

(No Model.)

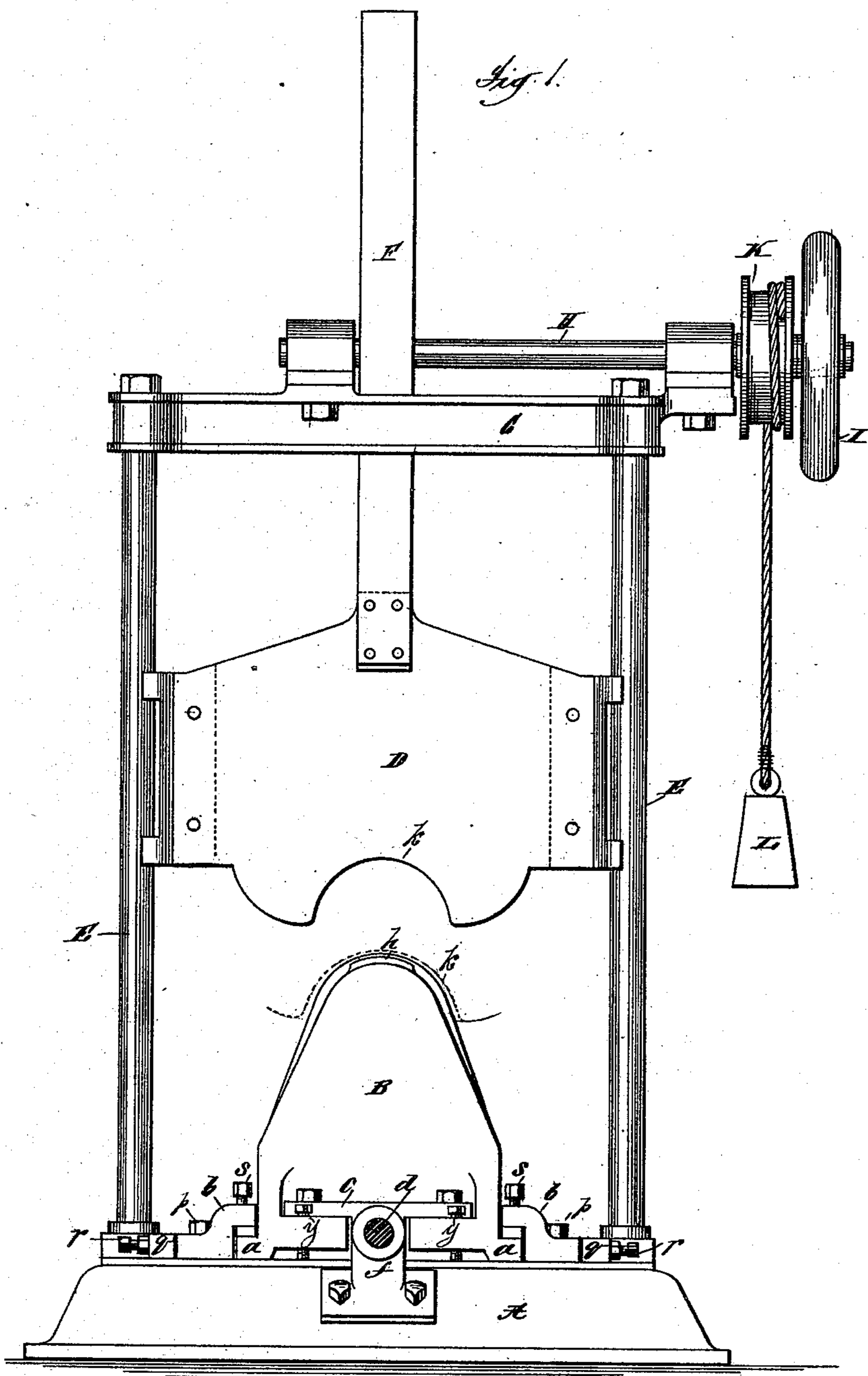
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H. B. SMITH.

MACHINE FOR MANUFACTURING DRESS SHIELDS.

No. 413,974.

Patented Oct. 29, 1889.



Attest

Chas. H. Kott
Edward Wood,

Inventor

Haris B. Smith
By *Phieff Phelps & Horsey*
Attys

(No Model.)

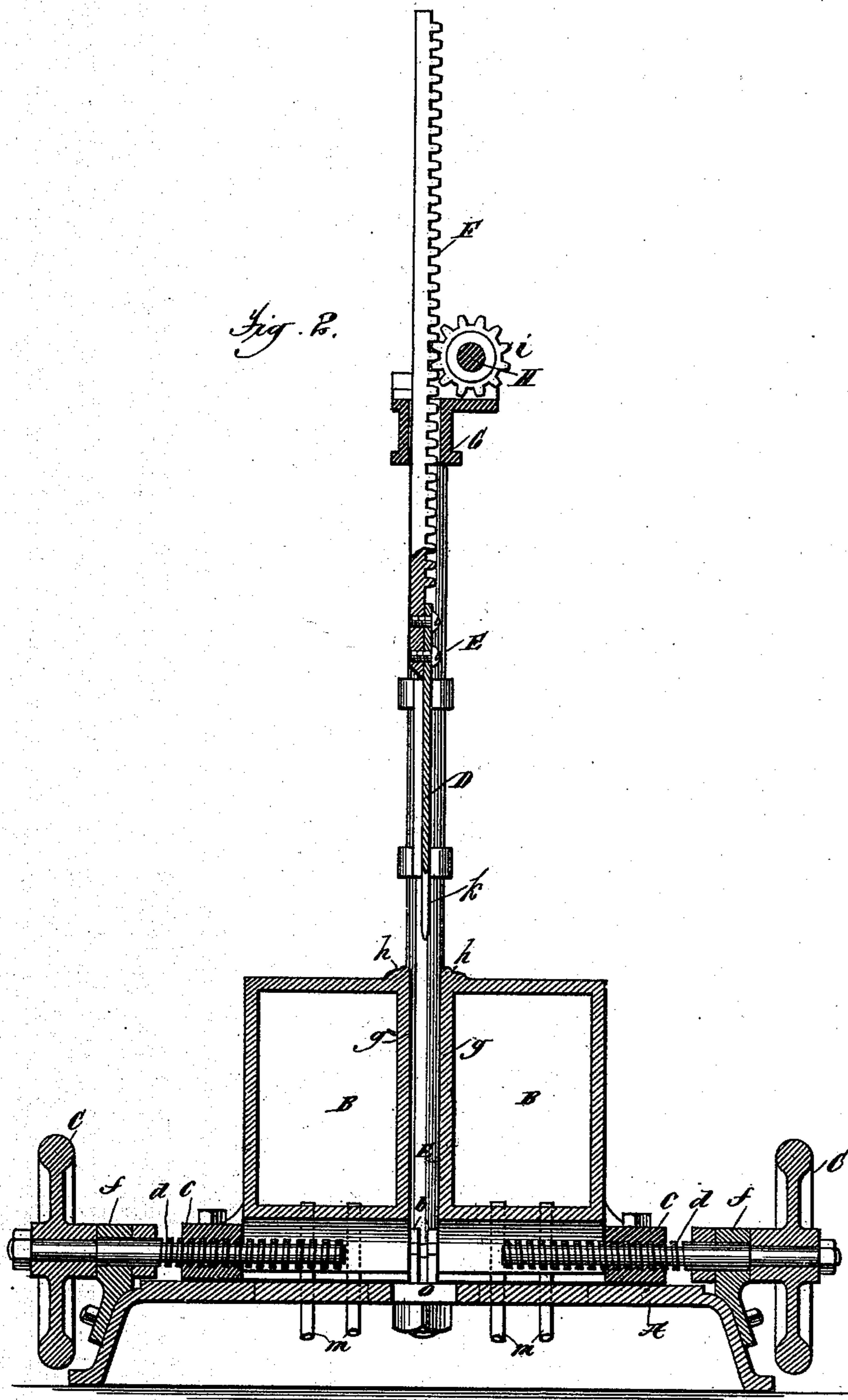
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No. 413,974.

Patented Oct. 29, 1889.



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Chas. H. Lott
Edward Wood

Inventor:

Harvey B. Smith
By Philip Phelps & Horsey
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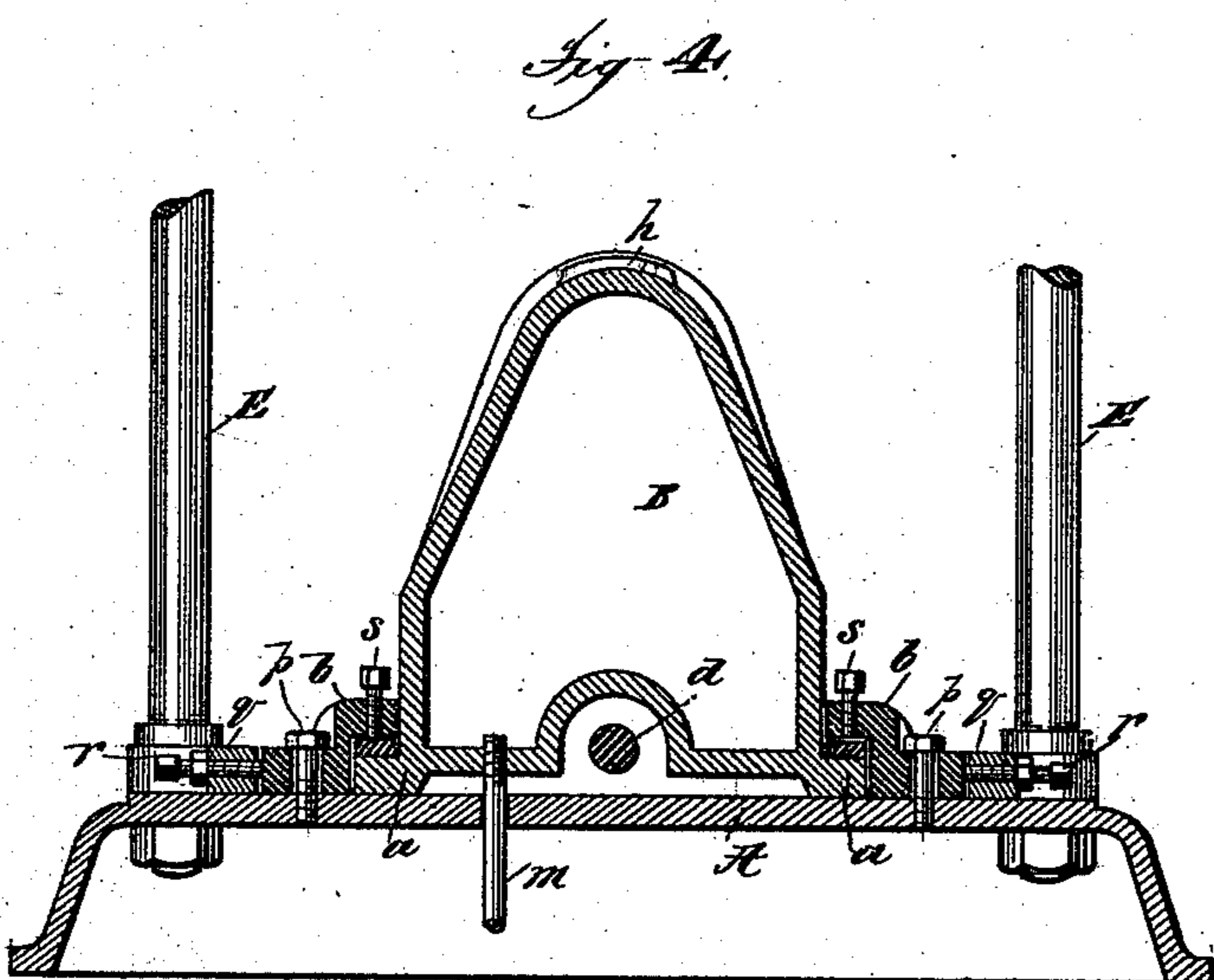
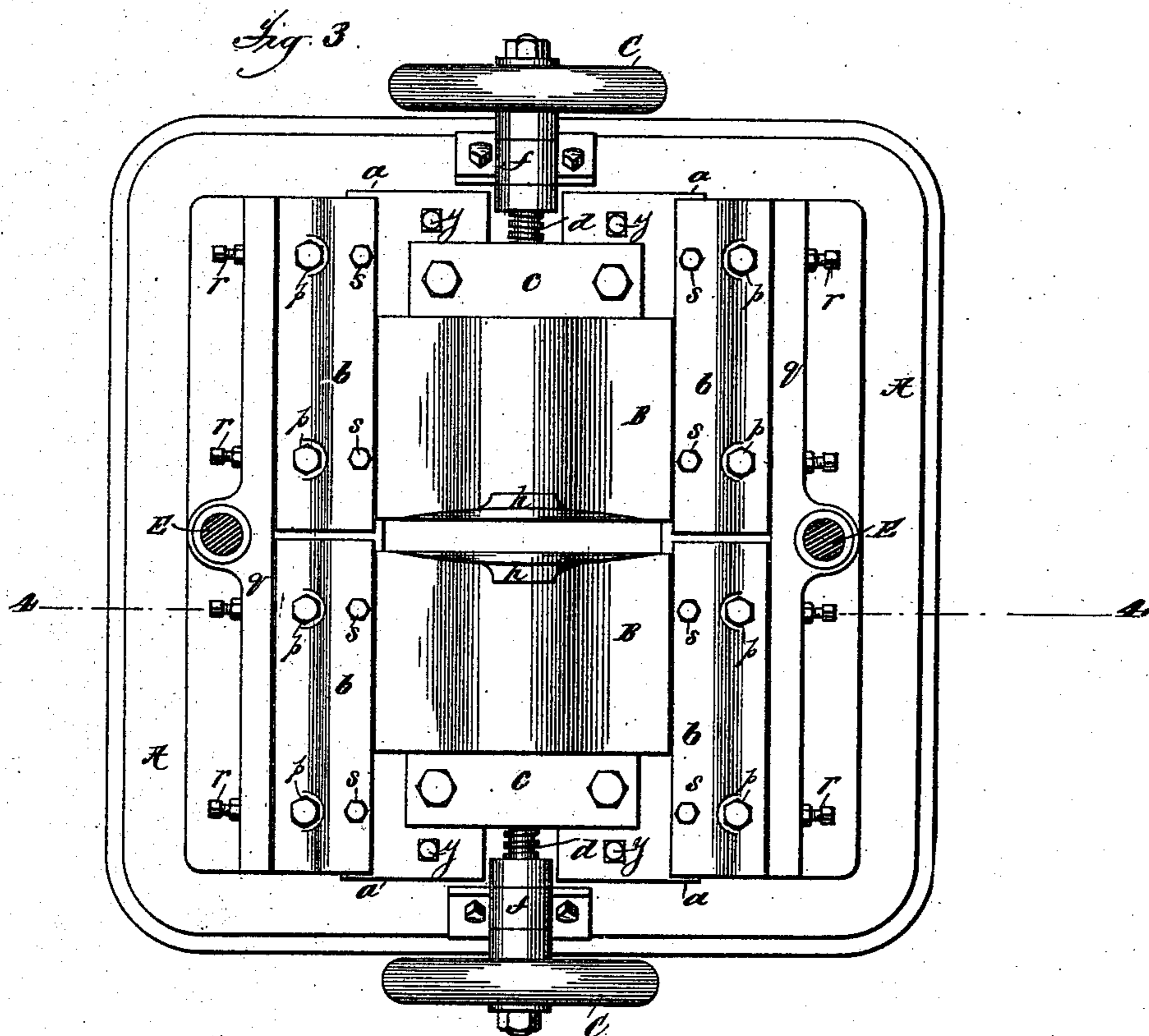
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H. B. SMITH.

MACHINE FOR MANUFACTURING DRESS SHIELDS.

No. 413,974.

Patented Oct. 29, 1889.



Attest
G. H. Batts
Edward Wood

Inventor:
Harris B. Smith
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Attys

(No Model.)

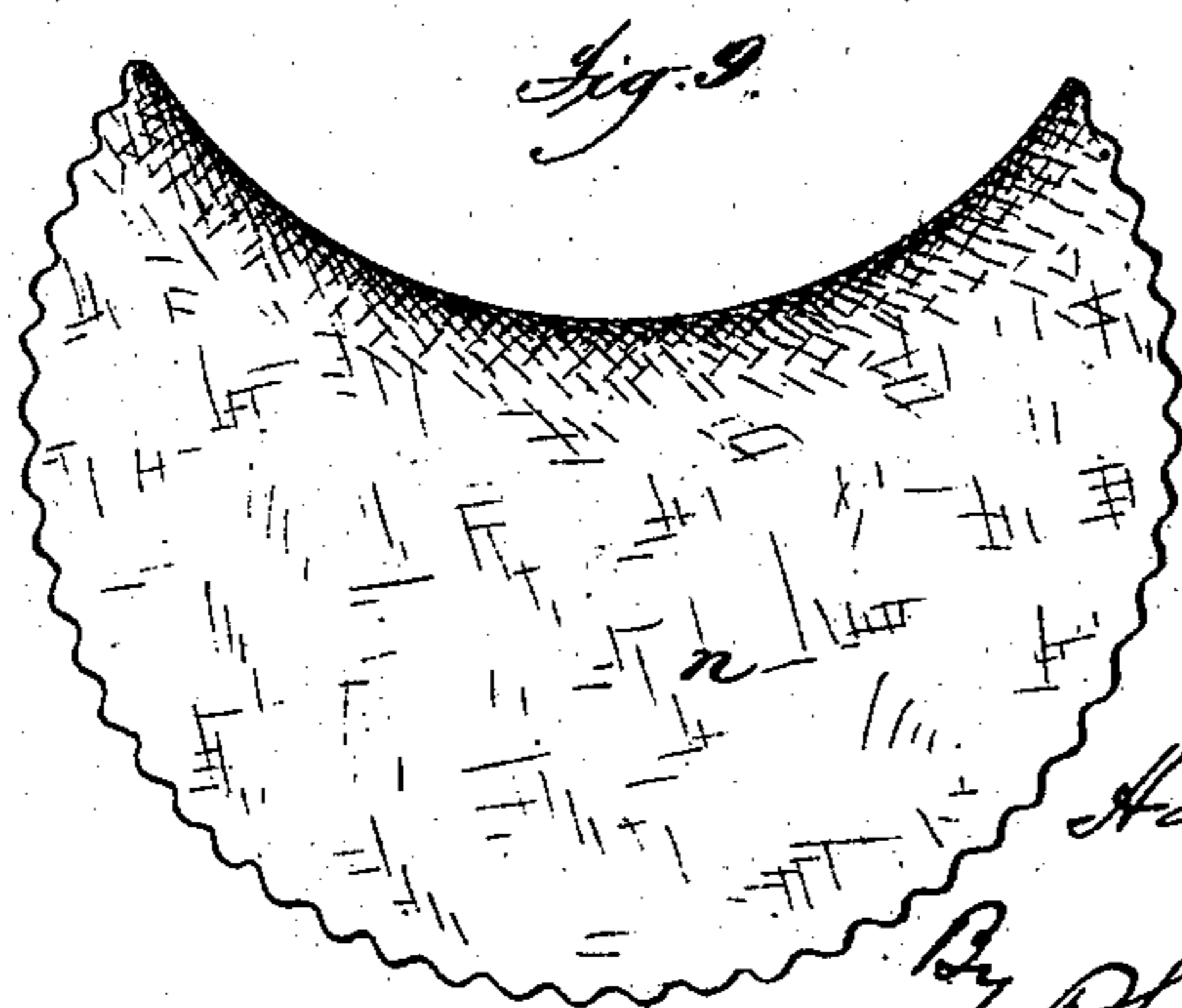
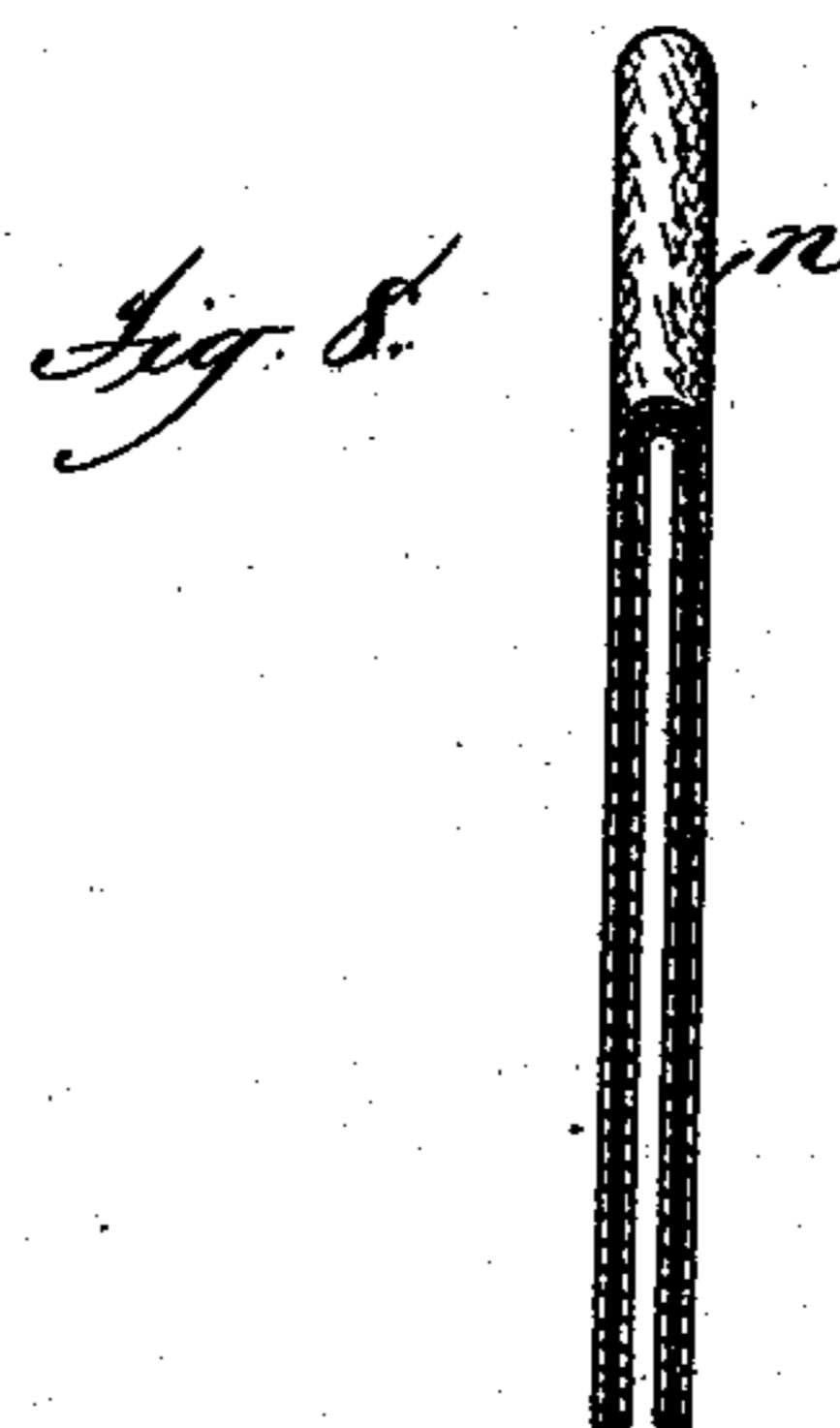
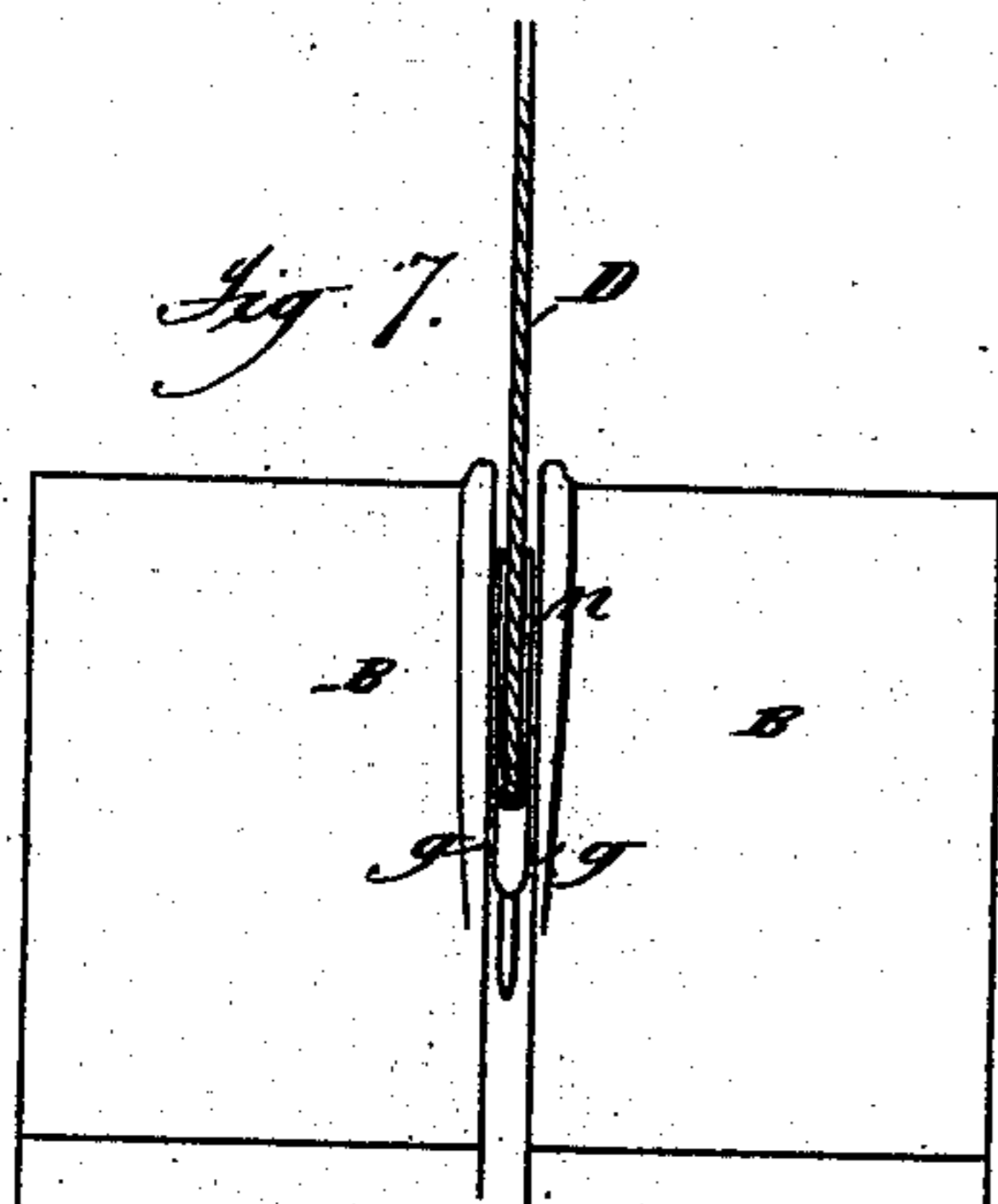
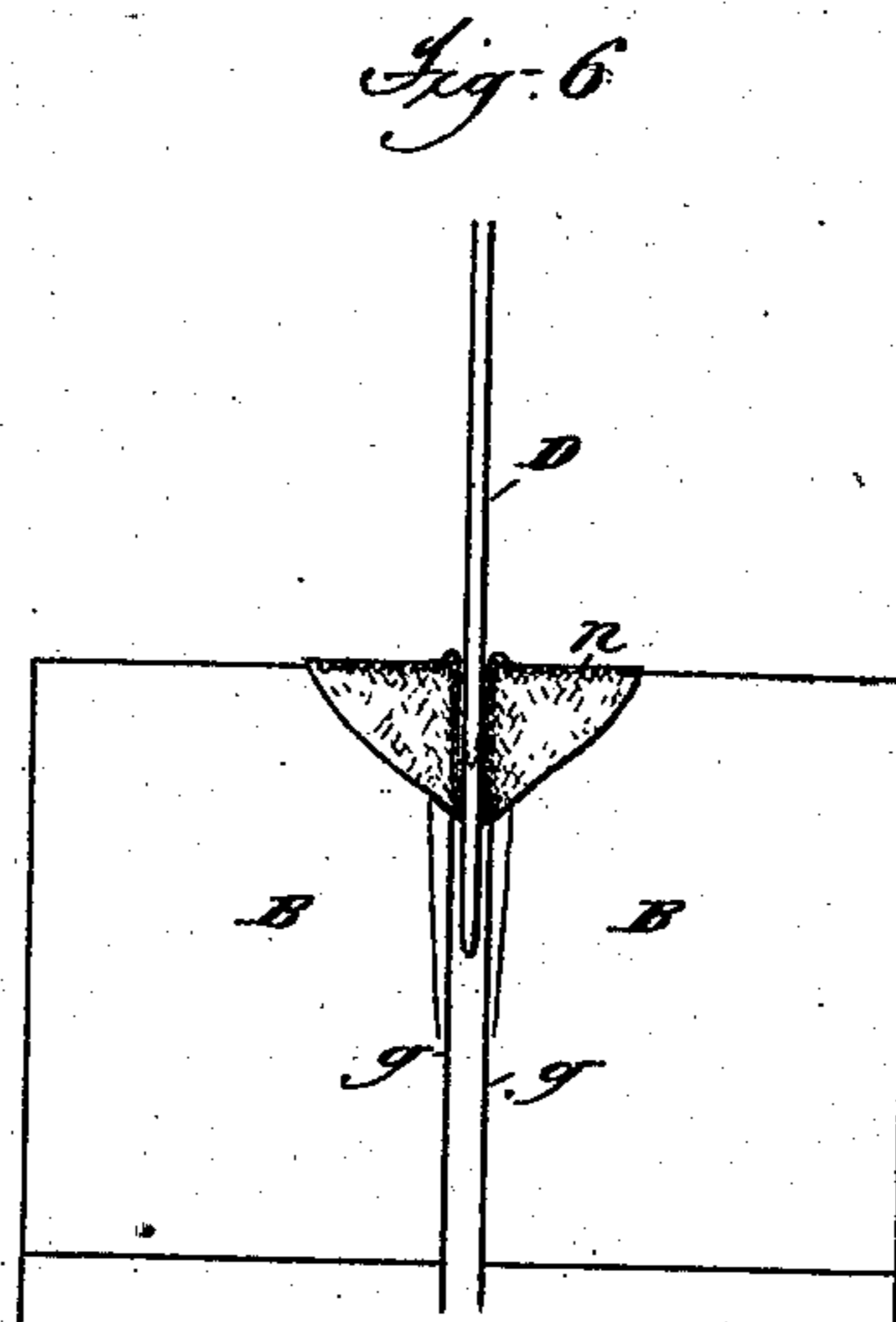
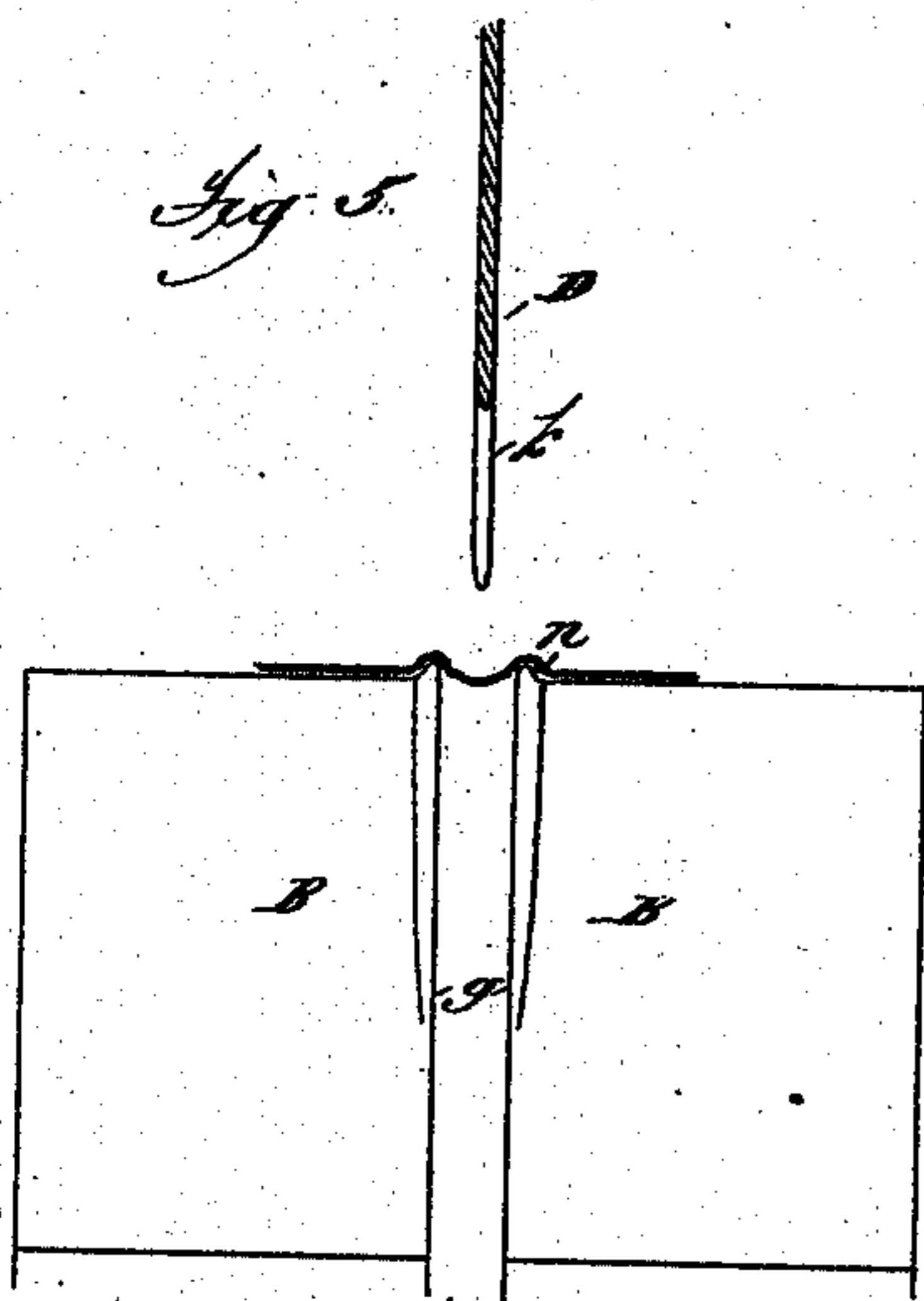
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H. B. SMITH.

MACHINE FOR MANUFACTURING DRESS SHIELDS.

No. 413,974.

Patented Oct. 29, 1889.



Attest:
Geo. H. Little.
Edward Wood.

Inventor:
Harris B. Smith
By Philip Phelps
Attys

UNITED STATES PATENT OFFICE.

HARRIS B. SMITH, OF BRIDGEPORT, CONNECTICUT.

MACHINE FOR MANUFACTURING DRESS-SHIELDS.

SPECIFICATION forming part of Letters Patent No. 413,974, dated October 29, 1889.

Application filed January 5, 1889. Serial No. 295,539. (No model.)

To all whom it may concern:

Be it known that I, HARRIS B. SMITH, a citizen of the United States, residing at Bridgeport, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Machines for Manufacturing Dress-Shields, fully described and represented in the following specification and the accompanying drawings, forming a part
10 of the same.

My invention relates to an improved machine for the manufacture of women's dress-shields or armpit-protectors. The better quality of such appliances, which are employed to protect the outer garments of women from sweat permeations, are made of
15 light textile fabric in which india-rubber is introduced, so that the sweat-shields are pliable and at the same time water-proof.

In order to render the shields conformable to the dress-sleeve at its juncture with the dress-body, a peculiar crescent form must be given to the lapped fabric, and then the article must be vulcanized by heat to preserve
25 it in shape and render it permanently water-proof.

Heretofore the dress-protectors or armpit-shields above mentioned have been cut to nearly a proper form, so as to afford the double flap required, then stretched over metal
30 forms that give the armpit curvature to the folded edge of the shield, and finally these goods were introduced while upon the forms into a heated muffle to vulcanize the rubber portion of the fabric.

The process for manufacture of vulcanized dress-shields as heretofore conducted is comparatively slow and involves the use of large numbers of forms of varying shapes to afford
40 sizes suited to the demands of the trade; hence it is of importance to furnish improved facilities for the production of such specialties.

The object of my present invention is to provide a simple, compact, and efficient mechanism whereby dress-shields cut to an approximate form may be stretched and folded to produce the proper curvature of the folded edge, and vulcanized by applied heat while
50 thus stretched, the whole operation being continuous and rapid, affording uniformly-

perfect results as to shape and vulcanization of the goods.

With this object in view my invention consists in certain features of construction and combinations of parts, that will be hereinafter described, and pointed out in the claims. 55

Referring to the drawings, which illustrate the details of construction of the machine, Figure 1 is a front elevation, partly in section, of the machine. Fig. 2 is a central vertical section of the same. Fig. 3 is a plan view of the machine, the upper portion thereof being removed and the standards shown in section. Fig. 4 is a vertical section of a portion
60 of the machine, taken on the line 4 of Fig. 3. Figs. 5, 6, and 7 are views illustrating the operation of the machine. Fig. 8 is a sectional view, and Fig. 9 a side view, of the completed shield. 70

Referring to said drawings, it is to be understood that A represents the bed-plate of the machine, upon the upper surface of which are arranged two steam-chambers B, which are capable of being adjusted to and from
75 each other, and also of a limited adjustment laterally, for a purpose which will be hereinafter explained. For this purpose the chambers B are provided at their lower edges with outwardly-projecting flanges *a*, which project
80 beneath flanged guides *b*, which are bolted firmly to the base-plate of the machine. Each of the chambers B is provided with a nut *c*, in which works a threaded rod *d*, which turns in a bearing *f*, secured to the base-plate
85 in such manner that the rods are not capable of longitudinal movement in their bearings. The rods *d* are provided at their outer ends with hand-wheels C or other means by which they can be conveniently turned, so as to adjust the chambers to and from each other to
90 any desired extent. The chambers B are supplied with steam by means of pipes *m*, which enter the bases of the chambers, passing through slots in the base-plate, the slots in the base-plate being of sufficient length to permit the pipes to move as the chambers are adjusted to and from each other, the pipes being so arranged as to spring sufficiently for this purpose. The adjacent faces *g* of the
95 two steam-chambers form the female member of the die, which operates to give the proper 100

form to the shield and to retain the shield in proper shape during the process of vulcanization, as will hereinafter be explained. For this purpose the lateral walls of the chambers slope inward from points near their bases to near the apex *h* of the chambers, and the apex *h* of each chamber is curved to conform approximately to the contour of the folded edge of the completed shield. Co-operating with the female member of the die thus formed is a male member D, composed of a thin metal plate, which is arranged to enter between the adjacent faces *g* of the chambers B, and to move vertically between standards E, erected from the base of the machine.

For the purpose of giving vertical movement to the plate D it is provided with a rack-bar F, which passes through a suitable bearing in a cross-head G, which connects the two standards, and is engaged by a pinion *i*, mounted upon a shaft H, having a hand-wheel I or other suitable means by which it can be conveniently rotated.

For the purpose of counterbalancing the weight of the plate D and its rack-bar, the shaft H is provided with a pulley K, around which passes a cord, from which is suspended a weight L, which serves for this purpose, and is adjusted so as to maintain the plate D in any position to which it has been moved. The plate D is provided upon its lower edge with a curved recess *k*, which is of exactly the proper curvature to give the required shape to the folded edge of the shield.

It is found in the practical operation of the machine that it is preferable that the curvature of the recess *k* in the male member of the die should be slightly less—that is to say, the recess should be formed upon a slightly-greater radius than the female member of the die, which is formed by the apexes of the two steam-chambers. By reason of this relative curvature of the two members of the die it results, as will hereinafter appear, that as the male member is entered between the female member it acts to commence the folding of the shield at the center, the edges of the shield being the last to be acted upon by the die. From this it results that the folding is effected much more evenly than is the case when the two members of the die are of the same curvature, or when the female member is of less curvature than the male member. The walls of the chambers B are made of sufficient thickness to afford stability, and yet are thin enough to be readily heated by steam introduced therein through the pipes *m*.

The operation of the machine as thus far described is as follows: The chambers B are adjusted to such position with relation to each other and the die-plate D that when the latter is introduced between the adjacent faces *g* of the chambers there will be just sufficient room between the plate and the chambers for the accommodation of the fabric of which the shield is composed. A piece

of the fabric *n*, cut to the proper form, or approximately the proper form, for a shield, and composed of outer plies of stockinet or other suitable fabric, with an interposed ply of unvulcanized rubber, as indicated in Fig. 8, is placed upon the chambers B, which constitute the female member of the die, and beneath the male member of the die, as indicated in Fig. 5. The male member of the die is then moved downward by operating the shaft H, and as it is thus moved downward, as indicated by dotted lines, Fig. 1, it will first engage at the central portion of its recess *k*, as indicated by dotted lines, Fig. 1, with the central portion of the material *n* at the extreme apex of the female member of the die, and thereby commence the folding operation at that point in advance of commencing the folding at the edges of the fabric. As the downward movement of the male member continues, however, it will gradually force the fabric between the two walls *g* of the female member composed of the chambers B, as indicated in Figs. 6 and 7, thereby completing the folding and giving to the shield the form indicated in Fig. 9. When the shield has thus been folded, and before the male member of the die is removed from between the two parts of the female member, the two parts of the die and the fabric held thereby will be allowed to remain in that position for a suitable length of time to allow the heat generated by the steam in the chambers B to properly vulcanize and set the rubber of the shield, so as to retain the shield in proper form. After the shield has thus been vulcanized the male member of the die will be raised, thereby removing the shield from between the steam-chambers and the operation will be repeated. As a rule, the vulcanized shield will adhere more firmly to the male member of the die than to the female member, so that upon raising of the male member the shield will be withdrawn with it. By this means the operation of forming and vulcanizing the shield is rendered continuous and comparatively rapid. Whenever the thickness of the material *n* is changed, the steam-chambers constituting the female member of the die will be adjusted to or from each other to conform to the change in thickness of the material. In case the shield, after having been vulcanized as described, should stick to the female member of the die, so as not to be withdrawn with the plate D, it will simply remain between the steam-chambers and be forced downward through the opening *o*, formed in the base-plate A, when the next shield is introduced.

From the foregoing it will be seen that to insure the successful operation of the machine it is important that perfect parallelism should be at all times preserved between the adjacent faces *g* of the steam-chambers. To provide for this the openings in the flanged guides *b*, through which the bolts *p* pass, which secure the guides to the base-plate, are

slightly enlarged to permit of a limited adjustment of the guides to and from the steam-chambers, and the base-plate is provided with bars *g*, through which pass adjusting-screws *r*, which abut against the sides of the guides *b*, so as to adjust them accurately to any desired position and hold them in such position. By this means the chambers can be adjusted laterally, so as to always preserve the parallelism of their adjacent faces in a horizontal direction. To secure the same parallelism in a vertical direction between the adjacent faces of the chambers the flanges of the guides *b* are provided with adjusting-screws *s*, which bear upon blocks interposed between the flanges *a* of the chambers and the flanges of the guides in such manner as to prevent any tendency of the chambers to tilt by reason of a loose fit between the flanges *a* and the flanges of the guide, and the chambers are provided at the outer ends of their bases with adjusting-screws *y*, which bear against the base *A*, so as to tilt the faces *g* of the chambers vertically.

In operating upon some kinds of material it will be found preferable to provide the steam-chambers *B* at their apexes with raised ribs or flanges *h*, as shown, over which the material will be drawn as it is forced between the faces *g* by the male member of the die.

The curvature of the recess in the male member of the die may be changed within certain limits to vary the size and form of the shield without changing the female member of the die.

By means of the screw-rods *d* the chambers *B* can be moved apart sufficiently to permit access to be had to their adjacent faces *g* for cleaning or for other purposes.

What I claim is—

1. The combination, with the two steam-chambers *B*, the parallel adjacent faces *g* of which form the female member of the die, of the reciprocating plate *D*, adapted to enter between said chambers and having its edge recessed to form the male member of the die, substantially as described.

2. The combination, with the two steam-chambers *B*, having parallel adjacent faces which form the female member of the die and having their apexes curved to approximate the curvature of the folded edge of the shield, of the reciprocating plate *D*, forming the

male member of the die and having its edge reversely curved to conform to the curvature of the folded edge of the shield, substantially as described.

3. The combination, with the two steam-chambers *B*, having parallel adjacent faces which form the female member of the die, and having their apexes curved to approximate the curvature of the folded edge of the shield, of the reciprocating plate *D*, forming the male member of the die and having its edge reversely curved to conform to the curvature of the folded edge of the shield, but of less curvature than the curvature of the apexes of said chambers, substantially as described.

4. The combination, with the two steam-chambers *B*, each of which is adjustable to and from the other and having parallel adjacent faces which form the female member of the die, of the reciprocating plate *D*, forming the male member of the die, substantially as described.

5. The combination, with the plate *D*, having its edge recessed to form the male member of the die, of the two steam-chambers *B*, forming the female member of the die and each adjustable to and from the other, of the laterally-adjustable guides *b*, substantially as described.

6. The combination, with the plate *D*, having its edge recessed to form the male member of the die, of the two steam-chambers *B*, forming the female member of the die and each adjustable to and from the other, the laterally-adjustable guides *b*, and adjusting-screws *s*, substantially as described.

7. The combination, with the two steam-chambers *B*, having parallel adjacent faces which form the female member of the die and having their apexes curved to approximate the curvature of the folded edge of the shield and provided with raised ribs or flanges *h*, of the reciprocating plate *D*, forming the male member of the die and having its edge reversely curved to conform to the curvature of the folded edge of the shield, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HARRIS B. SMITH.

Witnesses:

J. J. KENNEDY,
A. M. WOOSTER.