

F. KRAUSE.
METHOD AND APPARATUS FOR MAKING WIRE DRAWING DIES.
APPLICATION FILED DEC. 22, 1911.

1,056,694.

Patented Mar. 18, 1913.

Fig. 1

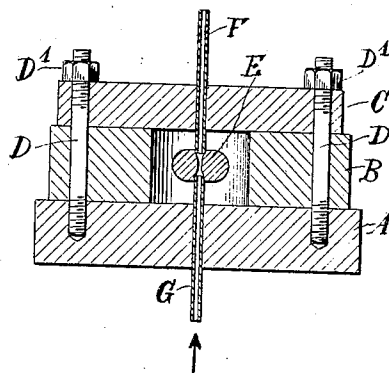


Fig. 2

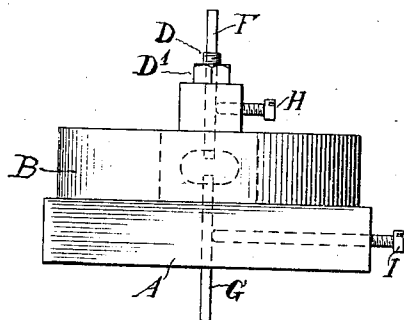


Fig. 3

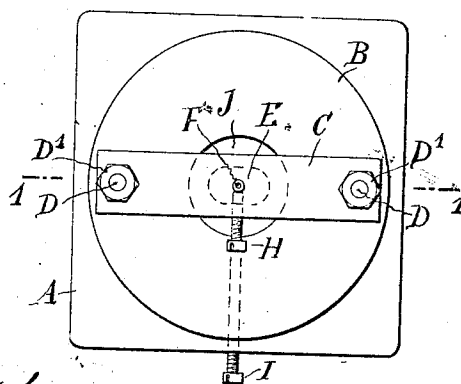
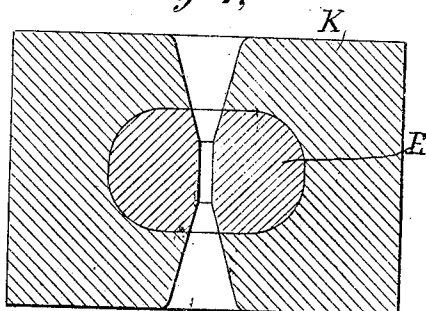


Fig. 4



Witnesses:
Max B. A. Doring
Marie H. Braun.

Inventor
Frederick Krause
By his Attorney
L. K. Böhm.

UNITED STATES PATENT OFFICE.

FREDERICK KRAUSE, OF JERSEY CITY, NEW JERSEY.

METHOD AND APPARATUS FOR MAKING WIRE-DRAWING DIES.

1,056,694.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed December 22, 1911. Serial No. 687,342.

To all whom it may concern:

Be it known that I, FREDERICK KRAUSE, a citizen of the Empire of Germany, and a resident of Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Methods and Apparatus for Making Wire-Drawing Dies, of which the following is a specification.

This invention relates to an improved method of and apparatus for making wire drawing dies.

Heretofore the casting of mantles around precious stones, preferably diamonds, was effected by supporting the diamond in the direction of its boring upon one or between two broad plates to hold same in position while casting a ring of metal, such as steel or nickel alloy around it, and to conduct away from the stone the high fusion heat of the metal of which the setting is composed. Wire drawing dies produced according to the above mentioned method are deficient in that the diamond, during the operation of drawing the wire does not have any support in the direction of its boring because the outer side of the boring is free from supporting material, therefore, the diamond itself has to bear the entire strain of the drawing of the wire. This quite often results in a splintering of the diamond around the opening or of tearing out particles at that side of the boring where the wire leaves the die.

It is the purpose of the present invention to overcome the described deficiencies and produce a wire drawing die whose stone is provided with a metallic mantle cast around it so that practically the boring alone is left free. Thus the stone has a strong support on part of the mantle during the drawing of the wires. To attain this purpose, the stone must be held between two conical pointed rods within the mold.

Practice has shown that these pointed supporting rods fuse to the cast metal owing to the high fusion temperature of the latter, particularly when steel or nickel alloys are used. Such fusion takes place especially on the thin pointed portions of the rods closely to the stone. The boring of the stone later becomes very difficult and the fused portions of metal near the stone are hard to open whereby the stone is injured in most instances. An insulation of the thin pointed

portions of the supporting rods with a refractory coating of clay or the like is not reliable. The insulating mass does not stick uniformly to all portions of the pointed rods, but falls off or is partly removed by the flowing metal. In this manner the cast mantle will contain impurities and a partial fusion of the mantle and the supporting rods may take place. Furthermore, experience has shown that the points of the holding rods are not sufficiently in contact with the stone, which results in an imperfect conduction of the heat therefrom. Under these circumstances the boring of the stone suffers because the opening therein is rough and shows minute cracks.

For the purpose of avoiding the described deficiencies I have invented the method, and apparatus for carrying same into effect, described hereinafter.

The present invention is illustrated in the accompanying drawing in which:

Figure 1 represents in vertical central section on line 1—1 of Fig. 3 an apparatus for making wire drawing dies in which the present method may be carried out. Fig. 2 is a side elevation of Fig. 3. Fig. 3 is a top plan view, and Fig. 4 illustrates in central sectional view on an enlarged scale the stone with the metal cast around it.

Similar characters of reference denote like parts in all the figures.

One of the novel features of the present invention consists in the use of fine metal tubes having more or less thin walls in place of the solid rods heretofore employed. These tubes do not require any insulation and may fuse or weld to the cast metal but leave the boring of the stone free. This renders it possible to finish the opening in the casting without difficulty and without injury to the stone, said opening being preferably made conical as shown in Fig. 4. In addition thereto the arrangement of the device is such that the mantle may be cast around the stone while same is in a horizontal position which permits of a circulation of air through the tubes during and after casting, whereby a sufficient cooling in the interior of the stone, particularly in the neighborhood of the opening, is effected. It is evident that the hot air rises and, therefore, a continuous circulation of air will take place during the process of casting, because the tubes are mounted in a vertical

position. The boring of the stone thus remains intact during the process of casting the mantle. If desired, air under slight pressure may be blown through the tubes and stone after the casting to effect a quicker cooling in the interior of the stone.

In the drawing A represents a base plate which is provided with a central boring forming a passage for one of the tubes. An iron ring B is mounted upon the base plate. A bridge C rests on the iron ring B. The bridge, ring and base plate are secured together by means of screws D with nuts D'. In order to render it possible to cast mantles around various sizes of diamonds, a number of rings may be provided, all fitting the apparatus but leaving more or less space inside. While the bottom tube G passes through the passage in the base, a like passage is produced in the bridge C through which the tube F is introduced into the apparatus. For the purpose of securing the lower tube G in the desired position a partly threaded horizontal passage is produced in the base plate A through which a screw I passes. The diamond E or other precious stone is placed onto the lower tube and the upper tube likewise is held in place by means of a screw H passing sidewise through the bridge C. As shown in Fig. 3, the ring B has an interior opening J which is wider than the bridge C, so that the liquid metal, if poured into the mold does not strike the stone directly, but meets the interior of the mold first. It is easily seen from Fig. 4 that the mantle K produced around the stone covers same completely up to the opening therein, except to note that the passages through the mantle have been enlarged to form conical openings as shown.

The little tubes for supporting the diamond may be of any suitable metal, for instance of iron, steel, nickel, brass and the like. Owing to the interior cooling by the circulation of air, said tubes may have relatively thin walls, even when temperatures occur which would fuse solid rods of the same diameter. This is especially valuable when mantles are cast from nickel alloys which have a higher fusion point than iron or steel. With such material of a higher fusion point it is particularly necessary to cool the boring of the stone for the purpose of protecting it on its sensitive inner surface. In this manner said opening in the stone is protected against injury and does not become rough and get minute cracks even if mantles are cast of materials possessing very high fusion points.

By virtue of the opening in the ring B, which is wider than the bridge C, the stone or diamond may be conveniently mounted between the little tubes and adjusted into an exact horizontal position by means of

pincers. As previously stated the metal is poured into the mold on one side of the ring B, it rises in the mold and on the other side of the bridge, it is readily seen, when sufficient metal has been cast. As soon as the metal becomes hard, air may be blown through the tubes by pressure, to effect a quick cooling of the stone from the interior. When sufficiently cooled off, the form may be opened by releasing the screws and the die, consisting of the diamond and mantle, may be taken out. The projecting portions of the tubes are now cut off and the conical openings produced. In the described manner a mantle may be cast around the stone or diamond which covers same up to its opening.

I claim as my invention:—

1. The method of producing wire drawing dies consisting in supporting a bored precious stone between two small tubes within a mold, and casting a metallic mantle all around said stone up to its opening.

2. The method of producing wire drawing dies consisting in supporting a bored diamond horizontally between two small vertically mounted metal tubes within a mold, and casting a metallic mantle around said diamond up to its opening.

3. The method of producing wire drawing dies consisting in supporting a bored diamond horizontally between two small vertically mounted metal tubes within a mold, casting a metallic mantle around said diamond up to its opening, and creating simultaneously an air draft through the supporting tubes and diamond.

4. An apparatus for producing wire drawing dies composed of a base plate with vertical opening, an exchangeable ring thereon with central mold opening, a bridge on said ring of less diameter than the ring opening and having a vertical boring coinciding with the like boring in the base plate, two small tubes one each mounted in said vertical openings and adapted to support the diamonds horizontally, and means for securing and releasing the various parts of the apparatus.

5. An apparatus for producing wire drawing dies composed of a base plate with vertical central opening, a small vertical tube within said opening, a securing screw for same in the base plate, an exchangeable ring on said plate with borings and central mold opening, a bridge with borings and central opening coinciding with the corresponding opening in the base plate, a second vertical tube in the central opening of the bridge, a securing screw for same therein, and securing screws passing through the bridge and ring into the base plate, said vertical tubes being adapted to support the bored diamond horizontally centrally within the mold opening of the ring.

6. In an apparatus for producing wire
drawing dies an exchangeable ring with
mold opening, two small tubes extending
into said mold openings and adapted to sup-
5 port a bored diamond in a horizontal posi-
tion, and means for supporting said ex-
changeable ring.

Signed at New York, N. Y., this 21st day
of December 1911.

FREDERICK KRAUSE.

Witnesses:

MARIE H. BRAUN,
MARIE H. LEHR.