

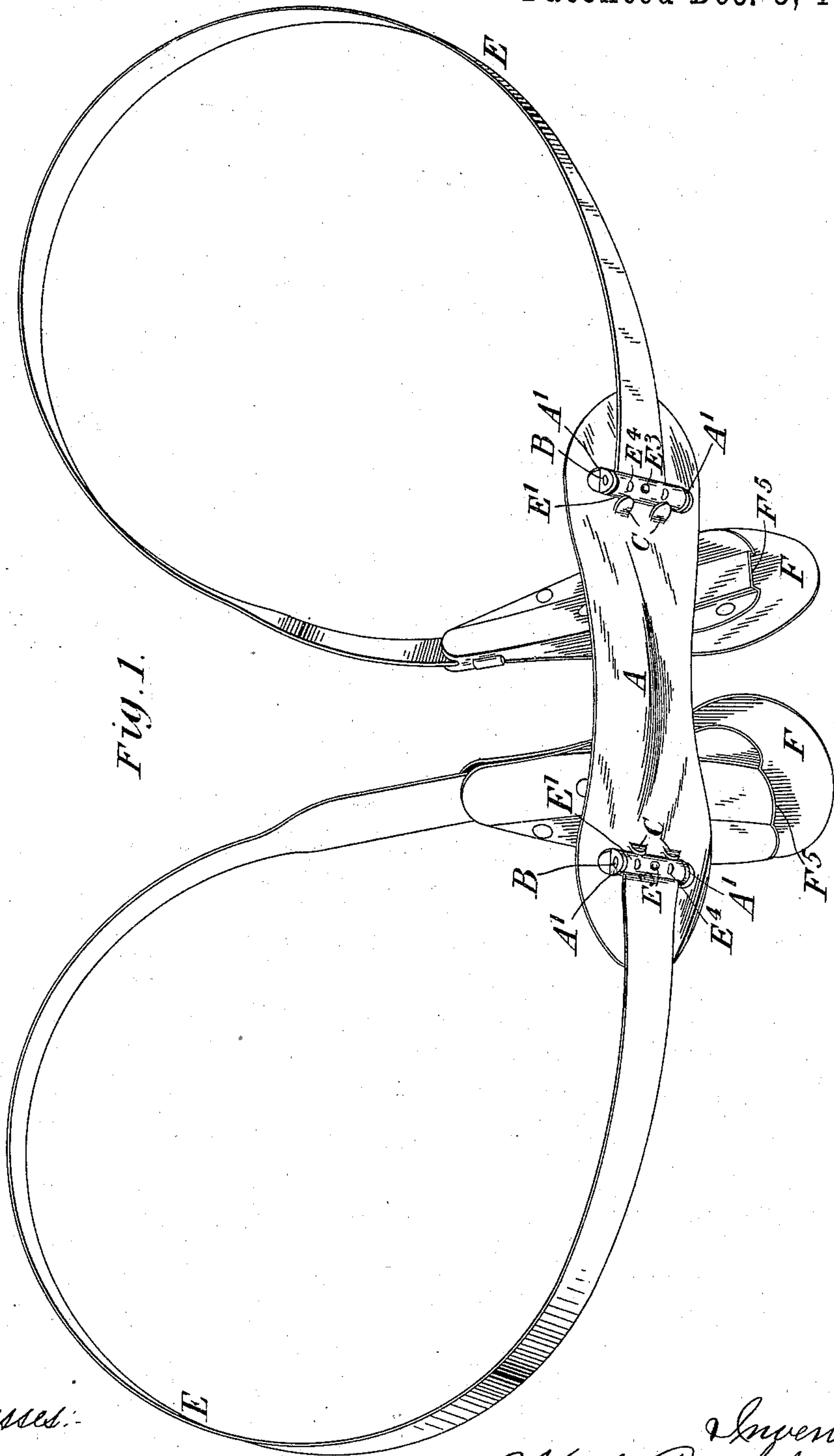
(No Model.)

3 Sheets—Sheet 1.

K. R. SCHRAMM.  
TRUSS.

No. 550,647.

Patented Dec. 3, 1895.



Witnesses:  
H. N. Boulter  
B. H. H. H.

Inventor  
Karl R. Schramm  
By H. N. Boulter  
attorney

(No Model.)

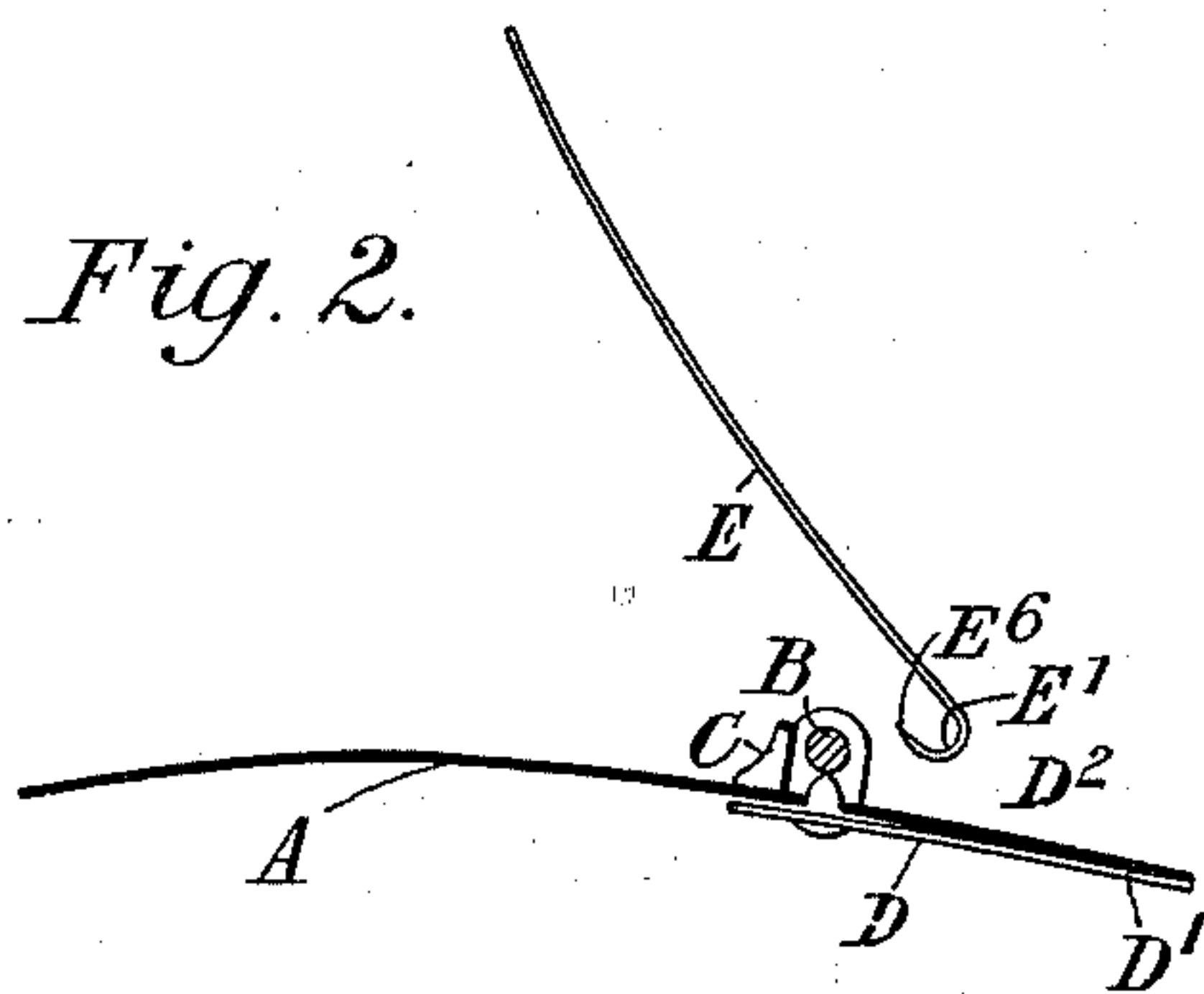
3 Sheets—Sheet 2.

K. R. SCHRAMM.  
TRUSS.

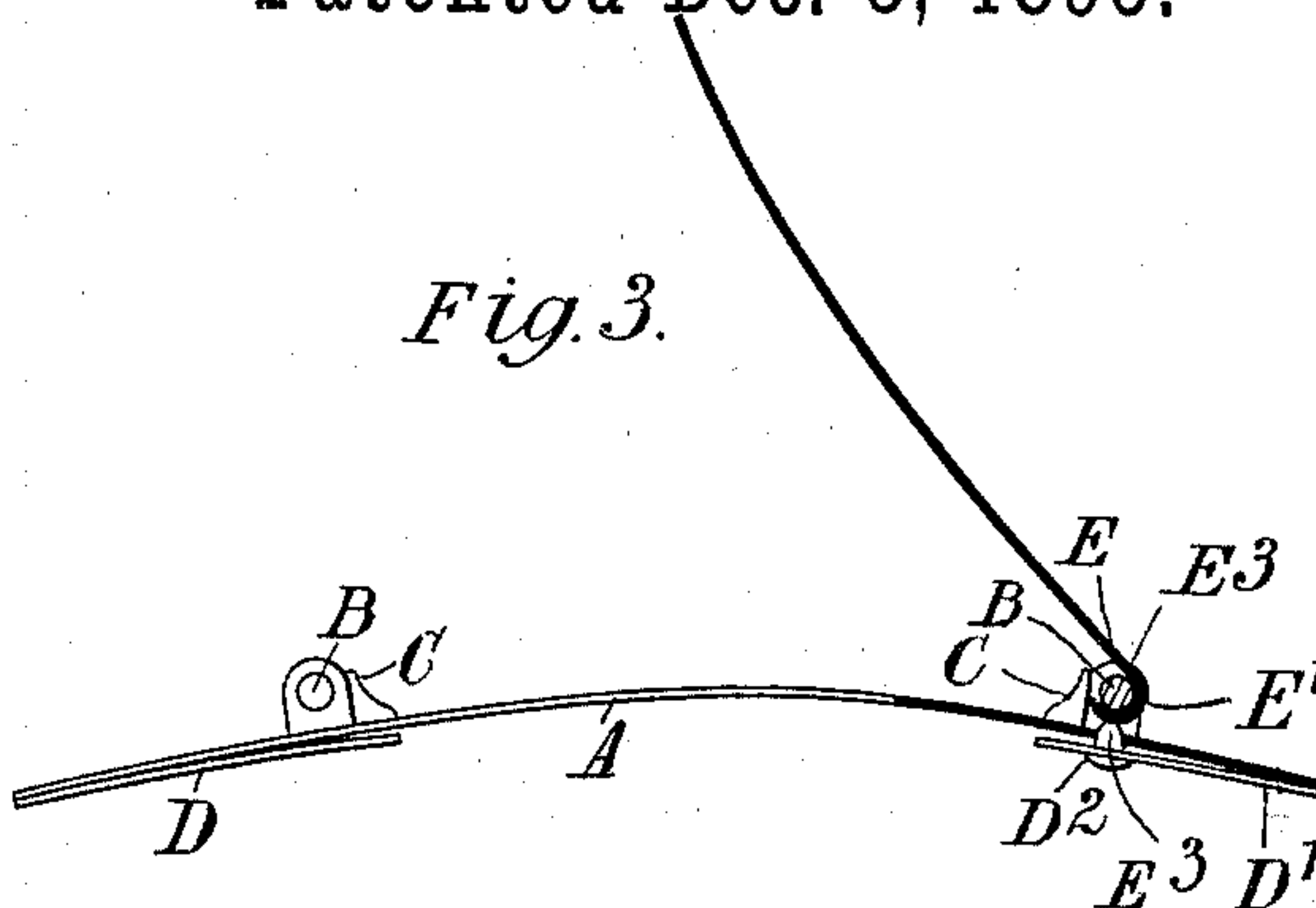
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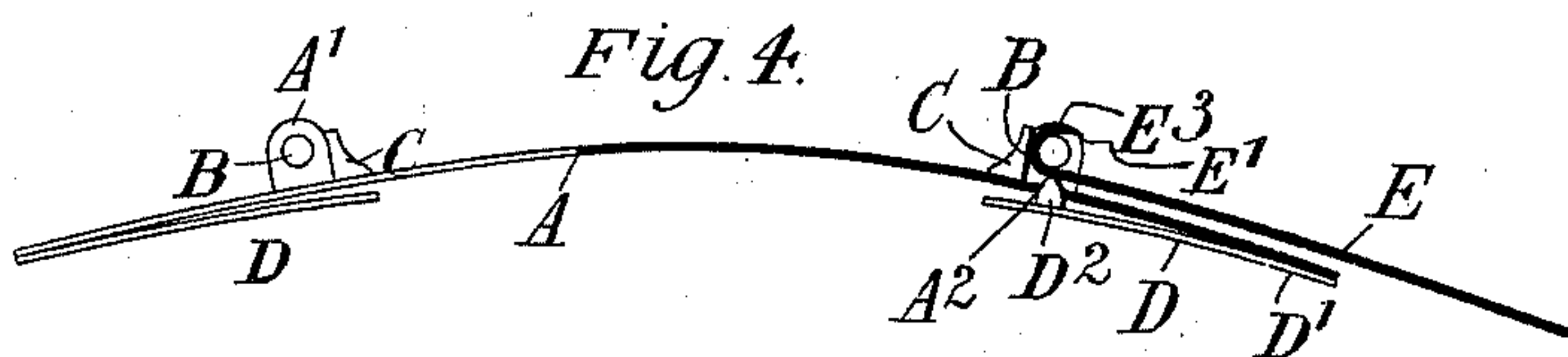
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Fig. 5*

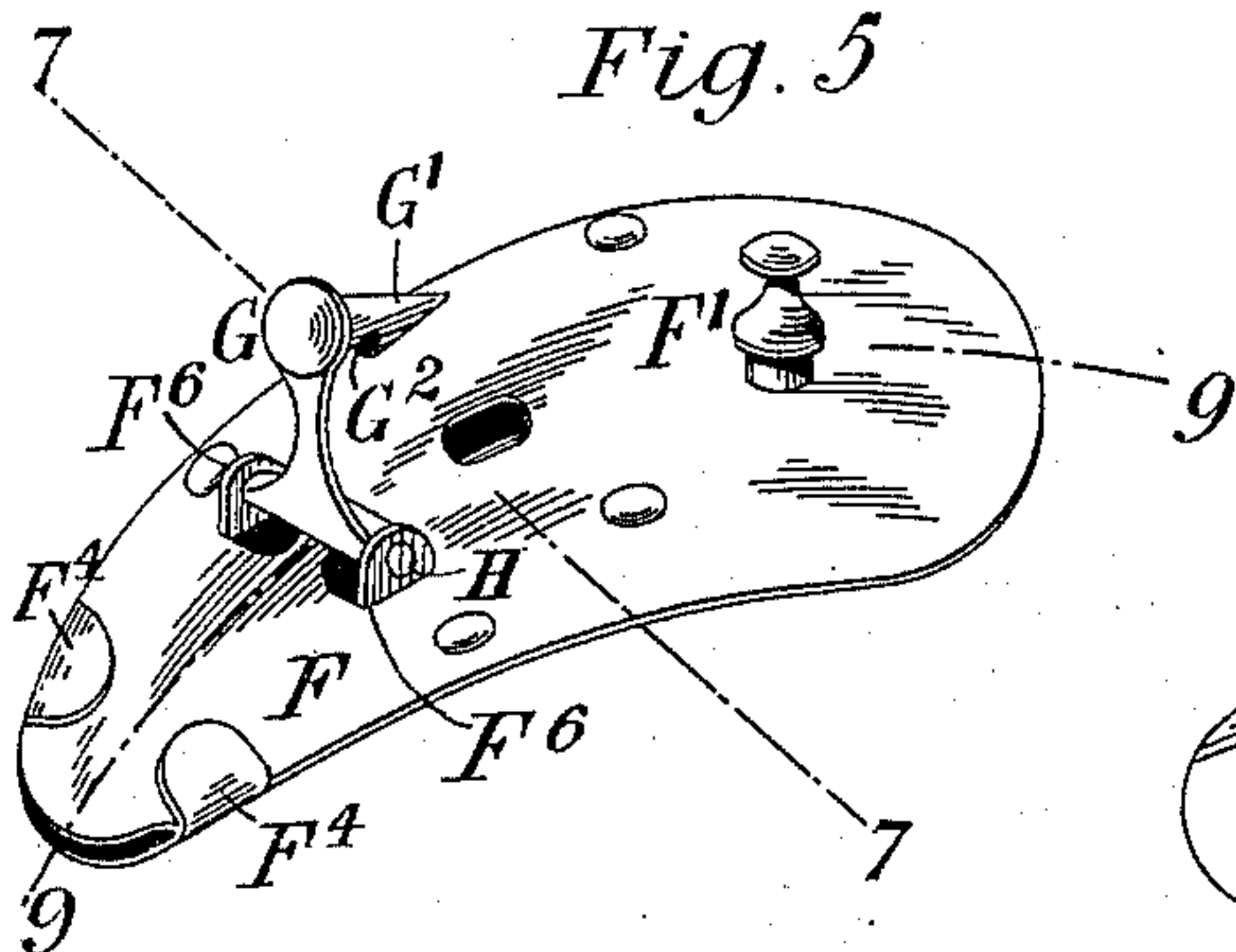


Fig. 6

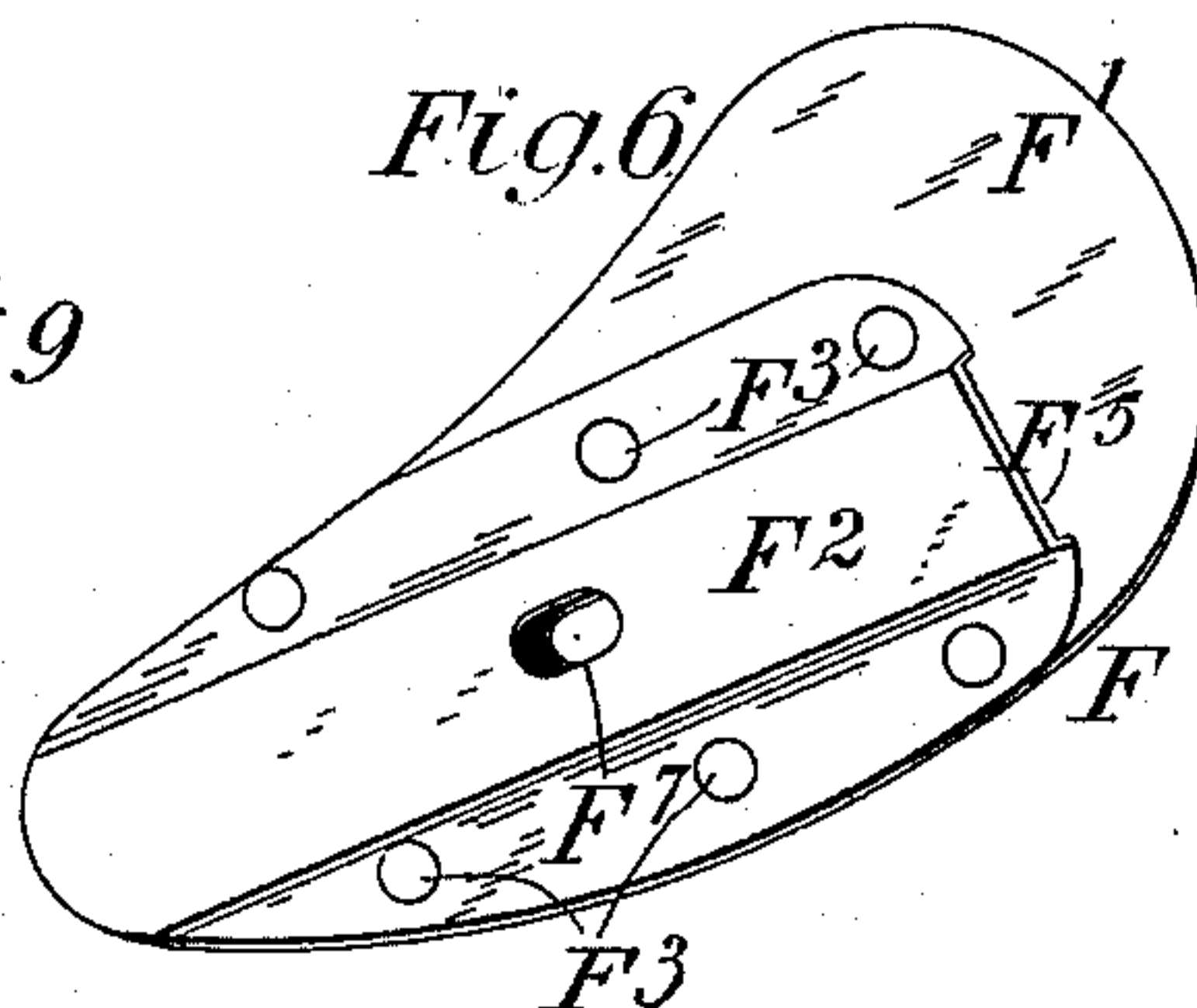
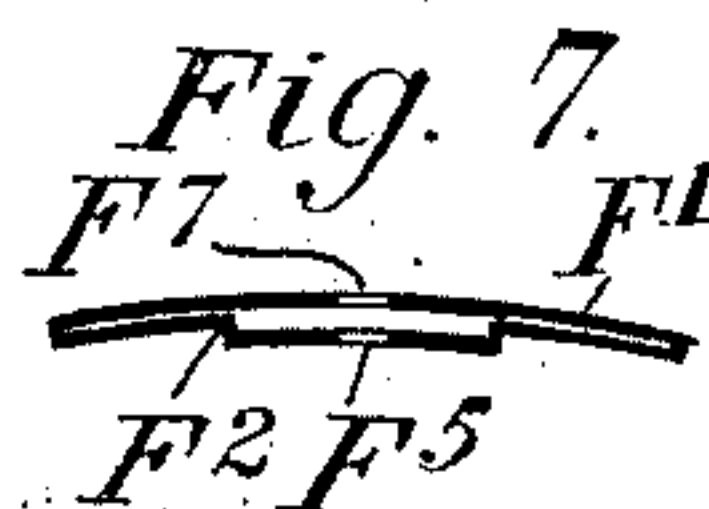
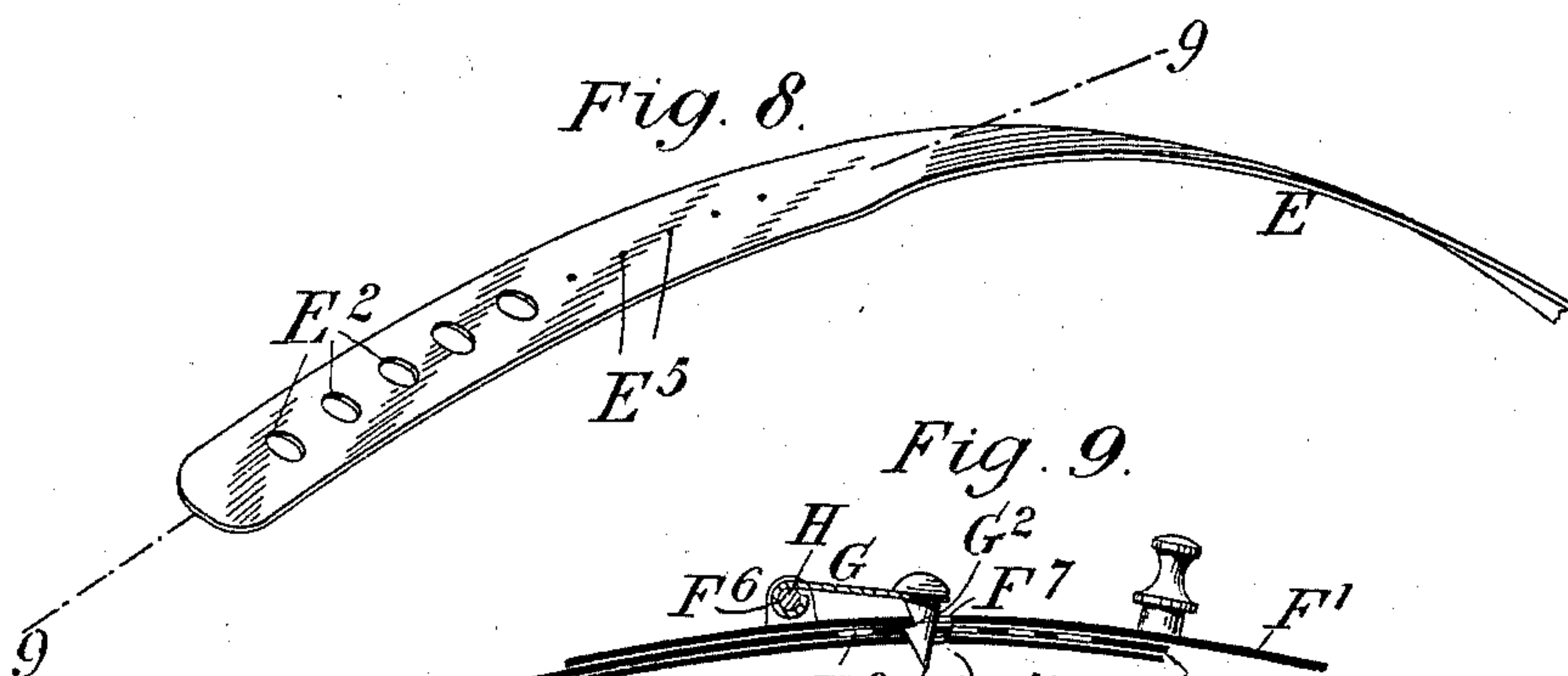


Fig. 7.

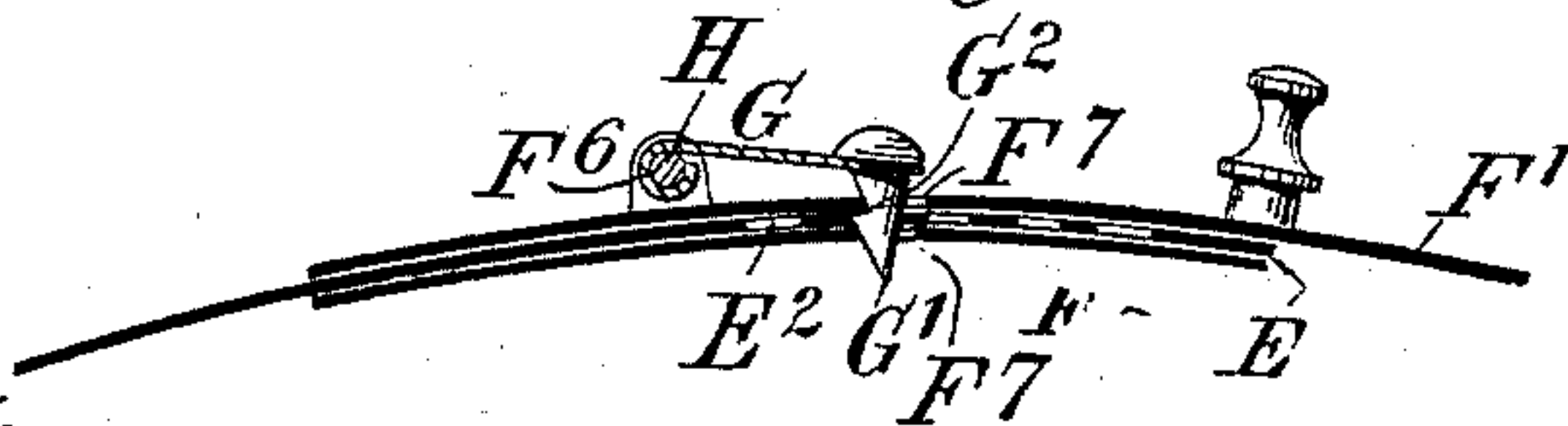
F1 F2 F5 F7



*Fig. 8.*



*Fig. 9.*



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(No Model.)

8 Sheets—Sheet 3.

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TRUSS.

No. 550,647.

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Fig 10.

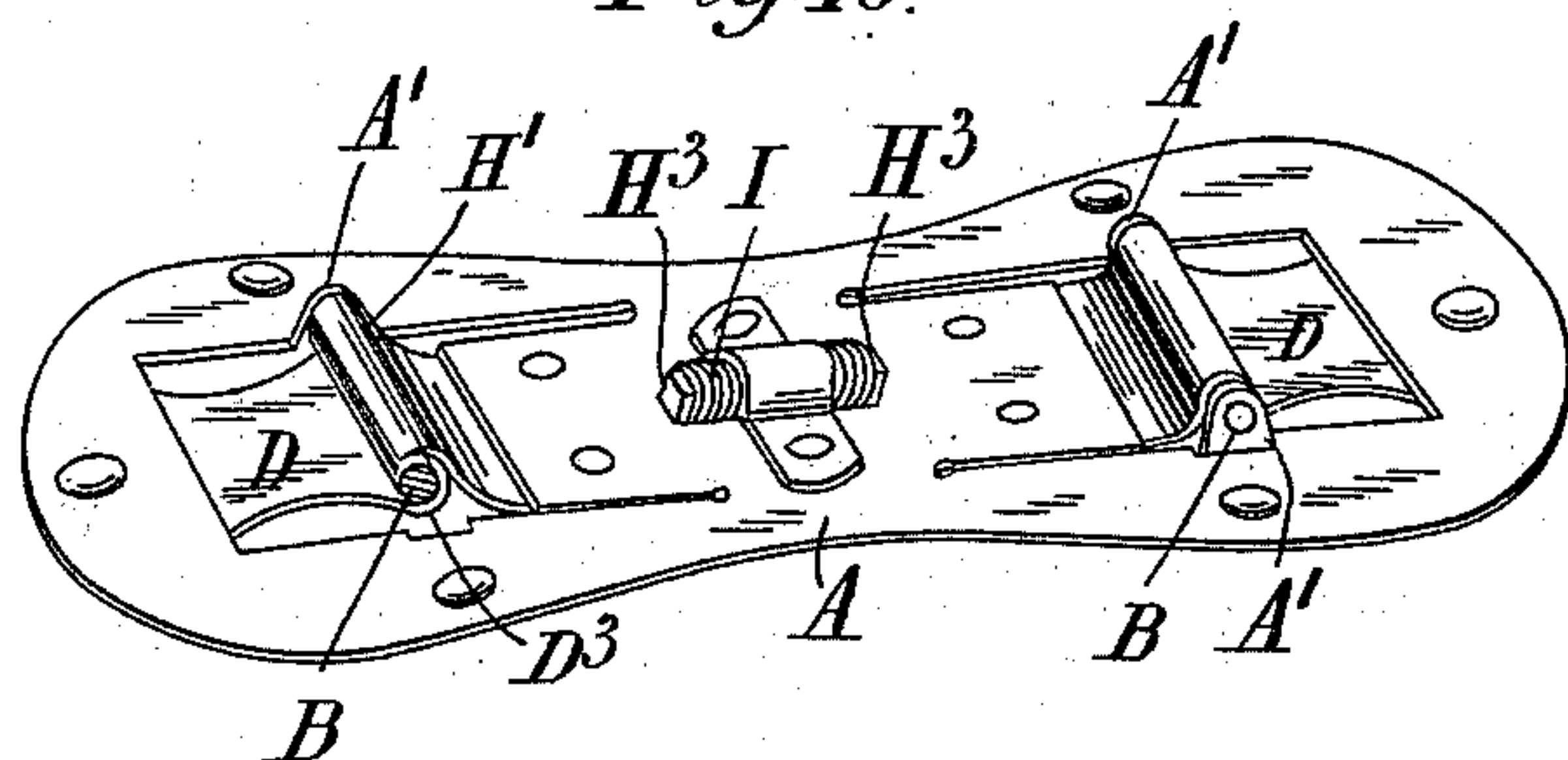
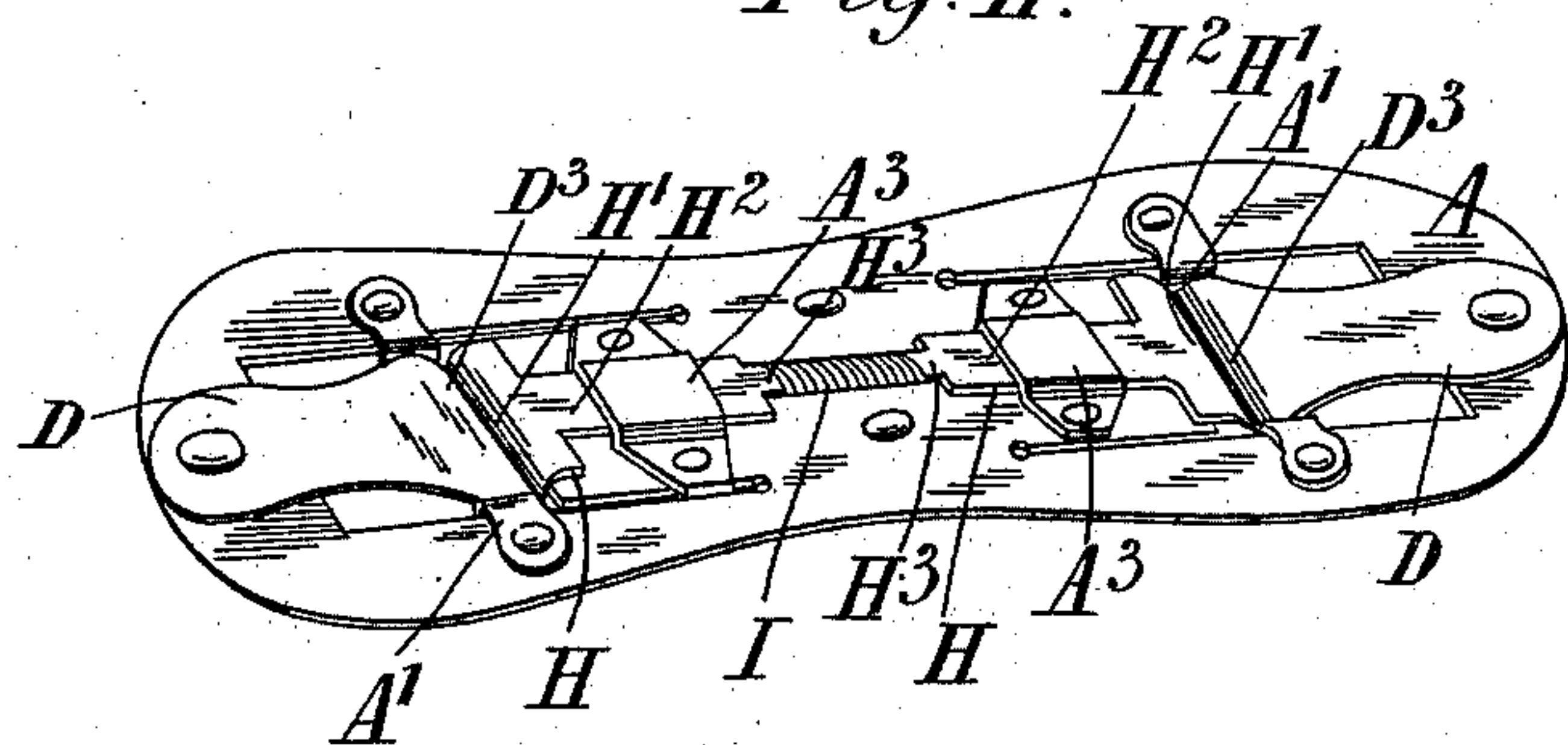


Fig. 11.



Witnesses:-

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attorney



# UNITED STATES PATENT OFFICE.

KARL ROBERT SCHRAMM, OF LONDON, ENGLAND.

## TRUSS.

SPECIFICATION forming part of Letters Patent No. 550,647, dated December 3, 1895.

Application filed July 22, 1895. Serial No. 556,782. (No model.)

*To all whom it may concern:*

Be it known that I, KARL ROBERT SCHRAMM, a subject of the Queen of England, residing at London, England, have invented certain new and useful Improvements in or Relating to Fastening Devices for Trusses and other Surgical Appliances, of which the following is a specification.

This invention relates to the devices for fastening together the springs and pads of trusses and the pads or other parts of other surgical appliances. I will describe it as applied to connecting the springs and pads of hernia-trusses.

In the accompanying drawings, which illustrate, by way of example, the application of my invention to a hernia-truss, Figure 1 is a perspective view of the complete truss. Fig. 2 is a view presented edgewise of the back or spinal pad-plate and of the hooked end of one of the two spring-arms which are to be connected therewith, as hereinafter explained. Parts of this view are in section. Fig. 3 is a view similar to Fig. 2, except that the spring-arm is shown in engagement with the back pad-plate, while Fig. 4, also a view similar to Fig. 2, shows the spring-arm, the back pad-plate, and appurtenances in the position they are intended to occupy relatively to each other when the truss is in use. Figs. 5 and 6 are respectively perspective, plan, and under-side views of the pad-piece, which is adjustable on the spring-arm of the truss. Fig. 7 is a section on the line 7 7 of Fig. 5. Fig. 8 is a perspective view of that end of the spring-arm on which the pad-piece, Figs. 5 and 6, is adjustable. Fig. 9 is a section on the line 9 9 of Figs. 5 and 8 and shows the pad-piece and spring-arm engaged with each other; and Figs. 10 and 11 are perspective, plan, and under-side views, respectively, of an alternative construction of back pad-plate according to this invention.

Like letters indicate like parts throughout the drawings.

With reference, first, to Figs. 1 to 9, A is the back pad-plate, to which a suitable soft pad can be secured in a manner well understood. At each end two lugs A' are struck up out of the solid plate, as shown. B is a hinge-pin extending between the individual lugs of each pair, as shown, and having its

ends riveted over to retain it in position. In proximity to each hinge-pin are two studs C, with their lower ends fixed in the pad-plate A and their upper ends beveled off, as shown, on the side which faces away from the adjacent hinge-pin. The clearance or least distance between each stud and the hinge-pin is approximately equal to or very little greater than the thickness of metal of the hook-shaped end of the spring-arm hereinafter described.

D are spring-plates, one of which is situated below each hinge-pin at the opposite side of the pad-plate A thereto. Each spring-plate D is rigidly secured by one end D' to the pad-plate A and provided at its outer end with a pin D<sup>2</sup>, which projects through a hole A<sup>2</sup> in the plate A.

E are the spring-arms of the truss. Each of them is an elastic strip of metal, which at one end is bent to form a hook E' and at the other end has a series of perforations E<sup>2</sup>.

E<sup>3</sup> E<sup>4</sup> are depressions in the exterior or convex surfaces of the hooks E', the former to receive the pins D<sup>2</sup> and the latter to receive the studs C, as hereinafter described.

E<sup>5</sup> are marks made upon the spring-arms to serve when brought to the edge of the pad-plates to indicate which of the perforations E<sup>2</sup> is under the detent of the pad-piece.

F F are the pad-pieces, which are adjustable on the perforated ends of the spring-arms E, and like the back pad-plate may have soft facings, as is customary. Each pad-piece F consists of two plates F' F<sup>2</sup>, of sheet metal, one of which, F<sup>2</sup>, is of channel form in cross-section, as shown, and is secured to the other, F', by rivets F<sup>3</sup> and by bending over tongues F<sup>4</sup>, which are integral with the plate F<sup>2</sup>. By the arrangement of the channeled plate F<sup>2</sup>, as shown, relatively to the plate F' a channel F<sup>5</sup> is constituted, in which one of the spring-arms E is received.

G is a detent pivoted upon the plate F' of each pad-piece F by a hinge-pin H, the latter being held in place by lugs F<sup>6</sup>, struck up like those A' on the back pad-plate A. Holes F<sup>7</sup> are made opposite each other in the plates F' F<sup>2</sup>, and a tongue G' is arranged on the detent, so that it can pass through both these holes to lie across the channel F<sup>5</sup>. The tongue is notched, as at G<sup>2</sup>, and the detent G and holes F<sup>7</sup> are so arranged relatively to each other



that the tongue G' presses laterally, in passing, against the edge of the hole F<sup>7</sup> in the plate F', and therefore has to be forced there-through. Consequently when forced far enough it springs to an extent sufficient to engage it at its notched part with the under side of that plate and cannot be accidentally freed therefrom. To free the pad-plate from the arm, all that is necessary is the application of sufficient force to the pad-piece to cause the plate F<sup>2</sup> to thrust back and raise the pointed end of the detent. Hitherto where fittings of this nature have been employed the attachments to the plate F' merely rested upon it and were secured by screws; but it was found that they were apt to work loose, and were besides usually cast in gun-metal and were therefore heavy and to some extent clumsy, whereas the present fittings can all be made of thin stampings, light, elegant, and secure.

To connect each spring-arm E with the back pad-plate A, the end E<sup>6</sup> of the hook E' is insinuated between one of the hinge-pins B and the pin D<sup>2</sup> below it, first depressing the latter and its spring D so that the pin D<sup>2</sup> engages with one of the depressions E<sup>8</sup>, as shown in Fig. 3. Next it is turned about the hinge-pin B into the position in which it is shown in Fig. 4. In assuming this latter position the end E<sup>6</sup> of the hook is deflected inward by being forced along the studs C, which slightly yield simultaneously and are received in the depressions E<sup>4</sup>, which are provided in order that the studs may not offer too much hindrance to this first part of the movement of the spring-arm. After passing these studs the hooked end restores itself elastically to its original form and therefore will not become disengaged from the hinge-pin B except by an operation the reverse of that just described. Further, by the time that the spring-arm has turned about its hinge-pin into the position in which it is shown in Fig. 4 the depressions E<sup>4</sup> have passed clear of the studs C, which consequently are sprung back a little from the hinge-pins and thus bear with increased force upon an undepressed part of the hook, so as to hold it securely in position.

To adjust a pad-plate F upon the perforated end of one of the spring-arms E, the latter is introduced into the channel F<sup>5</sup> and any desired one of its perforations E<sup>2</sup> is brought into line with the holes E<sup>7</sup> of the pad-plate E, whereupon the detent G is moved to cause its tongue G' to pass through the perforation E<sup>2</sup> and holes E<sup>7</sup> and lie across the pad-piece F and channel F<sup>5</sup> to retain the pad-piece in position and to lock itself in the manner hereinbefore described.

With reference now to the alternative construction of back-plate illustrated in Figs. 10 and 11 the hinge-pins B are carried by lugs A', riveted to the base-plate A, and the spring-plates D have tongues D<sup>3</sup> thereon, which partly encircle each hinge-pin B at one side, the opposite side thereof being partly encir-

led to a greater extent by the hooked part H' of a strip H. There are two of these strips, one for each hinge-pin, and the straight part H<sup>2</sup> of each is received in a guide A<sup>3</sup>, secured to the base-plate.

I is the spring, which is compressed between projections H<sup>3</sup> of the two strips H and acts to keep the hooked parts H' thereof close to the hinge-pins B, while permitting those parts to be moved away from the hinge-pins when the hooked end E' of a spring-arm E (such as is shown in Fig. 2) is engaged with the hinge-pin. Such engagement is effected by forcing the hooked end of the spring-arm over the spring-plate D and causing the edge of the hook to pass between the hinge-pin and the hooked part H' of the strip H. The spring-plate D will then bear against the hook in such manner as to keep it steady in any position into which it is moved about the pin B.

As regards trusses, all the pads have not hitherto been made detachable from the springs; but a very great advantage results from this arrangement, inasmuch as the shape, size, and resistance of the pad can be promptly varied, and also a stronger or weaker spring or one of a different shape or size can be applied at any time, or a truss can be immediately prepared from the various parts to meet any special requirements, and the whole truss is by the construction above described lighter than those usually made and no screws of any kind are employed.

Hitherto the cross-strap usually employed for connecting the two front pads across the front of the wearer has been a simple strap and was therefore liable to press upon the wearer between the pads. To avoid this I place in or upon the strap (preferably the strap is double and stitched together around the edges) a spring or strip of metal shaped or bowed outward, so as to relieve this pressure and prevent the strap from taking a perfectly straight course from pad to pad. The strap is provided with a number of holes at each end, so as to adjust it to length, or other length adjustment may be adopted.

I claim—

1. In a hernia truss or the like, the combination with the main pad-piece, of a hinge, lugs to support the hinge, plates one of which is rigidly secured at one end to the back pad-piece, the other being movable, each being provided at its free end with a projection, a guide and control spring for the movable plate, a spring arm with one end in operative connection with the said hinge and the other end perforated, a channeled pad-piece of sheet metal, and a notched detent hinged thereon, substantially as set forth.

2. In a hernia truss or the like, the combination with the back pad-piece, of lugs struck up thereon, a hinge-pin carried by the lugs, other projections on the back-piece in proximity to the hinge-pin, a spring plate rigidly secured at one end to the back-piece and pro-



vided at the other end with a projection, a spring arm with one end hook-shaped and the other end perforated, the hook being indented on its convex surface, a pad-piece with channeled strip fixed thereto, and notched detents hinged thereon, substantially as set forth.

3. In a hernia truss or the like, the combination with a spring arm having one end hooked and indented on the convexity of the hook the other end being perforated, of a channeled pad-piece of sheet metal having a notched hinged detent, substantially as set forth.

15 4. In a hernia truss or the like, a pad plate consisting of two plates or sections one of which is of channel form in cross section and secured to the other the two forming a space

or channel between them, in combination with a notched detent pivoted at one end to the plate, a tongue on the other end of the detent, said sections of the pad-plate having aligned openings through which said tongue is adapted to pass, and a spring arm adapted to be inserted within the channel between the sections of the pad-plate and having a series of perforations adapted to be engaged by the tongue in the manner specified.

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

KARL ROBERT SCHRAMM.

Witnesses:

HARRY B. BRIDGES,  
FRANK W. JARVIS.