(No Model.)

C. MORRILL.

HERNIAL TRUSS.

No. 261,168. Patented July 18, 1882.

Fig. 1.

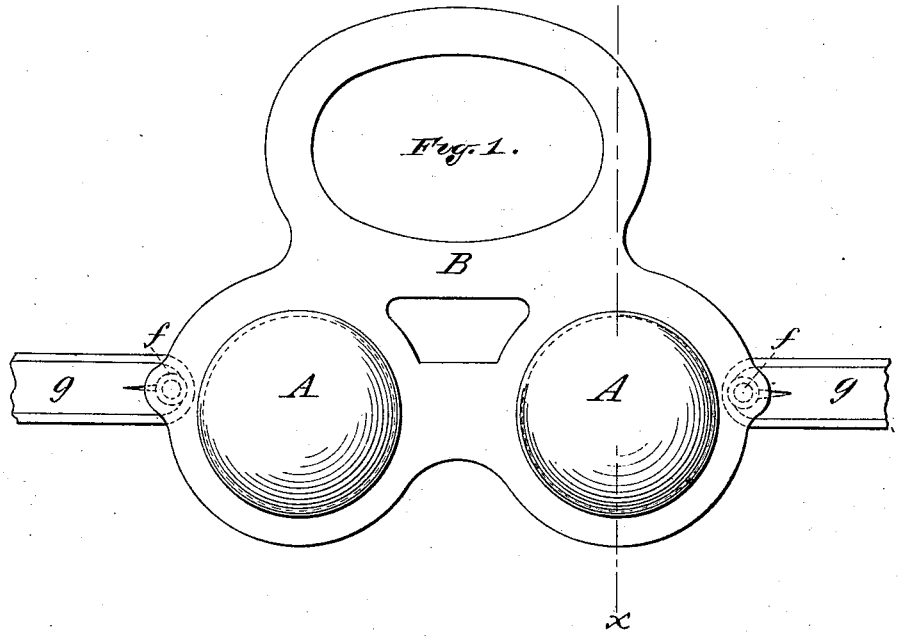


Fig. 2.

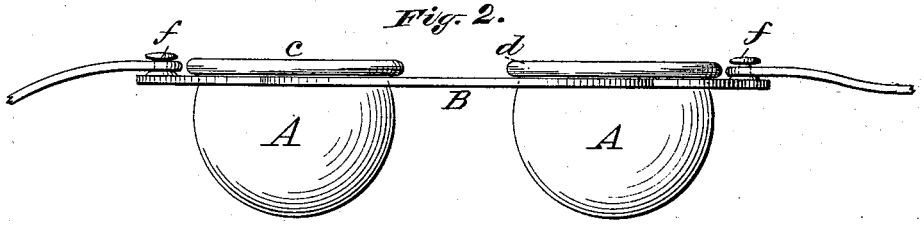
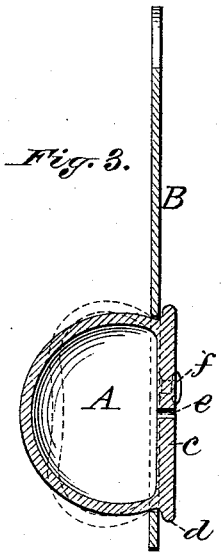


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES MORRILL, OF NEW YORK, N. Y.

HERNIAL TRUSS.

SPECIFICATION forming part of Letters Patent No. 261,168, dated July 18, 1882.

Application filed June 6, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MORRILL, of New York city, in the State of New York, have invented certain new and useful Improvements in Hernial Trusses, of which the following is a specification.

Several trusses have been heretofore devised with hollow pads of rubber in spherical or rotund shapes, which are designed to adapt themselves to the anatomy or exact form and location of the rupture in each individual and press in an elastic, diffused manner upon the same. My improvement belongs to this class of trusses; and it consists in several improved details of construction, whereby greater lightness, simplicity, and efficiency are obtained. Heretofore the hollow rubber pad has been entirely closed or sealed, and its elasticity has been due chiefly to its confined air, and but slightly to its rubber walls, which have been made thin, whereas in my case the hollow pad is vented and its walls are made thick and its elasticity lies entirely in the elasticity of its walls, whereby a more elastic and better adapting pad is produced, and, moreover, a circulation of air is allowed in its interior. Again, heretofore the hollow rubber ball or pad has either been held in a cup-shaped holder or has been stitched into a belt or band, or has been molded with a broad base-plate, whereas in my case I provide a rigid sustaining pad-plate having socket-openings in which the pad-balls are simply inserted or sprung and held merely about their circumference, so that a much lighter and firmer truss is produced and a firm grasp obtained upon the pad-balls, and at the same time they are presented in a more elastic manner against the person.

My invention therefore consists chiefly in the features here indicated, and also in the particular construction of the pad-balls, whereby they are readily inserted and held in the pad-plate, as hereinafter fully set forth.

Figure 1 of the annexed drawings presents a front elevation of the essential parts of my improved truss—viz., the socket-plate and pads—viewed from the inner side. Fig. 2 is a plan view thereof, and Fig. 3 a vertical section on *x x*.

In these figures the truss is shown as double, adapted for double inguinal hernia; but the surgeon or instrument-maker or other expert person will readily understand that the truss may be modified to suit any kind of rupture, whether single or double, whether for umbilical rupture or any of the various forms of inguinal or femoral rupture, without departing from the essential plan illustrated.

In the drawings, A A indicate the truss-pads, which are hollow and elastic and of globular, or nearly globular, shape, being preferably made of hollow balls or cushions of vulcanized india-rubber. These hollow balls or pads are held in a socket or sustaining-plate, B, preferably made of thin sheet or cast metal or other strong or sufficiently rigid material, which is strapped upon the person or otherwise fastened so that the pads properly press upon the location of the rupture, as will be understood. This plate B is flat, or nearly flat, and is preferably made in the form of a trefoil, the pad-balls being inserted in the two lower leaves, while the third or central leaf is extended upward to rest lightly against the abdomen or pubis. The upper and central parts of this trefoil plate are perforated or cut out, as shown in Fig. 1, so as to lighten the plate, and the lower portion is perforated with socket-openings to receive the pads, as shown in Figs. 1 and 3, thus greatly reducing the weight of the plate, while retaining all necessary strength.

The pads are preferably made of true spherical form on their bearing side, and their form includes a little more than half the sphere, as illustrated in Figs. 2 and 3, and they are provided beyond the equatorial zone with a flat base or head, *c*, having a lip or flange, *d*, which projects beyond the circumference of the ball, as shown fully in Figs. 2 and 3, thus forming a groove or recess between the lip *d* and the equator of the ball. These balls are preferably held about their circumference in the socket-plate in the circular openings formed therein to receive them, which openings, as illustrated by dotted lines in Fig. 1 and section in Fig. 3, are smaller than the equatorial circumference of the balls, so that the balls are sprung into these openings and firmly held between the equatorial bulge and flange *d*, as shown in Figs. 2 and 3. The construction of the pads and plate and their mutual connection is thus not

only very simple and secure, but the pads are very easily inserted in the plate or removed therefrom when desired, yet are not capable of accidental removal, for it will be observed that when the bearing-face of the pad is pressed against the person it tends to flatten and spread out, as indicated by dotted lines in Fig. 3, thus rendering its fixation in the socket-plate the more secure.

The balls or pads, as before mentioned, are preferably made of vulcanized rubber in the hollow form illustrated in Fig. 3, and the balls are vented at some point, as shown at *e*, preferably in the center of the base, so that the elasticity of the pad lies entirely in the elasticity of the spherical rubber walls. If, however, a stiffer degree of elasticity is desired, the vent *e* may be plugged, so as to use the elasticity of its confined air in connection with the rubber walls, or the quantity of the air may be reduced by first partly collapsing or flattening the ball and then plugging the vent, so as to regulate the stiffness and elasticity as may be desired. It is generally preferable, however, to have the vent open and rely on the elasticity of the rubber, which will be sufficient for all cases, for I will here specify that the balls may be made with a greater or less thickness of rubber in their walls, so as to provide any degree of stiffness and elasticity required. Hence the truss may be fitted with balls of greater or less elasticity and stiffness to suit each individual, according to the nature of the rupture, the pressure required to retain it, or according as the person is engaged in easy or laborious work, and the balls may be readily changed or interchanged at any time desired, as occasion may require, thus adapting the truss to the individual and occasion.

The socket-plate *b* is provided with a projecting stud, *f*, on each end, on which straps *g g* may be attached, which, being passed around the body just over the hips and buckled at the back with any desired degree of tightness, will thus hold the truss properly upon the person in a simple ordinary manner, so that the pads will be pressed properly upon the location of the rupture or ruptures.

Where the individual is engaged in laborious or active work the truss may be held with greater security by additional straps extending from the back of the body-strap, passing under the groin and up to the studs *f f*, so as to prevent the possibility of the truss rising out of place.

It will be noted on reference to Fig. 1 that the studs *f f* project from the socket-plate on a line which is above the center line of the pad-balls, or, rather, above the line or axis on which the upper and major part of the plate, &c., tends to rotate away from the body, which line corresponds nearly with the center of gravity of the plate and pads. Hence the tendency of the strain of the binding-strap is to turn the upper part of the plate against the abdomen, with the center line of the balls as a fulcrum; but as the top of the plate is at a long radius from the line of strain or fulcrum it presses very lightly against the abdomen, and the result is that all, or nearly all, the strain is inward centrally upon the pads, pressing them effectually against the seat of the rupture, and at the same time tending to rotate the major part of the plate against the abdomen, whereby the whole device remains secure in proper position upon the person.

I have stated that I prefer to hold the pad-balls about their circumference, for it may be noted that if they were simply held at their centers one-half of the ball would tend to bend concavely into the other half, so that its elasticity or adapting nature could not be properly availed of; but when the ball is held around its circumference in a socket-opening in the sustaining-plate, not only is the ball held securely and the plate rendered light, but the ball is presented in a firm manner against the person, so that its elasticity is of a firm nature, yet sufficiently yielding and adapting to render the truss both certain and easy in its action.

I have also stated that I prefer to form the pad-balls of vulcanized rubber, as this is manifestly the best material now known for this purpose; but any other yielding or elastic material now in use or which may hereafter be produced may be used instead.

In lieu of making the pads in spherical form, as I prefer to do, any similar curved or rotund shape may of course be adopted, and while I consider it preferable to make the plate B of fine malleable iron cast about one-sixteenth of an inch thick, yet it may be made of celluloid, hard rubber, or other material sufficiently strong for the purpose.

The bearing-face of the rubber pads may, if desired, be perforated to permit the free action of the skin against which they press.

What I claim is—

1. A hernial truss formed with a rigid sustaining pad-plate having a flat or nearly flat extent, and with one or more socket-openings therein, in combination with an elastic pad inserted in said opening and held about its circumference therein, substantially as herein set forth.

2. An elastic adapting truss-pad formed with a circumferential recess, in combination with a rigid pad-plate having a socket-opening to receive and hold said pad by the engagement of the recess on the pad with the edge of the socket-opening, substantially as herein shown and described.

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