

D. HOGAN & C. W. MEINECKE.  
ADJUSTABLE BED.

APPLICATION FILED MAY 25, 1909.

964,105.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

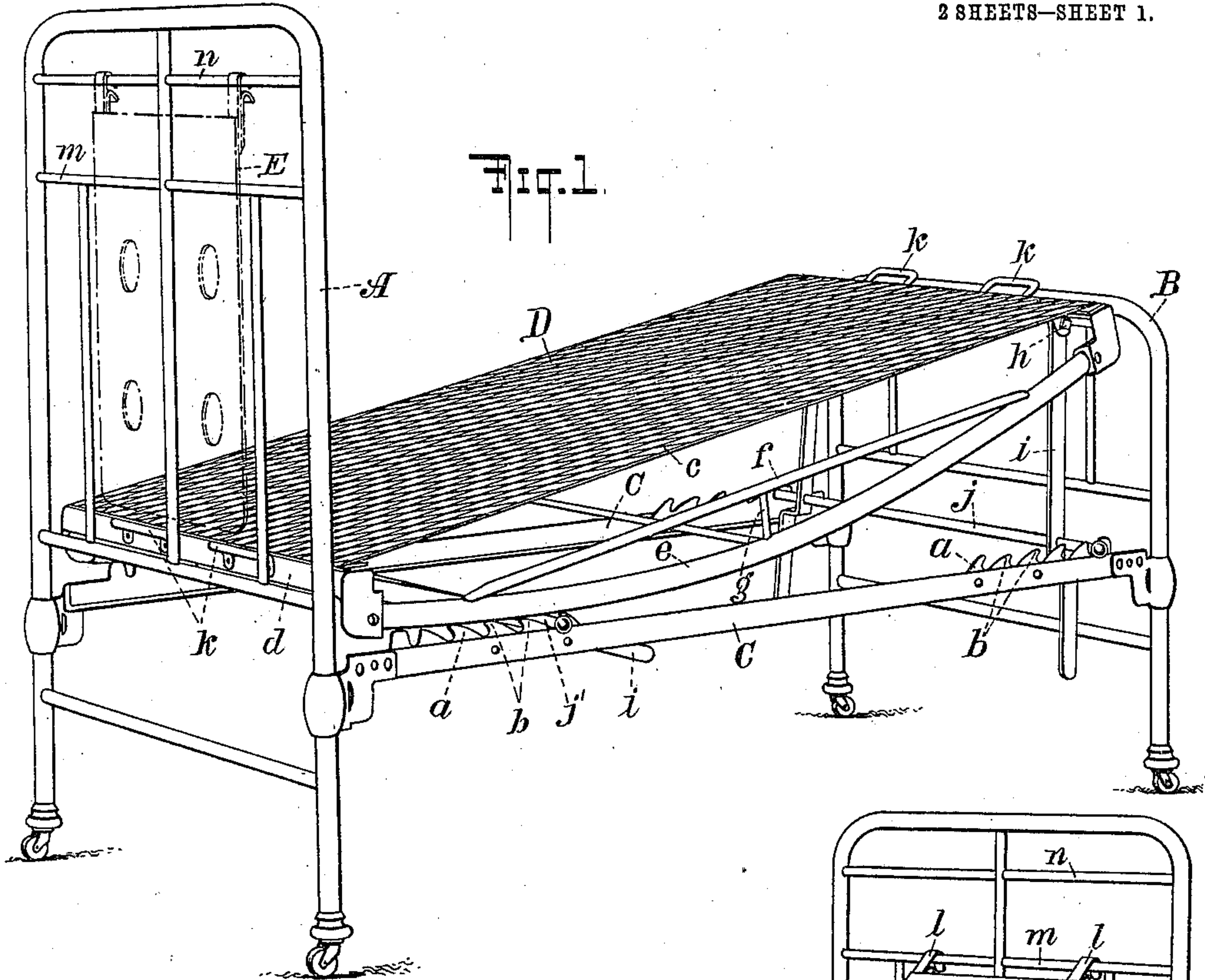
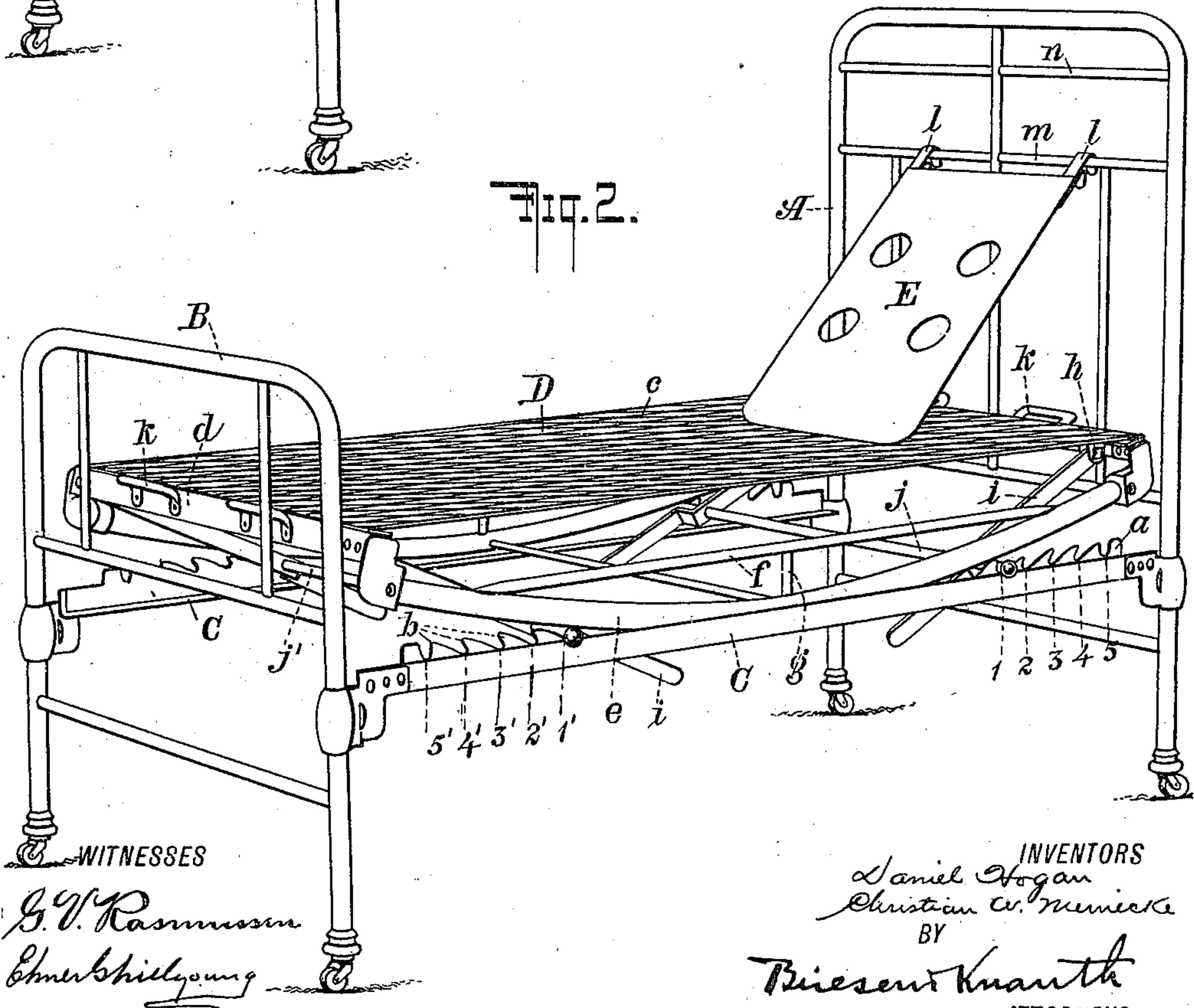


Fig. 2.



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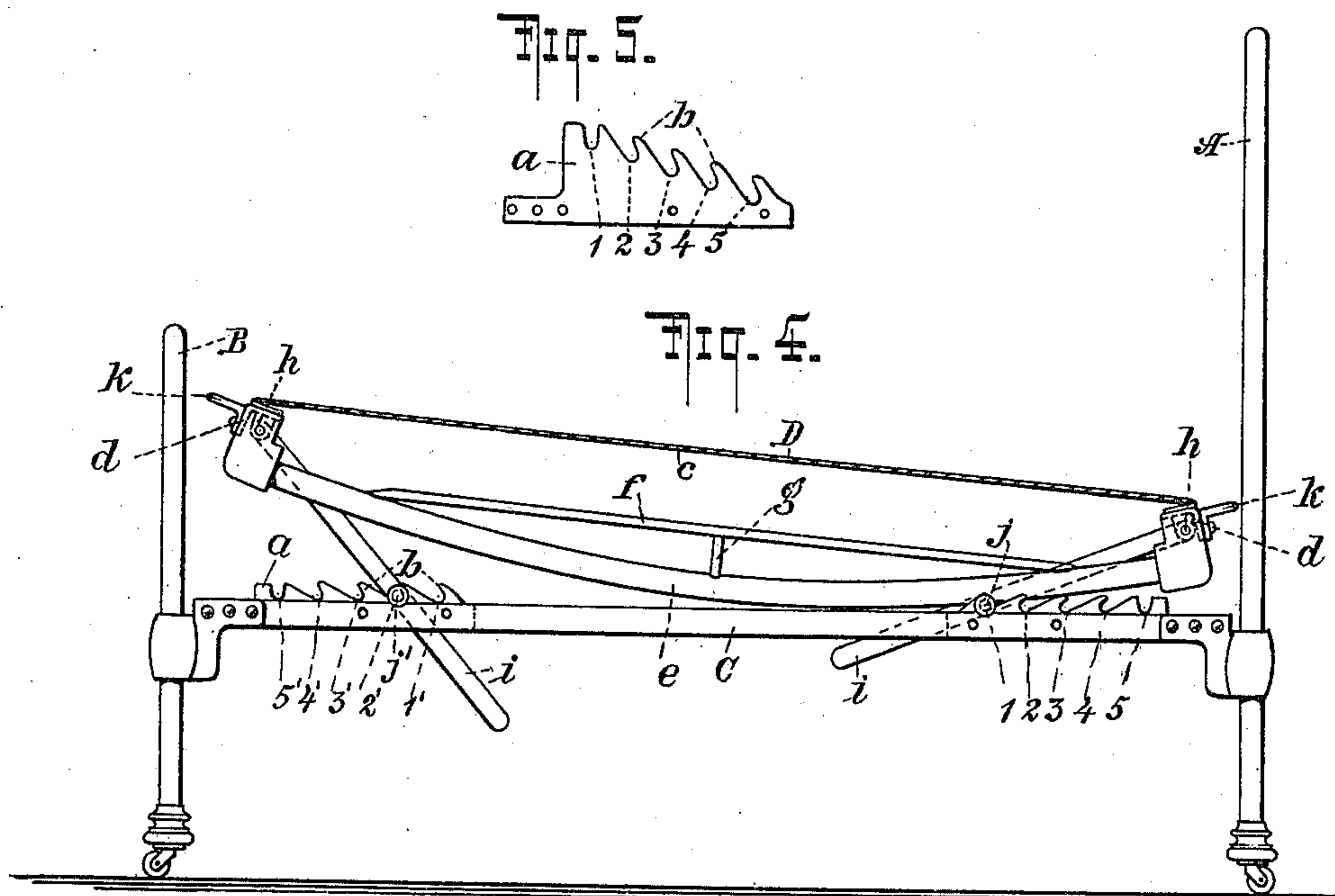
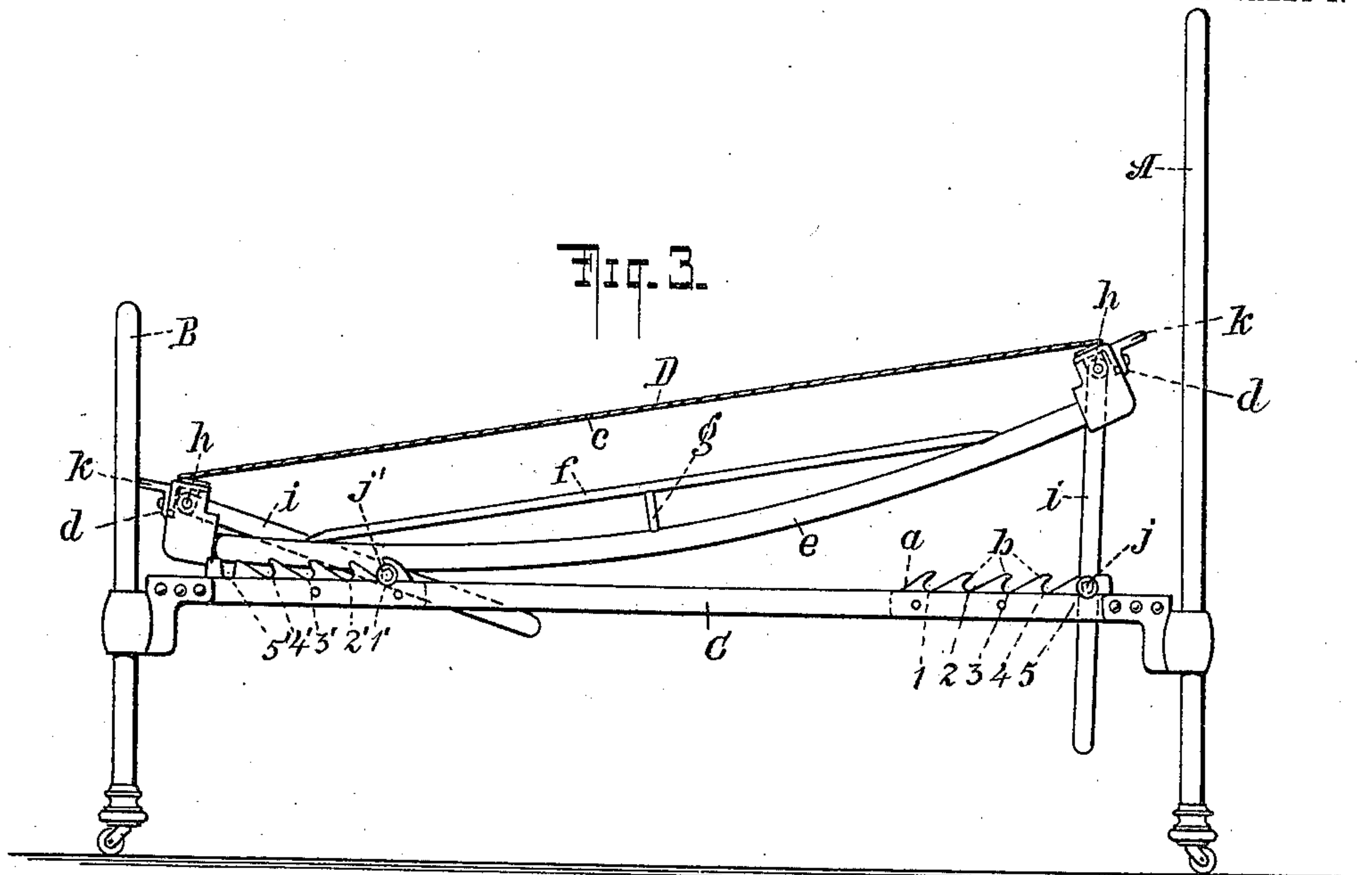
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# UNITED STATES PATENT OFFICE.

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## ADJUSTABLE BED.

964,105.

Specification of Letters Patent.

Patented July 12, 1910.

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*To all whom it may concern:*

Be it known that we, DANIEL HOGAN, a resident of Hoboken, county of Hudson, State of New Jersey, and CHRISTIAN W. MEINECKE, a resident of Jersey City, county of Hudson, State of New Jersey, have invented a new and useful Improvement in Adjustable Beds, of which the following is a specification.

Our invention relates to adjustable beds as required in hospital, medical and surgical practice, and has reference to such a bed so constructed that the mattress and thereby the patient may be adjusted at any reasonable angle as to elevation of head or foot for the convenience of the attendant, practitioner or nurse.

The object of our invention is to provide such a bed of simple construction not liable to derangement and one in which the various adjustments may be made quickly and easily and without requiring the application of undue strength on the part of the attendant.

A further object of our invention is to provide such a bedstead so constructed that any adjustment when made is absolutely permanent and locked against any accidental shifting.

A further object of our invention is to provide a bedstead as described such that the adjustments may be made smoothly and evenly and without jarring or disturbing the patient.

A still further object of our invention is to provide such a construction for the improvements mentioned as may be applied to bed frames differing but slightly from conventional designs thus making for economy and speed of manufacture.

A still further object of our invention is to provide the adjustable bed of the class described with an auxiliary adjustment by means of which the upper portion of the patient's body may be varied as to its angle with the mattress.

Many conditions arise in medical and surgical practice which make the ordinary bed of daily life very inconvenient and entail much unnecessary strain on both patient and attendant. Thus, the average bed intended for repose is generally too low and requires much stooping; in fever cases, also, where it is necessary to frequently bathe the patient, and even in bathing ordinary cases, it is not easy even with liberal use of

rubber cloths and other precautions to avoid wetting the bed clothes and the patient. In making medical and surgical examinations and in many cases of hemorrhage, in obstetrical cases, in the giving of injections and in many surgical operations, it is very desirable, and in many cases imperative that the body of the patient be inclined with the upper portion of the body either up or down. In all of the above instances, it has been almost a universal custom, certainly in private homes, and to a great extent in all of the best equipped hospitals, to accomplish this change of angle or the raising of the bed as a whole by the use of blocks, bricks, books or almost any other convenient adjunct placed under the legs of the bed. In accomplishing this the bed casters usually drop out and as a rule the structure formed is so unstable either by reason of the materials used or the lack of skill in using them that before the bed is fairly lifted one or more of the supporting means falls and the bed will drop to the very serious discomfort, if not to the injury of the patient.

Numerous adjustable beds have been proposed in the prior art. Many of them have involved considerable complexity of mechanism while others, simple as to mechanism, have provided for numerous adjustments. It is the inventors' belief that only two adjustments are desirable in a bed of the class described, namely, a general adjustment of change of level and an adjustment as to angle.

Referring to the drawings annexed which form a part of this specification, Figure 1 is a perspective view taken from the head of the bed showing the foot of the mattress support lifted to its highest limit; Fig. 2 is a similar perspective view taken from the foot of bed, the mattress support being horizontal at its lowest possible level; this figure shows also our backrest adjusted in its lowest position; Fig. 3 is a side elevation of our improved bed showing the mattress support with head raised and foot down at its lowest limit; Fig. 4 is a similar side elevation showing the lowest position of head with the foot only partially raised. Fig. 5 is a detail showing a modified form of one of the side bar ratchets.

Referring to the drawings, A, B, are head and foot boards respectively, and C side bars of our improved bed; each side bar has



near each end a rack  $a$  provided with teeth  $b$  extending upwardly and away from the center, thus forming grooves 1, 2, 3, etc., 1', 2', 3', etc., rounded at the bottom and inclined downwardly and toward the center.

D is the mattress support comprising a stout wire mesh  $c$  stretched upon a frame which comprises parallel end bars  $d, d$ , separated but joined by a trussed frame constituted of parallel and similar rocker bars  $e$ , tension rods  $f$ , and verticals  $g$ .

Pivoted near each end of each end bar  $d$ , (both at head and foot of bed) at  $h$  is a link  $i$ . At the bottom of the head links and at the bottom of the foot links are cross bars  $j, j'$ ; the head and foot links are preferably, although not necessarily, of the same length. At the head and foot of the mattress support, are handles,  $k, k$ , by means of which said support may be lifted. The cross bars  $j, j'$  project on each side of the bed beyond the links  $i$  to an extent sufficient to more than cross both of the side bars  $C$  while the links  $i$  are prolonged below and beyond cross bar  $j, j$  and are set and bent to pass just within and practically in contact with the side bars  $C$ ; this arrangement thus centralizes the mattress support as to the width of the bed and prevents any lateral slip of said support while the two cross bars  $j, j$  extending outwardly as aforesaid are adapted to engage the notches 1, 1' etc., at head and foot.

Fig. 2 shows the mattress support level in its lowest position with the cross bars  $j, j'$  in notches 1 and 1'. To raise the head, it is only necessary to stand behind said head and lift upon the handles  $k, k$ ; rocker arm  $e$  on mattress support will pivot upon the foot cross bar  $j'$  while the head cross bar  $j$  with its links  $i$  will fall toward the head of the bed into one notch after the other until the head is lifted to the limit decided upon. The effort required to make this lift will be, relatively, quite small even for the heaviest patient owing to the fact that the fulcrum  $j'$  at the foot of the bed is so far within the end of the mattress support and toward its center that a considerable part of the body's weight is counterbalanced. Should the head be raised as in Fig. 3 and it be desired to raise the foot, for example, to the same extent, the attendant would similarly lift on the handles  $k$  at said foot. In such case, the head of the mattress support being already raised, the fulcrum would not lie inside the end of said support but substantially at said end so that the patient would not now be partially counterbalanced, and the lifting effort required would be greater than before, but still theoretically not more than one-half the weight of the patient. It must be remembered, of course, that the actual lifting effort would vary in any case according as the head or the foot might have to be

raised as obviously the upper half of the body is considerably more weighty than the lower half of the body. By placing the grooves of rack  $a$  upon an incline as in Fig. 5 instead of horizontal as in Figs. 1-4, the mattress support will start from the same bottom position but the height difference represented by moving the cross bars from notch to notch will be greater than when the notches are arranged horizontally. With this arrangement, also, the tendency to lift too high when raising head or foot is not so great as when the rack is horizontal.

It should be noted that in lifting either head or foot of the mattress support, said support sometimes pivots on the cross bar ( $j$  or  $j'$ ) and sometimes on both said cross bar and the axis of  $h$  in which the links  $i$  of the cross bar are pivotally attached to the support. This cross bar and axis of  $h$  constitute together an axial system upon either or both members of which the mattress support is adapted to pivot when the other end of said mattress support is raised or lowered; in the claims following we use the term axial system in this way. It should be noted further that the cross bars  $j$  and  $j'$  at head and foot with their attaching links  $i, i$ , constitute two locking systems which, with the racks  $a$  on each end and at each side of the bed, hold the mattress support securely at all times against any accidental slip or change of angle other than such change as may be deliberately intended.

The total absence of all wheels, gears and operative mechanism obviously makes for economy of manufacture, and ease of adjustment even by unskilled attendants.

Should it be desired to have the upper part of the patient's body inclined at an angle to the lower part no matter what the angle of the mattress support might be, that is, should it be desired to have the patient in a reclining position rather than in a supine position, our backrest  $E$  may be used. This is preferably of sheet metal of sufficient thickness or otherwise so ribbed or constructed as to have the necessary stiffness, and is, of course, slipped under the bed clothing or behind the pillows in the usual way. This rest is provided with two hooks  $l$  which slip over the cross bar  $m$ ; should it be desired to raise the patient's back still higher, the hooks  $l$  would be placed upon the bar  $n$ . Angles with the mattress support so obtained for the backrest would, of course, be somewhat different according to the position with reference to the horizontal which the mattress support itself might have. To increase the number and range of angles it would be merely necessary to add additional bars similar to  $m$  and  $n$  and parallel thereto. When not in use, the backrest  $E$  is removed and hung on the outside of the bed as shown in Fig. 1. It is thus placed quickly entirely



out of the way and yet in a convenient position for quick use when desired.

While we have described our improvements as applied to a bed it is clear that they may be used with equal advantage in a couch or any usual substitute for a bed.

Many changes of detail may be made without departing from the spirit of our invention which we have embodied in the following claims:

1. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon each of two parallel axes as an end is raised or lowered, one of said axes being at the other end of said support and the remaining axis between said end and the center of said support, substantially as and for the purpose described.

2. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon each of two parallel axes as an end is raised or lowered one of said axes being situated in and the other outside of said support.

3. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon each of two parallel axes as an end is raised or lowered one of said axes having a fixed position as to said support and the other being adapted to change its position relatively thereto during such change of inclination, substantially as and for the purpose described.

4. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon each of two parallel axes as an end is raised or lowered one of said axes having a fixed position as to said support and the other being adapted to change its position relatively thereto during such change of inclination, said axes being further always at an unvarying distance from one another, substantially as and for the purpose described.

5. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon either of two axial systems the system not used as a pivotal means serving as means to hold said support at a given inclination, substantially as and for the purpose described.

6. In a bed, the combination of a bed frame and an inclinable mattress support

adapted to pivot as a whole upon either of two axial systems said systems being respectively located between the center and opposite ends of said support and the system not used as a pivotal means serving as means to hold said support at a given inclination, substantially as and for the purpose described.

7. In a bed, the combination of a bed frame and an inclinable mattress support adapted to pivot as a whole upon either of two axial systems said systems being on opposite sides of the center of said support each of said systems including two axes of which one in each system maintains an unvarying distance and the other in each system a varying distance from the corresponding axis in the other system as the inclination of said mattress support is changed, substantially as and for the purpose described.

8. In a bed in combination:—a bed frame, a mattress support, pairs of links pivoted to said support on opposite sides of the center thereof, parallel cross bars fixed one to each pair of links, and means fixed to the bed frame adapted to adjustably engage said cross bars, substantially as and for the purpose described.

9. In a bed in combination:—a bed frame, a mattress support, pairs of links pivoted to said support on opposite sides of the center thereof, parallel cross bars fixed one to each pair of links, and racks fixed to the bed frame provided with grooves for engaging said cross bar, substantially as and for the purpose described.

10. In a bed in combination:—a bed frame a mattress support, links pivoted to said support on one side of the center thereof, a cross bar fixed to said links, and a rack fixed to the bed frame provided with grooves for engaging said cross bar, said grooves being inclined downwardly and toward the center of the bed, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

DANIEL HOGAN.

CHRISTIAN W. MEINECKE.

Witnesses:

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JOHN A. KEHLENBECK.