

(Model.)

F. A. NICKERSON.

COMPOUND DIE FOR PLASTIC MATERIALS.

No. 285,058.

Patented Sept. 18, 1883.

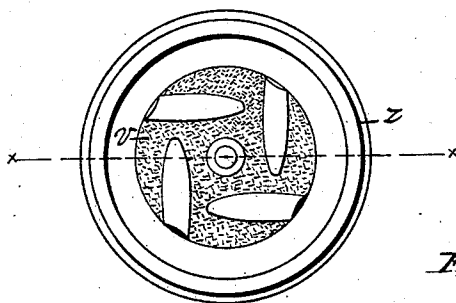


Fig I,

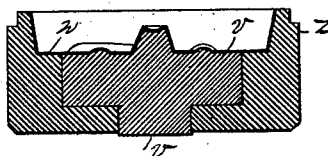


Fig II,

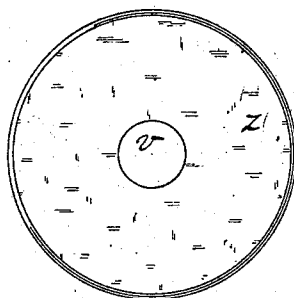


Fig III,

Witnesses,
Wm H. Chapin
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UNITED STATES PATENT OFFICE.

FRED. A. NICKERSON, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE
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COMPOUND DIE FOR PLASTIC MATERIALS.

SPECIFICATION forming part of Letters Patent No. 285,058, dated September 18, 1883.

Application filed May 4, 1883. (Model.)

To all whom it may concern:

Be it known that I, FRED. A. NICKERSON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Compound Dies for Plastic Materials, of which the following is a specification.

This invention relates to improvements in compound dies for forming, under pressure, objects from plastic material; and it consists in constructing said dies from two metals of different degrees of hardness, and in covering their finished faces with an overlying thin coating of nickel, the object being to provide economical means for making such dies, and for preparing their faces in such a manner that the action of the heat to which they are subjected in working is in no way injurious to the articles molded therein, and to produce upon such dies a face of uniform hardness.

In the drawings forming part of this specification, Figure I is a plan view of the face of a die constructed according to my invention. Fig. II is a sectional view through the line *x x*, Fig. I. Fig. III is a plan view of the bottom of the die.

In the drawings, *z* indicates the die-blank; *v* is the figure-bearing core or center, and *n* indicates the nickel coating of the compound die.

In the manufacture of articles from plastic materials having the nature of hard rubber, which are softened by contact with a heated metal plate, a great variety of dies is required, and particularly so when such materials enter into the formation of buttons and similar objects, and means have long been sought whereby the figured portion of such dies may be made of a soft and easily-worked metal, and then by inclosing such figured portion in a die-blank, *z*, make a die which might serve a practical purpose and take the place of an expensive solid steel die. Such efforts have heretofore proved futile, for the reason that a soft-metal center and a steel or hard-metal blank present to the plastic material which is forced against them with a pressure-power of several tons metal faces of such varying capa-

bilities of resistance that perfect work has not been obtainable from dies made of said metals. Furthermore, the necessary heat to which said dies are subjected in working—say 200° to 300°—operates, in dies which are made of two metals having differing affinities for heat, unfavorably to the production of perfect work therefrom when the faces of the two metals are allowed to come in contact with the pressed article, and such has been the difficulty in making ordinary compound dies practically useful that they have been abandoned.

I have discovered that by applying to the face of the metals of a compound die a coating of nickel, all of the aforesaid objections to dies made of two metals of varying hardness are obviated, and that the result is a die which, in working under the influence of heat and pressure, as aforesaid, produces work equally perfect with that made in a solid hardened-steel die.

In constructing my improved die I make a suitable blank, *z*, from steel, turning out its central portion to receive the figure-bearing center *v*, and to support the latter. Said center *v* is made from brass or metal having a similar nature, and which is easily worked to produce thereon, by impress or by cutting, suitable ornamental designs which it is desired to reproduce upon said articles of plastic material, and said center is tightly fitted into the blank *z*, as shown. I then, by electroplating or by other suitable means, cover the faces of the blank *z* and the center *v* with a coating of nickel, *n*, whereby the said faces are given a surface of uniform hardness, and a compound die is produced having, for practical purposes, the qualities of a solid steel die.

I do not claim, broadly, in this application covering the face of a soft-metal die with nickel, as and for the object stated, as that is the subject of another application already filed.

I am aware of patent to Hyatt, of October 28, 1879, for process of polishing sheets of celluloid by means of "a flat polished surface, preferably of nickel-plated metal." Such I do not claim.

What I claim as my invention is—

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1. The compound die hereinbefore described,
consisting of steel blank and removable cen-
ter piece of softer metal, the working-faces of
both parts being nickel-plated, substantially
5 as described.

2. The compound die hereinbefore described,
having the external portion of hard metal, the
inner portion of soft metal, resting in a conical

recess therein and adapted to fit therein, the
working-face of said soft-metal inset being ro-
nickel-plated, substantially as described.

FRED. A. NICKERSON.

Witnesses:

H. A. CHAPIN,
G. N. BOWERS.