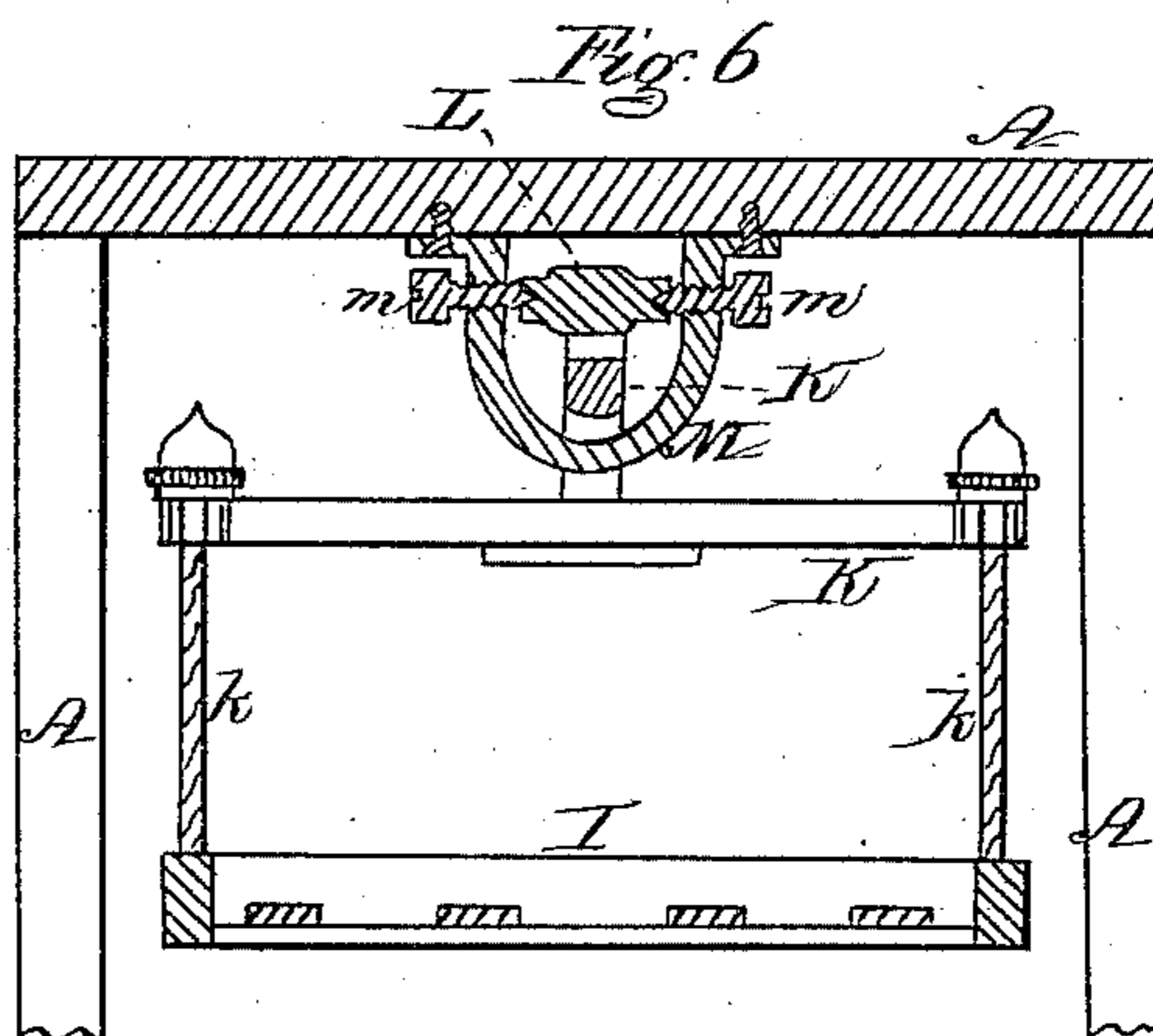
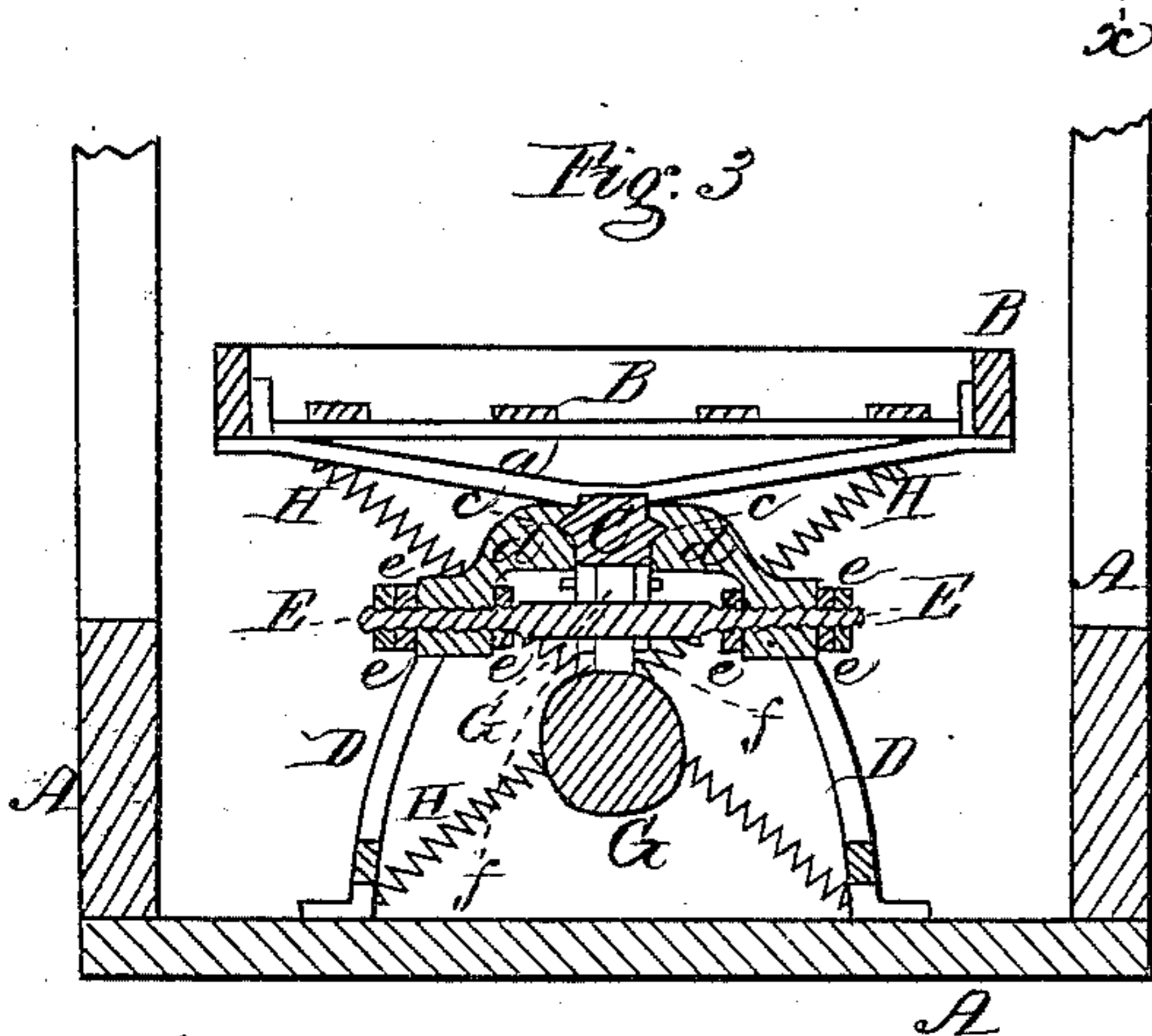
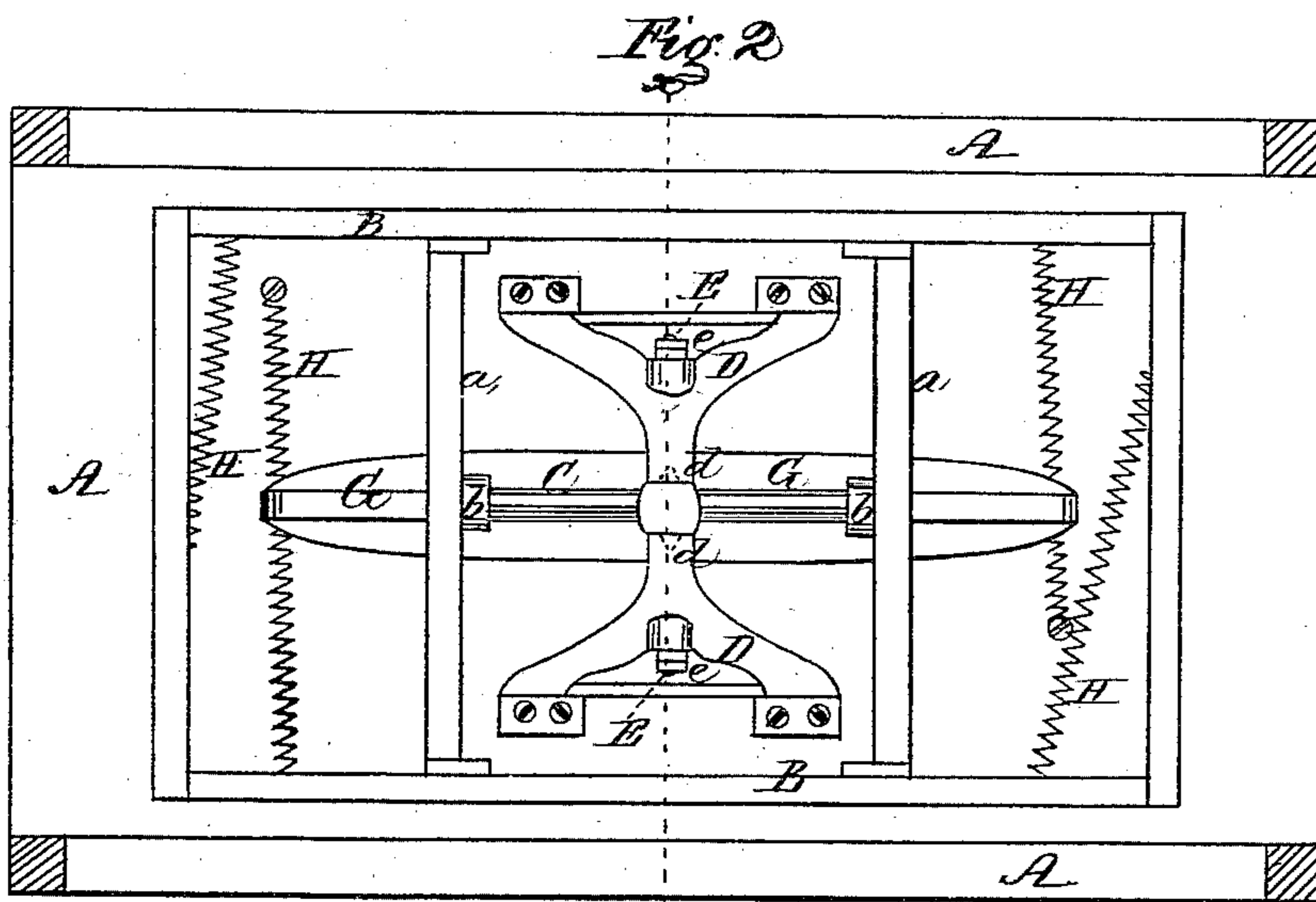
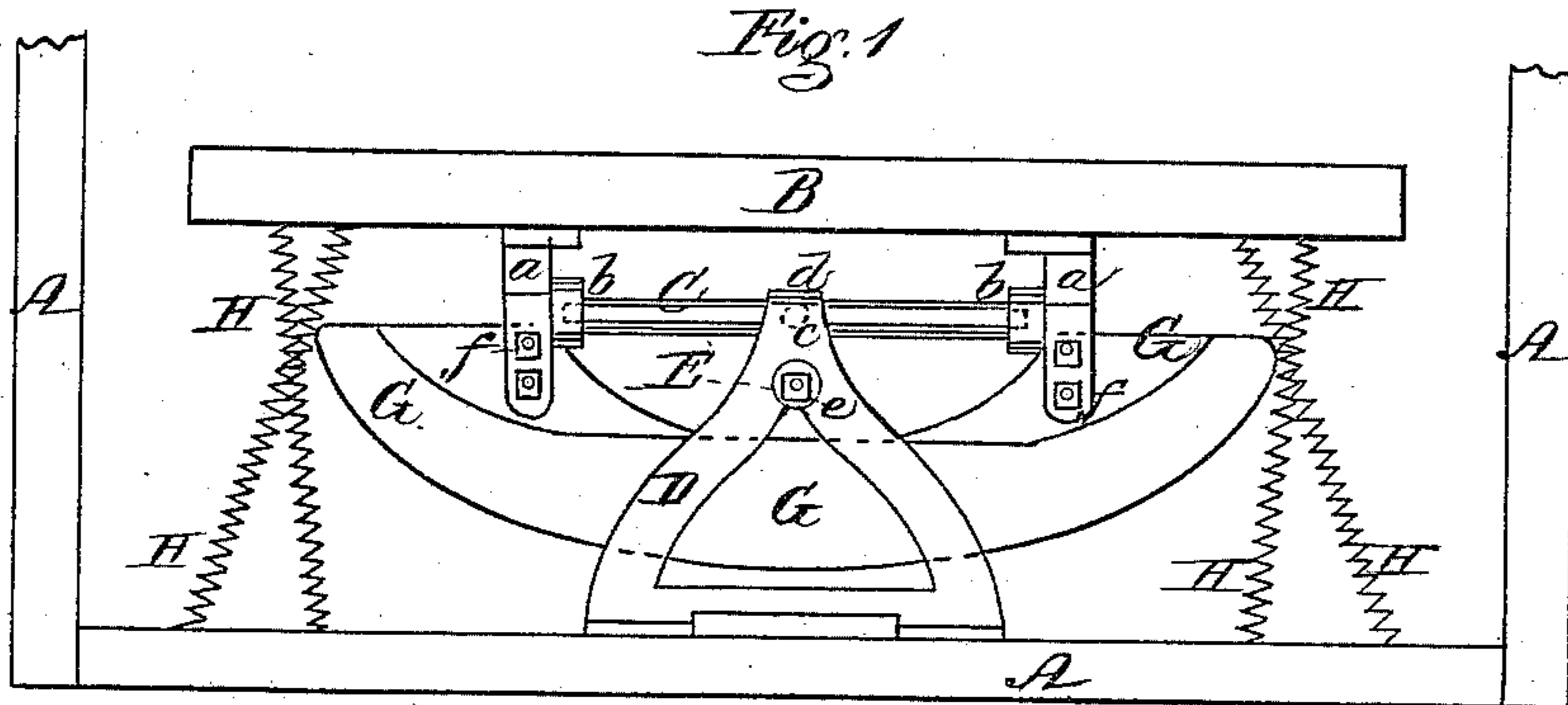


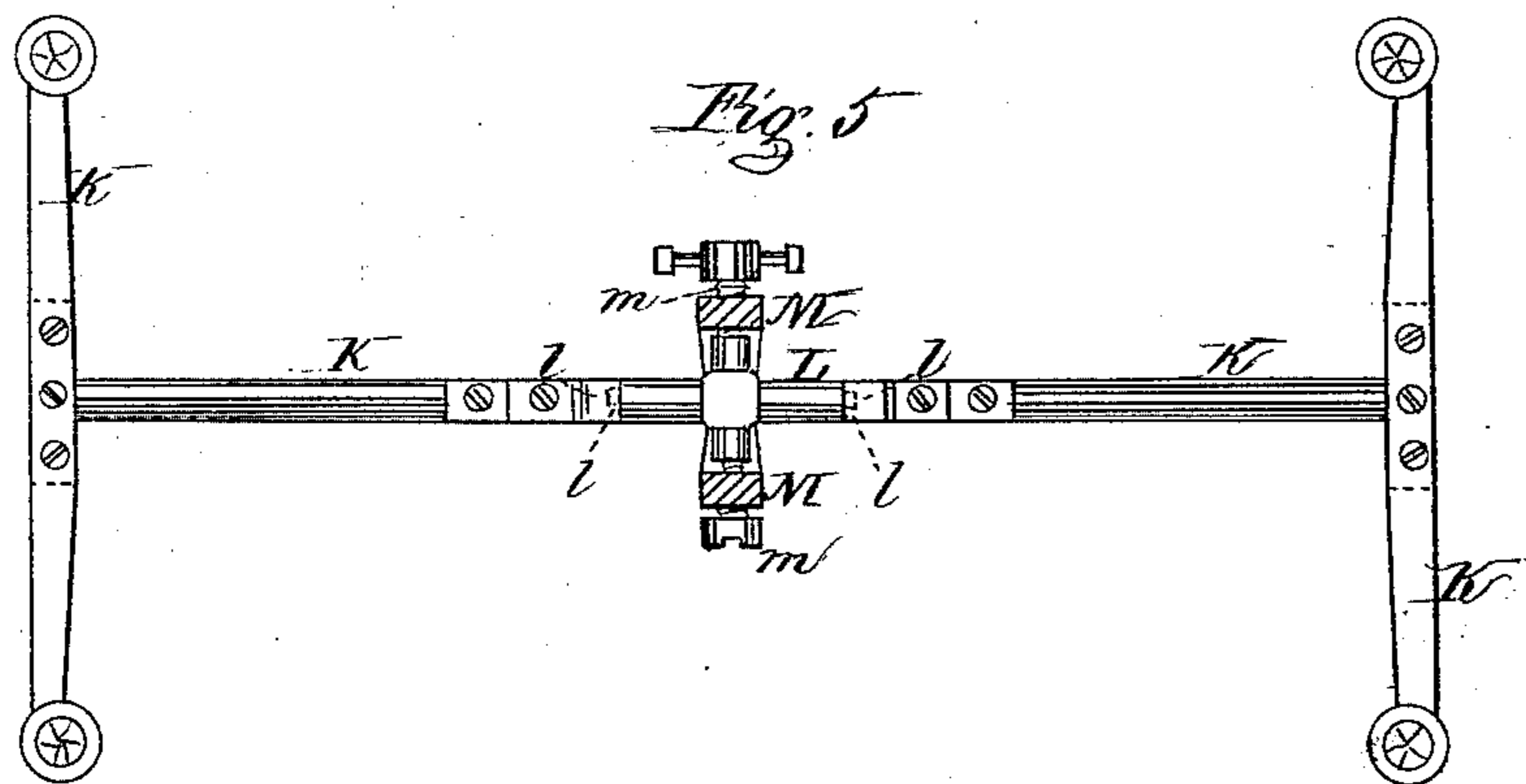
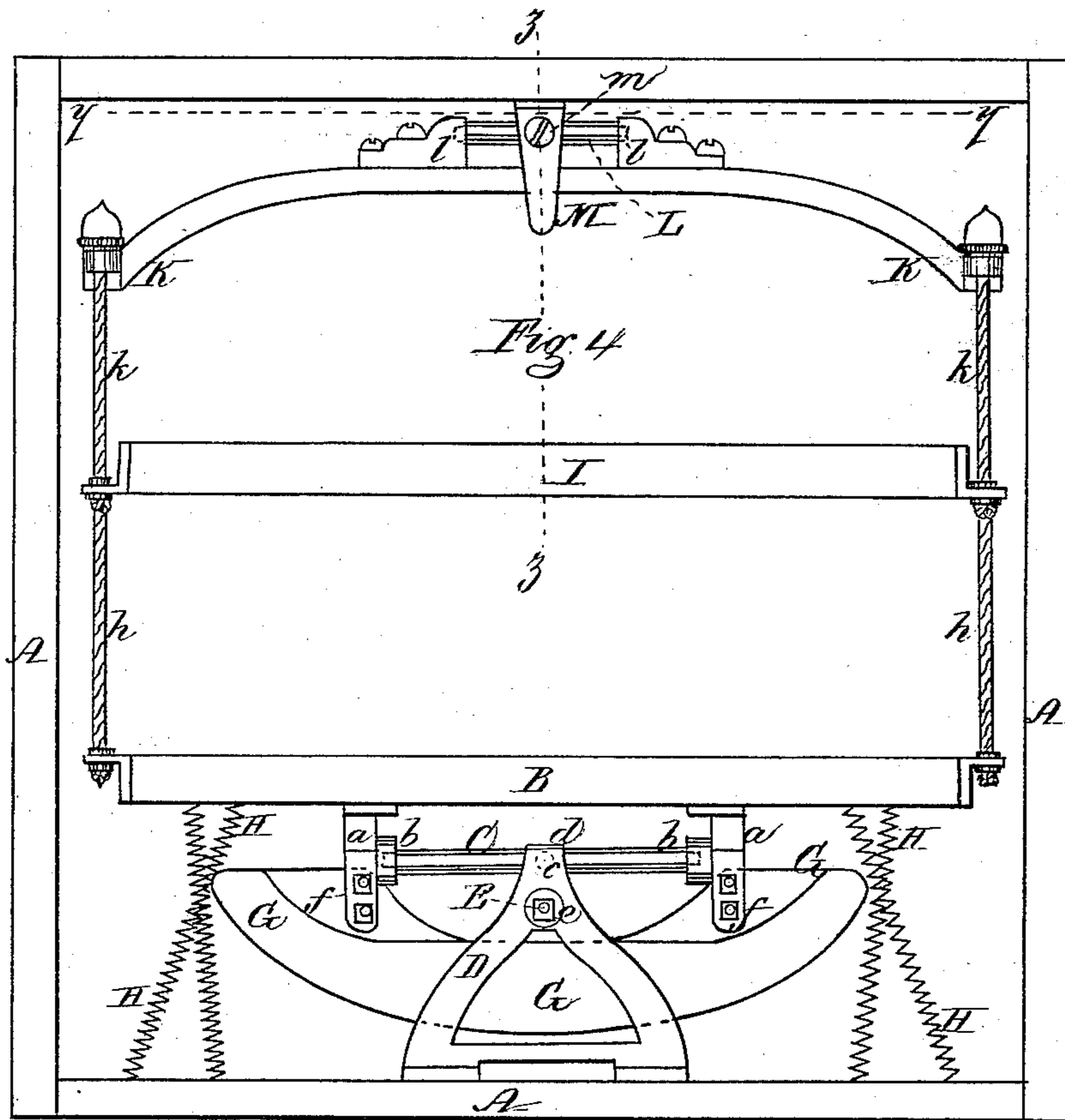
D. HUSTON.
Self-Leveling Berth for Vessels.
No. 222,050. Patented Nov. 25, 1879.



Witnesses
W. J. Cambridge
Chas. E. Griffin

Inventor,
David Huston
per R. E. Schenck
Att'y

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Atty.

UNITED STATES PATENT OFFICE.

DAVID HUSTON, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENT, TO THE HUSTON IMPROVED SHIPS BERTH COMPANY, OF SAME PLACE.

IMPROVEMENT IN SELF-LEVELING BERTHS FOR VESSELS.

Specification forming part of Letters Patent No. **222,050**, dated November 25, 1879; application filed October 17, 1879.

To all whom it may concern:

Be it known that I, DAVID HUSTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Self-Leveling Berths for Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of a self-leveling berth constructed in accordance with my invention. Fig. 2 is a plan of the same, the slats which support the bed being removed. Fig. 3 is a transverse vertical section on the line *xx* of Fig. 2. Fig. 4 is a side elevation, representing two berths constructed in accordance with my invention, and arranged one over the other within the same casing. Fig. 5 is a horizontal section on the line *yy* of Fig. 4. Fig. 6 is a vertical section on the line *zz* of Fig. 4.

My present invention relates to a self-leveling sleeping-berth for vessels, in which the bed-bottom shall at all times remain in, or nearly in, a horizontal plane independently of the motion of the vessel in pitching or rolling, thereby removing the causes which induce sea-sickness, and promoting the ease and comfort of the occupant of the berth; and my invention consists in supporting the berth-frame on a double-swivel or universal joint, which is applied to its under side and serves to connect it with the floor beneath, or other suitable support, the berth-frame being provided with a heavy counterpoise-weight attached to its under side for the purpose of steadying it and maintaining it in its proper position, and with springs arranged in such a manner as to yield when the berth vibrates either on its longitudinal or transverse axis, and, in connection with the counterpoise-weight, return it to its normal position when not occupied; and my invention also consists in connecting, by suitable wires or cords, a berth-frame supported on a double-swivel or universal joint, and provided with a counterpoise-weight and springs, as above described, with a berth-frame placed directly thereover, and suspended from an overhung swinging frame, by which arrange-

ment the upper berth is steadied and controlled in its movements by the counterpoise-weight and springs of the lower berth, whereby the necessity of heavily weighting the swinging frame from which the upper berth is suspended, as hitherto required, is entirely avoided.

In Figs. 1, 2, and 3 of the said drawings, A represents the casing in which the berth is located. The rectangular frame B of this berth has secured to its under side two metallic bars, *aa*, extending transversely across it and forming a part thereof, and between these bars at *b b* is pivoted a longitudinal shaft, C, which is provided on each side of its center with a trunnion or gudgeon, *c*, these trunnions being supported in suitable bearings *d* in the side pieces of a stout metal frame, D, which is bolted securely to the floor of the casing; and by thus pivoting the ends of the shaft C between the bars *aa*, and its center between the side pieces of the frame D in lines at right angles to each other, a double-swivel or universal joint connection is formed, upon which the berth-frame B is supported, and which allows it to vibrate freely on both its longitudinal and transverse axes, so as to preserve its equilibrium as the vessel pitches or rolls, but prevents it from swinging in a horizontal plane around a vertical axis, thereby avoiding contact with the sides of the casing in which the berth is placed.

The two side pieces of the frame D are secured firmly together near the top by means of a transverse rod or brace, E, the ends of which are provided, both on the inner and outer sides of the frame, with screw-nuts *e, e'*, means of which the upper ends of the side pieces may be drawn together or separated, and held immovably at the required distance apart.

Between projections *ff*, extending down from the under side of each of the transverse bars *a* at its center, is bolted or otherwise secured a heavy counterpoise-weight, G, of the form seen in Fig. 1, which extends longitudinally under the center of the berth, and serves to steady it and maintain it in its proper position, ample space being afforded between the side

pieces of the frame D for the free swinging of the weight G.

At the head and foot of the berth are a pair of crossed spiral springs, H H, one end of each spring being secured to the berth-frame, and the opposite end to the floor or side of the casing A, these springs, when thus arranged, assisting the counterpoise-weight G to steady the berth and render it less tremulous, and also to return it to its normal position when not occupied, as a lateral movement in either direction will cause a tension to be brought upon one spring of each pair, and a longitudinal movement in either direction will bring a strain upon one pair or the other of the springs, as the case may be, and in this manner the necessary stability is given to the berth, while it is nevertheless free to swing and preserve its equilibrium as the vessel pitches or rolls.

Instead of the spiral springs H H, rubber or other suitable springs may be employed, and the points of attachment of these springs to the berth-frame and floor or casing may be changed to suit the requirements of the case.

Where it is desired to employ two berths arranged one directly over the other, as seen in Fig. 4, the lower berth-frame, B, is connected at its corners by means of suitable wire ropes or cords *h* with the frame I of the upper berth, which is suspended by wire ropes or cords *k* from a swinging frame, K, pivoted at *l l* to the opposite ends of a cross-piece, L, the transverse portion of which is pivoted by means of screws *m* within a U-shaped hanger, M, bolted firmly to the under side of the top or ceiling of the casing A, the pivotal points of the longitudinal and transverse portions of the cross-piece L being arranged in lines at right angles to each other, a universal joint being thus formed similar to that on which the lower berth-frame, B, is supported, which permits the frame K to vibrate freely on both its longitudinal and transverse axes, so as to preserve its equilibrium as the vessel pitches or rolls; and by thus connecting the two berth-frames B I together by means of the cords *h*, the counterpoise-weight G and springs H of

the lower berth are utilized for steadying and controlling the movements of the upper berth, and the necessity of heavily weighting the swinging frame K below the hanger M, as heretofore, which renders it clumsy and unwieldy, is thus entirely avoided.

Berths constructed as above described will preserve their equilibrium or balance, and maintain themselves in a horizontal position when occupied, independently of the vessel's motion, thus removing the causes which induce sea-sickness, and promoting the ease and comfort of the occupants.

It is evident that racks for supporting glassware, crockery, &c., in ships' cabins, ships' tables, chairs, settees, &c., and the floors of state-rooms may be constructed in a manner similar to the berths above described without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The berth-frame B, supported upon a double-swivel or universal joint, consisting, essentially, of the shaft C, pivoted to the under side of the berth-frame, and to a stationary frame, D, or part beneath in lines at right angles to each other, in combination with the counterpoise-weight G, attached to and extending longitudinally under the center of the berth-frame, and the springs H H, attached to the berth-frame and to the casing A, substantially in the manner and for the purpose set forth.

2. The combination, with the berth-frame B, supported on a double-swivel or universal joint, and provided with a counterpoise-weight, G, and springs H H, of an upper berth-frame, I, connected with the frame B by means of cords or wires *h*, and suspended from an overhung swinging frame, K, substantially as and for the purpose described.

Witness my hand this 4th day of October, A. D. 1879.

DAVID HUSTON.

In presence of—

P. E. TESCHEMACHER,
W. J. CAMBRIDGE.