

No. 639,096.

Patented Dec. 12, 1899.

L. L. SAGENDORPH.

METHOD OF MAKING DIES FOR SHEET METAL PLATES.

(Application filed Dec. 31, 1898.)

(No Model.)

Fig. 1

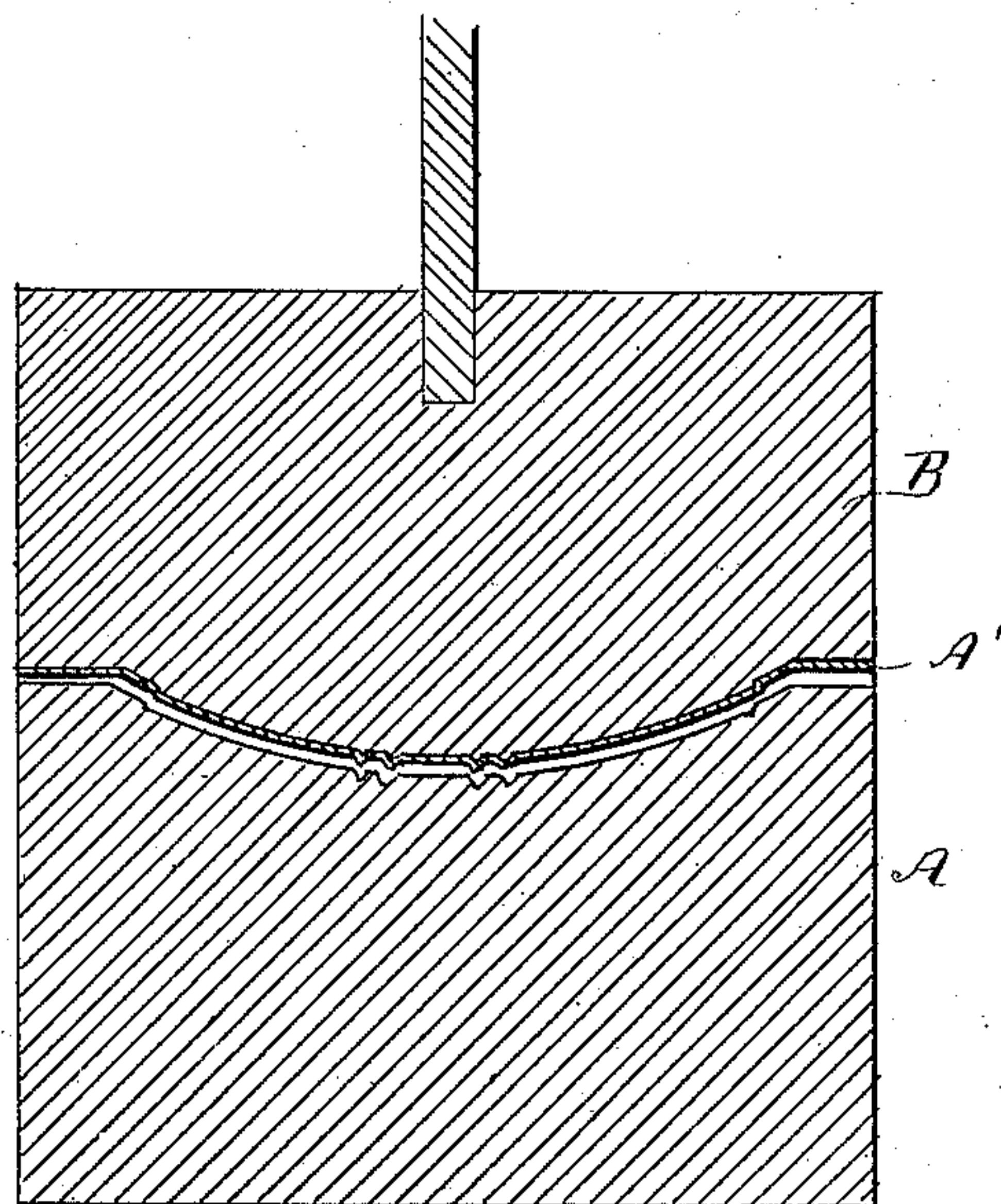


Fig. 2

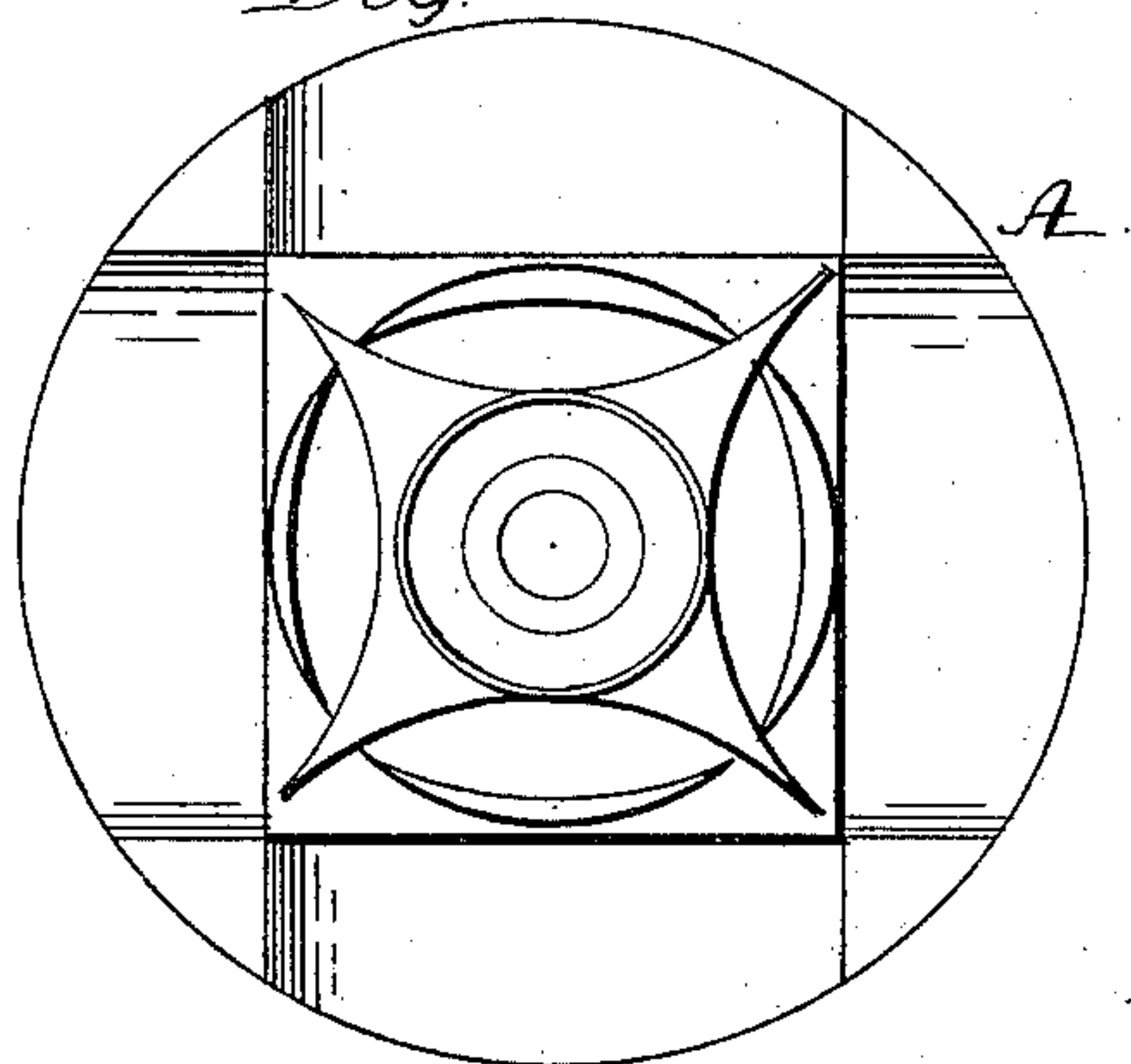


Fig. 3

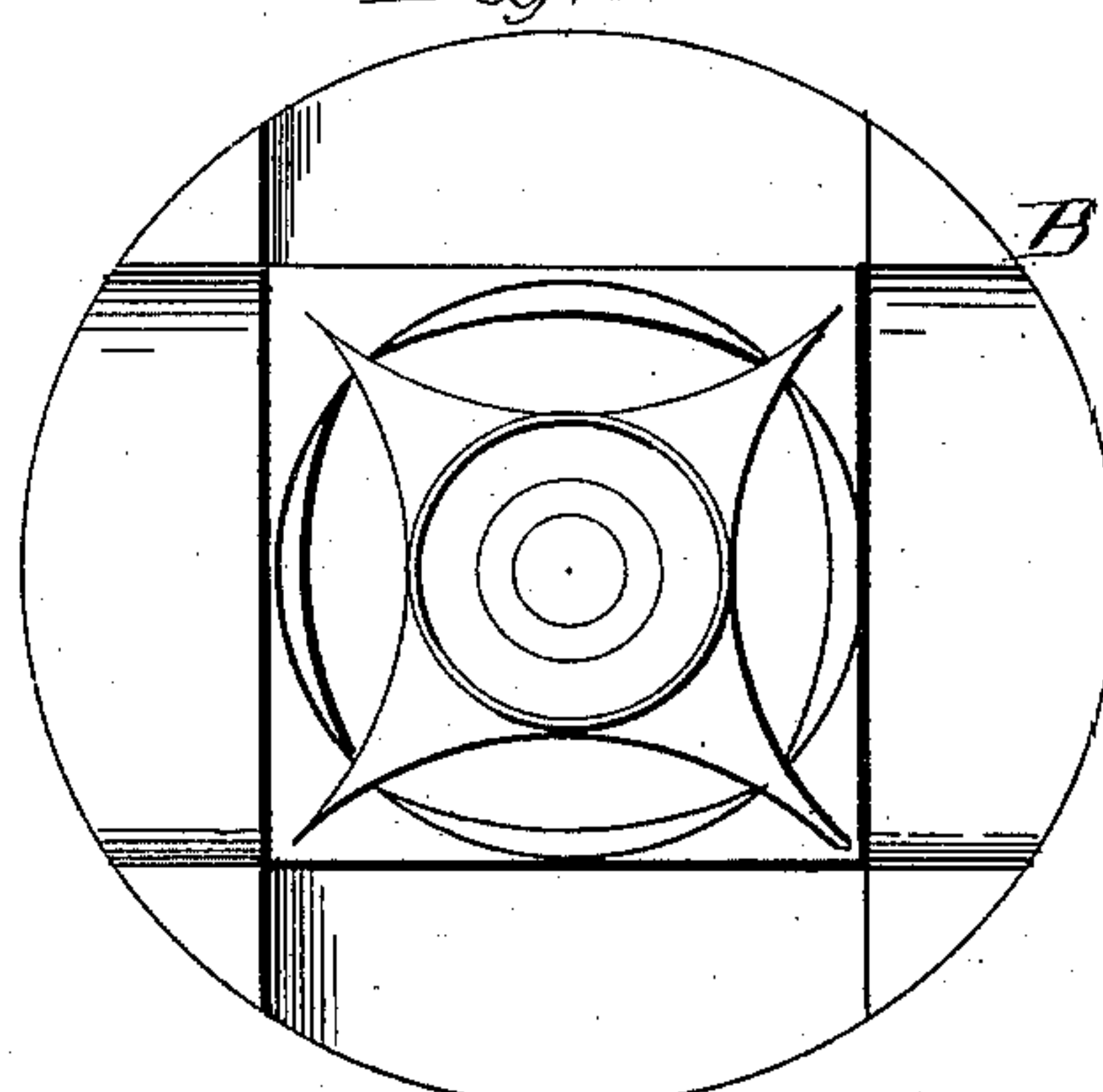
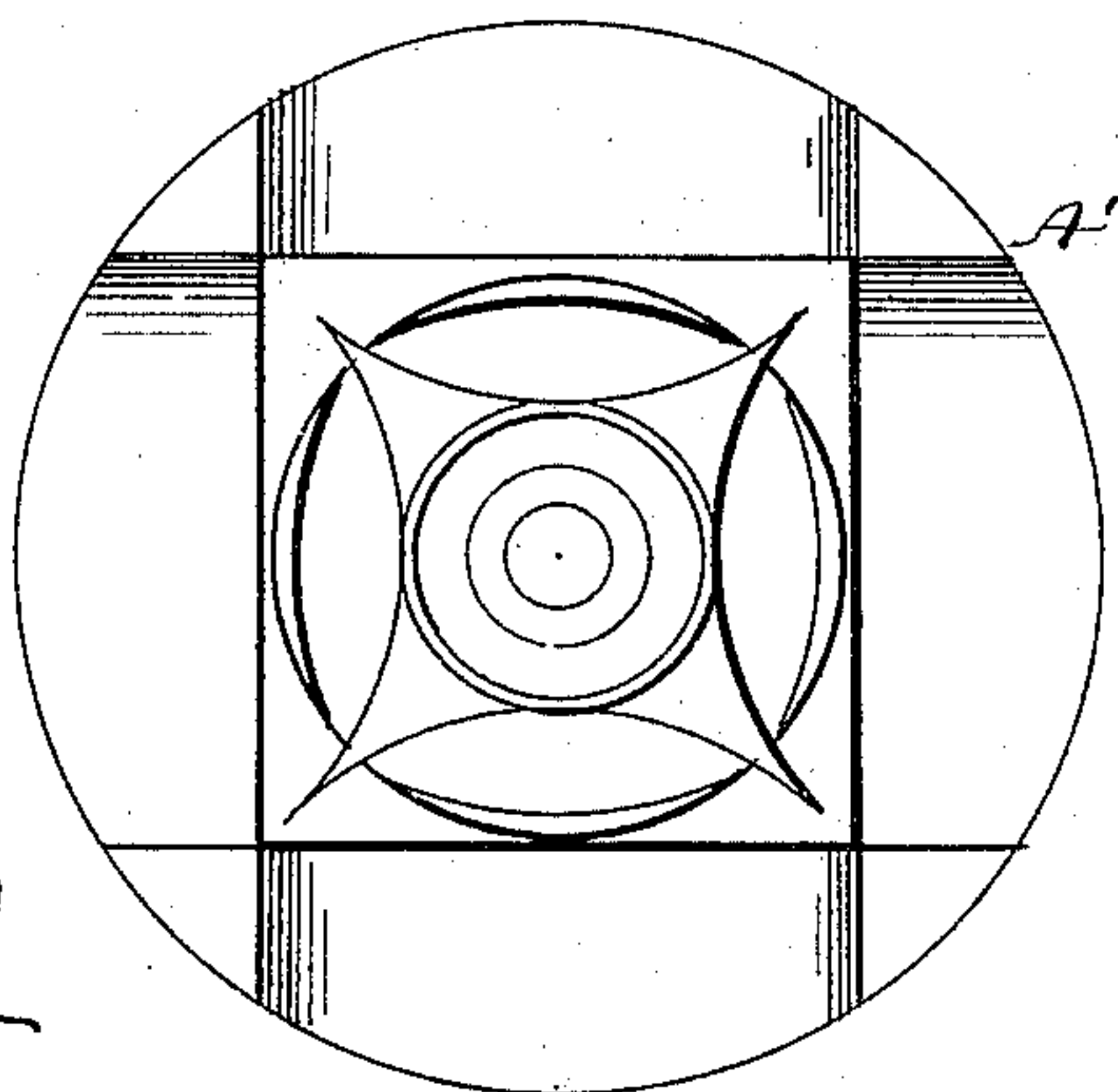


Fig. 4



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# UNITED STATES PATENT OFFICE.

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## METHOD OF MAKING DIES FOR SHEET-METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 639,096, dated December 12, 1899.

Original application filed January 21, 1898, Serial No. 667,437. Divided and this application filed December 31, 1898. Serial No. 700,809. (No model.)

*To all whom it may concern:*

Be it known that I, LONGLEY LEWIS SAGENDORPH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Making Dies for Sheet-Metal Plates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This application is a division of the application filed by me January 21, 1898, Serial No. 667,437.

This invention has relation to dies for pressing into shape metal plates for ceilings, walls, roofs, panels, &c., and has for its object the provision of a method for facing and protecting the soft-metal die member, so that the durability of the latter may be greatly increased, its sharpness preserved, and a very great saving in the cost of die-metal and its renewals and the labor incident thereto effected.

According to the present methods of constructing dies for pressing sheet metal, such as iron and steel, for building and decorating purposes a solid steel female or male member is first cast, with the upper face bearing the configuration to be impressed in intaglio. A male or female member is then produced by casting into the face of the steel member a molten composition or alloy of Babbitt metal with other metals, such as copper, tin, or antimony. The two dies or members are then arranged in a press, the upper die raised a sufficient distance to admit between the dies a sheet to be pressed or stamped, and the upper die then forced down, so as to produce the desired configuration in the sheet of metal. Dies so made and used have many disadvantages. Thus the soft metal for the upper die costs from ten to twenty cents per pound, and its life in wearing is from four thousand to ten thousand sheets of metal, after which, owing to the wear, it has to be melted and recast. With such melting and recasting there

is a loss of metal of at least ten per cent. This requires the addition of ten per cent. of new metal, and this, coupled with the cost in labor of recasting, adds from three dollars to ten dollars to the first cost of the die. Again, the soft metal of the upper die is so much softer than the steel of the lower die that the former in use rides the latter and by being displaced and distorted becomes useless after pressing from one hundred to two hundred sheets. Recasting in such an instance is necessary, and even when this riding does not take place early in the use of the dies the sharpness of the configuration is greatly impaired by the pressing of a limited number of sheets, so that the run is uneven, the last sheets failing to perfectly match the first or present a perfect pattern.

My present invention is designed and adapted to overcome these and other defects, and to that end consists in adding to the soft-metal die a hard or comparatively hard and durable facing, which will last as long as the life of the lower die and entirely obviate the necessity of frequent, if any, renewals of the metal of the soft die.

In the accompanying drawings, Figure 1 is a sectional view of a pair of dies embodying my invention. Fig. 2 is a plan view of the lower die. Fig. 3 is a plan view of the upper die, and Fig. 4 is a plan view of the facing-plate.

In carrying my invention into effect I preferably first produce the steel female die A in the usual way, as by casting in a configured mold or by cutting the intaglio pattern in a block of steel, casting, however, being preferred as being cheaper and equally suitable, except for products of great firmness. I then cast into the steel die a male die B, formed of an alloy of any suitable character, adopting for such a purpose the cheapest material obtainable and suitable, as there will be no wear or abrasion to be provided against, and the high-priced alloys heretofore used will be unnecessary. After finishing and fitting the dies to the press I proceed to form a facing for the upper die, and for this purpose



I take a sheet of some metal harder than the upper die, such as steel or brass, and hammer it closely into the depressions of the steel die until a perfect fit is produced, or I may  
5 press this sheet of hard metal into the steel die by the action of the upper die, preference, however, being given to the hammering operation, since it prevents injury to the soft metal of the upper die, which might ensue in  
10 using force to press a flat hard-metal sheet into the depressions of the lower die. When this facing-sheet is perfected as far as can be done by hammering, I force down the upper die until the facing-sheet fully conforms to  
15 the face of the upper die and then raising the upper die fasten the facing-plate to it, A' being said facing-plate. The preliminary hammering of the sheet into the lower die may be dispensed with and the facing-sheet A' produced by the first action of the two dies upon  
20 a commercial sheet of steel, which, being afterward fastened to the upper die, forms a face, held between which and the lower die the other sheets are pressed.  
25 I have carried this process and the use of these dies into practical and extensive work and estimate that the wear on the faced upper die is too small to be computed in any question of economy. I have been able with  
30 dies embodying my invention to press as many as forty thousand plates of steel without material depreciation in the quality or sharpness of the dies, so that the hard-metal facing renders the life of the dies practically  
35 indefinite.

Should it happen that the hard-metal facing becomes imperfect from any cause, all

that is required is to replace it, but without recasting the soft-metal body.

If at any time it is found that the lower die 40 has worn somewhat while yet capable of producing good work, all that is necessary is to remove the upper die, remelt it, and cast it upon the lower die, upon which has been placed and securely fastened a sheet of hard 45 metal, which is afterward attached to the upper and recast die.

It is obviously within the letter and spirit of my invention to reverse the order of forming and facing the dies. Thus, for instance, 50 the male die may be the lower and the female die the upper member. So, too, the female die may be the soft-metal member and the one to which the hard-metal facing-plate is attached, while the male die is of hard metal. 55

Having thus described my invention, what I claim as new is—

The method of forming dies for pressing ornamental metal plates which consists in first producing a hard-metal member bearing 60 the configuration to be produced on the plates, casting upon the same a soft-metal member, separating the two members, inserting a sheet of metal between them and pressing the same to the configuration of the dies, 65 then attaching said plate to the soft-metal member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LONGLEY LEWIS SAGENDORPH.

Witnesses:

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