

No. 747,666.

PATENTED DEC. 22, 1903.

F. VOIGTMANN & S. H. POMEROY.

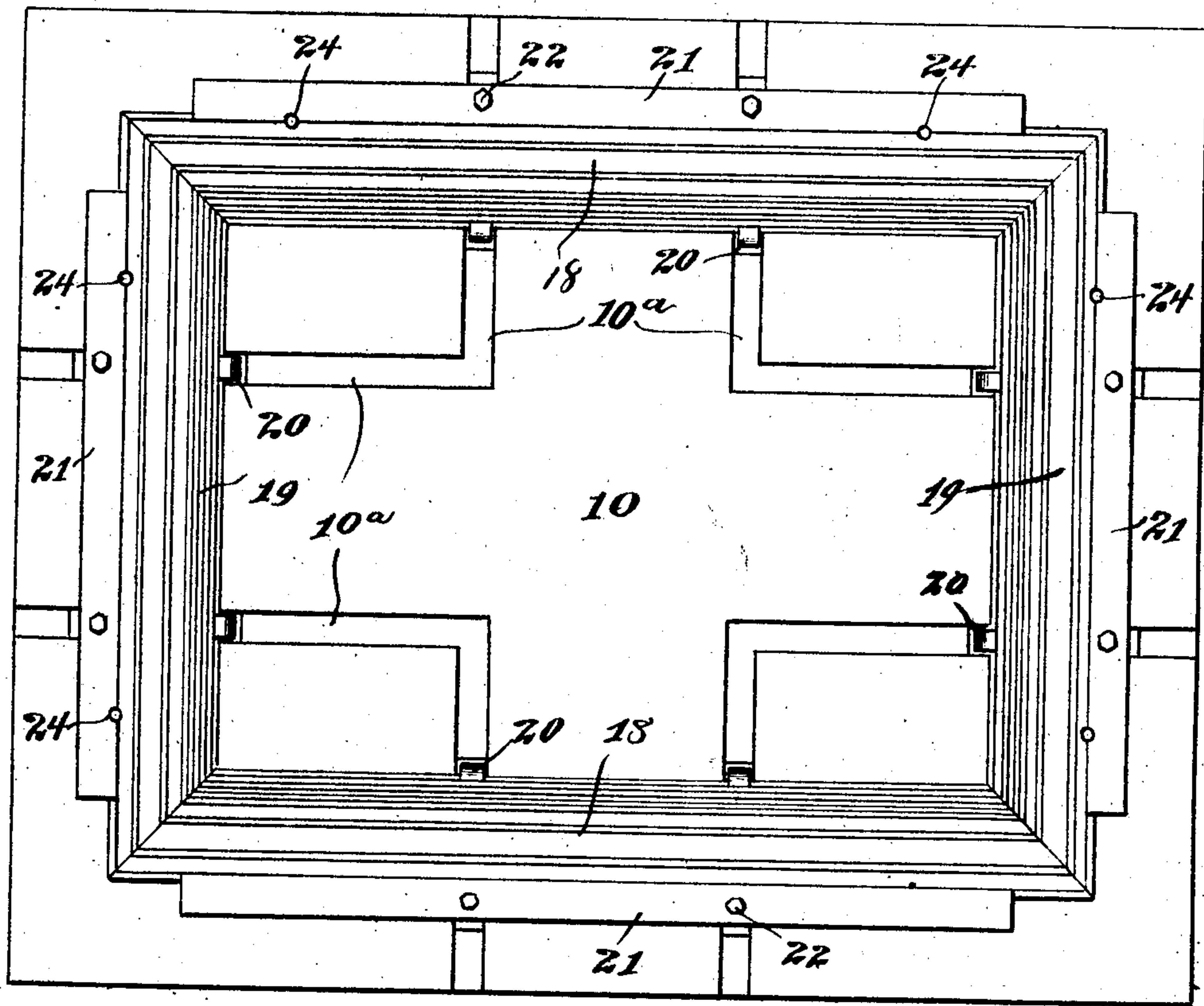
DIE FOR MAKING HOLLOW SHEET METAL WINDOW OR OTHER SASHES.

APPLICATION FILED NOV. 12, 1902.

NO MODEL.

5 SHEETS—SHEET 1

Fig. 1.



Witnesses,

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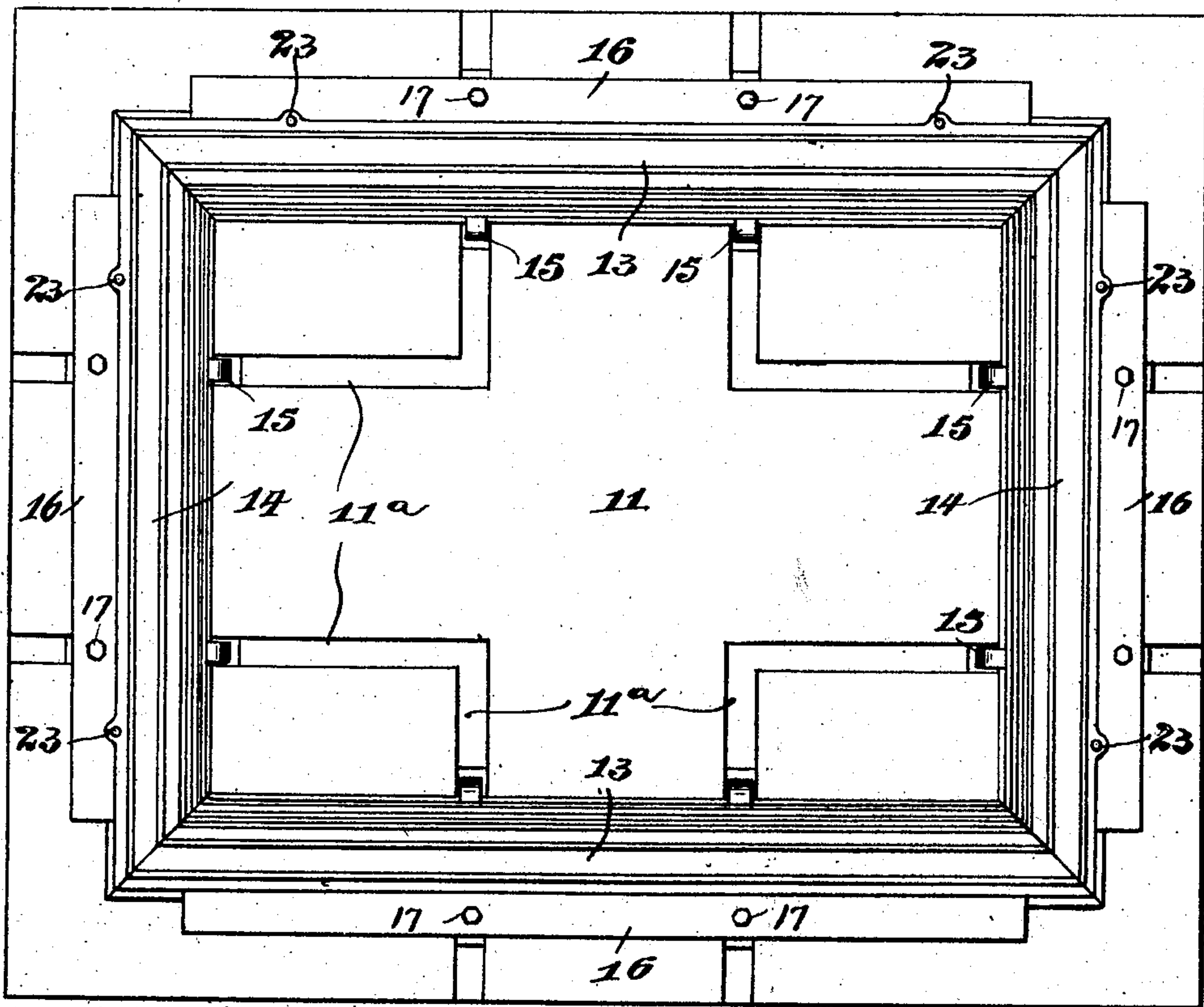
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5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 3

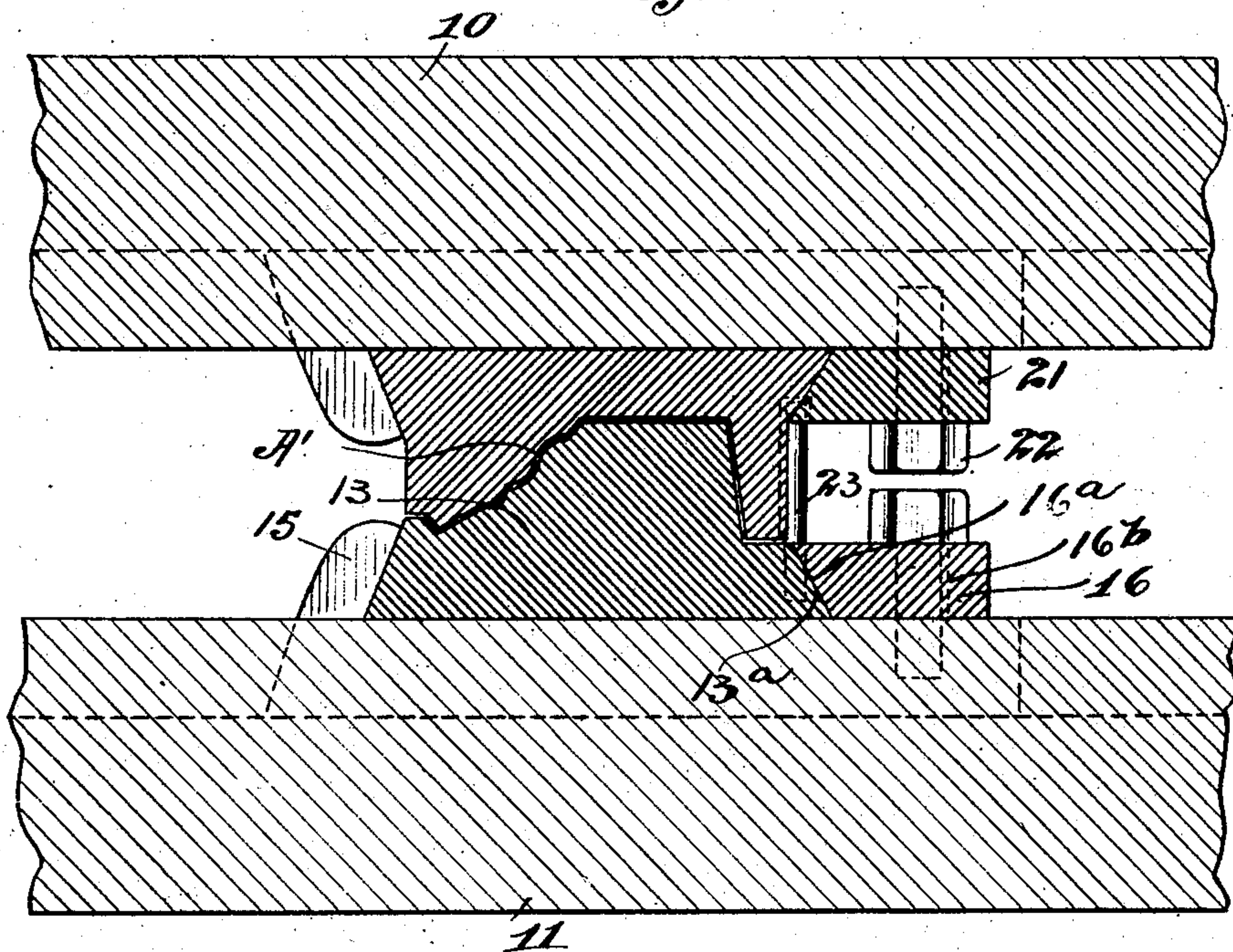
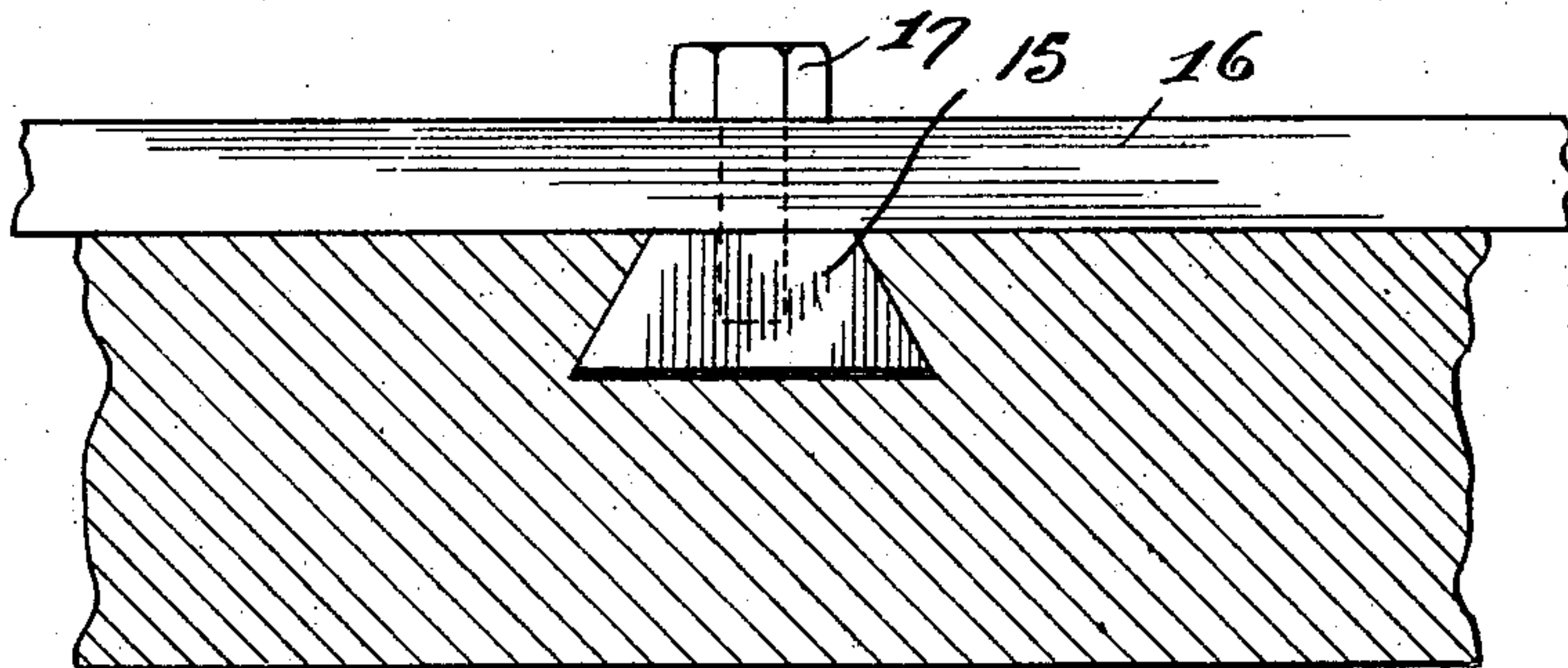


Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 5.

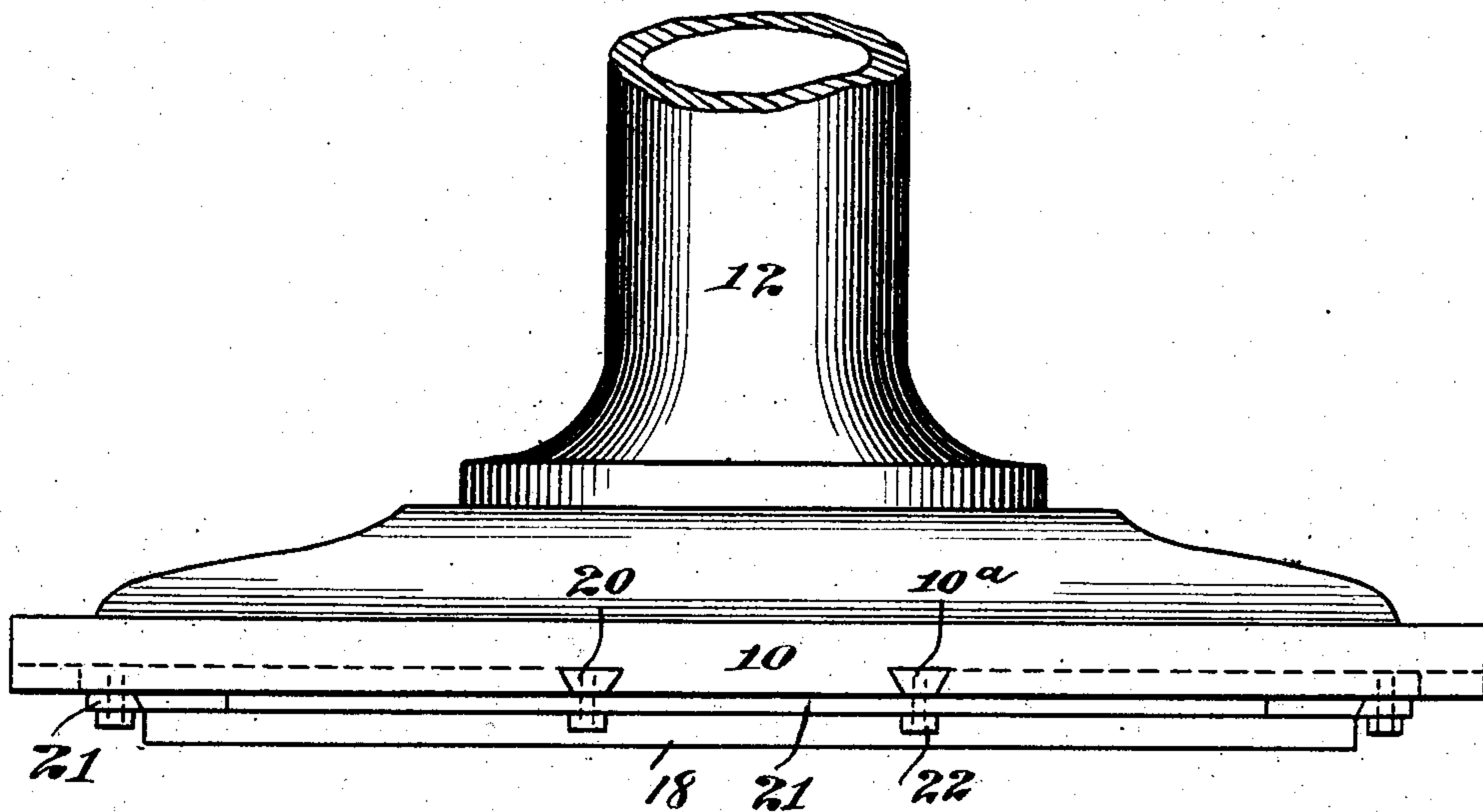
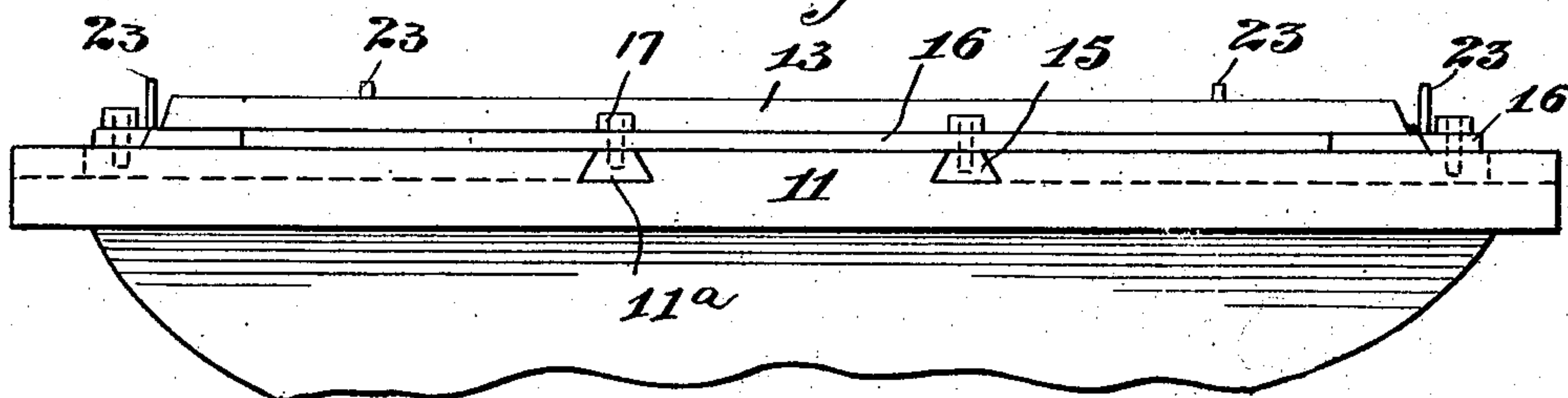


Fig. 6.



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5 SHEETS—SHEET 5.

NO MODEL.

Fig. 7.

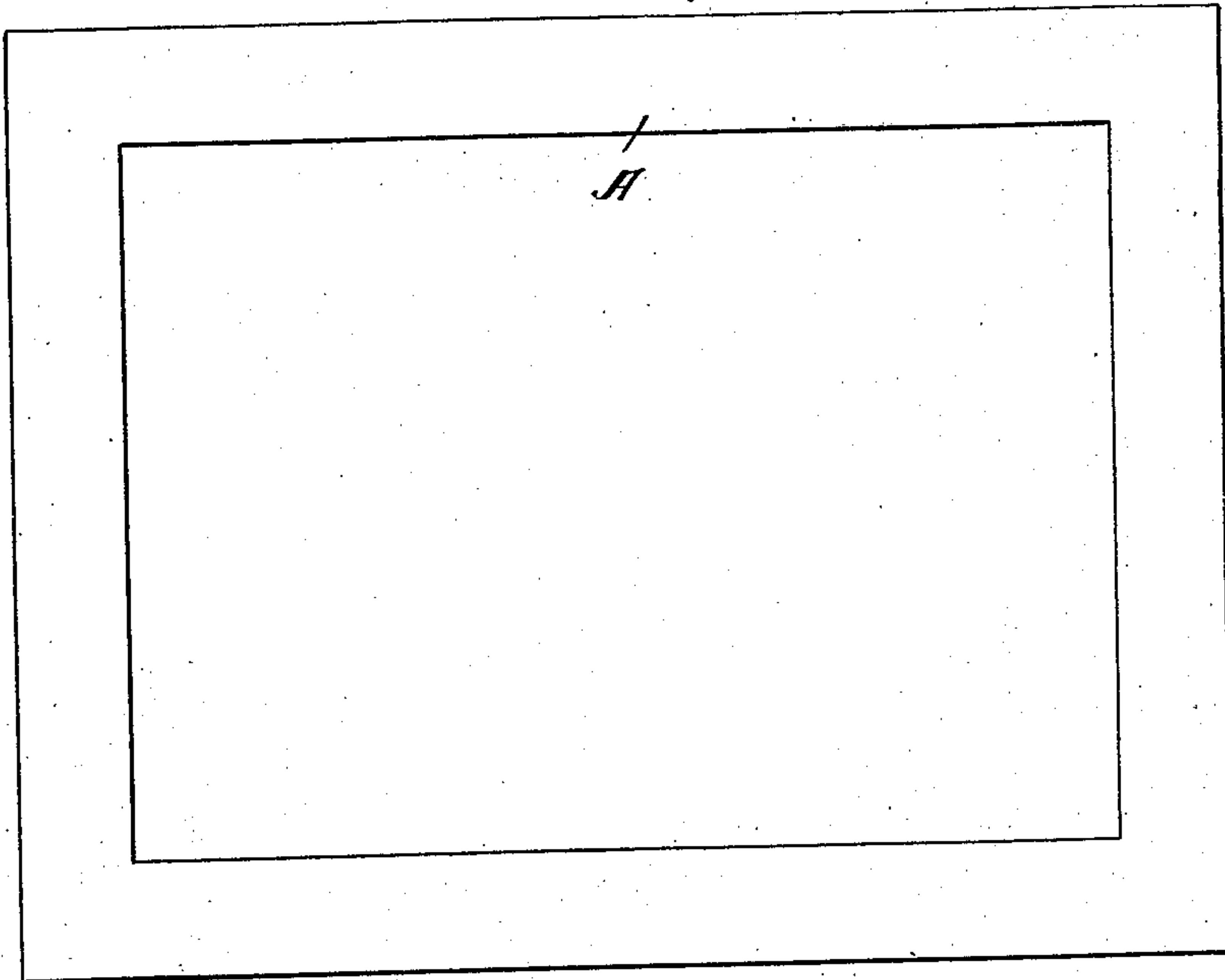


Fig. 8.

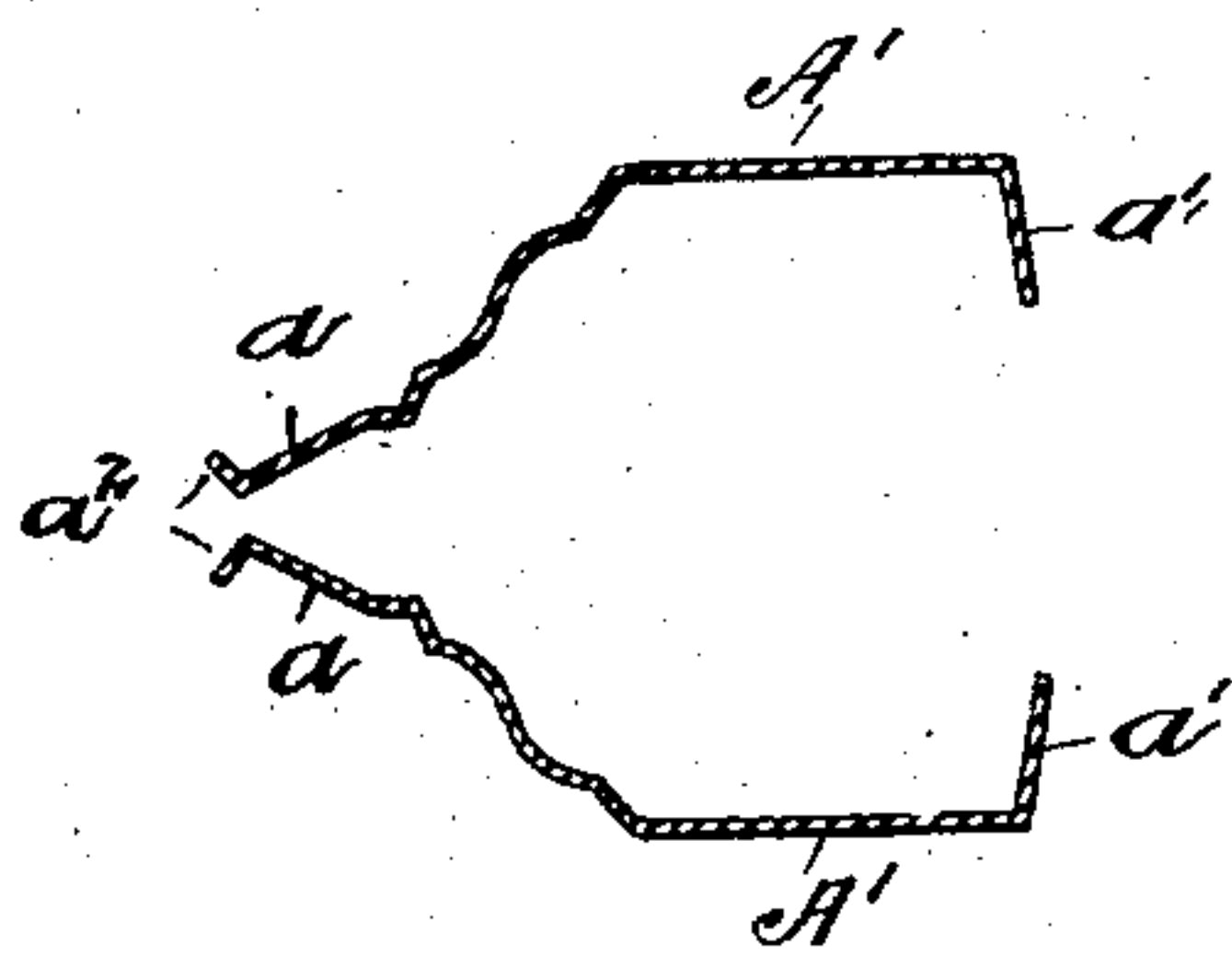
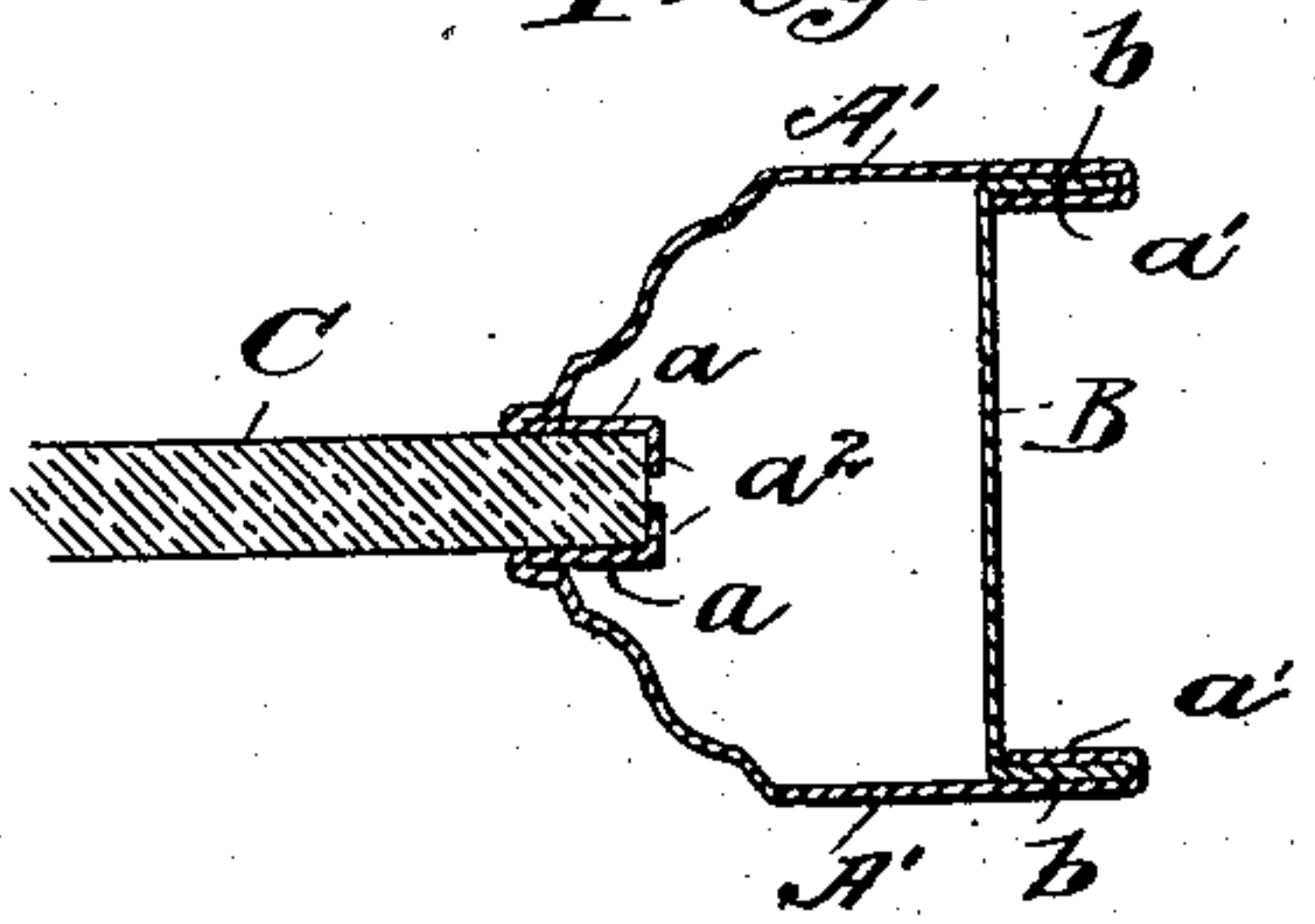


Fig. 9.



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UNITED STATES PATENT OFFICE.

FRANK VOIGTMANN, OF CHICAGO, ILLINOIS, AND SILAS H. POMEROY, OF
NEW YORK, N. Y.

DIE FOR MAKING HOLLOW SHEET-METAL WINDOW OR OTHER SASHES.

SPECIFICATION forming part of Letters Patent No. 747,666, dated December 22, 1903.

Application filed November 12, 1902. Serial No. 131,044. (No model.)

To all whom it may concern:

Be it known that we, FRANK VOIGTMANN, of Chicago, Illinois, and SILAS H. POMEROY, of New York, State of New York, both citizens of the United States, have jointly invented certain new and useful Improvements in Dies for Making Hollow Sheet-Metal Window or other Sashes, of which the following is a specification.

Our invention relates to the manufacture of hollow sheet-metal window-sashes, such as are commonly employed in fireproof and other buildings, and has for its primary object to provide means whereby a hollow sheet-metal sash may be produced with a minimum number of parts and without seams or joints at the corners.

Another important object of the invention is to cheapen the cost of production of such articles.

These objects we attain through the use of novel and improved means for their manufacture in the nature of a die which is capable of stamping from rectangular sheet-metal blanks the inner and outer face members of the sash in integral forms, respectively, and requiring only to be suitably connected or united at their inner and outer meeting edges.

A die embodying the principle of our invention in the best form we have as yet devised is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the top or movable member of the die. Fig. 2 is a similar plan view of the bottom or stationary member of the die. Fig. 3 is an enlarged cross-sectional detail view through the mating impression members of the die and their bed-blocks, showing said members in registration with a sheet-metal blank stamped to its intended form between them. Fig. 4 is a fragmentary detail view, in vertical section, through one of the bed-blocks, illustrating the means for securing and adjusting the impression members on their supporting-blocks. Fig. 5 is a side elevation of the upper movable or stamping member of the die. Fig. 6 is a similar view of the lower stationary or forming member. Fig. 7 is a plan view of the integral rectangular sheet-metal blank designed to be acted upon by the die. Fig.

8 is an enlarged cross-sectional view through companion members of a pair of mating blanks stamped and assembled preparatory to their permanent association in a sash structure, and Fig. 9 is a similar cross-sectional view through one member of a completed sash.

In carrying out our invention we provide a pair of preferably rectangular bed-blocks 10 and 11, constituting the supporting and carrying elements of the top and bottom members of the die. The bed-block 10 is provided on its under surface with a series of longitudinally and transversely disposed undercut grooves or channels 10^a, and the bed-block 11 is similarly provided on its upper surface with a corresponding series of longitudinally and transversely extending undercut grooves 11^a. The upper bed-block 10 may be mounted on the lower end of any suitable actuating means, such as the stem 12. (Shown in Fig. 5.)

The impression-forming elements of the die members proper are cut from metal bars of uniform cross-sectional dimensions and contour, being preferably made from commercially-rolled steel bars having interfitted or mating faces between which the sheet-metal blanks are compressed and shaped. The bar which serves as the lower passive member of the die is cut into four sections with mitered joints, the two longer sections (indicated by 13) serving to form the stiles of the sash and the two shorter sections (indicated by 14) serving to form the rails. These elements are arranged to constitute a rectangular frame, as shown in Fig. 2, and are rigidly secured upon their supporting bed-block 11, with capacity for relative adjustment to secure a perfect joint at the mitered corners, by the following devices: 15 designates margin-hooks dovetailed in the grooves 11^a beneath and engaging the under surfaces of the stile-formers 13 and the rail-formers 14. In order that these margin-hooks may grip their respective rail and stile formers and secure the latter rigidly to the bed-block, the outer projecting ends of the margin-hooks are overlaid transversely by clamp-bars 16, which are each provided with an inclined or beveled inner edge, as shown at 16^a in Fig. 3, registering with an inversely-inclined outer edge 13^a on the outer

margin of the stile or rail former engaged thereby. At the points where the clamp-bars overlie the rearward extensions of the margin-hooks the former are provided with through-slots 16^b, Fig. 3, slightly elongated in a direction transversely of the bars, through which slots are passed screw-bolts 17, the lower threaded ends of which engage threaded holes in the underlying extensions of the margin-hooks. This construction enables the stile and rail formers to be adjusted into a snug and perfect fit at their mitered corners and to be rigidly secured in such positions by simply turning up hard the screw-bolts 17 after the clamp-bars 16 have been forced inwardly to crowd the stile and rail formers hard against each other at the corners and against the inner abutments of their respective margin-hooks, the turning up of the screw-bolts tending to draw the oblique sides of the margin-hooks into close frictional engagement with the undercut side walls of their respective grooves, whereby said margin-hooks are securely held against any sliding movement longitudinally of their grooves.

The upper active member of the die is constructed and assembled in precisely the manner already described in connection with the lower or passive member, with the exception that the elements thereof constituting the immediate impression members are of course cut from a single length of bar that is rolled or otherwise formed with a surface of such a contour or pattern as will exactly register with and interfit the opposed meeting face of the companion bar from which the rail and stile formers already described were cut. In Fig. 1 the stile-stamps are indicated at 18, the rail-stamps at 19, the margin-hooks holding the same at 20, the clamp-bars for the rail and stile stamps at 21, and their adjusting screw-bolts at 22.

It is desirable to provide in connection with the lower stationary member of the die means whereby the blank may be accurately positioned thereon prior to the stamping operation, and such means may conveniently consist of a series of vertical pins 23, grouped around the two ends and one side of the framed structure constituting the lower stationary element of the die, said pins extending, as shown in Fig. 3, to a height slightly above the top surface of the die member and adapted when the members of the die are in operative engagement upon a blank to enter correspondingly-positioned holes 24, formed in the outer marginal portion of the upper movable member of the die. Said pins and holes are of course so relatively positioned as to register only when the cooperating faces of the die members are also in perfect registration.

We will now describe the manner in which the die is operated and the completed sash formed from the resulting product of the die. Fig. 7 shows in plan view the integral flat rectangular sheet-metal blank (designated by A)

constituting the article subjected to the operation of the die. The upper member of the die being raised to a sufficient height above the lower stationary member, this rectangular blank is readily inserted in position upon the face of the lower die member with its two end and rear sides contacting the several pins 23, which insures its accurate positioning. Thereupon the upper stamping member of the die is depressed and impinging upon the top of the blank bends and forces the material thereof down upon the stationary impression member, compressing said material between the opposed and mating faces of the impression members, and thus obviously imparting to the blank the cross-sectional form of said mating faces, as clearly shown in Fig. 3. The upper die member is then raised, the bent and crimped sash member removed, and another blank inserted and subjected to the same operation. Upon the removal of the second blank the two bent and crimped frames may then be readily assembled into a complete sash in the manner illustrated in Figs. 8 and 9. To do this, the two stamped members, which are designated by A', are placed in opposed relation, as shown in Fig. 8, and the inner and outer marginal portions of the members are turned inwardly, as shown at *a* and *a'*, respectively, the extreme inner edges of the inwardly-bent marginal portions *a* being again bent inwardly at right angles toward each other, as shown at *a*². The companion members A' thus assembled and shaped are connected and united into the form of a complete sash through a flat connection-strip B, having outwardly-bent marginal portions *b*, which are pressed into interlocking engagement with the edges *a'*, while the inwardly-bent margins *a* and their meeting extensions *a*² together constitute a housing for the edge portion of the glass C of the sash.

From the foregoing it will be seen that by our invention we provide a die which is capable of forming up from rectangular integral sheet-metal blanks the face members of a hollow metal sash, said sash being without transverse seam or joint at its corners, and thus possessed of great strength and rigidity. It will also be observed that our invention dispenses with the necessity of all special moldings or castings to form the impression elements of the die, since these elements are each constructed entirely from a single length of rolled bar-steel or other metal cut and mitered into sections corresponding with the marginal members of the sash to be formed thereby. While we have shown and described a die adapted to the production of a simple rectangular sash, yet it will be obvious that within our invention dies might be made of any other form in outline. It is also obvious that the die members may within our invention be formed with coacting faces of any desired or convenient outline or contour. An important advantage resulting from the

described manner of mounting the impression members on their respective supporting plates or blocks resides in the fact that the latter are capable of receiving and carrying
 5 impression members of widely varying sizes, for which purpose said impression members may be readily removed and others substituted by simply withdrawing the marginal clamping-bars and readjusting the margin-
 10 hooks inwardly or outwardly of their respective channels.

While we have described the die as consisting of a stationary lower member and an upper movable member, it is perfectly obvious that, if desired, the upper member might
 15 be made stationary and the lower member movable, or both members might be made to move toward and from each other. Hence within the purview of our invention any
 20 desired or convenient relative movement may be imparted to the die members.

We claim—

1. In a die of the character described, a die member comprising an impression member
 25 composed of a plurality of sections cut from a rolled-metal bar and connected up end to end to form a closed frame, a bed-block, and independent devices for adjustably securing the respective sections of said frame-shaped
 30 impression member to said bed-block.

2. In a die of the character described, a die member comprising an impression member composed of a plurality of straight sections cut from a rolled-metal bar and connected
 35 up with mitered endwise-abutting joints to form a closed frame, a bed-block, and independent clamping devices for adjustably securing the respective sections of said frame-shaped impression member to the surface of
 40 said bed-block.

3. In a die of the character described, a die

member comprising an impression member composed of a plurality of straight sections cut from a rolled-metal bar and connected up with mitered endwise-abutting joints to form
 45 a closed frame, a bed-block having a channeled surface, a plurality of independent margin-hooks in the channels of said bed-block and embracing the respective sections of said frame-shaped impression member, and
 50 means for adjustably clamping said margin-hooks in said channels and thereby securing said frame-sections in closely-fitting relation to each other.

4. The herein-described adjustable die for
 55 forming hollow sheet-metal window-sashes, consisting of a pair of cooperating die members, each member comprising an impression member composed of a plurality of straight
 60 sections cut from a metal bar of uniform cross-sectional dimensions and contour, and connected up with mitered endwise-abutting joints to form a closed frame, a bed-block having its surface provided with channels
 65 extending radially thereof, and in directions at right angles to the respective sections of the frame-shaped impression member, independent margin-hooks in the channels of said bed-block embracing said frame-sections,
 70 and means securing said frame-sections in the grasp of the margin-hooks and the latter fixed against movement in their respective channels.

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