

C. H. FIELD.
Device for Making Watch Cases.

No. 237,734.

Patented Feb. 15, 1881.

Fig. 1.

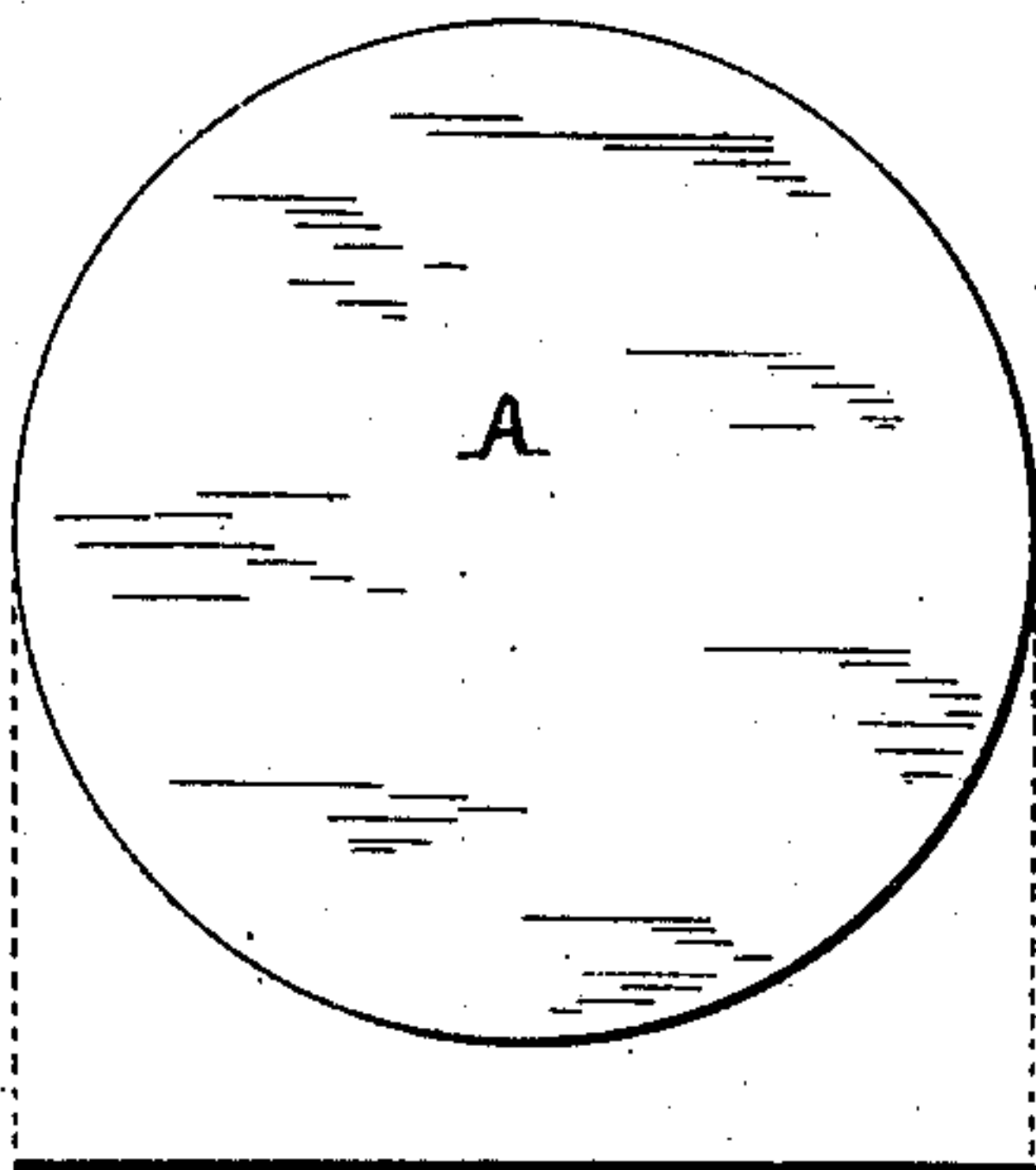


Fig. 2.

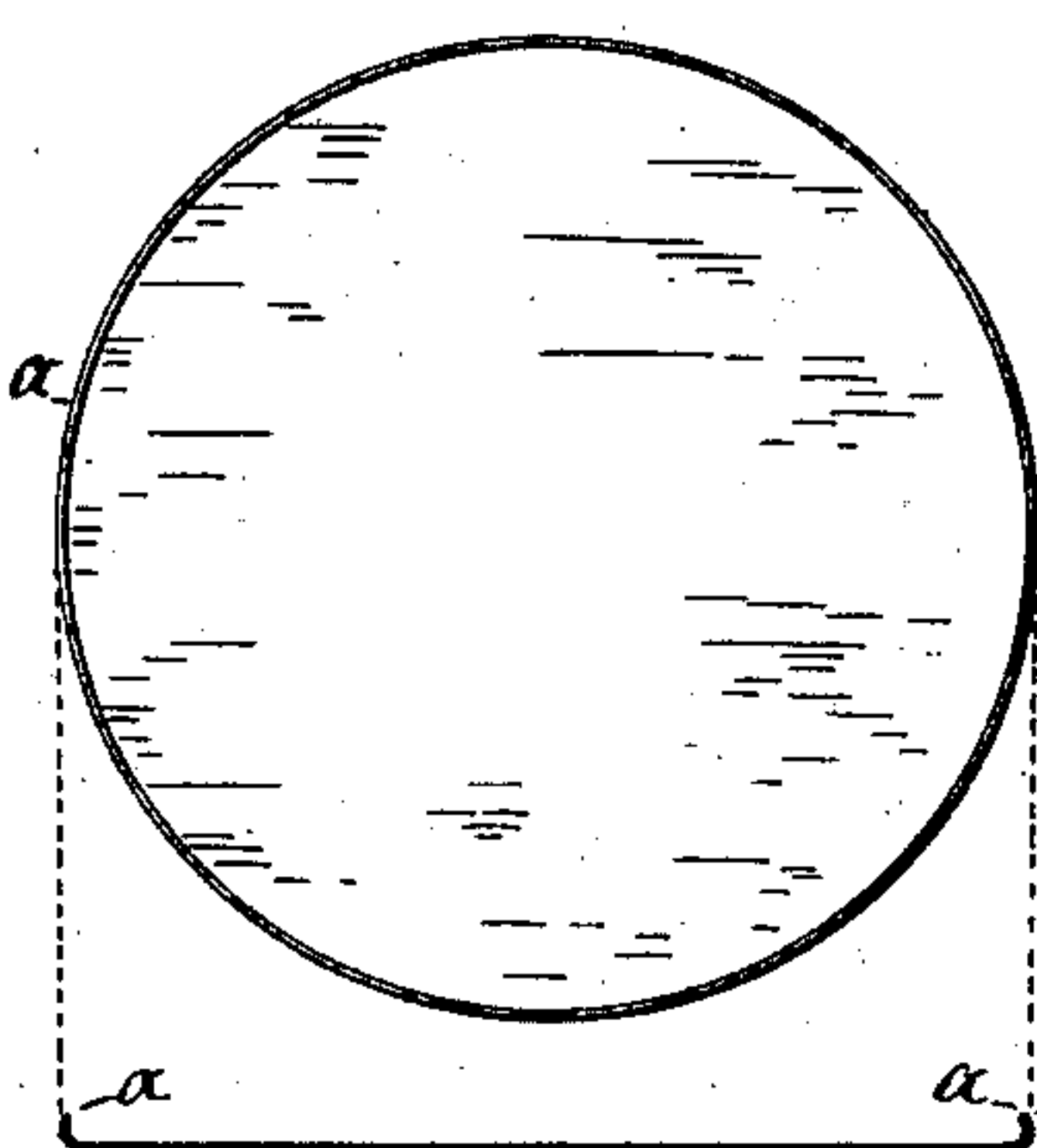


Fig. 3.

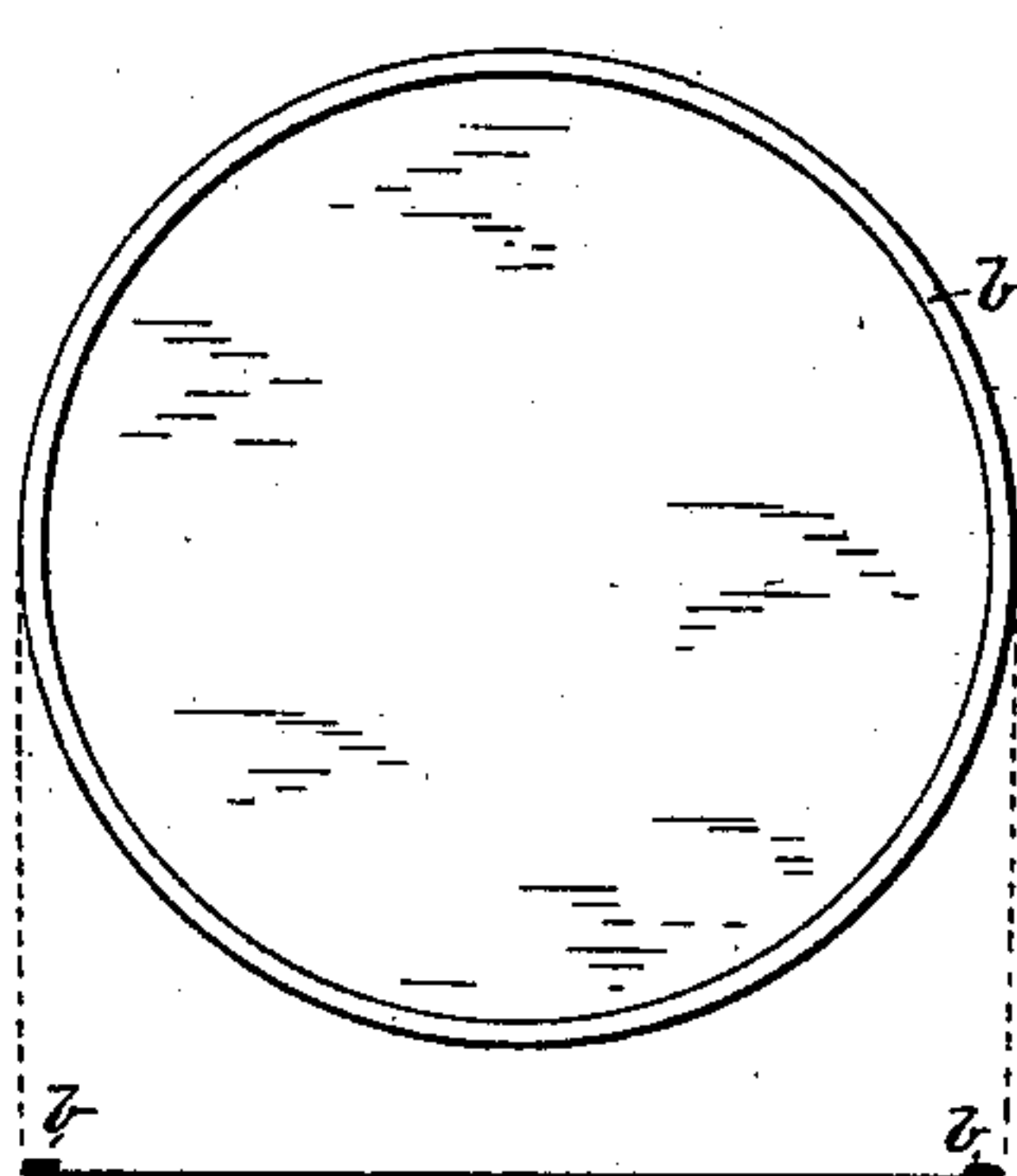


Fig. 4.

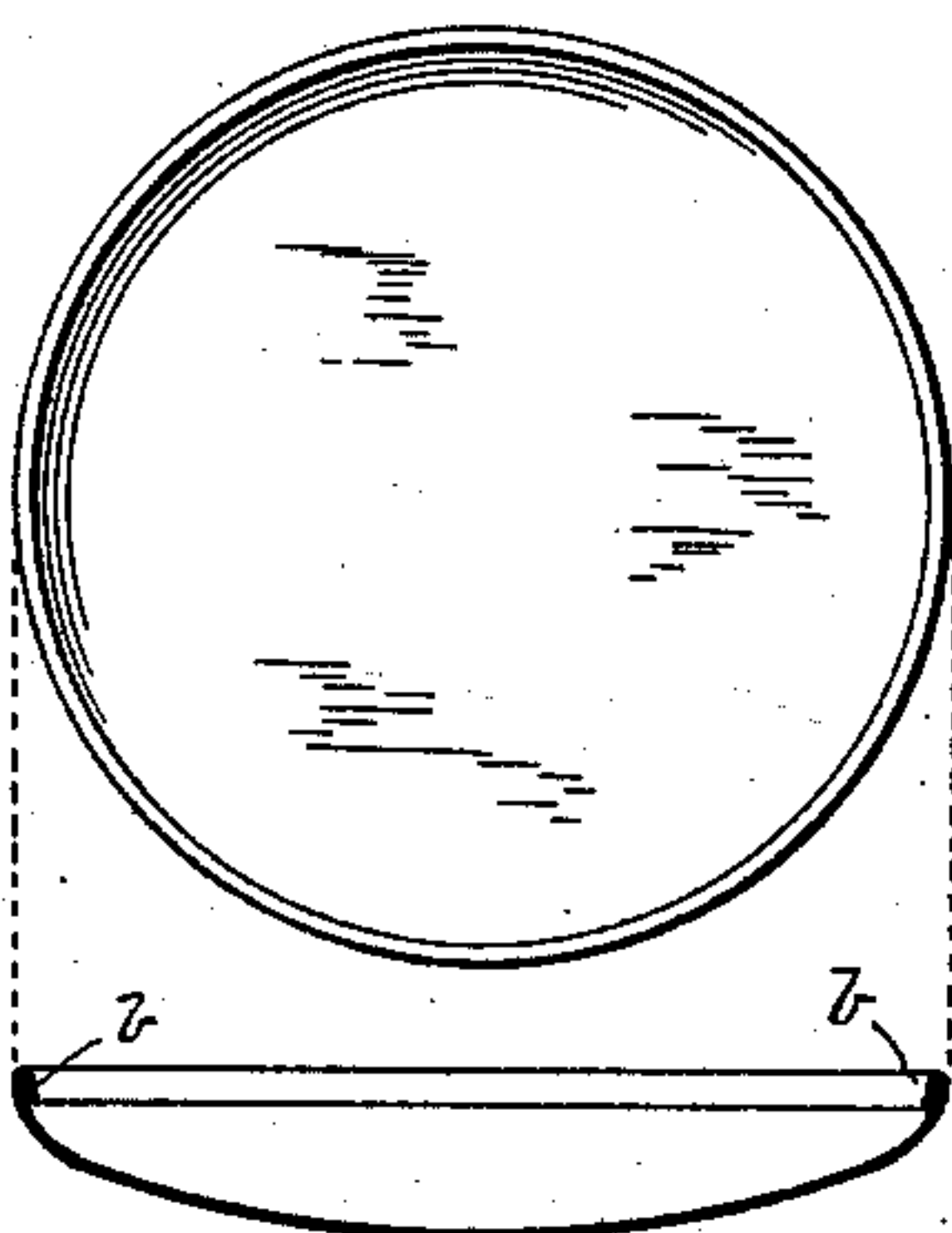


Fig. 6.

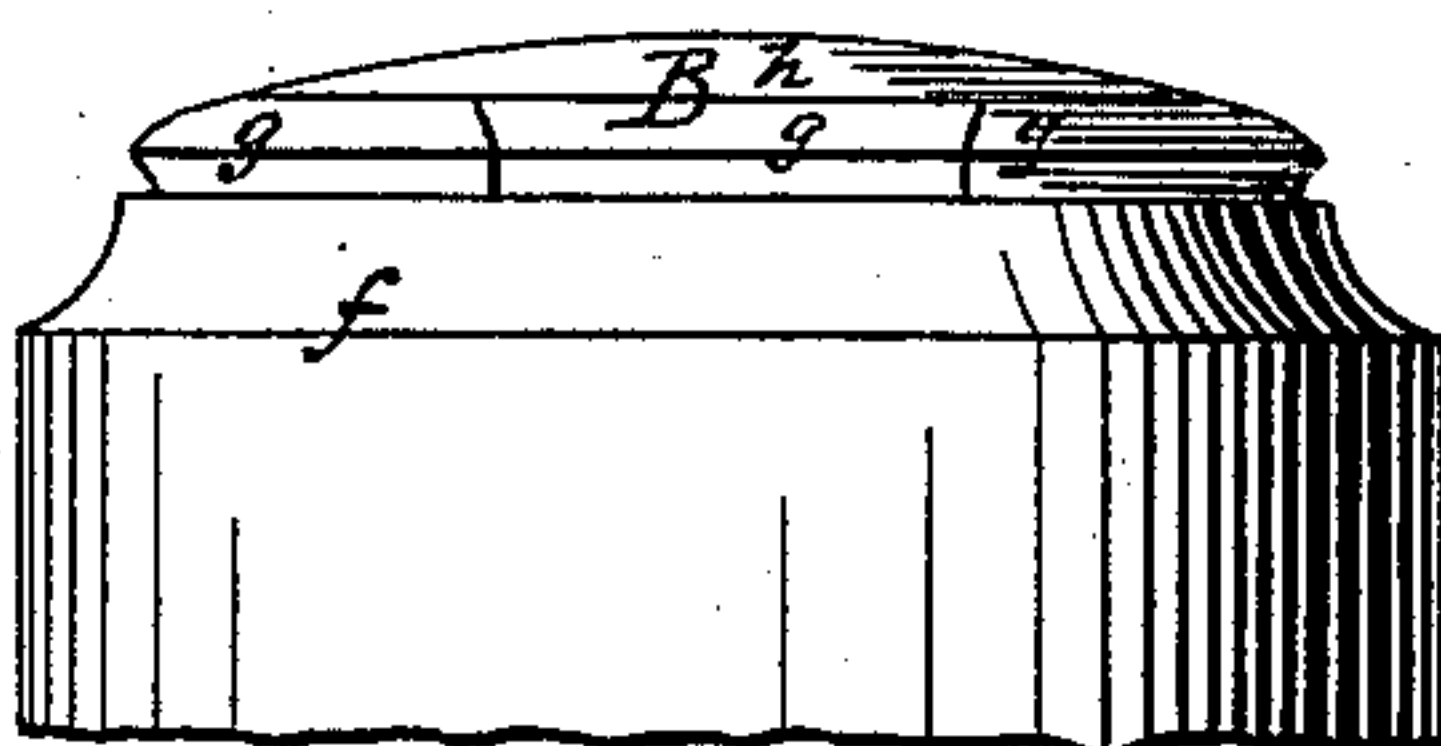


Fig. 8.

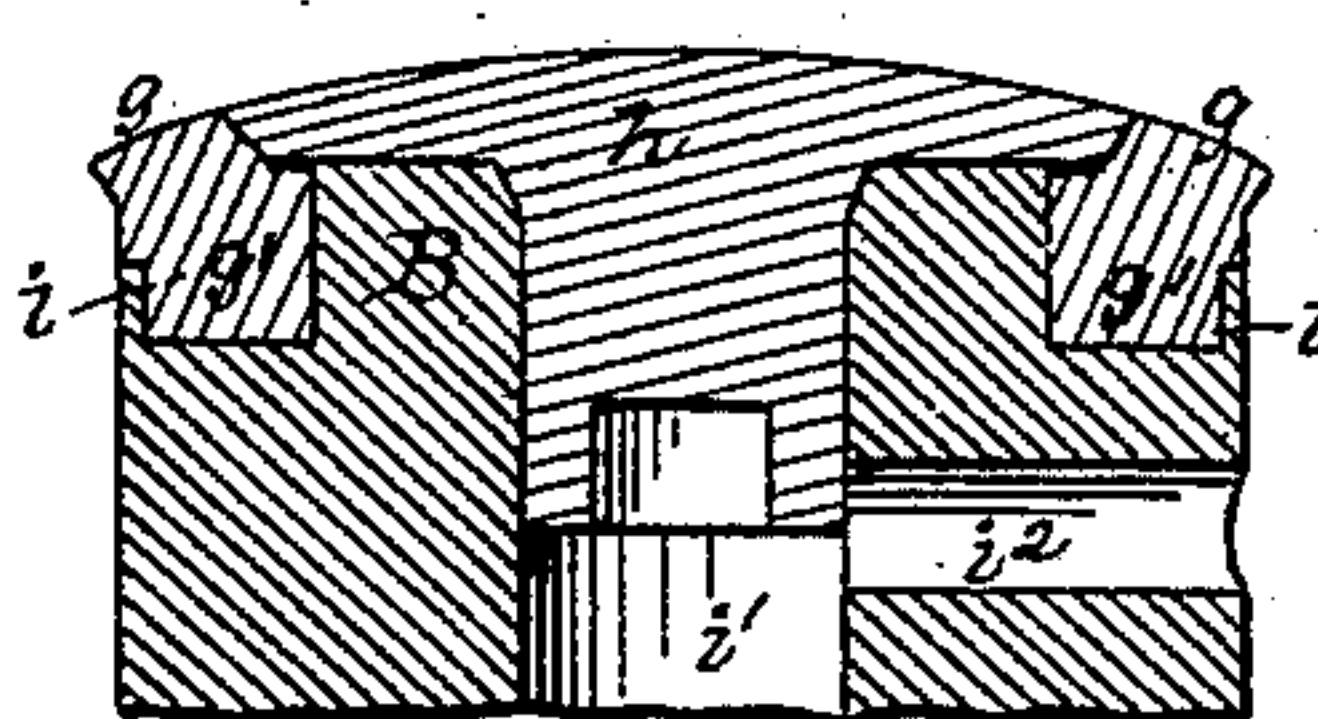


Fig. 7.

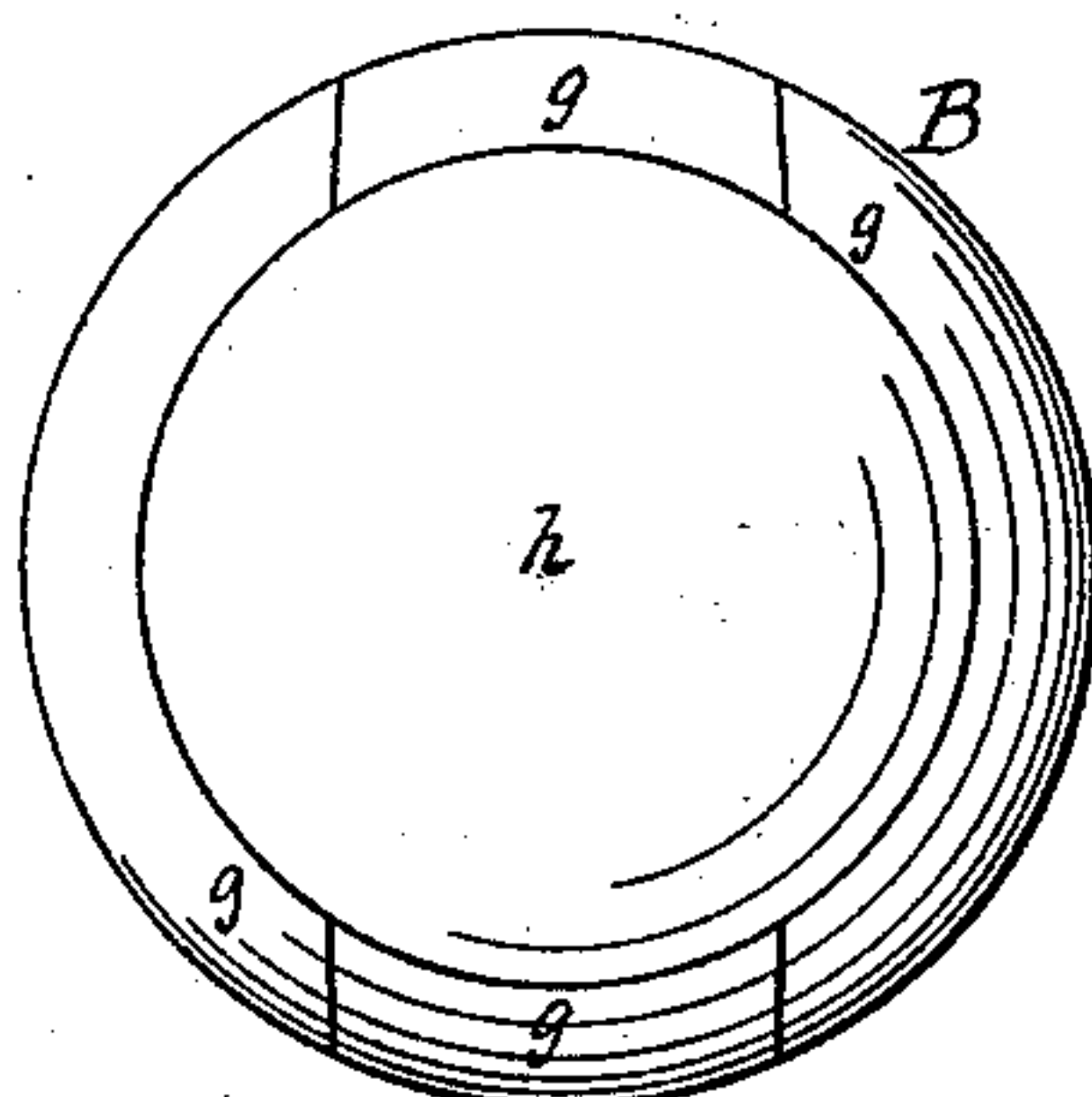


Fig. 9.

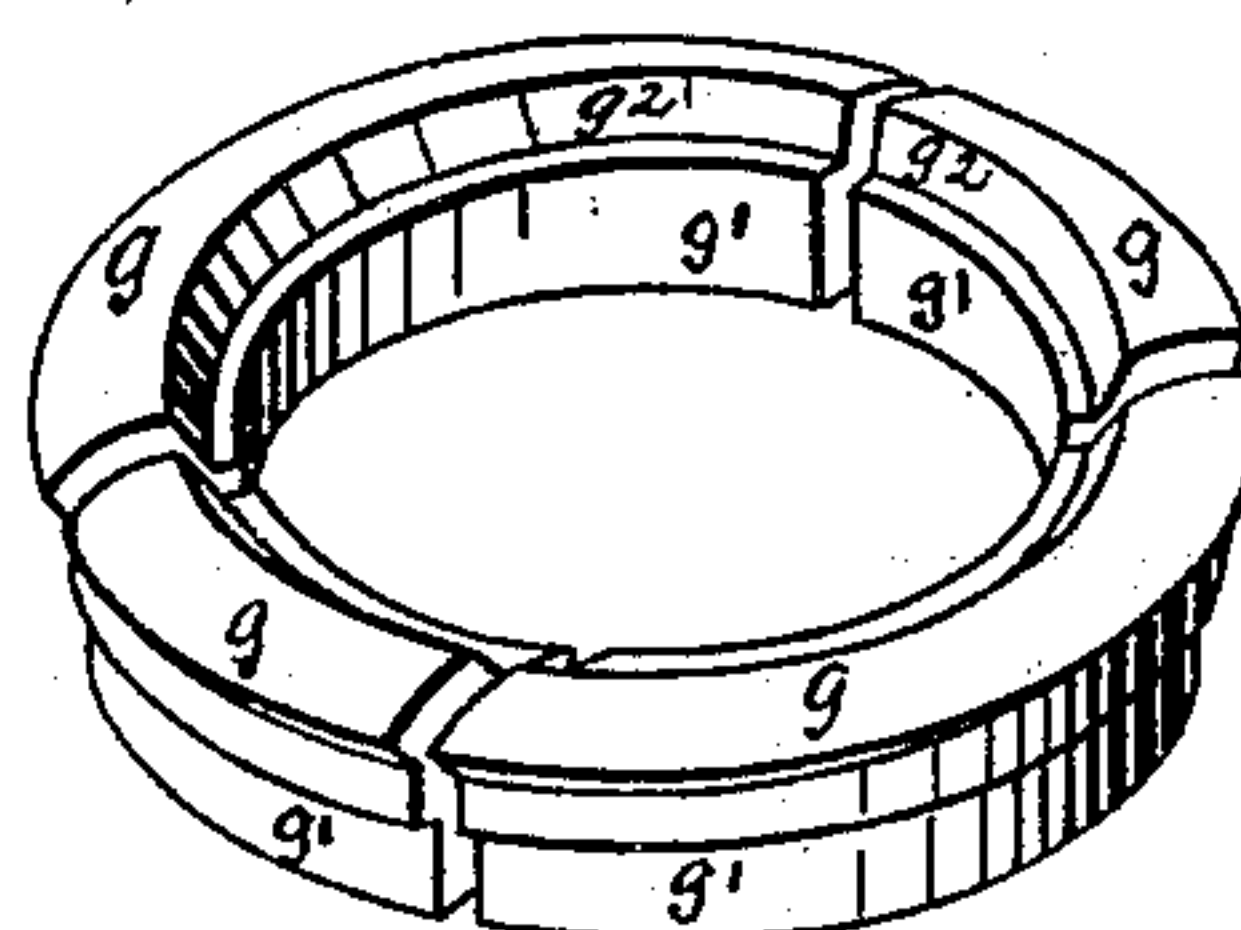


Fig. 5.

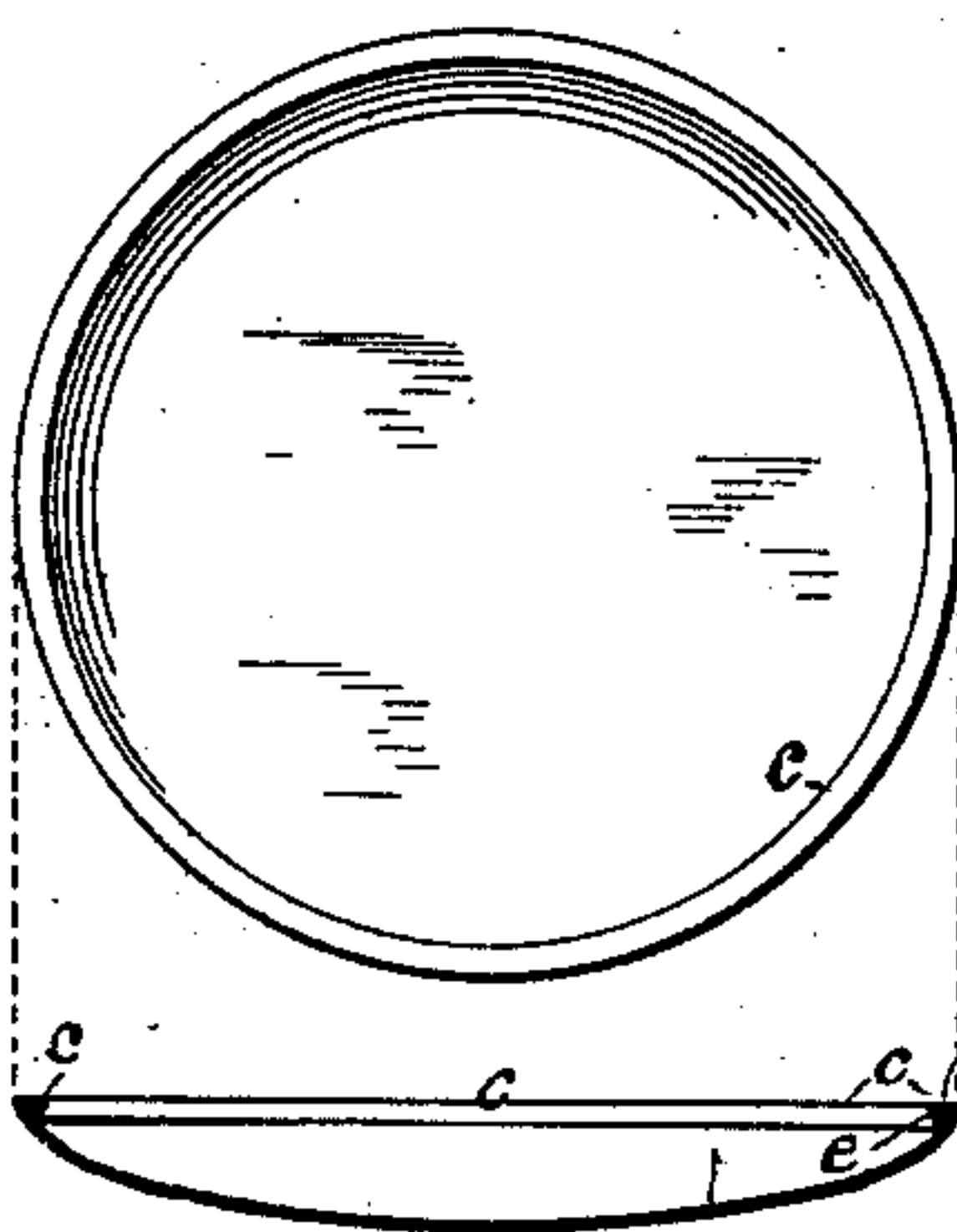


Fig. 11.

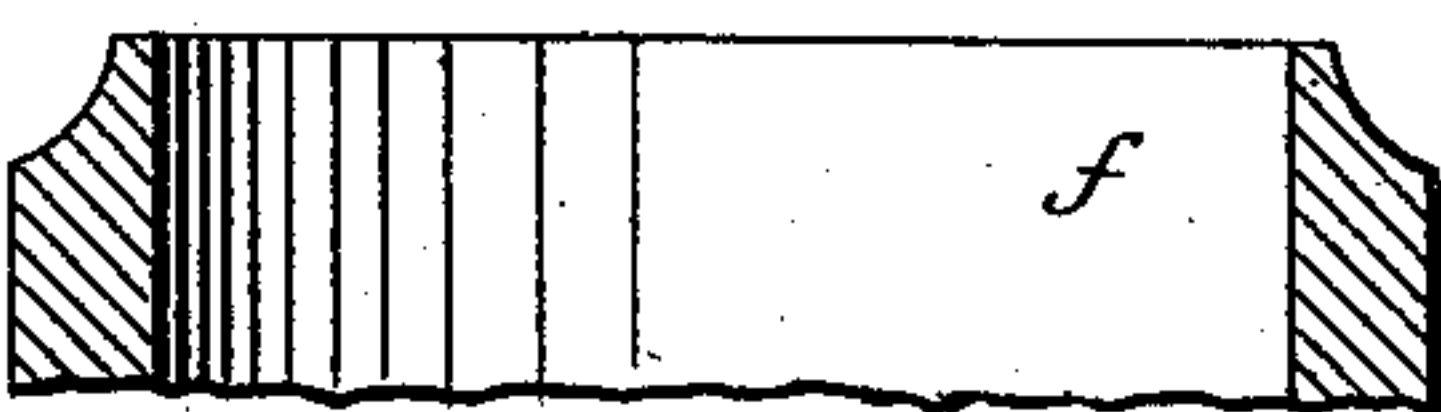


Fig. 10.

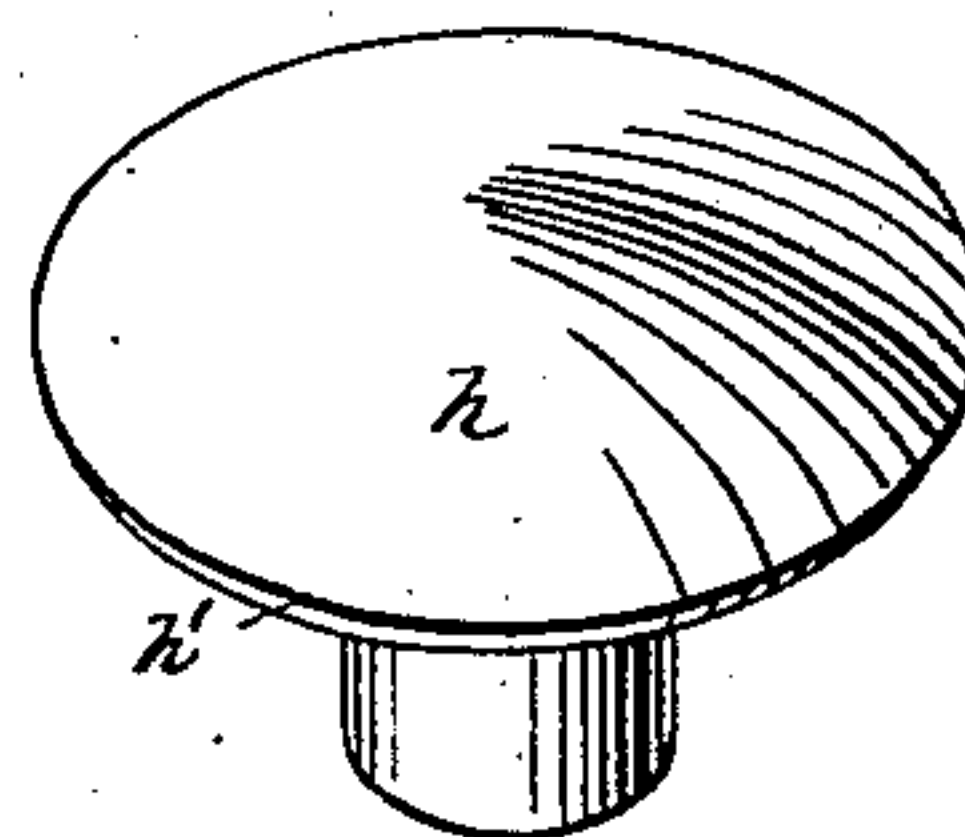
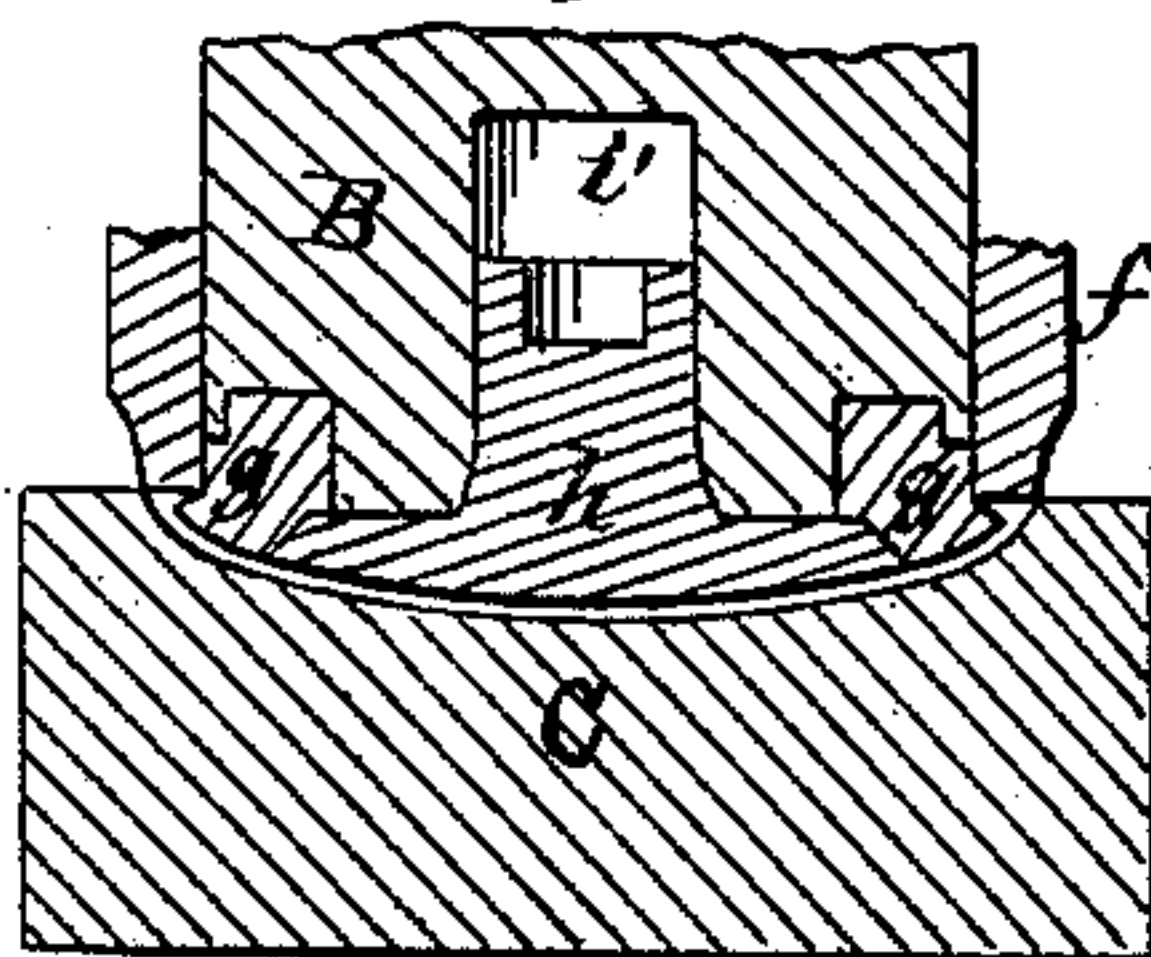


Fig. 12.



Witnesses:
Philip J. Garner.
Novell Bartle.

Inventor:
Charles H. Field.
By M. B. Wood
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES H. FIELD, OF BROOKLYN, NEW YORK.

DEVICE FOR MAKING WATCH-CASES.

SPECIFICATION forming part of Letters Patent No. 237,734, dated February 15, 1881.

Application filed March 1, 1879.

To all whom it may concern:

Be it known that I, CHARLES H. FIELD, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Manufacture of Backs or Covers for Watch-Cases and Locketts, and in tools used therein; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of the several features of my invention.

It is well known that the inwardly-projecting flange of a back or a front of a watch-case is commonly termed a "snap," because of its snapping engagement with an annular shoulder on the rim of the case in the act of closing.

The object of one portion of my invention is to attain, in the use of thin light stock, a strong and comparatively heavy snap which is wholly integral with the back, said snap being formed from the same piece of thin rolled metal by a novel redistribution of a portion thereof. Snaps integral with their backs are not new; but so far as my knowledge extends such have only heretofore been possible in connection with backs composed of heavy stock, because this latter must be sufficiently heavy to admit of such edge-upsetting, as has heretofore been practiced, without swaging for forming the snap. Other integral snaps have been formed by the mere inward turning of the metal to form the flange without swaging; but in such cases the snap can never be stronger or thicker or more condensed than the metal of which the back is composed. As a rule, in the manufacture of light stock backs, the snap has been heretofore produced by the insertion and soldering of a separate ring, which is subsequently turned out in a lathe to form the angular edge of the snap; but, by reason of my invention, I attain as heavy and strong a snap as was heretofore secured by means of the inserted ring, and no interior turning is required.

The main feature of my invention is the improvement in the manufacture of backs and fronts of the cases of watches and lockets which consists in turning the edge of the disk of metal, of which the back or front is composed, flatly upon itself under heavy pressure and swaging this doubled stock to form the snap.

Tools in great variety may be employed in the practice of my invention. The soft annealed metal plate is first cut into disks and then reduced in diameter by the upward turning of a nearly-rectangular flange, as heretofore practiced in some cases. The next step is a novel one, and it consists in turning the flange down upon the body of the disk, with heavy pressure between the faces of flat dies, and, the metal being clean, this results in the production of a disk having a thickened rim or edge, which is as solid as it is possible to attain with cold swaging. This rimmed disk is then cup-shaped for producing the exterior contour desired in the finished back, and then it is subjected to the action of swaging-dies, which operate upon the double stock at the edge of the back, substantially as is done by me in accordance with my present invention in forming the snap from a single thickness of thick stock.

So far as relates to the main feature of my invention it is immaterial at which stage in the successive operations indicated the stock be doubled upon itself, so long as it has been doubled prior to the upsetting operation by which the snap is swaged—that is to say, the original flat disk may be first shaped to the contour of the back and thereafter have its edge turned inward upon itself and properly swaged by means of special tools suitable therefor; but it is obvious that the metal will be best controlled if the doubling thereof be effected while the disk is in its original flat condition.

Another feature of my invention consists in a novel method of making a watch-case back with a complete hardened and finished snap from sheet metal by steps as follows: first, forming the blank, by compression, into the general form of a watch-case back; second, inserting into said blank, while in a matrix-die, a male die which is detachable from a finished snap; third, turning the edge of said blank inward upon said male die and swaging it to form the finished snap.

A snap in its best form should possess a comparatively sharp edge and a receding or angular inner surface, and the metal of which it is composed should be condensed and thereby hardened as far as is possible by the swaging operation. To form a snap of this kind

the die should have a corresponding angular surface, and because the snap is finished thereon said die, in order that it may be separated from the back, is constructed in sections.

5 Heretofore, in the manufacture of so-called "jewelry bases," which are structures of annular or oval outline composed of sheet-metal so bent as to afford an internal annular recess, a sectional former has been employed, upon and
10 around which the metal is first bent or turned down and thereafter employed as a foundation upon which to burnish the edge so turned by means of a lathe-chuck and burnisher; but I know of no tools heretofore employed
15 with which a finished snap could be formed by a swaging operation.

My invention further consists in the combination, with a matrix-die for receiving a blank, of a male die composed of flanged sections detachable from a finished snap, and a compressing-die for swaging the edge of the blank upon the flange, of the male die in forming the snap. As constructed by me, the projecting
20 flange of the male die affords an internal support for the metal in forming the snap during the swaging action of the compressing-die. The peripheral surface of the male die, immediately above said flange, serves to secure a corresponding perfect annular edge for the
25 snap, because the metal swaged is confined within the annular space bounded on the outside by the inner surface of the matrix-die, on the upper side by the working or lower face of the sleeve-die, on the lower side by the upper
30 surface of the flange, and on the inner side by the surface of the male die, immediately above the flange.

My invention further consists in a male die embodying, in combination, a die-stock, a
40 flange constructed in sections, each of which has an inclined inner surface, and a central key having a shank and an inclined periphery. The central key, by means of its shank, serves to confine the flange-sections to the
45 die-stock. Its inclined periphery, by contact with the inner inclined surfaces of the flange-section, serves to force them slightly outward to their work when pressure is applied to the male die as in use; and this feature is of special value when the flange-sections become slightly worn, because of the
50 wedge-like action incident to the contact of the inclined surfaces. Said inclined surfaces also facilitate the removal of one of the flange-sections from a finished snap preparatory to the removal of the remaining sections.

A cover for a watch-case or locket constructed in accordance with the main feature of my invention is readily distinguishable by
60 persons skilled in the art from that class of covers which have the snap composed of a soldered ring, and also from such as have snaps formed by the upsetting and swaging of a single thickness of metal.

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

Figures 1, 2, and 3 represent, respectively, each in plan view and section, a plain disk, a flanged disk, and a disk with the consolidated
70 and re-enforced periphery as developed in accordance with my invention. Fig. 4 represents, in like manner, the re-enforced disk formed to the general contour of a watch-case cover. Fig. 5 represents, in like manner, a
75 completed cover constructed in accordance with my invention. Fig. 6 represents, in side elevation, a male die and the compressing or swaging die which co-operates therewith. Fig. 7 represents the male die in end view. 80 Fig. 8 represents the same in vertical central section. Fig. 9 represents, in a group, the male-die flange-sections. Fig. 10 represents the central key in perspective. Fig. 11 represents the annular swaging-die in central section. 85 Fig. 12 represents, in central section, the matrix-die and the die, Fig. 6, all in position as if forming a snap.

The stock from which watch and locket cases are made varies in its character and value; but
90 for economical working it is usually rolled to a uniform thickness, from which the disk A, Fig. 1, is cut by means of well-known dies. Other dies equally well known are then employed for forming the flange *a*, Fig. 2, and
95 this flange, by means of flat dies otherwise so constructed as to first bend the flange inward in a manner well known, is heavily compressed upon the body of the disk and practically incorporated therewith for forming the thickened
100 periphery *b*, Fig. 3. Then, with other dies well known, the disk, with its periphery, receives its cup-like form, as in Fig. 4, with an exterior contour as desired, whether it be rounded
105 throughout or whether it be flattened more or less closely adjacent to the edge, which is usually rounded in section, but sometimes more or less angular. The operations, when success-
110 sively performed, as described, result, as I believe, in the most satisfactory results, although, as I have before stated, I am well aware that approximately-valuable results may be attained
115 if the metal be doubled upon itself to form the thickened periphery *b* after the cup shape or its equivalent is attained by the employment of complex tools suited for that purpose, and
120 that it is immaterial, so far as the main feature of my invention is concerned, at what stage of the operation the doubled periphery is formed, so long as it precedes the swaging operation, which is hereinafter described.

The snap *c*, Fig. 5, has the usual triangular sectional contour, the front face *d* being rectangular to the axial line of the cover, and the
125 inner face, *e*, being angular to the front face, so as to afford a sharp firm edge for the snap.

The male die B (shown in Fig. 6) is surrounded by an annular upsetting swaging-die, *f*. Said male die is composed of several parts, viz: an annular block, four flange-sections, *g*,
130 and a central key, *h*. The flange-sections have segmental shanks *g'*, which occupy an annular groove, *i*, in the lower end of the die-stock, and the central key has a spindle or shank,

which snugly occupies an axial opening, i^1 , in the die-stock, and its inner end partially occupies a transverse slot, i^2 , in said die-stock, by which access is afforded to said shank for
 5 longitudinally moving the key after the well-known manner of detaching drills from lathe-spindles. The rear or inner surfaces, g^2 , of the flange-sections g are inclined outwardly, and the coincident or bearing surface of the key is
 10 correspondingly inclined, so that when the male-die is forced into a blank in the matrix-die C, in forming the snap, the flange-sections will be more or less forced outward in the performance of their work, proportioned always
 15 to the degree of wear to which they may have been subjected, as before herein stated. The key, with or without the inclined surface, performs the function of holding the flange-sections and the die-stock together during those
 20 movements which precede its work, in co-operation with the matrix-die and the swaging-die.

The formation of the snap is effected as follows: The cup-shaped disk, with or without the
 25 thickened periphery, is placed within the matrix-die C. The male die, with its several parts in proper position, is placed within the cup-shaped blank in the matrix-die and submitted to longitudinal pressure; the annular swaging-die f , under heavy pressure, is then forced upon
 30 the periphery of the blank, upsetting the same and swaging it into the annular space bounded by the face of the upsetting-die, the inner surface of the matrix-die, and the adjacent
 35 surfaces of the flange-sections of the male die, thus perfecting the snap in all essential particulars. The swaging-die is then lifted, and the male die, with the case-cover attached, is removed from the matrix-die and the central
 40 key started outward sufficiently to permit the cover to be detached by the removal of the flange-sections, which are then reunited to the die-stock for another operation. The mere surface-finish on the face of the snap is a matter
 45 of subsequent procedure, to which my invention does not relate.

It is immaterial in what manner the requisite holding-pressure is applied to the male die, or how power is applied to the swaging-die, for they may be each separately operated
 50 as in well-known die-presses, or the male die may have no individual actuating mechanism, but be attached with a yielding connection to the swaging-die.

55 It will be seen that, in accordance with the main feature of my invention, a quantity of metal is consolidated to form the snap, which

is fully equal to double the quantity contained in the flange first formed, and that it would be difficult, if not practically impossible, to directly upset from the edge of the original disk, Fig. 1, for instance, a width of the thin metal equal to nearly double the width of said flange. The prime advantage accruing from the main feature of my invention, when viewed as to
 60 practical results, consists in the successful working of snaps from light stock, and by my invention, broadly, I obviate the expense of forming and fitting a separate ring, the requisite soldering, and the subsequent turning operation, as in a chuck. Moreover, in the use of stock which is gold-plated on both sides, it will be seen that the snap as formed by me of
 65 doubled metal will be wholly gold-surfaced.

Although I have herein referred to the rim of the disks being doubled it will of course be obvious that for still heavier snaps the metal may be a second time doubled, so as to afford a quadruple thickness from which to develop
 70 as heavy a snap as could possibly be desired.

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

1. The improvement in the art of making backs or covers for cases of watches and lock-
 85 ets which consists in turning the metal at the edge of the disk of which the back is composed flatly upon itself under heavy pressure, and upsetting and swaging this doubled stock to form the snap, substantially as described.

2. The method of making a watch-case back with a complete hardened and finished snap, substantially as hereinbefore set forth, by steps as follows, viz: first, forming the blank by compression into the general form of a watch-case
 90 back; second, inserting into said blank, while in a matrix-die, a male die which is detachable from a finished snap; third, turning the edge of said blank inward upon said male die and swaging it to form the finished snap.

3. The combination, substantially as hereinbefore described, of the matrix-die for receiving the blank, the male die, constructed in sections and detachable from a finished snap, and the swaging-die.

4. The male die embodying in combination the stock, the flange-sections having inclined inner surfaces, and the central key having an inclined periphery, as and for the purposes specified.

CHARLES H. FIELD,

Witnesses:

HAYWARD SMITH,
 CHAS. V. QUICK.