(No Model.)

C. H. CHASE.

FOLDING STAIR CASE.

No. 296,526. Patented Apr. 8, 1884.

Fig. 2.

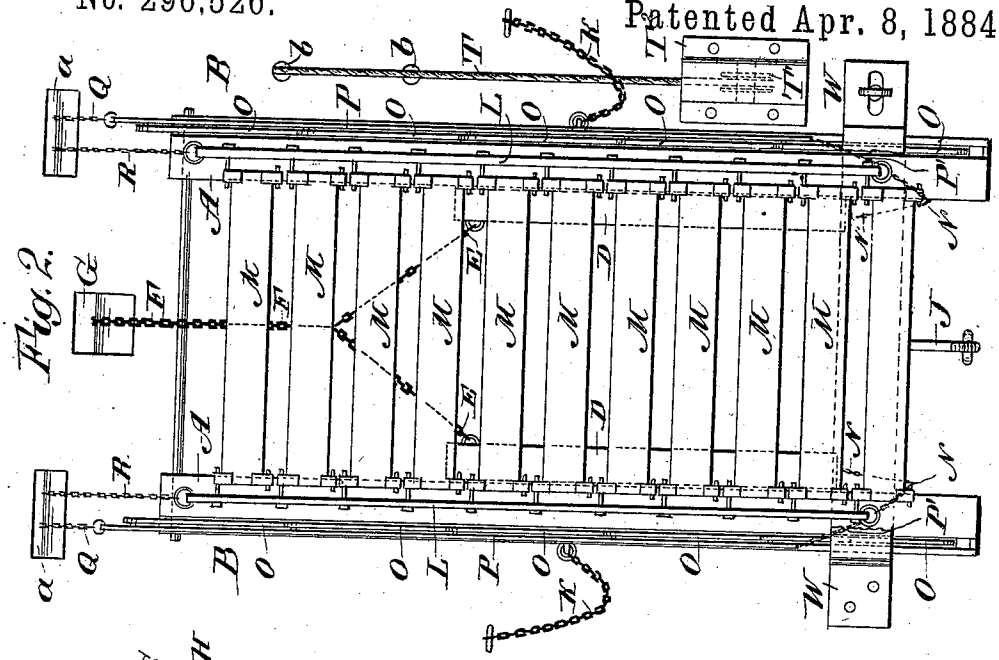


Fig. 1.

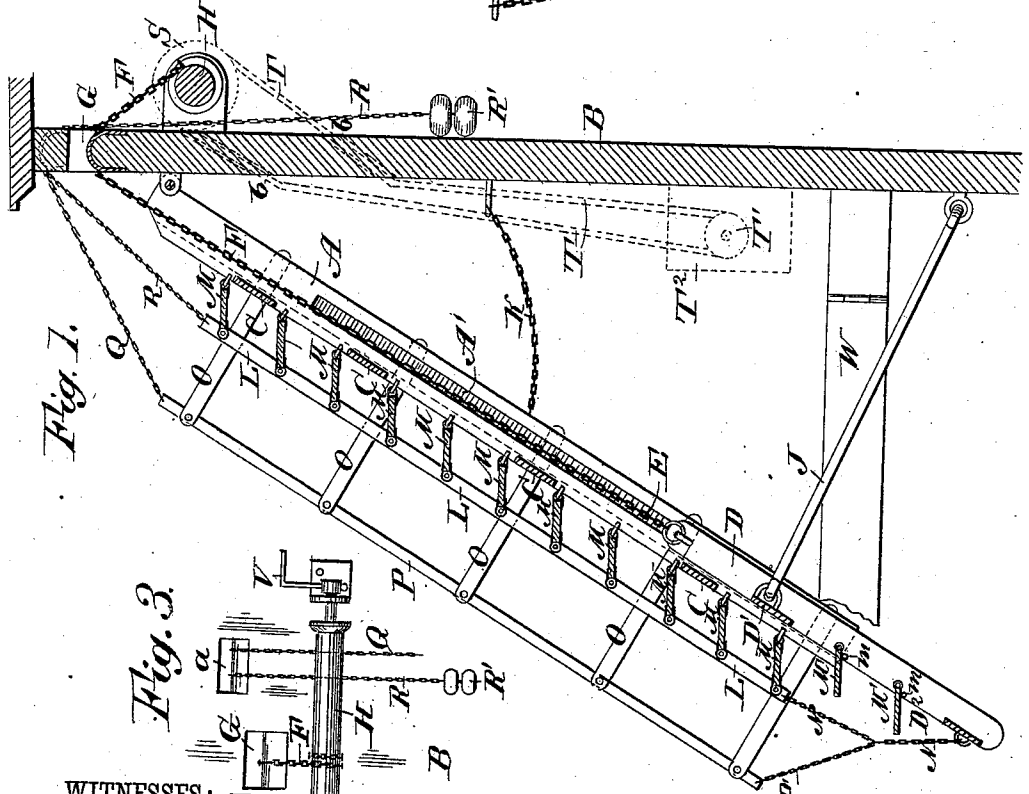


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES H. CHASE, OF NEW ORLEANS, LOUISIANA.

FOLDING STAIRCASE.

SPECIFICATION forming part of Letters Patent No. 296,526, dated April 8, 1884.

Application filed December 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. CHASE, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Automatic Folding Staircase, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved automatically-folding ladder or staircase, which can be used as a fire-escape, for boarding vessels, &c.

The invention consists in the combination, with a pivoted staircase-section, of a sliding section provided with chains for raising it, which sliding section is provided with a pivoted brace-rod, which is pivoted to the wall or other support. If the sliding section is permitted to slide downward, it swings the staircase outward.

The invention also consists in various parts and details and combinations of the same, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved folding staircase, showing it adjusted for use. Fig. 2 is a front view of the same, showing it folded. Fig. 3 is a longitudinal elevation of the shaft on the inner surface of the wall or side of the ship.

Two side bars, A, each provided with a longitudinal groove, A′, in the inner side, are hinged or pivoted to the wall B or to the outer surface of the side of a vessel, which bars A are united by a series of transverse pieces, C. Two side bars, D, fitted to slide in the grooves A′ of the side bars A, are united by cross-pieces D′ D².

To the upper end of each side bar D a chain, E, is fastened, which chains are both fastened to a chain, F, the upper end of which is passed through an opening, G, in the wall, and is secured to a shaft, H, journaled in brackets on the inner surface of the wall, the shaft H being directly before the opening G, which opening has its bottom edge rounded, or has a roller journaled in the said lower edge. A brace-rod, J, is pivoted to the cross-piece D′, uniting the side bars D and the wall. Two chains, K, are secured to the side bars A and to the wall.

To the upper edges of the side bars A a series of steps, M, are pivoted at their lower edges, Fig. 2, which steps are also pivoted at their upper edges, Fig. 2, to rods L, having their lower ends connected by chains N with the ends of the side bars D. Steps M′ are pivoted to the side bars D, which bars are provided with studs *m*, on which the steps M′ can rest when swung down. Bars O have their lower ends pivoted to the outer surfaces of side bars A, and their upper ends are pivoted to hand-rails P, having their lower ends connected by chains P′ with the lower ends of the side bars D. Chains Q and R, fastened to the upper ends of the rails P and the rods L, respectively, pass through apertures *a* in the wall, and have weights Q′ R′ on the inner ends. A grooved pulley, S, is rigidly mounted on one end of the shaft H, and over the said pulley an endless rope or chain, T, passes, which also passes over a pulley, T′, contained in a box, T², secured on the outer surface of the wall. The rope or chain T passes through apertures *b* in the wall. A jointed locking-plate, W, is hinged to the outer surface of the wall, and is adapted to be swung over the lower part of the folding staircase. At its free end it is provided with devices for locking it on the wall. The shaft H is adapted to receive a crank-key, V, on one end.

The operation is as follows: If the ladder is to swing outward for use, the locking-plate W is unlocked and swung outward, and the shaft H is turned in such a manner that the chain F will be unwound, thereby permitting the side bars D to slide downward. The weight of the said side bars carries downward and outward the outer end of the brace J, and thereby swings the lower end of the staircase outward. At the same time, by means of the chains N and P′, the rods O are swung upward and the railing raised, and the steps M M′ are swung outward. The shaft H can be turned by means of the crank-handle V or by means of the rope or chain T from the casing T². The staircase can thus be swung outward from the inside or outside. If the ladder is to be raised or folded, the chain F is wound on the shaft H, and thereby the side bars D are

drawn upward, and the folding staircase is swung against the wall or side of the vessel. The weights Q' R' automatically draw the chains Q R upward and fold the railing and steps. The folding staircase can be made any desired suitable width and any suitable length.

It can be used as a fire-escape on buildings, or as a staircase for vessels, &c.

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

1. A folding staircase constructed substantially as herein shown and described, of two sections, one adapted to slide within the other, as set forth.

2. The combination, with a pivoted staircase-section, of an additional section adapted to slide within the first, and of a chain for raising the sliding section, substantially as herein shown and described.

3. The combination, with a pivoted staircase-section, of a sliding section adapted to slide within the pivoted section, a chain for raising the sliding section, and a brace pivoted to the wall and to the sliding section, substantially as herein shown and described.

4. The combination, with a pivoted staircase-section, of an additional section adapted to slide within the same, a chain for raising the sliding section, a folding railing pivoted to the pivoted section, and of chains and weights for automatically folding the railing, substantially as herein shown and described.

5. The combination, with a folding staircase, of pivoted steps, a pivoted rod uniting them, a chain attached to one end of the rod, and a weight suspended from the inner end of the chain, substantially as herein shown and described.

6. The combination, with the pivoted side bars A, of the sliding side bars D, the shaft H, the chain F, the pulley S on one end of the shaft, the steps M and M', the endless chain T, and the pulley T', substantially as herein shown and described.

7. The combination, with the pivoted side bars A, of the sliding side bars D, the chain F, the shaft H, means for revolving the shaft from the inside or outside of the building, &c., the steps M M', the rods L, pivoted to the steps M, the rods O, the railing-bars P, the chains Q R, attached to the bars P and rods L, respectively, and of the weights Q' and R' on the inner ends of the chains Q and R, substantially as herein shown and described.

8. The combination, with a pivoted folding staircase, of the pivoted locking-bar W, and means for holding the free end of the same to the building, substantially as herein shown and described.

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