

(No Model.)

2 Sheets—Sheet 1.

F. B. DAVIDSON.
PAPER BOX.

No. 571,512.

Patented Nov. 17, 1896.

Fig. 1

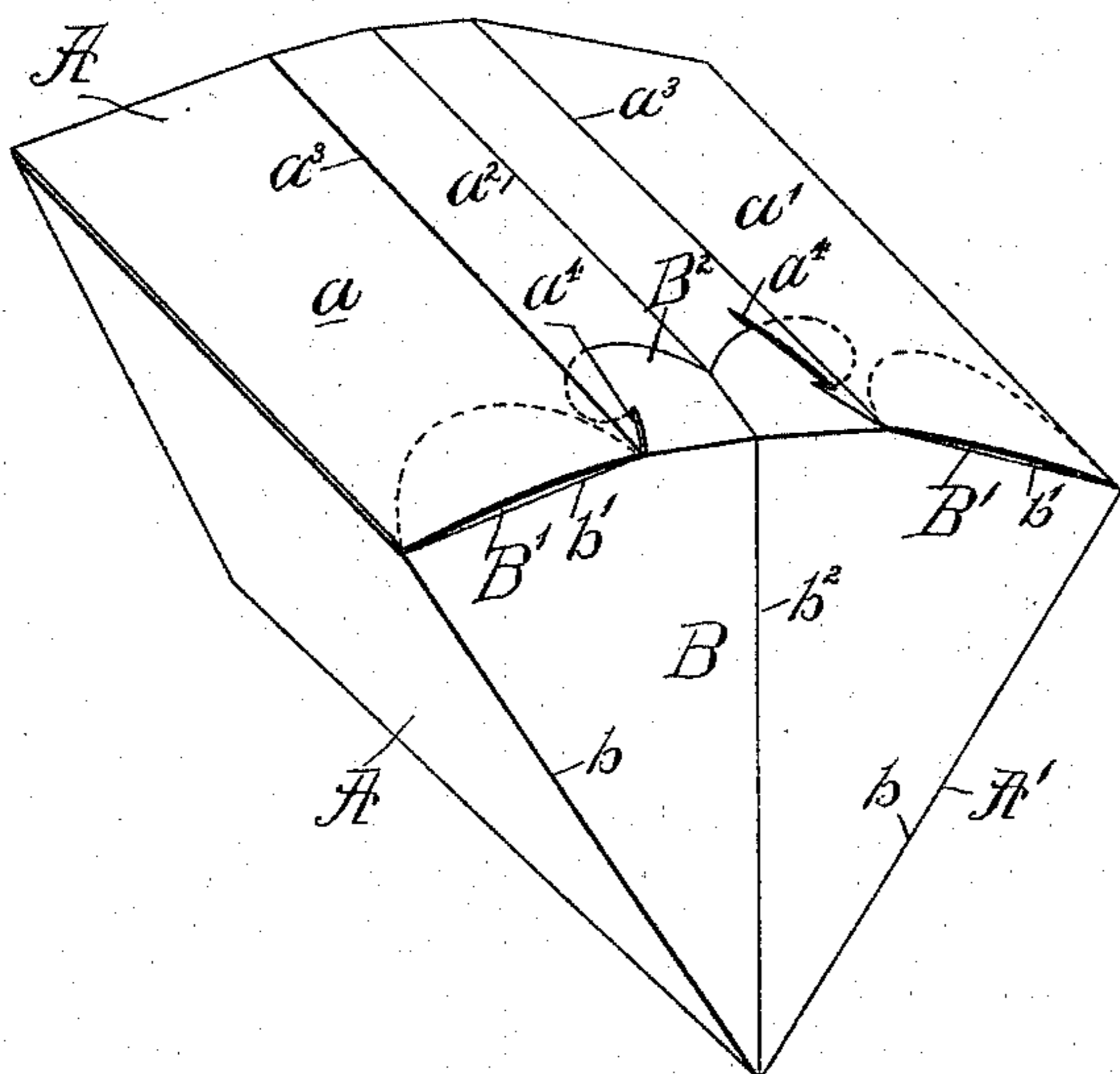


Fig. 2

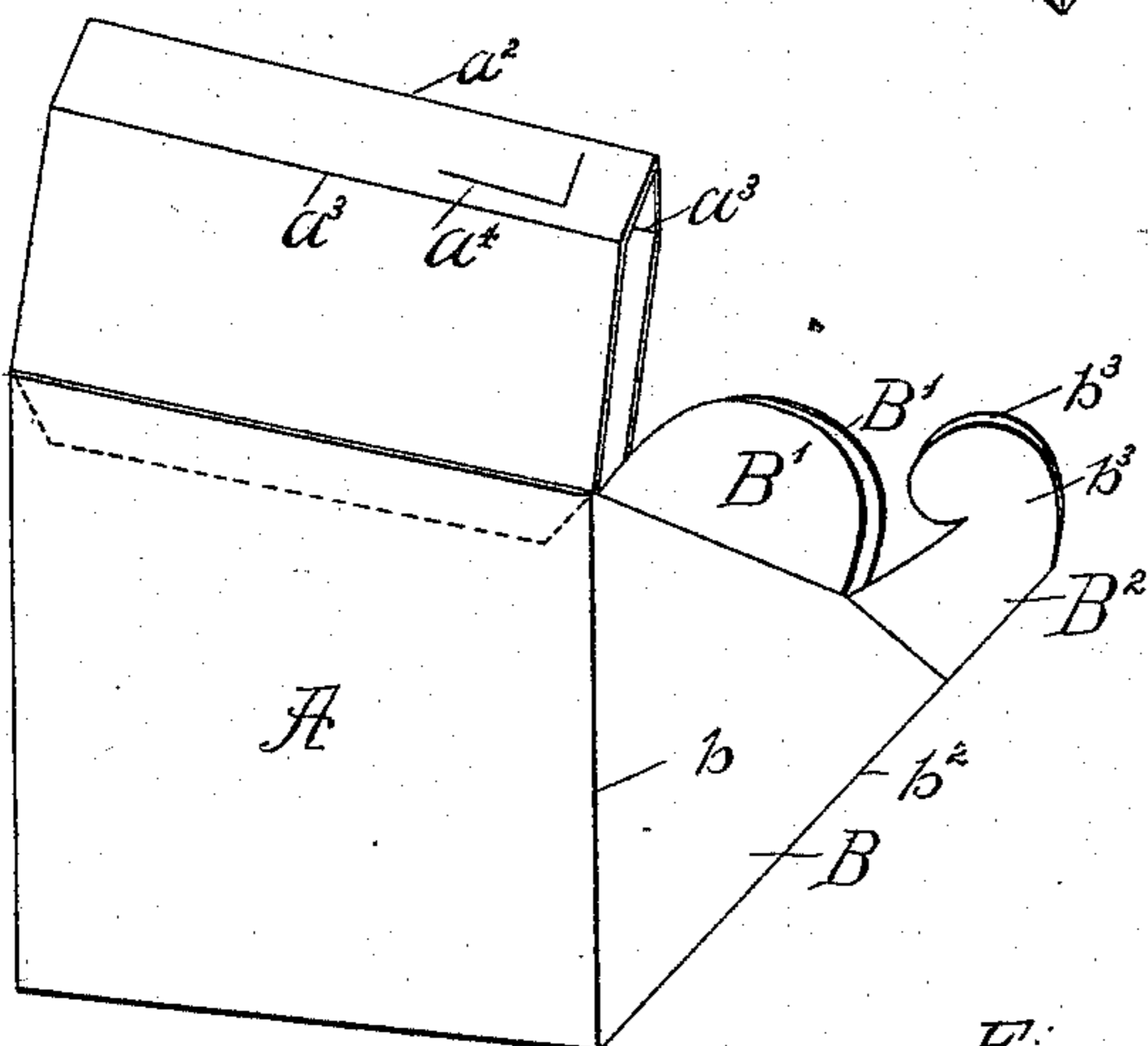
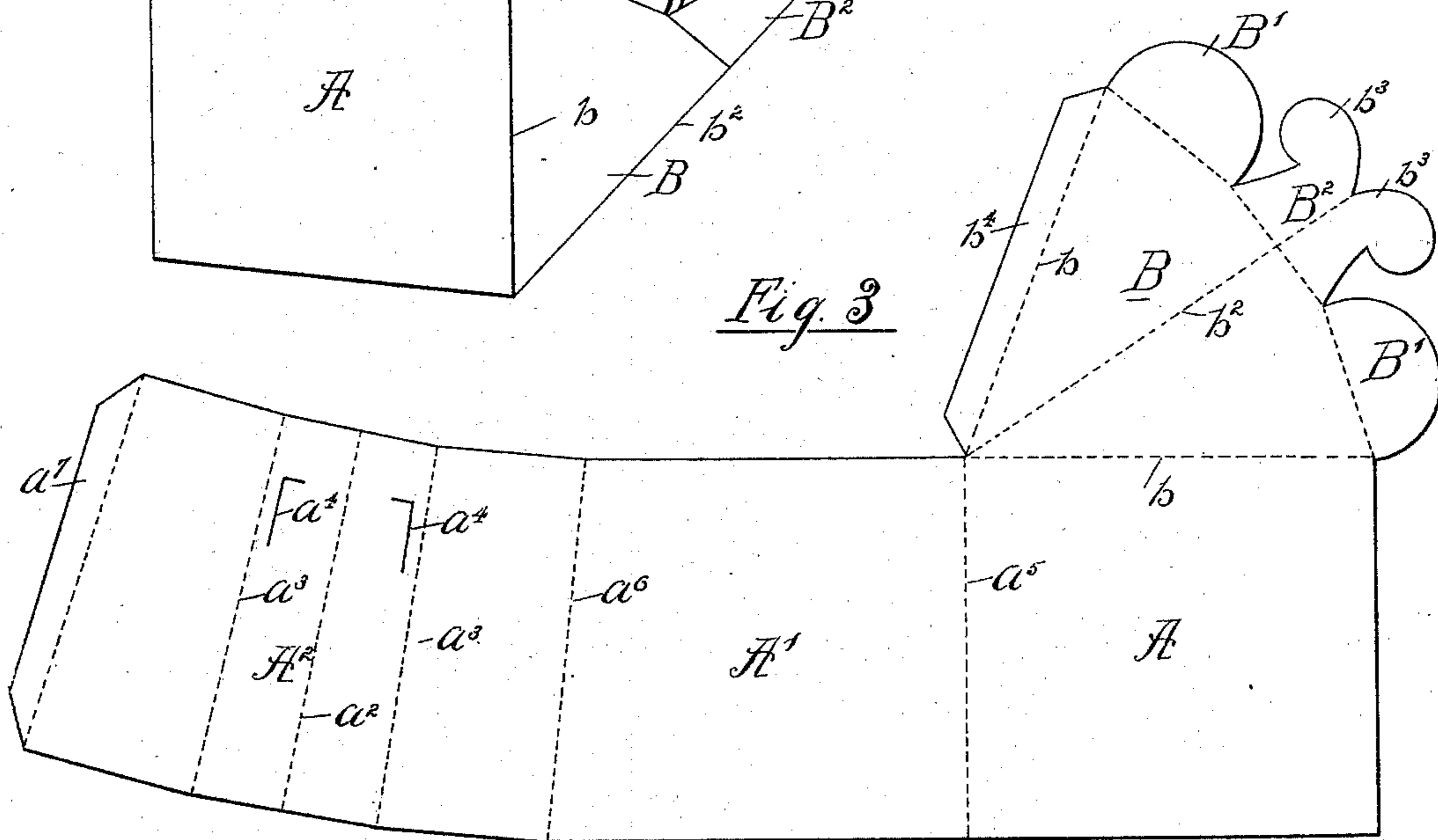


Fig. 3



Witnesses

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his Attorneys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

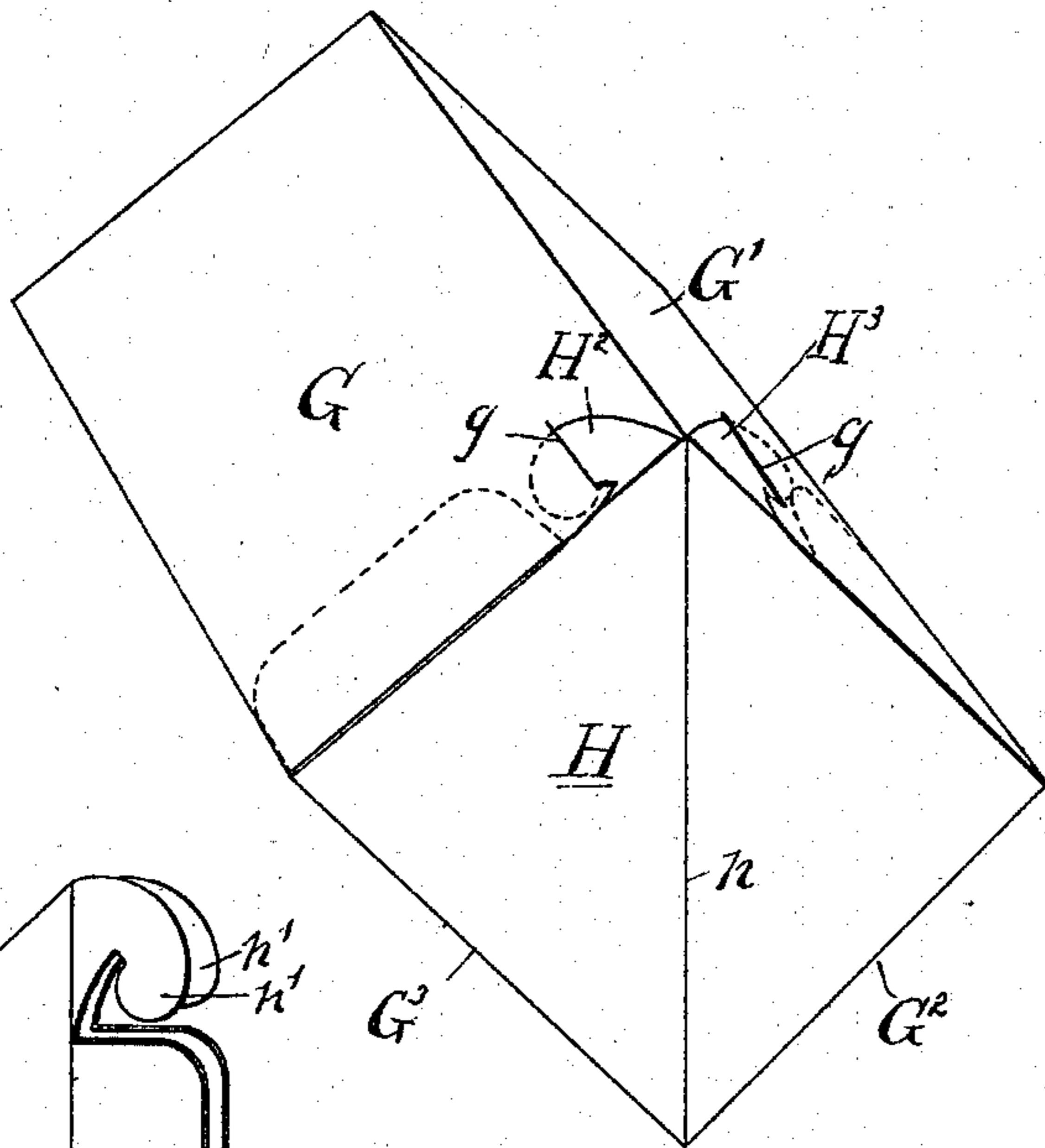


Fig. 5.

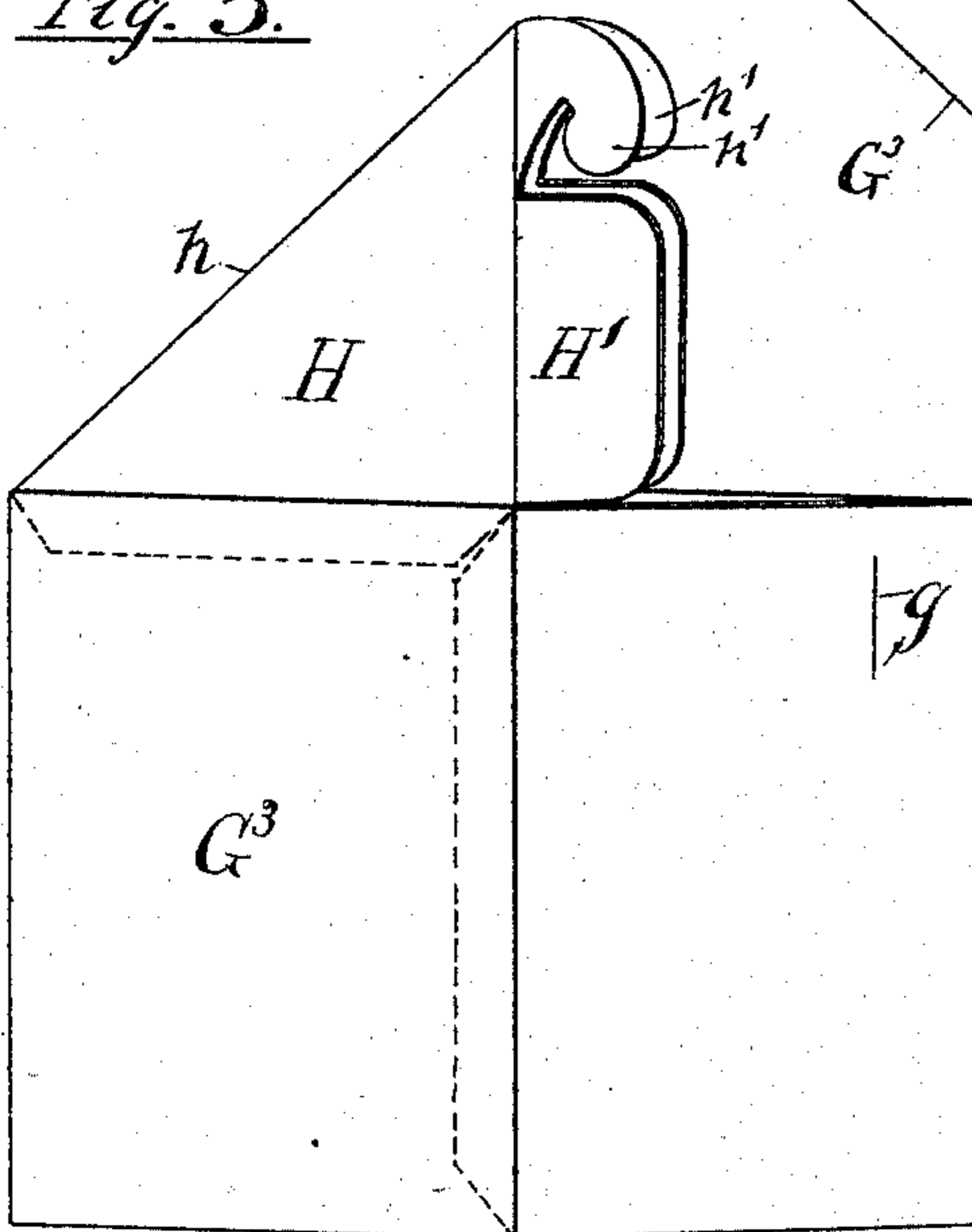
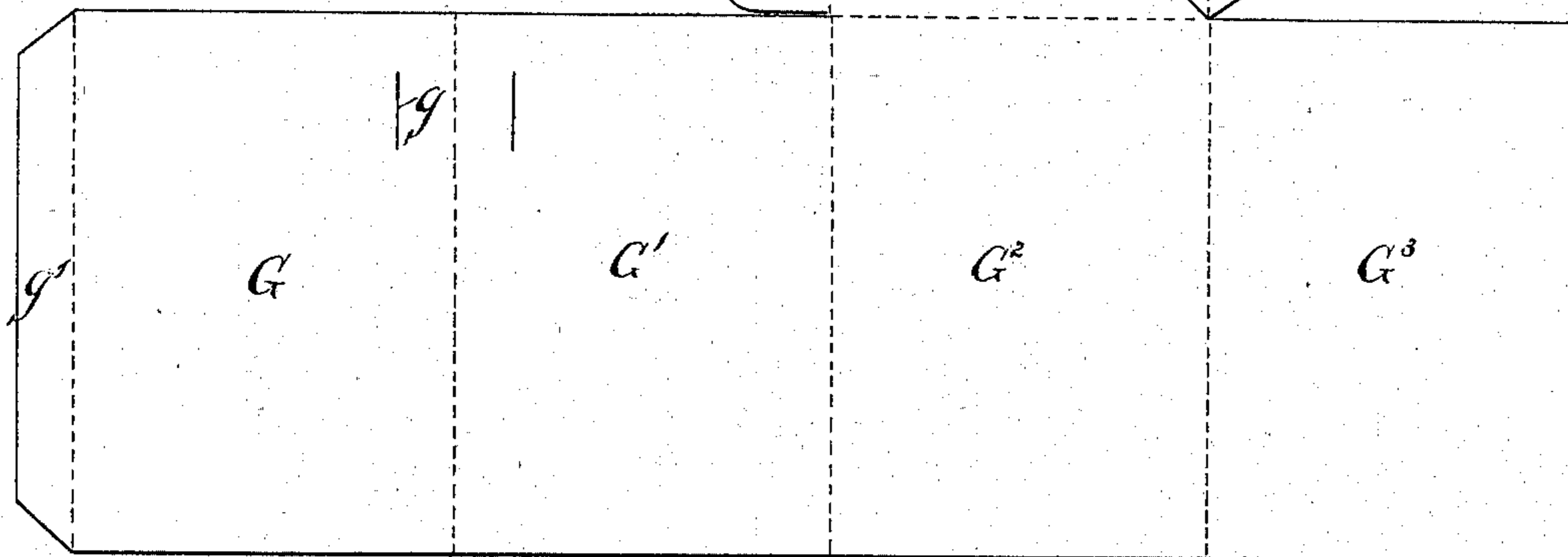
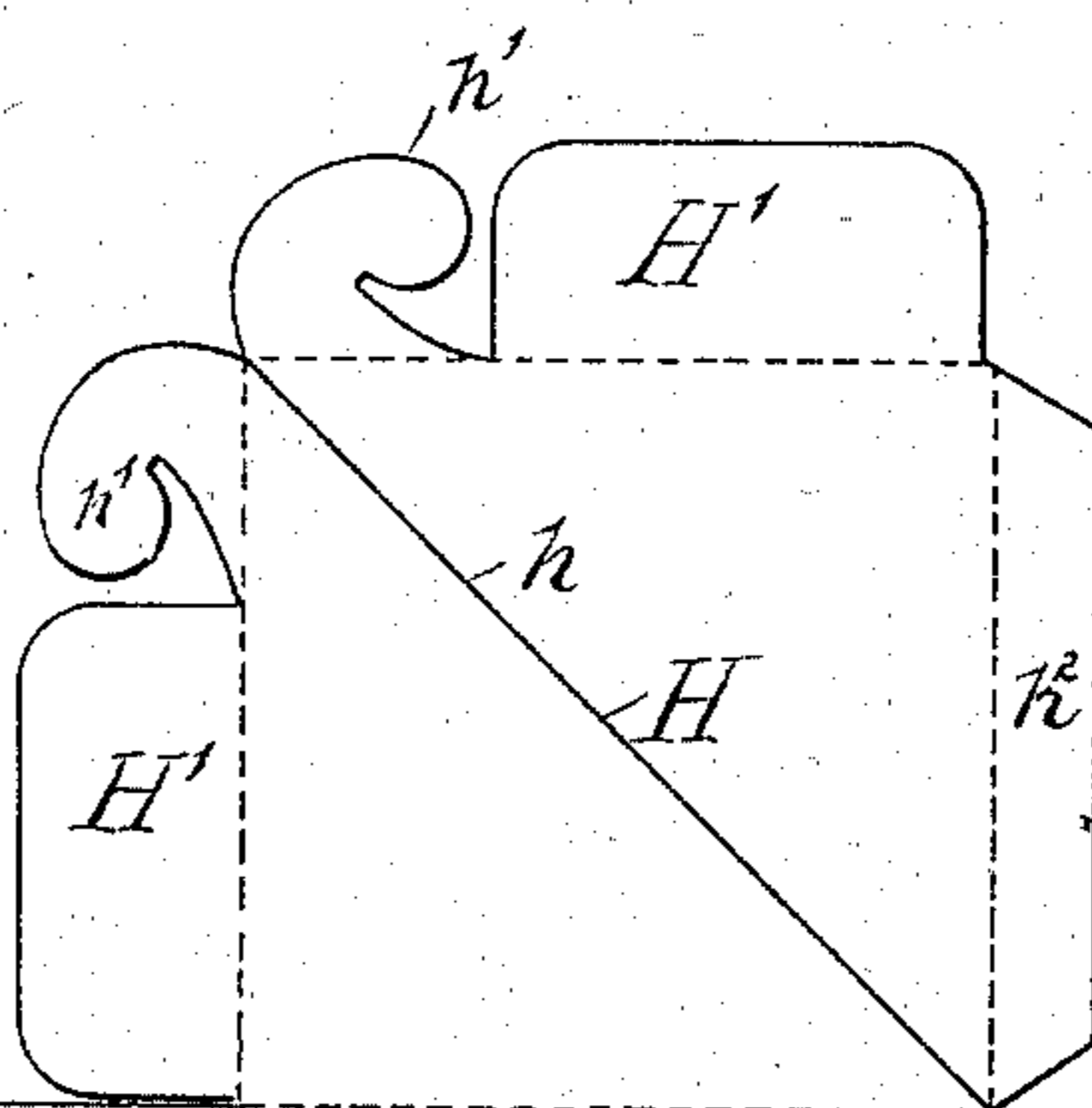


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK B. DAVIDSON, OF CHICAGO, ILLINOIS.

PAPER BOX.

SPECIFICATION forming part of Letters Patent No. 571,512, dated November 17, 1896.

Application filed March 15, 1895. Serial No. 541,851. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. DAVIDSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper Boxes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in paper boxes or cartons of that class which are adapted to be folded flat for transportation and to be opened up by the user at the time of filling the same.

The invention consists in the matters hereinafter described, and particularly pointed out in the appended claims.

My improvement is especially applicable to sector-shaped boxes, or those used for packing stick candy and other kinds of merchandise in buckets, pails, barrels, and other receptacles, and may be used in connection with boxes made of wood veneer or other thin material, as well as paper. Certain features of the invention are, however, applicable to rectangular boxes also, as will hereinafter appear.

In the application of my invention to sector-shaped boxes the sides of the boxes which correspond with the radii of a circle, and which may be called the "radius" sides, are flat and straight, and the part which constitutes the end wall of the box is permanently attached to both of said radius sides, and is provided with a central crease, so that when the box is folded flat by bringing the radius sides together the triangular end wall will be folded together along its center, thereby bringing each half of the end wall into the same plane with the radius side to which it is attached and enabling the box to be folded flat, notwithstanding the permanent attachment of the two sides of the end wall to the two sides of the box. This construction may be employed at either one or both ends of the box, the operation being the same in either case, as will hereinafter appear. In the application of this construction to a sector-shaped or triangular box one edge only of the triangular end wall is unattached to the body of the box, so that it is necessary in order to

completely fasten the end to the body that suitable tucks or other fastening devices should be applied in such manner as to secure the free edge to the adjacent parts of the box. In its application to a square box an end wall similarly creased at its middle would be secured to two adjacent sides of the body of the box, which sides will correspond with the radius sides of a sector-shaped box, and the end wall then needs to be connected in setting up the box with the two opposite side walls, the box being folded by bringing together the side walls, to which the end wall is permanently attached, and at the same time folding said end wall along an oblique line extending from said attached corner to its outer or free corner, as will hereinafter more fully appear. The features of construction described may, moreover, be applied to rectangular boxes of other than square form, as well as to other boxes of symmetrical shape.

Boxes containing my invention may be constructed either of a single blank, or the same may consist of several connected pieces, as may be found convenient or desirable.

In the accompanying drawings, illustrating my invention, Figure 1 is a perspective view of an open-ended sector-shaped box embodying my invention. Fig. 2 is a perspective view of the same in its folded form. Fig. 3 illustrates the shape of the blank for making the box shown in Figs. 1 and 2.

In Figs. 1, 2, and 3 is shown a box which closes at one end only, or provided with only one end wall, and which may be made of paper, strawboard, wood, veneer, or other thin sheet material. The side walls of the box comprise two equal and similar radius sides $A A'$ and an arc side A^2 , composed of two equal and similar sections $a a'$, the said arc side being in fact continuous with the radius sides, and an intermediate line defining the two equal parts, the sections $a a'$ being in fact merely a scored line a^2 along the said arc wall to easily fold at its middle. In the approved form of boxes shown the said arc side is provided with two other scored lines $a^3 a^3$, which permit the arc side to open in form corresponding approximately with the curved side of the inclosing vessel in which the box is packed.

B is the box end, which is generally of tri-

angular form having two edges $b\ b$, arranged at an angle with each other corresponding with the angular distance apart of the radius sides $A\ A'$ of the box-body, and a third edge b' , which conforms approximately to a circular curve drawn with the intersection of the sides $b\ b$ as the center. Said edge b' is, however, provided with free flaps $B'\ B'$ and B^2 , which flaps, when the box is set up, are opened at right angles to the end wall, so that the edges b' in said end wall consist in fact of three straight lines, which define the line of fold between the flaps and the body of the end wall. Said end wall is permanently secured at its two edges $b\ b$ to the ends of the radius sides of the box-body, its curved edge b' being left free from the radius wall A^2 to permit the folding of the box, but being connected therewith by the interlocking of the middle flap B^2 with said arc wall when the box is in readiness for use. Said end wall B is provided along its center with a fold or crease b^2 , which extends from its apex to the free end of the tongue B^2 , and serves to bisect the angle formed by the said edges $b\ b$ of said end wall. By reason of the presence of the crease b^2 said end wall, when detached from the arc wall, may obviously be folded along its center, so as to bring its opposite edges $b\ b$ together, while at the same time the radius walls $A\ A'$ of the body are brought together, and the arc wall A^2 is folded along its center crease a^2 , so as to bring the two parts $a\ a'$ thereof together. Said folding of the box is clearly shown in Fig. 2. From this figure it will be seen that the box may be folded flat, notwithstanding the permanent attachment of two edges of the end wall with the adjacent radius walls of the box-body, and, furthermore, that all that is needed for securing the free edge of the end wall so as to completely close the end of the box is to properly interlock the flap B^2 of the end wall with said arc wall. In the construction illustrated the said flaps $B'\ B'$ of the end wall are made of the same width as the distance from the side margin of the arc wall to the creases or scores a^3 therein, while the intermediate flap B^2 is made at its base approximately the same width as the distance between the scores $a^3\ a^3$. Moreover, the said intermediate flap B^2 is adapted to interlock with the arc wall to secure the end wall thereto, while the end flaps $B'\ B'$ are adapted to merely fold inside of the arc wall for the purpose of making a tight joint which will prevent the escape of the contents of the box at this point.

The interlocking of the flap B^2 with the arc wall is accomplished in the construction illustrated by means of two lateral projecting tongues $b^3\ b^3$ on the flap B^2 , which tongues are adapted to engage slits $a^4\ a^4$ in the arc walls. Engagement of the tongues thus constructed with the slits is easily accomplished by pressing together the ends of the tongues when the flap is partially folded over and inserting the ends of both tongues at once into

the slits, after which, by pressing the flap against the arc wall so as to bring it into the same plane with the same, the tongues are forced into place and the interlocking is completed. The pressing together of the tongues in the manner described is of course facilitated by the presence of the crease or score b^2 , which extends outwardly through the middle of said flap.

The box illustrated is adapted to be used in connection with a packing-pail larger at the top than at its bottom, and for this purpose is made of tapering form, larger at one end than the other. The arc side only of the box is inclined, however, as the radius sides must necessarily be perpendicular to the planes of the top and bottom ends of the box, in order that contiguous boxes may come closely in contact with each other when packed in the pail. To this end, therefore, each radius side is made of trapezoidal shape, with its top edge or that adjacent to the open end of the box longer than its bottom edge, while the arc side is made long at its top edge and has its side edges equally inclined from its center line.

The several side walls and end wall of a box embracing the features above described may be made of one or more pieces of paper or strawboard, and if made of more than one piece the parts may be connected or joined in any manner found convenient or desirable. The box shown in Figs. 1 and 2 is made from a single blank, such as is illustrated in Fig. 3. In this blank the two side walls $A\ A'$ and the arc wall A^2 are joined side by side in a single strip which is provided with a fold or crease a^5 at the junction of the radius walls and another fold or crease a^6 where the radius wall A' joins the arc wall A^2 . At the end of the arc wall is formed a flap a^7 , which is fastened to the edge of the radius wall A to complete the body of the box. The end wall B has the form of a flap attached to the radius wall A and is provided with a flap b^4 at its opposite radius edge, which flap is secured to the lower edge of the radius wall A' . The blank, as shown in Fig. 3, is not only simple in form, but enables the joining of the parts by paste or glue to be more easily effected, it being obvious that if the blank be folded along the lines b^2 , a^2 , and a^5 the parts will be brought into the position shown in Fig. 2, and with the securing-flaps $b^4\ a^7$ in proper position for pasting, so that if paste or glue is applied to these flaps before the parts are folded they will be properly joined when the folding takes place and will then be ready for shipment.

The general construction heretofore described and embodied in the sector-shaped box illustrated may be applied as well to square boxes. This will be better understood by reference to Figs. 4, 5, and 6 of the accompanying drawings, wherein a square box is shown, the box shown in those figures being an open-ended one or having one end only closed by means of an end wall. As shown

in said figures, the box is provided with side walls $G\ G'\ G^2\ G^3$ and with the end wall H . Said end wall is of square form and is attached at two of its margins to the side walls $G^2\ G^3$. Said end wall is also provided with a central crease or score h , extending from one of the corners at its connected side diagonally across to its opposite corner. At its free margins the end wall is provided with flaps $H'\ H''$, located adjacent to the walls G^2 and G^3 , and with other flaps $H^2\ H^3$, located adjacent to its free corner and having lateral tongues $h'\ h''$. These tongues are adapted to engage with slits $g\ g'$, formed in the side walls $G\ G'$, adjacent to the corner box. The box thus made is adapted to be folded flat by folding the same along the lines which join the sides $G^2\ G^3$ and $G\ G'$, so as to bring the walls $G\ G^3$ into contact with the walls $G'\ G^2$, while at the same time bringing opposite corners of the end wall H together by the folding of the same along the oblique line h , as clearly seen in Fig. 5, which shows the box in its flat knocked-down form.

In Fig. 6 I have shown a blank adapted for making the box illustrated in Figs. 4 and 5. This blank consists of a main part formed by the connected side walls $G\ G'\ G^2\ G^3$ and a lateral projection forming the wall H , which latter is integral with one of the side walls, in the instance illustrated the wall G^2 . The main strip forming the side walls is provided at one end with a flap g' , while the end wall H is provided with a similar flap h^2 . In fastening the parts of the blank together to constitute the knock-down or folded box shown in Fig. 5 the flap h^2 is secured to the adjacent margin of the wall G^3 , while the flap g' is secured to the side margin of said side G^3 . The blank may be brought into position for joining these flaps with a wall G^3 by folding the same on the lines between the sides $G\ G'$ and $G^2\ G^3$ and by also folding the end H on the diagonal line h . This will bring the side margins or the sides G and G^3 together and it will also bring the flap h^2 into contact with the end margin of the side G^3 . The parts will then be in the position in Fig. 5, and if adhesive material is applied to the flaps $h^2\ g'$ before or at the time the folding takes place the parts will be properly secured by the application of pressure to the blank in its folded form and no such manipulation of the blank will be necessary until it is opened up for filling the box.

The open-ended box shown in Figs. 4, 5, and 6 may be used as one member of telescoping box, may have a separate cover, or its opening may be closed by means of interlocking flaps, made in any convenient manner. A box thus made can be used to great advantage as a strawboard shell to be afterward covered with a paper wrapper for packing articles of merchandise, such as oatmeal, the construction described being a desirable one for this purpose not only by reason of the

ease and convenience with which it may be opened up and the end wall secured, but because the end walls afford a smooth and flat surface over which the paper wrapper may be applied and which would show no irregularities beneath said paper wrapper, and thus give a smooth and neat-looking package.

The general advantage attained by the folding end wall described is that of economy of material, such end wall containing a much smaller quantity of paper than one which is formed by a number of overlapping flaps.

I claim as my invention—

1. A collapsible paper box, consisting of a strip which is bent into tubular form to constitute a plurality of side walls and is provided at one end with a pasting flap by which the ends of the strip are permanently united, and a polygonal end wall forming an integral extension at one side of said strip, and conformed to the shape of one end of said tubular part, a pasting flap by which one of the edges of the polygonal end wall adjacent to its integrally-connected side is permanently secured to the adjacent edge of a second side wall, said end wall being provided with a score or folding line which bisects the angle included between the integrally-connected side and the permanently-attached side, and an integral locking-tongue on the free marginal part of said end wall adapted to engage locking-slits on the adjacent part of the tubular body, substantially as described.

2. A collapsible sector-shaped paper box consisting of a strip which is bent into tubular form, and is provided at one end with a pasting flap which is permanently secured to the opposite end of the strip, said strip forming a tubular body having two radius sides and an arc side, an end wall of sector shape made integral with the strip and forming an integral extension at one side thereof, a pasting flap by which the edge of said end wall adjacent to its integrally-connected wall is secured permanently to the adjacent radius side of the body, said end wall being provided with a score or folding line which bisects the angle included between the two radius sides of the box, and the other edge of said end wall being provided with an integral locking-tongue adapted to engage with locking-slits on the adjacent part of the arc wall of the body, substantially as described.

3. A box-blank consisting of a strip adapted to be bent into tubular form to constitute a plurality of side walls, a flap upon one end of said strip for uniting the ends thereof, a polygonal end wall formed at one side of said strip conformed to the shape of one end of said tubular part, a pasting flap for permanently attaching one of the edges of said polygonal end wall adjacent to its integrally-connected side to the adjacent edge of a second side wall, said end wall being provided with a score or folding line which bisects the angle included between the integrally-con-

nected side and the side adapted to be permanently attached, and a flap for detachably uniting the remaining free edge of said end wall with one of said walls of the tubular
5 body, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature, in presence

of two witnesses, this 12th day of March, A. D. 1895.

FRANK B. DAVIDSON.

Witnesses:

C. CLARENCE POOLE,
ALBERT H. GRAVES.