3 Sheets—Sheet 1.

G. D'HAISNE.

Invalid-Bedstead.

No. 217,999. **Patented July 29, 1879.**

Fig. 1.

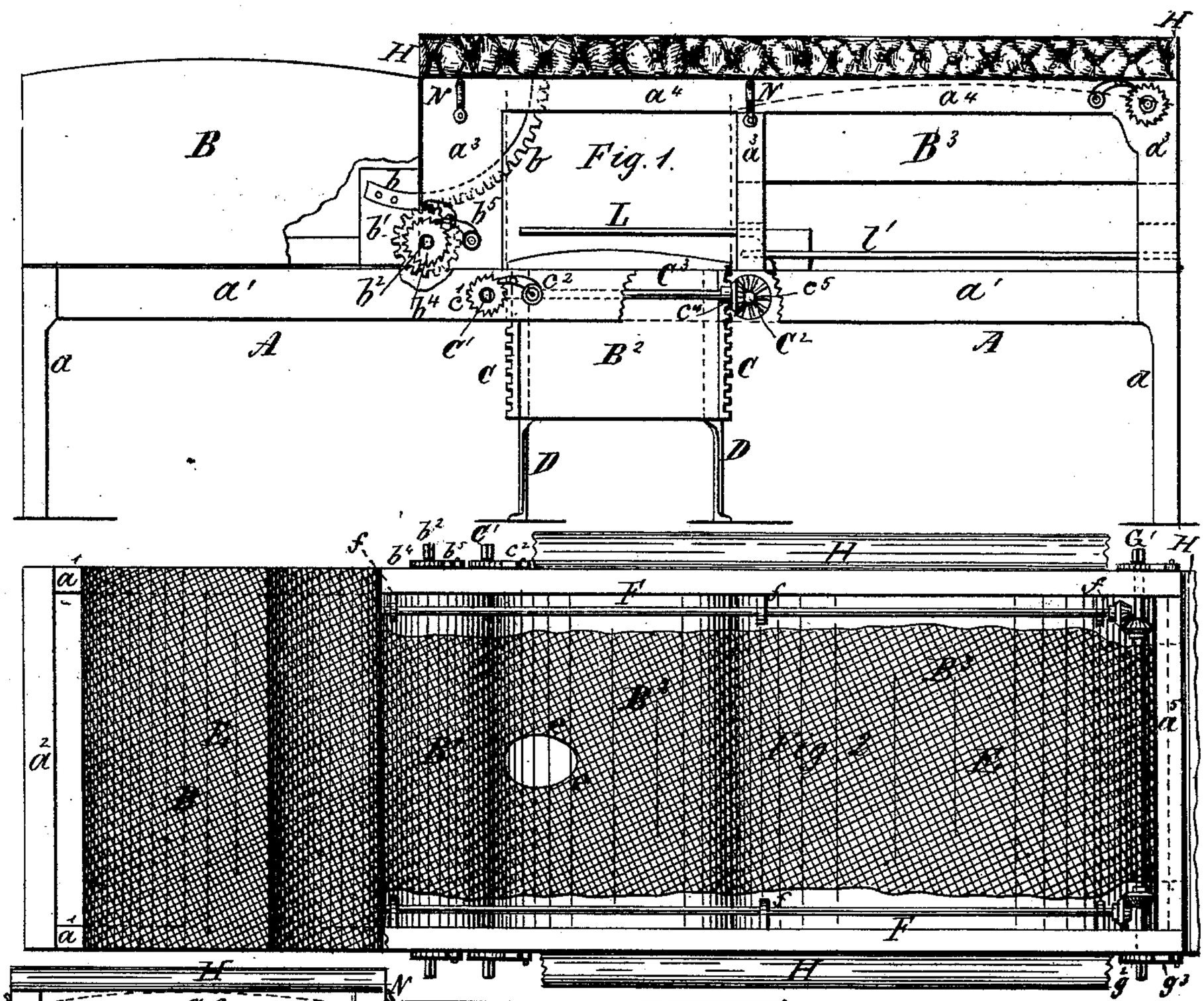


Fig. 4

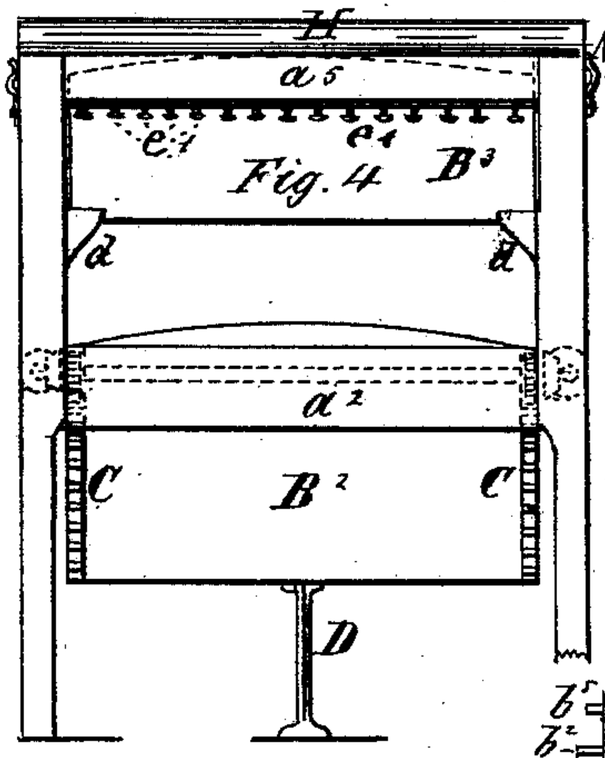
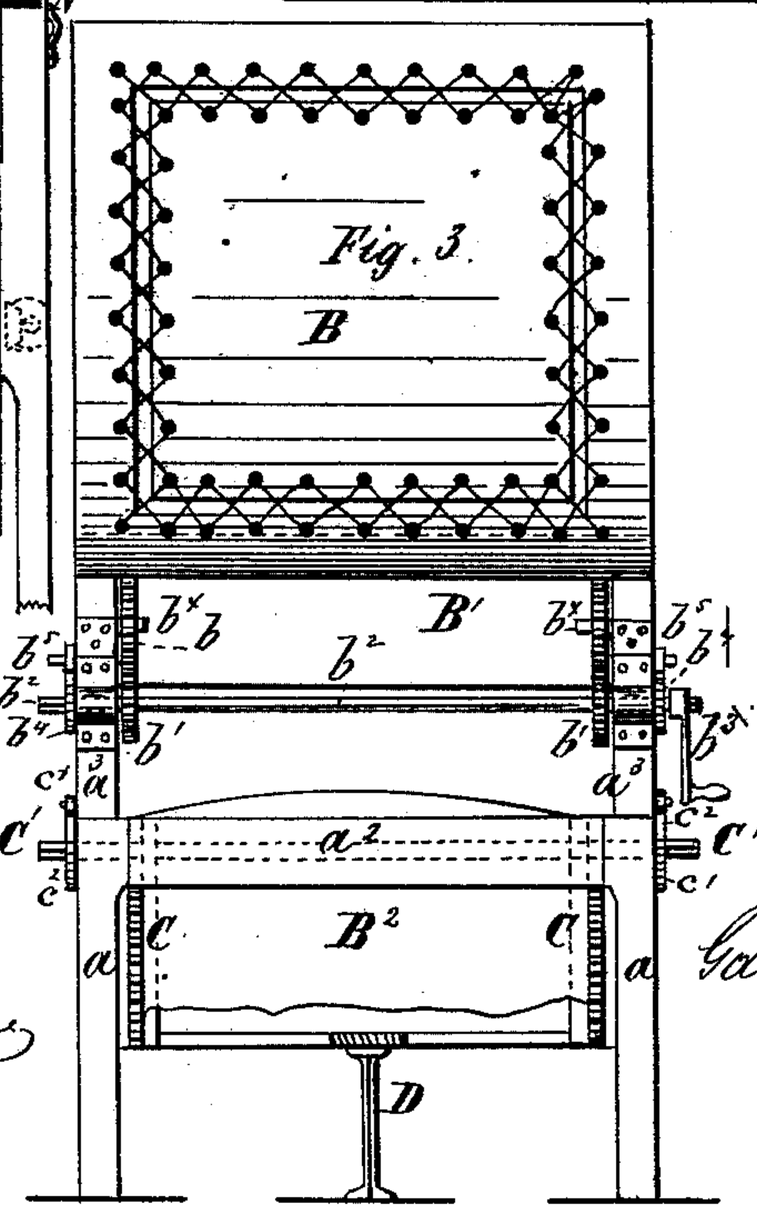


Fig. 3.



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3 Sheets—Sheet 2.

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Fig. 9.

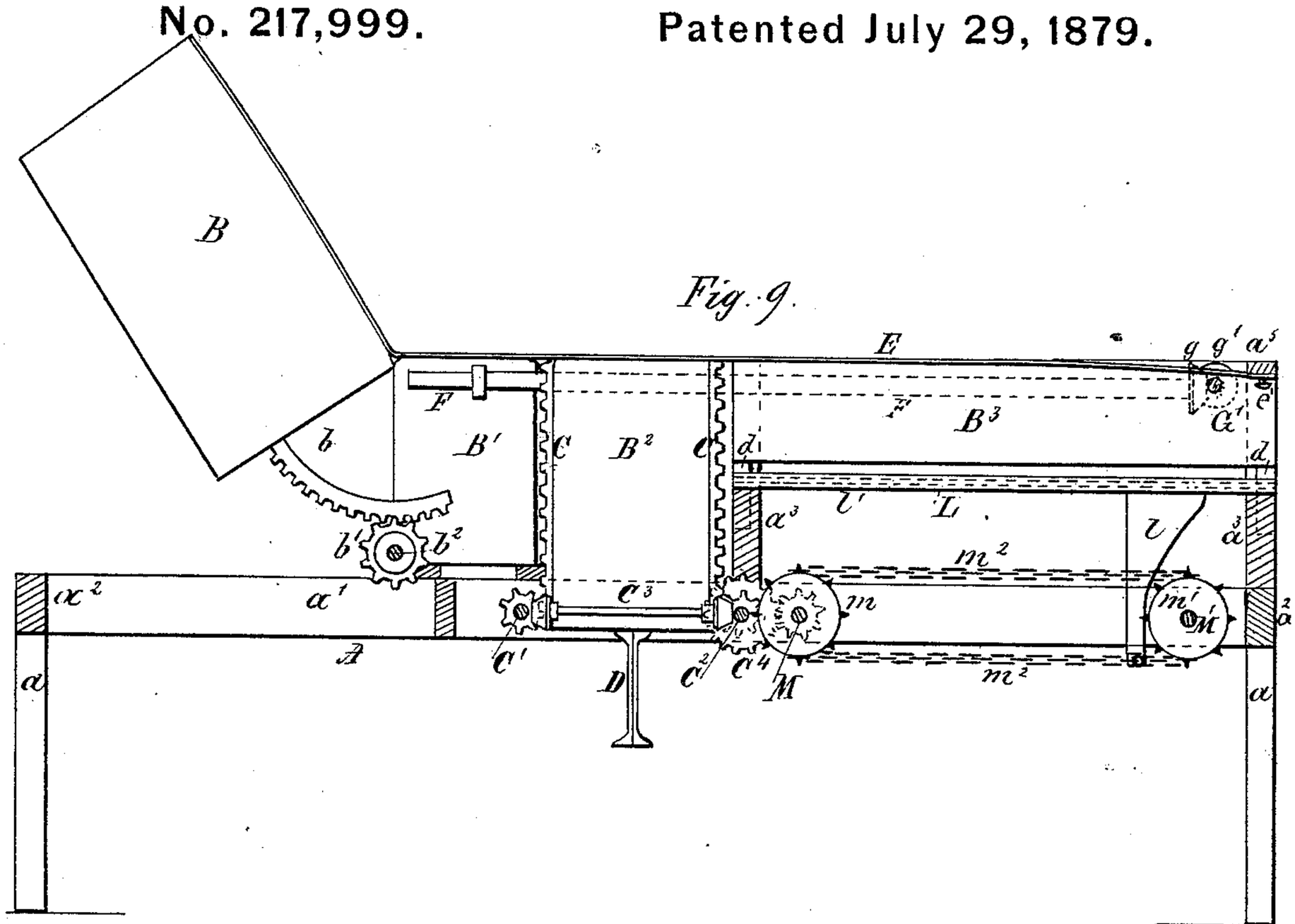

Fig. 7

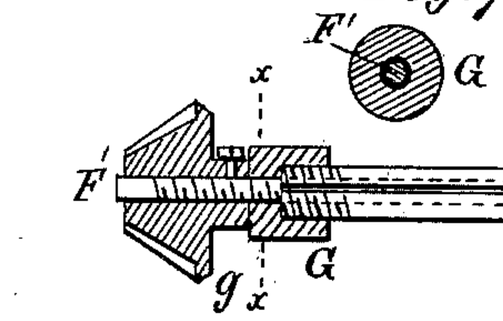

Fig. 6.

Fig. 8.

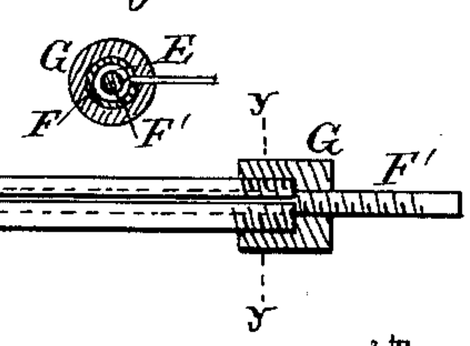

Fig. 5.

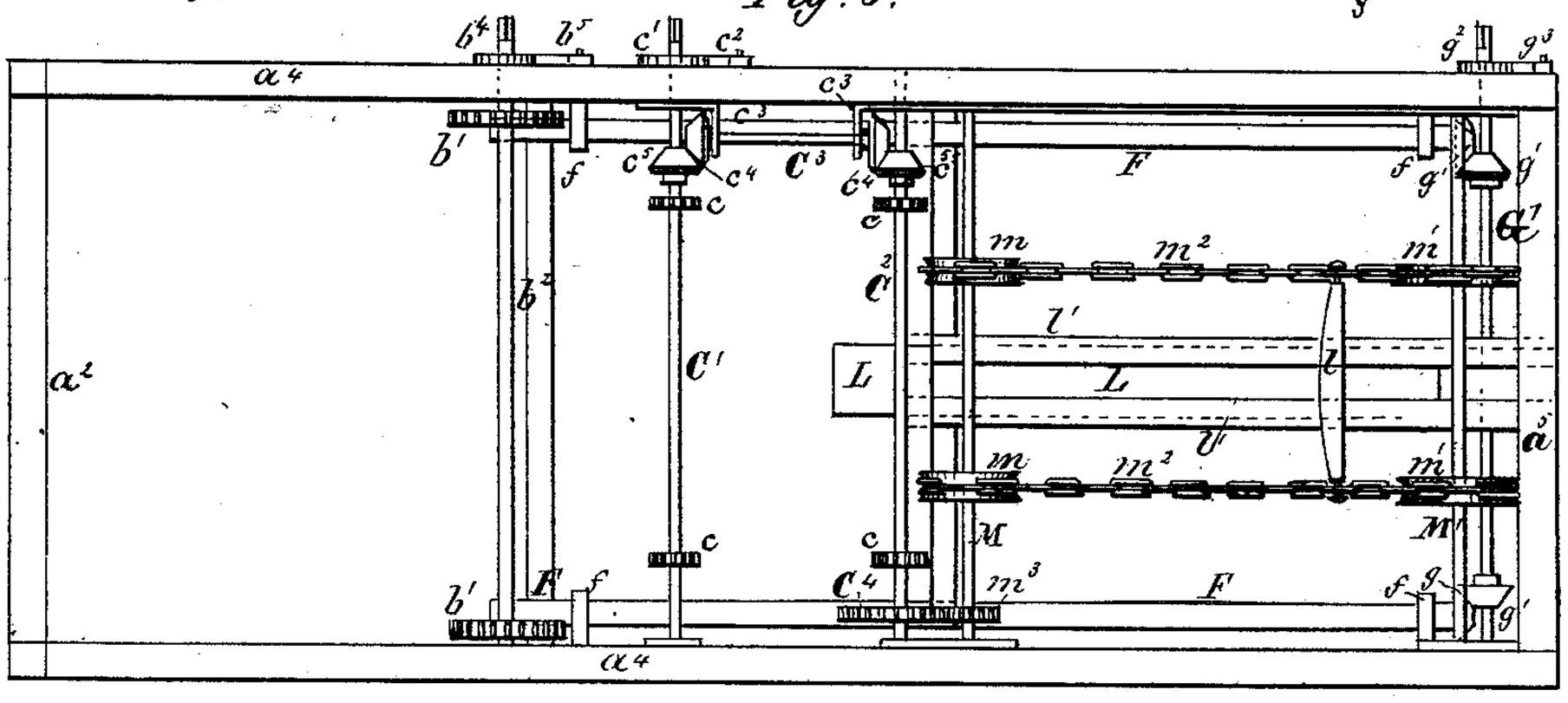

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Fig. 11.

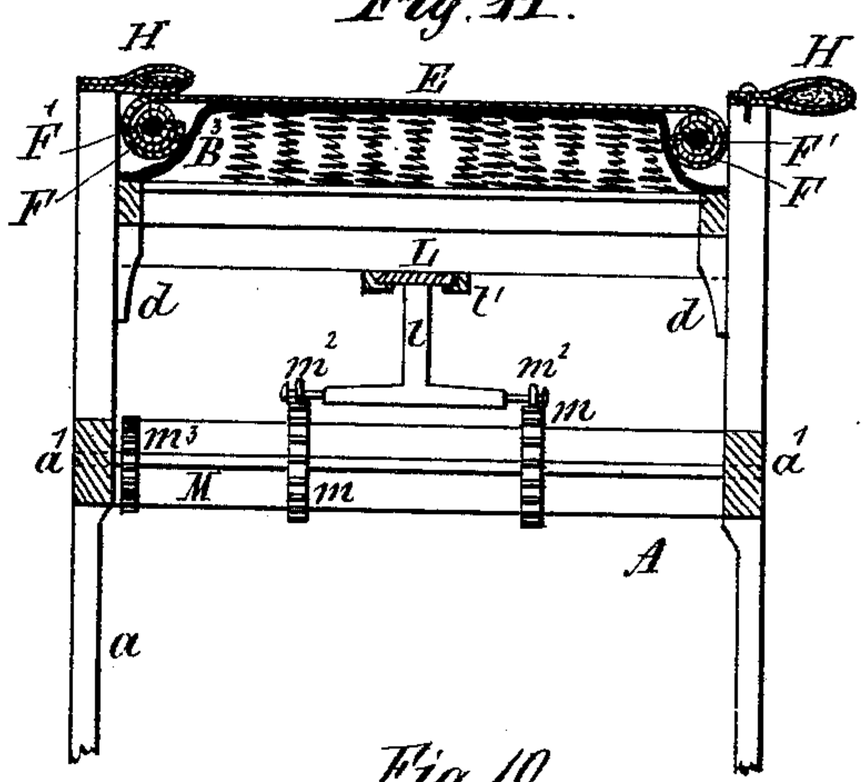
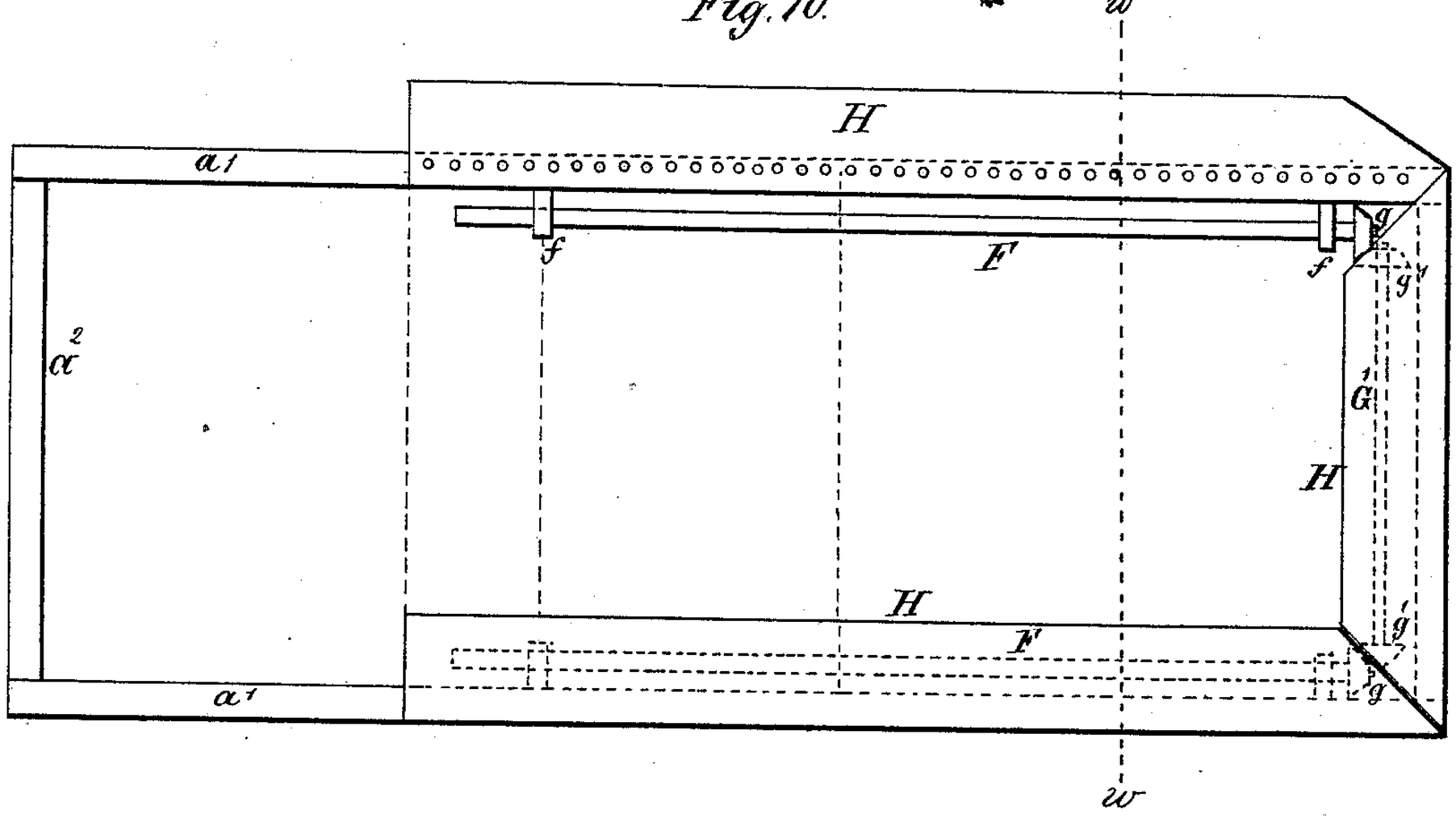


Fig. 10.



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UNITED STATES PATENT OFFICE.

GASTON D'HAISNE, OF PARIS, FRANCE, ASSIGNOR TO AMÉDÉE ANTONIE LEFÉBVRE, OF SAME PLACE.

IMPROVEMENT IN INVALID-BEDSTEADS.

Specification forming part of Letters Patent No. **217,999**, dated July 29, 1879; application filed July 24, 1878; patented in France July 18, 1877.

To all whom it may concern:

Be it known that I, GASTON D'HAISNE, of the city of Paris, in the Department of the Seine, Republic of France, have invented new and useful Improvements in Invalid-Bedsteads, for which I have obtained a patent in France, dated July 18, 1877, No. 113,769, of which the following is a specification.

In the accompanying drawings, Figure 1 is a side elevation, part of the frame being broken away. Fig. 2 is a plan view, and Figs. 3 and 4 end elevations, of an invalid-bedstead constructed according to my invention. Fig. 5 is a plan view of the frame, showing the various gearing for operating the movable parts. Fig. 6 is an elevation, partly in section, of one of the stretcher-rods. Figs. 7 and 8 are sections through lines *x x* and *y y* of Fig. 6, respectively. Fig. 9 is a side elevation, one side of the frame being removed to show the mechanism for operating the sliding board or tablet; and Fig. 10 is a plan view, and Fig. 11 a transverse section, on line *w w*, Fig. 10, showing especially the arrangement of covering-flaps H.

Similar letters of reference are employed in the above-described drawings to indicate corresponding parts wherever such may occur.

A represents the main frame, supported upon four or more legs, *a*, and consists of the longitudinal bars a^1 and cross-pieces a^2, upon which are fastened the uprights a^3, the longitudinal girts or bars a^4, and the transverse girt or bar a^5, forming a supplemental frame smaller than the main supporting-frame, and elevated above it, for purposes hereinafter described.

The bed portion consists of three movable and one stationary sections, B B^1 B^2 B^3. The head-section B is of such a length as to extend below the shoulders of the patient, and receives the pillow or pillows. This section is so connected or hinged to the stationary section as to adapt it to be raised from a horizontal to a vertical, or nearly vertical, position, to give the desired inclination to the body of the patient. The raising or lowering of section B is effected by means of segment-racks *b*, meshing with pinions b^1, mounted on opposite ends of a shaft, b^2, both extremities of which project through the sides of the frame, and are squared to receive a key or crank, b^*. (See Fig. 3.) Upon the outer ends of the shaft, on the outside of the frame A, are mounted two ratchet-wheels, b^4, which are locked, together with the shaft, in the desired position by means of the pawls b^5, pivoted to the main frame.

The toothed segments *b* are each bolted at one end to the opposite sides of the head-section, B, their free ends running in guides $b^\times$, secured to the uprights a^3. It will be seen that when shaft b^2 is revolved by means of the key or crank, the pinions b^1, meshing with the segments *b*, will elevate the section B, and when raised to the desired position said section is locked in position by means of the pawls b^5. The fixed section of the bed B^1 is secured to the uprights a^3, or caused to rest upon brackets secured to said uprights.

The center or seat section, B^2, is so arranged as to adapt it for vertical movement, so as to lower it from under the patient for purposes of ventilation, or when otherwise required, and this is effected by means of four vertical rack-bars, C, secured to the four corner uprights of the frame of the center section, B^2, and the pinions *c*, mounted upon two transverse shafts, C^1 C^2, the former carrying at its outer extremity, on the outside of frame A, a ratchet-wheel, c^1, to lock the section into the desired position by means of the pawls c^2.

To insure uniformity of motion, and to give more strength to the gearing, I employ, preferably, two additional longitudinal shafts, C^3, which have their bearings in brackets c^3, secured to frame A. Each shaft C^3 carries bevel-pinions c^4, which mesh with similar pinions, c^5, mounted upon shafts C^1 C^2, the arrangement of this mechanism being clearly shown by Fig. 5.

To avoid the speedy wear of the rack-bars and pinions when the section is lowered, I support said section upon one or more feet, D, Figs. 1, 3, 4, and 9, secured to the section B^2 in any desired manner. In this way the weight is transferred from the teeth of the pinions and rack-bars to the foot or feet D. The foot-section B^3 rests loosely upon brackets *d*, and may be withdrawn by sliding it out through the foot end of the bed.

E is a stretcher, one end of which is secured to the head-section B, and forms part thereof, while the other or foot end is secured to pins e', fastened to the upper transverse bar, a^5, of the frame A. (See Fig. 4.) Any suitable material may be employed for this stretcher, though I prefer to use fine netting, especially upon bedsteads used for patients who have undergone amputation of the lower limbs, or for invalids who from long illness have become so emaciated as to cause flesh-wounds by reason of the contact of the body with the mattresses, as it will be readily seen that by means of this netting the patient may not only be removed from the mattresses when desired, but a thorough ventilation all around his body may readily be effected, which in all cases is very desirable in warm weather.

The fabric or netting is stretched by means of two rods, F, mounted in brackets f in the upper longitudinal girts or bars of the frame A. These rods F are hollow, and are provided throughout their length with a slot, f', the outer ends of both rods being screw-threaded. The longitudinal edge or seam of the fabric or netting is inserted into this slot, and a solid rod, F′, slightly longer than hollow rod F, is then inserted in the latter and upon the edge or seam of the fabric to wedge the same firmly to rod F. Two sleeves, G, adapted to fit the projecting smaller ends of rod F′ and the ends of rod F, are then screwed upon the two to hold them firmly together. Upon one end of the rod F′ is mounted a bevel-wheel, g, which meshes with a similar pinion, g', upon the transverse shaft G′, which, like the shafts b^2 C^1, projects through the sides of the frame and carries a ratchet-wheel, g^2, upon each end, which ratchets are locked in position by means of the pawls g^3, both ends of the shaft being squared to receive a key or crank.

It will be seen that when shaft G′ is rotated, and with it the pinions g^1, the latter will rotate the pinions g, and with them the rods F F′, in opposite directions, thus winding the fabric or netting upon said rods until it is sufficiently taut.

To insure uniformity of motion and the even stretching of the fabric or netting, I may connect the foot end of said fabric to the shaft G′, so as to stretch it both longitudinally and transversely; and instead of connecting the upper end with the head-section B. I may, under some circumstances, connect it to a shaft secured in bearings at the outer end of said section B, whereby the patient's whole body may be raised from off the bed when desired. The arrangement of this mechanism and its construction are clearly shown by Figs. 2, 5, 6, 7, and 8.

H H are hinged cushions or lined or upholstered flaps, flexibly connected with the upper frame, which cushions are turned in over the sides and foot end and cover the operating mechanism, and serve to protect the patient from contact therewith or with the frame of the bedstead.

The stretcher E is provided at the seat or central section, B^2, with an aperture, e, for the purpose of enabling the patient to relieve himself when nature demands it; and to this effect, and to avoid the soiling of the mattresses, I make the central section, B^2, movable vertically, and employ in conjunction therewith a movable tablet or board, L. sliding upon bars l', with which it is connected by tongue and groove, and may be pushed forward by hand, the chamber or vessel being placed upon this tablet.

In order to automatically move the said board or tablet L under the patient, and also to move it simultaneously with the center section, B^2, I employ the following mechanism, as shown by Figs. 5 and 9: M M′ are two shafts, which have their bearings in the sides of the frame. Each shaft carries two sprocket-wheels, m and m^1, over which travel two pitch or Vaucanson chains, m^2, upon which is secured the foot l of the tablet or board L. The shaft M also carries a pinion, m^3, which meshes with a pinion, C^4, mounted upon shaft C^2. It will be readily seen that when shaft C^1 is revolved to lower section B^2 the corresponding revolution of shaft C^2 will, by means of the pinion C^4, revolve shafts M M′, and their sprocket-wheels m m^1 will advance the chains, and with them the tablet L, upon the guides l'.

Under some circumstances it is desirable that the covering should not come in contact with the body or a certain portion of the body of the patient. To effect this I employ a series of S-shaped springs, N, secured to the upper bars or girts of the frame, by means of which the covering may be stretched taut over the patient, or over a part of his body only, the covering being held in that position by the springs.

In some diseases requiring the body or a part of the body to be kept cool, I place upon the bed sectional rubber mattresses adapted to be inflated or filled with cold water.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an invalid-bed, the combination of the head-section, B, oscillating upon a stationary pivot, the stretcher E, connected with said head-section, a vertically-movable seat-section, B^2, and mechanism, substantially as described, for operating said sections B B^2 independently of each other, the stationary section B^1, and the removable section B^3, and frame A, all constructed and operating as and for the purpose specified.

2. In an invalid-bed, the head-section, B, intermediate fixed section B^1, foot-section, B^3, adapted to be removed, and the stretcher E, in combination with the independently vertically-movable section B^2 and the rigid tablet L, adapted for movement simultaneously with the central section, B^2, substantially as described, and operating as and for the purposes shown and set forth.

3. In an invalid-bed, the combination, with

the main frame, a stretcher, and a vertically-movable seat-section, B^2, of the tablet L, guide-bars l', shafts M M′, sprocket-wheels m m^1, and the pitch or Vaucanson chains m^2, all arranged and operating substantially as and for the purposes specified.

4. In an invalid bed, the combination of the main frame, a stretcher, and a vertically-movable seat-section, B^2, and the shaft C^2, carrying pinion C^4, of the tablet L, guide-bars l', shafts M M′, pinion m^3, sprocket-wheels m m^1, and the chains m^2, all arranged and operating substantially as and for the purpose specified.

5. The combination, with the frame A and the mechanism for operating the stretcher, of the cushioned or lined flaps H, flexibly connected or hinged to said frame A, substantially as shown and described, for the purpose specified.

In witness that I claim the foregoing I have hereunto set my hand.

GASTON D'HAISNE.

Witnesses:

PAUL GIRARD,

LEOPOLD BOURGEOIS.