

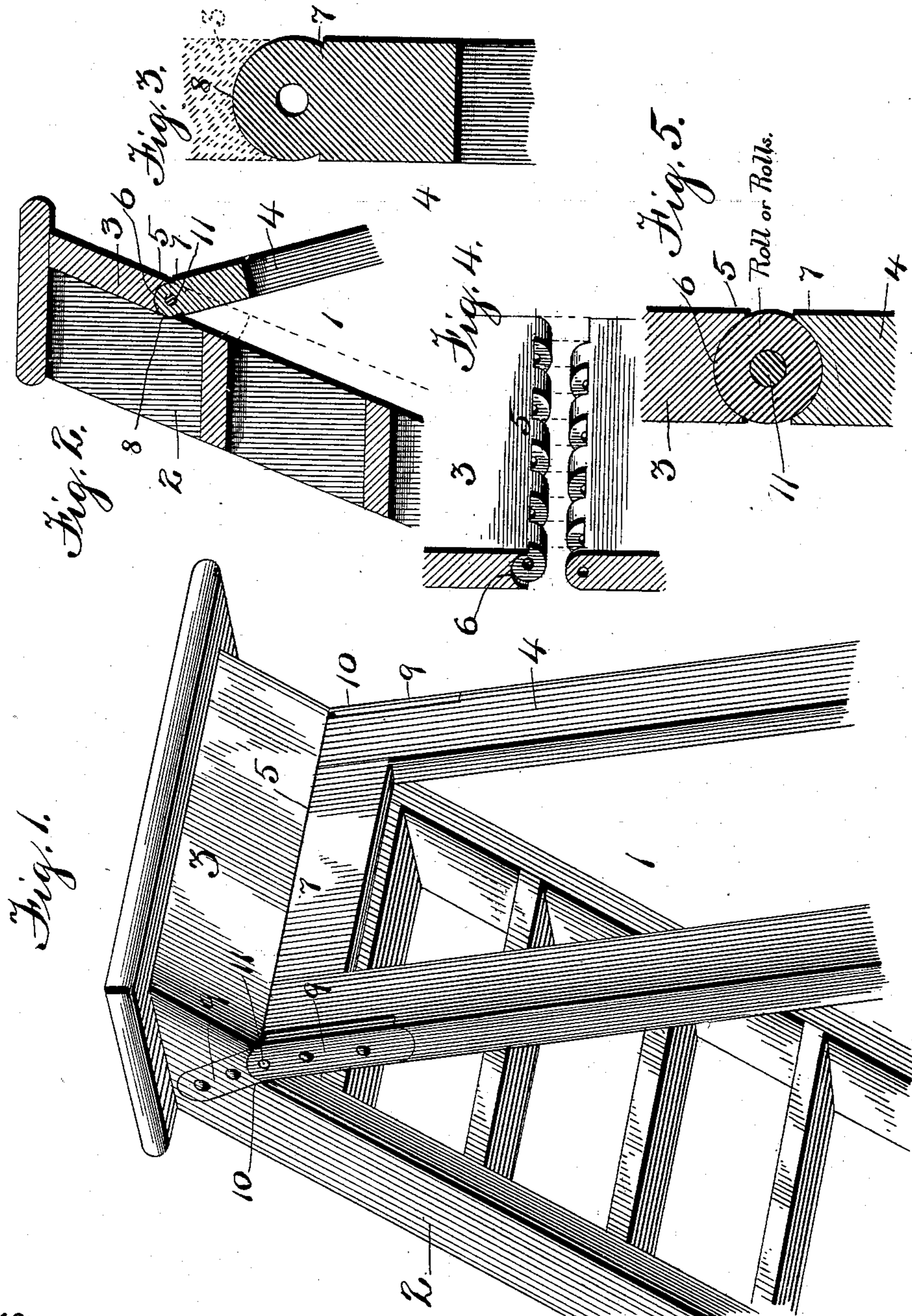
No. 628,624.

Patented July 11, 1899.

J. P. GRACE.  
STEP LADDER.

(Application filed Nov. 25, 1898.)

(No Model.)



Witnesses:

Horace C. Deitz  
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Joseph P. Grace, Inventor

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# UNITED STATES PATENT OFFICE.

JOSEPH P. GRACE, OF MONTREAL, CANADA, ASSIGNOR TO MARY ETHEL GRACE, TRUSTEE, OF SAME PLACE.

## STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 628,624, dated July 11, 1899.

Application filed November 25, 1898. Serial No. 697,386. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH P. GRACE, a subject of Her Majesty the Queen of Great Britain, residing in the city and district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Step-Ladders, (for which Letters Patent of the Dominion of Canada were granted December 17, 1898, No. 62,097, the application for which was duly filed November 23, 1898, Serial No. 83,794;) 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.

The object of my invention is to provide a connection between the supporting-frame and the ladder portion which will prevent all liability of the parts becoming loose and thereby making the ladder unsafe.

A further object is to provide a bearing connection which extends the entire width of the support, whereby the wearing portions of the bearing will be continuous.

A further object is to provide a step-ladder which is neat and attractive in appearance, durable in construction, simple and efficient in operation, and which can be made at an exceedingly-low cost.

To these and other ends my invention consists in the improved construction and combination of parts hereinafter fully described and particularly pointed out in the appended claims.

In the drawings, in which similar numerals of reference indicate similar parts in all of the views, Figure 1 is a perspective view of a step-ladder constructed in accordance with my invention. Fig. 2 is a cross-sectional view of the upper part of the same, showing the form of bearing. Fig. 3 is a detail of the top of the supporting-frame. Figs. 4 and 5 are views showing modified forms of bearing.

In constructing step-ladders heretofore it has been the practice to connect the supporting-frame to the step or ladder portion by hinges or by forming bearings at opposite ends of the connecting portions. These con-

structions have been found to be disadvantageous, however, by reason of the fact that the continual usage of the ladder causes the connecting parts to work loose, thus enabling the ladder to "wobble," often causing accidents.

To obviate these and other disadvantages which are apparent, I have provided a construction in which the bearing is extended the entire width of the connection, the wearing-surface being continuous. By this means it will be impossible for the supporting legs or frame to become loose, compelling the frame to move in true alinement, in addition to which the support accorded to the top of the ladder portion is formed for its entire width instead of at intermittent points, as is found in former constructions. To more fully set forth the construction, I will now describe my improved ladder as set forth in the drawings in detail.

1 designates my improved step-ladder, comprising the step or ladder portion 2, having the top 3 and the supporting-frame 4 hingedly connected to the top. The portion 2 may be of any preferred construction or size, as may also the frame 4, my invention relating particularly to the form of the top or bearing portion of the frame 4 and the top 3, together with the means of connecting the same.

As shown in the drawings, the top 3 has its lower rear edge 5 formed with a semicylindrical groove 6, extending for its entire width. The upper end 7 of the frame 4 is provided with a semicircular portion 8, adapted to fit the groove 6 and extending the entire width of the end 7. The top 3 and frame 4 are each provided with sections 9 of the hinge 10, one of said hinges being mounted at opposite ends of the top 3 and frame 4, said hinges being connected by means of a rod 11, passed centrally through the semicircular portion 8. It will be readily seen that while the pivotal connection between the parts is formed at the end, yet the weight placed on the ladder portion is borne equally along the entire width of the top, no weight whatever falling on the hinges 10 or the bar 11, while by reason of the bearing portions being semicircular and fitting within one another any liability of the portions warping is obviated. All wear of

parts is equally distributed along the entire surface, so that at all times the parts will retain their proper positions.

In the construction shown in Figs. 4 and 5 modifications are provided showing different means of forming the bearing, but retaining the particular feature of the present invention in that the bearing-surface extends the entire width of the connection.

While the construction herein shown and described is what is believed to be a preferable embodiment of the invention, it is to be understood that I do not limit myself thereto, as various changes in the form, proportion, and minor details of construction may be resorted to, and I therefore reserve the right to modify or vary the invention as may fall within the spirit and scope thereof.

Having thus described my invention, what I claim as new is—

1. A step-ladder, comprising a step or ladder portion; a supporting-frame; and a pivotal connection between said portion and said frame, said connection forming a continuous bearing.

2. A step-ladder, comprising a step or ladder portion; a supporting-frame; and a bearing formed between said portion and said frame, said bearing having a continuous contact between said portion and said frame for their entire width.

3. A step-ladder, comprising a step or ladder portion, having a top; and a supporting-frame, pivotally connected to said top, the adjoining faces of said top and said frame contacting for their entire width.

4. A step-ladder, comprising a step or ladder portion, having a top; and a supporting-frame, pivotally connected to said top, the adjoining faces of said connection being adapted to fit one another for their entire length.

5. A step-ladder, comprising a step or ladder portion, having a top; said top having its lower face provided with a groove; and a supporting-frame pivotally connected to said top, said frame having its upper end arranged to fit and have movement within said groove.

6. A step-ladder, comprising a step or ladder portion; a supporting-frame; and a pivotal connection between said portion and said frame, said connection forming a bearing contact between said portion and said frame.

7. A step-ladder, comprising a step or ladder portion, having a top, said top having its lower face provided with a groove, said groove extending the entire width of said top; and a supporting-frame pivotally connected to said top, said frame having its upper end extending the entire length of said groove, and also provided with a face adapted to fit and have movement within said groove, whereby a bearing contact will be formed between said top and said supporting-frame extending the entire width of the frame, said contact retaining its position against vertical and lateral strain, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH P. GRACE.

Witnesses:

HORACE G. DEITZ,  
W. J. KOERTH.