

2 Sheets-Sheet 1.
E. P. Banning,

Truss.

N^o 44,913.

Patented Nov. 1, 1864.

Fig. 1

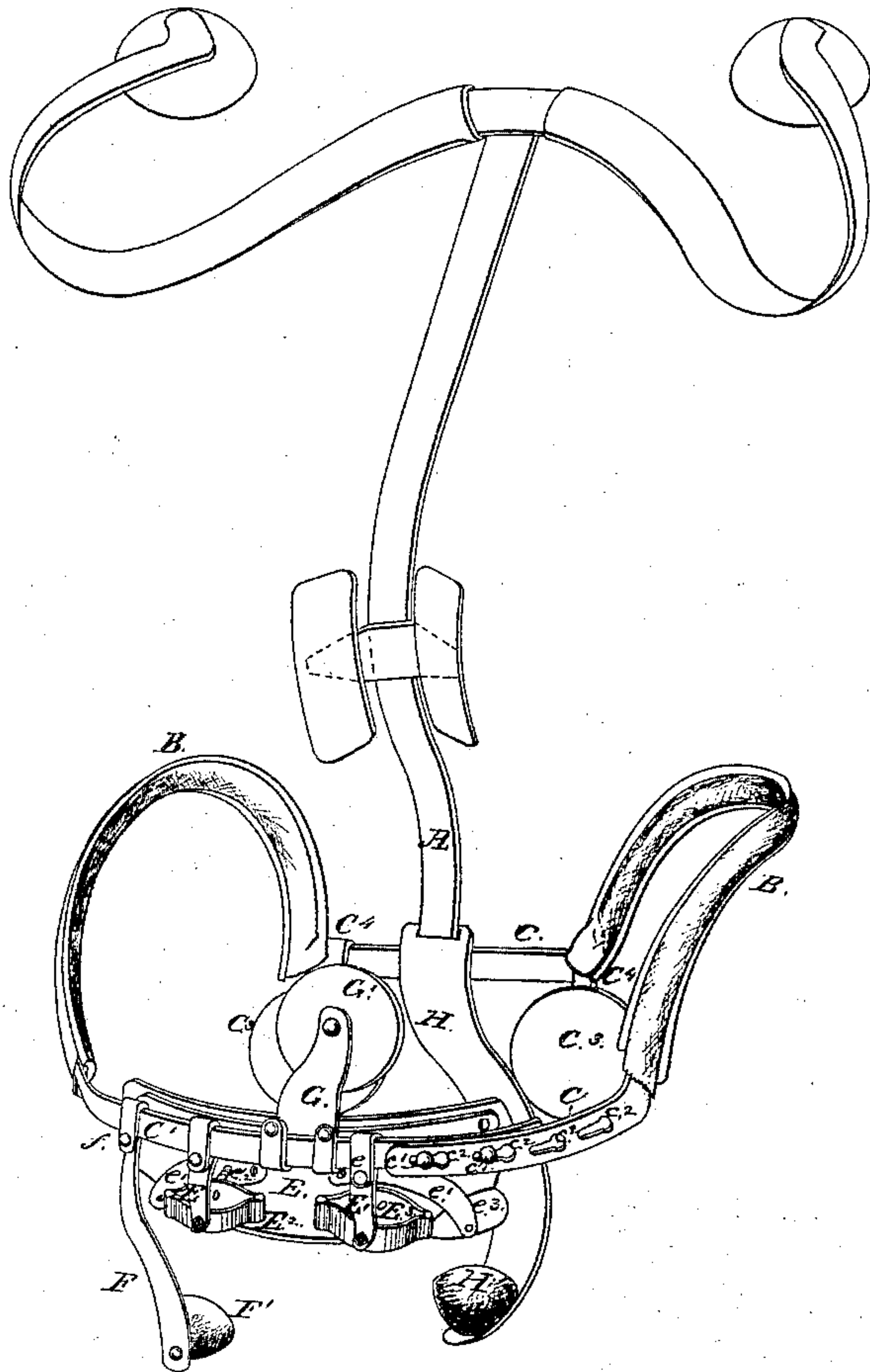
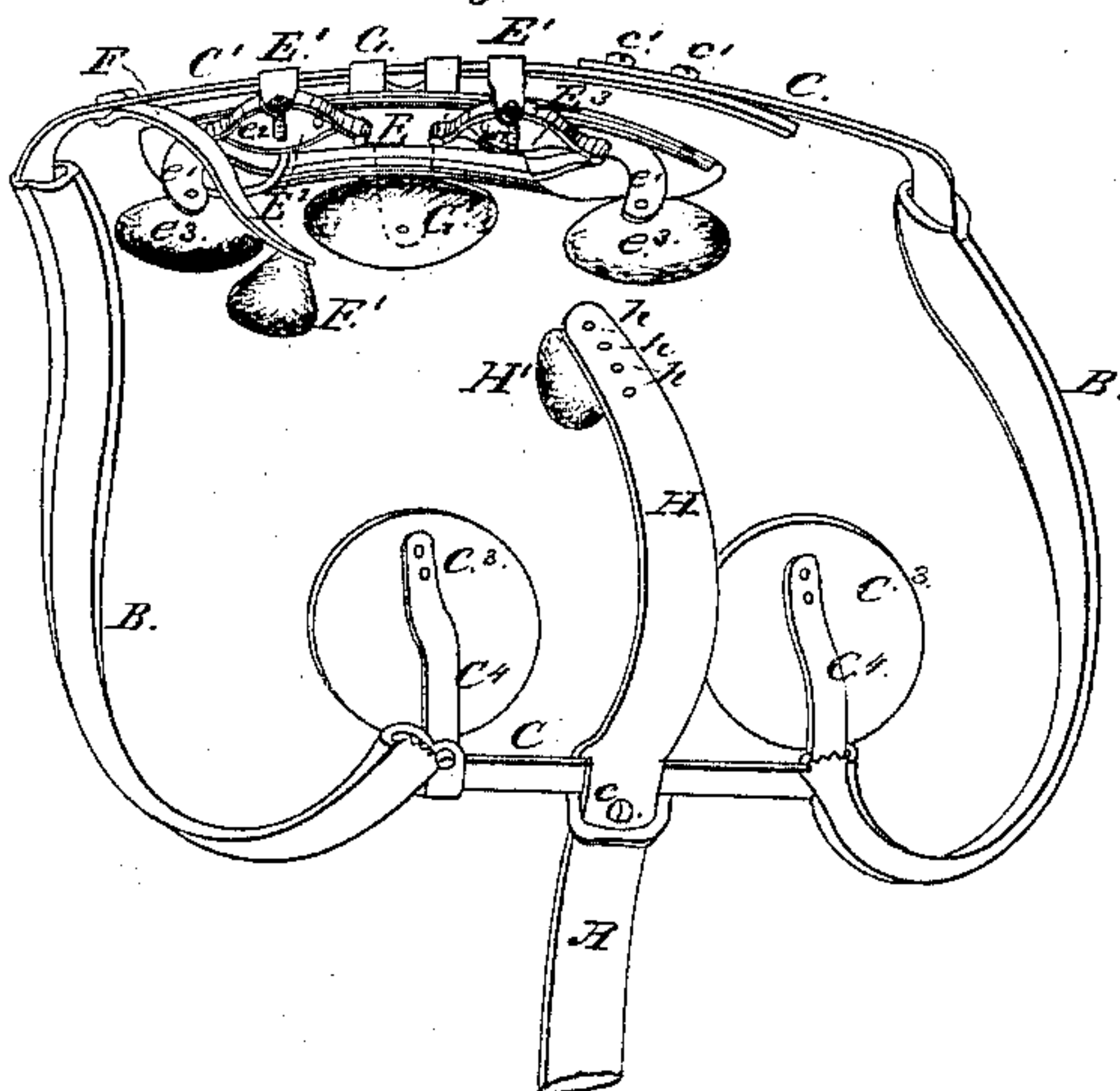


Fig. 2.



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Inventor:
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By *Amos G. Allen*

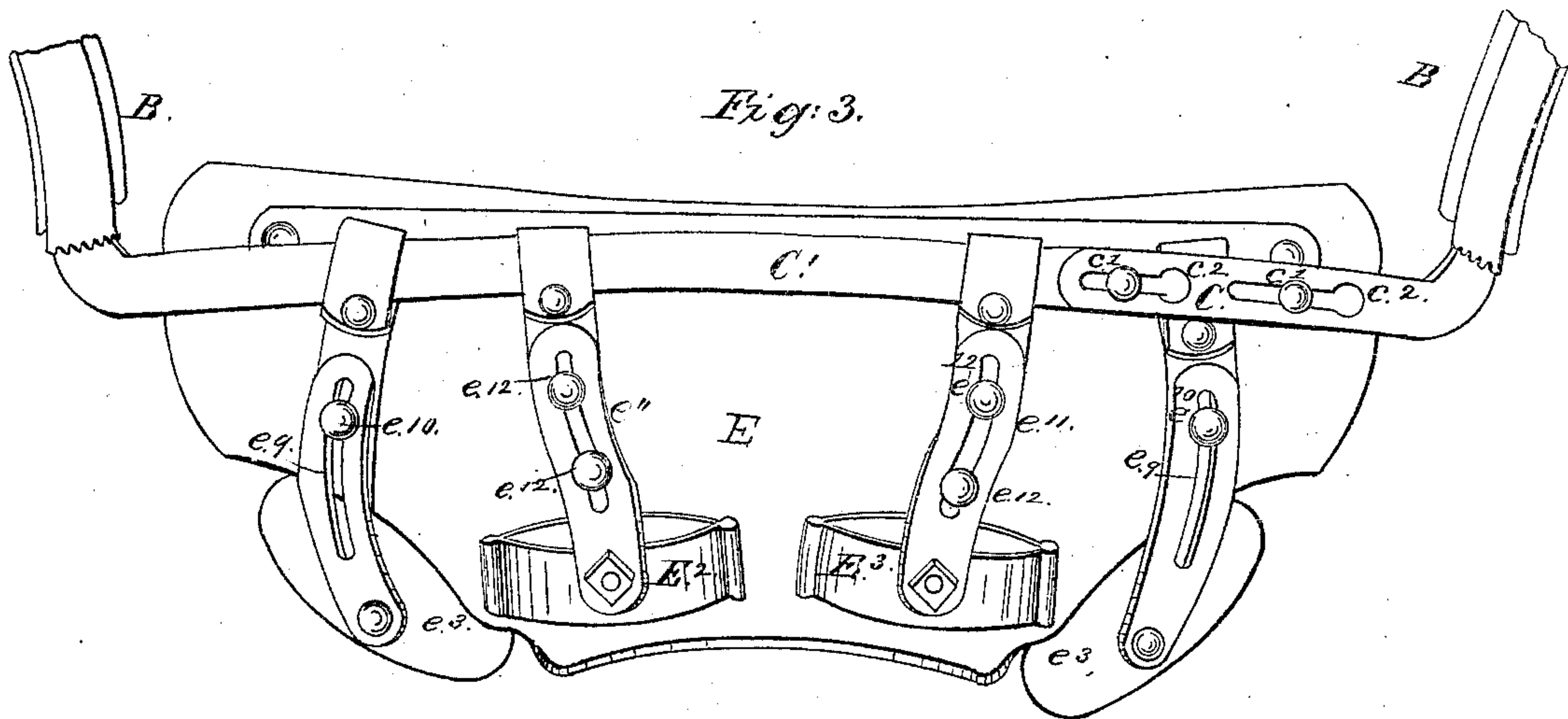
2 Sheets-Sheet 2.

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Witnesses:

Edward H. Knight.

G. D. Smith.

Inventor:

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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN TRUSSES.

Specification forming part of Letters Patent No. 44,913, 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 certain new and useful Improvements in Hernial and other Trusses; 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 a combined truss, illustrating my invention. Fig. 2 is an under side view of the same. Fig. 3 is a detached view illustrating a modification in the mode of applying the inguinal pads.

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

This invention relates to an apparatus for the relief and radical cure of the various descriptions of hernia and of hemorrhoids or piles and other affections of the abdomen and bowels.

In order that others skilled in the art to which my invention appertains may be enabled fully to 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 a 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 called a "slip-lock," the bar C' being provided with projecting catches C', which enter either of a series of corresponding apertures *c*² 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 glutæi 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 glutæi 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 not be influenced 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 or 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 and producing uneasiness, numbness, and dissatisfaction generally. It is evident that by my invention these difficulties are altogether obviated.

E 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 short and curved vertical springs E', which are looped over the bar C' and se-

cured in position by screws *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 or semi elliptical springs *E²* *E³*, which are interposed between the lower end of said springs *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 traversing 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.

In each of the lower corners of the plate *E* is formed a scallop about long and deep enough to receive the disk of a small egg, and at each end of the plate *E* is attached a short, flat spring, *e'*, the outer end of which projects over into the vacancy made by the scallop, said outer end of the spring *e'* being adapted to be adjusted in contact with or at any desired distance in advance of the plate *E* by means of a thumb-screw, *e²*.

To the outer end of each spring *e'* is attached a ball or pad, *e³*, which occupies the corresponding recess or scallop in the end of the plate *E*, and is adapted by the spring *e'* to receive a free rocking motion.

The springs *e'* may be each formed in two parts, secured together by a clamp inserted in suitable slots or holes in the two parts of the spring, so as to permit the latter to be extended or contracted in length to adjust the height and position of the plate *E*. By these means either end of the said plate may be set up or down independently of the other to meet the requirements of a rupture on either side.

In Fig. 3, *e⁹* represents springs depending from the bar *C'*, employed instead of the spring *e'* for the attachment of the inguinal pads *e³*. Either spring *e'* or *e⁹* may be made in two parts, perforated or slotted, and provided with clamps *e¹⁰* for the elongation or contraction of the springs in order to adjust the pads. The plate *E* acts as an infallible retainer of inguinal hernia. This is accomplished first by the action of the plate in elevating and sustaining the weight of the viscera from the inguinal rings, thereby removing a great amount of pressure from the same; and, secondly, by the pressure of the balls upon the whole canal.

The advantage of this combination over all others for the cure of hernia is, first, that it

is self-adjusting, and must of necessity come to the right points by the innominate pressing and supporting on each side; secondly, the arched springs *B B* so fit the whole pelvis that they cannot move under the motions of the body, and consequently are not liable, like other trusses, to let the rupture down by its accidental displacement.

A third but radical advantage of this feature of my invention consists in what may be termed its "break-water" action upon the bowels when they are suddenly and violently descending upon the weak abdominal rings in jolting, falling, coughing, sneezing, or laughing, the whole plate *E* catching the descending bowels and throwing them up again before they can reach and protrude through the rings, the action being similar to that of springs under a vehicle which break the jolt before it bruises the passenger. By this arrangement not half the steady pressure on the ring is necessary as a contingent power, and thus a vast amount of irritation, excoriation, and even suppuration, the consequence of hard pressure, is avoided.

An additional advantage of this combination is that in case of a single inguinal hernia the plate *E*, by extending over and supporting the round side, and also holding or breaking weight from the ring, acts as a preventive of a rupture on that side, whereas it is a well-known fact that the very best trusses which act only on the plug principle greatly tend to produce a rupture on the opposite side by causing a crowding on the opposite ring commensurate with the pressure it exerts upon the ruptured side.

By attaching the springs *e⁹* of the pads *e³* directly to the bar *C'*, instead of to the yielding plate *E*, it will be manifest that any required pressure or rigidity may be applied to the said pads, and such pressure will be constant and unaffected by the yielding of the plate. They are thus adapted to hold and retain rupture in severe cases where otherwise they would be but partially effective.

By attaching the plate *E* to the bar *C'* by slotted and divided springs *e¹¹*, secured by clamp-screws *e¹²*, as illustrated in Fig. 3, the said plate is rendered capable of vertical adjustment to any necessary extent.

To the outer end of each of the respective front bars, *C' C²*, I attach a pendent spring, *F*, said spring being formed with a loop at one end to admit of its ready application or removal, and when looped over its supporting-bar the spring may be secured by a screw, *f*.

To the lower end of each of the springs *F* is attached a ball or pad, *F'*, of any desired size, form, or substance, by means of a screw, whereby the position of the pad *F* may be varied vertically, for which purpose the spring *F* may be provided with a series of apertures. These balls *F* press precisely upon the femoral rings below Poupart's ligament, and by so doing aided largely by the lifting or break-water action upon the viscera by the plate *E*,

effectually retain and ultimately cure femoral hernia, which effect is attributable to the fact that as the mainsprings B B cannot move under motions of the body the balls F' cannot become displaced, whereas there has never heretofore been constructed a femoral truss which will keep its place in every motion of the body.

G represents a spring looped over and secured by means of a screw upon the bar C', said spring being of sufficient length to extend from the bar C' to the navel, and to its upper end is attached a plate, G', of any required size, and formed either flat, convex, or concave to suit the emergency in the case of umbilical hernia. The spring G is curved in such manner that when applied its upper extremity has an inward tendency and is adapted to press the plate G' firmly upon the navel. The effect of the employment of the plate G' upon the largest and most obstinate cases of hernia is complete, because, first, the plate E sustains the bowels in such manner as to give firmness to the parts and remove the slipperiness and squashiness of the ventral tumor, thereby enabling the plate G' to press firmly on the tumor; secondly, by the lifting action upon the whole viscera the great movableness thereof is destroyed and hard pressure upon the umbilicus is allowable without the usual pain and sense of sinking at the stomach, which is permitted by the dragging action of other trusses, which plug up the ring but do not support and compact from below; and, thirdly, the apparatus presses upon no point but where it effects a good result, whereas other hoop-trusses press tightly around the middle of the body, and not only squeeze downward but compress the whole abdomen at intermediate points, beside being always liable to slip up or down from its position, and thus leave the patient unprotected. The application of my improved combination of devices has been found to render the greatest relief in cases where the patient had been in a despairing condition for years.

H represents a spring attached to the lower end of the spinal lever A, said spring being provided with a transverse slot at its upper end, through which the lever A passes, and which adapts the upper end of the spring H to admit of a free vertical play upon the lever A. This spring H is curved to conform to the perpendicular or vertical curve of the sacrum and extends forward between the nates and limbs to a point a little beyond the anus. To the forward end of this spring H

is attached a round or oblong ball or pad, H', the attachment being made by means of a screw, which may be inserted in either of a series of apertures, h, in order to vary the position of the ball H'. This ball fits and supports the anus and invariably keeps its proper position during all movements of the body, the slot in the upper end of the spring H permitting the spring to play up and down without moving the ball H'. By this device, as employed in connection with the other parts of the apparatus, the worst forms of the piles and prolapsus ani are retained. The two powers which act in the treatment of these affections are, first, the elevating action of the plate E, whereby visceral pressure is held off from the hemorrhoidal veins, (the first and perpetual cause of the affection,) and, secondly, by the local pressure or support of the ball H.

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

1. The scalloped front pad or plate, E E² E³, in the described combination with inguinal pads e³ e³, attached by separate springs to the mainspring B, and occupying the scallops in the plate E, all substantially as herein described.

2. In combination with the scalloped front pad or plate, E, and inguinal pads e³ e³, the extensible springs e⁹ e⁹, constituting adjustable attachments for the said inguinal pads independent of the attachments of the plate E.

3. The combination of the mainspring B, front pad or plate, E, and femoral-hernia pad F F', constructed and adapted substantially as herein specified.

4. Attaching the respective ends of the front pad or plate, E, by independent springs, so as to admit of changing the height of either end of said plate without affecting the other end.

5. Making the extension-springs, which are attached by loops to the mainspring, with slots working easily on guide-pins or otherwise, so as to automatically extend and contract by the motion of the body, and become adjusted in length with the surface on which they impact, conforming in length to the linear extension due to the flexure of the body, and rendering the instrument relatively permanent while the attachment is adjustable.

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Witnesses:

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