No. 672,646. Patented Apr. 23, 1901.

H. E. MERENESS, JR.

BILLIARD CUE.

(Application filed Oct. 24, 1900.)

(No Model.)

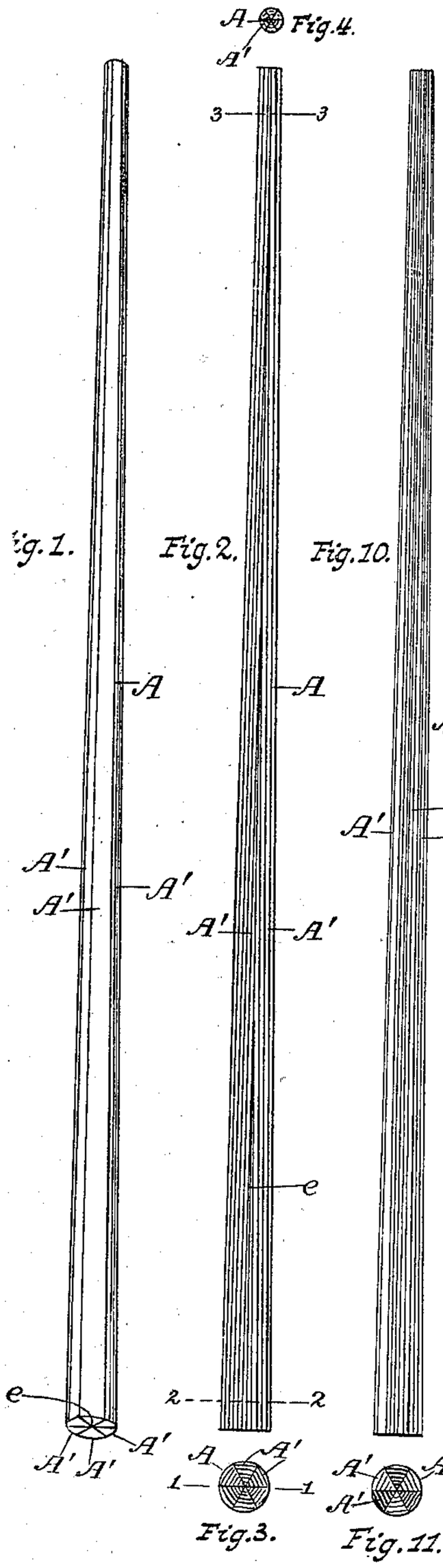

Fig. 1. Fig. 2. Fig. 10. Fig. 3. Fig. 11.

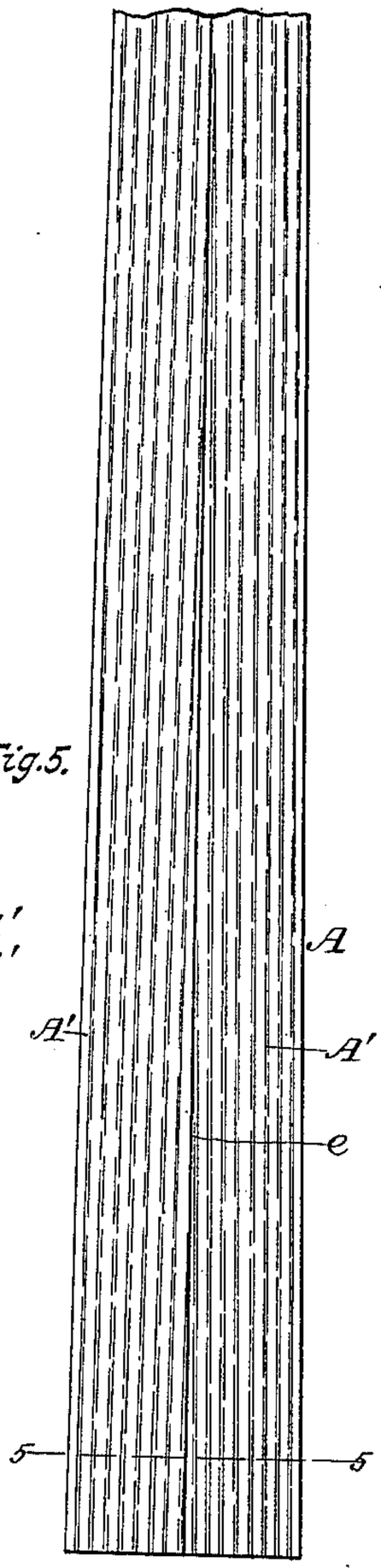

Fig. 5.

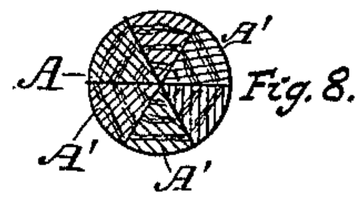

Fig. 8.

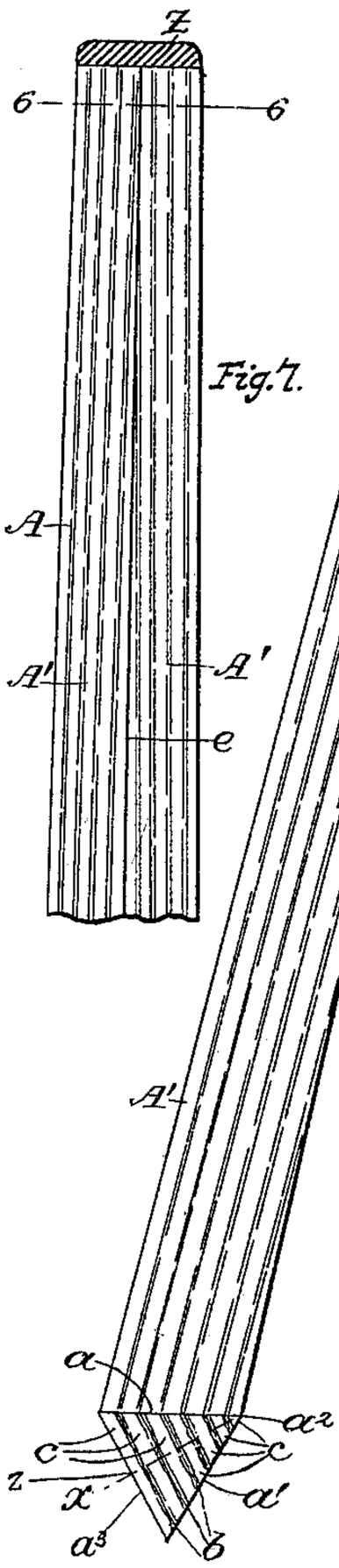

Fig. 7.

Fig. 9.

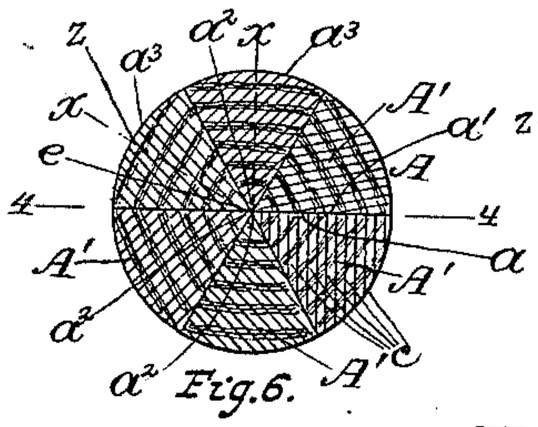

Fig. 6.

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BILLIARD-CUE.

SPECIFICATION forming part of Letters Patent No. 672,646, dated April 23, 1901.

Application filed October 24, 1900. Serial No. 34,117. (No model.)

To all whom it may concern.

Be it known that I, HARRY E. MERENESS, Jr., a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Billiard-Cues, of which the following is a specification.

My invention relates to billiard-cues; and one object of my invention is to provide a billiard-cue composed of a series of triangular strips of hard wood, in which the denser layers of wood, alternating with porous portions thereof, may be so disposed in reference to the exterior surfaces of the outer side of the respective strips that said denser layers may in their extension in cross-direction run from the surface of one of the inner sides to the surface of the opposite inner side and relatively parallel to the exterior surface of the strip and parallel with each of the other layers in the same strip; also, to so taper each of the several strips in the series in the billiard-cue that the laps of the denser wood, alternating with the porous portion, may in cross-direction extend from the surface of one of the inner sides to that of the opposite and in longitudinal direction run in lines parallel to each other and with the line of outer surface of the exterior side of the strip, while the line of longitudinal extension of the inner corner of each strip will run relatively tapering in relation to the line of direction of length of the layers of denser wood and that of the outer side of the strip, and, further, to provide a billiard-cue which tapers from its handle end to its top and is composed of a series of triangular strips of wood united together by cement in such a manner that the inner corner of each strip will abut the adjoining inner corners of the other strips and be coincident with the axial line of the cue, and the denser layers of wood, alternating with the porous wood in each strip, may be in their cross-direction relatively in lines at right angles to a line drawn from the point of inner corner of each strip to a point midway in the width of the exterior side of the strip, thereby in cross-direction of the finished cue dispose the layers of denser wood, alternating with the porous portion of the same, in form of a series of concentric hexagonal figures from its center to circumference, so that the several said denser-wood layers of each strip may operate to brace those of the adjoining strips, and thereby uniformly stiffen the cue in all directions transverse to its length.

Other objects and advantages of the invention will be fully understood from the following description and claim, when taken in connection with the annexed drawings, in which—

Figure 1 is a perspective view of a billiard-cue embodying my invention. Fig. 2 is a longitudinal section taken at line 1 in Fig. 3. Fig. 3 is a section taken at line 2 in Fig. 2. Fig. 4 is a section taken at line 3 in Fig. 2. Fig. 5 is a longitudinal section, on enlarged scale, of the handle-end portion, taken at line 4, Fig. 6. Fig. 6 is a section taken at line 5 in Fig. 5. Fig. 7 is a longitudinal section of the tip-end portion of the cue. Fig. 8 is a section taken at line 6 in Fig. 7. Fig. 9 is a perspective view of a triangular strip before being combined with the others in a cue. Fig. 10 is a view of a cue embodying my invention and with strips of dark and light colored woods alternating. Fig. 11 is a section of the same.

Similar letters of reference refer to similar parts throughout the several views.

Fishing-rods have been constructed of split bamboo, well known to be the hollow stem of a species of grass, comprising a series of comparatively short lengths of natural tubes and knots between, and is porous in structure, of grain elastic, light in weight, and strong to a considerable degree when its exterior hard enamel-like outer portion of substance is left undisturbed; but when that enamel-like outer substance is removed, either in whole or part, the bamboo becomes weak and readily splits under sudden endwise blows from hard substances. These above-mentioned qualities, together with the insufficiency of thickness of the substance of the walls of their short lengths of natural tubes, and the occurrence of the knots between, which necessitates such a reduction of the thickness of the bamboo, in some portions of its length, as to require all the hard enamel-like substance to be wholly removed, and also that for use in producing billiard-cues of suitable length and diameter, and a degree of taper on true straight lines from handle to top, as is not natural in bam-

boo, the substance of the several triangular strips of bamboo requires such a greater degree of dressing down of some portions of their length than other portions as to cause this bamboo substance to be wholly unfit for use in the structure of billiard-cues, in which are essential the quality of reasonable weight (for being well balanced for proper handling) and the element of stiffness, so as not to be liable to spring under shocks from heavy sudden blows received on its tip end, and also the element of strong cohesion of the substance of the cue at its tip, so as not to readily splinter when delivering blows to balls.

Golf-sticks, which are required to possess the element of pliability, have been made of triangular-form strips, having the grain of each so disposed in relation to the grain of the adjoining other strips as to render the stick more or less pliable, as may be best suited to the player or preferred by him, and be at the same time light in weight, and yet sufficiently stiff and strong for giving the stick that resiliency essential to enable the player to drive a ball the greater distance with less exercise of strength than is required by sticks deficient in pliability.

I have discovered that in billiard-cues of best quality for delivering to a billiard-ball a blow from any line of direction or angle with great accuracy it is essential that the axial line of the cue from its handle to its top should always be absolutely straight and that its taper should be uniformly in true lines in the entire length of its circumference and the substance of the cue about its axial line should at all times be in true balance and that, as a shaft, which is liable to receive sudden impacts endwise on its tip from force of resistance of a ball from different directions or lines of angles of strokes, it should have the element of stiffness, so as to prevent the cue from buckling or springing. For producing in billiard-cues these above-mentioned essential elements I have devised a cue of novel construction, in which are employed strips of arrangement of the laps or layers of denser portions in the same, as will be hereinafter described, and of equilateral triangular form in their cross-direction and having their opposite sides a and a' tapering on straight lines and also having the lines of their inner corners a^2 and exterior surface a^3 running in straight tapering lines from end to end and secured together by strong waterproof cement. These strips A′ may be made from any suitable well-seasoned straight-grained hard wood, as ash, hickory, beech, hard maple, or other wood, which have their laps or layers of denser wood, alternating with porous portions, of thickness varying from one-eighth of an inch, more or less, as is found in the above-mentioned woods. These strips A′ are of length equal to that of the cue to be produced and are in their cross-direction of equilateral triangular form and similar in area at both their handle and tip ends, as shown in Figs. 6 and 8. In these triangular-form strips a and a' are the inner sides, which respectively abut similar sides of the adjoining strips when combined and cemented together, as in Figs. 2, 6, 8, and 11. a^2 in each strip is the inner corner of the same, which corners are coincident with the axial line of the finished cue, and a^3 a^3 are the exterior sides of the said strips. The grain of wood of these strips A′ is so disposed in a section of each strip that the layers of denser wood in the grain and the porous portions of the latter, which naturally alternate with said denser laps, shall in their cross-direction of width extend from side a to side a' in each strip in lines about at right angles to a line, as line x, Figs. 6 and 9, drawn from the corner a^2 thereof outward to and through a point, as z, located midway in the width of the exterior side a^3 of the strip, as shown in said figures, whereby the lines of said laps of dense wood in their cross-section, as from side a to side a', may be parallel to that of the exterior surface a^3 and also to that of the other laps in the same strip, as shown in Fig. 6. By this relative arrangement and disposition of these dense-wood laps in the triangular strips A′ the latter are made to be stiff under strains applied transverse to the lines of the edges of the said laps and also under strains applied endwise under force of sudden concussions, while these same strips would be most pliable under strains transverse to the lines of the flats of said laps and cause the strip to spring only in direction of the sides of the flats of laps, as would also be the case when strains are applied under force of endwise concussion. Besides making each of these equilateral triangular strips in the cue to have the like relatively-arranged laps c c of dense wood, as above described, I combine and cement these strips together, so that the outer edges of the dense-wood laps in each strip A′ may about coincide with and abut the edges of the similar laps in the adjoining strips A′, and thereby cause the stick so produced to combine what are, in effect, a series of unbroken concentric hexagonal tubes of hardwood laps, which alternate with what, in effect, are concentric hexagonal natural fillings of porous and weaker substance, while the dense-wood laps c c in each strip of each pair of antipodal strips will be parallel in relation to those of the other and angular in relation to those in adjoining strips belonging to the other two pairs of antipodal strips in the cue. By means of this relative placement of the series of dense-wood laps c c in each pair of antipodal triangular strips in the cue, and then relative angles to the similar laps c c in the adjoining strips, also in antipodal pairs, I give to the cue the maximum of stiffness which a stick of wood can receive by use only of its own substance, but which cannot be had from combined triangular strips of bamboo as have been employed in both single and double pieces or layers in fishing-rods for giving to

them both uniformity of pliability and a sufficiency of strength to prevent their breaking down under pulling strains applied to their tip ends; nor can this maximum of stiffness be obtained by use of triangular strips of hard wood as are employed in golf-sticks, in which absolute stiffness is a defective element and pliability is a necessary quality for best sticks, which will prevent stinging the hand and enable the player to deliver best driving-blows to the ball with ease, which pliability in these golf-sticks was obtained by causing the grain in each triangular strip to be so disposed in reference to the grain of the adjacent similar strips as to give to the finished stick a preferred degree of pliability.

The triangular strips A′ may have their sides a and a' dressed smoothly by any preferred means, so as to give to each triangular strip a tapering form both in width from side a to side a' and in the transverse from interior corner a^2 to exterior side a^3, as shown in Fig. 5, so that this taper last mentioned may have the exterior dense lap in each strip parallel to the line of the exterior surface of the exterior side a^3, while the line of the interior corner a^2 shall be the line of taper running relatively oblique to the dense-wood laps c, as shown in said Fig. 5. With this construction the cue produced will not only be made to have the maximum of stiffness necessary in the best cue-stick with perfect balance of all portions thereof around its axis, but when its exterior tapering surfaces are smoothly dressed the exterior surfaces of the several strips of like kind of wood in the cue will be of one uniform texture, hardness, and color.

By making alternate strips A of two different-colored woods—as, say, white-ash and beech or other contrasting-colored wood, as shown in Figs. 10 and 11—an ornamental billiard-cue will be produced.

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

In a billiard-cue, the combination of a series of equilateral triangular strips which taper in their length in their lines of abutting sides a a' and also lengthwise by their lines of inner corners a^2 running relatively oblique to their lines of exterior side a^3, and having the dense hard-wood laps c c in each strip extended in direction of its width from one side thereof to the other in lines parallel to each other, and parallel to the line of extension of the outer lap in its cross-direction; the strips in the series being placed and rigidly secured together in such a manner that the dense hard-wood laps c c exterior in each strip, are on equal tapering lines, in the finished cue-stick, from its handle end to its tip, and the interior dense hard-wood laps, in cross-direction and lengthwise are parallel to said exterior lap; so as to produce in the cue-stick about its axis a series of concentric hexagonal form of rigidly-connected dense hard-wood laps to give the cue-stick the maximum stiffness, and also produce exterior and all around, in the cue-sticks a dense-wood substance of like hardness and similar texture and uniformity of color, substantially as described.

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Witnesses:

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