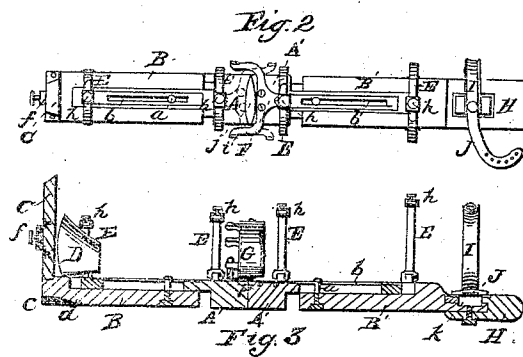
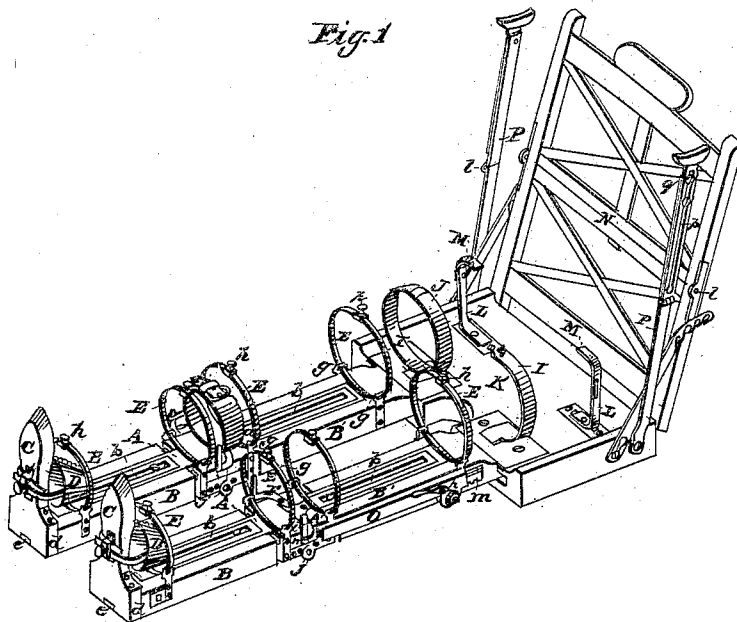


L. Hussey,
Fracture Apparatus.
Nº 9,467.
Patented Dec. 14, 1852.



UNITED STATES PATENT OFFICE.

ZIMRI HUSSEY, OF CHILlicothe, OHIO.

APPARATUS FOR TREATMENT OF FRACTURES.

Specification of Letters Patent No. 9,467, dated December 14, 1852.

To all whom it may concern:

Be it known that I, ZIMRI HUSSEY, of Chillicothe, in the county of Ross and State of Ohio, have invented certain new and useful
5 Improvements in Apparatus to be Employed in the Surgical Treatment of Fractures and Luxations; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the
10 accompanying drawings, forming part of this specification, in which—

Figure 1, is a perspective view of the apparatus to be employed in difficult cases of fracture of both or one of the inferior extremities. Fig. 2, is a plan view of what I
15 term the perfect adjuster which constitutes part of the apparatus shown in Fig. 1; Fig. 3 is a side view of the same.

Similar letters of reference indicate corresponding parts in each of the several figures.

This invention consists in certain improvements in and certain appendages to be applied to the apparatus known as the
25 double inclined plane, for the purpose of making a more perfect instrument which I term the "perfect adjuster."

It also consists in the attachment of a seat piece with certain braces and other
30 appendages to a pair of double inclined planes or "perfect adjusters" for the purpose of rendering additional aid in the adjustment or reduction of the most difficult cases of fracture or luxation of the lower limbs,
35 where both or only one are injured.

To enable those skilled in the art to make and use my invention I will proceed to describe fully its construction and operation.

A, A', B, B', (Figs. 1, 2 and 3,) represent the parts of the double inclined plane; A, A', being hinged together at *j*, and having
40 tongues fitting in rabbets in B, B'. which allows B, B', to be extended longitudinally. Screws *a*, *a*, with nuts are provided to secure
45 A, A', B, B', in any positions relatively to each other. Slots *b*, *b*, being made for the screws to work in. These parts as far as described do not differ materially from the ordinary double inclined plane.

To the lower piece B, of the double inclined plane, a foot piece C, is attached, consisting of a flat board of about the same
50 shape as the sole of the foot; it is attached to the piece B, by a band *d*, of metal which is secured to it and embraces the end of B,
55 a spring catch *c*, being secured to B, which

catches the band *d*, and holds the foot piece in place (see Fig. 3). Connected to the foot piece there is a shoe D, of leather or other material which is intended to be placed
60 around the ankles, to this shoe the foot piece C, forms a sole, the shoe being connected to C, by a pair of straps *e*, *e*, one attached to each side of the shoe, and both passing through a screw clamp *f*, attached to the
65 back of the foot piece.

The straps *e*, *e*, may be shortened or lengthened to bring the shoe closer to or farther from the foot piece. The foot piece
70 and shoe are for the purpose of producing extension or counter extension either of the whole limb, or only below the knee.

Metallic bands E, E, are attached to the pieces A, A', B, B', at suitable points to pass around the upper and lower portions of
75 the thigh and leg. These bands consist of light bars or strips of metal passed through a loop or pair of loops *g*, *g*, attached to the parts which form the inclined planes, and bent like hoops, with their ends overlapping
80 each other and secured together by screw clamps *h*, *h*, which allow their size to be altered.

The bands are for the purpose of confining the limb to the adjuster and for con-
85 fining two, three, or more splints upon the limb where needed.

Attached to the part A', close above the hinge or joint *j*, is what I term the knee fork which consists of a metal plate F, of
90 forked shape secured by screws or otherwise to A', and having two horns *i*, *i*, which stand up on each side of the knee. These horns *i*, *i*, are for the purpose of receiving two of the loops of a band G, of
95 leather, or other material which is placed around the lower part of the thigh above the condyles of the femur for the purpose of extending the thigh, being padded inside to protect the nerves and blood vessels inside
100 from too great pressure.

The same fork may be turned around and secured to the part A, below the hinge or joint *j*, as shown in dots in Fig. 2, for the purpose of applying the band G, in the re-
105 verse way, below the knee, for counter extension.

The uppermost part B', of the double inclined plane has a small block H, attached to it, which carries a brace for the hip. This hip brace I, consists of a semicircular
110 arc of metal attached in such a manner as

to be easily taken off and turned from one side to the other, it is intended to extend from under the upper part of the thigh and around the hip. Its outer face is concave and a leather strap J, is attached to it which passes under it and along the perineum, the said strap going entirely around the limb and being padded where necessary. The best idea of the hip brace is given in Fig. 1, the apparatus there shown requiring two, viz, one for each hip, one of which is shown with and the other without its strap. In that apparatus the seat piece K, supplies the place of the blocks H. The shank or stock $\frac{1}{2}$, of the braces I, serve as the means of connecting the inclined planes with the seat piece K, or blocks H, the pieces B', having tongues fitting in mortises in the seat piece or blocks, and the shank $\frac{1}{2}$, passing through both and being made secure by a nut below. In the apparatus shown in Fig. 1, provision must be made for the lateral adjustment of the hip braces and also of the two pieces B, B', to accommodate patients of different sizes, this is effected by making slots in the seat piece; but to suit extremes in size two or more sets of these braces will be required.

The seat piece K, is furnished with two other braces consisting of standards L, L, adjustable laterally in the seat piece and having curved or bent pieces of metal M, M, attached to them and adjustable at various heights, the said pieces M, M, being suitably formed to confine or inclose the crests of the ilium upon which they are made to press to prevent a rotary or twisting movement of the hips, and thus preserve the proper extension and coaptation of the parts in cases of fractures of the neck and shaft of the femur.

The seat is furnished with a back piece N, which is adjustable at different inclinations to support the patient in a reclining position; and also with a pair of crutches P, P, which are attached to its sides for the purpose of supporting the patient while the parts are being adjusted; the shafts of these crutches are hinged at $\frac{1}{2}$, to allow them to be adjusted laterally, and the upper joint has a sliding extension piece connected by screws g, g , working in slots r, r , to admit of their being adjusted in height.

In order to extend the double inclined planes, or adjusters, I employ a jack or jacks O, see Fig. 1, which are the same as what is commonly known as the rack and pinion jack. There are small recesses or notches m, m , in each of the pieces A, A', B, B', and an ear on the body and another on the rack of the jack; by placing the ears in the notches of A, and B, or of A', and B', and turning the pinion, the extension may be effected either above or below the joint or hinge j .

The spindle n , of the pinon is furnished with a ratchet into which a pawl p , attached to the body of the jack, engages and maintains the extension until the set screws a, a , are brought into operation, when the jack may be removed.

The construction of the several parts of the apparatus and their uses having been described I will now give a short explanation of the *modus operandi* commencing with the simple apparatus Figs. 2, and 3, which I will first suppose to be applied to the lower limbs, the parts A, A', B, B' always being applied to the posterior of the limb.

When the double inclined plane or the whole of the apparatus (Figs. 2, and 3,) is used, counter extension is secured by the strap J, which incloses the hip securely, in connection with the band G, or foot piece C. Extension if required to be applied to the whole limb, is produced by the said strap J, and the shoe D; but if only required at the knee, by the strap J, and the band G, placed above the condyles of the femur. In cases of dislocations of the hip joint, and in some cases of fractures in the femur the lower part A, B, may be taken away entirely and only the upper part A', B', H, used, because it will more readily admit of being moved in any direction necessary to the quickest and most perfect adjustment of the parts. Extension and counter extension of the parts may be then produced by the strap J, and in most cases of fracture or dislocation below the knee the lower part A, B, is all that is required, the knee fork F, being then secured to A, as shown in Fig. 2, in dotted lines. Extension or counter extension are then produced by the band G, and shoe D, or foot piece C. This apparatus or either part of it can be used upon either limb and is intended to be continued upon the limb with its metallic bands and a suitable number of splints, for the purpose of preserving the extension and the coaptation of the parts, as long as necessary. The bands and splints are not applied until the adjustment is complete.

This apparatus is applicable to all cases of dislocations of the joints of the arm and hand, as well as of the inferior extremities. When applied for the reduction of luxation of the head of the humerus or for the adjustment of fracture of its shaft, the whole of the double inclined plane is placed directly along the posterior of the extended arm, the hip brace I, passing over the shoulder from back to front; the strap J, is secured around and beneath the shoulder, a strap is passed around and just above the elbow and confined to the horns i, i of the knee fork, and the extension produced as directed for the lower limbs. The apparatus is more simple and efficient than any contrivance heretofore used for this purpose,

and allows any necessary movement of the arm in order to its adjustment and in cases of luxation admits of a sudden suspension of the extending force to restore the head of the humerus to its socket. To reduce dislocation of the elbow, the strap is placed around the arm just below the elbow, and secured to the horns of the knee fork, the brace I, and strap J, being confined at the shoulder as before directed, the arm held firmly and the elbow flexed to an obtuse angle; the necessary extension is now accomplished and the luxation reduced. For fractures and dislocations below the elbow the strap is placed around the arm lower down; the wrist, thumb, or any one of the fingers as the case may require, and secured to the foot piece; the extension can then be accomplished with steadiness, ease, and facility, and the reduction or adjustment easily effected.

The larger double apparatus shown in Fig. 1, is only intended to be used in the most difficult cases, for instance, a fracture of the neck of the femur, oblique fractures or extensive injuries of the shafts of one or both of the thighs. The patient is placed upon the seat and the two double inclined planes are adjusted at a proper distance apart. The two hip braces I, I, and their straps J, J, are brought into operation, as also are the ilium braces, L, M, L, M. The adjustment or reduction is then proceeded with in the same manner as with the simple apparatus, the extension being obtained at the knees, and care being taken that both limbs be made of one length. By this apparatus the connection may be restored without shortening the injured limb or limbs; and for the reason that rotary motion of the pelvis is prevented by the ilium braces, greater facility and certainty is given to the perfect reduction or adjustment. It is intended that the apparatus be furnished with cushions or folded cloths or blankets, necessary to the comfort of the patient. It is so constructed that the patient remains upon it as a couch of the most comfortable form, and may be moved from place to place any desired distance without impediment to the essential operations of nature, or disturbance of the injured parts.

The metallic bands E, E, are a very convenient means of confining the limb to the

inclined planes and allow the application of just so many splints as are required, without requiring them to be applied where they are not absolutely needed. This not only disturbs in the least possible degree the cutaneous exhalations, but allows washing and applications essential in cases attended with bruises and flesh wounds. The readiness and exactness with which they may be adjusted, makes them useful in all instruments applied to the limbs for any purposes substantially similar to those described.

The ease with which extension and counter extension is effected and maintained; the fixed position of the metallic bands and the splints which they inclose, the facility afforded for placing a dense cushion between the hip brace and the body, and passing an additional strap over the concave surface of this brace and around the entire body at the hip, all afford advantages for establishing and preserving the apposition of fractured bones not furnished by any known instrument.

Having thus fully described my invention, I will proceed to state what I claim and desire to secure by Letters Patent—

1. The hip brace I, of semicircular or nearly semicircular form, and the strap J, passing over it and around the limb, the said strap and brace operating as and for the purpose substantially as set forth.

2. The knee fork F, attached either to the upper part A', or lower part A, of the double inclined plane for the purpose of attaching a band which clasps the limb, to effect extension or counter extension at the knee as herein explained.

3. The application of the adjustable braces L, L, to the crests of the ilium substantially as and for the purpose described, the said braces being attached to a seat piece K, or its equivalent.

4. The seat K in combination with an adjustable back piece N, attached to two double inclined planes substantially as herein described, for the purpose of moving the cripple without changing the adjustment of the splints, for the purpose set forth.

ZIMRI HUSSEY.

Witnesses:

W. H. DOUGLAS,
JONATHAN SUTTON.