T. P. FORD.

Ships Berths, &c.

No. 156,079. Patented Oct. 20, 1874.

Fig. 1.

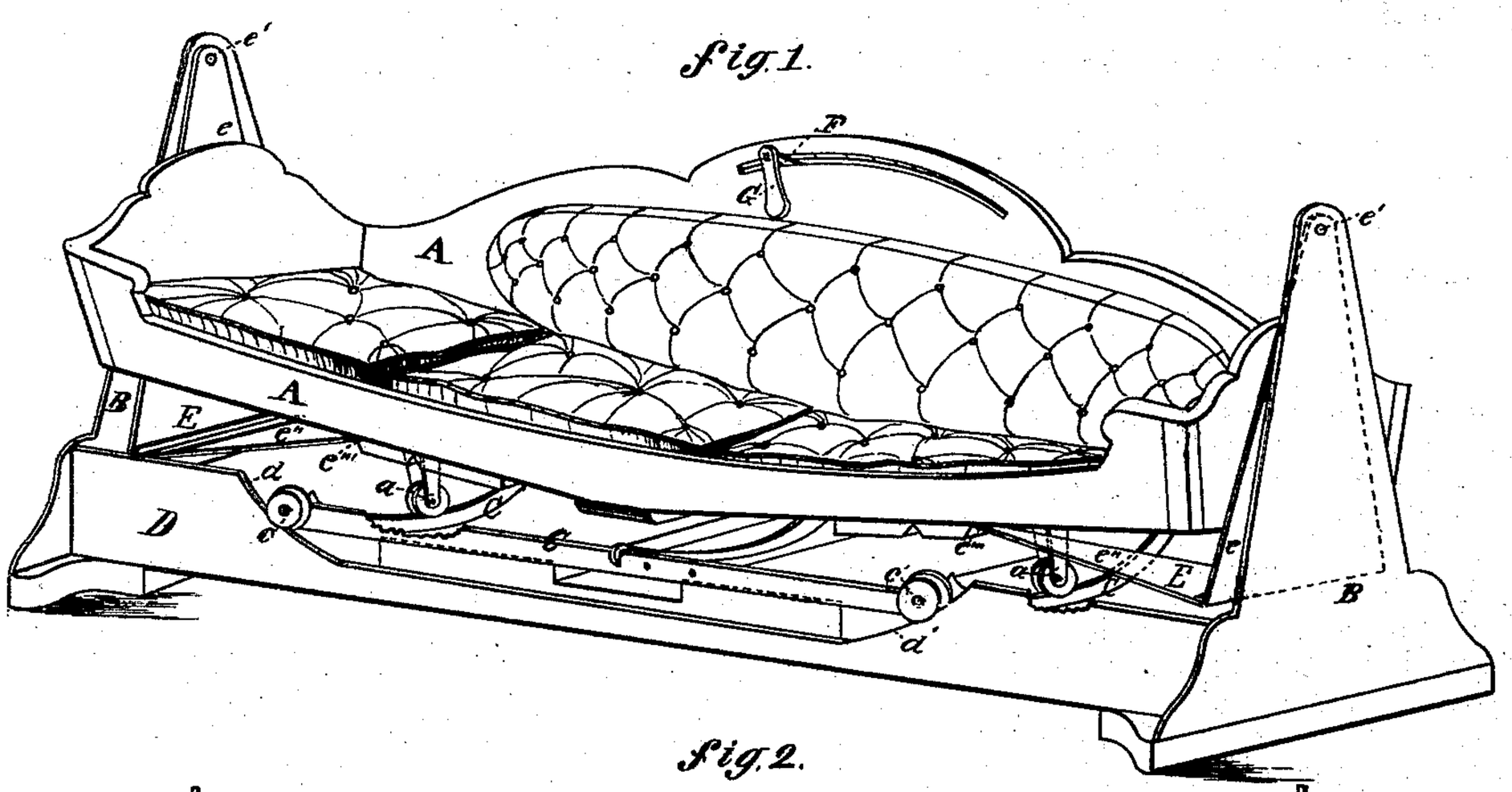


Fig. 2.

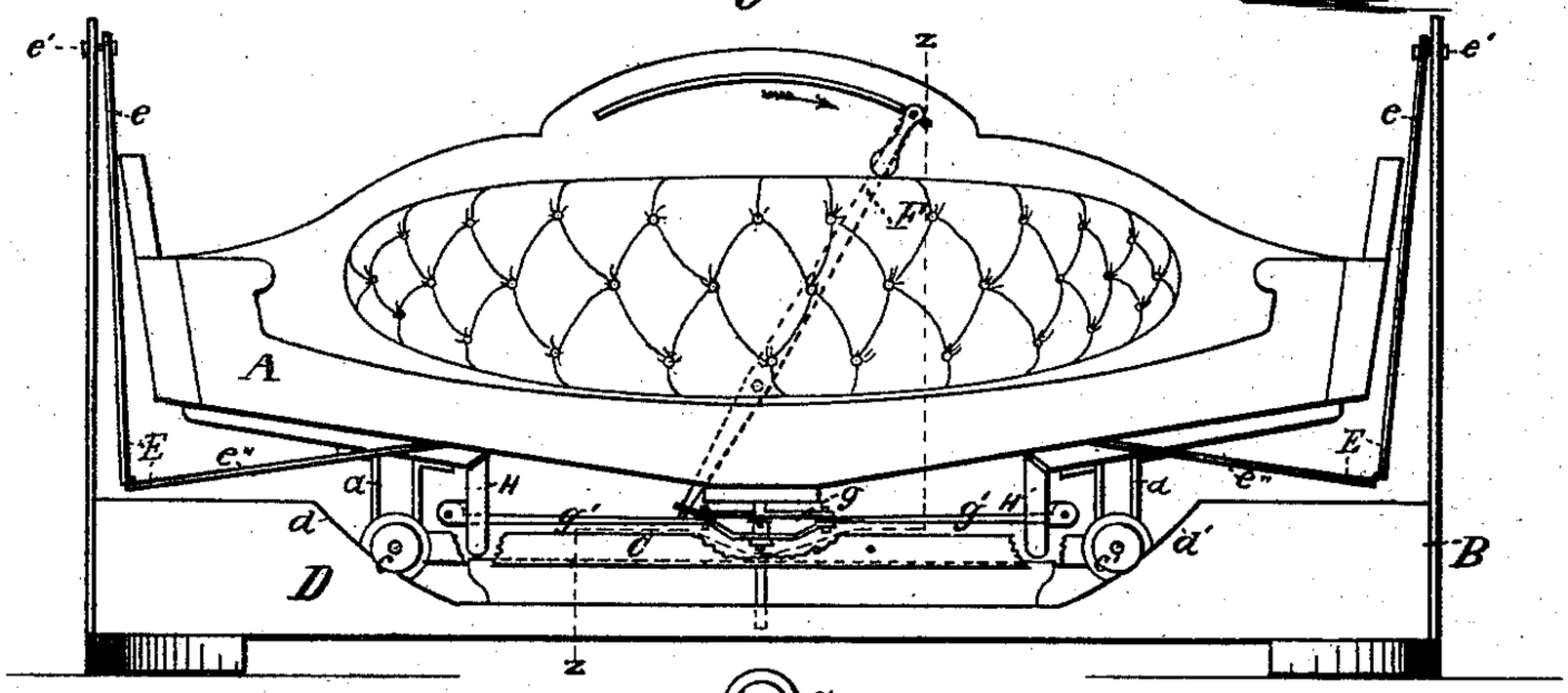
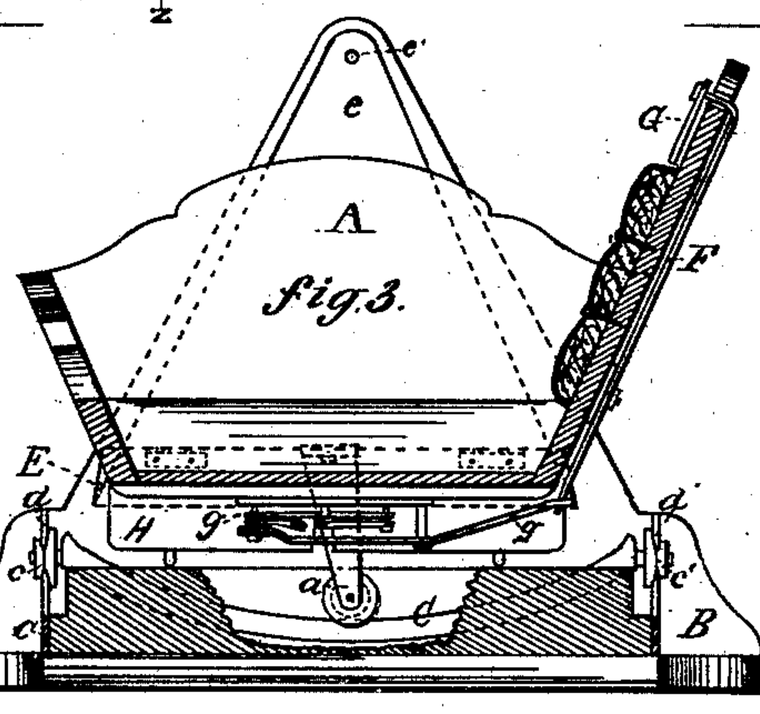


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS P. FORD, OF GREEN POINT, BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO THOMAS SCOTT DICK, OF SAME PLACE.

IMPROVEMENT IN SHIPS' BERTHS, &c.

Specification forming part of Letters Patent No. **156,079**, dated October 20, 1874; application filed August 17, 1874.

To all whom it may concern:

Be it known that I, THOMAS P. FORD, of Green Point, in the city of Brooklyn and State of New York, have invented Improvements in Ships' Berths, Cabins, &c., of which the following is a specification:

The object of my invention is to limit and control the motion of the berth and so to support it upon a supporting-carriage, and so to balance it in connection with the free movements of the carriage, that an equilibrium shall always be maintained in the berth while the supporting-carriage or the vessel moves or sways laterally or longitudinally, any change or tendency to change from a horizontal level of the carriage or vessel being met and compensated for by the balanced berth; and to effect these ends my invention consists in the employment, beneath the berth, of a carriage having rails or tracks of a curvature in the arc of a circle, and on which the berth runs with friction-rollers, such carriage itself resting by friction-rollers upon other curved tracks located in planes at right angles to the carriage-rails, the berth thus being supported underneath by the devices which control its motion and preserve its equilibrium, while at the same time it is hung to jointed guide-frames, which permit its sway to the required degree, to offset either the rolling motion or the pitch of the vessel.

In the accompanying drawings, Figure 1 represents a perspective view of a berth constructed according to my invention. Fig. 2 is a front elevation, and Fig. 3 a vertical section, in the lines *z z* of Fig. 2.

A is the berth, to the bottom of which, at or near its longitudinal center, are fixed projecting bars *a*, having friction-rollers resting on the track of the carriage C; B, a portion of a vessel, cabin, or other place in which it is placed; C, the movable carriage, with curved tracks, on which the berth rests, and on which it may ride in a direction athwart-ships, to offset the roll of the vessel; D, the stationary part of the vessel or frame, on which are the curved ways or tracks *d* d^1, upon which the carriage C may move, by means of friction-rollers *c c'*, a limited but sufficient distance in a direction fore and aft, to compensate for or offset the pitch of the vessel. The friction-rollers *c c'* are made adjustable, so as to be nearer to or farther from the center of the frame, according to the degree of stability required. E E are two jointed and similar guide-frames of thin plate metal, the upper portion *e* of each being suspended by a pin, *e'*, from the wall, post, or other permanent part of the cabin or vessel, and the lower part *e''* being secured to the bottom of the berth, at some distance from its ends, as seen at *e'''*. These guide-frames, as will be seen, widen out from their point of suspension, so that at their joint and the line where they are hinged or jointed at *e'''* to the bottom of the berth their breadth is about or quite equal to the breadth of such bottom. This serves to control the motions of the berth, and prevents it from having any improper movement or strain on its own longitudinal center or axis, as would be the case if the connection of such frame to the bottom were only at or near such center, instead of all across the bottom, as shown. F is a hand-lever, by which the occupant of the berth may at will, by means of the handle G inside the berth, lock or bring the berth to a rest or set it free, the levers *g g* and connecting-rods *g' g'*, to which this hand-lever is connected, serving to raise or lower the foot-levers H H, which are hinged or otherwise arranged to swing on the under side of the berth. The movement of the lever in the direction of the arrow in Fig. 2 serves to lower the levers H H until they are brought to or about a vertical position, thus bringing their lower edges against the floor or platform beneath the berth, thus preventing any further movement of the berth, independently of that of the vessel.

By moving the lever in the opposite direction, as shown in Fig. 1, the levers H H are raised, and the berth is again free to sway as may be demanded by the varying movements of the vessel.

The back of the berth is made high. This serves not only to give a good leverage to the lever-handle, but to bring the handle where it is most accessible for use and least in the way.

The high back is also more artistic, and gives a better finish to the whole structure.

The carriage-tracks are curved in the arc of a circle described from an imaginary center at a point midway between the points *e' e'* from which the guide-frames are hung. The curved tracks *d d'* are also in the arc of a circle of larger radius, but described from the same center.

It will thus be seen that although my berth rests on the carriage and tracks beneath it, yet all the movements of the berth, as the vessel sways or rocks, are about a common imaginery center of motion above the berth, while by my mode of construction I entirely dispense with all frame-works, devices, or appliances over the berth or over the head of the occupant. This is a great advantage, as it leaves all the space above the berth entirely free, and removes all danger of striking the head or body against them in getting into or out of the berth.

The form of the sides, ends, and bottom of the berth are all inclined as shown, the bottom having two inclines, meeting at or near the center. The inclinations of the bottom I make such that each shall be in a plane or line at right angles to the bevel or incline of the end at the opposite end of the berth. The variation of the inclines at the end would, therefore, in the construction of a given berth, demand a corresponding variation in that inclination at the bottom which meets the opposite inclined end. Under no conditions then can the head of the sleeper be swung lower than his body, and a law of construction is afforded applicable to variations of sweep or play which is positive and simple. The degree of these inclines is determined by and adjusted to the range of motion of the vessel and berth, and the space within which it may be allowed to sway. Thus, assuming that thirty degrees is the maximum of rolling motion, or athwart-ships, and ten degrees the maximum of pitch fore and aft, the inclinations of the berth are made accordingly. Thus all available space between limits, both vertical and horizontal, is saved for the erection of each berth. The berth in a heavy sea is never liable to project out into the cabin any more than in a calm, and the double-inclined bottom also imparts a gentle curvature to the mattress, which is most comfortable and desirable for the occupant of the berth. The guide-frames E E, being made of broad sheet-metal, admit of being made so thin as to occupy so little space that the berth itself may be given the maximum possible length within a limited space to be assigned for a berth.

By avoiding the use of gimbals as a means of suspension and support, it will be seen that I avoid all obstruction to getting in or out of the berth, and also avoid the necessity of an equal swing in directions transverse of each other, while I arrive at or approximate the best results. By giving the double incline to the bottom I not only give to the sleeper the easiest position, somewhat like that in a hammock, but the inclinations on the exterior prevent the head sinking lower than the body when the ship sways fore and aft, and also allow plenty of play for the frame E beneath it, without causing the frame to arrest its movements, and without hanging such frame unnecessarily low. The same principle and method of balancing and maintaining an equilibrium, as above described, for a berth, it is evident may be applied to other things—as, for instance, to a cabin, sofa, chair, table, platform, car, &c.

I claim—

1. The herein-described method of limiting and controlling the motion of and maintaining an equilibrium in ships' berths, &c., by supporting them upon curved tracks in planes at right angles to each other in addition to its means of suspension.

2. The combination of the berth or balance frame A, guide-frames E, and the transverse movable carriage C, substantially as shown and described.

3. The system of levers and connecting-rods, combined with the hand-lever F, and with the hinged foot-levers H, for stopping and releasing the berth.

4. In combination with the berth, the jointed frames E E secured by a joint to the bottom of the berth at points or lines between its ends, and operating as shown and described.

5. The berth, constructed with its bottom inclined gently upward from at or near its center towards its ends, and with its sides and ends also inclined upward, the inclination of each end being at right angles to the inclination of that plane of the bottom which meets its opposite end, all as shown, and for the purpose described.

THOMAS POWNAL FORD.

Witnesses:

THOS. S. DICK,

ARTHUR W. DICK.