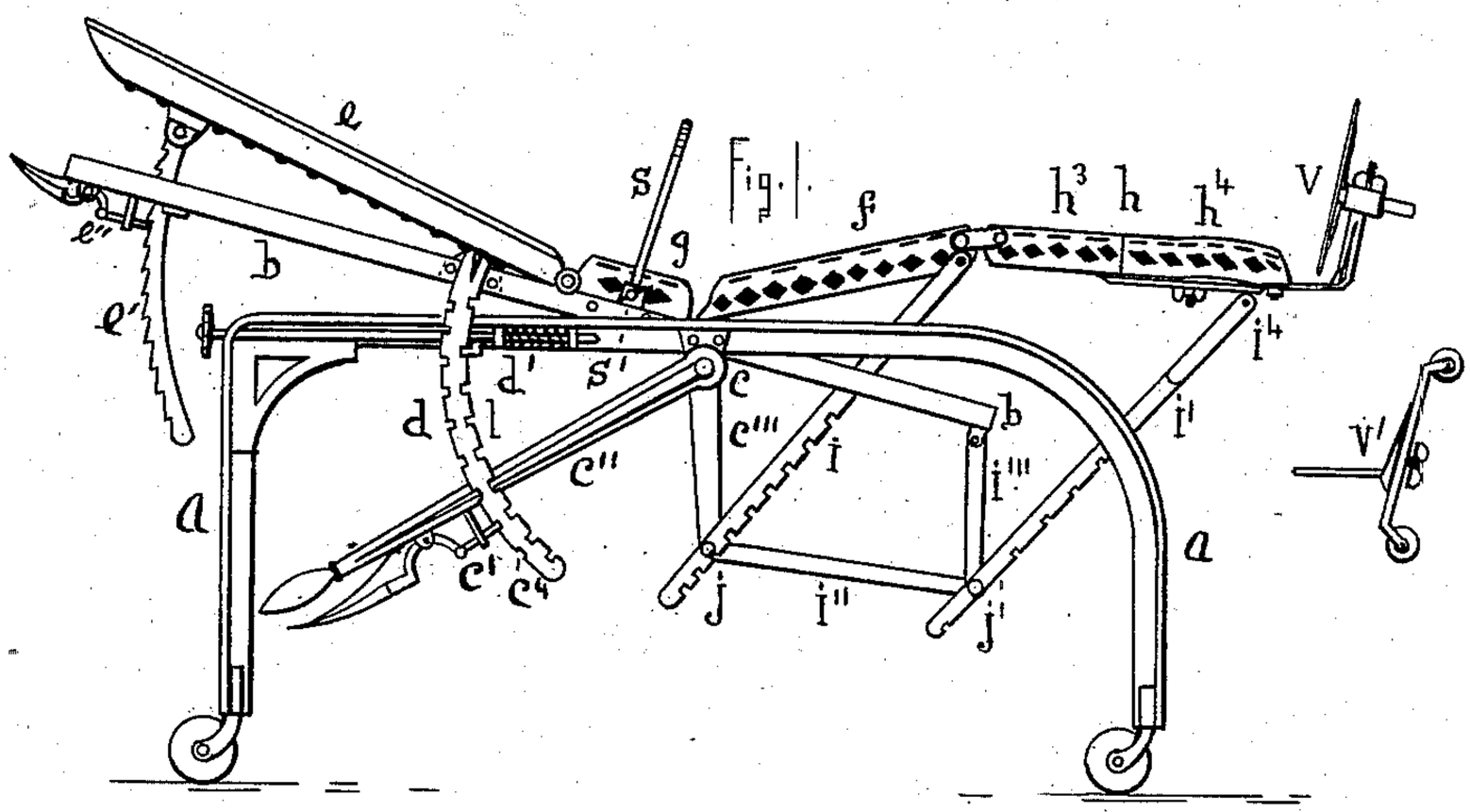
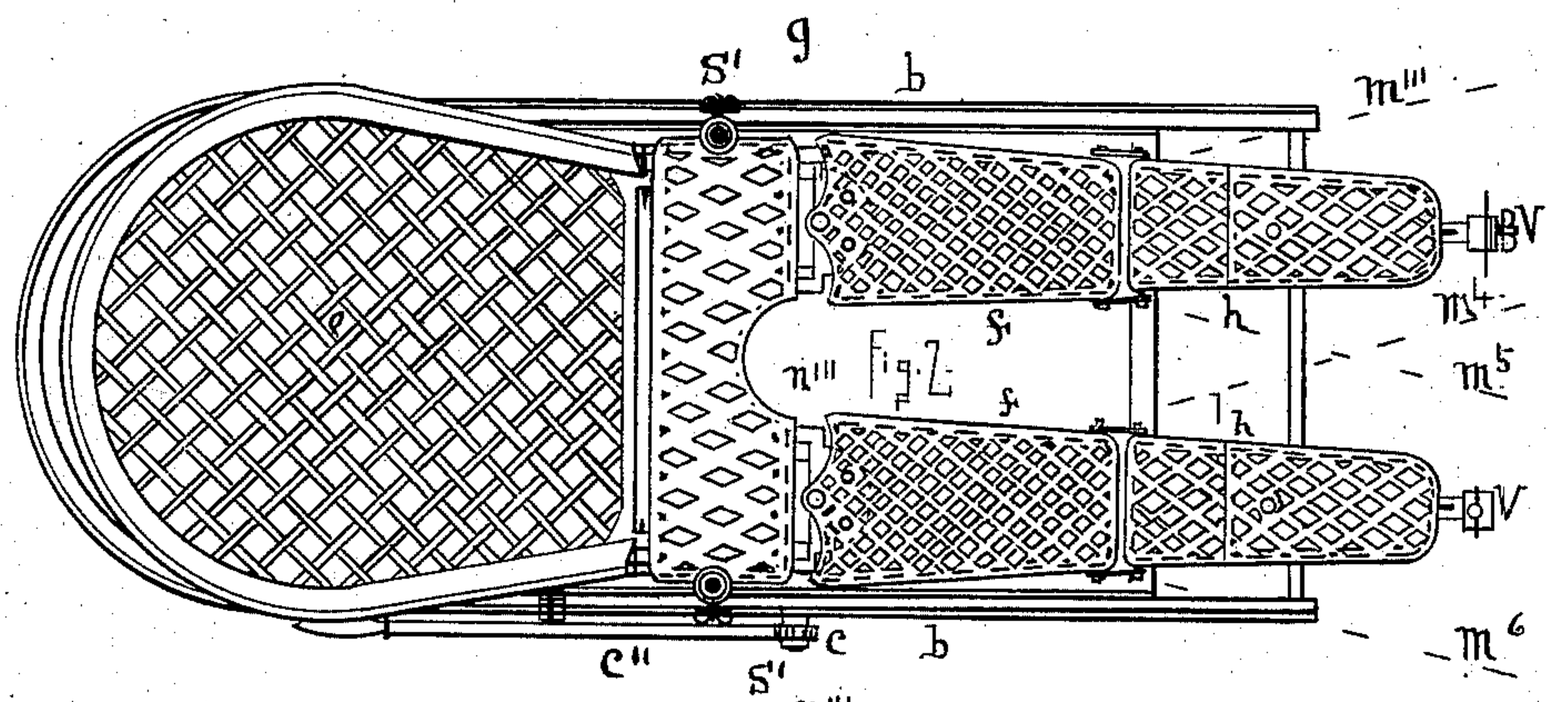
(No Model.)

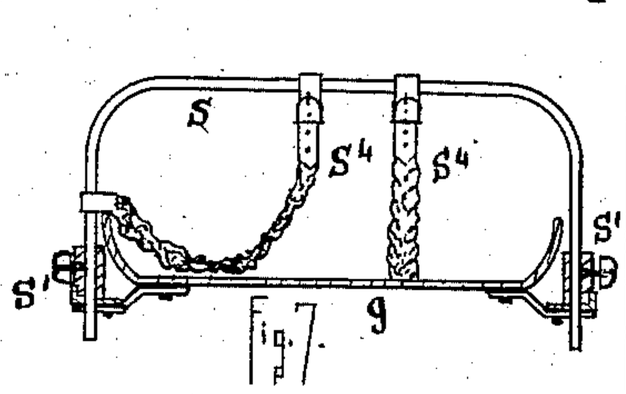
E. J. MORGAN.

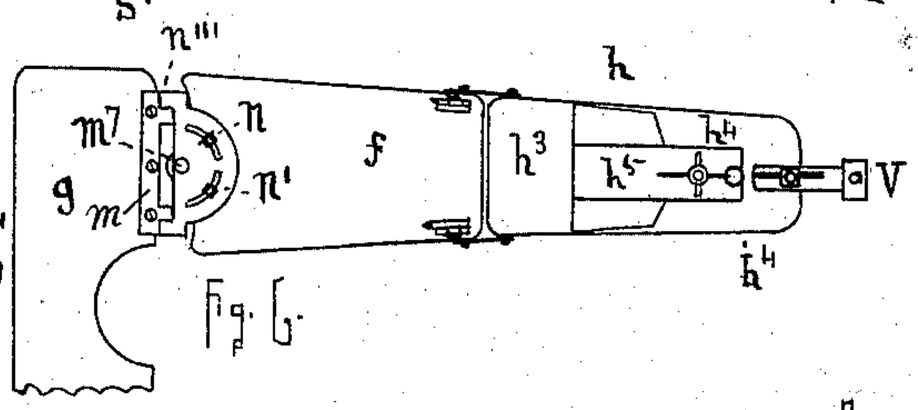
Invalid Bed.

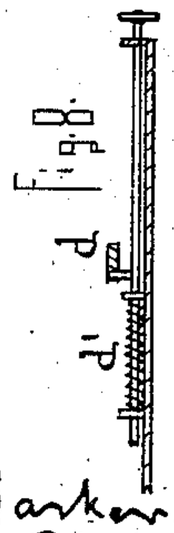
No. 238,799. Patented March 15, 1881.

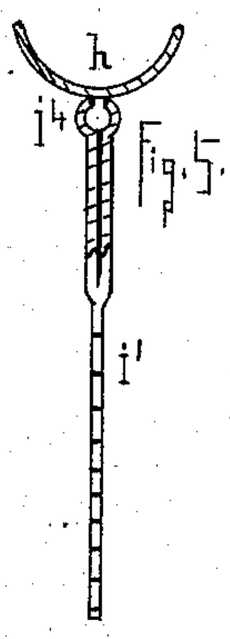


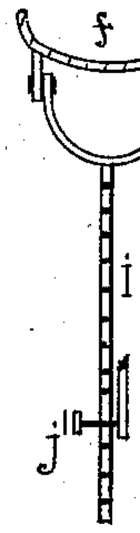


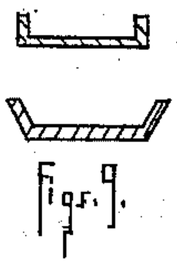


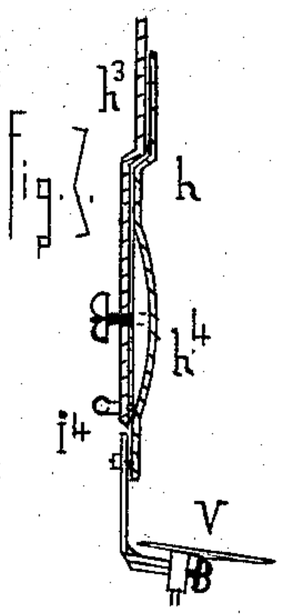












S. J. Parker.
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Witnesses.

E. J. Morgan.
Inventor.

UNITED STATES PATENT OFFICE.

EDWARD J. MORGAN, OF ITHACA, NEW YORK.

INVALID-BED.

SPECIFICATION forming part of Letters Patent No. 238,799, dated March 15, 1881.

Application filed October 1, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDWARD JAY MORGAN, a resident of Ithaca, Tompkins county, New York, and a citizen of the United States, have invented an Improved Fracture or Invalid Bed, of which the following is a specification.

My improvement consists in the construction of certain parts of a bed which was patented to Charles M. Clinton and myself on the 8th of April, 1873, No. 137,696, and to which reference is made for certain features of the bed as now described. My invention will be apparent as I describe the several parts of the bed, the patent just named being owned by myself.

Figure 1 is a side elevation of my bed; Fig. 2, a plan view, and Figs. 3 to 9 are detached parts of it.

In the figures, *a* indicates an iron bedstead, made of angle-iron bars held together by cross-rods, near the central part of which is a shaft, *c*, secured by journals on each side of the bedstead. To this shaft the bed-frame *b* is hinged by bearings. This frame is also preferably made of an angle-iron bar, which is curved to a semicircular form at the head of the bed, and is held together at the foot by a cross-bar. By this frame the bed is held either horizontally or at an inclination as the frame is turned on the shaft *c*, without any change of the bed or its parts other than the frame, which is a great relief to the patient. This change of inclination is effected by the operator, while at the head of the bed, by lifting or letting down the frame, he at the same time opening the spring-catch *d'* by its rod, that extends to near his right hand. The extent is from a horizontal position, when the head of the frame rests on the bedstead *a*, to any convenient angle which the height of the bedstead allows. The frame is held by the catch in any one of the right-hand notches in the segment *d*, which segment is fast to the frame *b*, and at its upper end projects a little out from the frame, so as to clear the side of the bedstead, and then curves downward, and in so doing comes in reach of the catch *d'*. The frame is extended under the thigh and leg splints, where it gives support to the hinging-rod *i'''* and its connections, soon to be described.

The bed itself is composed of four parts, which are, first, the pelvic plate *g;* second, the thorax and head plate *e;* third, the thigh cradle or splints *f;* and, fourth, the leg cradle or splints *h*. The pelvic cross-plate is first mentioned because it is the part to which all the other parts of the bed are hinged. It is made short in its length, with a suitable reference to the length of the human pelvis, which rests on it. It is bolted fast to the frame *b* on each side of that frame, and it has the greater part of the urinal and fecal opening at its center, as shown, and is flat in its middle, with its sides curved upward, making it somewhat trough-shaped. To the end next to the head of the bed the thorax and head part *e* is hinged. Beneath the metallic lattice-work of this thorax part *e* is a cross-bar, fast to the curved metallic frame that holds the perforated or lattice work, and to this cross-bar a segment, *e'*, is hinged, which hangs downward and passes near a cross-bar of the frame *b*, to which a spring-catch, *e''*, is secured, which catches in any notch of that segment, and thus gives any degree of elevation of the thorax and head of the patient above the frame *b*. The thigh cradle or splint is hinged by a hinge-plate to the pelvic plate. This hinge-plate has two hinges: first, a horizontal one to the pelvic plate, and, second, a vertical one. Fig. 6 is a bottom view of the right-limb cradles. In it *g* is the pelvic plate and *m* the hinge-plate. At m^7 is the bolt of the vertical hinge for lateral motion, and at n''' is the horizontal hinge for vertical movement, of splint *f*, and *n n'* are two slots for set-screw bolts, by which the degree of lateral motion is limited. The last part of the bed is the leg-splint *h*, composed of two pieces, the one h^3, the other h^4, with a two-part hinge, half on each side of the splints *f* and *h*, which together make a plain hinge of these splints.

The next subject is the adjustments for the thigh and leg splints *f* and *h*, in which two things are desirable: first, that they shall be adjustable at the will of the operator in their relation to the frame *b*, or, in other words, that the limbs of the patient shall be changeable in their relation to his body. For this purpose there is made fast to the front end of the shaft *c* a hand-lever, *c''*, which has near its handle a spring-catch, *c'*, which is, by its handle, moved at the will of the operator in and out of the notches c^4 on the left-hand side of the segment *d*, and is similar in its action to the catch *d'*,

as all the spring-catches are nearly alike, moving in the notch *l* of the right-hand notches of that segment. By this lever the parts connected with the lever are made to rise and fall whenever the lever is moved. These connected parts are the arm *c'''*, the splint-rods *i* and *i'*, hinging-rod *i'''*, and connecting-rod *i''*. Of these the rod *i* reaches from the distal end of the splint *f*, where, by a fork-like division into two parts, it embraces each side of the cradle *f* downward to the button-knob *j*. The connecting-rod *i''* is placed between the arm *c'''* and the hinging-rod *i'''*. The arm *c'''* is fast to the shaft *c*. From the button-knob *j'* another splint-rod, *i'*, reaches to the distal end of the cradle-splint *h*, where it hinges with the splint by a ball-and-socket joint. Hence the rods *i* and *i'*, which are of any convenient length, when fast or placed by any notch in them, are fixed in their relations to each other and to the other mechanism just described, and to the frame *b*, and the said frame may then be raised or lowered with the parts attached to it and no change be effected in said parts or in the position of the patient, and yet by the lever *c''* the fixtures of the lower limbs, which are thus made fast to the shaft *c*, and the limbs on them, may be at any time varied by that lever, the other parts of the patient's body being stationary. Thus the first thing sought is accomplished, for by the lever *c''* and the described connected mechanism both lower limbs are moved alike by that lever, the mechanism being the same for both limbs, and both sets of parts being fast to the shaft *c*, the flexion taking place at the hip-joint of the patient.

The second desideratum is to move either of the limbs of the patient independently. For this purpose, as each limb is in a separate set of cradles, each with its arm, its rods, one set on each side of the bed, it is apparent that if either of the rods *i* or *i'* of either set is lifted from either of the button-knobs so as to clear the notches in them the splints *f* or *h*, or their duplicates for the other limb, may be elevated or depressed, as is desired. This adjusts the right or the left limb of the patient independent of the other limb, as the operator wishes; and, further, it is clear that if the rod *i* be elevated and the rod *i'* lowered there will be an angular flexion at the knee-joint, and so on of other uses of these rods.

Again, it will be seen that a cross-rod, *s*, is made bow-shaped and reaches over the pelvis of the patient, and is secured and is adjustable in sockets *s'* at its ends, which sockets are fast on each side of the bed to the frame *b*, or, if desired, to the pelvic plate *g*. To this cross-bowed rod is attached the perineal band s^4, Fig. 7, reaching down between the limbs of the patient, and is made fast to the pelvic plate *g*, or bent about the thigh and fastened to the rod at or near the sockets, thus holding the patient's pelvis securely for any extension which is desired at the end of the limb, where foot-plates *v* and pulleys *v'* are shown for this extension. Also, the pelvic plate and the splints have rectangular openings for the attachment of these or other bands and bandages or other appliances for service for any part of the patient near them.

Another matter is the elongation of the leg-splint. This is seen detached in Fig. 3, where h^3 is the hinged part of the cradle or splint *h*, and h^4 is its distal end, which moves on the portion h^3, there being a slotted plate made as part of or attached to the portion h^3, and a set-screw in the portion h^4. This set-screw being loosened, these portions can be moved to elongate or shorten the leg-cradle, and when adjusted be held fast by the set-screw.

The dotted lines m''' m^4 m^5 m^6 indicate the degree of lateral motion of each lower limb provided for by the hinge-bolt m^7 and slot-bolts *n n'*, as has already been alluded to.

Foot-plates *v* are seen in the drawings, and foot-pulleys; but they have been long in public use; and to effect the lateral motion of the limbs, as has been mentioned, the button-knob *j* must be loose enough to allow a variable motion at the knob. There must also be either at the button-knob *j'* a greater lateral motion or other arrangement; hence I make it, as more preferable, at the joint i^4 of the rod *i'* with the leg or cradle, where I place a ball-and-socket joint, as shown.

On the iron bed, constructed as has been described, is placed a mattress, made in sections corresponding to the parts of the bed, on which the patient and his lower limbs are placed, his arms being free.

In elevating and turning the thigh-splints *f* the edge of the splints next to the pelvic plate *g* rises over the pelvic plate, thus allowing ample motion of the corners of the splints. The central part of the splints is also the lowest part of the trough-like splint or cradle, and is the place of the vertical hinge. Fig. 9 shows other forms of cradles or splints besides the curved form shown in Figs. 4 and 5.

Fig. 8 is a detached view of the catch *d'*, looking down on it, the angle-iron bedstead-frame *b* being in part cut away. There are no apertures represented in Fig. 6; but the outlines of the under side of the parts are indicated.

The mere mechanical adjustments and construction of the bed, as well as its advantages, are apparent.

I claim—

1. The double hinge-plate *m* between the stationary pelvic plate *g* and the movable thigh splint or cradle *f*, the said plate *m* being provided with a horizontal hinge-joint for vertical motion of the splint, and a vertical hinge with set-screw for the lateral motion of the splint, the same being combined and constructed as set forth.

2. The pelvic cross-piece *s*, adjustable in sockets *s'* on each side of the bed, and adapted to and designed for the attachment thereunto of perineal bands or other appliances suitable

to hold fast the hips or pelvis of the patient under treatment, as set forth.

3. The combination of the splints or cradles *f* and *h*, frame *b*, rods *i i'*, connecting-rod *i''*, shaft *c*, arm *c'''*, hinging-rod *i'''*, segment *d*, and lever *c''*, adapted to operate together and control the elevation or flexion of the limbs on the splints *f* and *h*, as set forth.

4. The variable sliding jointed leg-splint *h*, the said splint being made of the parts h^3 and h^4, lapping over each other, the rib h^5 being slotted and sliding over the part h^4, and a set-screw being in the slot of the rib-piece h^5, the whole combined and constructed as set forth.

5. A rod, *i'*, with a ball-and-socket joint at its top, and resting on a button or notch knob, *j'*, the same acting in combination with the hinging-rod *i'''*, connecting-rod *i''*, and rod *i*, and adapted to allow lateral movement of the limb in the splints *f* and *h*, and constructed and combined together as set forth.

6. The connecting-rod *i''*, making the connection between the rods *i* and *i'* and the splints *f* and *h*, rod *i'''*, frame *b*, the arm *c'''*, shaft *c*, and lever *c''*, the same combined and constructed as set forth.

7. The combination of the splints *f* and *h*, arm *c'''*, connecting-rod *i''*, hinging-rod *i'''*, and rods *i i'*, frame *b*, and shaft *c*, making the lower-limb adjustment set forth.

EDWARD JAY MORGAN.

Witnesses:

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E. H. BOSTWICK.