Specification of Andrew Kurtz : invalid beds and couches.

Contributors

Ball, Ancell.

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A.D. 1871, 7th DECEMBER. N° 3305.

SPECIFICATION

OF

ANCELL BALL.

INVALID BEDS AND COUCHES.

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A.D. 1871, *7th* DECEMBER. N° 3305.

Invalid Beds and Couches.

LETTERS PATENT to Ancell Ball, of Spalding, in the County of Lincoln, Physician, for the Invention of "IMPROVEMENTS IN INVALID BEDS AND COUCHES, AND IN FITTINGS THEREFOR."

Sealed the 30th April 1872, and dated the 7th December 1871.

PROVISIONAL SPECIFICATION left by the said Ancell Ball at the Office of the Commissioners of Patents, with his Petition, on the 7th December 1871.

I, ANCELL BALL, of Spalding, in the County of Lincoln, Physician, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN INVALID BEDS AND COUCHES, AND IN FITTINGS THEREFOR," to be as follows :—

This Invention relates to a peculiar construction and arrangement of invalid bed or couch and fittings therefor, whereby the patient can be readily placed in any desired position without the slightest bodily exertion.

Ball's Improvements in Invalid Beds and Couches.

The improved invalid bed or couch consists essentially of a fixed and moveable frame, the outer or fixed frame being either a specially prepared frame or the framing of an ordinary bed or couch. The inner frame is connected to the outer one by screw pivots situate opposite to each other, both in the centre of the head and foot and in the centre of the two sides, so that according and as one or the other pair of pivots be employed, the patient can be brought either to a vertical or sitting position by turning the inner frame on the side pivots, or he may be turned on his face whilst in a horizontal position by turning the frame on the end pivots. Pins and notched or perforated plates are employed for fixing the inner frame in any position, whether at an angle or otherwise.

A rocking motion on the longitudinal axis may be effected by the patient by the aid of a cord passing over a guide pulley carried by the inner frame and secured to a fixed point under the bed assisted by a spring, a pin in a curved slot serving to control the rocking motion.

At the head and foot of the inside of the inner frame there are fixed two perforated flat bars, which with the assistance of pins serve to carry what I call the mattress boards or supports. There are two such boards, to each of which I attach specially adapted mattrases, the one for the back, which I designate the "spinal" or dorsal mattress, and the one for the face, the "facial" mattrass. Portions of the sides of the spinal mattras board and mattrass are hinged or jointed so as to turn up and afford support to the patient, when required to lie on either side, and in conjunction with this arrangement I employ a lateral chest supporting net of any distinctive color, to distinguish it from the ordinary bed net. This lateral chest supporting net surrounds the shoulders of the patient and takes the chief weight at the part where the sides of the mattrass do not fold up. The said net being hooked to any fixed part of the frame at the side. The ordinary bed net is also used, in which the patient lies, it is attached to the foot of the outer frame when required serves to support his back in an upright position should it be found necessary.

The spinal mattress is made in two or more parts formed with openings to facilitate the use of a bed pan, and to ease the pressure on the shoulders in cases of bed sores for example.

A hinged trap door is also provided in the spinal mattrass board, opening either upwards or downwards and adjustable to any angle, so as

to form an elevated foot or leg rest or to admit of the legs of the patient passing through so as to bring him to a sitting position. To the upper end of the same mattrass board there is hinged a support for the back of the patient, such support being capable of adjustment to any angle.

A reversible table or reading desk is capable of being fitted to hinged supports attached to the sides of the inner frame.

The facial mattrass board or support has openings made therein at the chest, face, and feet, and carries a mattrass having an opening for the face and another for the toes of the patient, and this is laid upon the patient when it is desired to turn him on to his face, the pressure of the mattrass being regulated by a stop screw. The facial mattrass board having been properly adjusted and secured by pins to the perforated bars before referred to, the two mattrass boards and mattrasses with the patient between them are reversed or turned over on the longitudinal axis.

When the top mattrass board and mattrass are removed the patient will be found lying on his face, and any portion of his back can be readily had access to by the employment of a garment or garments made in two parts, back and front, tied or otherwise secured together and provided at or about the middle of the posterior half with a flap which can be turned up or down as required for use.

When soiled, the posterior half of the garment can be readily removed and replaced by a clean one, without in the least degree disturbing the patient.

In case it should be required to move the patient the spinal mattrass board is provided with four concealed bearing handles, and if desired the supports or legs of the bed or couch may be made to fold or hinge, and may be provided with elevating screws.

Suitable axilary and perineal supports or bandages may be applied to the patient and secured to the moveable frame in order to support him whilst being turned in a vertical direction.

Ball's Improvements in Invalid Beds and Couches.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Ancell Ball in the Great Seal Patent Office on the 7th June 1872.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ANCELL BALL, of Spalding, in the County of Lincoln, Physician, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Seventh day of December, in the year of our Lord One thousand eight hundred and seventy-one, in the 35th year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Ancell Ball, Her special license that I, the said Ancell Ball, my executors, administrators, and assigns, or such others as I, the said Ancell Ball, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN INVALID BEDS AND COUCHES, AND IN FITTINGS THEREFOR," upon the condition (amongst others) that I, the said Ancell Ball, my executors or administrators, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Ancell Ball, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings, and to the letters and figures marked thereon, that is to say :—

My said Invention relates to a peculiar construction and arrangement of invalid bed or couch and fittings therefor, whereby the patient can be readily placed in any desired position without any exertion on his part.

The essential features of my Invention are the use of specially constructed top and bottom mattresses and frames (which I designate

respectively the "spinal or dorsal" mattress and the "facial" mattress) in conjunction with a reversing motion of the two mattresses and frames or supports either on end or on side pivots or centres, whereby the patient, who for the time being is lying between the two mattresses, may be turned upon his face, back, or side, without necessitating any movement or change of position of the patient on the bed itself.

This system affords great facility for the treatment of severe cases of bed sores and other surgical cases, wherein it is essential that the patient be not disturbed, or wherein he has lost all power of changing his position in bed. Suitable provision is made for raising, lowering, and supporting the back and lower limbs in any convenient or easy position, thus enabling the patient to be brought into a semirecumbent or into a sitting posture without exertion on his own part.

A convenient arrangement of bed pan is also applied to the improved bed, and a peculiarly constructed night shirt and flannel vest is provided to be worn by the patient whilst using the bed, the back and front of the said garments being buttoned, tied, or otherwise temporarily united together at the sides, so that the posterior half may be readily removed and replaced by a clean one should it become soiled. A flap is also provided when found requisite at or about the middle of the posterior half, which is capable of being turned up or down as required for use.

And in order that my said Invention may be fully understood, I shall now proceed more particularly to describe the same; and for that purpose shall refer to the several Figures on the annexed Sheets of Drawings, the same letters of reference indicating corresponding parts in all the Figures.

Figure 1 (Sheet 1) of my Drawings represents a side elevation of my improved bed with the top or facial mattress applied. Figure 2 is a corresponding end elevation of the bed shewing the exterior surface of the foot board. Figure 3 is a plan of the bed with the top or "facial" mattress removed shewing the lower or "dorsal" mattress which constitutes the reclining surface when the bed is in its normal condition, and shewing also in its proper position the "side rest" (herein-after referred to), which is to be used when turning the patient. Figure 4 is a transverse section of the bed taken along the line 1—2, in Figure 3, shewing the bed pan in its place, and also the side rest. Figure 5 is a plan of

the main framing of the bed with the lower mattress removed, and with the head and foot boards in horizontal section. Figure 6 is a transverse section of the lower or main frame taken along the line 3—4 (Figure 3), and shewing the inner surface of the head board. Figure 7 is a similar section taken along the line 5—6, and shewing the inner surface of the foot board.

Figure 8 is a longitudinal vertical section of the invalid bedstead with the mattress removed, shewing some of the various adjustments of which it is susceptible.

Figures 9 and 10 are details of the lever and spring pad (herein-after referred to), for opening or closing from below the aperture formed in the lower mattress for using the bed pan.

Figure 11 (Sheet 2) is a side elevation of the bed reversed (or turned over), the "facial" mattress being below and the "dorsal" mattress, with its frame, above the patient.

Figure 12 is a side elevation of the bed turned half-way round, and having the top or "facial" mattress and frame so inserted as to form the reclining surface, whilst the dorsal or lower mattress is brought into a vertical position and forms the back of the couch; this position of the parts being adopted when it is required to turn the patient on to his side.

Figure 13 is a longitudinal section of the top or facial mattress and frame detached. Figure 14 is a transverse section of the same. Figure 15 is a detached plan of the facial mattress removed from its frame. Figure 16 is a plan of the upper surface of the frame of the top or facial mattress with the mattress removed. Figure 17 is a similar view of the under surface, and Figures 18 and 19 represent respectively a side elevation and longitudinal horizontal section of the reversible side rest or support.

A, A, are two uprights or standards of wood or metal connected together below by a stretcher or tie rod B, which, for the convenience of packing, may be made removeable by being fitted into dovetailed or other sockets or connections in the standards, as is well understood; the standards are by preference supported on castors or small wheels, having india-rubber tyres for the convenience of moving the bed without noise. Near the upper end of each standard, and passing through the same,

there is a pin or journal *a*, *a*, secured to the centre portion of the head and foot boards C and C[1] respectively, the said journals forming the axis of revolution of the bed, as shewn by the dotted outline of the foot board in a different position at Figure 2. Although shewn as revolving on a longitudinal axis, or with the patient horizontal, it is obvious that the bed may be made to turn over or reverse on a transverse axis, thereby bringing the patient into a vertical position whilst in the act of being reversed. In this latter modification the legs or supports of the bed should be made telescopic, so as to admit of their being lengthened sufficiently to allow of the ends of the revolving part clearing the floor. A sliding bolt or pair of bolts *b*, *b*, fitted to the head and foot standards A, and engaging into one or other of a series of holes *c*, *c*, made in a metal ring *d* secured to the outsides of the head and foot boards serve to fix or maintain the bed in any desired position or angle. Or in lieu of the rings *d* metal studs may be fitted into the head and foot boards. The lower or main supporting frame D, which carries the set of "dorsal" mattresses E (herein-after more fully referred to), is secured to the head and foot boards by bolts *e*, *e*. Figures 6, 7, and 8 which engage into holes made to receive them in the projecting ribs *f*, *f*, secured to or formed on each side of the inner faces of the head and foot boards at or near their opposite edges. This frame D consists partly of wood or metal framing, and partly of the usual webbing or bands *g*. Its central portion is composed of separate parts, which although lying flush with the general surface when in their normal position, are so hinged or jointed as to be capable of forming special supports for the back and legs. F is a support made adjustable on hinges at *h* for sustaining the back of the patient at any desired angle, the said support being propped up at any angle by one or other of the two pairs of props *i*, *i*[1], (Figure 8) according to the amount of elevation required), which engage into the fixed ratchet teeth *k* formed on or attached to the framing D. A spring latch bolt *l* released by drawing either of the cords *m* secured thereto serves to secure the support F in its normal position, that is, when resting on the ledge *m*[1] by engaging into a hole at *l*[1] in the end of the frame D, the said bolt being thus withdrawn without disturbing the patient or the mattress when it is required to elevate the back support. G is another support jointed at *n* to the intermediate piece H, which is hinged at *o* to the piece I, hinged at *p* to the main frame D. The object of the parts G, H, and I is when elevated into the position shewn by dotted lines at Figure 8 to form a gout rest for the

leg, the said rest being supported in its elevated position by the hinged prop *q* and by the sliding bolts *r*, *r*, which engage into one or other of the holes *s*, *s*, made in the foot board in two vertical rows, as shewn clearly in Figure 7. When the patient is required to assume a sitting posture the hinged supports or rests G and H are let down below the surface of the main frame D, as drawn in full lines in Figure 8, to allow the feet and legs of the patient to pass below or through the bed, in which postion they are supported by the inclined rest G. *t* is a cord attached to the end of the hinged rest G for the purpose of lifting it without disturbing the lower mattress. When in their normal position the hinged parts G, H, and I are maintained flush or level with the general surface of the frame D by shooting the bolts *r*, *r*, into the holes *u*, *u* (Figure 7), made in the end of the lower frame D. In some cases I use the cord *t* (Figure 8) in lieu of the bolts *r*, the said cord being hooked on a hook at the top of the foot board, and I fasten the leg rest flush by two spring latch bolts entering sideways into the frame near the end of the leg rest. Both of these bolts are withdrawn by a cord passing through the end of the dorsal frame at D, D, (Figure 7), and through a groove, which cord draws back the bolt on the other side. Both bolts may thus be drawn back by one pull of the cord, and from either side of the dorsal frame. K is the removeable bed pan made of tin plate or other suitable material fitted with a handle and with projecting side flanges, which latter slide along the guide pieces *v*, *v*, (Figures 4 and 8) secured transversely to the under side of the frame D. This bed pan is also provided with a lid which fits into a rimmed recess, which holds water in order to make the pan air or gas tight. It also contains one or more cups or separate cavities or receptacles inside in order to receive chloride of lime, carbolic acid, chloralum, or other disinfectants or deodourisers. Two of the usual mattress springs *w*, *w*, Figures (4, 5, and 8) are disposed one on each side, but a little in advance of the opening L communicating with the bed pan. This pan is easily slid in or out from beneath the bed without in any way disturbing the patient, suitable stops in the guide pieces *v* serving to insure the pan being always in its proper position when pushed home. An aperture corresponding to the mouth of the bed pan is formed in the lower mattress E, as shewn clearly in Figures 3 and 4, and this opening is closed from below when not in use by a spring pad or cushion M (Figures 3, 9, and 10), which just fills the same and remains flush with the general surface of the mattress. This pad is fitted on to the lever N

when required for use, the said lever being hinged by means of straps x, x, to one side of the frame D, corresponding straps x^1, x^1, on the opposite end of the lever serving when engaged on to buttons in the side of the main frame to hold it in its elevated position and maintain the spring pad in its place. When the bed pan is to be introduced the lever N and pad are lowered, and the pad should be detached from its lever by turning it partly round when the small cross pin y in the stem z will be brought in line with the slot in the lever, thus admitting of the removal of the pad.

The "dorsal" mattress E (as shown in Figures 3 and 12) is made in several separate parts or sections in order that it may be arranged to suit the various adjustments of the parts constituting the adjustable portions of the frame D.

The facial mattress E^1, shewn in Figures 1, 11, 12, 13, 14, and 15, is made in one piece and provided with an opening O for the reception of the face of the patient when applied, and another aperture P for the reception of the toes. This mattress is secured by webbing and buttons 1, 1, to its supporting frame D^1, the sections composing the "dorsal" mattress being secured to the frame D by tapes or otherwise. The supporting frame D^1 of the facial" mattress is like the frame D composed partly of wood and partly of webbing g^1, g^1; an adjustable frame or support Q hinged at 2 is fitted into one end of the frame D^1, and is raised or lowered more or less to any desirable inclination by moving the adjustable sliding support R along the guiding grooves 3, 3, in the frame D^1, the said support R being fitted with dovetailed guides on its surface which take into and slide along corresponding grooves in the under side of the adjustable frame Q, the support R being moved for adjustment by the loops at 4, 4. The object of the adjustable frame Q is to enable the "facial" mattress to be adjusted with accuracy over the chest of the patient. When it is required to turn the patient on to his face so as to afford free access to the back, the "facial" mattress E^1 and frame D^1 are laid upon him and then secured in the position shewn in Figure 1, by shooting the bolts 5, 5, (Figure 17), attached at each corner to the under side of the frame D^1 into one or other of two or more corresponding holes made in the projecting ledges 6, 6, on the inner faces of the head and foot boards. Before adjusting the "facial mattress however, the side rest or support S (Figures 18 and 19) must be fitted into its place between the head and foot boards, secured to the

head board by shooting the bolts 7, 7, with which the said rest is provided, into one or other of the holes 8, 8, in the head board, whilst the opposite end of the rest is held in position by being fitted between the projecting ledges 6 and 9, as shown in Figures 3 and 7. This rest S consists, as shewn in the Drawings, of a wooden frame covered with stretched canvas 10, the frame and canvas covering being so shaped and arranged as to form a recess 11 for the reception of the shoulder of the patient. In lieu of a separate rest however, either side of the mattress frame may be made to turn up on hinges into a vertical position, so as to afford the required lateral support to the patient whilst being turned over. The side rest S and facial mattress having been adjusted and secured in their places so as to pack the patient comfortably, the end bolts *b*, *b*, are withdrawn and the entire bed (that is to say the head and foot boards with the "dorsal" and "facial" mattresses and frames) is reversed or turned upside down upon the longitudinal axis *a*, *a*, when the parts will assume the relative positions shewn in Figure 11, and may be there fixed by the bolts *b* as before. The "dorsal" mattress E and frame D are now at the top and are lifted off after having been released by shooting back the bolts *e*, *e*, (Figures 6, 7, and 8), when the patient will be found lying on his face. If dressed in the improved night dress shown at Figure 20, wherein the sleeves and back and front are all made readily detachable by simply unfastening the strings or fastenings 12, 12, which unite the parts, it is obvious that the linen may be changed without disturbance. If desired, a flap shown by dotted lines at 13, in Figure 20, may be formed in the posterior half of the garment for the facility of access to the lower part of the back of the patient, and for enabling the bowels to be relieved into the bed pan beneath through the opening left when the flap is drawn up without disturbing the patient.

In Figure 12, which represents the parts adjusted so as to accomodate the patient on his side, the bed is turned round ninety degrees on its axis *a*, *a*, so as to bring the "dorsal" mattress E and its frame into a vertical position, thereby forming the padded back of a couch, the reclining portion of which is formed by inserting the "facial" mattress" E^1 with its frame D^1 edgewise between the projecting ribs 9 and 6 on the foot board, and between the projecting ribs 6 and 14 on the head board, the said frame and mattress being locked in their place by the bolts 5, 5, or otherwise, if found requisite.

In Figure 1 of my Drawings, I have represented in red lines, the

application to my improved bed of a small table T, capable of conversion into an inclined reading desk, as shewn by the dotted red lines; it is placed across the bed in front of the patient and supported by means of side pieces or supports U hinged to each side of the table or desk, which supports are screwed to the opposite sides of the "dorsal" mattress frame D by the hand screws 15 (Figure 1), the said side pieces or supports U for the table or desk being slotted, in order to admit of the height being adjusted to suit the convenience of the patient.

Having now described and particularly ascertained the nature of my said Invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion, that what I consider to be novel and original and therefore claim as the Invention secured to me by the herein-before in part recited Letters Patent is,—

First. The construction and use of invalid beds or couches made to turn over so as to reverse their position on a longitudinal or on a transverse axis, and provided also with movable "dorsal" and "facial" mattresses and mattress boards or frames, and adjustable side rest or support constructed, arranged, and operating together, substantially in the manner and for the purpose herein-before described.

Second. The application and use of pins or bolts and notched or perforated plates or their equivalent for maintaining the bed or couch at any required angle, substantially as herein-before described.

Third. The combination of a dorsal mattress having an opening therein with a bed pan made to slide under such opening from either side of the bed, substantially as herein-before described.

Fourth. The application of a hinged trap door made to open either upwards or downwards and capable of being maintained at any desired angle, so as to form an elevated leg rest or so as to allow the feet and legs of the patient to pass below the bed when in a sitting posture, substantially as herein-before described.

Fifth. The combination with the said hinged trap door or flap of an adjustable hinged frame, forming a support for the back of the patient, and capable of being maintained at any desired angle or elevation, substantially as and for the purpose herein-before described.

Ball's Improvements in Invalid Beds and Couches.

Sixth. The providing openings in the top or "facial" mattress for the reception of the face and toes of the patient, substantially as herein-before described.

Seventh. The mode of reversing a patient by confining him for the time being between top and bottom mattresses made to turn over or reverse their position, and supporting him laterally whilst being turned over by a hinged or removable side piece or support.

Eighth. The construction and use of a night dress or other equivalent garment intended to be worn by a patient when in bed, wherein the back and front consist of separate and distinct parts united together along the sides by tapes, buttons, or other suitable fastenings, substantially as and for the purpose herein-before described.

Ninth. The forming a folding flap in or about the centre of the posterior half of the said improved night shirt, as and for the purpose herein-before described.

In witness whereof, I, the said Ancell Ball, have to this my Specification set my hand and seal, the Fifth day of June, One thousand eight hundred and seventy-two.

ANCELL BALL. (L.S.)

LONDON:
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BALL'S Specification.

12 SHEETS /
SHEET 1

FIG. 1.

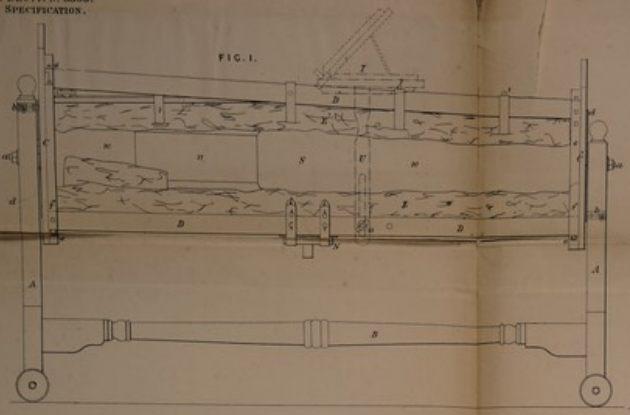


FIG. 2.

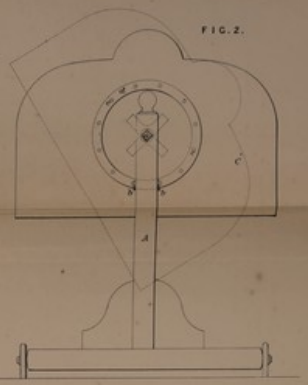


FIG. 3.

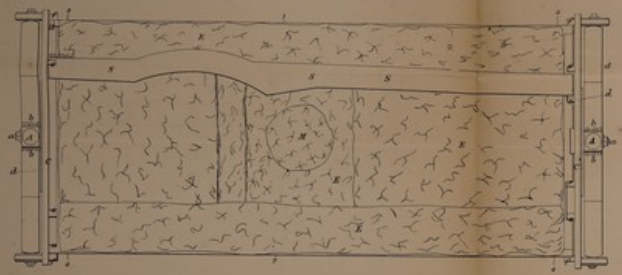


FIG. 4.

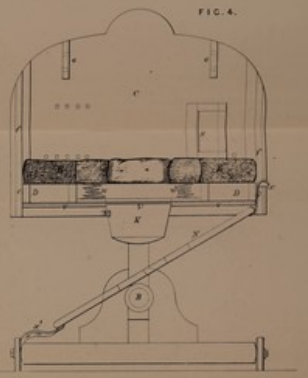


FIG. 5.

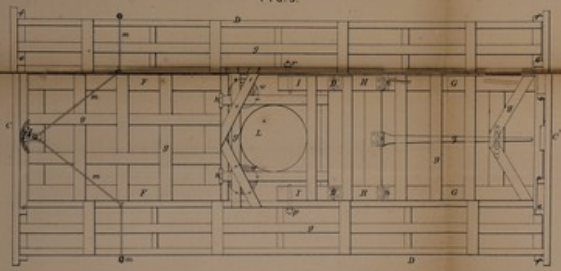


FIG. 6.

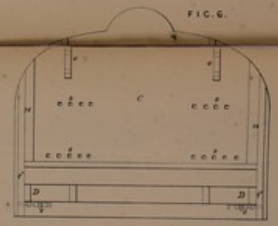


FIG. 7.

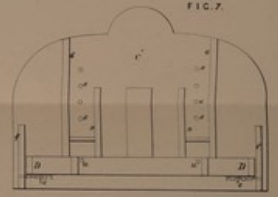


FIG. 8.

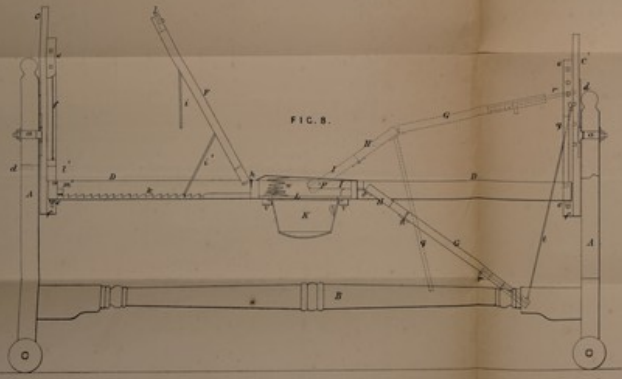


FIG. 9.

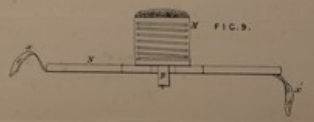
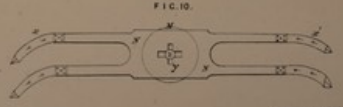


FIG. 10.



The filed drawing is partly coloured.

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BALL'S Specification.

(2 SHEETS)
SHEET 2.

FIG. 11.

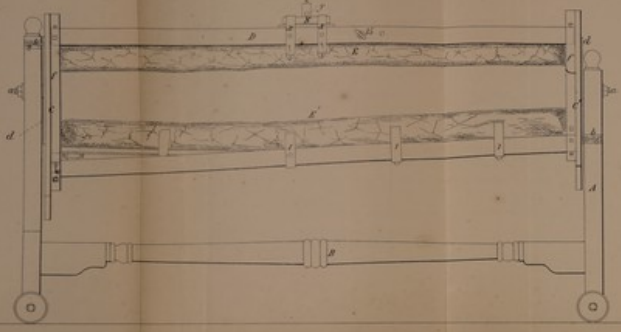


FIG. 12.

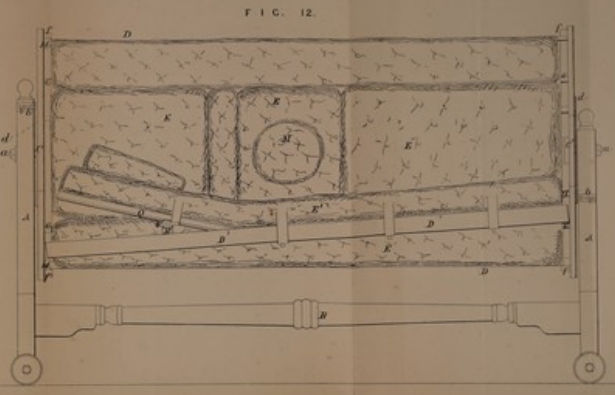


FIG. 13.

FIG. 14.

FIG. 15.

FIG. 16.

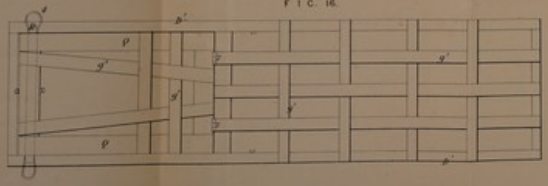


FIG. 20.

FIG. 17.

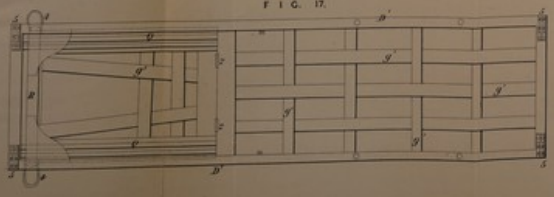


FIG. 18.

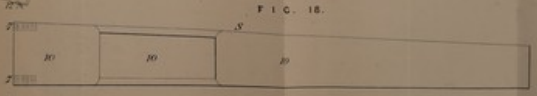
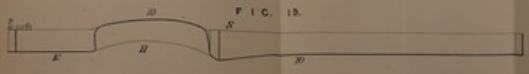


FIG. 19.



The filed drawing is partly colored.

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