

2 Sheets-Sheet 1.

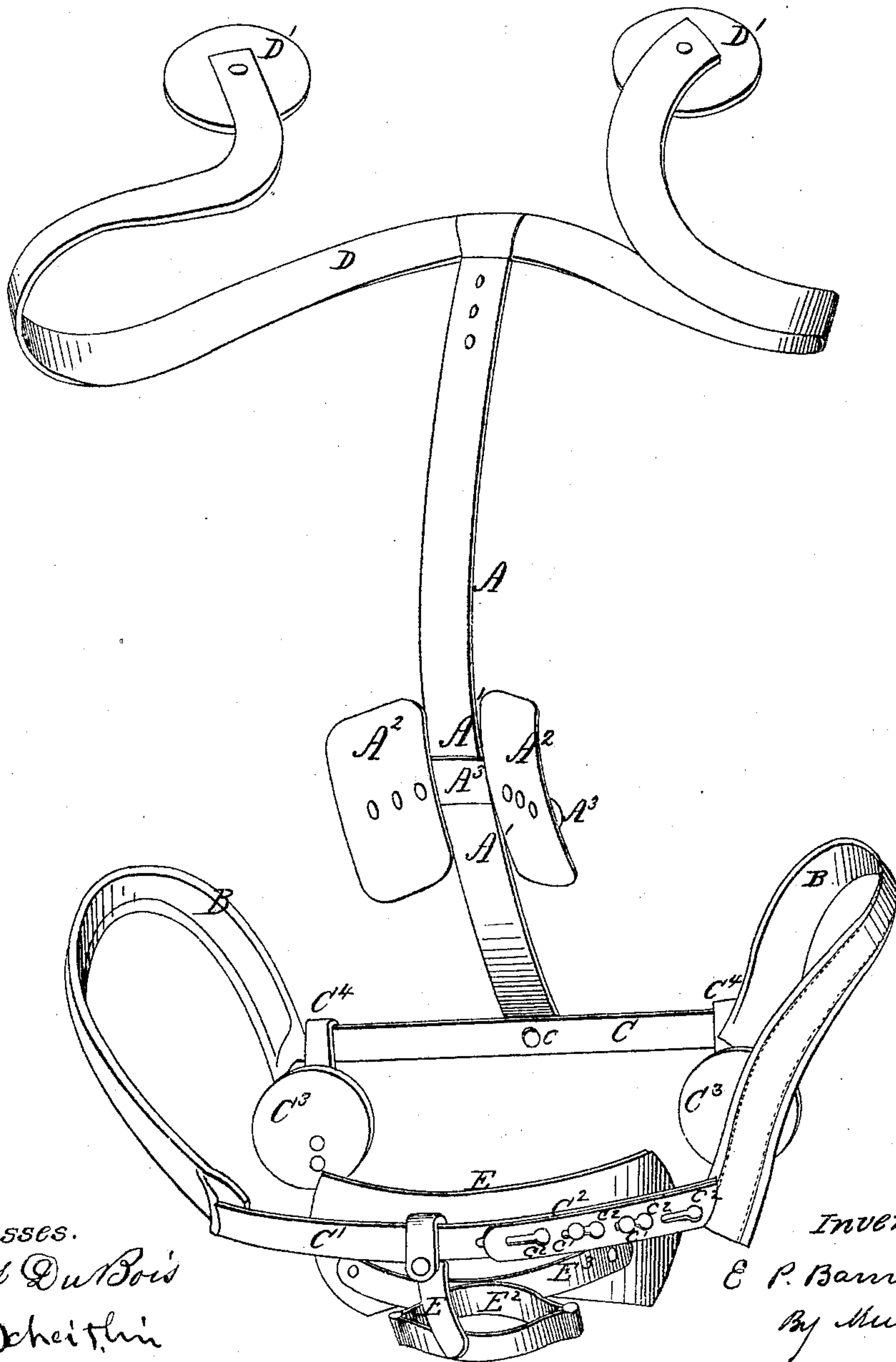
E. P. Banning,

Truss.

N^o 44,914.

Patented Nov. 1, 1864.

Fig. 1.



Witnesses.
Chas DuBois
O Scheithin

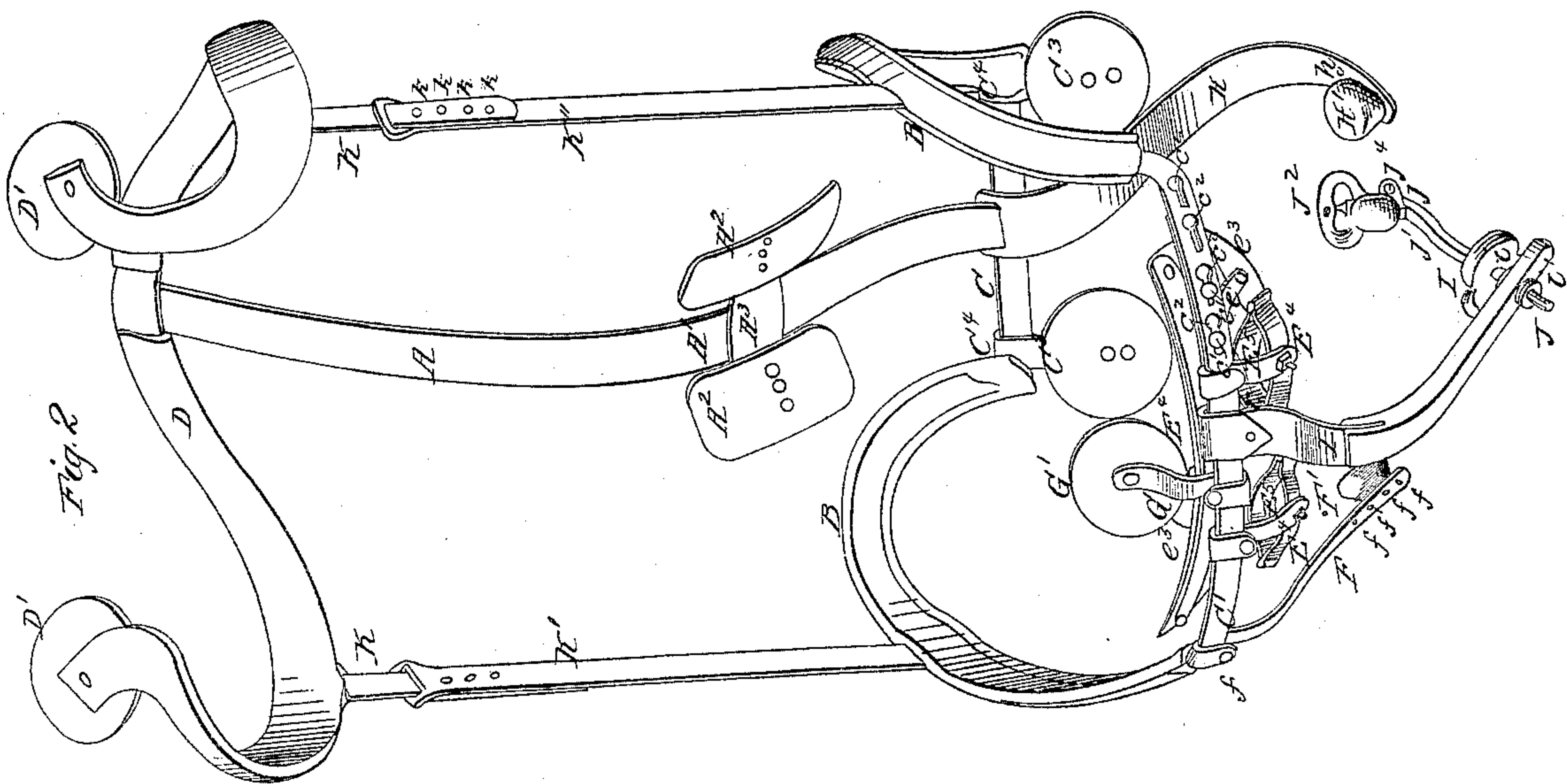
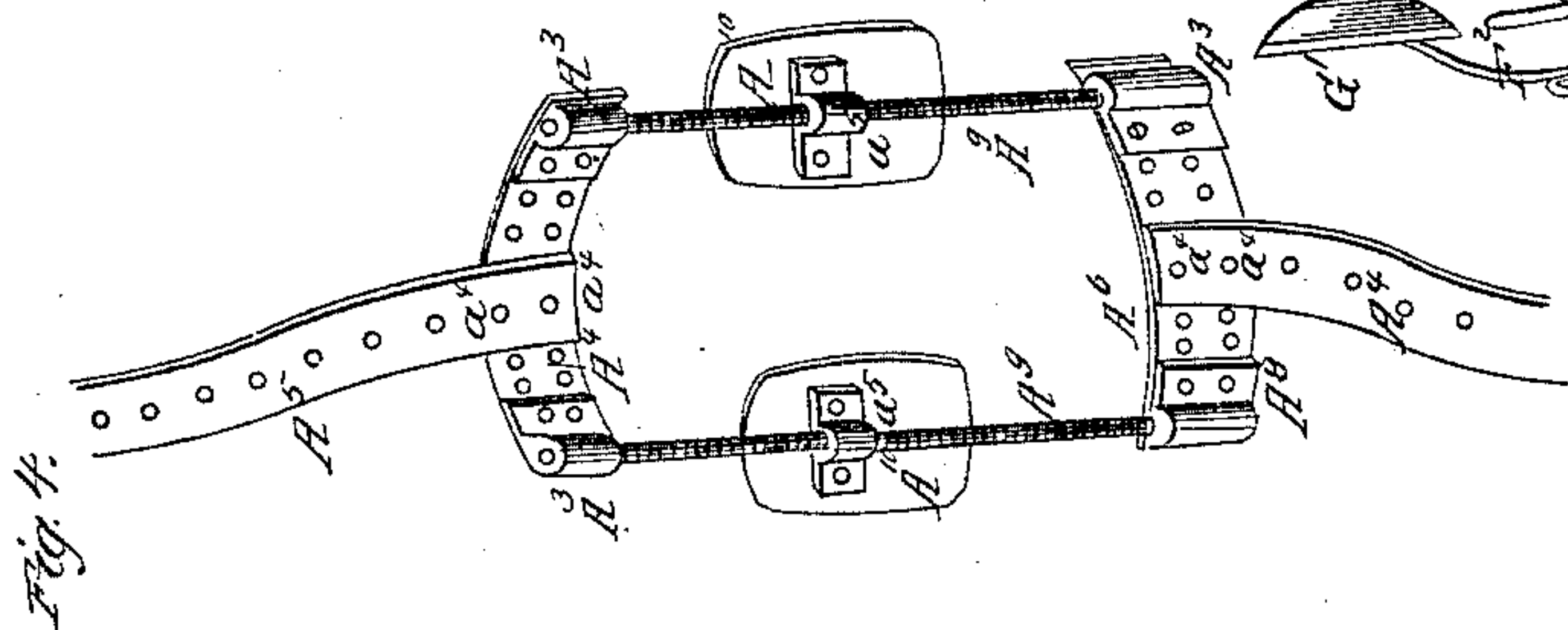
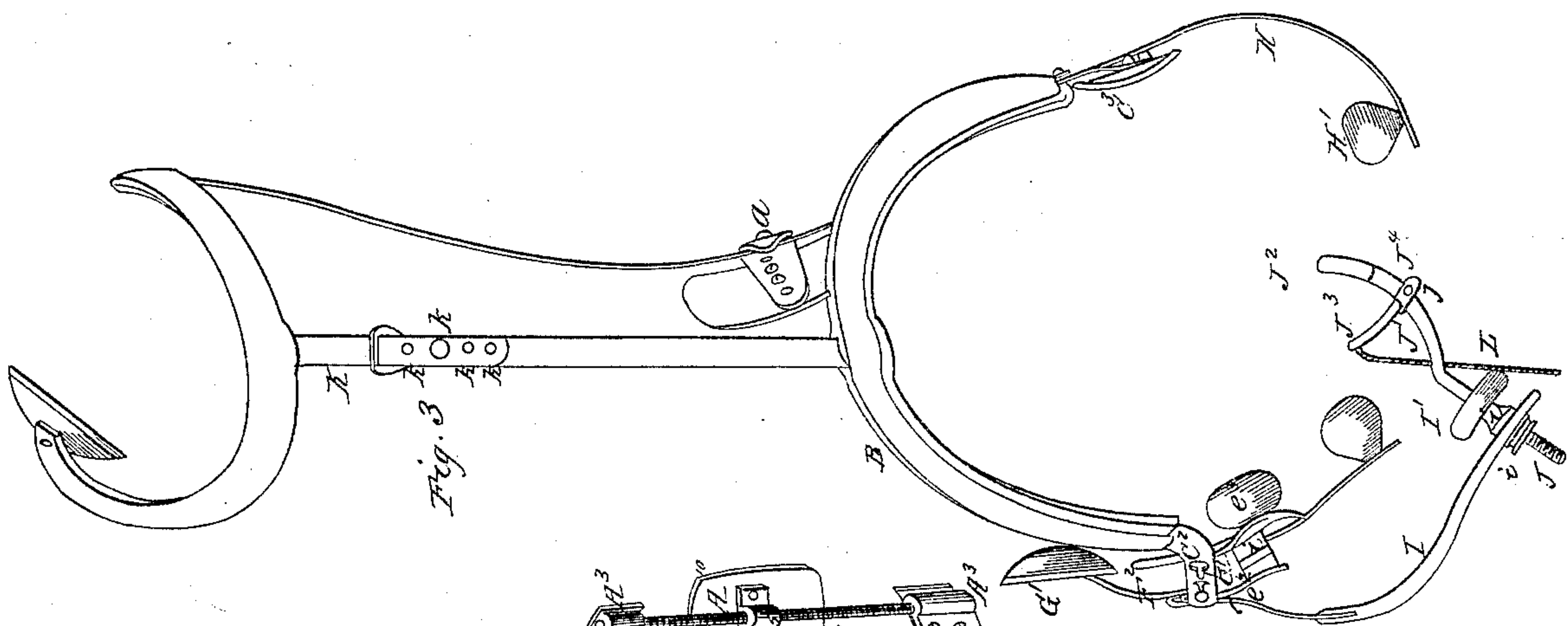
Inventor
E. P. Banning
By Munn & Co

E. P. Banning,
Trusts.

Truss.

Π^o 44,914.

Patented Nov. 1. 1864.



Witnesses

Chas Du Bois
D. Schreiner

D. Schreiter

Inventor

E. P. Barrett

By Mumukshu Bhattacharya

UNITED STATES PATENT OFFICE.

EDMUND P. BANNING, OF NEW YORK, N. Y.

IMPROVEMENT IN BODY-BRACES.

Specification forming part of Letters Patent No. 44,914, dated November 1, 1864.

To all whom it may concern:

Be it known that I, EDMUND P. BANNING, M. D., of the city, county, and State of New York, have invented a certain new and Improved Combination Universal Brace; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a similar view illustrating the employment in connection with the brace of side posts, to be hereinafter described, for supporting the weight of the upper part of the body. Fig. 3 is a side elevation of the same. Fig. 4 illustrates a modified form of spinal support.

Similar letters of reference indicate corresponding parts in the several views.

This invention relates to an apparatus that may be employed with salutary effect by persons suffering from weakness of the chest and spine, derangements of the abdominal and pelvic organs, hemorrhoids or piles, falling of the womb, or other affection or affections for the cure or relief of which either a brace or support may be employed, said apparatus by its peculiar construction being adapted for effective use either in connection with one disease or affection alone, or where a combination of affections are to be treated simultaneously, as will be hereinafter fully explained.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, B B represent springs, which are arched or curved in the manner shown, and either formed in one piece with the horizontal bar C or securely attached thereto by screws, or in any other suitable manner. The bar C passes through a loop formed on the lower end of a bar, A, and is firmly fastened therein by a screw, c. The curved springs B B may be made to exactly conform to or fit the arch of the innominate or side bones of the hips, and when adjusted to the person, and employed in connection with the other parts of the apparatus to be described, said springs exert a regular and even pressure at the sides and upon the front and hinder parts of the body throughout

their entire extent, their position when adjusted being just above and inside of the crests of the hip-bones. At their front ends, or the ends opposite those conjoining the bar C, the springs B B may be connected by bars C' C², which occupy about the same horizontal plane as the bar C, and cross the body at a point, say, one and one-half or two inches above the pubes. The bars C' C² may in like manner with the bar C be formed in one piece with the springs B B, or separately, as may be preferred, and they are adapted to be turned open to any extent to admit of the application of the springs B B to the body, and form what may be termed a "slip-lock," the bar C' being provided with projecting catches c', which enter either of a series of corresponding apertures, c², in the bar C², whereby the springs B B may be securely retained in any position in which it is desired to adjust them.

To the rear bar, C, are attached hip-pads C³ C³ by means of short perpendicular springs c⁴ c⁴, which are so curved inward as to adapt the pads C³ C³ to press upon the glutei muscles in such manner as to prevent the bar C from squeezing or chafing the hips. These pads C³ C³ constitute the rear bearing-points of the mainspring's power, and they not only protect the bones, vessels, nerves, and muscles from the pressure of the bar C, but by their firm pressure upon the belly of the glutei muscles they greatly support and aid in walking, precisely as a person when fatigued receives support and rest by pressing the hands upon the hips.

When the springs B B are adjusted to the hips, they are not liable to accidental displacement, the hips constituting such firm bearings for them to rest upon that they will be uninfluenced by any movement of the body whatever, and from their peculiar construction and adaptation are capable of sustaining a great amount of weight—even the weight of the whole body—without causing pain, strangulation, or impediment in walking.

As hitherto constructed, the horizontal bands and braces which pass around and outside of the hips are very defective, as they are caused to assume lower positions under pressure or weight, and constantly compress the muscles, strangle the vascular and nerve circulation, and are perpetually shirking or slipping as the patient bends or shifts his

weight from one foot to the other, thus depriving the wearer of any firm or reliable support, thus producing uneasiness, numbness, and dissatisfaction generally. It is evident that by my invention these difficulties are altogether obviated.

To the upper end of the bar A, and capable of vertical adjustment by means of a screw, is secured a shoulder bow or brace, D, which may be made flat or round, as desired, and which is formed or curved in such manner as to exactly fit the various planes of the shoulder-blades, axillæ, and chest, over which it passes. The end of the lever A is passed through and secured in a loop affixed to the back of the bow D. The point at which this brace crosses the back may be either over or upon the scapulæ, near their inferior, and prominent angles or below them, and, passing under the respective armpits, ascends in front of the breast at each side as high as the head of the humerus, where the ends of the brace are deflected in an outward and upward direction in such manner that the tuber of each humerus will be covered by the respective circular caps or cups D' D', secured upon the extremities of the brace D. These caps D' D' may be constructed of horn or any other suitable substance, may be fastened by screws, rivets, or otherwise to the ends of the brace D, and are each formed with a delicate depression or concavity corresponding to the convexity of the tuber humeri, which, in connection with the peculiar elastic action of the spring, adapts said caps to maintain a firm yet easy and undisturbed position during all motions of the arms or body.

In manufacturing, the bow or spring D is so set before being tempered that when adjusted upon the patient no uncomfortable pressure will be exerted upon the scapular or large pectoral muscles, or upon any of the nerves or vessels, and instead of discommoding the wearer or imparting a feeling of restraint the action of the bow D has a strong tendency to relieve the wearer while retaining the members in their proper, natural positions, and enabling their functions to be performed in a much more facile and satisfactory manner. The points upon which the spring D acts are at the inner edges of the inner scapulæ on the back and the heads of the humeri in front; consequently when on the body its action is purely that of a lever, turning in and causing the respective outer faces of the scapulæ to occupy about the same vertical plane and rolling out and back the humeri, thereby protruding the chest and tending to balance the body's apex behind its axis. In this it differs from all tissue shoulder braces, for they, having no fulcrum or lever, their action is merely circular and not distal and fulcral, and in consequence they compress intermediate points, strangulate more or less the nervous and vascular circulation, and more especially tend to restrain a free action of the pectoral muscles. For the same reasons the brace

also differs from all metallic bows hitherto employed, for they act merely as a band or hoop having no particular points or fulera from which to act; besides, none of them cover the tuber humeri, and thus roll back the drooping and advancing shoulders, but, on the contrary, press upon the pectoral muscles and upon the ribs just under the collar-bone, thus interfering with perfect fullness of inspiration, their only service being that of a crutch for the body to settle upon.

If the described springs or braces B B and D were employed alone the action of the instrument would be very incomplete, inasmuch as the drooping of the shoulders is more the result of the retreat of the spinal fulcrum or axis at about the point against which the part A' of the bar A acts when the instrument is adjusted to the body (thus compelling the upper part of the body to hang forward) than of any primary weakness above. Hence the only way in which the erect axial or centripetal bearing of the body may be restored consists in pressing or pushing up the part of the spine, against which A' rests, to the position of the true axis, which operation compels the previously injurious weight to become a remedy by hanging behind the axis. To this end I construct the bar A of tempered steel, rubber, or any other elastic material, and curve the same forward at A' to act upon the spine in the manner explained. This elastic bar A may be curved forward to a somewhat greater extent than the most natural and erect spine, and at the curvature A' are attached plates or pads A² A² by means of a slide, A³, and screw a, which slide A³ may be made elastic, so as to permit the pads A² A² to rock or turn in such manner as to exert an equal pressure upon the dorsal muscles in all positions of the body.

E, Fig. 1, represents a plate or pad attached to the front bar, C', at a point equidistant between the front ends of the mainspring B B by means of a short and curved vertical spring, E', which is looped over the bar C' and secured in position by a screw, e. The lower edge of the plate E is of such length and shape as to fit just inside of the bony boundary of the lower abdomen and through the medium of the curved springs E' and the elliptical and semi-elliptical springs E² E³, which are interposed between the lower end of said spring E' and the plate E. The inner face of the latter is presented in such an upward and backward direction or position that when in contact with the body it has an almost exclusive lifting or upward action, and does not (as is the case with front plates of other supports) have to depend upon transversing the periphery or sweep of the long mainspring, in which case the upward movement exerted on the body by the plate is scarcely anything when compared with its backward movement, which causes only a squeezing or pressing upon the bowels.

In my invention the front plate, E, in turning

inward on its axis, gives an elevating and supporting action not only upon the lower link of bowels, but also upon the whole line of viscera. The value of this peculiar lifting action of the front plate, E, in the cure of affections of the spine, chest, abdomen, pelvis, and extremities will be apparent.

The relief rendered to the spine by the devices already described is great. The tenderness and ulceration of the bodies of the vertebrae and their intervening cartilages, the result of undue and constant pressure upon them, is relieved by the weight of the body being translated to another and sound point. The aching pain and weariness of the dorsal muscles and spinal ligaments from constant tension are relieved by the relaxation of these parts, caused by the shortening of the posterior face of the spine effected by the pushing forward of the spine by the pads $A^2 A^2$. In a word, all the pressures on one part and all the tensions on the other are removed by means precisely similar to the individual and collective action of the abdominal muscles. With regard to the treatment of the spine the effect of the action of one member alone of the apparatus would be beneficial to but a very slight degree, but by the combined action of the apparatus both the specific and the general action are secured. But if the inflammation, curvature, or irritation be great in any portion of the spine, then this combination (though perfect as far it goes) will be too gentle and inefficient to accomplish all that may be done, for, beside the influences exerted by the apparatus described, the case may demand that a portion of the body's weight be absolutely lifted and permanently retained from the irritated, inflamed, or softened and curved point, so as to place a quietus upon the excitants and provocations (which are weight) of the affection, for as soon as the pressure is diminished, if but to a small degree, the relief in many cases to every part of the body, as well as to the tender portion of the spine, is very immediate and complete, for the reason that the remaining organic forces are encouraged in their constant and inherent efforts to return to a normal state. To this end I next construct posts or bars $K K' K K'$, which are looped over and secured, respectively, by screws to the springs D and B B in the position shown, and which overlap each other, so as to admit of variation in length, each bar K' being provided with a projection, k' , which hooks into either of a series of holes, k , in the bar K. These side posts or bars are attached in such manner as to allow all motions of the body to be performed freely. When these posts $K K'$ are applied, in addition to the lifting of the viscera, the bracing or pushing forward of the curve, and the drawing back of the shoulders simultaneously, I obtain the advantage of a vigorous lifting of the body from the overtaxed muscles, ligaments, and tender spine. It not only acts as a protection from pressure,

but also as a contingent protection or break in case of any jolting of the body.

The pads $A^2 A^2$ may be adapted for lateral adjustment, so as to cause one to press with more force than the other in cases where the spine has deviated in a lateral direction.

The bow D is so cushioned as to render its strong pressure on the oxillæ devoid of discomfort. The spring B B may also be cushioned.

An important use for which the combined brace is admirably adapted is the treatment of a fracture of the clavicle, for which purpose the bow D may be so constructed as to exert a greater degree of elastic force than when intended for the treatment of the ordinary cases or affections for which it may be employed. The supporting of the body by the elevation of the pelvis and the fixing of the body's center perpendicularly to the base in the manner described permits the shoulders to be rolled back by the pads $D' D'$ and the parts of the clavicle to be effectually held in apposition until the desired reunion takes place.

In the modification of the spinal support illustrated in Fig. 4 the bar A is represented as being divided at the curved part A' , so that the two sections $A^4 A^5$ are thus formed. To the section A^4 is secured an adjustable curved plate, A^6 , and to the section A^5 is secured a corresponding plate, A^7 . These plates $A^6 A^7$ may be secured to the sections $A^4 A^5$ by means of screws $a^4 a^4$, and upon their respective outer ends are attached sockets A^8 , in which work the ends of the screws $A^9 A^9$. On each screw A^9 is secured a pad, A^{10} , by means of a threaded clasp, a^5 , which adapts the pads A^{10} by being rotated to be adjusted vertically to any desired extent. This form of spinal support is to be employed in cases of external protrusion, and the manner in which it operates will be readily understood.

The attaching bars or springs of the pads $F' G'$ and of other parts of the apparatus may be made extensible by means of slots and guide-pins, so that the pads may automatically accommodate themselves to motions of the body, the attachment being varied in length to conform to the changing linear extension due to any flexure of the body. Both the mainspring and the pads are thus permitted to rest immovably upon that part of the person to which they are applied without offering any constraint to motions of the body. This feature I have made the subject of a claim in a separate application, and hence do not include it in this.

The apparatus above described may be likened to the whole human trunk, and when it is applied to the body not only are all the local supports given about the pelvis, but by the pushing force of the portion A' of the spring A on the retreated spine and the opening and drawing-back action of the bow D $D' D'$ the weight of the upper body upon the pelvis is removed and actually made to help raise the internal organs by swinging behind the body's axis. This completes the whole panoply, as

suggested by the combination and action of the three natural forces—i. e., the abdominal muscles, the dorsal muscles, and the scapular muscles, all constituting a unit in their combination.

Other parts represented in the drawings, being made the subjects of separate applications, require no specific description here.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The shoulder-bow D and pads D', constructed and adapted to flatten the scapulæ and roll back the shoulders, in the manner explained.

2. In combination with the aforesaid shoulder-bow, constructed and operated as specified, and with the mainspring B B, the lever A, for attaching and supporting the shoulder-bow D and pressing forward the spine, as explained.

3. In combination with the aforesaid shoulder-bow D and with the mainspring B B, one or more side posts, K K', for relieving tender diseased spines, as explained.

E. P. BANNING.

Witnesses:

CHARLES D. SMITH,
R. H. MAYHEW.