(No Model.) 2 Sheets—Sheet 1.

W. HILLMAN.

TENNIS BAT.

No. 346,751. Patented Aug. 3, 1886.

Fig: 1.

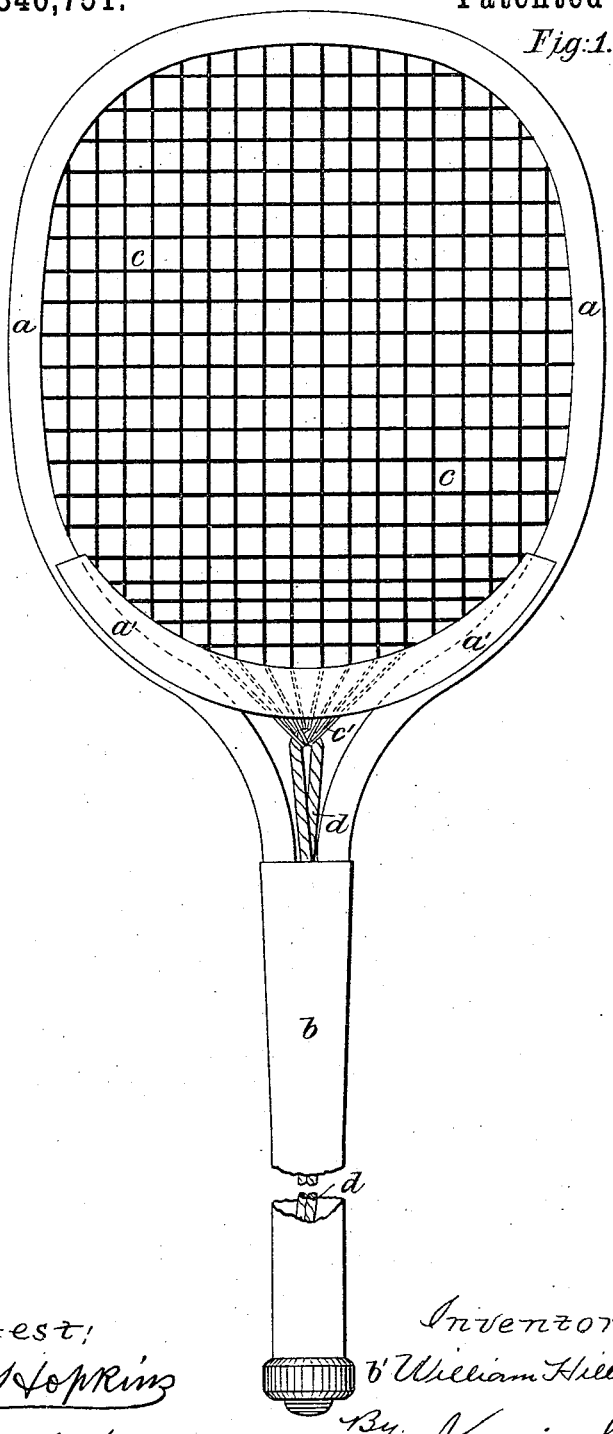
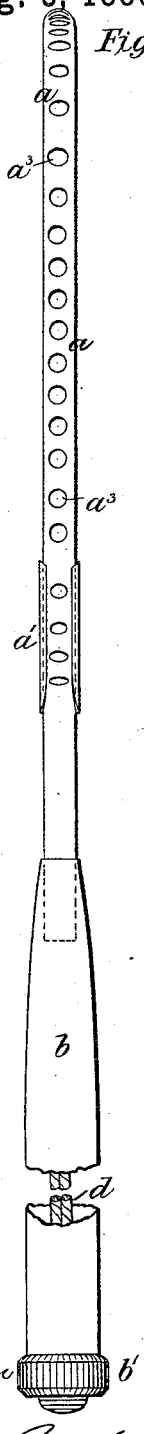


Fig: 2.



Attest:
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b' William Hillman b'
By Knight Bros
Atty's.

(No Model.) 2 Sheets—Sheet 2.

W. HILLMAN.

TENNIS BAT.

No. 346,751. Patented Aug. 3, 1886.

Fig: 3.

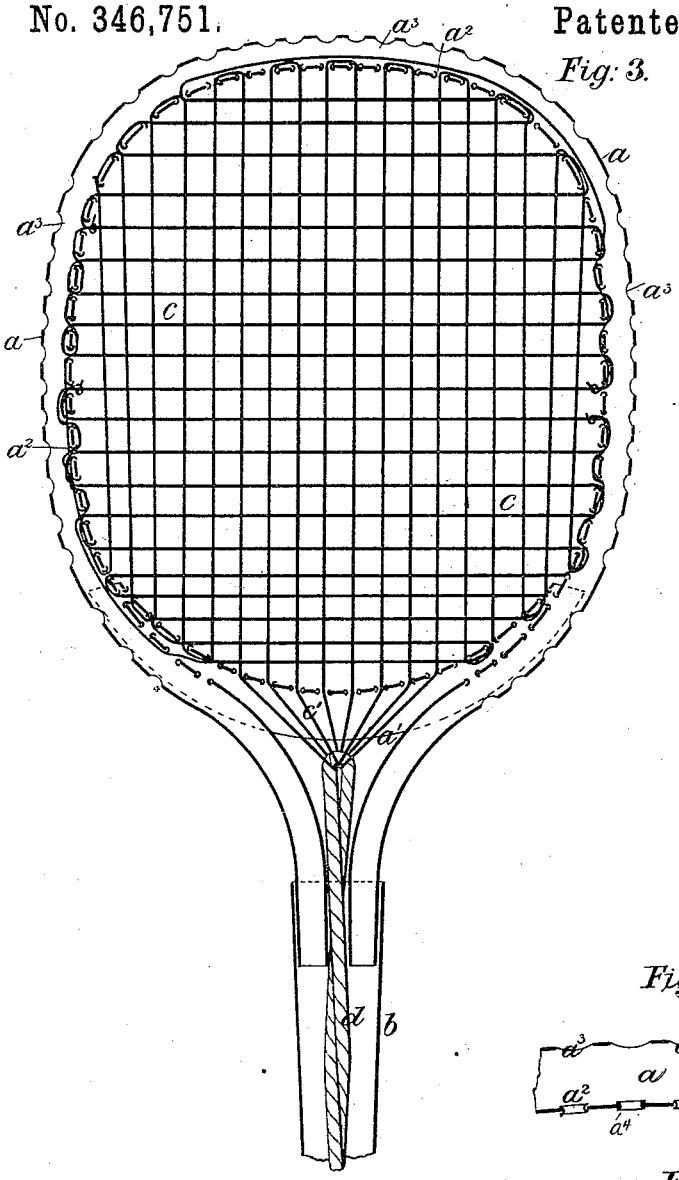


Fig: 4.

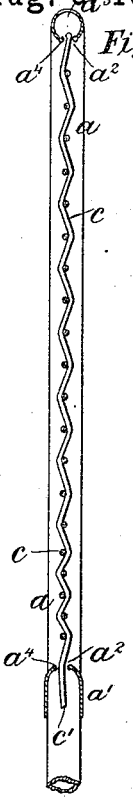


Fig: 5.

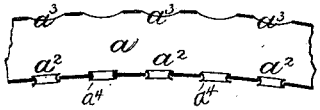
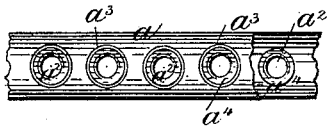


Fig: 6.



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UNITED STATES PATENT OFFICE.

WILLIAM HILLMAN, OF COVENTRY, COUNTY OF WARWICK, ENGLAND, ASSIGNOR TO HILLMAN, HERBERT & COOPER, (LIMITED,) OF SAME PLACE.

TENNIS-BAT.

SPECIFICATION forming part of Letters Patent No. 346,751, dated August 3, 1886.

Application filed April 12, 1886. Serial No. 198,615. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HILLMAN, a subject of the Queen of Great Britain, residing at the Premier Works, Coventry, in the county of Warwick, England, velocipede-manufacturer, have invented certain new and useful Improvements in Tennis or Racket Bats, of which the following is a specification.

This invention relates to improvements in lawn-tennis or racket bats, and has for its chief object the construction of a tennis or racket bat which, while being light in weight and not liable to warp or break, has the additional advantage of a simple adjustable tension for the threads or guts.

I construct the frame of weldless-steel or other metal tube, and in the holes thereof through which the threads or guts pass I fit metal eyelets to prevent the said threads or guts being cut or worn in the process of threading or regulating the tension. All or part of the longitudinal threads or guts I arrange to pass through a bridge-piece at the handle end of the frame, where they are connected to a strong loop of gut or other suitable material, and the latter, passing axially through the handle of the bat, is connected to a knob of wood or other material in the end thereof, so arranged that the loop of gut or other material may be twisted, and thereby contracted in respect to its length, by which means the tension of the threads or guts in the frame of the bat may be regulated. The tension-regulator is also applicable to wooden-framed bats.

In order that my said invention may be more clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawings, more fully to describe the same.

In the drawings, Figure 1 is a face view, Fig. 2 is an edge view, and Fig. 3 is a longitudinal section flatwise, of a tennis or racket bat with my improvements applied thereto. Fig. 4 is a longitudinal cross-section of the same with the handle removed. The above-mentioned figures are drawn to half the real size of the bat. Fig. 5 is a longitudinal section, and Fig. 6 is an outside top view, of a portion of the frame drawn full size.

a is the outer rim or frame of the bat, which I form, as has before been proposed, of steel or other metal tube; but I prefer to employ weldless-steel tube for such purpose.

a' is a bridge-piece which is employed to complete the frame of the bat at or near its junction with the handle *b*. This bridge-piece *a'* is brazed or otherwise rigidly fixed to the outer rim or frame, *a*.

Around the inner face of the outer rim or frame, *a*, and of the bridge-piece *a'* holes a^2 are formed, through which the threads or guts *c* are passed, and around the outer face of the outer rim or frame, *a*, holes a^3 are formed, which, while facilitating the threading of the guts or threads *c* through the holes a^2, also assist in lightening the bat. I also, in order to prevent the cutting or chafing of the guts or threads *c* against the edges of the holes a^2, fix in such holes metal eyelets a^4, and thereby form a rounded edge thereto.

All or nearly all of the longitudinal threads or guts *c* at the handle end of the frame *a* are arranged to pass through the bridge-piece *a'*, and according to my invention I extend a number of such threads or guts *c* beyond the bridge-piece *a'* in the form of loops *c'*, connecting the said threads or guts *c* together in pairs. Through these loops *c'* I pass a loop of strong gut or other suitable material, *d*, which latter is passed axially through the handle *b* of the bat, at the lower end of which it is connected to a knob, *b'*, of wood or other material, which is capable of rotation in the end of the handle *b*, so that the loop, *d*, of gut or other material may be twisted or untwisted, and thereby either contracted or extended in respect to its length, by which means the tension of the threads or guts *c* in the frame may be regulated as required.

The above-described means of regulating the tension of the threads or guts *c* are equally applicable to wooden-framed bats, in which latter case the handle would be formed hollow to permit of the passage therethrough of the double thread or gut *d*.

I would here remark that I make no claim to the use of a metal frame, nor of eyelets to prevent the chafing or cutting of the guts or threads passing through the holes a^2.

I am aware that it is not new in tennis bats or rackets to employ a rod passing longitudinally through the handle of the bat, and which

is screw-threaded for the reception of a nut and a key for turning said nut, the rod being attached to a bridge-piece, to which some of the longitudinal strands of the net are secured, and whereby they may be tightened; but,

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a tennis bat or racket, the combination, with the frame and handle, of the net having gathered loops, a thread of gut or analogous material passed through the loops, and a device for securing the thread to the handle, forming the means for applying a tensile strain to said thread, substantially as and for the purpose set forth.

2. In a tennis bat or racket, the combination, with the frame and handle, of the net having gathered loops, a thread of gut or analogous material passed through the loops and extending axially through the handle, and a knob on the end of the handle, to which said thread is secured, substantially as and for the purpose set forth.

3. In a tennis bat or racket, the combination, with the frame and handle, of the net having longitudinal and transverse strands, a bridge having perforations through which the longitudinal strands are passed, forming loops which are gathered together, a thread of gut or analogous material passed through the loops, and a device for securing the thread to the handle, forming the means for applying a tensile strain to said thread, substantially as and for the purpose set forth.

WILLIAM HILLMAN.

Witnesses:
G. PEARSALL LOCKER,
FREDERICK BAXTER,
Both of 47 New Street, Birmingham.