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2,028,652

DRAWING OF WIRES

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Fig. 1

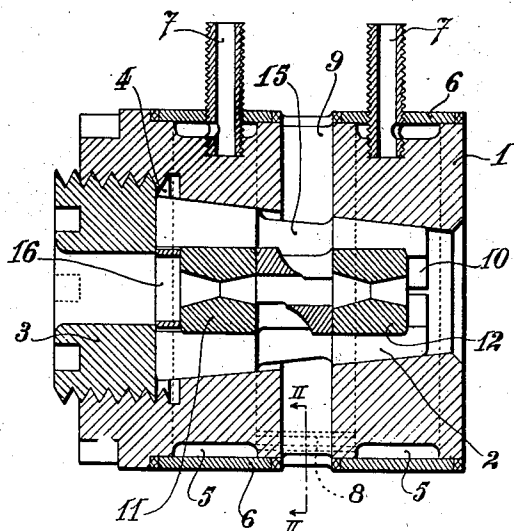


Fig. 2

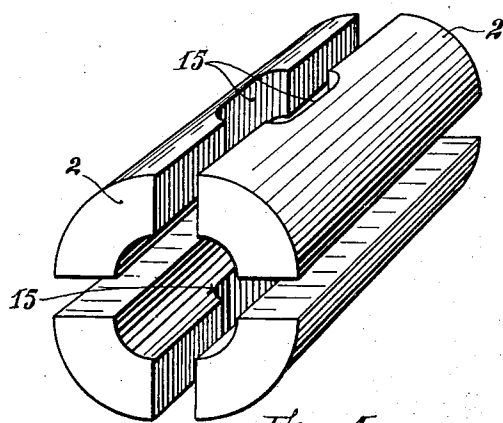
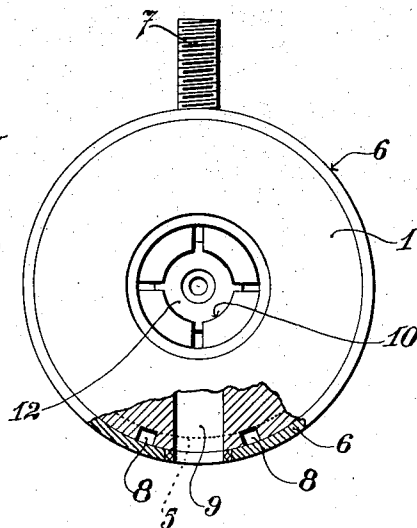


Fig. 4

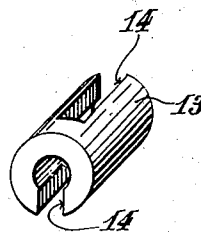


Fig. 3

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DRAWING OF WIRES

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5 Claims. (Cl. 205—25)

My invention relates to the drawing of wires.

A good drawing requires a low temperature of the drawing cone of the die and a high counter-tension within the die. The temperature of the drawing cone is kept as low as possible by the provision of cooling means within the die holder, but such means absorb heat from the die only by conduction through the mass of the die holder. Since heat is generated on the extremely small surface of the drawing cone, the latter is liable to become overheated notwithstanding such cooling means.

It is possible to lower the temperature of the drawing cone by reducing the elongation of the wire within the die. But this reduces the counter-tension near the outlet of the drawing cone; the pressure of the metal of the wire against the inner surface of the die becomes too high and the cone wears out too rapidly. Also the number of drawing operations for a given elongation becomes too great.

According to my invention several dies are disposed in succession with each other, preferably co-axially in the same die-holder and the wire is passed through them at the same time on its way to the drawing spool.

In the annexed drawing:

Fig. 1 is a longitudinal section of a die holder according to my invention.

Fig. 2 is an end view thereof with partial section through line II—II of Fig. 1.

Fig. 3 is a perspective view of the hollow stay.

Fig. 4 is a perspective view of the split conical member.

The die holder comprises a cylindrical body 1 having a conical central bore into which is fitted a split conical member 2 held by an annular cover 3 which is screwed into a threaded cylindrical recess 4 of body 1. The latter has two circular grooves 5 on its outer surface. A tube 6 is fitted over the grooved portion of body 1 so as to close the grooves which thus form canals for the cooling fluid. Two hollow studs 7 are adapted for the inlet and the outlet of said fluid. The grooves are connected with each other by longitudinal passages 8, such passages being preferably provided in the portion opposite to the studs 7.

A transverse hole 9 is also provided through body 1 and tube 6, such hole being used for the admission of lubricant to the dies.

The tightness of the joints is preferably ensured by soldering.

The split conical member 2, Fig. 4, has a cylindrical internal bore with a restricted outlet

as shown at 10, Fig. 1. It encloses the first-step die 11 and the finishing die 12 separated from each other by a cylindrical hollow stay 13, Fig. 3, having opposed grooves 14 arranged to permit of admitting lubricant to the wire between the dies 11 and 12. The split conical member 2 is itself transversely pierced, as shown at 15, to afford a communication between hole 9 and the grooves 14 of stay 13.

An annular stay 16 is arranged between the first-step die 11 and the face of cover 3.

The wire is drawn from left to right. It passes through the first-step die 11 and thence through the finishing die 12, lubricant being if needed admitted at will by means of hole 9.

Since the contraction of the wire is small for each die, the amount of heat generated is reduced and the latter easily flows through the metal of the dies, of member 2 and of body 1, without the temperature of the drawing cones becoming unduly high. The conditions of working are good for the finishing die 12 since the wire which passes through the same is already tensioned owing to the drawing through the first step die 11. The bore of the finishing die is thus well preserved from wear and the size of the wire remains unaltered during the drawing operation. In fact high drawing speeds are attainable without risk of wire breakage and without an abnormal wear of the dies.

A further advantage of my invention is that the dies 11 and 12 are radially compressed by the split conical member. This compression balances the radial action resulting from the drawing of the wire and the strain on the metal of the external part of the die is suppressed. The radial action of the wire on the die being also reduced owing to the decrease of the elongation, it becomes possible to use smaller dies. The cost of the dies is therefore greatly lowered.

I claim:

1. A wire drawing device comprising in combination a cylindrical die-holder having circular grooves on its outer periphery; a tube tightly fitting on said grooved portion; a cooling fluid inlet in communication with one of said grooves; a cooling fluid outlet in communication with another one of said grooves; and passages between said grooves to ensure circulation of the cooling fluid.

2. A wire drawing device comprising in combination a die holder having a conical axial bore with a threaded cylindrical recess of larger diameter at the entrance thereof and a transverse hole; a split cone fitting into said conical axial bore, said split cone having a cylindrical axial bore

with restricted outlet at the tip of the cone and a transverse passage able to register with said transverse hole; two cylindrical drawing dies arranged in said cylindrical axial bore respectively on one and the other side of said transverse passage; a hollow stay in said cylindrical bore, said stay having grooves affording a radial passage; an annular screw axially screwed into said threaded recess to axially press said split cone into said conical axial bore to radially compress said drawing dies; and a tubular stay interposed between said annular screw and the adjacent one of said drawing dies.

3. A high-speed drawing device for plain cylindrical wires comprising in combination a die-holder; a plurality of drawing dies of decreasing diameter co-axially arranged within said die-holder; means to radially compress said drawing dies within said die-holder; and means to axially retain said drawing dies in proper relation within said die-holder, said die-holder and said first-named and second-named means having holes provided between each two successive drawing dies to afford a passage for circulating lubricant.

4. A high-speed drawing device for plain cylindrical wires comprising in combination a die-holder having a conical axial bore; a split cone fitting into said conical axial bore, said split cone having a cylindrical axial bore with restricted out-

let at the tip of the cone; a plurality of cylindrical drawing dies arranged in said cylindrical axial bore in such relation that their diameters decrease from the inlet of said last-named bore down to its restricted outlet; a hollow stay in said cylindrical bore between each two successive drawing dies; and means to axially press said split cone into said conical axial bore to radially compress said drawing dies.

5. A high-speed drawing device for plain cylindrical wires comprising in combination a die-holder having a conical axial bore with a threaded cylindrical recess of larger diameter at the entrance thereof; a split cone fitting into said conical axial bore, said split cone having a cylindrical axial bore with restricted outlet at the tip of the cone; a plurality of cylindrical drawing dies arranged in said cylindrical axial bore in such relation that their diameters decrease from the inlet of said last-named bore down to its restricted outlet; a hollow stay in said cylindrical bore between each two successive drawing dies; an annular screw axially screwed into said threaded recess to axially press said split cone into said conical axial bore to radially compress said drawing dies; and a tubular stay interposed between said annular screw and the adjacent one of said drawing dies.

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