(No Model.) 3 Sheets—Sheet 1.

J. B. ROBINSON & G. W. HOLMES.

OPERATING CHAIR.

No. 332,836. Patented Dec. 22, 1885.

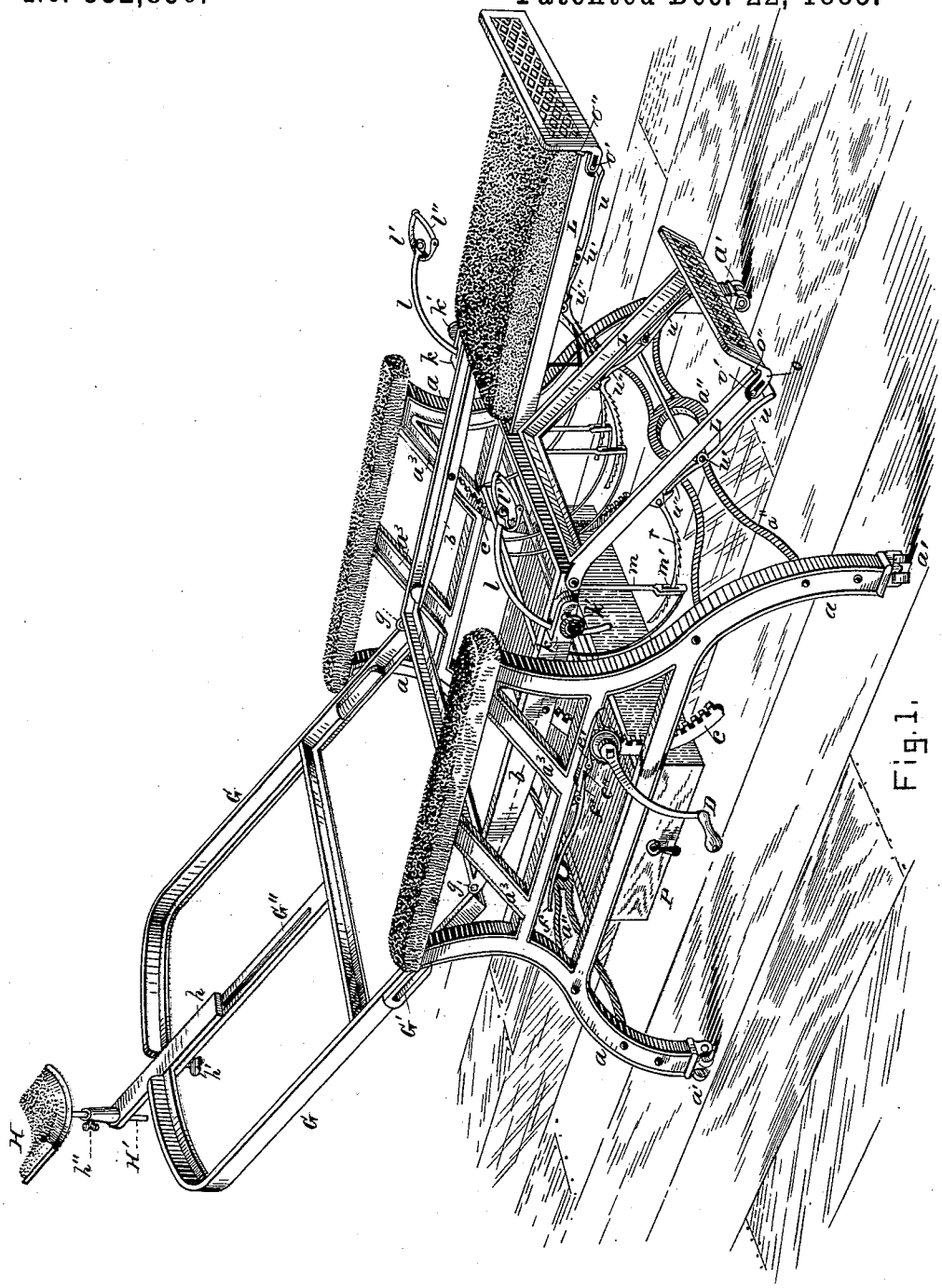


Fig. 1.

Witnesses.
Sarah M. Goodrich
Henry Chadbourn.

Inventors:
James B. Robinson
George W. Holmes.
by Albert Andrews Thacher Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

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J. B. ROBINSON & G. W. HOLMES.

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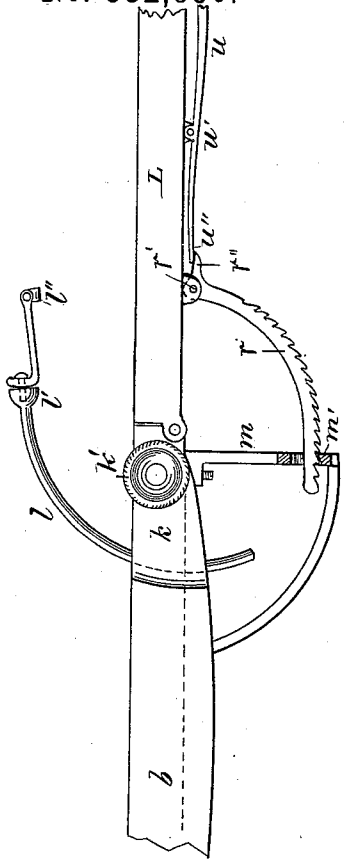


Fig. 7.

Fig. 2.

Fig. 4.

Witnesses.
Sarah M. Goodrich
Henry Chadbourn.

Inventors.
James B. Robinson
George W. Holmes.
by Albert Fredrick their attys

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

J. B. ROBINSON & G. W. HOLMES.

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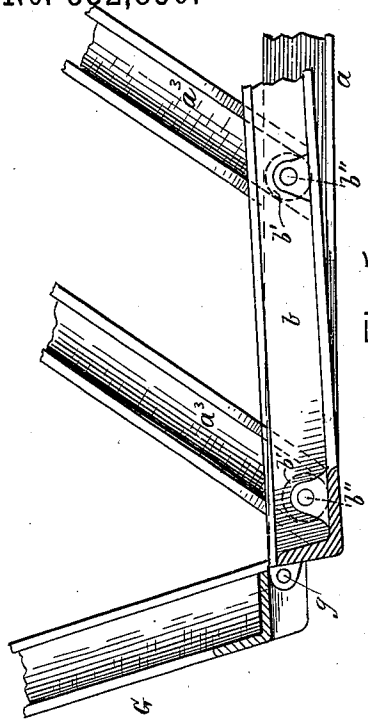


Fig. 5.

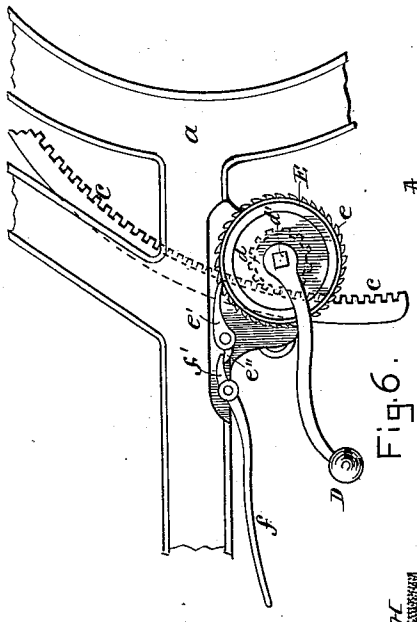


Fig. 6.

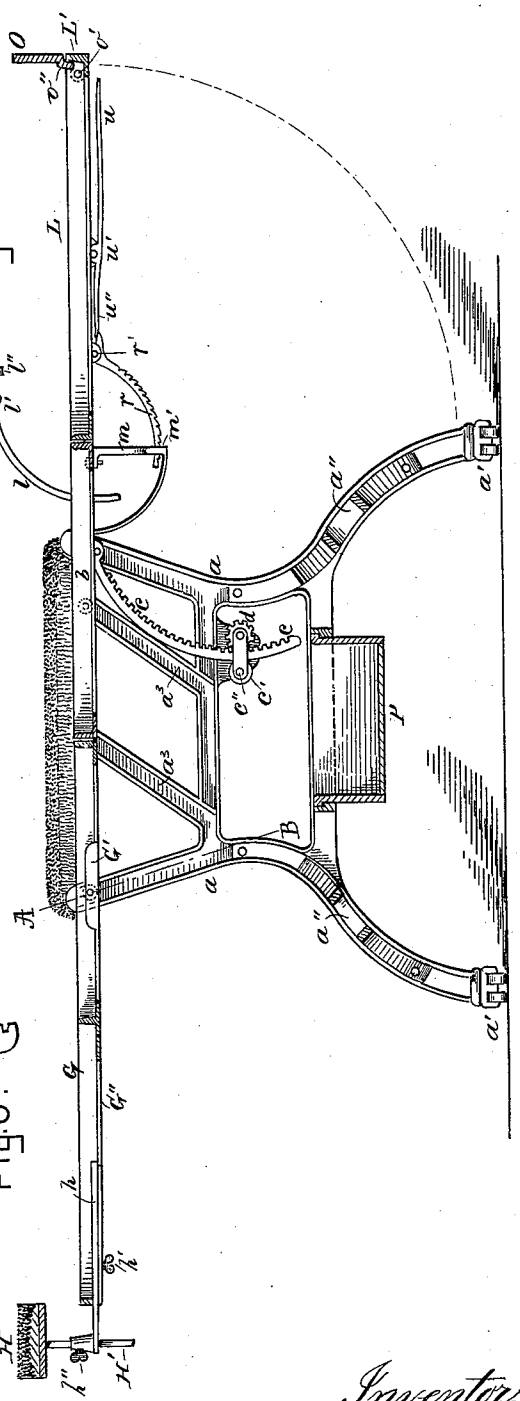


Fig. 3.

Witnesses.
Sarah M. Goodrich
Henry Chadbourne

Inventors.
James B. Robinson
George W. Holmes.
by Albert Andrews their atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JAMES B. ROBINSON AND GEORGE W. HOLMES, OF BOSTON, MASS.

OPERATING-CHAIR.

SPECIFICATION forming part of Letters Patent No. 332,836, dated December 22, 1885.

Application filed April 10, 1885. Serial No. 161,785. (No model.)

To all whom it may concern:

Be it known that we, JAMES B. ROBINSON and GEORGE W. HOLMES, both citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have jointly invented certain new and useful Improvements in Operating-Chairs; and we do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements in surgical or operating chairs, and it is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a perspective view of the improved chair. Fig. 2 represents a side elevation showing the back, seat, and leg-rests in a horizontal position. Fig. 3 represents a central longitudinal section of the chair in the same horizontal position. Fig. 4 represents in detail a cross-section on the line A B, shown in Fig. 3. Fig. 5 represents a detail of the seat-frame and the manner of guiding it in the side frames or legs. Fig. 6 represents a detail of the crank, rack, and pinion for raising and lowering the seat; and Fig. 7 represents a detail view of the seat and leg-rest at the place where they are hinged together.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a a represent the side frames or legs, made of metal, and provided in their lower ends with casters *a' a'*, of any ordinary construction.

a'' a'' are front and rear braces connecting the legs *a a*, as shown in Figs. 1 and 3.

b is the seat-frame, also of metal, provided at its sides with anti-friction rollers *b' b'*, (two on each side of the frame *b*,) mounted on pins *b'' b''*, secured to seat *b*, as shown in detail in Fig. 5, such rollers being guided in the inclined grooved bars a^3 a^3, forming part of the respective side frames or legs, *a a*, as shown in Figs. 1, 2, and 3. To the under side of the seat *b* are hinged the upper ends of the curved toothed racks *c c*, which engage into the teeth of the pinions *d d*, secured to the shaft *d'*, located in suitable bearings in the sides *a a*.

D is a crank secured to one end of shaft *d'*, by means of which the latter and its pinions *d d* are turned for the purpose of raising or lowering the seat *b*.

For the purpose of insuring a proper engagement of the teeth on racks *c c* with the teeth of the pinions *d d*, and at the same time to cause the said curved racks to move noiselessly and without much frictional resistance, we locate at the back of each rack *c* an anti-frictional roller, *c'*, that is journaled on a pin, *c''*, secured to the side *a*, as shown in Fig. 3. Thus it will be seen that the seat *b* may be raised or lowered by turning the crank D, causing the pinions *d d* to act on the curved racks *c c*, and the seat to be guided in relation to the sides *a a* by means of the rollers *b' b'* working in the grooved bars a^3 a^3, hereinbefore described.

For the purpose of retaining the seat in any desired position after being adjusted we employ the following locking and releasing mechanism: To one end of crank-shaft *d'* is secured the ratchet-wheel *e*, as shown in Fig. 6. To one of the side frames *a* is loosely hinged the pawl *e'*, having a rear extension, *e''*, as shown in said Fig. 6. Back of the pawl *e'* is hinged to the frame *a* the releasing handle or lever, *f*, having a forward lip or projection, *f'*, located above the rear extension, *e''*, on the pawl *e'*. The weight of the respective pawl *e'* and releasing-lever *f* will tend to keep them always in their normal positions shown in Fig. 6, the pawl *e'* resting against one of the teeth on the circumference of the ratchet-wheel *e*.

To release the pawl *e'* from the ratchet-wheel *e*, when it is desired to lower the seat of the chair, it is only necessary to raise the handle or lever *f* a little, when its forward projection, *f'*, depresses the rear extension, *e''*, of the pawl *e'*, and causes the latter to be disengaged from the ratchet-wheel *e*. By letting go the lever *f* the pawl *e'* is instantly locked on the ratchet-wheel *e* in the position as shown in Fig. 6.

In an operating or surgical chair it is very desirable that all motions of the chair should be accomplished with as little noise or friction as possible, and for this purpose we provide the ratchet-wheel *e* at its side with a rubber or leather ring, E, on which the extreme end of the pawl *e'* is made to rest, instead of dropping into the bottom of the recesses between the teeth on the circumference of the ratchet-wheel *e*. Such flexible ring E may be made of any

suitable material that will prevent the usual harsh metallic clicks when a pawl drops between the teeth of a metallic ratchet-wheel.

As a modification of said noiseless pawl device, we may to equal advantage provide the end of the pawl with a noiseless shield, bed, or packing, and dispense with the soft ring E on the ratchet-wheel *e*.

G is the metal frame for the back, and it is hinged in its lower end to the rear of seat *b* by means of suitable hinges, *g g*, as shown.

To the upper rear portions of the side frames *a a* are secured the pins *h h*, (shown in detail in Fig. 4,) each such pin being provided with an anti-frictional roll, *h'*, projecting into the slot G' on the outside of back G, as shown in Figs. 1 and 4, by which means the said back G is properly guided when the seat is raised or lowered. As the grooved guide-bars a^3 a^3 are made inclined toward the front of the chair, as shown in Figs. 1, 2, and 3, it will be seen that as the seat is raised it also moves toward the front of the chair, and on this account it is necessary that the recesses G' G' in the back G should be sufficiently elongated to partake of the motion of the adjustable seat *b*. During the commencement of raising the seat *b* the back G is slightly raised, and by continuing the upward motion of the said seat the back G is swung on the fulcra *h' h'* until the seat is in its highest position, when the back G is made to form a horizontal extension of the seat *b*, as shown in Figs. 2 and 3. The back G has a central slotted or grooved guide-bar, G'', in which is longitudinally adjustable the head-rest guide *h*, which may be secured in position to the bar G'', after being adjusted, by means of a set-screw, *h'*, or similar device.

H is the head-rest, having a downwardly-projecting rod or shank, H', that may be adjusted up and down in a bearing in the upper end of the guide *h*, and secured in position to the latter, after being adjusted, by means of the set-screw *h''* or similar device, as shown in Fig. 1.

To the forward ends of the sides of seat *b* are secured the clamps *k k* for the stirrup-shanks *l l*, which are adjustable in the said clamps and secured in position to the seat by means of the clamping-screws *k' k'* or similar fastening devices.

To the upper end of each stirrup-shank *l* is hinged the stirrup *l'*, having journaled to its upper ends the foot-rest *l''*, as shown in Figs. 1, 2, 3, and 7, and by this arrangement of securing the stirrups to the seat instead of to the stationary frame or the hinged leg-rests the advantage is obtained of retaining the relative positions of the lower limbs and trunk of the patient, even if the vertical adjustment of the seat should be changed.

To the front of the seat *b* are hinged independently of each other the leg-rests L L, as shown in Fig. 1. By having each of such leg-rests independently hinged to the seat the advantage is obtained of being able to raise or lower one of the patient's limbs while the other may be at rest; or, if so desired, both limbs may be adjusted simultaneously.

For the purpose of adjusting each leg-rest and securing it in position relative to the seat, the following mechanism is used: To the under side of each leg-rest L are hinged at *r' r'* a pair of curved and toothed racks, *r r*, the teeth of which may be locked against a tooth or projection, *m'*, in the slotted brace *m*. (Shown in detail in Fig. 7.) In its upper end each curved rack *l* has a forwardly-projecting lip, *r''*. (Shown in Figs. 1, 2, 3, and 7.)

To the under side of each leg-rest L is hinged at *u' u'* the lever *u*, having forward projections *u'' u''*, located above and in close proximity to the respective lips *r'' r''*, as shown. Supposing a leg-rest to be in a raised position, (shown in Figs. 2 and 3,) with the racks *r r* locked to the slotted braces *m m*, and it is desired to lower such leg-rest, all that is necessary to do is to raise the outer end of the lever *u*, when its projections *u'' u''* will depress the lips *r'' r''* on the curved racks *r r*, by which the lower ends of the latter are raised and disengaged from the locking projections or stops *m'* in the slotted braces *m m*. Whenever the operator lets go his hold on the tripping-lever *u*, the curved racks *r r* are instantly made to drop by their own gravity, so as to retain the leg-rest in the desired position by the stop *m'* locking in one of the teeth of the curved rack *r*, as shown.

To the lower end of each leg-rest L is jointed the foot-rest O, which is so arranged that when not required for use it may be swung out of the way, preferably on the under side of the leg-rest. For this purpose the foot-rest O is provided with slotted ears or side projections, *o o*, into the slots of which project the pins or screws *o' o'*, secured to the sides of each leg-rest L. The foot-rest O has a downwardly-projecting lip or flange, *o''*, that serves as a stop against the upwardly-projecting lip L' in the lower end of the leg-rest L, as shown in Fig. 3, when the foot-rest is in use.

If it is desired to remove the foot-rest O, all that is necessary to do is to raise it sufficiently to allow the lip *o''* to pass by the projection L' on the leg-rest, when the foot-rest O can be drawn forward and swung downward on the fulcrum-pins *o' o'* to the position shown in dotted lines in Fig. 2.

If so desired, the foot-rest may be folded on top of the leg-rest L to equal advantage, although we prefer to swing it down, as described, when not required for use.

In the drawings the frame of the chair is shown only; but in practice the seat, back, and leg-rests are provided with upholstered cushions, as is usual in surgical chairs.

P is a sliding drawer, located in suitable guides attached to sides *a a*, below the seat *b*, and is adapted to contain the necessary surgical instruments, bandages, or medicines, or other articles requisite in an operating-room, as may be desired.

Having thus fully described the nature, con-

struction, and operation of our invention, we wish to secure by Letters Patent, and claim—

1. In an operating-chair, the sides *a a* and their grooved guides a^3 a^3, in combination with the seat *b* and its anti-friction rollers *b' b'*, the curved racks *c c*, hinged to the seat, and shaft *d'*, with its pinions *d d* and crank D, for the purpose of vertically adjusting the position of the seat, as herein set forth.

2. In an operating-chair, the stationary sides *a a*, having guides a^3 a^3, and the vertically-adjustable seat *b*, having the curved racks *c c* hinged to it, in combination with shaft *d'*, pinions *d d*, crank D, and anti-friction guide-rollers *c' c'*, as and for the purpose set forth.

3. In an operating-chair, the stationary sides *a a* and the vertically-adjustable seat *b*, guided in the sides *a a*, in combination with the back-rest G, hinged to the seat *b*, and having slotted recesses G' G', adapted to receive and to be guided on the pin, and rolls *h h'* on the sides *a a*, as and for the purpose set forth.

4. In an operating-chair, the vertically-adjustable seat *b*, its curved racks *c c*, pinions *d d*, shaft *d'*, and crank D, combined with the ratchet-wheel *e*, pawl *e e'*, and releasing-lever *f f'*, as and for the purpose set forth.

5. In an operating-chair, the vertically-adjustable seat *b*, having the slotted braces *m m'* secured to its forward end, in combination with the hinged leg-rests L L, having hinged to them the curved ratchets *r r''* and releasing-levers *u u''*, as and for the purpose set forth.

In testimony whereof we have affixed our signatures in presence of two witnesses.

JAMES B. ROBINSON.
GEORGE W. HOLMES.

Witnesses:
ALBAN ANDRÉN,
HENRY CHADBOURN.