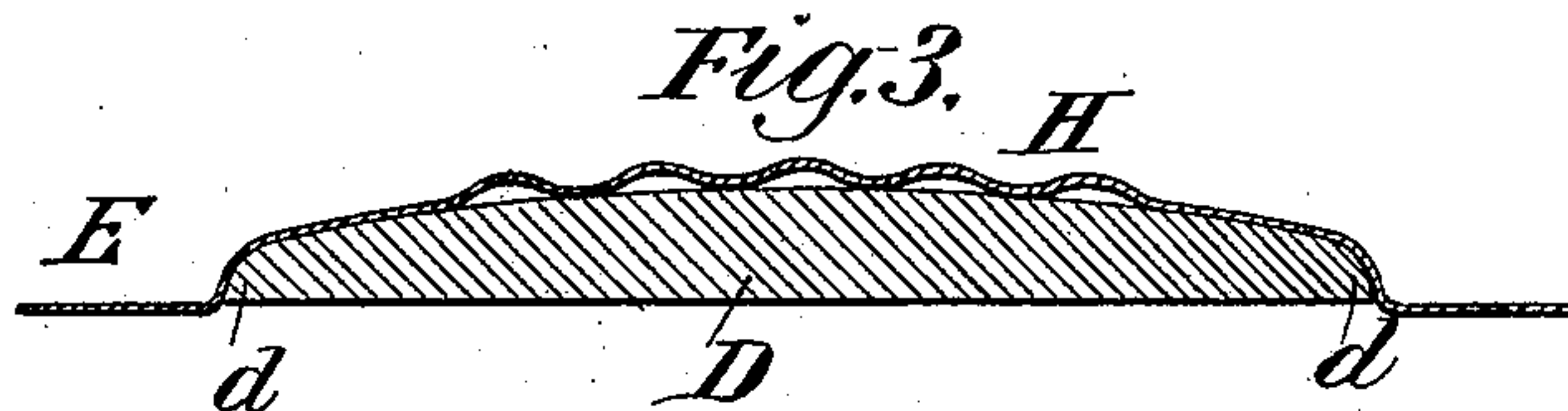
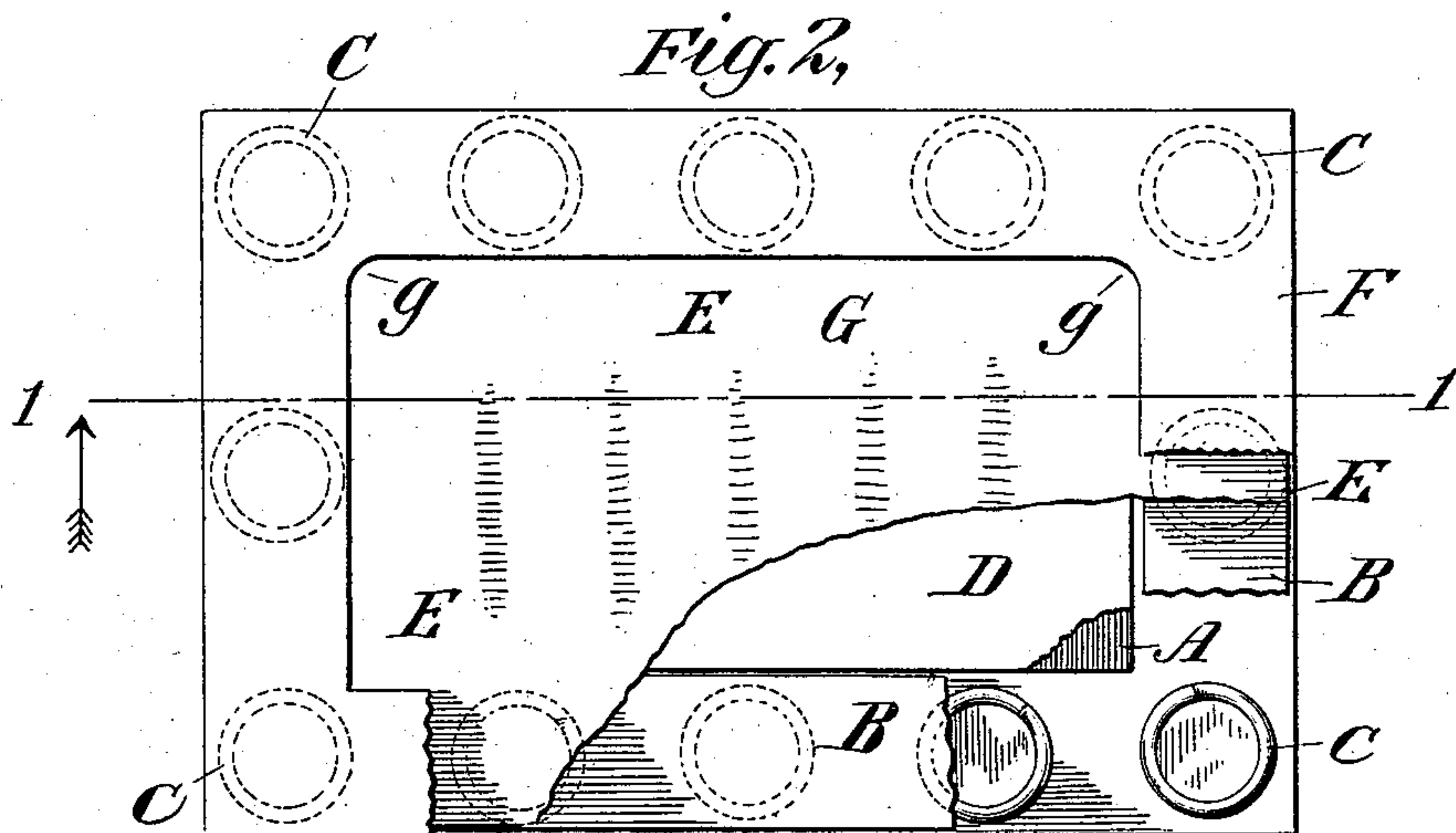
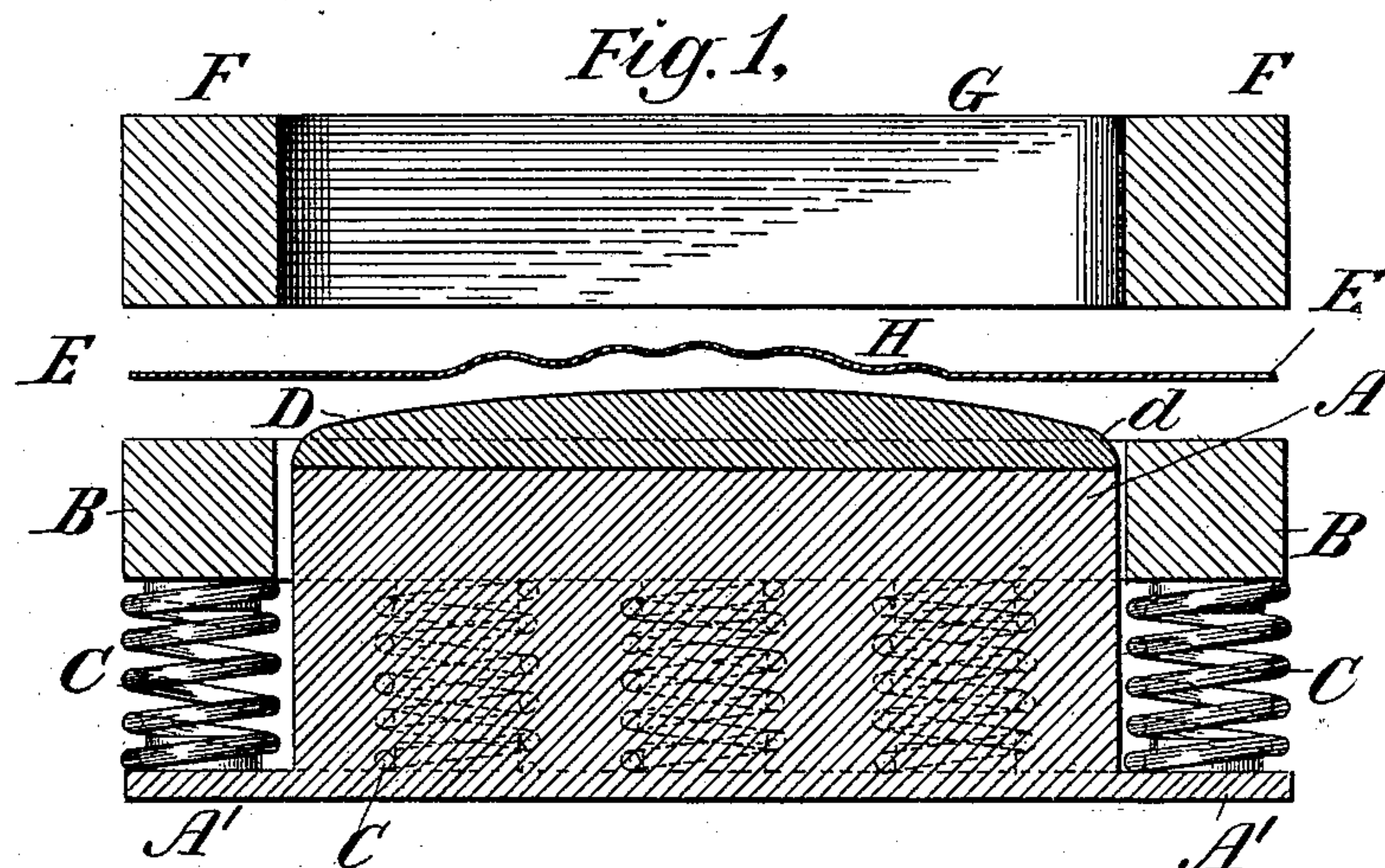


(No Model.)

A. C. HAFELY, J. REDLEFSEN & C. A. HAPPE.
METHOD OF AND APPARATUS FOR VENEERING WITH CELLULOID
COVERS AND CORNERS OF BOOKS, BOXES, &c.

No. 601,214.

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METHOD OF AND APPARATUS FOR VENEERING WITH CELLULOID COVERS AND CORNERS OF BOOKS,
BOXES, &c.

SPECIFICATION forming part of Letters Patent No. 601,214, dated March 22, 1898.

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To all whom it may concern:

Be it known that we, ALFRED C. HAFELY, JENS REDLEFSEN, and CHARLES A. HAPPE, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Methods of and Apparatus for Veneering with Celluloid the Corners and Covers of Books, Boxes, &c., of which the following is a specification.

Our invention relates to methods and apparatus for veneering with sheet-celluloid or kindred material capable of being rendered plastic by heat the covers and corners for books, boxes, and like uses; and it has for its object to simplify and improve such methods and apparatus and to prevent injury to any embossing and ornamental work that may be upon the sheet-celluloid or kindred material during the process.

It consists of the methods and devices hereinafter more particularly set forth, and claimed in the claims at the end of this specification.

In veneering rounded lids for albums, books, boxes, &c., with sheet-celluloid or similar material capable of being made plastic by heat the main difficulty encountered is to dispose of or prevent the formation of wrinkles or folds in the sheet at the rounded corners of the lid to be veneered or where the surface of the lid rounds together from the straight sides of the lid and rounds down toward the extreme point or the toe of the corner. The words "rounded corners," as employed in this specification, will be used in the said sense of corners rounding down toward the extreme point or toe of the corner as distinguished from corners rounding in a horizontal plane only. At these places where the rounding in the surface of the lid occurs the sheet of celluloid is apt to wrinkle or fold, thus impairing the beauty of the veneered lid and destroying its resemblance to a solid piece of ivory or of such other material as the celluloid is tinted to resemble. Heretofore such wrinkles or folds in the sheet-celluloid have been prevented or disposed of by subjecting the sheet of celluloid or other mate-

rial to pressure between heated dies of the shape of the cover or corner to be formed, by means of which the sheet has been made, under the influence of the heat and pressure, to permanently conform to the shape of the dies, such a molecular rearrangement of the sheet-celluloid taking place at the corner as to eliminate the folds or wrinkles or to reabsorb them into the sheet. In such a method two dies of the desired shape are required, a male and a female die, the process being substantially one of forming the sheet between the male and female dies under the influence of heat and pressure. The main objection to this method is that the use of the female die is apt to injure the raised, embossed, or ornamental work upon the said sheet, and as such embossed work is used upon nearly all of the sheet-celluloid used for veneering this objection is a serious one. We have discovered a method of successfully veneering such lids with celluloid or kindred material which entirely dispenses with the use of the female die, and which thus avoids all danger of injury to the embossing.

The drawings show the preferred form of our improved apparatus and show apparatus by means of which our improved process can be carried out.

Figure 1 is a vertical section of the same, taken on the line 1 1 of Fig. 2. Fig. 2 is a plan of the same. Fig. 3 is a vertical section taken through the center of a lid which has been veneered, but before the edges of the celluloid sheet have been bent over against the under side of the lid.

A plunger is employed to form the sheet. As shown in the drawings, it consists of an iron block or anvil A of the proper size and shape and a patrix D supported thereon. The patrix D may be integral with the block A, or, as shown in the drawings, it may be a separate piece. In the latter case it may be the lid which is to be veneered.

The patrix D in either case is made in the shape usually employed in lids for album-covers—that is to say, having rounded corners, or corners as above described, which round upward from the horizontal plane of

the under side of the patrix, as shown in Figs. 1 and 3 at *d*. It may also, if desired, have some of its corners rounded in the plane of its under side, as shown at *g g* in Fig. 2. In veneering such a lid or patrix D with celluloid or kindred material the celluloid is apt to form in folds or wrinkles at the corners *d*, which round upward from the plane of the base of the patrix, and particularly at the corners which also round in a horizontal plane, as at *g g*.

B is an iron ring or gripper surrounding the block or anvil A and following the contour of the anvil. It is mounted upon a series of springs C C, the springs being secured to a circular extension A' of the anvil A. The springs enable the gripper B to work up and down around the anvil A.

E is the sheet of celluloid or kindred material embossed, if it be so desired, with ornamentation at H in the usual manner.

F is an iron ring or clamping-frame, with an opening G in its center corresponding to the shape of the patrix D to be veneered and of the same size.

The operation of the form of our device shown in the drawings is as follows: The patrix D to be veneered is placed upon the plunger A. In the normal position of the gripper B the latter projects slightly above the upper surface of the plunger A, thus holding the patrix D in position. The sheet of celluloid E is then placed over the patrix, as shown in Fig. 1. The clamping-frame F in the form of apparatus shown in the drawings is stationary. The anvil A, with the gripper B, patrix D, and celluloid sheet E, are moved upward by any suitable mechanism until the sheet of celluloid is gripped between the gripper B and the clamping-frame F. The anvil A in its further progress upward forces the celluloid sheet E into the opening G within the clamping-frame F. The gripper B, however, cannot rise any farther, because the clamping-frame F is stationary. The springs C C are accordingly compressed. The patrix D therefore rises into the opening G until its under face is at least up to the level of the upper surface of the ring B. During the operation or before it the metal portions of the apparatus are heated, thus communicating heat to the celluloid sheet. Under the influence of the heat and through the upward movement of the anvil and patrix and the gripping of the celluloid sheet along the edges of the patrix by the gripping devices, gripper B, and clamping-frame F the celluloid sheet is stretched over the patrix D, especially at the rounded corners, and is made to permanently conform to the shape of the patrix, and smooth and slightly-veneered corners are formed without any folding or wrinkling and without destroying in any way the density, elasticity, or polish of the sheet-celluloid. When the patrix is removed from the anvil, it presents the appearance shown in Fig. 3. As the upper surface of the patrix

D with the sheet of celluloid on it rises into the opening G of the clamping-frame F the embossing H upon the sheet-celluloid does not come into contact with any female die. It is therefore not in any way affected or injured by the operation. After the patrix D with its veneering-sheet E is taken from the anvil the workman with any suitable tool cuts away the superfluous material of the sheet at the square corners to form a right-angled miter, and at the corners rounded in the plane of the bottom of the patrix D he cuts away the superfluous celluloid, leaving, however, sufficient to form a flap. Then the edges of the celluloid on the four straight sides of the patrix are bent over and back on the under side of the patrix. The flap is likewise bent back on the under side of the patrix over or under the adjoining straight sides and the edges of the celluloid sheet are secured to the undersurface of the patrix by cement or glue, and the overlapping edges and the flap are secured to one another by pressure and heat or cement in the ordinary manner. The rough edges of the cover at the corners are then sand-papered and the finished celluloid veneer cover is the result.

Various modifications in detail could be made in the process and apparatus without departing from the spirit of our invention. Thus, for instance, if desired, the plunger instead of working from below upward could work from above the sheet downward. The shape of the patrix could be varied or glue or cement might be applied to the under surface of the sheet E before the operation. It is also evident that after the celluloid sheet has been made to conform to the shape of the patrix, as shown in Fig. 3, the patrix D can be removed, if desired, and another and permanent patrix be substituted in its place and the edges of the sheet be turned over onto the back of the second patrix. In this way the first patrix used may be of metal.

What we claim as new, and desire to secure by Letters Patent, is--

1. The method of veneering rounded corners, covers of books, boxes and similar articles, with sheet-celluloid or kindred material capable of being rendered plastic by heat, which consists in gripping the edges of the sheet, applying heat to the sheet and forcing the sheet around the rounded corners of the articles to be veneered, whereby the said sheet will be made to permanently conform to the rounded shape of the corners, substantially as set forth.

2. The method of veneering rounded corners, covers of books, boxes and similar articles, with sheet-celluloid or kindred material capable of being rendered plastic by heat, which consists in gripping the edges of the sheet, applying heat to the sheet and forcing the sheet around the rounded corners of the articles to be veneered, whereby the said sheet will be made to permanently conform to the rounded shape of the corners, and turning

over the projecting edges of the sheet upon the back of the inclosed patrix and securing them thereto, substantially as set forth.

3. The method of veneering rounded corners, covers of books, boxes and similar articles, with sheet-celluloid or kindred material capable of being rendered plastic by heat, which consists in gripping the edges of the sheet, applying heat to the sheet and forcing the sheet around the rounded corners of the articles to be veneered, whereby the said sheet will be made to permanently conform to the rounded shape of the corners, turning over the projecting edges of the sheet upon the back of the inclosed patrix and securing them thereto, and uniting or blending said edges to each other at their overlapping portions, substantially as set forth.

4. The combination with a plunger having its face of the shape of the article to be veneered and adapted to be forced against a sheet of celluloid, of gripping devices to hold the sheet taut, whereby the sheet will be made to permanently conform to the shape of the face of the plunger, substantially as set forth.

5. The combination with a plunger having its face of the shape of the article to be veneered and adapted to be forced against a

sheet of celluloid, of a gripper mounted on springs and surrounding the plunger, and a hollow clamping-frame against which the gripper is adapted to press to hold the sheet taut, whereby the sheet, when heated, will be stretched over the face of the plunger within the hollowed-out portions of the clamping-frame, and be made to permanently conform to the shape of the face of the plunger, substantially as set forth.

6. The combination with a plunger having its face of the shape of the article to be veneered and adapted to be forced against a sheet of celluloid, a gripper surrounding a plunger and a hollow clamping-frame, whereby the sheet will be gripped between the gripper and the hollow clamping-frame and be held taut and will be made to permanently conform to the shape of the face of the plunger, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALFRED C. HAFELY.

JENS REDLEFSEN.

CHARLES A. HAPPE.

Witnesses:

J. B. GUNN,

F. W. GREAVES.