the finishing of the bore 14. This bore will be finished after the hinge pin 19 has been inserted, with the two castings held a slight distance apart. These are all very simple operations, and the cost of manufacture will be comparatively low.

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

1. A die holder comprising two separate hollow members shaped jointly to provide a recess for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, a fluid conduit connecting the two members, means to supply cooling fluid to one member, and means whereby fluid may escape from the other member.

2. A die holder comprising two separate hollow members shaped jointly to provide a cylindrical bore for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, a fluid conduit connected at its ends to the respective members, means to supply cooling fluid to one member, and means whereby fluid may escape from the other member.

3. A die holder comprising two separate hollow members of cast metal shaped jointly to provide a recess for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, a fluid conduit of relatively flexible material connected at its ends to the respective members, means to supply cooling fluid to one member, and means whereby fluid may escape from the other member.

4. A die holder comprising two separate elongated hollow members hinged together at one end and shaped jointly to provide a recess for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, a fluid conduit of relatively flexible material connecting the members adjacent their hinged ends, means to supply cooling fluid to one member, and means whereby fluid may escape from the other member.

5. A die holder comprising two separate elongated hollow members of cast metal hinged together at one end and shaped jointly to provide a recess for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, each member having two openings in its opposite ends, a U-shaped conduit of relatively flexible material connecting the openings in the hinged ends of the members, and means to supply cooling fluid to the other opening in one of the members.

6. A die holder comprising two separate elongated hollow members of cast metal hinged together at one end and shaped jointly to provide a recess for the reception of a wire-drawing die, a bolt connecting the other ends of the members to pull them together and thereby clamp the die between them, each member having two openings in its opposite ends, a U-shaped conduit of relatively flexible material connecting the openings in the hinged ends of the members, and means to supply cooling fluid to the other opening in one of the members.

7. A die holder comprising two separate hollow members shaped jointly to provide a recess for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, and means to supply cooling fluid to the interior of the members.

8. A die holder comprising two separate juxtaposed hollow members with their adjacent faces provided with substantially semi-cylindrical recesses which jointly provide a pocket for the reception of a wire-drawing die, means to urge the members toward one another and thereby clamp the die between them, and means to supply cooling fluid to the interior of the members.

PHINEAS A. BEAMAN.