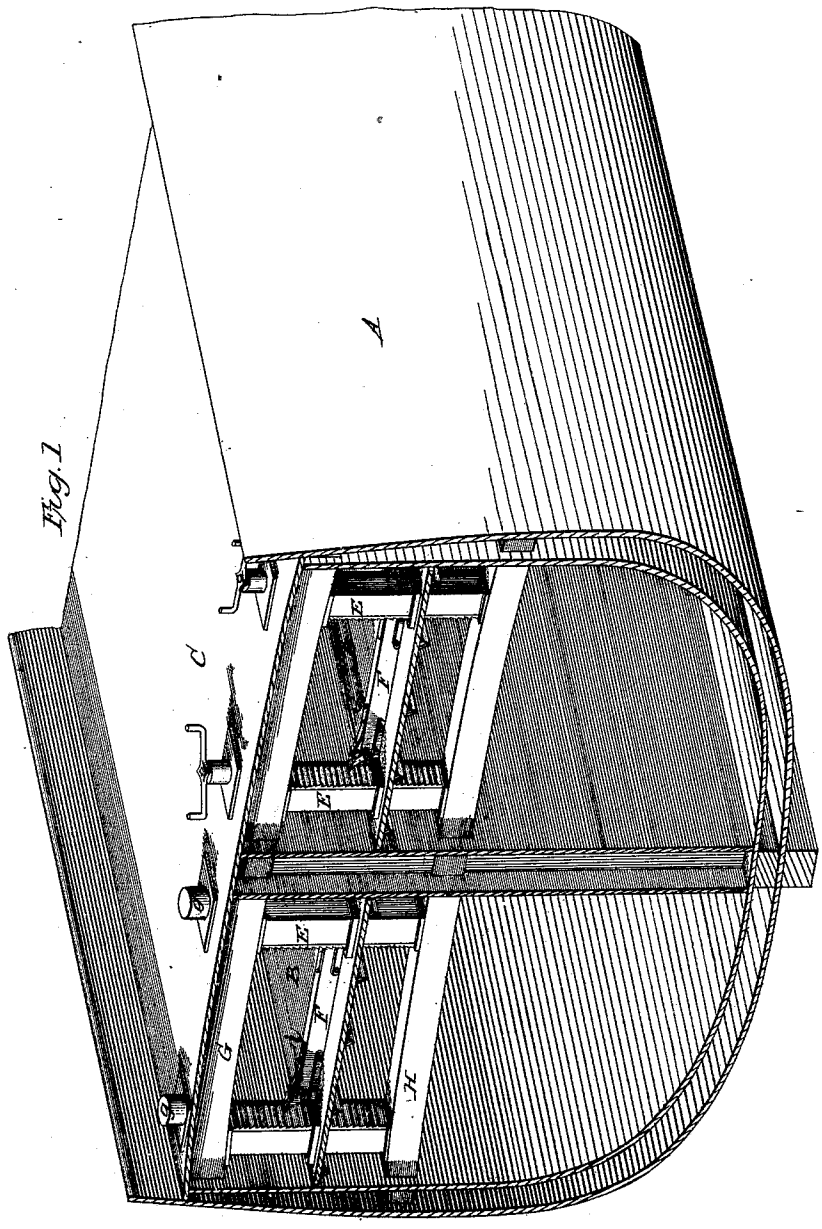
3 Sheets—Sheet 1.

D. KNOWLES.

Marine Vessels for Preventing the Shifting of Cargoes.

No. 215,136. **Patented May 6, 1879.**

Fig. 1



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3 Sheets—Sheet 2.

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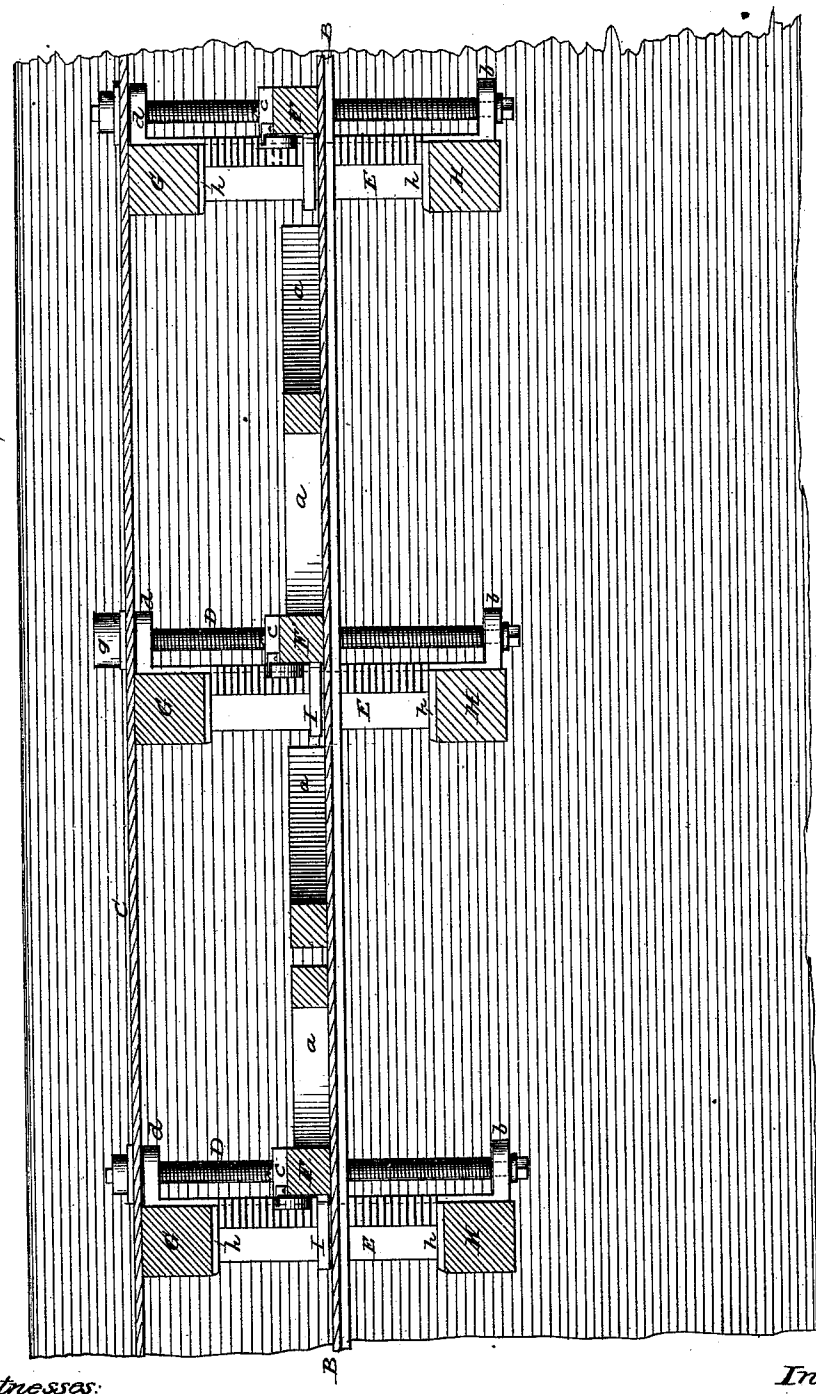


Fig. 2.

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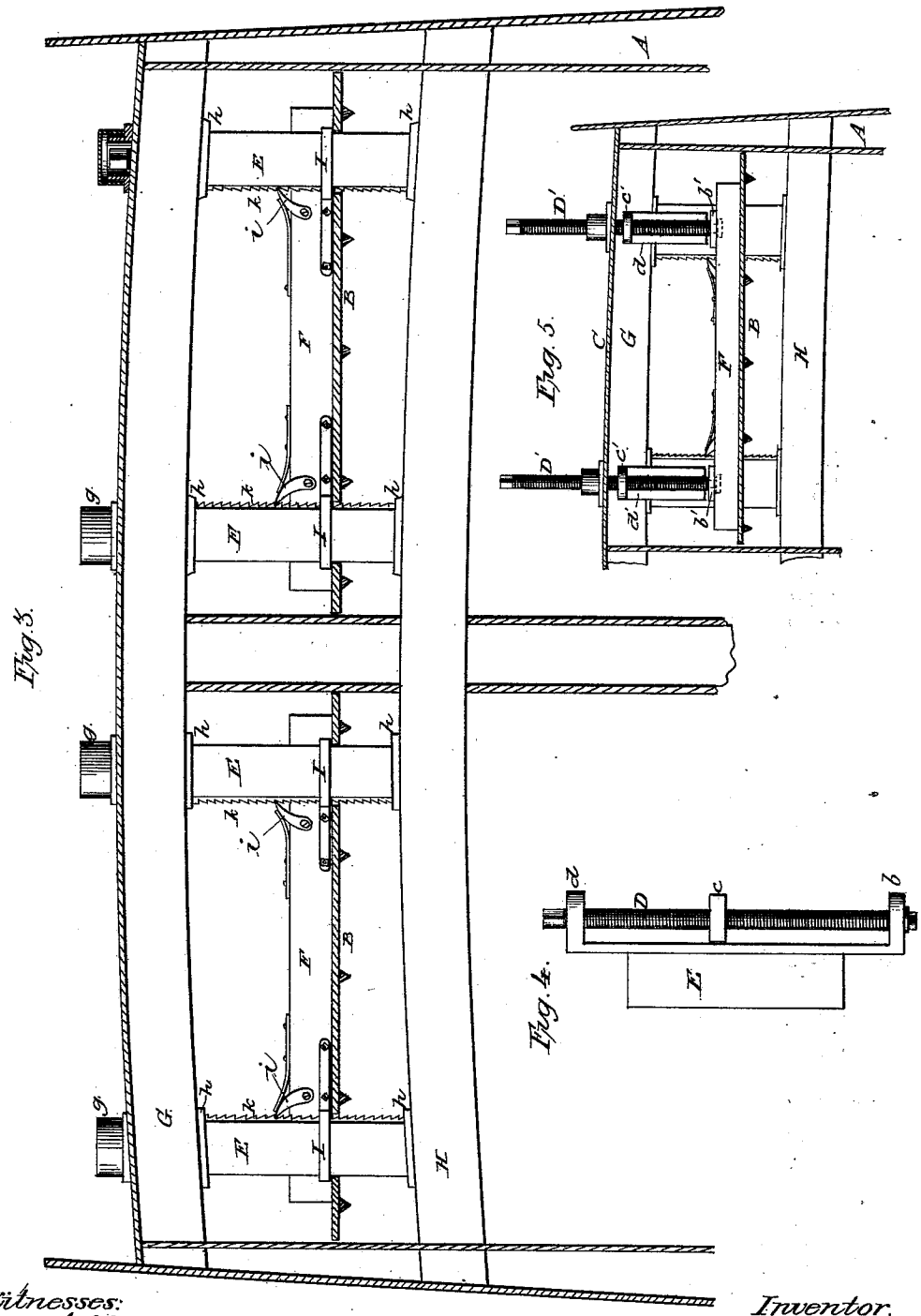
N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

3 Sheets—Sheet 3.

D. KNOWLES.

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UNITED STATES PATENT OFFICE.

DANIEL KNOWLES, OF NORFOLK, VIRGINIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO OBED E. WHITEHURST, OF SAME PLACE.

IMPROVEMENT IN MARINE VESSELS FOR PREVENTING THE SHIFTING OF CARGOES.

Specification forming part of Letters Patent No. **215,136**, dated May 6, 1879; application filed March 21, 1879.

To all whom it may concern:

Be it known that I, DANIEL KNOWLES, of the city of Norfolk, in the county of Norfolk and State of Virginia, have invented a new and useful Improvement in Marine Vessels for Preventing the Shifting of Cargoes; and I do hereby declare the following to be a full, clear, and exact description of the same.

The object of my invention is to provide improved means for preventing the lateral shifting of loose cargo in the hold of a vessel when it careens in a stiff breeze or storm, and thereby obviate the danger of the vessel foundering in consequence of failing to recover her balance. Vessels loaded with grain are particularly liable to loss from this cause, since the mass of grain settles considerably after it has been a few days in the hold, thus leaving a vacant space between it and the deck, which allows the upper portion of the grain freedom to run and shift from side to side as the vessel rolls. When the contraction of the volume of the cargo has exceeded a certain limit, if the vessel then chances to roll heavily, the danger of foundering becomes very great from the lateral shifting of the cargo and the corresponding shifting of the center of gravity.

The means I employ to prevent this, and thus carry out my invention practically, is a movable false deck or horizontal partition, which is adjustable vertically, to adapt it to be held up out of the way while the cargo is being placed in the hold, and then lowered as the cargo contracts and settles, so as to confine it and prevent any change of place by movement of the vessel.

In the drawings, forming part of this specification, Figure 1 is a sectional perspective view. Fig. 2 is a longitudinal section; Fig. 3, a vertical section, and Figs. 4 and 5 are detail views.

The section of the hull A represented is part of a wooden sailing-vessel, but my invention is applicable to iron vessels as well.

B indicates the movable false deck or horizontal partition. The same is placed directly beneath the true deck C, parallel thereto, and is both suspended and adjusted vertically by means of screws D D, while it is prevented from lateral or endwise movement by its sliding attachment to the vertical posts or stanchions E E, hereinafter described. It may be constructed of planks or scantling, strengthened by diagonal or transverse cross-timbers *a*, or of plate or sheet iron, provided with ribs of wrought or cast iron. When made of planks it will be taken out and thrown away at the termination of the voyage; but if of iron it will constitute a permanent portion of the structure of the vessel. Thick beams F F are secured transversely to the false deck B at its ends, and also at suitable intervals of distance throughout its length, and to these beams the screws D D are connected.

I illustrate two ways of arranging the latter. One is shown in Fig. 5, and consists in swiveling the lower ends of the screws D to metal plates *b'*, bolted on the beams F, while their upper ends pass up through the deck C and work in nuts *c'*, which are held in brackets *d'*, attached to the posts or stanchions E. Said stanchions are securely fixed between the deck-timbers G and beams H, extending transversely between the sides of the hull A. By this arrangement of the screws they project above the deck C more or less, according as the false deck B is raised or lowered.

I prefer, however, the arrangement shown in Figs. 1, 2, 3, 4, in which the lower ends of the screws D D are swiveled in fixed brackets *b*, and work through nuts *c*, which are bolted to the beams F, and slide free in brackets *d*, attached to stanchions E. Thus, to whatever position the false deck B may be adjusted, the screws D D will project up through the true deck C only far enough to allow the convenient application of a wrench or lever for turning them, and will hence offer practically no obstruction to any of the usual operations incident to loading, unloading, or maneuvering the vessel. The upper ends of the screws D D may be covered by metal caps *g*, to protect them, and prevent entrance of water where they pass through the deck.

The false deck B is attached to the several stanchions E E by means of bands or keepers I, which slide on the latter as the deck is adjusted higher or lower. In Fig. 4 the stanchions E are represented detachable from the deck-timbers G and cross-beams H, being tem-

porarily secured thereto by means of metal socket-plates *h*, or any other preferred device capable of the same function. The screws D, bracket *d*, nuts *c*, and pressure-beams F, being also connected with the said stanchions, are detachable with it, and thus at the end of a voyage the stanchions E, screws D D, pressure-beams F, and other attachments are removed together from the timbers and beams G and H, and stowed away in a bunker or other convenient place until again wanted for use with another false deck.

Pawls *i*, pivoted to the pressure-beams, may be employed in connection with ratchet-plates *k*, attached to the stanchions E, Fig. 1, to supplement the function and strength of the screws in holding the false deck down upon the grain with the requisite degree of pressure.

I am aware that railway stock-cars have been provided with a movable or false floor, which can be adjusted and held fixed at any desired point between the true floor and the roof or deck of the car for the purpose of adapting the latter for transportation of a larger number of animals; but the purpose of such construction and the arrangement of the device for adjusting the false floor are, respectively, foreign to and different from mine.

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

1. In a marine vessel, the combination, with the true deck, of the false deck and the screws passing through the said true deck, substantially as shown and described, whereby such screws are made accessible for operation for adjustment of the false deck to cause the same to press upon and hold the cargo in the manner specified.

2. The combination of the swiveled screws D D, the nuts *c*, brackets *d*, stanchions E, false deck B, and true deck C, said screws porjecting through the latter, and being thus made accessible for application of a wrench or turning device, as shown and described.

3. The combination of the screws D D, the fixed brackets *d*, in which they are swiveled, the nuts *c*, attached to the pressure-beams F, the guides in which the screws work free, the stanchions E, and the false deck B, substantially as shown and described, whereby the rotation of the screws D D effects the adjustment of the false deck B without changing the position of said screws with relation to the true deck or other fixed portion of the vessel.

4. The combination of the detachable stanchions E, sockets *h*, brackets *d*, and screws D D, the pressure-beams E, and nuts *c*, all said parts being connected as shown and described.

5. The combination of the false deck B and keepers I with the vertical parallel stanchions E, on which said keepers slide when the false deck is adjusted, as specified.

The above specification of my invention signed by me this 14th day of March, 1879, at Norfolk, Virginia.

DANIEL KNOWLES.

Witnesses:
J. W. PUGH,
THOS. J. SCOTT.