E. Crain,

Truss.

No. 2,913. Patented Jan. 16, 1843.

Fig. 3.

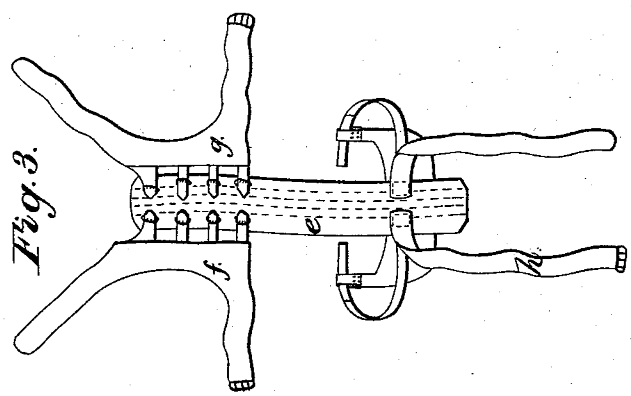


Fig. 2.

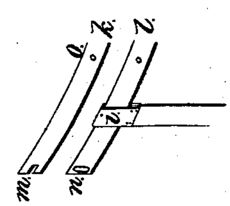
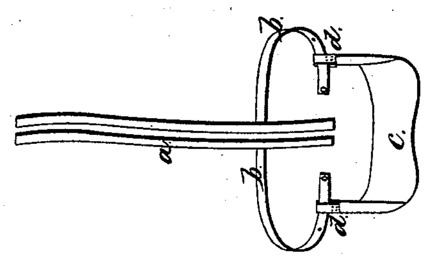


Fig. 1.



Witnesses.

Geo W Porter

Fredk W Porter

Inventor.

Eleanor Crain

UNITED STATES PATENT OFFICE.

ELEAZER CRAIN, OF SPRINGFIELD, VERMONT.

APPARATUS FOR THE CURE OF CURVED SPINE, HERNIA, &c.

Specification of Letters Patent No. 2,913, dated January 16, 1843; Antedated July 16, 1842.

To all whom it may concern:

Be it known that I, ELEAZER CRAIN, of Springfield, in the county of Windsor, in the State of Vermont, have invented a new and improved surgical apparatus for the treatment and cure of weak backs, curvature of the spine, chronic affections of the chest and stomach, weakness of the sides, abdominal weakness, and the class of complaints requiring an abdominal supporter; and I do hereby declare that the following is a full and exact description thereof.

The said apparatus consists of three parts or portions, viz: an abdominal supporter, a spring or rather, pair of springs to support and sustain the spine, and a pair of "shoulder braces" or shoulder straps to hold the shoulders back and give room for the action of the lungs.

To construct the said article I make use of two springs (as exhibited at *a* Figure I of the annexed drawings). These springs are intended to be fitted one on each side of the spine and are of such a degree of intensity and stiffness and therefore of such a material as the patient may require; I have generally used steel but have reason to believe that whalebone and even wood may in some cases be used with propriety. The direct and principal use of this pair of springs is to support the spine, but they also by passing up the back between the shoulder blades hold the shoulder braces (herein after described) in their place, and they are likewise each riveted to a steel hoop (as exhibited at *b* Fig. I) which passes partly around the patient's body above the hip, which pair of hoops both together clasp an abdominal supporter firmly against the portion of the abdomen which may most require the pressure. These hoops too, are of such curvature as will fit the patient's size, and of a stiffness or elasticity adapted to his strength and to the requirements of his disease. The object and purpose of this pair of hoops being to hug the abdominal support firmly against the abdomen and also to hug the springs firmly to the back of the patient so that his belly and back will mutually sustain each other. Any surgeon will of course know that between infant and adult patients there will be different degrees of stiffness required in these hoops. For adult patients I have both for the hoops and springs used the sheet steel number 20 and of the width of five eighths of an inch. To prevent rust it is well to cover these springs with a coating of japan varnish or to tin them.

Abdominal supporters as is well known to surgeons should in size, shape and material be adapted to the wants of each particular case. They are pads of such size, shape, hardness or softness as may be required, and they are to be gently pressed against such parts of the person as uterine or abdominal diseases may render necessary. A minute description of any one particular pad it is presumed is not here necessary. The pad I use in cases of general weakness of the abdominal muscles, as also where the object is to merely sustain the spine, is a tin plate of a crescent shape and of a concavity fitting the convex form of the belly and I cover it with soft wash leather. This form of the pad is exhibited *c* Fig. I. It is also well to cover the inner surface of this pad with india rubber cloth to exclude the perspiration. Whatever the shape of the pad may be it is hugged against the abdomen by connecting it with the hoops above described, and this connection is formed by having the forward end of each hoop slide through a stout brazen loop fitted to receive it, and this loop is firmly riveted to a steel spring which at its other end is riveted to the pad; the length of these last named springs must of course be adapted as also their curvature to the part of the abdomen requiring the pressure of the pad.

When the metallic part of the apparatus is finished the back springs and all but the forward portion of the hoops are inclosed in wash leather; and the back springs are also stitched between two thicknesses of firm cloth. And to this covering near the upper end of each spring one of a pair of shoulder braces is attached by buckles (as seen at *f* and *g* Fig. III.) But in stitching said springs into the cloth they are placed at such a distance apart as will prevent their pressure on the spine or rather will leave room for the spine between them. (See *a* Fig. I and *e* Fig. III). The shoulder braces may be attached by means of lacing instead of buckles, or by sewing.

I have said that the forward part of each hoop slides through a brass loop connected with the pad. This sliding is required 1st whenever one of the hoops is to be liberated from the loop and pad to enable the patient to put on or take off the apparatus. 2d it

is necessary in exchanging one pad for another; 3d to make the hoops fit the abdomen whether when first adjusted or during subsequent motion by breathing or otherwise. To effect all these purposes and yet prevent all accidental withdrawals of the hoops there is a contrivance which is exhibited at Fig. II. The loop (*i*) is large enough to receive the hoop (*k*) and another shorter piece of steel of similar width and thickness (*l*). The hoop has a slot in its end (*m*) which after sliding through the loop slides under the button (at *n*); and another button or rivet (at *b*) on the short piece snaps into an eyelet hole (at *o*) in the hoop so that the hoop and its shorter piece of steel will slide through the loop together. And when it is desired to withdraw the hoop from the loop, the above operation is reversed, the hoop being sprung till the button or rivet (at *b*) is withdrawn from its eyelet, and then the hoop is withdrawn from its loop, and the apparatus is opened and ready to clasp the patient's body.

A belt of india rubber webbing passes around the body outside of the hoops. This belt being firmly stitched behind to the covering of the back springs keeps their lower portions properly separated and also by being buckled in front supports the upper part of the abdomen. This belt is exhibited at *h* Fig. III.

I do not claim as my invention the shoulder braces, or springs to support the spine, or the abdominal supporter, but

I do claim as my invention—

The combination of said three parts and the combination of any two of them except that of the shoulder straps and abdominal supporter in the manner and for any of the purposes specified above.

In testimony whereof I have hereto affixed my signature.

ELEAZER CRAIN.

Witnesses:
GEO. W. PORTER,
THOMAS DANA.