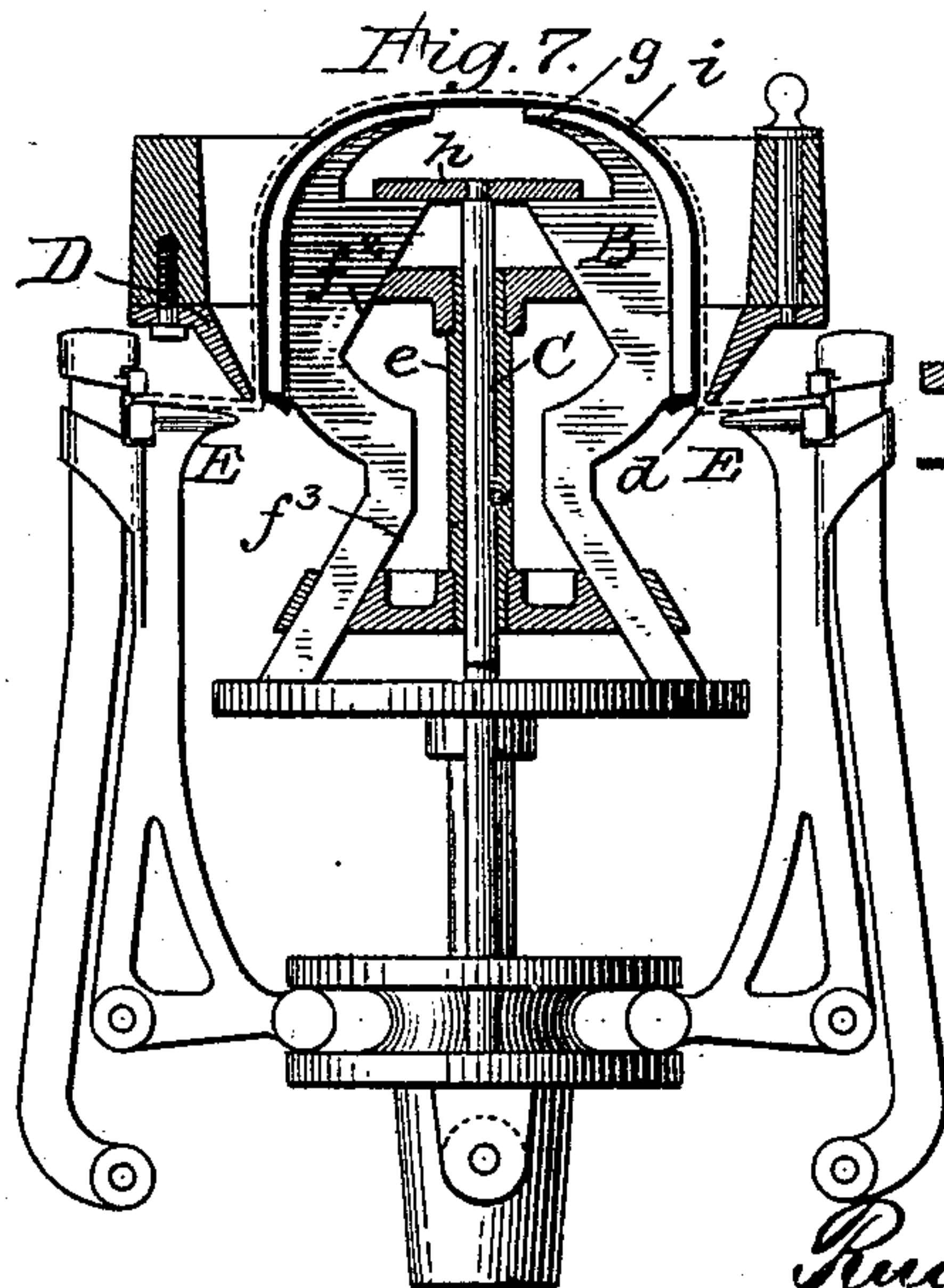
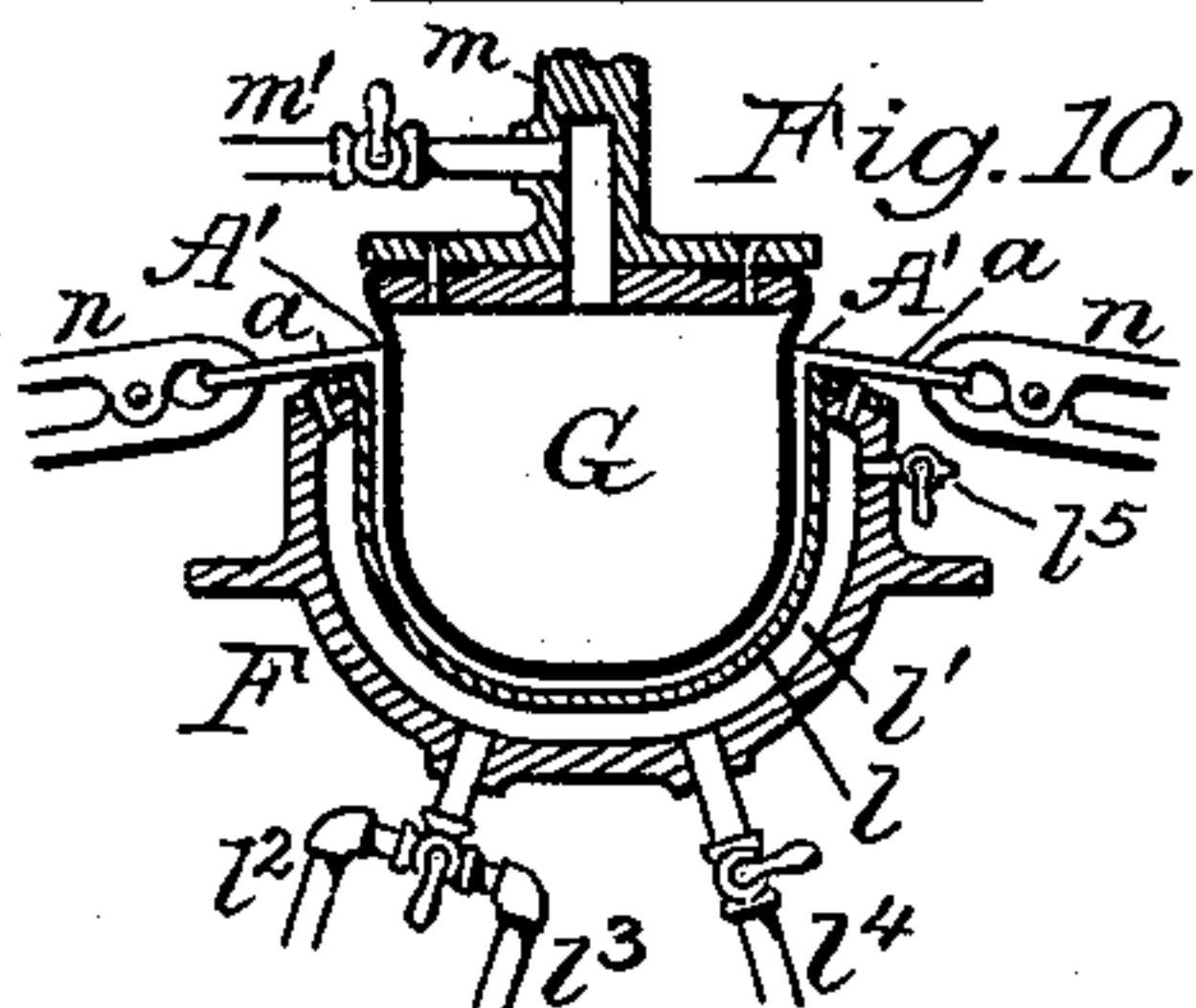
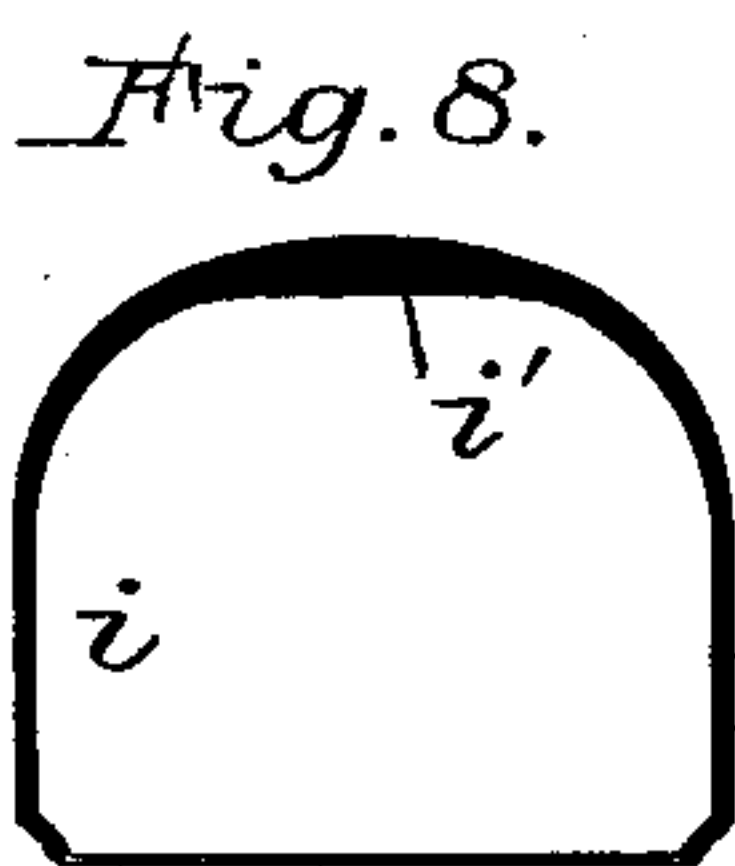
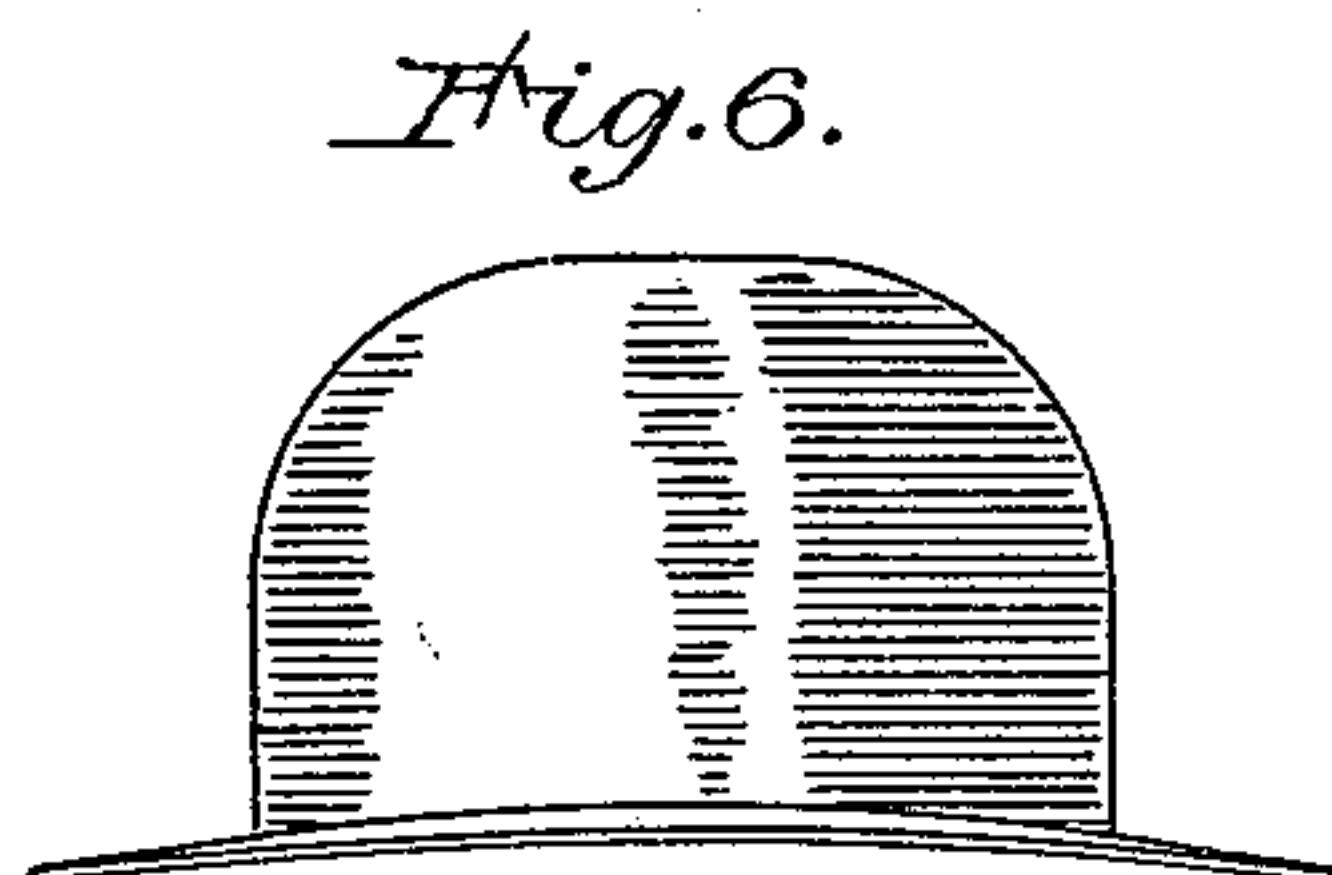
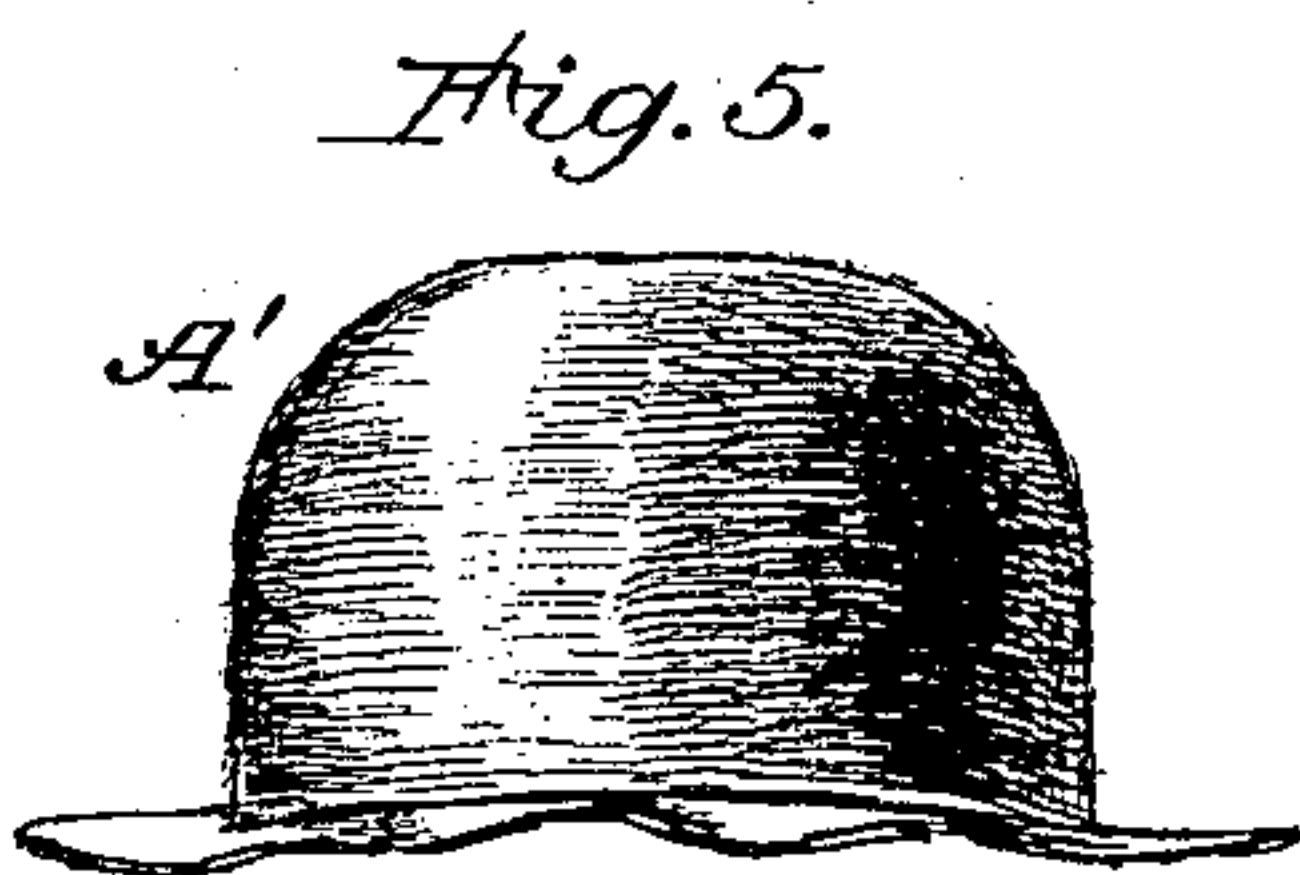
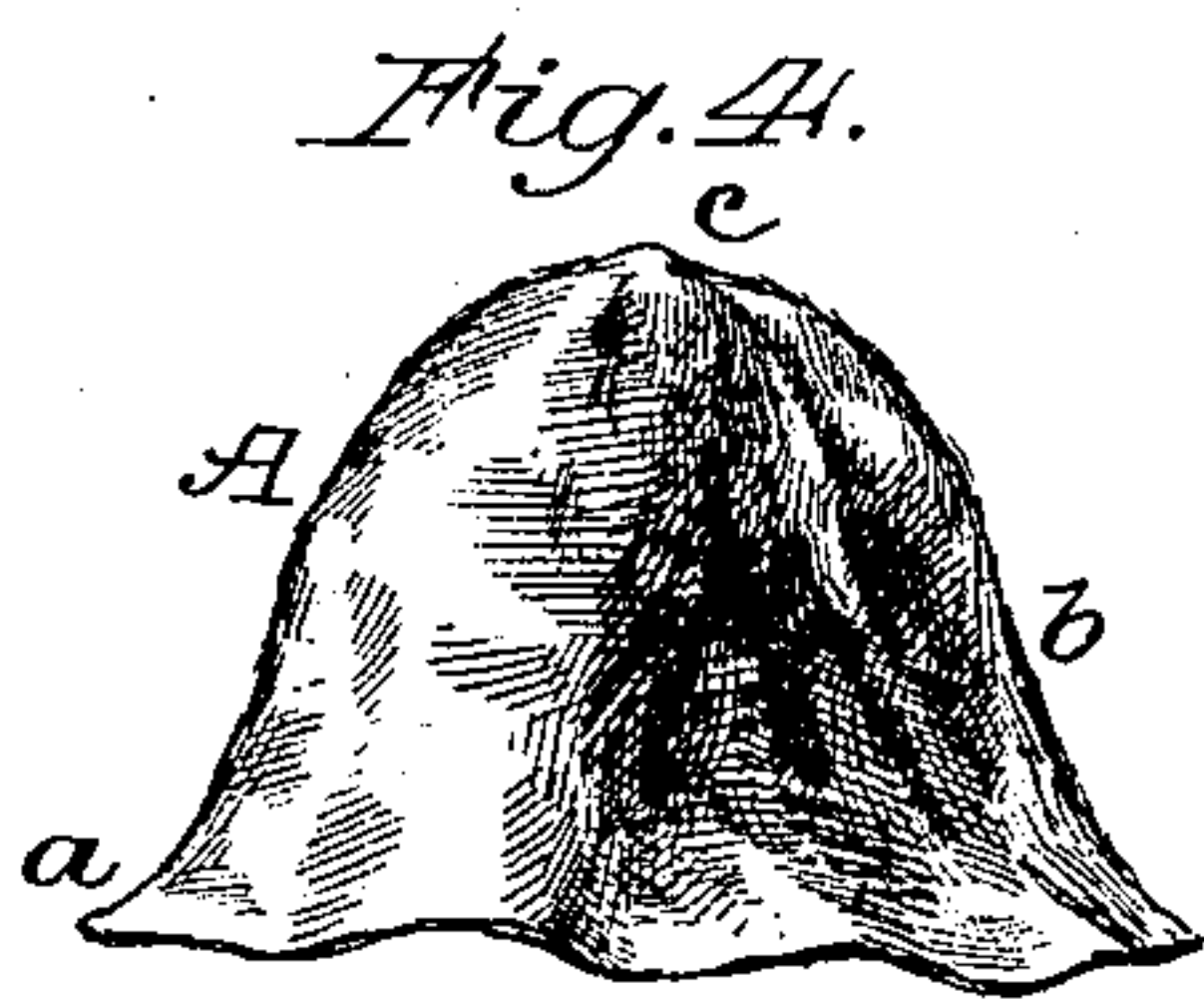
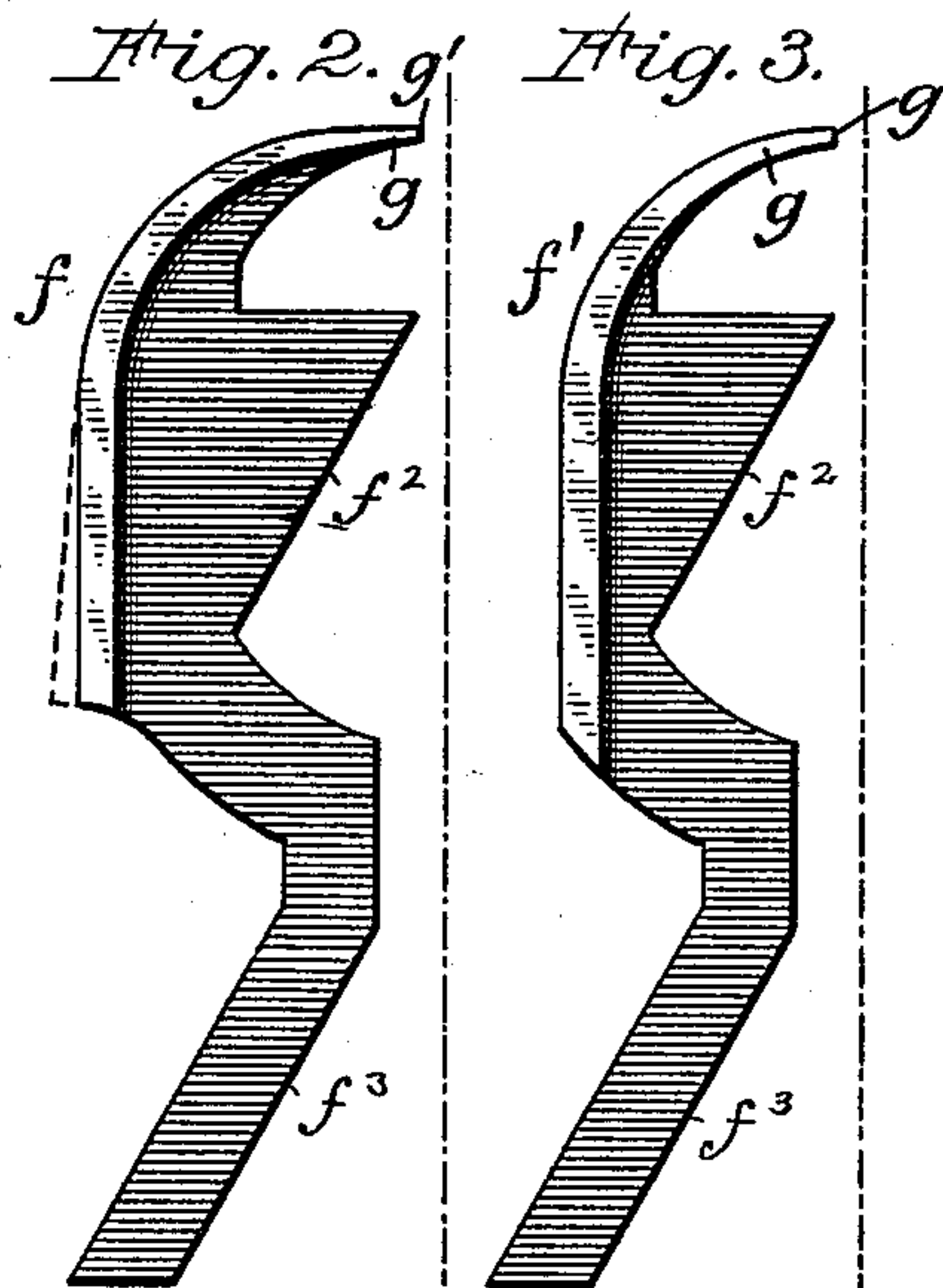
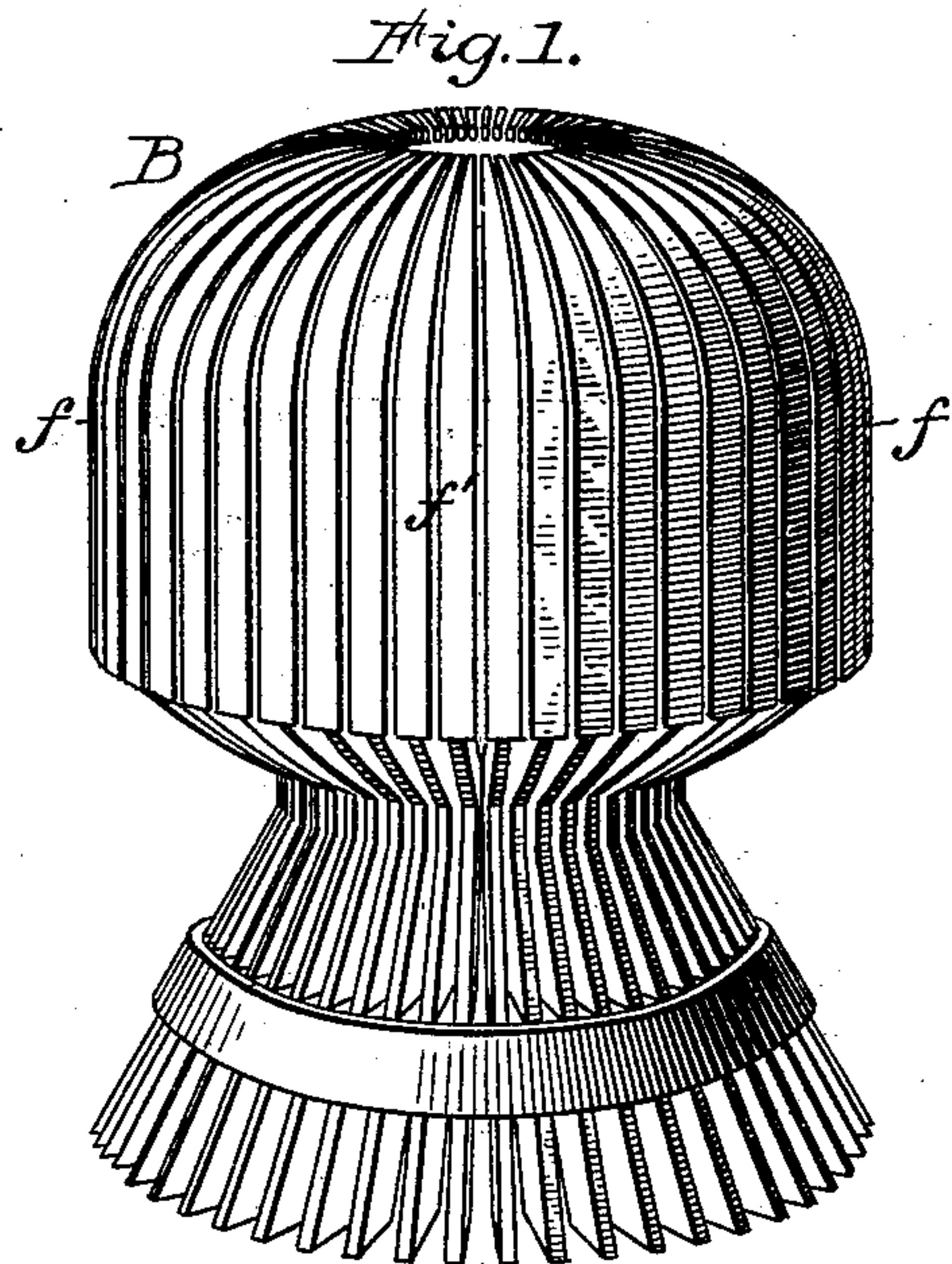


(No Model.)

R. EICKEMEYER.
METHOD OF AND MEANS FOR DEVELOPING DYED STIFF HAT BODIES.
No. 513,992. Patented Feb. 6, 1894.



Attest:
Philip F. Larner,
Notary Public

Inventor:
Rudolf Eickemeyer.
By *[Signature]* Attorney

UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

METHOD OF AND MEANS FOR DEVELOPING DYED STIFF HAT-BODIES.

SPECIFICATION forming part of Letters Patent No. 513,992, dated February 6, 1894.

Application filed May 14, 1892. Serial No. 432,977. (No specimens.)

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful improvements in methods of and means for developing dyed stiff hat-bodies or hats into complete size and form preparatory to either bag or mold pressing or ironing operations; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

Inasmuch as my improvements relate to certain intermediate methods or processes in the manufacture of stiff dyed felt hats, I will first briefly describe the usual steps, or processes, by which the hat bodies are developed up to the point, at which my invention enters. The operation of "pouncing," being in no manner involved with my invention, it is to be understood that the hat bodies or hats may be shaved and "pounced" when dry, and while cone shaped. The felting material having been applied to a "former," is "sized" or felted into cone shaped hat bodies, then shaved and pounced, and the "stiff" applied thereto, this being usually, shellac in solution. The hat bodies are then stretched at the tip, and at the brim, as by means of ribbed "formers," and co-operating stretching fingers; and then further stretched, and developed at the side crown and brim, as by a sectional block, brim stretching tongs, and a banding ring, and this operation is carried out, so as to slightly "overstretch" as to size of crown and brim. The hats are then dyed, this operation causing the felt to shrink, and balance the overstretching referred to, thus making the hat bodies substantially of or closely approximating to, the sizes intended. These stiff dyed hat bodies, are developed as to complete size and form by me, by a method or process, which radically differs from the heretofore practiced methods or processes, and in order that the novelty involved in my invention may be clearly indicated, I will first describe said prior methods, of which there are two.

In operating under what I will call the first of said prior methods, a dyed stiff hat is soaked in very hot water to soften the "stiff,"

and then again partially shaped as by the same old form of sectional block (used prior to dyeing), and the hat body is then douched with cold water to set the "stiff," and then lifted off and dried. Such a hat body or hat, has a flat tip, is imperfectly formed at the "square," (or junction of side crown and tip,) and the side crown is imperfectly developed. Next, for arching or symmetrically rounding the tip and square, and perfecting it in size and form, the hat is steamed, and forcibly applied to a wooden finishing block, of the exact form and size desired, and sometimes, the hat is corded to the block at the band. If the hat is to be ironed, the ironing operation is performed while the hat is on said block, but if the hat is to be pressed, as in a bag press or mold, the hat is first stripped or removed from the block upon which it is tightly fitted. As regards this first prior method, one object of my invention, is to obviate the second, or re-use of the old sectional block, coupled with the use of the wooden block, as a shaping block, and to thereby save time and labor. The arching of the "tip" and "square" of the hat, on the wooden shaping block, involves heavy strains and pulls at the brim and the band of the hat, in forcing it upon the block, and the felt is often ruptured or injured, and it is more or less unevenly strained at various points, all of which I seek to obviate. If the hat is to be ironed, it must of course be supported upon a block, but the latter need not be used as a shaping block, but merely as an internal support while ironing. In this connection, I seek to obviate loss in time and labor, by having the hat already so true to form and size, that it can readily be put on and taken from the supporting block, which is required in the ironing operation.

In working the second of said prior methods, the dyed stiff hat body, (as in the other case,) is soaked in hot water, and then forcibly applied to a wooden shaping block, (instead of re-using the old sectional block, as in the other prior method,) this wooden block being of exact form, and size, and whereon the tip, and square is symmetrically rounded, and the crown developed as to complete size and form. Putting the hat on the wooden block in this case, involves the same excessive strains on

the brim, and square, as when steamed, and put on the block, and the hat body is as liable to be torn or injured in this case, as in the other. The hat is then douched with cold water, for setting the "stiff," and it is thereafter stripped from the block, and dried, as in a dry room, on suitable racks or trays. In addition to the risk of injury to the hat, this mode of operation requires a large number of comparatively expensive blocks, not only for each size of hats, but also different sets of sizes are required for each variation in the height of the crown, and as they are used with wet hats, and are more or less water soaked, the same blocks are not used in subsequent finishing operations. One object of my invention, is to dispense with the whole line of blocks, with substantial resultant economy in the matter of first cost, and maintenance, as well as in the extensive handling involved. In operating with these wooden shaping blocks, the hats are drawn thereon, or the blocks forced therein, under very heavy strains, and therefore the douched wet hat, adheres closely to the block, and much labor and skill is required in stripping the hat therefrom, and frequently the hat is so distorted in the stripping operation, as to require much skill and time in its correction, to obviate all of which, is another object of my invention. The application of the hats to the wooden shaping blocks, in both of the prior methods, not only involves heavy strains, but said strains are unevenly distributed, being mainly applied at the brim and band of the hat, and at its brim, often resulting in rupturing or weakening the hat at various points, and another object of my invention is to secure a uniform distribution of strain on the felt, and to obviate liability of injury to the hat. In other words, in the use of said wooden shaping blocks, all of the strains are applied outside of the hat and in a vertical direction, so that all of the arching and the radial strains at the tip, and the combined radial and peripheral strains at the "square" or junction of the tip and side crown, and the peripheral strains on the side crown, are the resultants of the necessarily heavy strains applied in one direction at the side crown and at the band outside of the hat, and at its brim, and hence the felt is dangerously strained at and near the band of the hat. These unequal and precarious strains, are now obviated by me, because in accordance with my invention, all the force required for the radial and peripheral expansion, is applied within the hat, and the strain applied is equally distributed over the whole hat body. Now referring to both of the prior methods described, it will be remembered, that a stripping operation is involved, in that in both, the hat has to be forcibly removed from a wooden block, to which the hat has been forcibly applied, and under heavy strains made to conform in effecting radical changes in the shape of the tip from its flat stretched condition into the sym-

metrically arched or rounded form, as well as the straight side crown usually desired in stiff hats. This stripping operation, in the one prior method, being done when the block and the hat are wet, involves much labor and great skill and care, because of their great adhesion, and there is somewhat greater liability of distorting the hat, than in the other method, wherein the hats are steamed and forcibly applied to the wooden shaping block, (whether thereafter ironed on the same block, or removed without ironing, for bag press operations,) but nevertheless, in this as in the other prior method, the stripping operation, quite frequently results in serious distortion and injury to the hat. This stripping operation, or in other words, the forcible laborious and precarious removal of the hats from wooden shaping blocks to which the hats are forcibly and laboriously applied, is wholly dropped out by me, because, as before stated, I secure the radial and peripheral expansion of the hat, by force or strains applied inside of the hat, and consequently, the hat after receiving its cold douche, is internally relieved from all of said strains, without requiring any immediate manipulation of the hat, other than its mere transfer to a tray, for transit to a dry room.

Stated in terms, my improvement in the method of developing dyed stiff hat bodies or hats into size and form preparatory either to bag pressing or ironing operations, consists in first wet heating the dyed stiff hats or hat bodies as heretofore; then developing their tips and crowns into complete form and size by internally supporting the tips and applying uniform and well distributed force and strains within each hat or hat body, and thereby radially and peripherally expanding it, and at the same time applying appropriate stretching force and strains outside of the hat at its brim, while confining it by a ring of suitable shape at its band; then while still under strain, but completed in form and size, applying the cold douche to set the "stiff" in the hat; and then, finally, without manipulation of the hat, relieving it from all of said strains.

As compared with one of the prior methods hereinbefore described, I not only avoid the stripping operation, but also the re-use of the old sectional block, and also the use of the wooden shaping block, and the transfer of hats from one block to the other; and as compared with the other of said prior methods, I not only drop the stripping operation, but apply the straining force to the hats, in a radically different manner from that involved in the use of wooden shaping blocks.

My invention as thus far described may be carried out by the use of mechanism and appliances which may be quite varied in their character; as for instance the dyed stiff hat body may be developed into exact form and size in a metal mold (one for each size and shape of the hats desired) jacketed for the al-

ternate reception of hot water, and cold water, the latter for setting the "stiff" by radiation through the walls of the mold in contact with the hat, these walls being thin and composed of metal favorable to heat conductivity. Into such a mold, conforming to the exterior of the hat desired, and of its exact size and form, the crown of a wet hot hat body would be inserted, the mold being then heated. Within the hat there would be a hollow flexible rubber bag containing liquid. Forcing the bag and the hat into the mold, would internally stretch and strain the tip and crown radially and peripherally until forced into exact conformity with the interior of the mold, appropriate strain being in the meantime applied outside of the hat at the band and brim, as by a suitable banding ring and brim tongs. The mold being then emptied of hot and filled with cold water, the setting of the "stiff" or the douching effect would be produced and then on relieving the bag from strain, the hat would be correspondingly relieved from internal strains, and freely drawn from the mold. Should the walls of the mold be heavy and not heated, and the hats thoroughly heated before insertion, the normal temperature of the mold would generally secure the chilling effect, the cold mold operating as a douche. This mode of operation would however, be slow and not very economical, because it involves the use of expensive molds and pressing machines, and therefore for securing the best results, with all the practicable and commercially valuable advantages accruing from my complete invention, the internal radial and peripheral strains should be applied to the hat body, by means of an expansible or sectional block, so constructed that it can, during its variable expansion, fully support the tip of a hat internally, and be always true to the shape or form of the tip, and the crown of the hat desired, regardless of variations as to size and depth of crown. No kind of sectional or expansible hat block known to me, prior to my present invention, is capable of, or adapted to, my present purposes, and for indicating their deficiencies, I will now refer to certain well known types of expansible blocks. The earliest of these blocks, embodied pivoted sections, surmounted by an annular or ring shaped rubber cap, as shown for instance in the patent to Sheldon, May 4, 1869, No. 88,601. This form of block, affords no proper shaping contact for the side crown of a hat, and no internal support at the tip, and consequently the latter can only be flat stretched thereon, and the hat crown, could not be truly shaped thereon, because the so called block was not of the hat oval form. Another type of sectional block was devised by me and disclosed in Letters Patent No. 141,338, issued to me July 29, 1873, and in various modifications, with accompanying mechanism, these blocks were further disclosed in subsequent Letters Patent issued to me, and especially in No. 269,032, December 12, 1882, in an organiza-

tion, otherwise well adapted for use in working my present invention. These old sectional blocks as devised by me, embodied numerous sections, which were not pivoted, (as in the Sheldon block,) but they contained sliding sections, which were movable bodily in radial lines, and whether normal or expanded, the blocks were oval. These old sectional blocks, embodied many closely arranged sections, and hence they were capable of the uses for which they were intended, without employing rubber caps or jackets, although they are often used therewith, but in all cases, as with the Sheldon cap, they have been designed and used for overstretching crowns, there being normally a large hole in the top of the cap, which is of course always enlarged in proportion as the block is expanded. The old blocks having these sliding sections, are larger at the top (or square) than at the bottom (or band,) and they afford no support for the tip of a hat, except closely adjacent to the "square" or junction of the side crown and tip, because the central upper portion of the block is occupied by a cap plate, the top of which is below the tops of the sections, and therefore when a hat tip was under flat stretching tension, there was more or less free space between the inner surface of the tip, and said plate, and when an annular rubber cap was used with any of said old blocks, there was still more free space below the tip of the hat, which could therefore only be strained flatly, because of the lack of internal shaping support. A sectional block, as now improved by me for the purposes of my present invention, embodies sliding sections, which at their tops have inwardly extending horns, which so overlie the cap plate, and are sufficiently elevated, or arched at their inner ends, as to always afford a reliable shaping support for the tip of a hat body, and such a block by itself as well as in combination with a flexible rubber cap, which wholly incloses the tip working portion of the block, as well as the side crown working portion, constitutes important mechanical features of my present invention, the same being novel means devised by me, for carrying out the improvement in the method or process of developing dyed stiff hat bodies, into complete form and size, preparatory to ironing or bag-pressing operations.

To more particularly describe my invention I will refer to the accompanying drawings, in which—

Figure 1, illustrates in perspective one of my improved sectional or expansive blocks, in a partially expanded condition. Figs. 2 and 3, respectively, illustrate the largest and the smallest section of the same block, the section Fig. 2, being accompanied with a dotted line for indicating modification in form. Fig. 4, illustrates a hat body, as it appears after it has been partially developed into hat form, stiffened and dyed, this being the condition of the hats, when ready to be treated

in accordance with my invention. Fig. 5, illustrates a similar hat, after it has received its complete size and shape in accordance with my invention. Fig. 6, illustrates a similar hat after it has been surface finished, whether ironed on a surface finishing block, or pressed within a bag mold. Fig. 7, illustrates my improved sectional block, its rubber cap, a banding ring and brim stretching tongs, with so much of the adjacent mechanism in a blocking machine, as is deemed necessary for the purposes of this specification. Fig. 8, illustrates in section, an elastic or rubber block cap, quite thick at the center of its top or "tip," and graduated in thickness to the edge or "square." Fig. 9, illustrates diagrammatically, the differences in operation, between my old sectional blocks and the new block. Fig. 10, in section, illustrates another means for practicing my method.

Referring to the stiff dyed hat body A, Fig. 4, it will be seen that the brim *a*, side crown *b*, and tip *c*, have been partially developed, it being understood that the tip and brim, have been stretched, as by ribbed "formers," and co-operating stretching fingers, and that the side crown, and brim, have each been stretched, and partially developed by the use of an old type expansible hat block, a banding ring, and brim stretching tongs, organized for instance as in my automatic blocking machine, disclosed in my Letters Patent No. 269,032. To compensate for the shrinkage incident to the dyeing operation, this preliminary blocking operation, as hereinbefore indicated, was in the matter of size, carried somewhat beyond the size or number intended, so that the shrinkage would take the hat back, to substantially the size intended. Now, for putting the hat body A, into complete shape and size, as in the hat A', it is first soaked in boiling hot water, the temperature of which softens the "stiff," and it is then placed upon the improved expansible block B, which, as indicated in Fig. 7, is mounted in a machine on a spindle C, in co-operative relations with a banding ring D, and a set of brim stretching tongs E, said block, spindle, ring, and tongs, being mechanically operated, for instance as disclosed in my said Letters Patent No. 269,032. The brim tongs firmly grasp the brim at many points on its periphery, and while moving outwardly, the banding ring is moved downwardly, until it bears or strains on the side crown, at the band *d*, as illustrated in Fig. 7, and in the meantime, the improved block B, is moved upwardly, and expanded, by the upward forcing of the interior sleeve *e*, with its cone plates, which engage with the several block sections at their interior inclined edges *f*² and *f*³. The peripheral contour of the block being that of a hat oval, the sections vary in their radial dimensions, the large sections *f*, Fig. 2, being located at the front and rear of the block, and the smaller sections *f'*, Fig. 3, being at the sides of the

block, the intervening sections, being appropriately graduated consecutively, from the largest to the smallest radial dimension. The novel feature in these sections, which imparts to the block B, its novel character, consists in providing each section at its top, with an inwardly and more or less upwardly extended horn *g*, appropriately curved on top, from its inner end *g'*, to the vertical outer edge of the section. When assembled in the block, the interior cap plate *h*, is abutted by the several sections and is substantially covered or inclosed, and the several horns of the sections, afford a complete shaping support for the tip of a hat, when on the block. Considered separately, these sections somewhat resemble the ribs employed in the tip stretching former, disclosed in my Letters Patent No. 256,204, but said ribbed former was employed with co-operating tip stretching fingers, which in operation engaged with the hat body at the spaces between the ribs, and hence said "ribbed former" was not a hat block, and it was incapable of performing similar duty.

In Fig. 9, I have diagrammatically illustrated the form of one of my old blocks B' as when expanded, and having a hat *k* thereon, with its tip *k'*, flat stretched, its band engaged by a banding ring D, and its brim *k*² distended. In dotted lines, I also indicate a hat crown as developed by the new sectional block.

It is now to be understood, that the oval at the "square" of a hat, sometimes differs from the oval at the band, in which case, the working edges of all of the sections of the block, are not parallel with the axis of the block as indicated in Fig. 2. If the large sections *f*, at front and rear of the block (or fore and aft), are of such dimensions as to afford a longitudinal diameter, which at the top of the straight portion, is one-eighth of an inch less than the diameter at the bottom of said straight portion, (approximately indicated in Fig. 2 by dotted lines) the smaller sections *f'*, remaining the same, and the intermediate sections varied in proportion, the resulting block, would have a form which is sometimes desired.

My improved block, involves not only novelty in the matter of the supporting horns *g*, but also in the rubber cap *i*, Fig. 7, which is novel in its construction, in that it is not annular, or open at the top, as heretofore, but is on the contrary, a close cap, the top of which completely covers the top of the block, and presents a shaping supporting contact surface, which is assured by the contour or upper surfaces of the horns *g*, said contour being varied, according to the particular style of crown desired, which in a stiff felt hat is always more or less arched, or upwardly curved. In some cases, the rubber cap may be relied upon, for securing moderate variations in the shape of the hat tips, without corresponding variations in the form of the horns; as

for instance, by varying the thickness of the top of the cap, and in other cases, by the interposition of suitable material between the closed top of the cap, and the block sections.

5 The rubber cap *i*, may be quite thin, and uniform in thickness, as indicated in Fig. 7, because the novel block is ordinarily capable of use without any cap, although the best results may be secured by the use of a rubber
10 cap in either of the forms shown in Figs. 7, or 8, but a rubber block cap, closed at its top, thick and heavy at its center as at *i'*, and rounded in gradually decreased thickness to the side (or square) of the cap, is a valuable
15 novelty in combination with a sectional block, whether the latter has the novel supporting horns, or is like the old blocks, and can afford no interior support for the center of the rubber cap, provided always that said center is
20 sufficiently heavy and thick, to afford the shaping contact or support for the center of the tip of a hat.

Referring now to Fig. 7, it will be understood, that a wet hot hat *A'*, is shown in dotted lines to be undergoing the shape finishing operation, in accordance with my invention, and it will be seen that the tip of the hat is fully supported, and that by the expansion of the block, the tip is stretched radially to size and form, and the side crown stretched peripherally to size and form, by force which is applied within the hat, and that said force is well distributed and uniform; also that by the depression of the banding ring *D*, and the outward movement of the brim stretching tongs *E*, force is simultaneously applied at the band of the hat, for pulling it downwardly, and straining the side crown, in lines parallel with the axis of the
40 hat. This downward straining of the side crown, instead of being the entire strain, (as when the wooden blocks are employed,) is only a fractional part of the strain involved, because the force applied within the hat, secures the requisite radial and peripheral expansion of the tip and square, and the peripheral expansion of the side crown, so that the strain at the band, need be no more than sufficient to confine the hat against
50 rising on the block, and to fully develop the band and the brim of the hat. When the hat has been thus blocked to its complete or finishing shape and size, it is so held, while the cold douche is applied thereto, which sets the "stiff," and then the block is contracted, the banding ring raised, and the brim tongs opened, thus without manipulation, relieving the hat from all strains, and leaving it free to be gently lifted from its place on the collapsed block, and put upon a tray for the dry room, without any liability of distortion, because the stripping operation incident to the use of the wooden blocks, has been wholly avoided. When dried, the hats thus completely blocked as to size and form, are in
65 due time placed upon appropriate surface finishing blocks, whether for ironing or allur-

ing, and advantageous results of my invention are here further realized, in that, as hereinbefore indicated, when wooden blocks are used as heretofore, for completing the shape and size, the hats are so frequently distorted out of shape and size, that very considerable extra time and labor is requisite for fitting them upon, or applying them to the blocks so subsequently used, whereas my improved expandible block, being true to form, and readily set or adjusted, by the usual gage, to each exact size, and the stripping operation being wholly avoided, a minimum of time and labor is involved, in subsequently putting them upon appropriate finishing blocks.

As hereinbefore indicated, a metal mold and a rubber bag, can be employed in the practice of my method, although with less valuable results, in the matter of economy. In Fig. 10, I show a mold *F*, having a strong thin hat shaping interior shell *l*, and a jacketing chamber *l'*, to which, steam, or hot water, and cold water may be alternately supplied by way of pipes *l²*, and *l³*, and discharged by way of the pipe *l⁴*, appropriate cocks being provided therein, and also a vent cock at *l⁵*. A hat *A'*, is shown in position within the mold. Within the hat, there is a flexible bag *G*, suspended from a rigid base, carried on a reciprocating spindle *m*, and arranged to receive and discharge liquid by way of a pipe *m'*, whenever desired. Brim tongs are shown at *n*, in engagement with the brim of the hat.

In operation, the mold having been filled with hot water or steam, the wet heated hat and the bag are placed into the mold. The bag being filled with liquid, and under pressure, either hydraulic, or by way of its base, and the spindle, affords the internal pressure required for supporting the tip, side crown, and band of the hat, in shaping contact with the mold; while uniform and well distributed force is being applied within the hat body, thus radially and peripherally expanding the hat, while straining force is applied at the band and brim *a*, of the hat body, the annular edge of the shell *l*, serving as a banding ring during the operation of the brim tongs. The hot water or steam, is then cut off, and discharged from the mold, and the cold douching effect is then secured, by introducing cold water to the space *l'*, for setting the stiff in the hat; and, finally, the lifting of the spindle frees the hat from all internal strains, without requiring any manipulation or hand working of the hat for freeing it, either from the bag, or the mold. No high pressure being required within the heating and cooling space *l'*, of the mold, the hat shaping shell *l*, can, (by means of a gasket and screw,) be readily applied to, and removed from the body of the mold, but as the development of each size and shape of hat requires a special shell, the main economic advantages of my invention cannot be secured by their use, nor can they be used with that economy in time, as when the preferred

expansible block is employed, but their use as described, will obviate liability of injury to the hats, and involve the expenditure of less time and labor, as compared with the old methods.

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

1. The method of developing dyed stiff hat bodies into complete size and form, substantially as hereinbefore described, the same consisting in first, wet heating a dyed "stiff" hat body; then completely developing it into the size and form in which it is to be finished, by supporting the tip, side crown, and band of the hat body in shaping contact, and applying uniform and well distributed force within the hat body, and thereby radially and peripherally expanding it, and in the meantime applying straining force at the band of the hat body and at its brim; then while the hat is so held, cold douching it, for setting the "stiff," and, finally, without manipulation of the hat, relieving it from all of said strains.

2. The improved expansible hat block, comprising means for expanding the block, an interior top plate and numerous radial sections,

each of which abuts internally against the top plate and at its top overlies said top plate and extends inwardly, and more or less upwardly, and serves as a supporting and shaping horn, for a corresponding portion of the tip of a hat body when mounted on the block.

3. The expansible hat block, comprising in combination as described, numerous radial sections, each having at its top an upwardly and inwardly extended horn; a top plate against which said sections abut; an interior cone plate which actuates all of the sections, and a rubber cap which incloses the sections, and at its top presents a continuous and complete supporting and shaping surface for the entire tip of a hat when placed thereon.

4. The combination substantially as hereinbefore described, of an expansible hat block, of a rubber cap having a top or "tip" thick or heavy at its center, and gradually reduced in thickness between the center and its sides.

RUDOLF EICKEMEYER.

Witnesses:

STEPHEN D. FIELD,
CHAS. P. STEINMETZ.