

No. 689,422.

Patented Dec. 24, 1901.

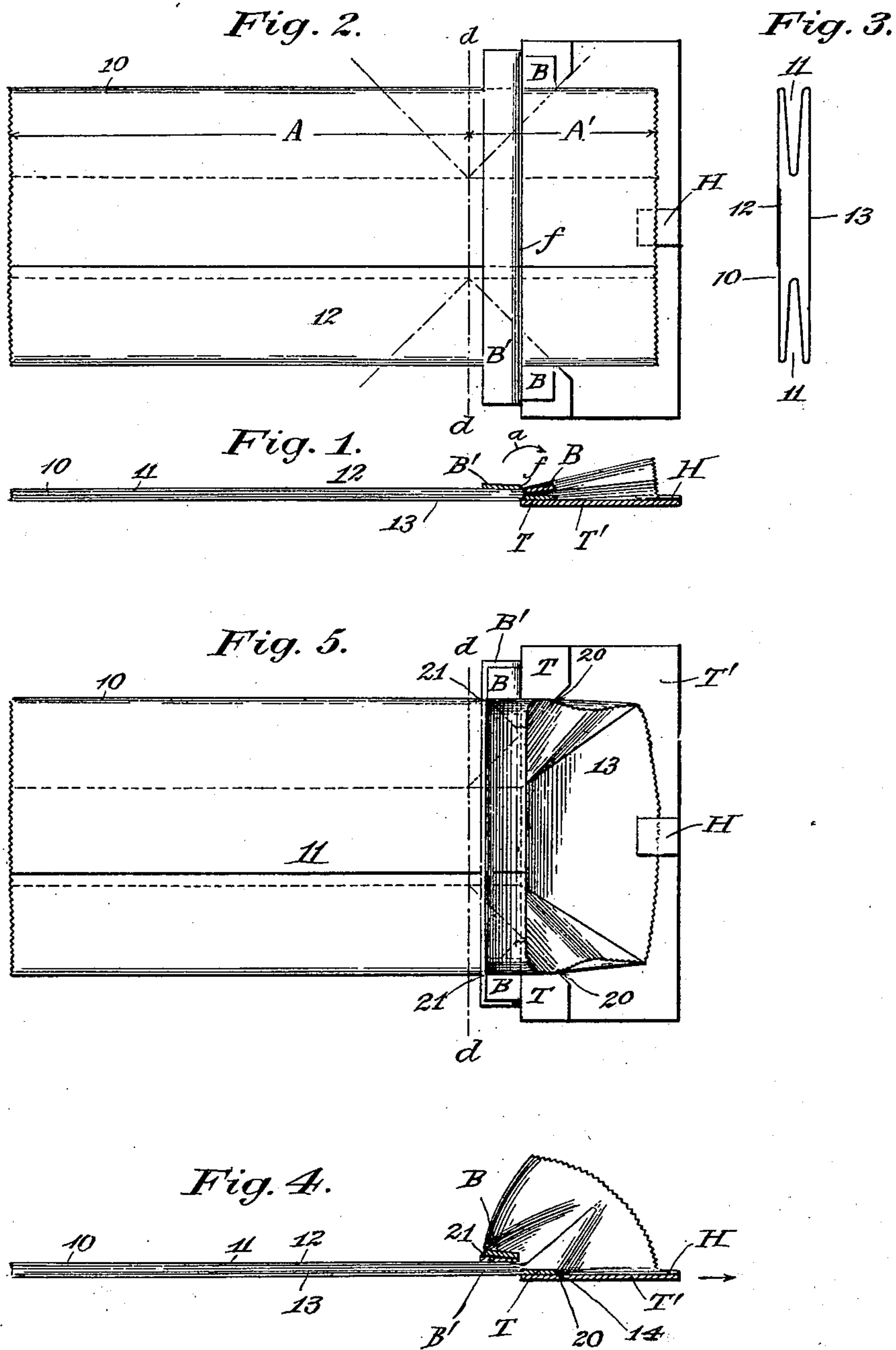
C. F. SCHMELZ.

ART OF MANUFACTURING SQUARE BOTTOM PAPER BAGS.

(Application filed Mar. 19, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

H. Mallner
Helle Phoenix

Inventor:

Charles F. Schmelz,
By his Attorney
William A. Lorenz

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2 Sheets—Sheet 2.

Fig. 7.

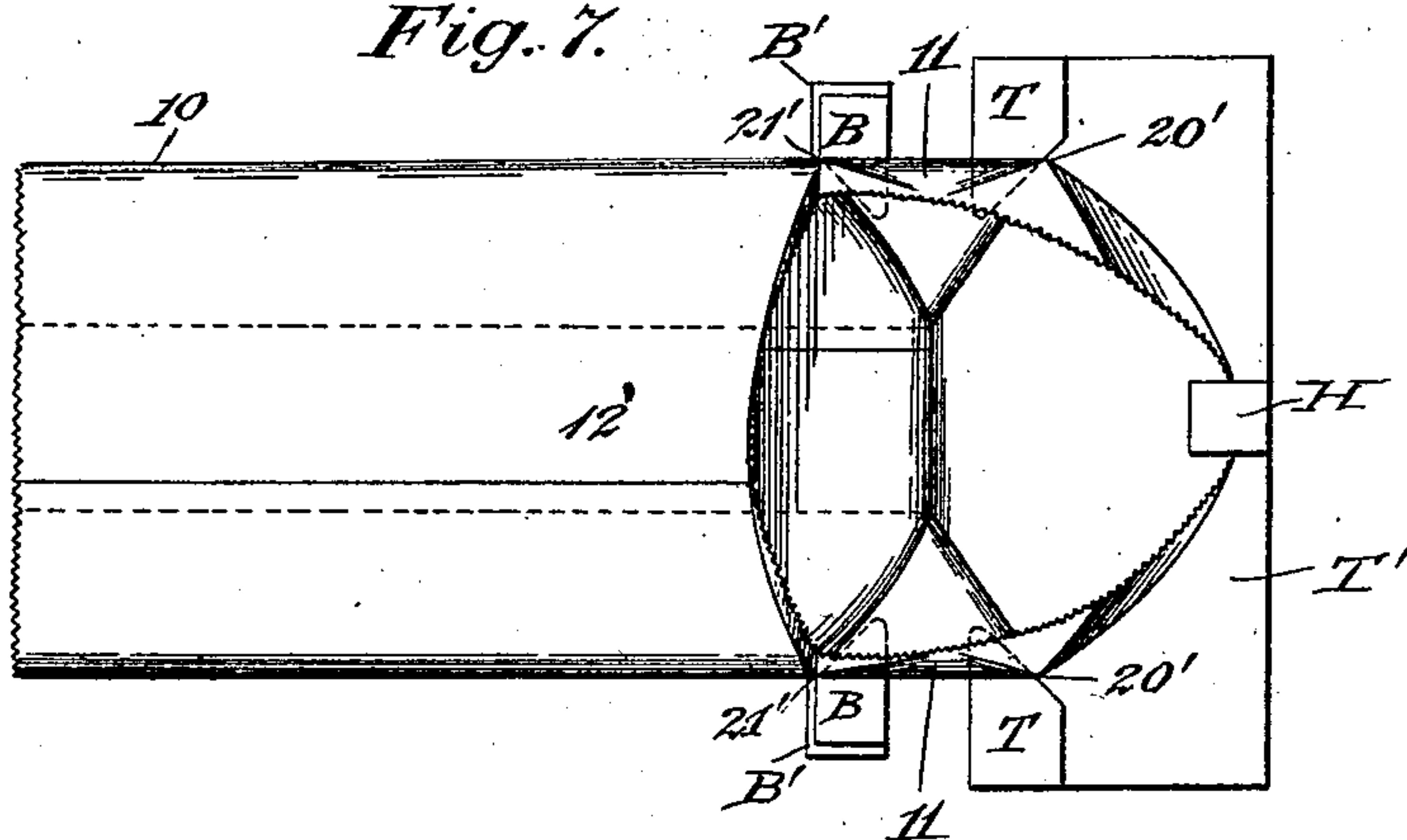


Fig. 6.

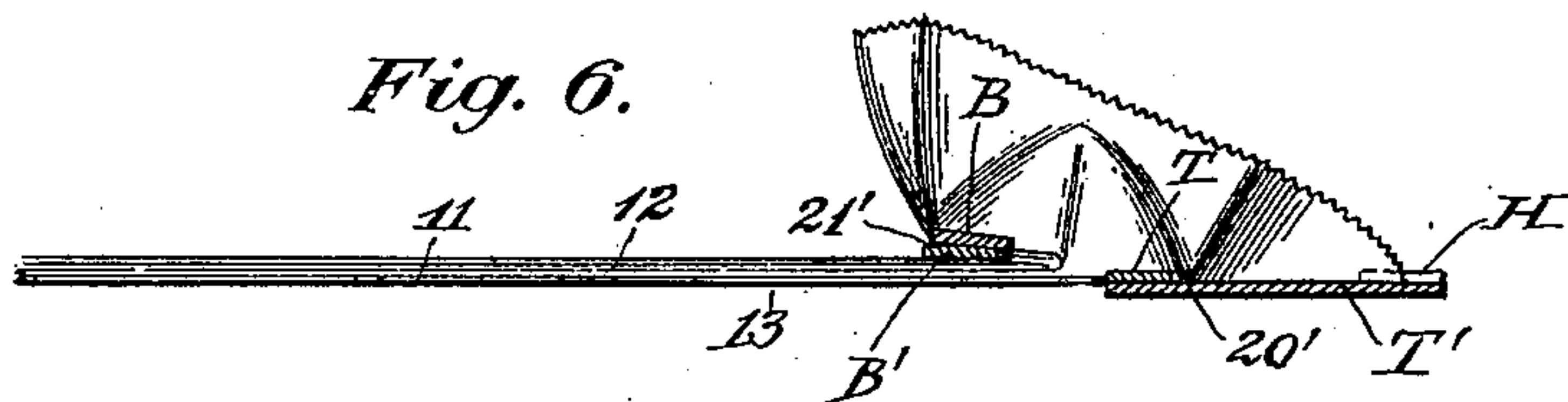


Fig. 9.

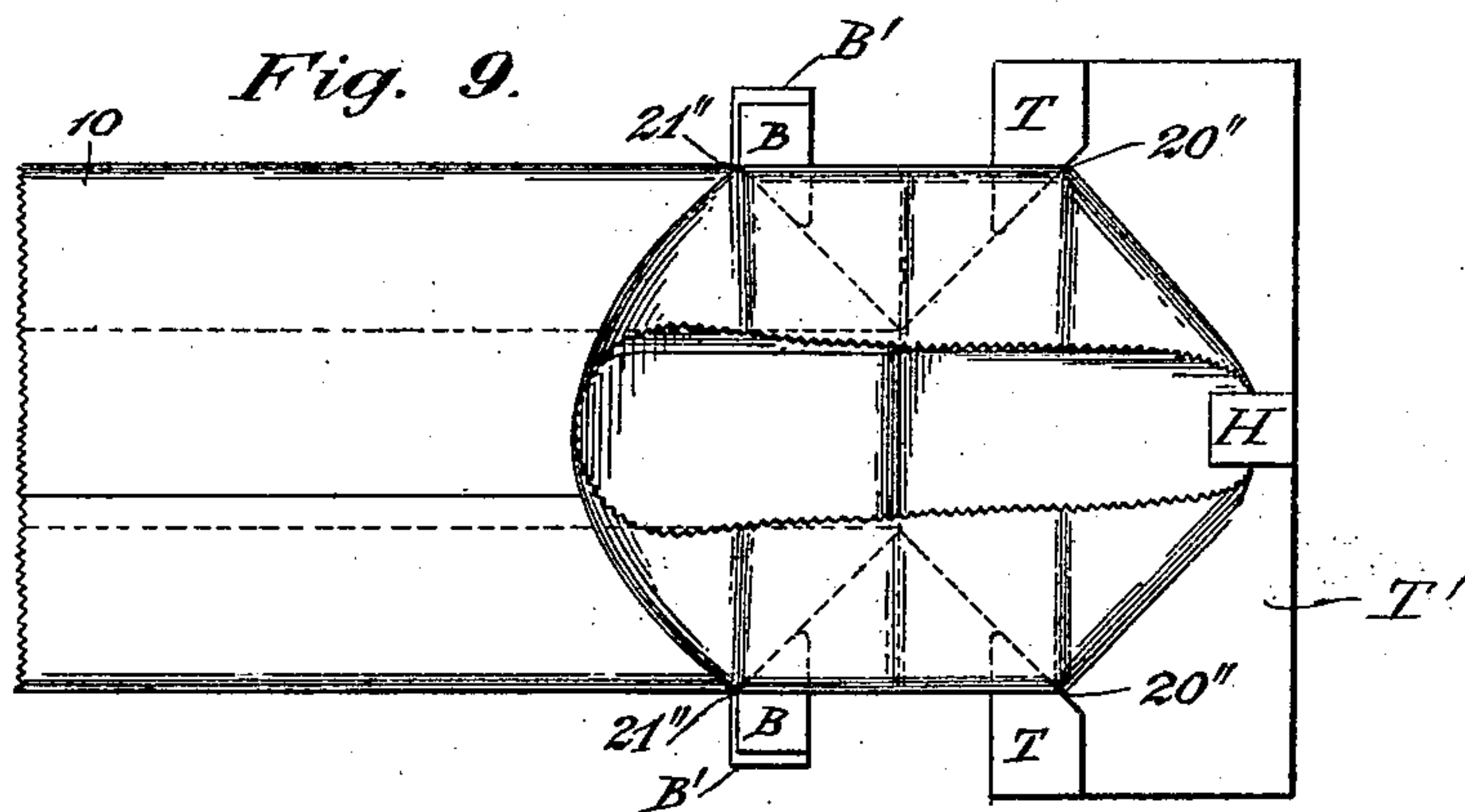
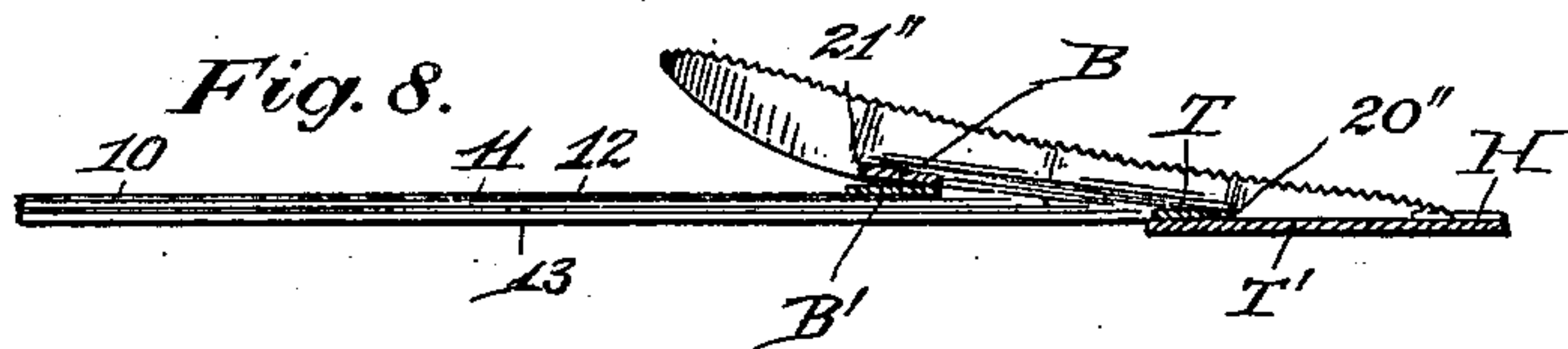


Fig. 8.



Witnesses:

H. Mallner
Helle Phoenix

Inventor:

Charles F. Schmelz,
By his Attorney
William A. Lorenz

UNITED STATES PATENT OFFICE.

CHARLES F. SCHMELZ, OF HARTFORD, CONNECTICUT, ASSIGNOR TO UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ART OF MANUFACTURING SQUARE-BOTTOM PAPER BAGS.

SPECIFICATION forming part of Letters Patent No. 689,422, dated December 24, 1901.

Application filed March 19, 1901. Serial No. 51,826. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SCHMELZ, a citizen of the United States of America, and a resident of Hartford, Connecticut, have
5 invented certain new and useful Improvements in the Art of Manufacturing Square-Bottom Paper Bags, of which the following is a specification.

This invention relates to the art of manufacturing square-bottom paper bags; and it has for its object an improved method of forming the so-called "diamond fold" in a bellows-sided or tucked tube or blank, such method being adapted for use in connection
15 with any well-known methods of forming the tube and of subsequently pasting and folding the diamond to complete the bag.

My invention has more particularly for its object the improved method of opening out
20 the open or bottom-forming end of the blank, so as to form the inside triangular folds in an easy and rapid manner, and it comprises as one of its features the manipulation of the plies of the blank between certain points thereof. The several instrumentalities for holding said plies are caused to engage the same at points the distance of which from the bottom-defining line is equal to the depth of the tucks, the blank being opened out by
30 and between these instrumentalities around a primary folding-line which is disposed between said points of engagement and the bottom-defining line, and when said points of engagement have arrived at positions at opposite sides of this primary folding-line the distance between the points of engagement is increased until the sides will have been fully stretched out between said points.

One of the ordinary methods of forming
40 the diamond on a bag-blank comprises the engagement of the upper and lower plies thereof by suitable devices generally known as "tuck" and "box" holders, these devices engaging said plies at certain distances from
45 the bottom-defining line, so that when the tucked sides are gradually straightened or stretched out by and between said devices the inside triangular folds will be fully developed. The process of straightening out or

stretching the tucked sides is usually carried
50 out by swinging the devices which engage one ply of the blank away from those engaging the other ply and substantially around the defining-line as an axis, the distance from each of said devices to the defining-line re-
55 maining substantially uniform throughout this folding operation. In my improved method the plies of the blank are manipulated in such a manner that the tucked sides will have been distended but partially be-
60 tween the points of engagement even after the latter have arrived at positions at opposite sides of the primary folding-line, so that subsequently the distance between such points must be increased in order fully to
65 stretch out the tucked sides of the tube.

A process incorporating my invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a bag-blank, illustrating the manner in which the upper and lower plies thereof are engaged by the folding instrumentalities. Fig. 2 is a top view of Fig. 1. Fig. 3 is an end view of the blank. Fig. 4 shows the upper ply of the blank folded
70 over around the primary folding-line. Fig. 5 is a top view thereof. Figs. 6 and 7 show a further advancement in the tube-distending operation; and Figs. 8 and 9 show a side and top view, respectively, of the blank when the
75 folders have arrived at their final positions and the diamond is substantially completed.

In the drawings the blank 10 is shown having tucked or bellows sides 11 and comprising a bag-forming section A and the bottom-
80 forming section A', the boundary-line between said sections being generally known as the "defining-line" and indicated in the present instance by $d d$. Referring to Figs. 1 and 2, the upper ply 12 of the blank is shown en-
90 gaged by the so-called "box-holders" B and the proper function of, which is to fold said ply around the edge f of a member B', which constitutes a folding member coöperative with the box-holders B. The blank 10 is properly
95 positioned relatively to the various folding instrumentalities, so that the member B' will be disposed above the upper ply, while the

box-holders B and the tuck-holders T will enter the tucks and the cooperative member T' will be disposed below the lower ply 13 of the blank, and the front diamond-holder H will
 5 engage the same in the manner clearly shown in Fig. 1. In order to insure the proper engagement of the upper ply of the blank by the box-holders B, the member B' may now be turned forward in the direction of arrow
 10 α and around the edge f until the upper ply is firmly clamped between the box-holders B and said member B', whereupon said member, and with it the box-holders, may be swung back again until the position shown
 15 in Figs. 4 and 5 has been reached, in which the primary folding-line is formed by said edge f . At this time the tucked sides have been partially distended between the points 20 and 21, which constitute the engaging
 20 points of the box and tuck holders, respectively. The distance between said points will now be increased, passing in its progress the condition shown in Fig. 6, which illustrates the "box form" nearly completed and showing
 25 the distance between the points 20' and 21' somewhat greater than that between the points 20 and 21 of Fig. 4. On a further increase of the distance between said points to the position shown in Fig. 8 the tucked sides
 30 will be fully distended or stretched out between the points 20'' and 21'', and the diamond may now be flattened and completed.

From the foregoing it will be seen that while the edge f of the member B serves at
 35 first as a member around which the upper ply of the blank is folded over, and to insure both sides of the upper ply being gripped in proper alinement with each other, said edge f will cease to be a folding edge as soon as the distance
 40 between the box-holders B B' and the tuck-holders T T' is increased, so that the fold, which finally culminates into the cross-fold line of the bag-bottom, is in reality a running fold which progresses at half the
 45 speed compared with the increase in distance between the box-holders and tuck-holders. The member T' is in this instance the movable member and supports the front diamond-holder H, while the member B' remains stationary.
 50 It is of course understood that it is immaterial to the proper manipulation of

the blank in accordance with my improved method which one of said members is stationary or movable relatively to the other so long as the distance between the tuck-holders and
 55 box-holders is increased.

While under ordinary conditions it is not deemed essential that the running fold should be in any way supported, yet in some instances, particularly with a heavier weight
 60 of paper, any proper support and guidance for said running fold may be advantageously employed. Furthermore, it is considered that for the purpose of properly carrying out my improved method it is not essential that the
 65 member B' or the edge f should extend entirely across the bag-blank, although this construction is preferable in some instances.

Having described my invention, what I claim as new, and desire to secure by Letters
 70 Patent, is—

1. The improvement in the art of forming the diamond on bellows-sided tubing, which consists in the engagement of the sides of the
 75 upper and lower tube-ply at points, the distance of which from the primary folding-line is less than the depth of the tucks, folding over one tube-ply substantially around the folding-line as an axis and until the points of
 80 engagement are brought to positions at opposite sides of said line, and subsequently separating said points to distend the tucked sides completely between said points and to develop the inside triangular folds, and subsequently completing the diamond.
 85

2. The improved method of forming a diamond in square-bottom paper bags from bellows-sided tubing, which consists in engaging the upper and lower plies at points, the distance of which from the bottom-defining line
 90 is equal to the depth of the tucks; completely folding one ply over and on a primary folding-line located between the points of engagement and the bottom-defining line, and subsequently increasing the distance between
 95 said points of engagement until the tucked sides have been fully stretched out between said points, and then completing the diamond.

CHAS. F. SCHMELZ.

Witnesses:

WM. H. HONISS,
 NELLIE PHOENIX.