(No Model.) 2 Sheets—Sheet 1.

# J. H. MILLIGAN.

## SELF LEVELING BERTH.

No. 267,360. Patented Nov. 14, 1882.

*Fig. 1.*

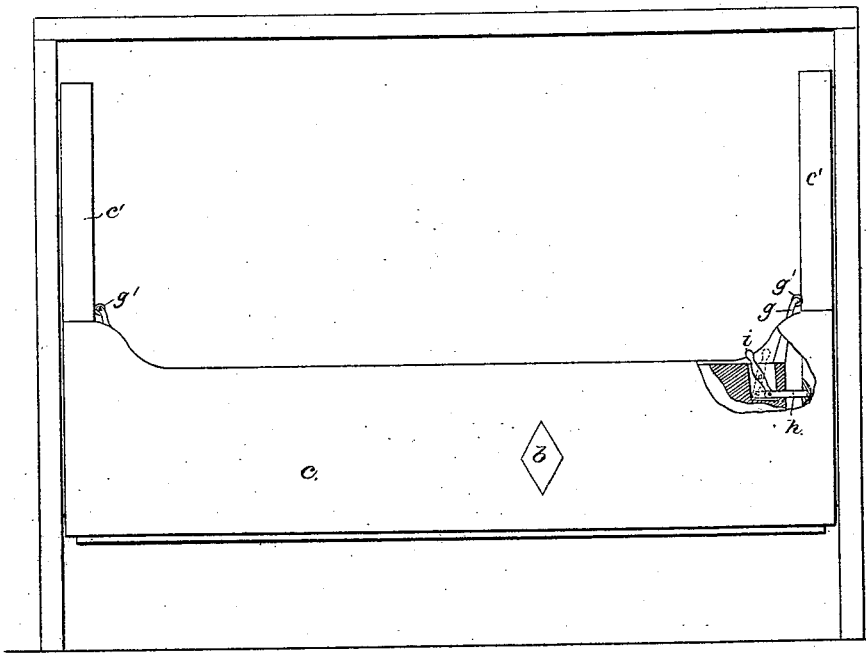
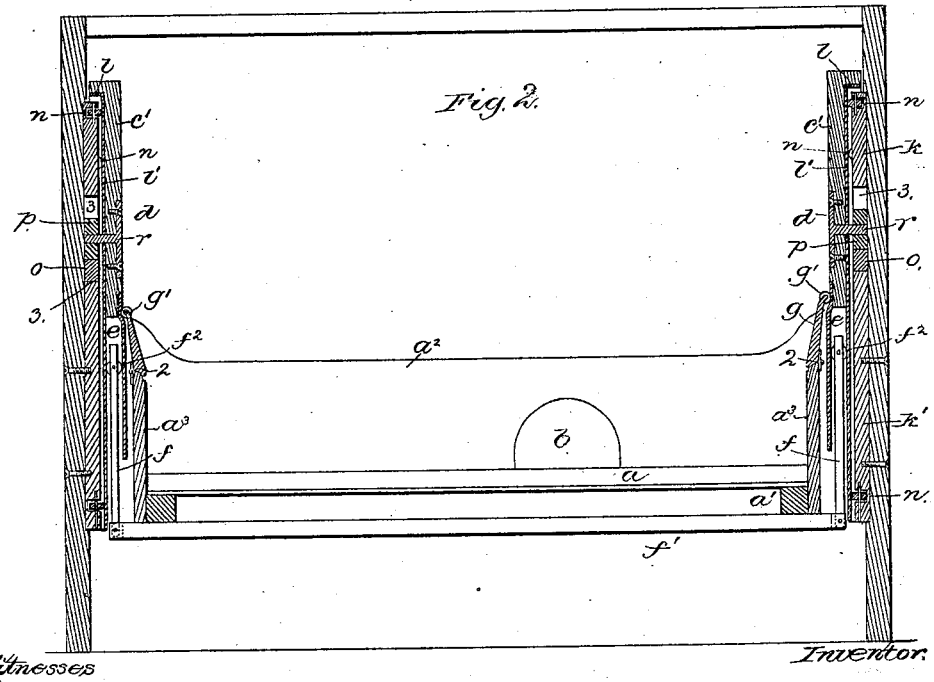



*Fig. 2.*




Witnesses
John F. C. Brinkloh
Bernice J. Noyes

Inventor.
Joseph H. Milligan.
by Crosby & Gregory Atty's

(No Model.) 2 Sheets—Sheet 2.

# J. H. MILLIGAN.

## SELF LEVELING BERTH.

No. 267,360. Patented Nov. 14, 1882.

*Fig. 3.*

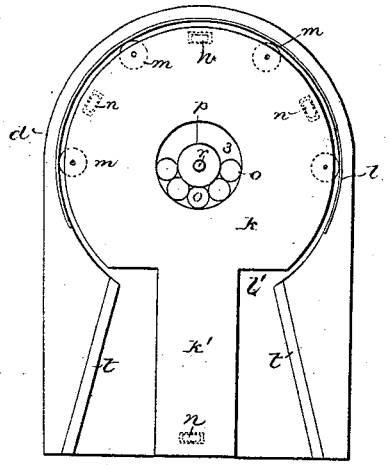



*Fig. 4.*

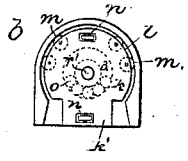
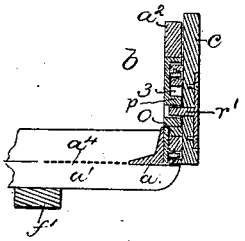



*Fig. 5.*




Witnesses.
John F. C. Prindle
Bernice J. Noyes.

Inventor.
Joseph H. Milligan.
by Crosby & Gregory Atty's

# UNITED STATES PATENT OFFICE.

JOSEPH H. MILLIGAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN F. CRONAN, OF SAME PLACE.

## SELF-LEVELING BERTH.

SPECIFICATION forming part of Letters Patent No. 267,360, dated November 14, 1882.

Application filed September 5, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH H. MILLIGAN, of Boston, county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Ship's Berths, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relating to ship-berths is embodied in a berth pivoted or hung upon bearings at its sides in a frame that is pivoted at its ends upon the frame-work of the vessel or partition of the state-room, and has for one of its objects to increase the strength and delicacy of action of the said bearings, the working parts of which are wholly inclosed and protected in the wood-work of the berth. By my improved construction space is greatly economized, it being possible to use in a state-room of given size a self-leveling berth containing my invention of nearly as great size as the ordinary fixed berth. The swinging or pivotal movement of the bunk or berth proper and of its supported pivoted frame is limited in either direction by elastic cushioned stops, the amount of such movement permitted being proportioned to the size of the vessel, and sufficient to compensate for the greatest pitching or rolling movement that will ever occur. The bunk or berth proper is hung by bearings at its sides, and has a longitudinal rocking movement in its supporting-frame, the sides of which are close to those of the said berth, which is provided with steadying guide arms or levers working in suitable guideways in the ends of the said frame, which extend above the ends of the berth proper, and are hung upon bearings the axis of movement of which is considerably above the main portion of the berth and frame. A leaf or board jointed to the head and foot piece of the berth proper rests against the end portions of its supporting-frame, and is provided with friction-rollers, which run upon the said end portions as the berth rocks in its frame, the said board thus covering the space between the said berth and frame and preventing the clothing from being caught therein.

Figure 1 is a side elevation of a berth embodying this invention; Fig. 2, a vertical longitudinal section thereof; Fig. 3, a detail illustrating the pivoted bearing of the berth-supporting frame; Fig. 4, a similar detail of the bearing of the berth proper in its frame; Fig. 5, a vertical section of the berth and frame through the axis of the said bearing.

The frame-work of the berth proper, consisting of two angle-pieces, *a*, (see Fig. 5,) preferably of cast-iron, extending along the bottom at each side of the berth, and connected by cross-beams *a'* at their ends, is mounted upon bearings *b*, the construction of which will be hereinafter described, the said bearings being supported upon the side pieces, *c*, of the berth-supporting frame at a point that will be beneath the center of gravity of an occupant of average size and build.

The side and end pieces, $a^2$ $a^3$, forming the bunk or berth proper, are fixed upon this frame-work, and the bottom, which is indicated at $a^4$ in Fig. 5, may be an elastic wire fabric stretched between the frame-pieces *a a*. The bunk is suitably ballasted to bring its center of gravity, either with or without the additional weight of the occupant, beneath the axis of the said bearing *b* when it is horizontal, its bearing *b* permitting it to retain this position during the pitching movement of the ship and berth-supporting frame connected therewith.

The end pieces *c'* of the berth-supporting frame extend upward above the main body of the bunk, and are hung upon bearings *d*, which permit the said frame to hang vertically downward during the rolling movement of the vessel. The end pieces are provided with guideways *e* to receive steadying arms or levers *f*, pivoted upon the ends of a longitudinal beam, *f'*, fixed upon the bottom of the bunk, the said arms *f* preventing any lateral movement of the bunk and relieving the bearings *b* of all twisting strain. The arms *f* are provided with friction-rollers $f^2$ to render their movement easier and prevent jarring.

The end pieces $a^3$ of the bunk are provided with leaves *g*, hinged at 2, and provided with rollers *g'*, working on the end pieces *c'* of the berth-supporting frame as the bunk moves on

its bearings *b* to compensate for the pitching of the ship. The leaves *g* cover the joint between the end $a^3$ of the bunk and the end of the frame *c'* and prevent the contents of the bunk from rubbing against the said supporting-frame or being caught between it and the bunk.

In order to retain the bunk steady until the occupant has become properly adjusted therein, it may be provided with a bolt, *h*, (see Fig. 1,) operated by the knob *i* to engage the end piece *c'* of the berth-supporting frame, and thus prevent the independent movement of the said bunk until the bolt is withdrawn by a movement of the knob *i* to the position shown in dotted lines.

The bearings *b* and *d* of the bunk and its frame are both constructed upon the same principle, each being composed of two portions—one connected with the moving part and the other with its supporting frame-work—the part connected with the side $a^2$ of the bunk and end portion *c'* of its frame being similar, and being termed the "moving portion" of the bearing, while the part connected with the side portion *c* of the berth-supporting frame and with the partition-wall of the state-room correspond, and are called the "fixed portion" of the bearing. The said fixed portion consists of a circular disk, *k*, having a downwardly-projecting portion, *k'*, serving as a stop to limit the movement of the other portion of the bearing, consisting of a cylindrical bearing-surface, *l*, concentric with the periphery of the disk *k*, and resting upon friction-rollers *m* therein. The fixed portion of the bearing is also provided with laterally-projecting friction-rollers *n*, which engage a plane bearing-surface, *l'*, (see Fig. 2,) of the movable portion of the bearing, and receive the longitudinal pressure of the berth-supporting frame when in an inclined position, owing to the pitching movement of the ship.

The rollers *m* are adapted to receive the entire weight supported by the bearing; but in order to give greater steadiness of movement, and to afford security to the berth in case one of the said rollers should break or otherwise become inoperative, the fixed portion *k* of the bearing is chambered around its center, as shown at 3, and provided with a series of internal rollers, *o*, supporting a sleeve or nipple, *p*.

In the bearing *d* between the berth-supporting frame and end of the state-room a pivot-piece, *r*, (see Fig. 2,) fixed to the end *c'* of the said frame, enters the nipple *p*, so that if the rollers *m* become inoperative the frame will remain supported by the pivot *r* upon the rollers *o* and internal surface of the chamber 3 in the portion *k*. In the bearing at the side of the bunk the pivot-piece *r'* is fixed to the side portion, *c*, of the berth-supporting frame, and the nipple or sleeve *p* is made as a portion of the movable bearing fixed to the bunk proper, and bears upon the rollers and chamber in the portion *k*, thus affording a secondary bearing for the bunk. The pivot *r'* serves to steady the bearing *b* and hold the two portions thereof in the proper relative position, and both pivot-pieces *r r'* have their bases made ornamental, as shown in Fig. 1, this being the only portion of the bearing that is not inclosed. The lower part of the movable portion of the bearing is chambered to receive the stop-arm *k'* of the fixed portion, and to engage it at the end of the maximum movement required for the bearing, to thus prevent the berth from being overturned or yielding too much when a person is getting in or out. A cushion-piece, *t*, of soft rubber or other yielding material, is interposed between the engaging portions of the bearing to cause it to stop without shock, and a similar cushion may be placed at the end of the guideway *e* or stop-lever *f* to prevent concussion in the longitudinal rocking of the bunk.

A double berth may be constructed upon the same principle, the bearings being made somewhat stronger in order to enable them to support the additional weight.

I claim—

1. In a ship-berth, the bunk or berth proper, hung upon bearings at its sides, and its supporting-frame, mounted upon bearings at its ends and provided with guideways, combined with the guide arms or levers, pivoted at the ends of the said bunk and working in the said guides to relieve the bunk-bearings of lateral strain, substantially as described.

2. The bunk and guide-levers pivoted thereon, and provided with friction-rollers at their ends, combined with the bunk-supporting frame having guideways to receive the said guide-levers, substantially as described.

3. The swinging bunk-supporting frame and bunk pivoted therein, combined with their pivotal bearings, in which the portion connected with the supporting frame-work consists of a disk provided with series of radially and laterally projecting friction-rollers and with a stop-arm, and the co-operating portion of the bearing connected with the supported bunk or frame has cylindrical and plane bearing-surfaces and a chambered portion provided with yielding cushions to receive the said stop-arm and by engagement therewith to limit the movement of the bearing, substantially as and for the purpose described.

4. The combination, with the frame-work or partition-wall of a state-room and bearing-disk mounted thereon, having friction-rollers in its periphery, and a central cylindrical chamber provided with rollers and a nipple or sleeve supported thereon, of the bunk-supporting frame and co-operating portion of the bearing mounted thereon, having a primary bearing on the said rollers in the periphery of the bearing-disk, and a pivot-piece entering the said nipple, and thus affording a secondary bear-

ing upon the rollers in the said central chamber, substantially as and for the purpose set forth.

5. The berth-supporting frame and bunk pivoted therein, combined with leaves or boards *g*, hinged at the ends of the said bunk and resting against the ends of its supporting-frame, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH H. MILLIGAN.

Witnesses:
JOS. P. LIVERMORE,
B. J. NOYES.