

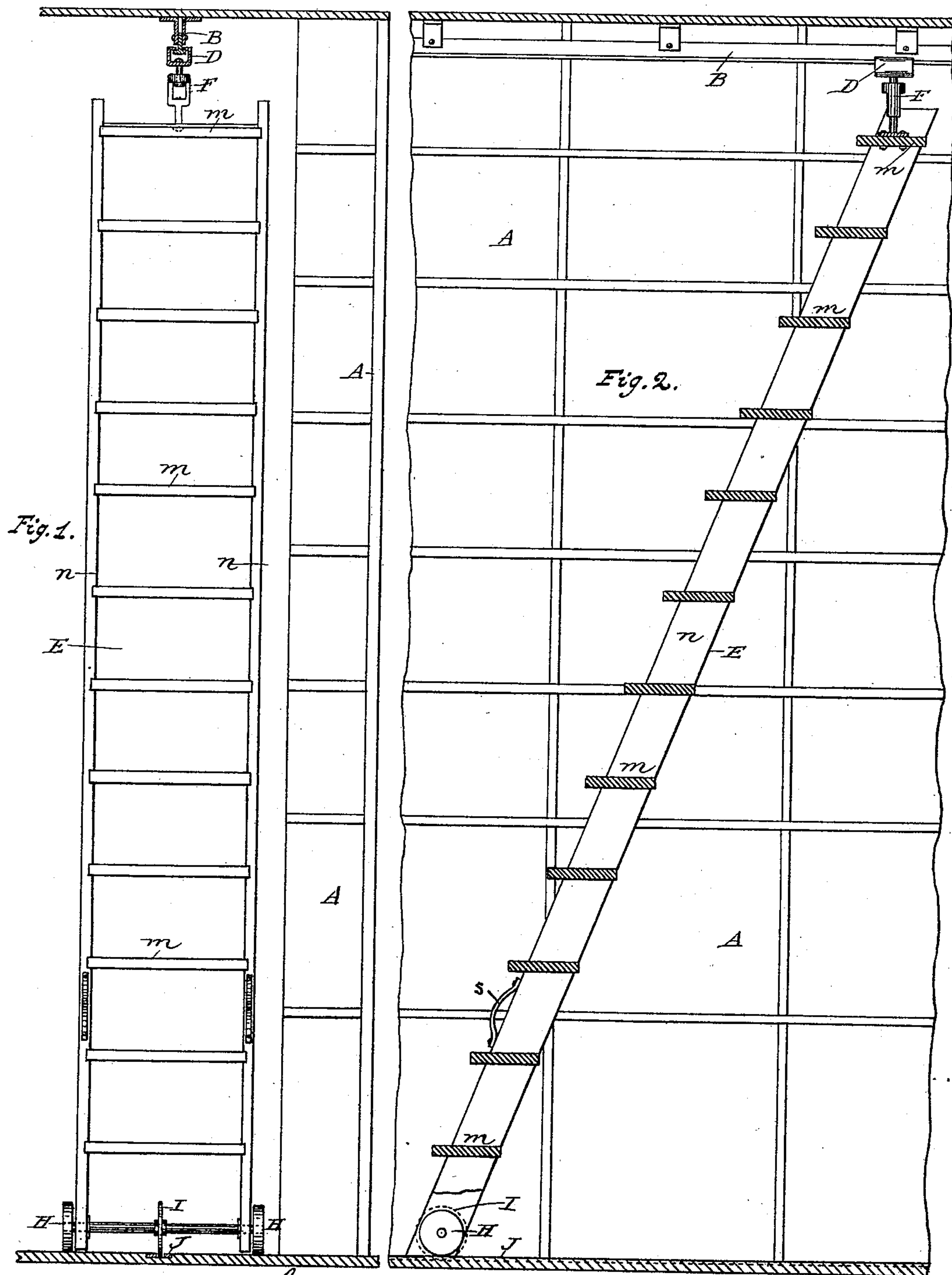
(No Model.)

2 Sheets—Sheet 1.

M. CROISSANT.
STEP LADDER.

No. 464,495.

Patented Dec. 8, 1891.



Witnesses:

Charles Croissant
A. L. Kirk Jr.

Martin Croissant,
Inventor.
by his Attorney

Alex. Delkirk

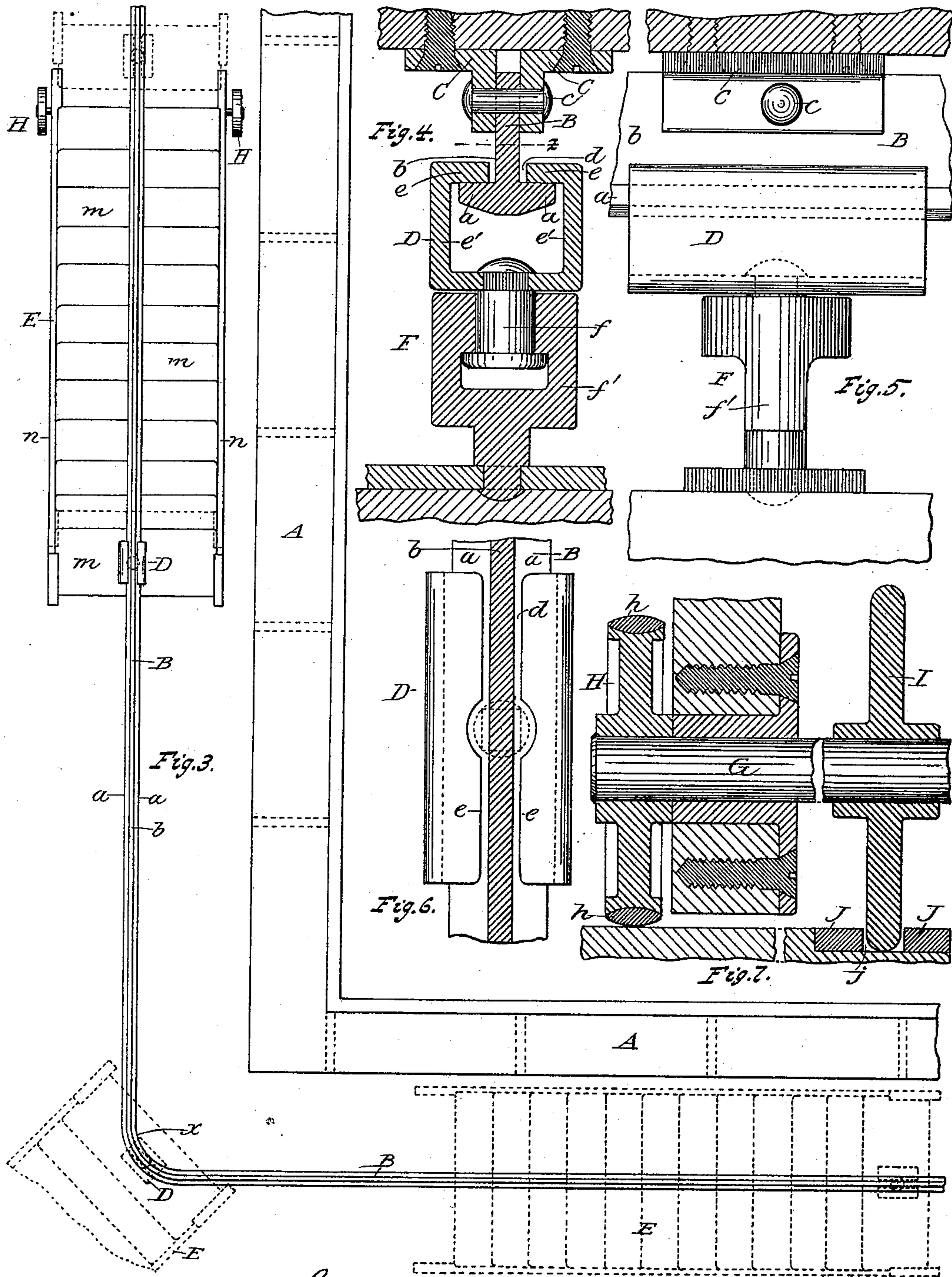
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A. Selkirk

Martin Croissant
Inventor

By his attorney

Alex. Selkirk

UNITED STATES PATENT OFFICE.

MARTIN CROISSANT, OF ALBANY, NEW YORK.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 464,495, dated December 8, 1891.

Application filed April 3, 1891. Serial No. 387,513. (No model.)

To all whom it may concern:

Be it known that I, MARTIN CROISSANT, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Step-Ladder Carriers and Their Ways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in step-ladders and their ways for moving the former at will in front of a case of shelves for access to the same from the steps of said ladder; and it consists of the combinations of devices hereinafter described, and specifically set forth in the claims.

The object of this invention is to provide, first, with a carrying-rail supported neighboring the face of a case of shelves or racks for holding articles, and a carriage holding with said rail and movable at will on the same, a step-ladder which has its upper end suspended while its body is set at an incline and its foot end is supported by the floor and is movable relatively thereto; and, second, to provide between a step-ladder and a carriage which is movable on a rail supported relatively in front of a case of shelves or racks a swivel form of connecting device, which will allow the body of the step-ladder to be turned transversely or to opposite situation without necessitating a shifting of the carriage, and, further, to provide particular combinations of devices by which my improvements may be readily embodied in railway step-ladders. I attain these objects by the means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an elevation illustrating a case of shelves, a carrying-rail supported in front of the same, and a ladder having its upper end suspended from said rail by means of one part of my improvement and its lower end supported and carried by another part of my improvements used in this invention. Fig. 2 is a side elevation in section and illustrating the same features. Fig. 3 is a plan view of the same. Fig. 4 is a cross-sectional view of the carrying-rail, carriage, and connecting de-

vice between the said carriage and the step-ladder. Fig. 5 is a side elevation of the same. Fig. 6 is a view of the same at line *z z*, Fig. 4. Fig. 7 is a sectional view of the mechanism for supporting and guiding the lower end of the step-ladder.

The same letters of reference indicate the same parts throughout the several views.

In the drawings, A A represent a case of shelves or racks extending from near the floor to near the ceiling and running from one side or end of a room to near the other. The drawing Fig. 3 represents this case of shelves to be of angular form in its plan view and running in lines corresponding with the outer lines of the limbs of the angle; yet they may be run to correspond with the inner lines of the limbs of an angle, as would be were the case of shelves extended along in front of a side wall of a room and continuous with one in front of an end wall of the same, as is common in stores for holding articles of merchandise.

B is a metallic carrying-rail, suitably supported relatively in front of the face of the case A of shelves and at a short distance from the same, and at any suitable distance below the plane of the ceiling of the room. This rail may be made with any form which will adapt a continuous portion thereof to operate as a track or way for a carriage to move freely thereon from one end thereof to the other; yet, for cheapness of construction, strength, and convenience for its attachment to brackets for supporting the rail relatively in front of the case of the shelves, I prefer to make it with the form (in its cross area) of an inverted T, as shown, in which form of carrying-rail the laterally-extended limbs *a a*, integral with the web *b*, form the tracks or ways on which the carriage employed may freely move, while the vertical extension of the web portion *b* from said laterally-extended ways *a a* or limbs operates to give the rail great stiffness in a vertical direction, and also serves as a means for convenient attachment by rivets *c* or bolts to the brackets C C, by which the rail is shown to be supported from the ceiling. Although this carrying-rail may be run in a straight line in its entire length, yet it can be made to run in lines part straight and part curved, accordingly as may be required

for a suitable correspondence with the line of the face or faces of the case or cases of shelves to which access is to be had from the step-ladder used with the same; but when
 5 these cases of shelves in a room are arranged at angles as shown, or as above described they may be set, and a single continuous rail B is employed, it will be made in its plan
 10 view to correspond with the angle of the faces of the cases of shelves this rail is to be used with, and as illustrated in Fig. 3, so that after a portion thereof is arranged straight and
 15 parallel with the face of the contiguous or neighboring or other case which may be at an angle to the first-mentioned case. Mounted on the said carrying-rail is a suitable carriage, which is free to be moved in either di-
 20 rection on the tracks or ways integral with said rail. Although this carriage may be provided with wheels or rollers revolving in contact with said track or tracks, yet I prefer to omit the use of such rollers or wheels when
 25 the traveling step-ladder to be used with it is of light weight, as it may be in most cases.

My preferred form of carriage D, having neither wheels nor rollers, is shown in its essential features in the drawings, Figs. 4, 5,
 30 and 6; and it consists of a metal piece made in the form of a slotted tube of any suitable form and preferably of rectangular form in its cross area, as shown in Figs. 1 and 4, with the slot *d* in its upper side about central between
 35 the oppositely-located angular portions *e e*, made integral with the side portions *e' e'* of said carriage. This tube form of carriage D is made with a length of from two to four
 40 inches and has its slot *d* made with a width a little greater than the thickness of the web *b* of the carrying-rail B, and the width of the chamber between the side portions *e' e'* is a
 45 little greater than the width of the two angular ways *a a* between their outer edges, so that the said carriage may be free to move with-
 out binding on the portions of the rail B in contact when turning a curve, as at *x*, occurring in said rail.

E is a step-ladder made of wood or metal
 50 or both combined and with any suitable form of construction and comprising a series of steps *m m*, conveniently arranged and secured to the side rails *n n*. This step-ladder is sus-
 55 pended by its upper end from the carriage D, while its body is at an incline, with its lower end supported from the floor. The means for this suspension of the ladder by its upper
 60 end portion from the carriage D may consist simply of a stiff bar or link rigidly connected with both the carriage and the upper ends or
 the side rails of the ladder or upper step of same; yet I prefer to make this connecting
 65 device F in the form of a swivel, in which one of its parts—as, say, the swivel-pin *f*—is rigidly secured to the carriage D by riveting or
 otherwise, while the swivel-link is secured to any suitable piece *f'*, securely attached to

the upper step of the ladder. A reversal of these parts of the swivel in their connections
 70 with the carriage and ladder would be in effect the same. By providing this connecting device F with a swivel, which will occur be-
 75 tween the ladder and carriage, the body of the ladder can be readily changed in its relative situation or direction of its incline from
 80 the carriage D, so that the said ladder can at will be in situation in relation to said carriage as shown by full lines in Fig. 3 or its body
 85 be turned and be in situation indicated by dotted lines in said figure. This suspended step-ladder may have its foot end directly
 supported by the floor, especially when the ladder is light in weight; yet in many cases
 90 preference is given to the use of wheels or rollers suitably applied to the foot ends of the side rails *n n*, so as to sustain the same and
 95 render the movement of the ladder more easy to an operator. The wheels or rollers employed may be made to be in caster form of construction and connection with the ladder;
 yet preference is given to the use of a shaft G, suitably held in bearings secured to the
 100 side rails *n n* and wheels H H, mounted thereon. These wheels are preferably provided with rubber tires or faces *h* to render their rolling over the floor noiseless. In cases
 105 where heavy ladders are employed or where a careless use of the same is liable to be had I secure to the shaft G a guide-wheel I and to the floor a way or guide-track J, which co-operate
 110 together to hold the foot end of the step-ladder from shifting laterally in either direction. This guide-wheel may be placed at any suitable point on shaft G, and the track J will be
 115 located to correspond. Although the guide-track can project above the surface of the floor, yet preference is given to one sunken in the same, so that its top surface will be on a
 120 plane with that of the floor, and when it is made with a longitudinal groove *j*, as shown in Fig. 7, the guide-wheel I is made with a
 125 diameter, say, about one-half of an inch (more or less) greater than that of the wheels H H and with a width of outer portion a little less than the width of the groove *j* in the guide-track J, so as to freely move within said
 groove without binding. This form of guide-track is advantageous over one that projects
 above the plane of the upper surface of the floor, as it forms no obstruction for the pas-
 sage of store or hand trucks or movement of boxes or packages over the floor, is not in
 the way of the feet of employes or others, and can be easily kept clear by means of
 sweeping with a broom in direction of the groove *j* of said guide-track.

By my above-described improvements a step-ladder can be suspended neighboring
 to and relatively in front of a case or cases
 130 of shelves, whether running horizontally, straight, or at angles, or in curved directions, and be readily moved by an operator taking
 hold of the ladder or handles *s*, secured to the same, in either direction to bring the same

opposite the particular shelves or racks to which it is desirable access be had from the ladder, and the ladder can be readily turned in any direction and be moved at will into situations before a case of shelves, as required, in a noiseless manner.

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

1. The combination, with a carrying-rail supported neighboring the upper portion of the face side of a case of shelves and a carriage mounted on said rail and capable of being freely moved thereon in either direction, of a step-ladder, a swivel-jointed connection between the latter and said carriage, carrying wheels or rollers and a guide-wheel secured to the foot end of the ladder, and a guidetrack secured to the floor, for the purposes set forth.

2. The combination, with the carrying-rail B, made in the form of an inverted-T rail, the tubular form of carriage D, having in its upper side the longitudinal slot *d*, receiving

the web *b* of said rail, and the angular portions *e e*, riding on the laterally-extended limbs *a a* of the same, of a step-ladder suspended by its upper end portion from said carriage, with its foot end supported by the floor, for the purposes set forth.

3. The combination, with a step-ladder which is suspended from an overhead carrying-rail by means of a carriage capable of being moved in either direction thereon, of carrying-wheels and a guide-wheel mounted on a shaft secured to the foot end of the ladder, and a guideway or track having in it a slot running longitudinally and secured in the floor flush with the top surface of the same, for the purposes set forth.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

MARTIN CROISSANT.

Witnesses:

WILLIAM BANIER,
ALEX. SELKIRK.