Oct. 7, 1930. A. J. PLUMB 1,778,001

SURGICAL TRUSS AND LIKE APPLIANCE

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FIG. 1.

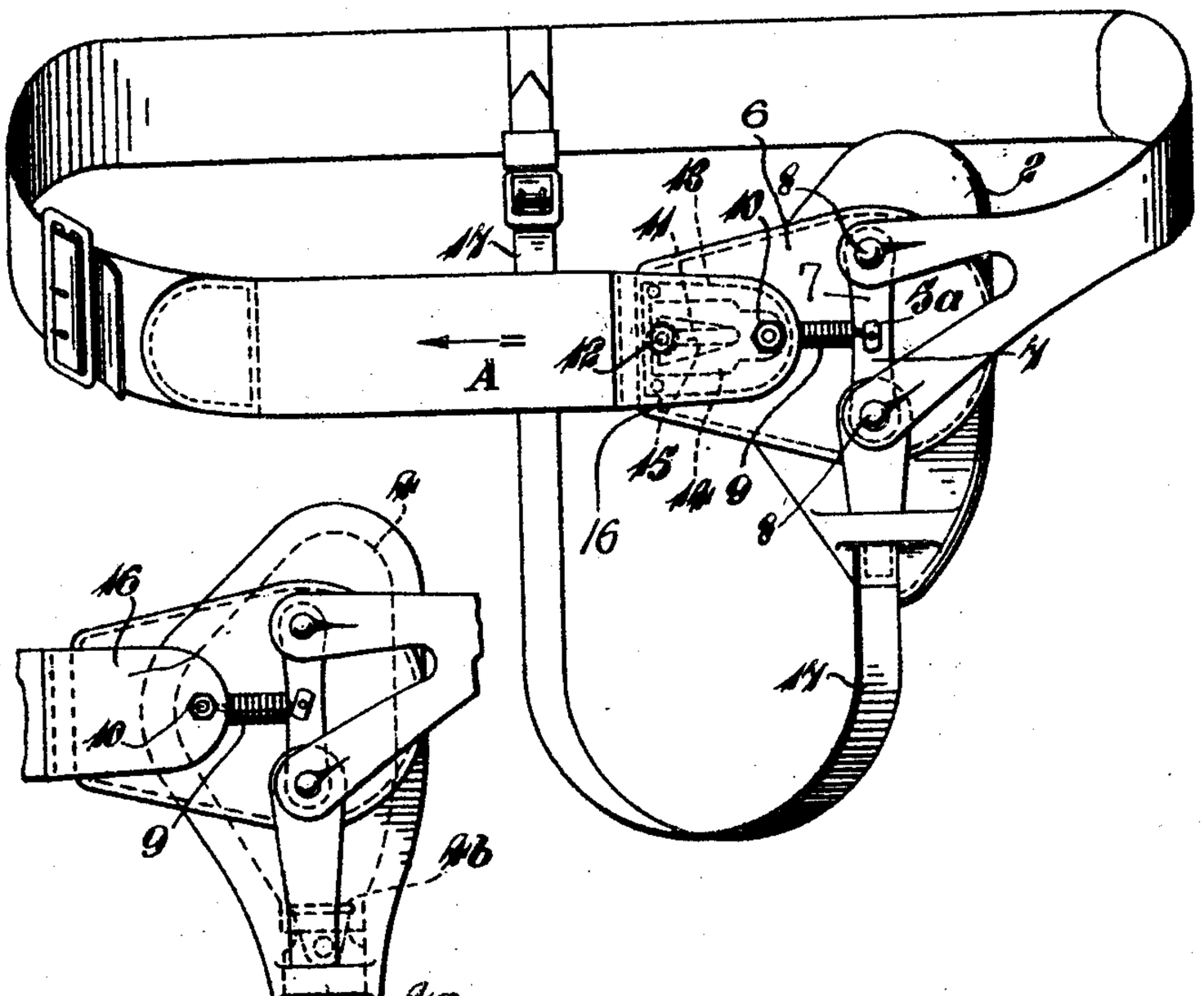


FIG. 2.

FIG. 3.

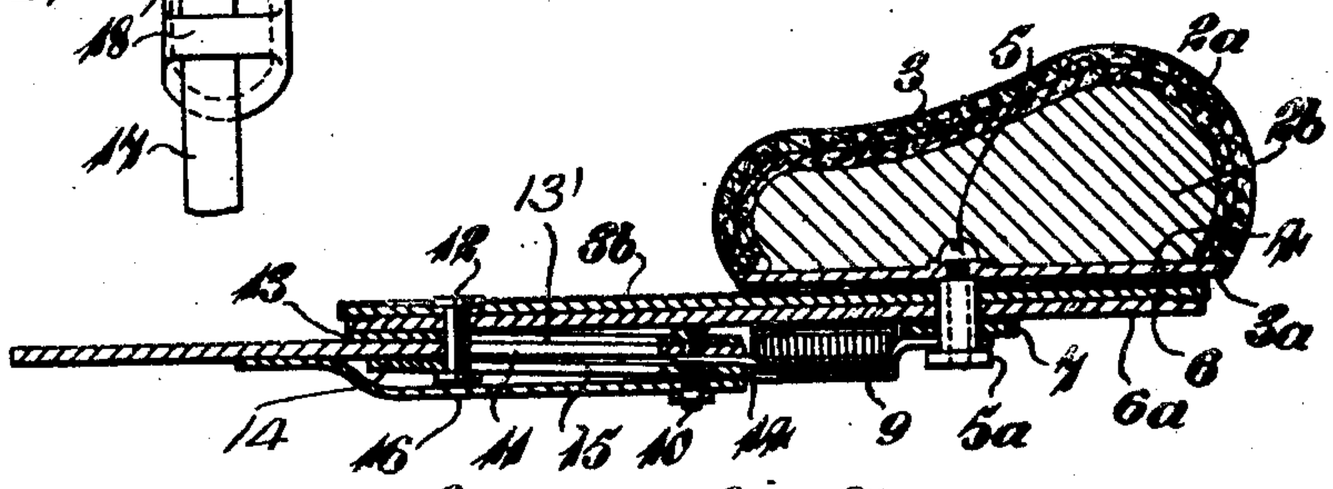
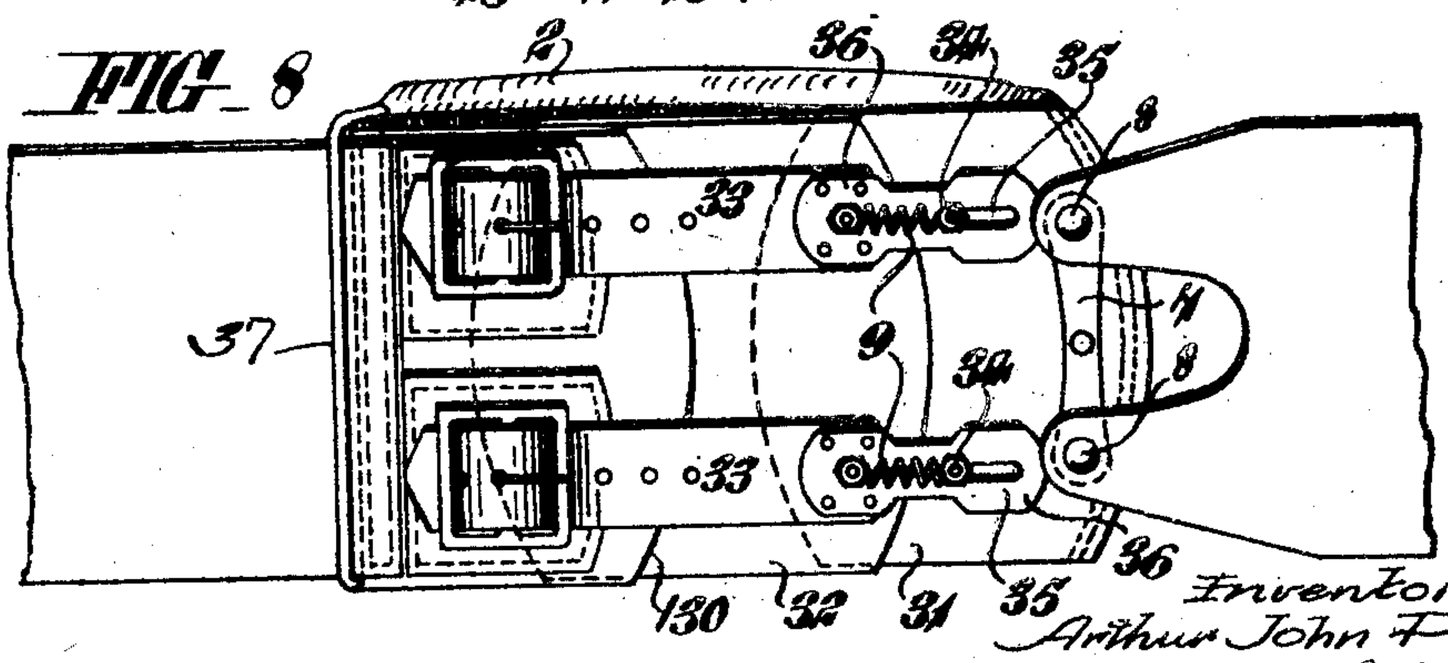


FIG. 8.



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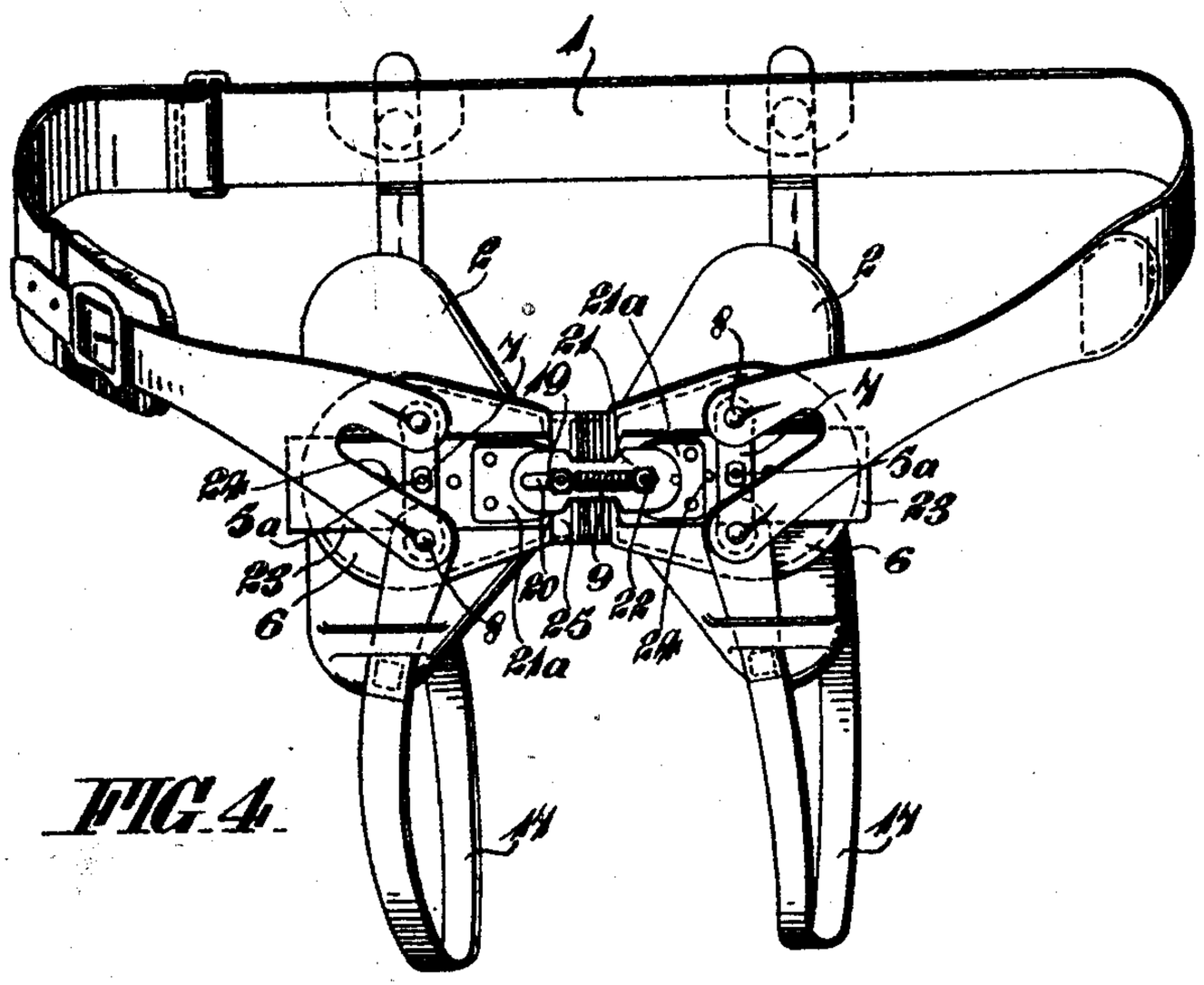

FIG. 4.

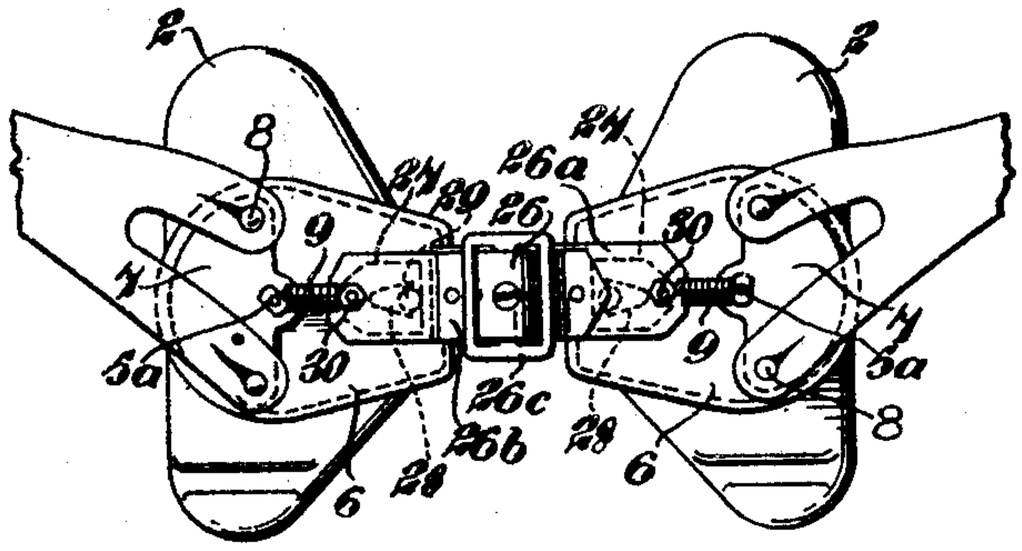

FIG. 5.

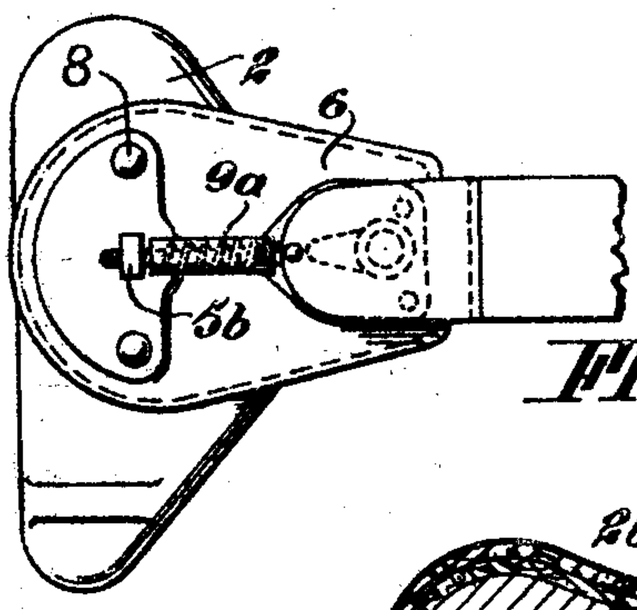

FIG. 6.

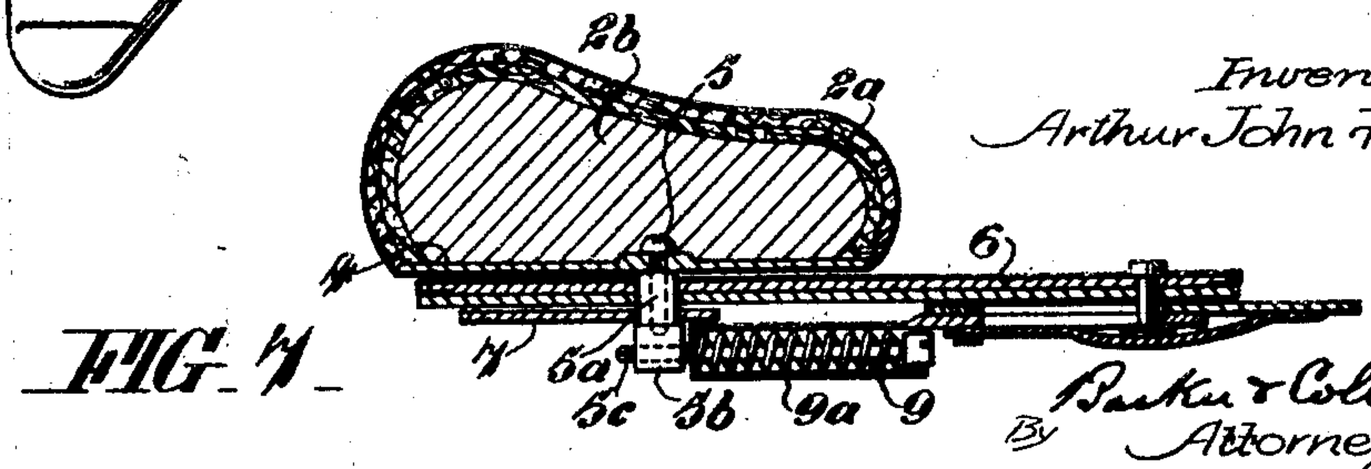

FIG. 7.

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UNITED STATES PATENT OFFICE

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SURGICAL TRUSS AND LIKE APPLIANCE

Application filed September 28, 1929, Serial No. 395,973, and in Great Britain September 27, 1928.

This invention comprises improvements in or relating to surgical trusses and like appliances and has more particular reference to appliances employed for the treatment of rupture and other ailments in connection with which pressure has to be applied to the affected part of the body, the object of the invention being to provide an appliance which, as compared with existing appliances, will afford increased comfort to the wearer and permit greater freedom of movement of the body without displacing the appliance from its adjusted position.

Additionally, the improved appliance is constructed so as to ensure the most effective degree of pressure being maintained at the exact required position or positions, and by so doing provide greater relief to the wearer and expedite a cure of the rupture or other ailment.

According to this invention a surgical appliance is provided comprising a pad, a retaining strap for said pad, a member slidable upon a part secured at the rear of said pad, said sliding member being interposed between the ends of the strap and a spring associated with said sliding member and resisting movement apart of the opposing ends of the strap.

The pad or pads of the improved appliance is or are preferably formed hollow or concave on the inner face, and may in some cases have a small plate member hinged at the lowermost part so as to apply upward pressure in the crotch beneath the pad.

In order that the invention may be more readily understood reference will now be made to the accompanying drawings, wherein:—

Fig. 1 illustrates one embodiment of the invention for use in connection with a single rupture or hernia.

Fig. 2 illustrates an attachment for applying upward pressure in the crotch.

Fig. 3 is a cross section of the pad shown in Fig. 1.

Fig. 4 illustrates an appliance in accordance with this invention for use in connection with a double rupture or hernia.

Fig. 5 shows a modified method of connecting the pads.

Fig. 6 is an elevational view of a further modified method of mounting the pad and the connections therefor.

Fig. 7 is an enlarged cross sectional elevation of the pad shown in Figure 6, and

Fig 8 illustrates a type of pad and method of mounting suitable for use as a kidney support or for other purposes.

Referring to Fig. 1, an adjustable body belt is represented at 1 and the pad proper is shown at 2. This pad may be of any usual or convenient construction, being shaped as requirements dictate and preferably comprising a covering of velvet or other suitable material 3. In the arrangement shown in Figure 3 the interior of the pad comprises two layers of felt 2^a next to the velvet and a centre core of sponge rubber 2^b, but as previously stated any known or convenient material may be utilized. When employed for treating rupture the pad is advantageously of greater thickness along that edge adapted to be disposed nearest to the hip of the wearer than at the opposite edge.

The pad is fixed by adhesive or other means to a metal plate 4 which is also preferably covered with velvet 3^a which may be stitched to the velvet 3 and thus constitute a means for anchoring the pad to the plate. Passing through the plate 4 is a screw 5, pivotally mounted upon which is a metal plate 6, preferably covered on the one face with velvet 3^b and on the other face with leather 6^a.

In the arrangement shown the screw 5 is furnished with a headed sleeve 5^a, there being in addition to the said plate 6 a connecting bar or plate 7 pivotally mounted upon the said sleeve. The one end of the body belt is detachably connected to each extremity of the member 7 by studs 8 or other convenient means. The other extremity of the belt is connected to said member 7 by spring 9, such spring being anchored to the sleeve 5^a and to a screw or bolt 10. The said screw 10 also passes through the last mentioned extremity of the body belt 1 and near such extremity is formed a V-shaped slot 11 through which passes a rivet 12 anchored to the plate 6.

Riveted to the body belt 1 is a metal strengthening plate 13 which is also provided with a V-shaped slot coinciding with the slot 11. Mounted exteriorly of the body belt is a second plate 14 positioned by the screw or bolt 10 and provided with a longitudinal slot 15 through which the said rivet 12 passes. An outer covering member of leather or other suitable material may be provided as shown at 16.

When in the assembled position shown in Figure 1 the one extremity of the body belt is capable of adjustment to suit the movements of the wearer by virtue of being attached to the pivotal member 7. The other extremity of the belt is capable of movement in the direction of the arrow A against the resistance of the spring 9 and is also capable of pivotal movement about the bolt 10 relatively to the plate 14, such pivotal movement being restricted by the triangular slot 11.

If a crotch strap is required this may be provided as indicated at 17, being preferably adjustable in length as shown and being removably connected to the lower stud 8 so that such strap is itself capable of adjustment by virtue of the fact that the member 7 carrying the stud is pivotally mounted as previously described.

It has been found in practice that in using appliances in accordance with this invention maximum freedom of movement is obtained without the pad 2 being moved from its adjusted position. In the modification shown in Figure 2 the pad is formed with a depending portion 2′ for the purpose of giving an upward pressure in the crotch if desired.

In the arrangement shown a metal projecting tongue 4^a is hingedly connected as at 4^b to the metal plate 4, the pad and projection being suitably upholstered and covered in any convenient manner.

In the arrangement shown the crotch strap 17 passes through keepers 18 located exteriorly of the projecting part 2′.

In the application of the invention to appliances for use in connection with double ruptures or hernias the resilient spring means may be located between the pads, or alternatively the body strap may at each extremity be connected to the pads by separate resilient means. These two modifications are illustrated in Figures 4 and 5 respectively.

In the arrangement shown in Figure 4 a metal plate 6, preferably covered with suitable material, is pivotally connected to the metal plate forming the backing of each pad 2 by means of a screwed sleeve 5^a. Each extremity of the body belt is detachably connected to studs 8 mounted upon a member 7 pivotally mounted upon said screwed sleeve 5^a and the crotch straps 17 are also attached to the lower of the said studs 8, such straps being detachably and adjustably connected at their opposite extremities to the body belt in accordance with customary practice.

The inner extremities of the two plates 6 are connected by a coil spring 9, the one extremity of such spring being anchored to a member 19 which is slidable in a slot 20 formed in a plate member 21, such latter member being pivotally anchored at the end remote from that in which the slot 20 is formed by a screw or the like 22 to which the opposite end of the said spring is itself anchored. The said members 19 and 22 may be carried directly by the said plates 6 or alternatively by leather or other straps 23 facially attached thereto, such straps 23 being preferably provided with adjusting holes 24 for the reception of the screwed sleeve 5^a, thereby allowing the relative position of the straps and the pads 2 to be readily adjusted. The plates 6 may if desired be connected by elastic webbing or other resilient connecting means indicated at 25 and strengthening plates may also be provided as indicated at 21^a.

It will be appreciated that the straps 23 are capable of relative movement in the direction of the length of the slot 20 and are also capable of pivotal movement about the members 19 and 22.

In the alternative arrangement shown in Figure 5 the members 7 are themselves connected by springs 9 to a connecting member 26. Such member may comprise two leather straps 26^a, 26^b joined by a buckle 26^c, such buckle allowing for the effective length of the connection 26 being adjusted. Riveted to the under side of each strap is a metal plate 27 and a slot 28 in each plate accommodates a pin or the like 29 projecting from the plate 6, thus providing for longitudinal movement of each of such plates 6 against the resistance of the springs 9 relatively to the connecting member 26 whilst the springs themselves allow for pivotal movement about the members 30, such latter members being bolts or screws carried by said plates 27 and forming the anchoring means for the one extremity of each spring. At the other extremity the springs are anchored to the screwed sleeves 5^a.

It will be appreciated that in the construction shown in Figure 5 the connection 26 allows of relative movement of the pads into and out of the paper in the manner of a hinge, but if desired the buckle 26^c may be replaced by a metal or other form of hinge, means being again preferably provided for varying the effective length of the connection.

A modified method of mounting the springs used in accordance with this invention is shown in Figures 6 and 7. The screw 5 passing through the plates 4 and 6 is provided with a sleeve 5^a and a screwed head 5^b. Passing through this head is a rod or bolt

5c. The spring 9 is assembled upon such bolt and located in a sleeve 9a so that in this construction the belt or associated part which functions to compress the spring is connected to the said sleeve or an extension thereto.

Figure 8 illustrates a construction suitable for use as a kidney support or for other purposes. The belt is connected at one extremity to a plate 130 and at the other extremity to a plate 31. Such latter plate is connected by springs 9 to an intermediate plate 32 and such intermediate plate is connected by adjustable straps 33 to the plate 130. The one end of each spring 9 is anchored to members 34 carried by the plate 31 and such members 34 are slidable in slots 35 formed in metal plates 36, such latter plates being axially connected to the intermediate plate 32 and the springs at the opposite extremity being anchored to members carried by such plates. The pad for bearing upon the affected part of the body is conveniently anchored at one extremity to the outer end of the plate 31 and at the other extremity it may be attached by means such as a rubber band 37 to that end of the plate 130 to which one end of the body belt is attached, the other end of such belt being removably connected to studs 8 formed on a pivotal member 7, such latter member being hingedly connected to the plate 31.

The retaining strap or belt 1 utilized with appliances in accordance with this invention may be extensible or otherwise as desired but it will be seen that the requisite freedom of movement of the body is obtained without relying upon the resilience of the retaining strap and without moving the pad from its adjusted position.

It will be seen that in each embodiment of the invention herein described one end of the strap or belt has pivotal connection with the plate that is attached to the pad, as through the plate or lever 7; that to the other end of the strap there is connected a member, such as a plate, that has limited and directed sliding movement relative to the plate connected to the pad, and that the spring or springs employed to constitute an extensible connection between the ends of the strap or belt is, or are, connected at one end, either directly or indirectly, with the plate united with the pad. In most of the forms of the invention illustrated the connection of the spring with the plate 6 is through the medium of the screw 5 and the sleeve 5a turning thereon, thus giving a pivotal connection between the plate and one end of the spring, as well as affording a pivotal connection between the plate and the pad.

I claim:—

1. A surgical appliance comprising a pad, a retaining strap therefor, a plate united to the pad, a bar lever to the opposite ends of which one end of the strap is connected permitting pivotal movement of the strap relative to the pad, a member having connection with the other end of the strap and associated with the said plate so as to have a limited sliding movement relative thereto, and a spring interposed between the said sliding member and the said plate, operating to resist movement apart of the opposite ends of the strap.

2. A surgical appliance comprising a pad, a retaining strap therefor, a plate at the rear of the pad, a pivotal connection uniting the plate and the pad, a bar lever to the opposite ends of which one end of the strap is connected, centrally supported upon the said pivotal connection, a sliding plate at the rear of the pad, with which the other end of the strap is connected, a guiding pin-and-slot mounting for the sliding plate, whereby it has limited movement relative to the plate that is pivotally united to the pad and a spring extending between the said sliding plate and the pivotal connection uniting the pad, plate and bar lever.

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