(No Model.)

J. B. JENKINS.

WIRE DRAWING DIE.

No. 382,650. Patented May 8, 1888.

Fig 1.

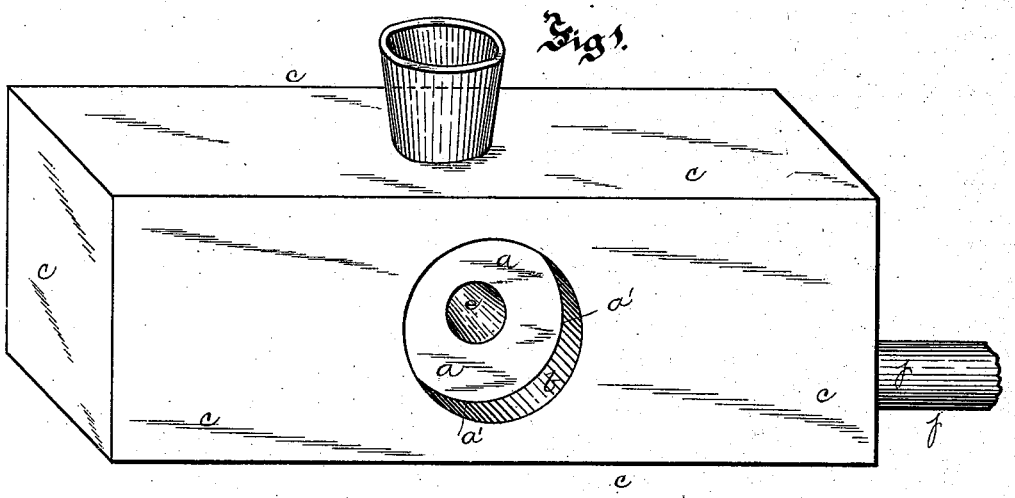


Fig 3.

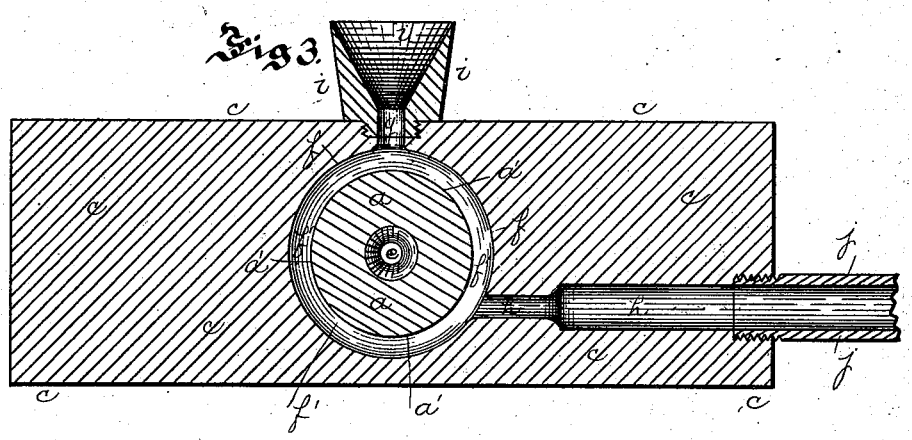
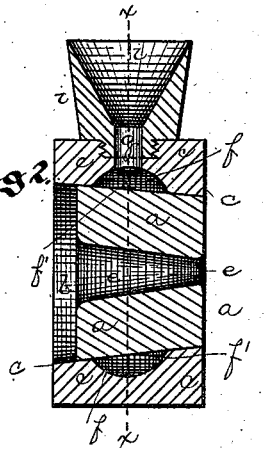


Fig 2.



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UNITED STATES PATENT OFFICE.

JOHN B. JENKINS, OF PITTSBURG, ASSIGNOR OF ONE-HALF TO D. S. CARROLL, OF ALLEGHENY CITY, PENNSYLVANIA.

WIRE-DRAWING DIE.

SPECIFICATION forming part of Letters Patent No. 382,650, dated May 8, 1888.

Application filed August 4, 1887. Serial No. 246,089. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. JENKINS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Drawing-Dies; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to dies for drawing wire, rods, or shafting, and more especially to the cooling of the dies. In the drawing of wire or shafting two forms of drawing-dies are usually employed, one consisting of a hardened steel block having a die-hole or series of die-holes swaged therein, and the other of a tapering die inserted in a tapering seat in a die-block, so that if the die becomes worn it can be replaced by a new die without disturbing the die-block. During the drawing operation the walls of the die and the adjacent metal become heated by the friction of the wire passing through it to such an extent that the temper of the die soon becomes injured and the steel softened, so that the die-hole wears very rapidly and it no longer produces the desired reduction in the diameter of the metal being drawn. The drawing operation must then be stopped and the die replaced by another, and this injured die either thrown away or reamed to larger size and the die-hole re-formed before it can be again used, which is a troublesome operation and involves delay and expense. To avoid this excessive wear of the die holes, some method of cooling the die during drawing is necessary; but it has been found that if the cold water comes in contact with the wire before it passes into the die the wire will immediately snap or break in two. Hence the spraying of the die with water is impracticable, as the water would run down on the wire in front of the die, as well as in the rear, and cause it to break.

To avoid these objections and secure some means of cooling the die so that the water will not come in contact with the wire during drawing is the object of my invention.

To that end my invention consists in a die having an annular space or chamber around the die-hole and water feeding and discharging connection therewith, by which the die is cooled by a constant circulation of water or cold air around it, as will be more fully hereinafter set forth.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved die in its preferable form. Fig. 2 is a central vertical section of the same; and Fig. 3, a longitudinal vertical section on the line *x x*, Fig. 2.

Like letters refer to like parts in each of the figures of the drawings.

I have shown my invention applied to the form of drawing-die in which the die *a* is inserted in a tapering seat, *b*, in the separate die-block *c*. This die *a* is of hard cast-steel and has the die-hole *e* formed therein, the outer surface, *a'*, of the die being turned off, so as to accurately fit the tapering walls of the seat *b* in the die-block *c*. This die-block *c* is cored out on the surface of its tapering seat, as at *f*, so as to form an annular chamber, *f'*, around the die when the latter is inserted in the seat.

If desired, some form of packing may be inserted between the outer surface of the die and the seat *b* to secure a tighter joint; but it is thought that if the die and the seat in the die-block are accurately formed a water-tight chamber will be obtained, as the great force which is brought on the die during drawing will hold it against the walls of the seat with great pressure. This annular chamber or channel *f'* in the die-block communicates with a water-inlet passage, *g*, and an outlet-passage, *h*, formed in the die-block, the inlet-passage preferably leading from the top and having a funnel, *i*, or a supply-pipe at its upper end, and the outlet-passage from the sides and having a pipe, *j*, secured therein by which the waste water can be carried to the desired point. The die-block *c*, when in its holder, is located below a suitable water-supply pipe, so that the water can run in the funnel *i*, circulate around the die *a*, and finally pass out of the outlet *h*. The die *a* is thus kept cool by a constant current of cold water circulating around it and in contact with the metal of the die during the drawing operation, and all heat

generated by the friction of the wire or rod passing through the die is taken up by the water or air and the softening of the steel avoided. This very materially increases the length of time which the dies can be employed without change, and also the life-time of the die itself, which is a great advantage over the present practice, where the dies have to be replaced in a comparatively short time. My invention may also be applied to the form of dies which consist simply of a plate with a die-hole formed therein by coring out the plate around the die-hole and inserting a suitable plug in the outer end of the chamber thus formed, and forming water inlet and outlet passages from the sides or ends of said plate to this chamber; and, in fact, I regard any construction which gives a chamber or space around the die-hole and inlet and outlets therefrom, so that circulation of water or cold air therein is obtained, as coming within the spirit of my invention.

Having now described my invention, what I claim is—

1. A drawing-die having a space or chamber in the metal around the die-hole and water or air feeding and discharge connection therewith, substantially as and for the purposes set forth.

2. A drawing-die having an annular space or chamber around the die-hole, and inlets and outlets from said chamber, substantially as described.

3. In a drawing-die, the combination of a die having a die-hole therein with a die-block having a seat for said die and an annular groove or channel in said seat, and an outlet and inlet from said channel, substantially as and for the purposes set forth.

In testimony whereof I, the said JOHN B. JENKINS, have hereunto set my hand.

JOHN B. JENKINS.

Witnesses:
N. S. STOCKWELL,
D. S. CARROLL.