

F. H. HOTCHKISS.
DIE.
APPLICATION FILED MAR. 11, 1908.

939,505.

Patented Nov. 9, 1909.

Fig. 1.

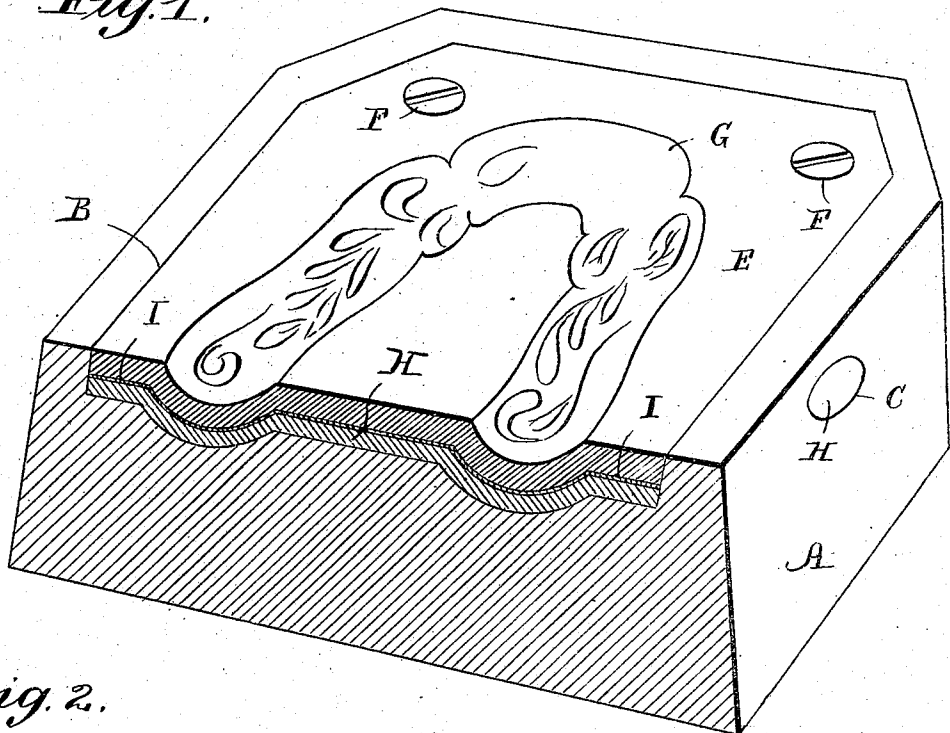
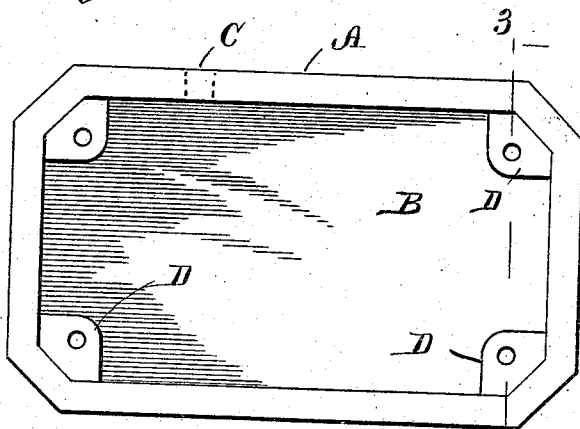


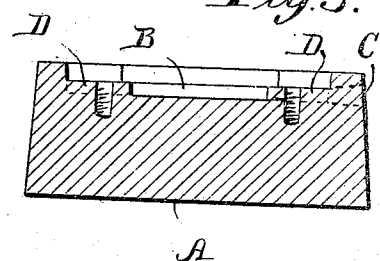
Fig. 2.



WITNESSES

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Fig. 3.



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DIE.

939,505.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed March 11, 1908. Serial No. 420,304.

To all whom it may concern:

Be it known that I, FRANK H. HOTCHKISS, a citizen of the United States, and resident of Shelton, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Dies, of which the following is a specification.

My invention relates to new and useful improvements in dies, for forming special shapes from sheet metal, as for instance in the manufacture of ornamental silver ware.

My invention refers more particularly to that class of dies which comprises in part a die block, a die plate or form, and a layer of filling metal therebetween. Such dies have heretofore been more or less impractical for general die work for various reasons, among which may be mentioned the inability to retain the die plate in proper position within the block so as to insure its retaining its shape. This objection has in some instances been partially overcome by forming the die plate very heavy, but large plates materially add to the expense of the die, as the metal from which such plates are made is very expensive compared with that of which the blocks are formed.

It is therefore the object of my invention to reduce the cost of producing dies for the above purposes by forming the same of several parts; to use a comparatively small die plate of proper metal as for instance bronze in which the design is formed and a large die block of a less expensive metal to support the plate; to produce this class of die in a practical and inexpensive manner and in a way to permit of the use of a thin die plate; to provide a substantial filling beneath the said die plate and intermediate of it and the block to retain the die in shape, and finally in the peculiar construction and method of assembling the said parts.

Referring to the accompanying drawings forming a part of this specification, and upon which similar characters of reference denote like or corresponding parts, throughout the several figures, Figure 1, shows a cross sectional perspective view of a die block constructed in accordance with my invention. Fig. 2, shows a plan view of the die block, upon a smaller scale and with plate removed, and Fig. 3, is a cross sectional view of the block shown in Fig. 2, and taken on line 3—3.

In detail A indicates the die block which may be in any preferred shape and prefer-

ably formed of iron or steel, cast or otherwise shaped to receive the die plate and other metals, and formed to accommodate the shape thereof. In this respect the said block is provided with a recess B in its top side, of a suitable depth and size to receive the die plate E and other metals supporting the same. The block is further provided with an opening C in one side which communicates with the said recess in the top of the block and through which the filling metal is poured while in a molten state. Suitable shouldering lugs D are provided in the outer portions of the recess as shown in Figs. 2 and 3, with their top surfaces finished off at a uniform distance below the top surface of the block A to insure the face of the bronze die plate E finishing flush with the surface of said block. The lugs are also of a uniform height from the bottom of the pocket thereby forming a recess therein when the plate is attached of a uniform thickness to receive the molten metal. The plate is secured to the lugs by flat headed screws F fastened through the said plate and into the lugs of the blocks. The edges of the plate E are finished to snugly engage the walls of the recess in the block so as to prevent any expansion or movement of the plate in practice.

G indicates part of the pattern, as formed in the one half of the die plate shown, which is for a small silver tray, but obviously forms no material feature of the invention since any of the usual class of designs for articles of manufacture as produced by dies can be employed, in dies constructed in accordance with my method.

In the formation of dies of this class I find it especially desirable to use a comparatively hard but free flowing metal H when melted beneath the die plate E as for instance a composition of tin or copper and to run it in such a way and under such condition as to positively and completely fill the entire space under the die plate and to also run it in under such condition as to cause it to adhere and fuse with the plate, so that when the die is complete the parts will be substantially one integral mass and practically inseparable. This obviously prevents any spreading, bending or breaking of the die plate and holds it up in place as well as though formed in one solid piece of bronze.

The die plates E may be produced from any of the die metals as for instance bronze

which is usually employed for that purpose, and may be produced from roller or cast stock which would be shaped to fit the block and cut to form the desired shape, or I may
5 employ an electrotype wherein the plate and design as well are formed by electrolysis with the assistance of a suitable pattern.

In the formation of these dies I first form the plate and then the block. Said plate
10 after being shaped to fit the recess in the block, is plated with suitable material I, as for instance tin. The plate is next secured in position by means of the screws F, of which there may be any number according
15 to the size and shape of the plate, and the partially completed die is thus placed in a furnace or otherwise heated sufficiently to soften the fusing metal I, to slightly expand the metals and soften the tin after
20 which a sufficient quantity of white or other kind of molten metal is run into the die block through the hole C to completely fill the recess beneath the plate. This metal thus obviously readily fuses with the tin
25 and the copper on the bronze plate in a way to thoroughly fit them together and likewise adheres to a degree to the block in a way to thoroughly unite and secure the parts together, so as to uniformly support the
30 plate in position and hold it against displacement during its operations upon sheets of metal.

While the above description has been directed more particularly to a lower die, it
35 will readily be seen that the same method of construction will apply equally as well to an upper die, or force, so called and therefore I do not wish to limit myself to either in particular.

40 Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A die of the class described, the same comprising a die block having a recess therein,
45 in, a die plate secured within the recess, a filling plate of soft metal arranged beneath the die plate, and a plate of fusible metal between the die plate and filling plate and fusing the same together.

2. A die comprising a die block having a
50 suitable recess therein, a die plate within the recess, screws for retaining the plate in place, a layer of filling material interposed between said die plate and the block, and a
55 plate of fusible metal beneath the die plate uniting the same to the filling metal.

3. A die of the class described, comprising a die block having a recess therein and a
60 hole communicating through the side of said recess, shouldering lugs formed within the recess, a die plate arranged within the recess upon said lugs, means for retaining the plate in the recess upon the lugs, and a filling
65 plate of metal intermediate of the die plate and block.

4. A die of the class described, comprising a die block having a recess therein, a die
plate secured in the recess, a filling plate of metal within the recess intermediate of the
70 die plate and block, and a plate of fusible metal between and fused with the die plate and filling plate uniting the same.

5. A die of the class described, the same comprising a block having a recess therein,
75 a die plate secured within the recess, a metal filling plate of uniform thickness within the recess intermediate the die plate and block, and a plate of fusible metal beneath the filling
80 plate for uniting said parts together.

6. A die of the class described, comprising
80 a die block having a recess therein and a hole communicating therewith, shouldered lugs formed within the recess at a uniform distance from the bottom thereof, a die plate
85 arranged within the recess upon said lugs and finishing flush with the surface of said die block, means for retaining the die plate in the recess upon the lugs, and a filling
90 plate of metal of uniform thickness intermediate of the plate and block.

Signed at Shelton, in the county of Fairfield, and State of Connecticut, this 4th day of February, A. D., 1908.

FRANK H. HOTCHKISS.

Witnesses:

C. M. NEWMAN,
RUTH RAYMOND.