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Patented June 24, 1902.

G. H. STEWART & A. L. WISEMAN.

HERNIAL TRUSS.

(Application filed Mar. 14, 1902.)

(No Model.)

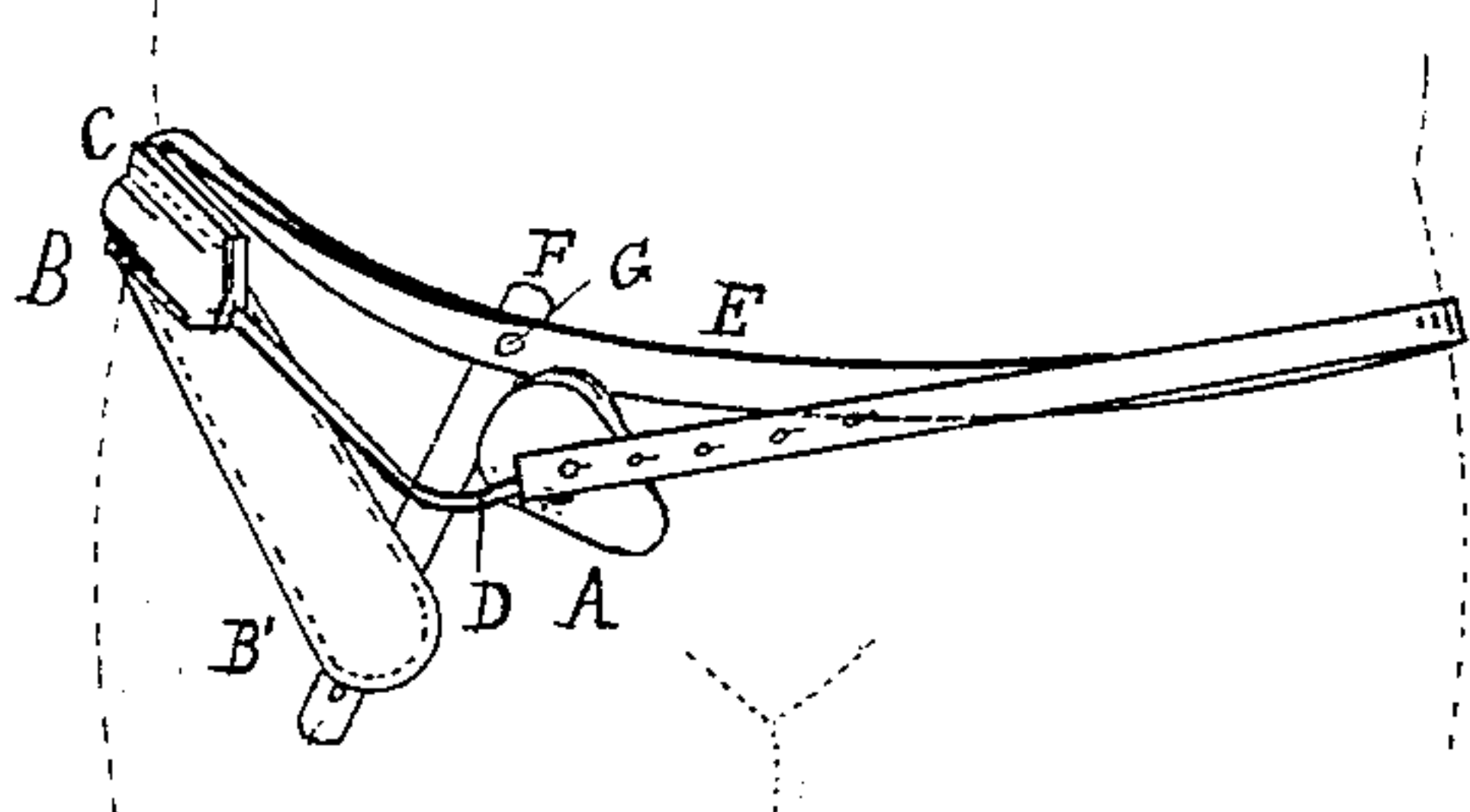


Fig. 1

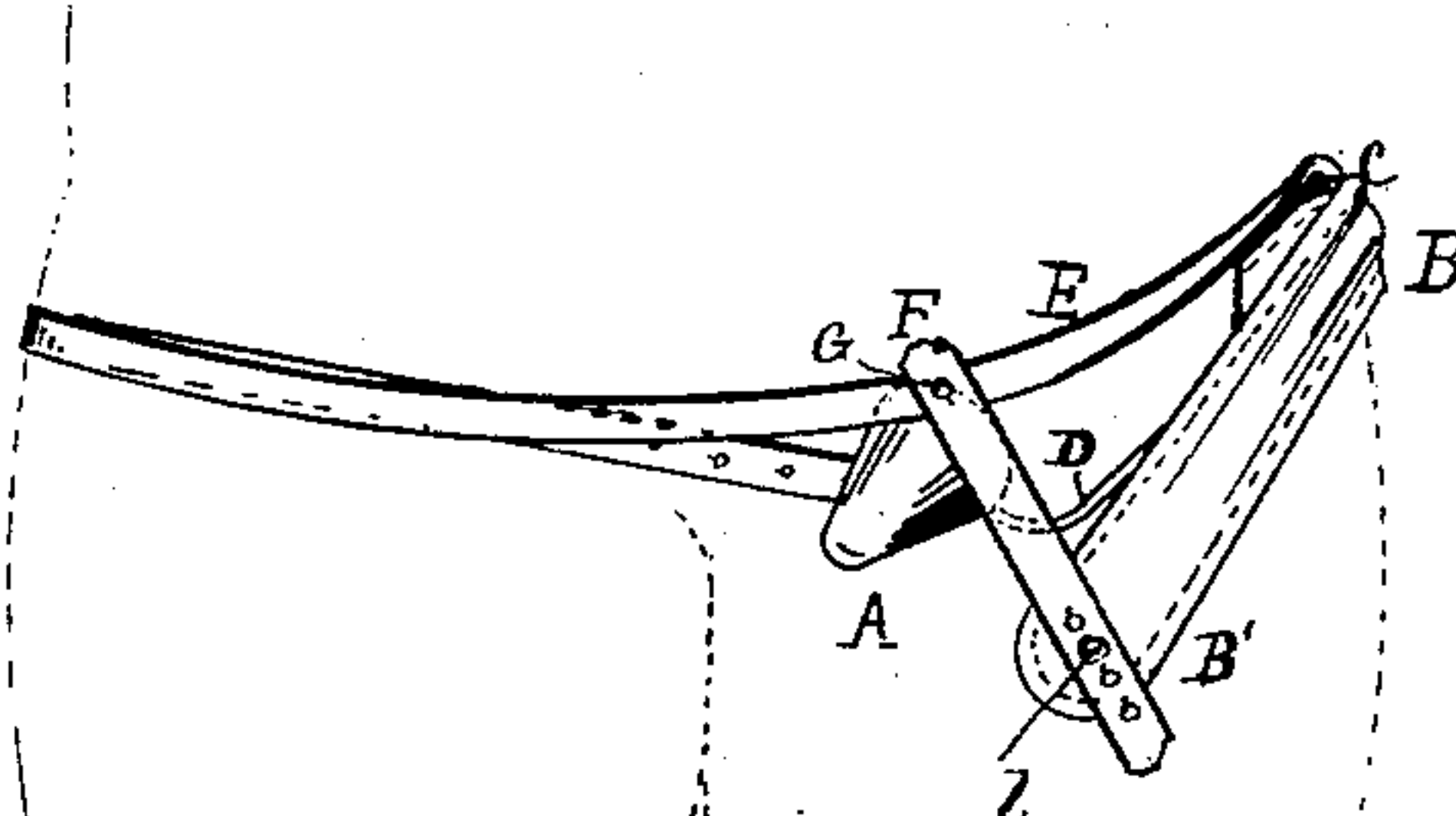


Fig. 2

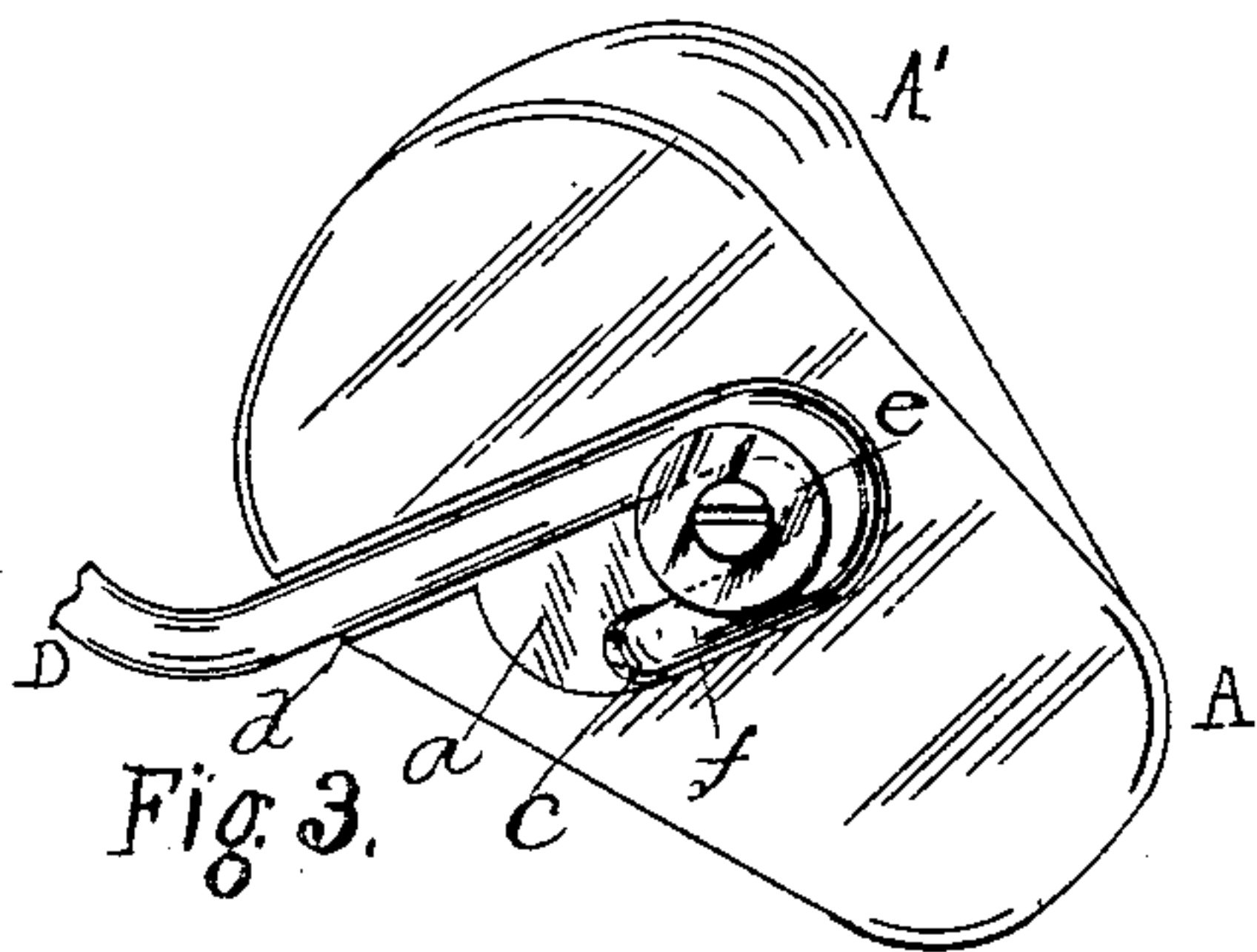


Fig. 3.

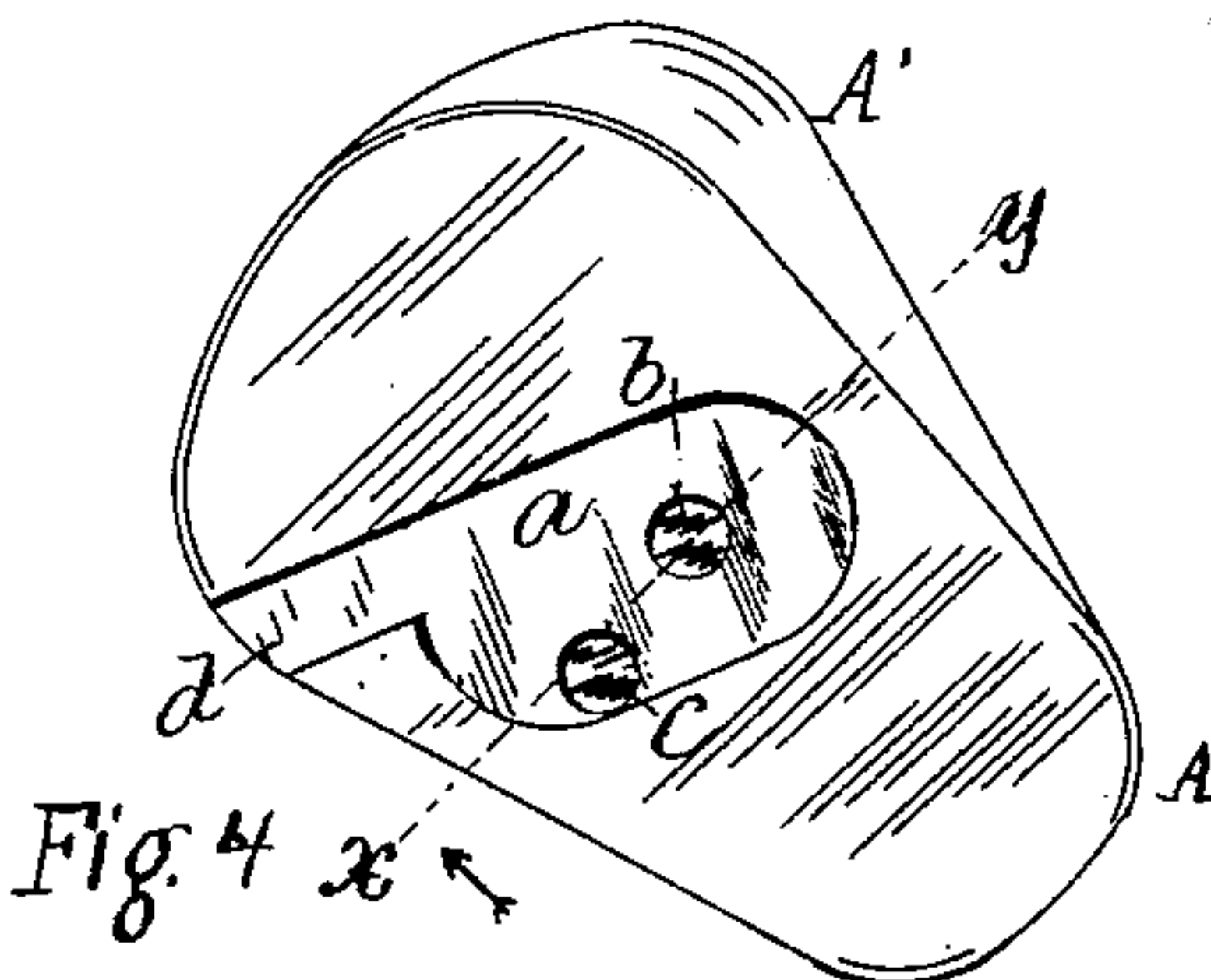


Fig. 4

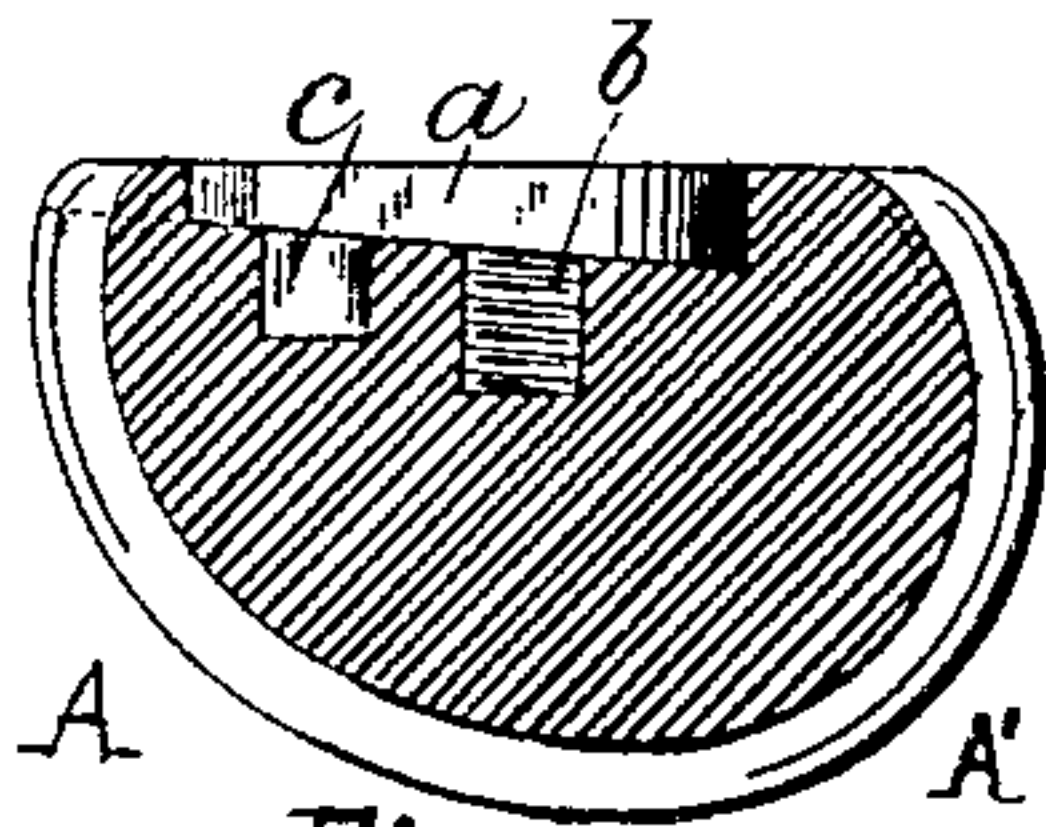


Fig. 5

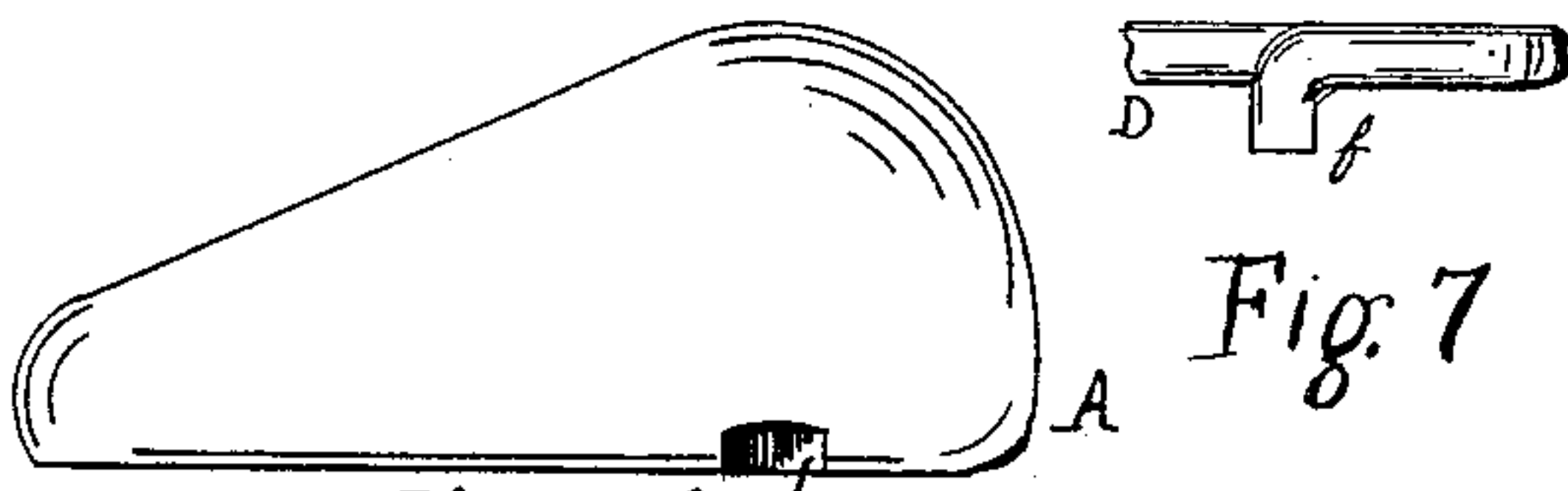


Fig. 6



Fig. 7



Fig. 8

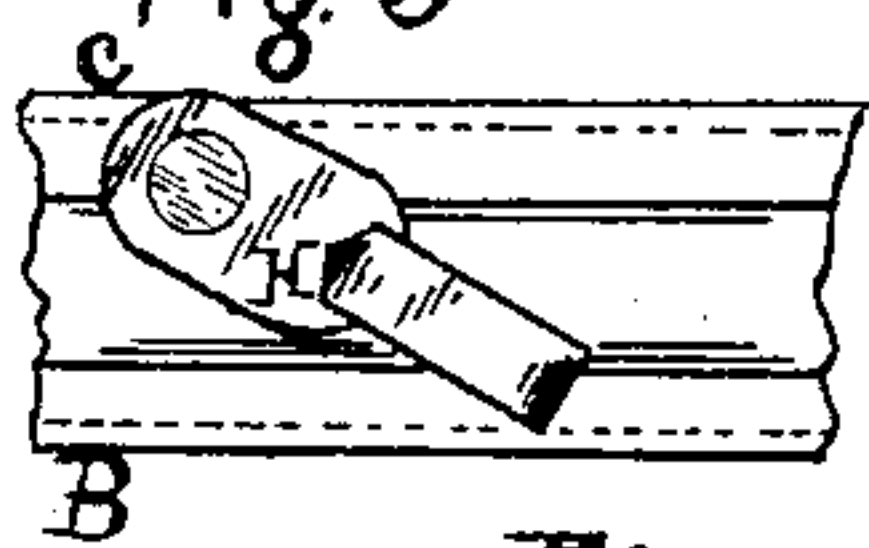


Fig. 9.

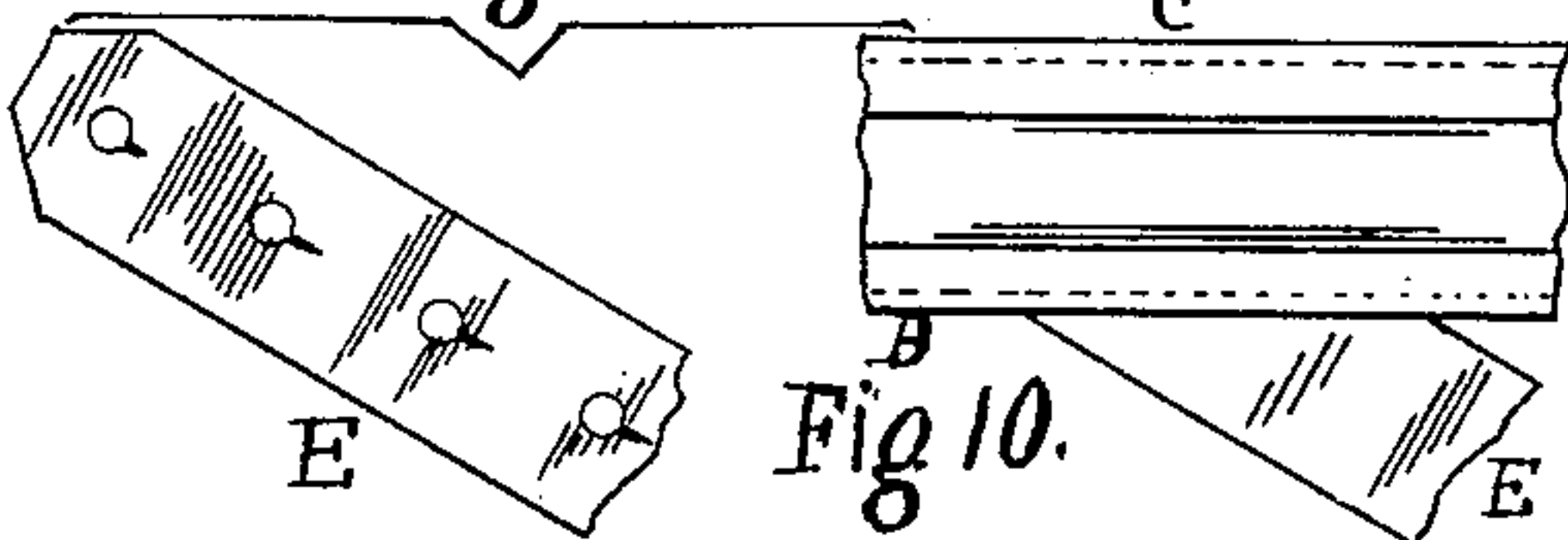


Fig. 10.



Fig. 11



Fig. 12.



Fig. 13.

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UNITED STATES PATENT OFFICE.

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HERNIAL TRUSS.

SPECIFICATION forming part of Letters Patent No. 703,095, dated June 24, 1902.

Application filed March 14, 1902. Serial No. 98,231. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. STEWART and ABRAHAM L. WISEMAN, citizens of the United States of America, residing at Topeka, 5 in the county of Shawnee and State of Kansas, have invented new and useful Improvements in Hernial Trusses, of which the following is a specification.

Our invention relates to hernial trusses, the 10 object being to produce a truss which is light, durable, effective, easy to wear, and simple in construction.

It relates particularly to the class of truss in which the pad is attached to a wire comprising an arch fitting over the hip and hav- 15 ing a body-strap to hold it in place, the strap being double or divided, one part connected to the arch at about its summit and the other at its rear end. As heretofore constructed these two straps have passed around the body 20 nearly parallel, but coming gradually together, joining at some point in the front of the body of the patient, both straps having a substantially horizontal or lateral pull. As 25 thus constructed the straps, or at least the upper one, passes around the small of the back, causing pressure thereon, which is injurious to the kidneys. On this account patients have frequently suffered from kidney trouble.

30 One of the objects of our truss is to bring all the straps below the small of the back, while at the same time securing the pad and arch more firmly in their positions and producing a truss which when once adjusted to 35 a particular patient may be readily replaced by him. We accomplish this by the devices more fully described hereinafter and shown in the drawings accompanying and forming a part of this specification, in which—

40 Figures 1 and 2 are respectively front and rear views of our truss applied to the patient. Fig. 3 is a view of the outer or flattened side of the pad, showing the method of attaching the arch-wire thereto. Fig. 4 is a similar 45 view of the pad, the arch-wire and stud being removed. Fig. 5 is a section of the pad through the line $x y$, Fig. 4. Fig. 6 is a side view of the pad. Fig. 7 is a side view of the U-bend of the arch-wire. Fig. 8 is a side view of the 50 stud-screw e . Fig. 9 is one method of attaching the main body-strap to the arch-wire at its summit, and Fig. 13 is a side view of the

hook and strap. Fig. 10 is a top view showing another method of said attachment by sewing. Fig. 11 is a view of the connection 55 of the strap F to the main body-strap by means of the stud or button G, which is shown in Fig. 12.

The pad A has the general form of a half-pear, the convex side being presented to the 60 body of the patient, the larger end uppermost and the axis of the pad resting at an approximate angle of forty-five degrees to a horizontal plane, it being understood, of course, that it lies over the inguinal canal 65 and may vary somewhat from that angle in different persons. In referring to the different parts of the pad, however, as "inner" side, "upper" end, &c., it will be understood that reference is made to the pad as occupy- 70 ing substantially this position. Our pad differs from others in two particulars—first, in having its outer upper corner cut away, giving the upper inner corner or end an abnormally-protruding effect, and, second, in hav- 75 ing the recess a , which has the hole c in its bottom, and the groove d to take in, respectively, the U-bend, the inwardly-bent extreme end f of the wire, and the wire beyond the U-bend, hereinafter more fully described. 80 The pad is made by turning it from the rough piece into a substantial pear shape, then cutting it in two longitudinally, making one portion slightly larger than the other portion, using the larger portion for the pad. The up- 85 per outer corner is then cut away, which gives the upper inner corner A' an abnormally-protruding effect, so that said upper inner corner forms a sort of "plug" for the hernia. The use of pads having the general shape of a half-pear 90 is not new with us; but the abnormally-protruding upper inner corner is new. It is the object of all good pads to close the internal ring and nearly or quite the entire inguinal canal. The accomplishment of this object, 95 of course, requires considerable nicety of adjustment. With the old forms of pad the large end of the pad has rested merely against the internal ring and the inguinal canal, while in our improved form the upper inner corner 100 forms a plug which forces the parts into the internal ring, thus more effectively forming a perfect closure for the hernia, while at the same time giving the desired pressure against

the entire or nearly the entire inguinal canal, and the cutting away of the upper outer corner of the pad serves to prevent the pad from slipping upward and away from the hernia, as also to prevent the wearer from being pinched or chafed, a feature especially desirable to persons having prominent abdomens.

The end of the arch-wire D, which is attached to the pad, has a U-bend, its extreme end *f* being bent inwardly into the pad. The inwardly-bent extreme end *f* of the arch-wire constitutes a novel and important feature of our means for attaching the wire to the pad. It serves at least two purposes. It gives rigidity to the attachment and prevents the otherwise exposed end of the wire from being caught in the clothing. The wire is held firmly in said recess *a* by a retaining-plate, which is formed by the lower flange of the stud-screw *e*, which is screwed into the pad between the legs of the U-bend. The legs of the U-bend are just far enough apart to permit the working therethrough of the shank of the stud-screw *e*. Each leg thus has a bearing on each side, the bottom of the recess *a* forming one bearing, the side of the recess forming the second bearing, the shank of the stud-screw forming the third bearing, and the flange of said stud forming the fourth bearing. We believe this means for the attachment of the wire to the pad to be more firm than any heretofore devised. We do away with many of the complicated parts which have heretofore been used. We simplify the parts, as it will be seen that we employ simply the screw-stud *e* besides the pad and the arch-wire. Moreover, after the pad has been once adjusted to the patient he may detach the pad from the arch-wire, if he so desires, and replace it himself without being required to refit or readjust it. There is no danger of its getting out of adjustment. It can be seen that even though the screw should work somewhat loose the pad cannot move away from the angle at which it has been adjusted unless the wire be entirely removed from the recess and groove.

The arch D is made, preferably, of spring-wire. It has a flexible covering B, which is made, preferably, of two strips of leather sewed together with the wire between them. This prevents the chafing of the wearer and gives an easy bearing against the hip of the patient. The summit C of the arch rests approximately at the crest of the ilium and the rear end of the arch rests at the rear of the hip. E is the main body-strap, which is attached to the wire D or its covering B at the summit C, preferably a little in the rear of the crest of the ilium. This attachment is made by sewing, as in Fig. 10, or by the hook H, attached to the arch, as in Figs. 9 and 13, whose tip H' is adapted to be bent into the strap to prevent its getting loose. The end of the strap, of course, is perforated. At the rear end of the arch is the stud *l*, to which is attached

the perforated lower end of the auxiliary strap F, whose upper end is attached to the main body-strap E at the back of the patient by the stud G, which is like an ordinary collar-button. The office of this auxiliary strap is twofold—first, to pull the main body-strap, E downwardly, and, second, to hold the rear end of the arch in proper position by the corresponding upward pull. The object in pulling the main body-strap downward at the back is twofold—first, that it will not rest against but below the small of the back, and, second, to give it a downward pull at its attachment to the arch summit. The object in holding the rear end of the arch in position by the corresponding upward pull is so that the rear end may be as far as possible toward the side of the patient, while still bearing against the body against the corresponding inward or rearward pressure of the pad. Of course if the rear end were permitted to slip too far around on the side of the patient it would serve no practical purpose whatever, either as a bearing against the pressure of the spring against the pad or to keep the body-strap from slipping sideways. By attaching the main strap at the summit we are able to come closer to a vertical position for the rear portion of the arch than has heretofore been possible, and we find that the forward portion of the arch swings, as on a hinge, on the rear portion—that is, the rear portion has its bearing on and against the rear of the hip near the side, being held in place thereon by said two straps—while the pull of the end of the main strap which is attached to the pad is in the general direction of the swing of the forward portion of the arch and draws the pad rearward and upward against the hernia. The main bearing of the rear end B' of the arch is against the hip. The auxiliary strap F serves only to keep it in position thereon—that is, keeps it from sliding too far around on the side of the patient, which is its normal tendency. The main horizontal pull upon the arch as a whole which offsets the pull of the main body-strap upon the pad is exerted by said strap E at the arch summit. By connecting the auxiliary strap to the main body-strap at the back it also serves the additional purpose, as heretofore explained, of drawing the latter strap down below the small of the back. Now the purpose of the auxiliary strap being made clear, it will be understood that it occupies a substantially vertical position, although it may vary greatly from the actual perpendicular. In actual practice it is found to give best results by making the connection at a point about one inch from the spine on the side on which the arch is located. It will also be seen that the main body-strap by reason of its being thus drawn downwardly passes around the opposite side of the body, resting lower down on the body than the summit of

the arch, but still not so low but that it gives an upward pull against the pad. By reason of this low position upon the body and its bearing upon the pelvic bones it is free from disturbance by the bending of the body.

The truss is fitted by bending the wire D to conform to the patient, the arch resting upon the hip, so that the internal ring is covered by the upper end of the pad, the pad nearly or quite covering the inguinal canal. The main body-strap is then brought around and fastened to the stud *e* in the pad, the strap F being adjusted so there is but slight tension on it. The lengthening and shortening of this auxiliary strap determines the position of the arch upon the hip. The main body-strap E bears nearly or quite all the horizontal or lateral pull upon the arch, the pull of the auxiliary strap being substantially vertical. There is substantially no horizontal or lateral pull on the auxiliary strap. The pad is drawn upwardly and inwardly against the hernia.

In all trusses it is expected that the truss shall be fitted to the patient, in the first instance, by a person skilled in the art. It frequently happens, however, that the truss is removed by reason of the screws or fastenings in the pad working loose or by other accident or from desire, and it is then a difficult matter for the patient to replace the truss unless he be expert, and it has seemed impracticable with the trusses of this kind heretofore used to instruct the patient so that he himself can replace the truss in its proper position. He may easily be instructed, however, as to the location of the internal ring. Once known it is seldom forgotten. The patient can then quickly and securely replace our truss by placing the arch over the hip, with the upper end of the pad bearing inwardly and upwardly against the internal ring, and then bringing the body-strap around and attaching it to the stud *e*, so there is easy tension on both straps.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with a pad and wire comprising the arch attached thereto, of a main body-strap connecting the pad and approximately the summit of the arch, and an auxiliary strap connecting the rear end of the arch and the main body-strap at the back.

2. The combination with a pad and wire comprising the arch attached thereto, of a main body-strap connecting the pad and approximately the summit of the arch, and a substantially vertical auxiliary strap connecting the rear end of the arch and the main body-strap.

3. The combination with a pad having the general form of a half-pear and having its upper outer corner cut away as shown giving the upper inner corner an abnormally-protruding effect so as to form a plug for the hernia;

of a wire comprising the arch attached to the pad; a main body-strap connecting the pad and approximately the summit of the arch; and a substantially vertical auxiliary strap connecting the rear end of the arch and the main body-strap.

4. The combination with a pad having the general form of a half-pear and having its upper outer corner cut away as shown giving the upper inner corner an abnormally-protruding effect so as to form a plug for the hernia; of a wire comprising the arch attached to the pad; a main body-strap connecting the pad and approximately the summit of the arch; and an auxiliary strap connecting the rear end of the arch and the main body-strap at the back.

5. In a hernial truss the combination with a pad having the general form of a half-pear and having its upper outer corner cut away as shown giving the upper inner corner an abnormally-protruding effect so as to form a plug for the hernia; a recess and a groove in the outer surface of said pad and a hole in the bottom of the recess; a wire comprising the arch fitting in the groove, and having a U-bend fitting in the recess, the extreme end *f* of the wire being bent inwardly into the hole in the bottom of the recess; a stud-screw whose shank is screwed into the pad between the legs of the U-bend and whose lower flange forms a retaining-plate for the U-bend; and means for holding the pad and arch on the body.

6. In a hernial truss, the combination with a pad having a recess in its outer surface, of a wire comprising the arch having a U-bend fitting in the recess, the extreme end *f* of the wire being bent inwardly into the pad, and means for holding the U-bend in the recess.

7. In a truss the combination with a pad having a groove and recess in its outer surface; of a wire comprising the arch fitting in the groove and having a U-bend fitting in the recess; a screw-stud whose shank is screwed into the pad between the legs of the U-bend and whose lower flange forms a retaining-plate to hold the U-bend in the recess; the extreme end *f* of the arch-wire being bent inwardly into the pad.

8. The combination with a pad having a groove and a recess in its outer surface; of a wire comprising the arch fitting in the groove and having a U-bend fitting in the recess, the extreme end *f* of the wire being bent inwardly into the pad, and means for holding the U-bend in the recess; a stud on the pad; a main body-strap connecting the pad and approximately the summit of the arch, and an auxiliary strap connecting the rear end of the arch and the main body-strap at the back.

9. The combination with a pad having the general form of a half-pear and having its upper outer corner cut away as shown giving the upper inner corner an abnormally-protruding effect so as to form a plug for the

hernia; a recess and a groove in the outer surface of said pad; a wire comprising the arch fitting in the groove and having a U-bend fitting in the recess, the extreme end of the
5 wire being bent inwardly into the pad; a stud-screw whose shank is screwed into the pad between the legs of said U-bend and whose lower flange forms a retaining-plate for the U-bend; a main body-strap connecting the
10 pad and approximately the summit of the arch; and an auxiliary strap connecting the rear end of the arch and the main body-strap at the back; substantially as described.

In testimony whereof we have affixed our signatures in presence of witnesses.

GEORGE H. STEWART.
ABRAHAM L. WISEMAN.

Witnesses to signature of George H. Stewart:

JOSEPH GROLL,
Z. T. FISHER.

Witnesses to signature of Abraham L. Wiseman:

CHAS. E. BALDWIN,
M. L. ROWLAND.