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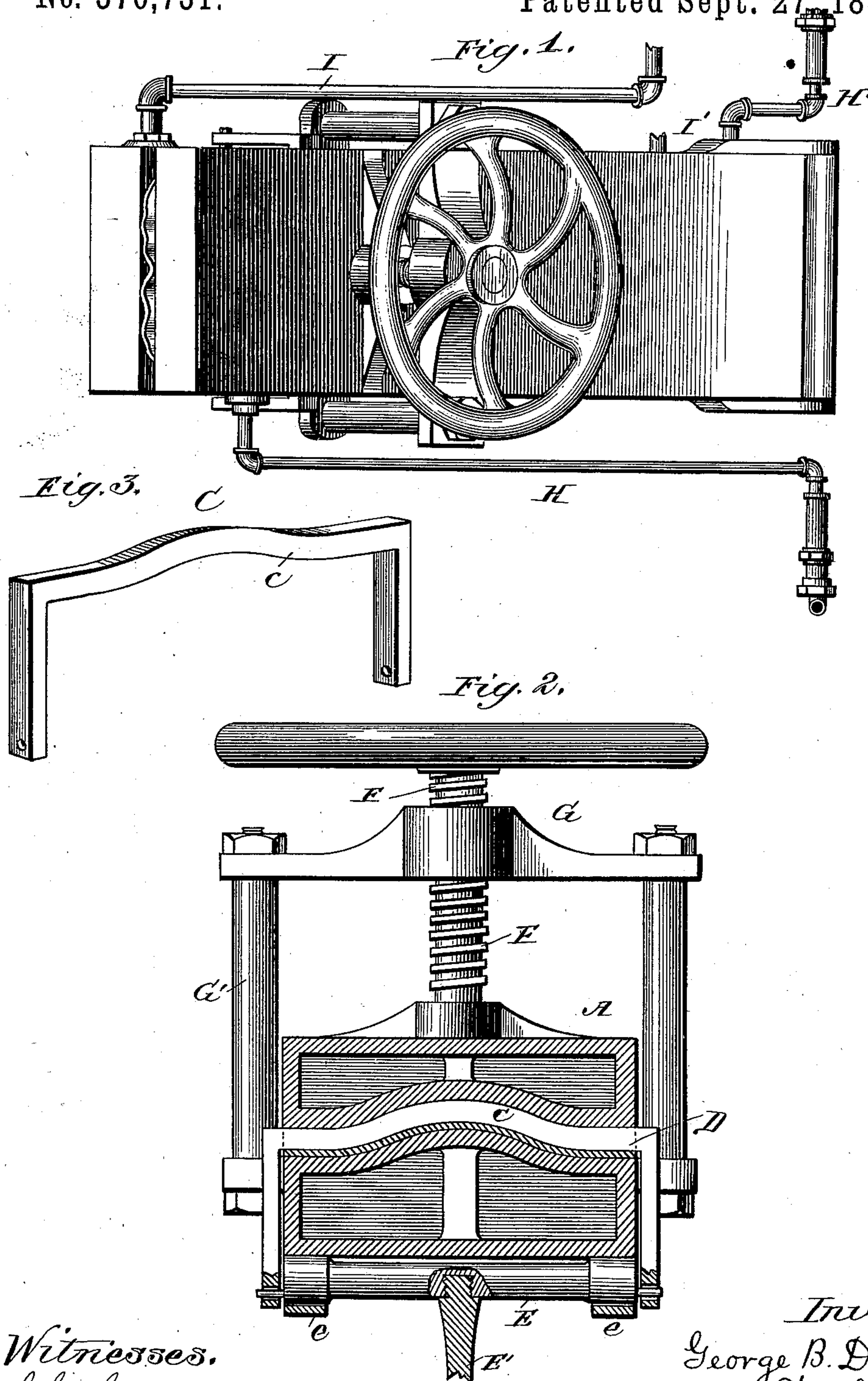
3 Sheets—Sheet I.

G. B. DURKEE.

APPARATUS FOR FORMING VIOLIN CASE COVERS.

No. 370,731.

Patented Sept. 27, 1887.



Witnesses.
L. S. Logan
W. Rossiter

Inventor.
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Atty.

(No Model.)

3 Sheets—Sheet 2.

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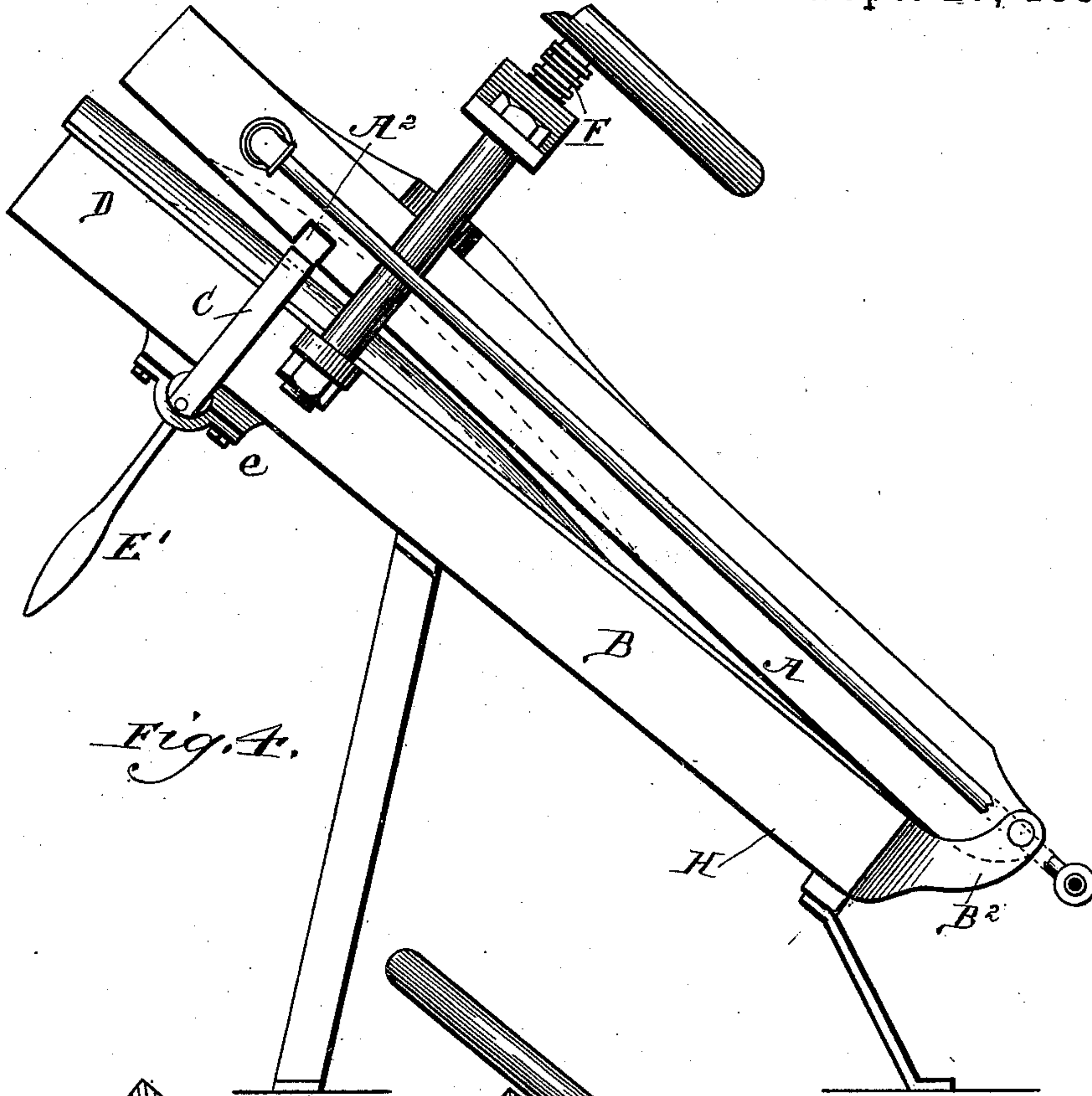


Fig. 4.

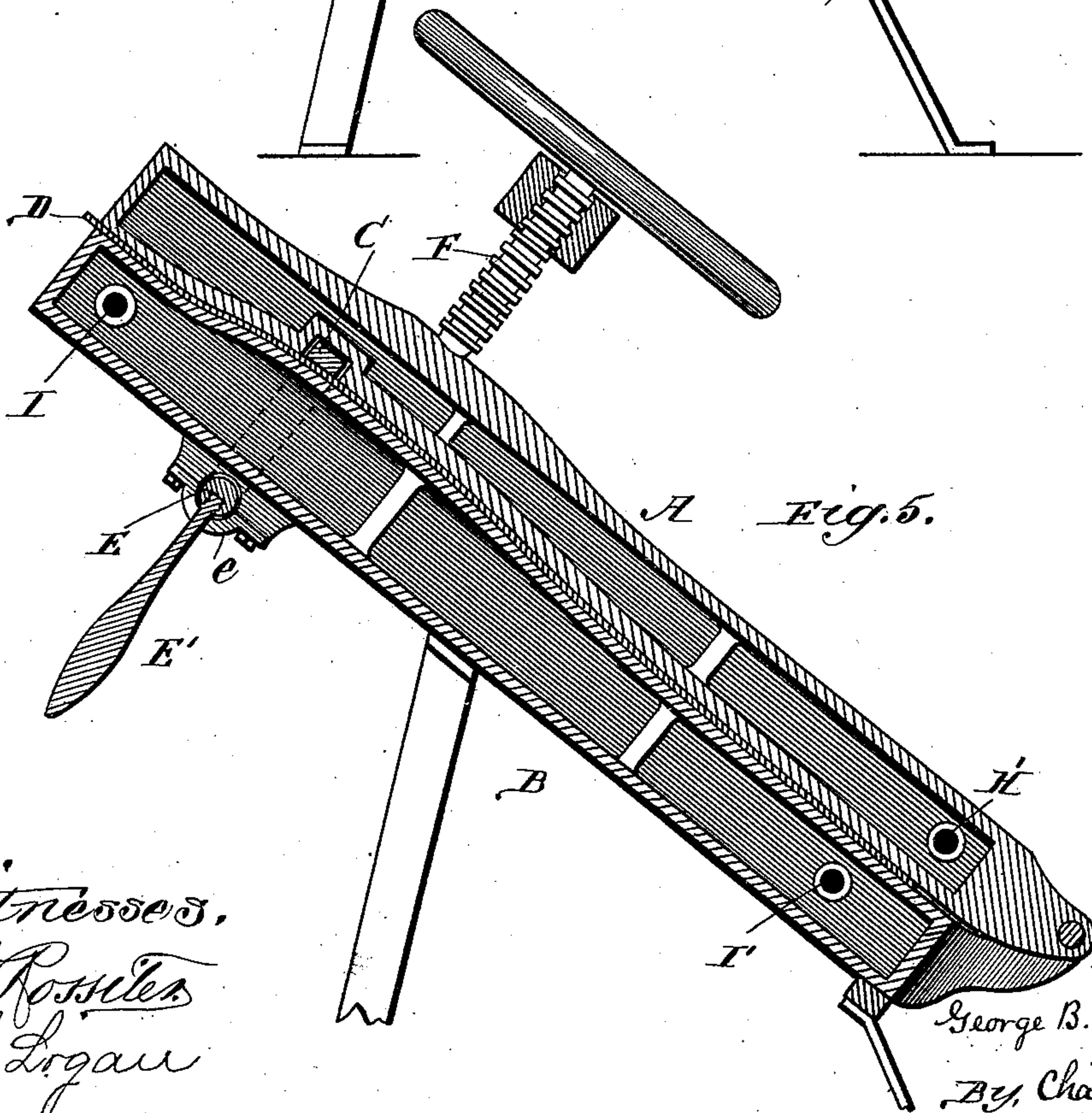


Fig. 5.

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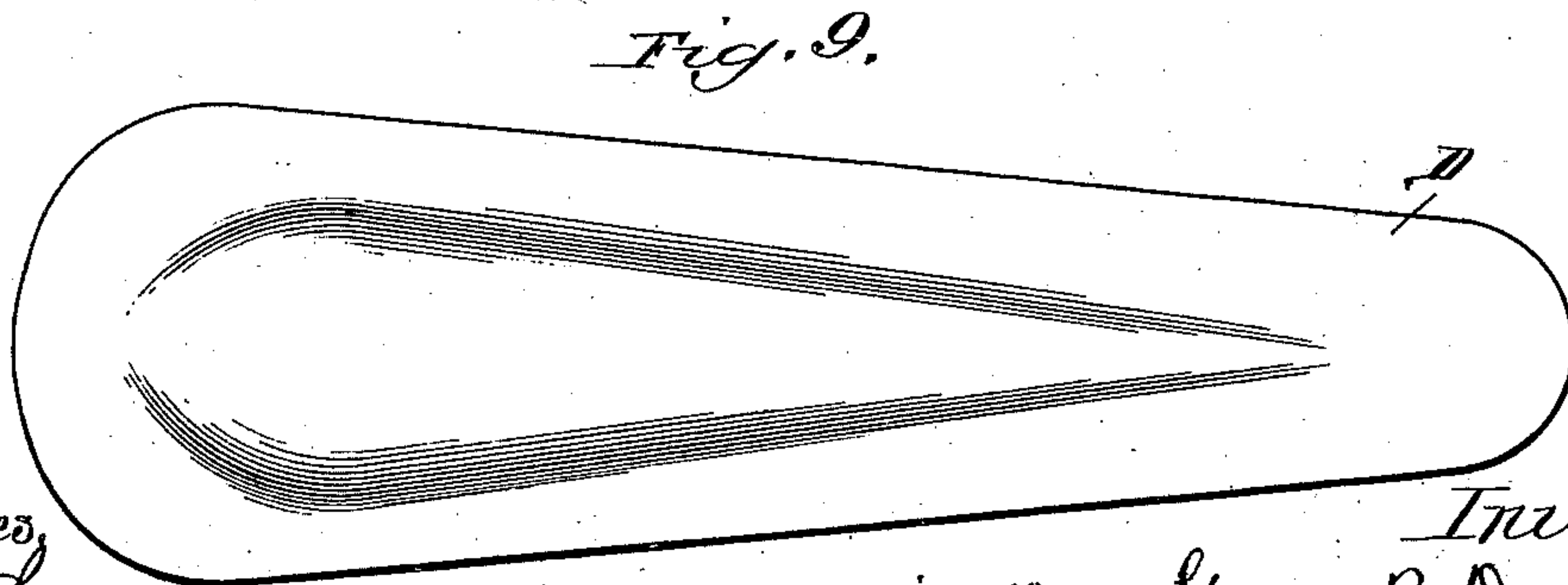
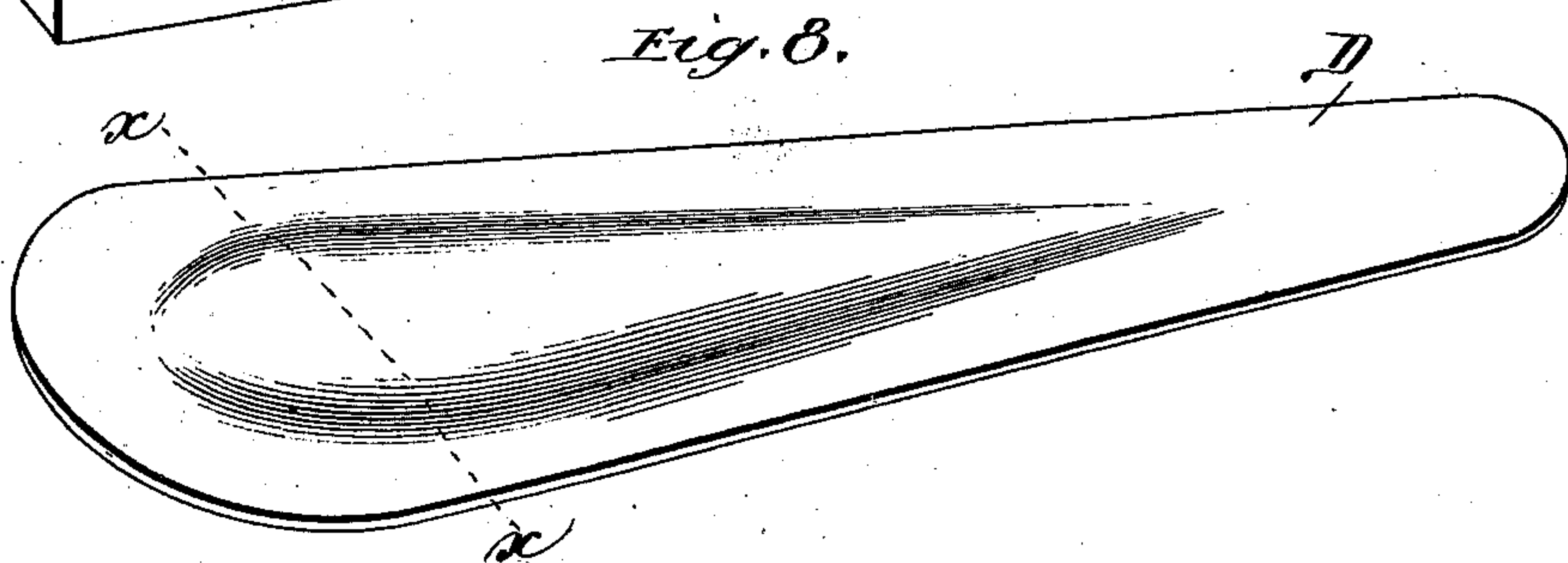
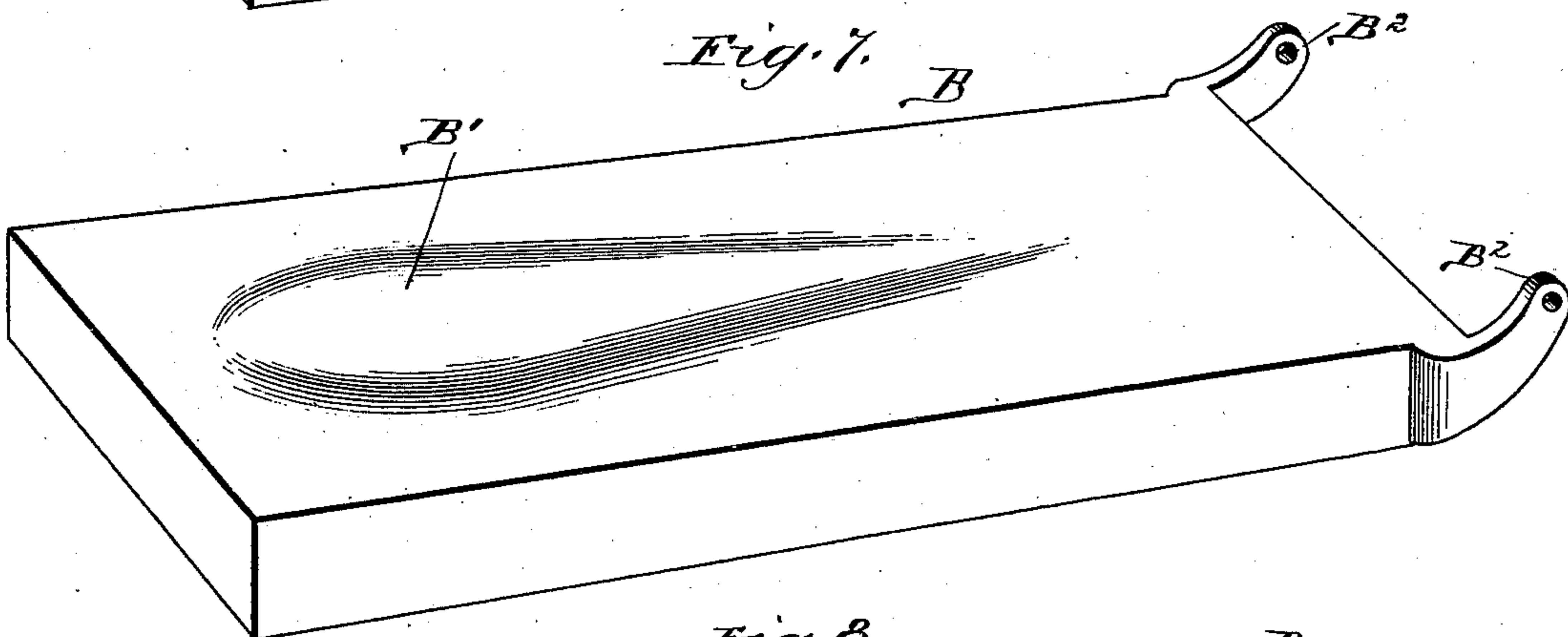
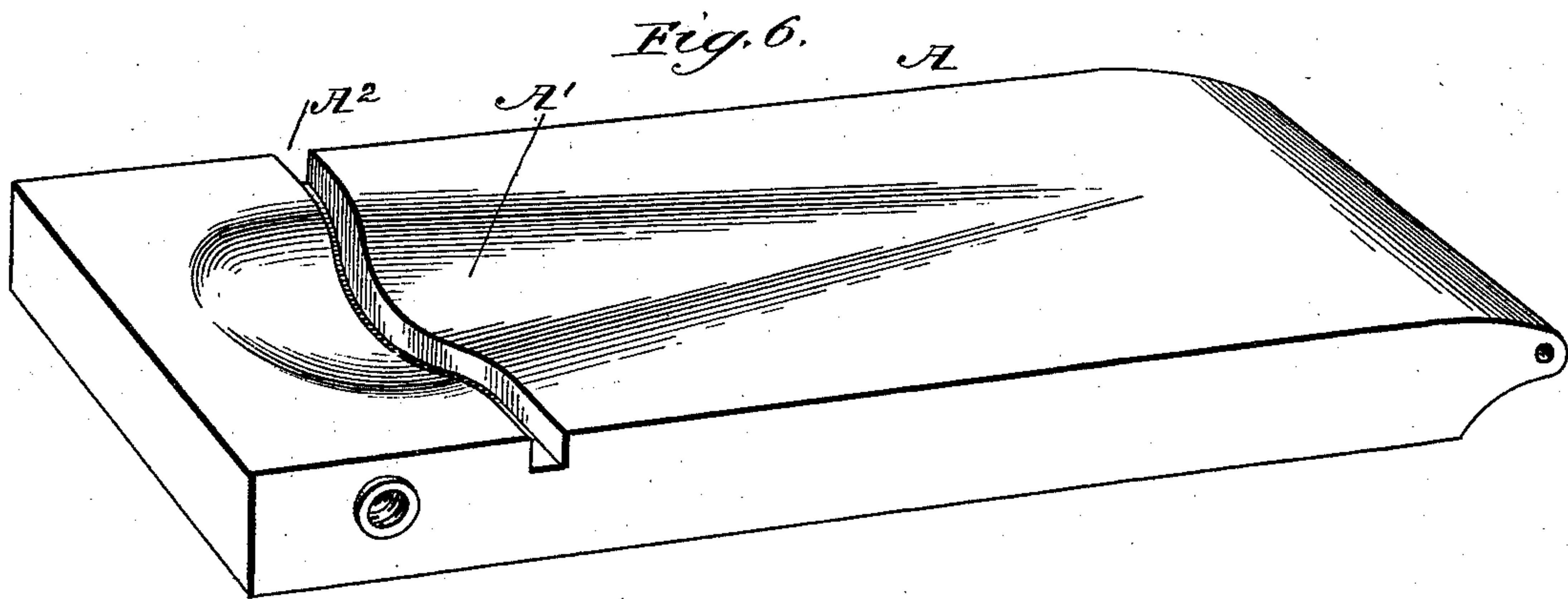
3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING VIOLIN-CASE COVERS.

SPECIFICATION forming part of Letters Patent No. 370,731, dated September 27, 1887.

Application filed September 2, 1886. Serial No. 212,469. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. DURKEE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Forming Violin-Case Covers, of which the following is a specification.

A violin-case usually contracts in width from one end to the other, the wider end portion of the case being adapted for the reception of the body of a violin. In order to adapt the capacity of the case to the height of the violin-bridge when the violin is strung up and laid with the case, the lid or cover of the latter has been formed with a longitudinally-arranged bulge or raised portion adapted in height to the height of the bridge and strings. Violin-cases of such construction have been made of wood and the covers bent upon a heated die or iron; but in such instance it has been found impossible to prevent a large proportion of the covers from cracking or splitting along the bend, and where it has been attempted to form the cover with a bulge or raised portion decreasing in height and width from one end to the other, and having its higher wider end portion at the wider end portion of the cover, it has been found necessary to remove a portion of the wood from the middle part of the wider end of the cover and to subsequently fill up the crack with glue, or with a proximately triangular-shaped piece glued into the space left by such prior removal of a portion of the wood, since, without the removal of such piece preparatory to pressing the flat board into shape, the wood in a majority of cases splits along its bent or dished portion—as, for example, along the wider higher end of the aforesaid raised portion, or at that portion of the wider end which is beyond the raised part of the cover. This disposition of the wood to crack has rendered the construction of a violin-case cover of any of the harder and finer grades of wood an exceedingly difficult matter, and in a majority of instances, irrespective of the kind of wood employed, imperfections are commonly found. The object of my invention is to obviate all of the difficulties which, prior to my invention, have attended the manufacture of vio-

lin-case covers, and to provide novel and improved means whereby the covers of any or all kinds of wood desirable for violin-cases can be rapidly and effectively pressed into the ultimate required shape without cracking or splitting.

To the attainment of the foregoing and other useful ends, I provide, in connection with a pair of dies for pressing or dishing up a longitudinally-extending middle portion of the cover-board, an intermediately-disposed preparatory bending and clamping device, which, prior to the operation of dishing up the cover-board by the action of the dies, is operated to bend the cover-board upon one of the dies along a line transversely to the length of the cover, and to hold the board along such line closely upon the transverse outline of the die, after which the dies are closed, so as to press or dish up the cover-board.

In the annexed drawings, illustrating an apparatus for shaping violin-case covers in accordance with the principles of my invention, Figure 1 represents a top plan view of said apparatus. Fig. 2 is a transverse section through the same, taken on a vertical plane at one side hand-wheel. Fig. 3 is a perspective view of the clamp detached from the apparatus or machine. Fig. 4 represents said apparatus in side elevation, with the dies in an open condition and with the board from which the violin-case cover is formed clamped upon one of the dies. Fig. 5 is a longitudinal central section through the apparatus, with the hand-wheel and screw shown in elevation. Fig. 6 is a perspective view of the upper female die in an inverted position. Fig. 7 is a perspective view of the lower male die. Fig. 8 is a perspective view of the board after it has been compressed between and bent into shape by the dies. Fig. 9 is a bottom plan view of said board. Fig. 10 is a transverse section of the board on the line *x x*, Fig. 8.

In said drawings, A indicates one and B the other of a pair of hollow dies, which can be heated in any suitable way—as, for example, by gas-flames or by steam. Preferably, however, the hollow dies are heated by steam in a manner similar to the way in which hollow dies have heretofore been steam-heated in apparatus for shaping steamed boards for trunk

and coffin lids, wherein in some cases steam-heated dies have been hinged together at one end and in others one of the steam-heated dies simply raised and lowered by hand-screws, 5 jointed steam-pipe connection being upon such occasions usually provided between the two dies, whereby a more uniform heat is obtained, and all danger of the dies becoming so hot as to burn the material which is being pressed be- 10 tween them is avoided.

The die A has its face provided with a longitudinally-arranged depression, A', which contracts or diminishes both in height and width from one end to the other, the wider end of 15 said depression being desirably rounded in marginal outline, or formed so as to approximate to one end portion of an ellipse.

The die B has its face provided with a longitudinally-arranged raised portion, B', which 20 corresponds in shape to the concavity or depression of the die A, these said face portions of the die being best shown in Figs. 6 and 7.

The die A is arranged so that it can be brought down upon the die B, in order that 25 the wood placed between said dies may be pressed into shape. The preferred arrangement of these dies is to secure the lower die, B, upon a suitable support, which can be arranged so as to maintain the die in an inclined 30 position, it being found that such position is the most convenient one for permitting the introduction of the work between the dies. The upper die is at its lower end hung upon or hinged to some suitable support—as, for exam- 35 ple, it can be pivoted to bearings B², formed with or secured to the lower end of the lower die. As herein shown, the female die A is the upper one of the two dies, although of course the positions of the dies could be reversed, so 40 as to bring the male die uppermost. It is preferable, however, to adhere to the present arrangement, since, preparatory to bringing the dies together, I propose clamping the work at a certain point upon the lower die by means 45 of a clamp, C, which serves to hold the work against the die at every point on a line taken transversely through the work.

The clamp C consists of a yoke arranged to straddle the lower die, and having its upper 50 cross-piece, c, shaped into conformity to the transverse outline of the face of the lower die at a point between the ends of the raised portion B' and adjacent to the terminal of the widest portion of said raised part of the die- 55 face. The position of this clamp may be somewhat varied from that herein shown; but, desirably, it is arranged over the widest portion of the raised part of the die-face, and is supported in a manner to permit the work to be 60 inserted between the lower die and the yoke and to then permit the latter to be drawn down, so as to clamp the work upon the lower die.

The upper die is provided with a transversely-arranged groove or channel, A², 65 adapted to receive the upper cross portion of the yoke-shaped clamp when the upper die is brought down upon the work, in which way,

while the work is being pressed between the dies, it will at a certain point be held by the clamp and thereby prevented from spreading 70 out to an extent which might cause it to split along its raised portion.

In practice a board, D, rounded at its ends and tapering from one to the other, as in Fig. 8 or 9, is first steamed or soaked in hot water 75 until it becomes sufficiently pliable, after which it is placed between the clamp C and the lower die, and the said clamp brought down so as to clamp the board upon the lower die, as in Fig. 4, the configuration of the clamp serving to 80 press the material of the board against the lower die on a line transversely to the length of the board. The upper die is then brought down upon the work so as to press the same 85 upon the lower die, as in Figs. 2 and 5, during which operation the board will bend or pucker at its wider end, as illustrated in Fig. 1, until it has been finally compressed between the dies. This tendency of the board to pucker 90 would in a majority of cases cause the board to split when it is finally pressed out between the dies, were it not for the clamp, which, adjacent to said end, holds the board against any disposition it may have to spread out.

The intermediate preparatory bending and 95 clamping device, C, partakes of the shape of the dishing-up portion of one of the die-faces on a line transversely to the length of the die, and is desirably arranged at a point where the widest extent of transverse die-surface occurs, 100 it being understood that the widest extent of die-surface in a line transversely to the length of the die will correspond to the portion of the dished-up board about on line *xx*, Fig. 8. After the cover-board, in a flat condition, has been 105 placed upon one of the dies and the clamp operated to bend the board along a line transversely to its length and in conformity to a line transversely across the dishing-up face of one of said dies, the dies can be closed. Dur- 110 ing the consequent dishing up of the board the material of the board at the end last clamped between the dies (for instance, the end of the board at the extreme left, Figs. 4 and 5) seems to be crowded together, rather 115 than to spread apart, the fibers being to some extent compacted, and hence while the wood may pucker just prior to the finish the straightening out of the puckered portion between the dies will not split the wood, which, by the 120 preliminary crowding together of its fibers, stands ready for subsequent attenuation to bring it back to its normal condition. By such means I am enabled to rapidly and economically shape the boards without their splitting. 125 The board thus pressed between the dies is for a short time left in such condition, in order that the heat upon the dies may dry the board and set it to a shape into which it has thus been pressed. 130

As a convenient means for operating the clamp, it is pivoted at its ends eccentrically upon the ends of a rock-shaft, E, which is supported in bearings *e* below the lower die and

provided with a handle, E', whereby it can be readily operated for the purpose of raising it from or drawing it down toward the faces of the lower die.

5 The means herein shown for raising and lowering the upper die consists of a screw, F, arranged to bear at its lower end upon the upper die and at its top provided with a hand-wheel. This screw works through a bearing
10 in the upper portion of a yoke, which may consist of a cross-bar, G, connected by rods or standards, or other suitable connection, with the lower stationary die.

15 In Fig. 1, H indicates a steam-pipe arranged to enter the die A near the upper portion of the latter, said pipe being suitably jointed, so as to permit said die to be freely raised and lowered. The upper die connects at its lower end with a waste-pipe, H', through
20 which water of condensation can be carried off.

Steam is admitted into the lower die through the steam-pipe I, and water carried off from said die through the waste-pipe I'.

25 It will be observed that the dies are arranged so that the contracted ends of their respectively allotted raised and depressed portion shall be nearest the point at which the dies are hinged together or at which the upper movable die is used, in which way during operation the pressing action commences at the
30 narrow end of the board, and from thence is

distributed toward the wider end thereof. It is found that this arrangement is preferable to the bringing the dies together at the start and that better results are obtained.

35

What I claim as my invention is—

In an apparatus for shaping violin-case covers having a longitudinally-arranged raised or dished-up portion, the combination, substantially as herein described, of the two dies
40 adapted for dishing up such longitudinally-extending middle portion of the cover-board, the intermediate preparatory bending and clamping device shaped in conformity to one of the die-faces on a line transversely across
45 the dishing-up portion thereof and arranged for bending and clamping upon said portion of the die-face one cover-board along a line transversely to its length, and a clamp-actuating device for operating the said preparatory bending and clamping device prior to
50 the closing of the dies upon the cover-board, one of said dies being provided across its face with a recess wherein the preparatory bending and clamping device is received when the
55 dies are brought together, substantially as described.

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