

May 20, 1930.

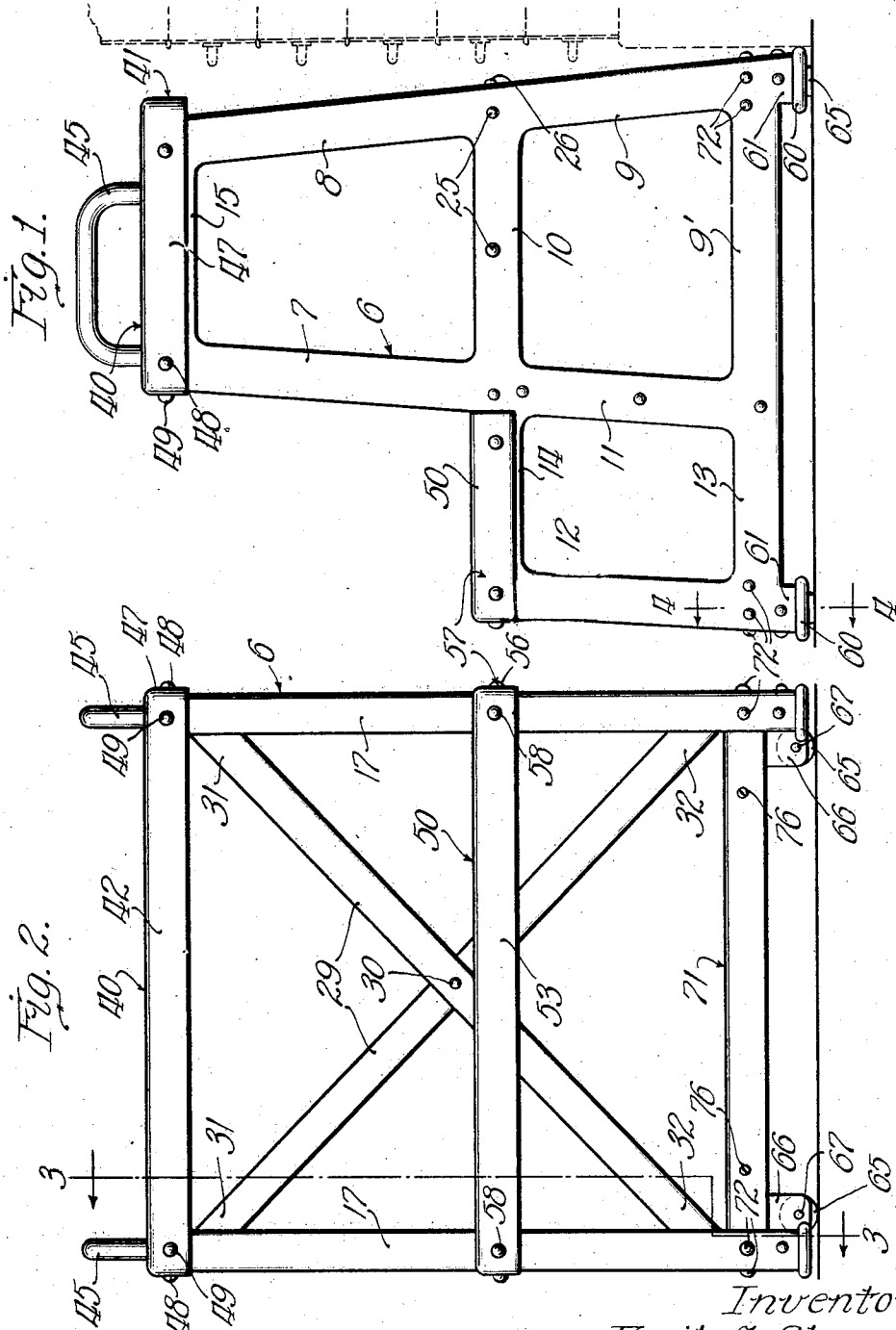
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1,759,424

STEPLADDER

Filed June 30, 1928

2 Sheets-Sheet 1



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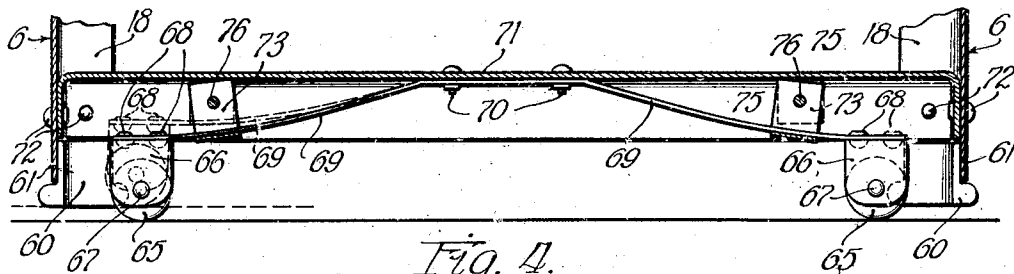


Fig. 4.

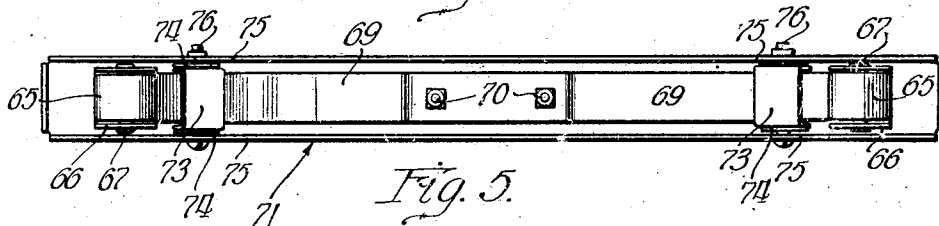


Fig. 5.

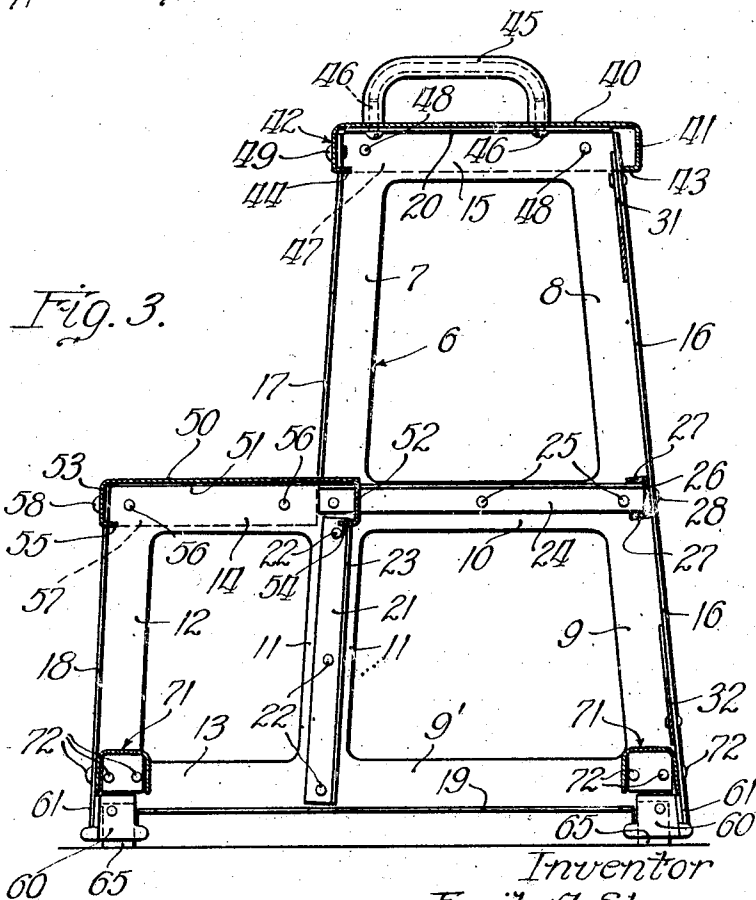


Fig. 3.

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# UNITED STATES PATENT OFFICE

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## STEPLADDER

Application filed June 30, 1928. Serial No. 289,338.

My invention relates to steps or step ladders, such as are used in vaults and like places.

Its object is to provide such a device which can be easily moved about, which normally runs upon wheels, but which rests firmly and stationarily upon the ground when a person mounts it.

Consistently, the step or step ladder of my invention is of light construction, which in itself forms a feature of my invention, and is mounted upon wheels through resilient means offering enough strength to keep the step or ladder itself off the floor but not enough to sustain the weight of a person, the result being that when a person mounts it his or her weight brings the feet of the structure down onto the floor, thus eliminating the possibility of its rolling out from under one.

Other features of my invention will appear and be made point of as this description proceeds.

In the accompanying drawings:—

Figure 1 is a side elevational view of a ladder embodying my invention;

Figure 2 is a front elevational view thereof;

Figure 3 is a vertical sectional view, taken substantially on the line 3—3 of Figure 2;

Figure 4 is a sectional view, taken on substantially the line 4—4 of Figure 1; and

Figure 5 is a bottom view of the roller supporting channel member shown in Figure 4.

The ladder illustrated in the drawings is, preferably, of light metal, such as aluminum, and comprises side frame or spiders 6. The main web portions 7 to 15, inclusive, of the spiders 6 are of flat material and the edges 16 to 20, inclusive, are bent at an angle with the portions 7 to 15, inclusive, thereby forming stiffening flanges for the spiders. In order to reinforce the spiders 6 more thoroughly, I have provided angle bars 21 secured to the web members 11 by means of rivets 22, as shown in Figure 3 and positioned so that the laterally extending flanges project inwardly. A similar angle bar 24, positioned horizontally and secured by rivets 25 to the web member, 10, reinforces the same. A channel member 26, having its flanges 27 extending inwardly,

is positioned horizontally and is secured by rivets 28 to the inwardly extending flanges 16 on the rear portion of the spiders 6 and aids in reinforcing this portion of the ladder.

In order effectively to brace the ladder from rocking sideways, I have provided braces 29 crossing and being secured together by a bolt or rivet 30 in the center of the back of the ladder. The ends 31 and 32 of the braces 29 are rigidly secured to the upper and lower ends, respectively, of the flanges 16, as best shown in Figure 3.

The upper step of the ladder is formed of a piece of sheet metal, positioned over the upper ends of the side members 6 and seated on the flanges 20 thereof. The top of the step is substantially level and flat and the edges 41 and 42 are bent downwardly and again bent inwardly at 43 and 44, respectively, in such a manner that no sharp or ragged edges are visible.

Suitable handles 45, consisting of cast aluminum tubing, are preferably secured adjacent the ends of the upper step, by means of suitable screws 46, extending upwardly through the flanges 20 and the top of the upper step. This arrangement also aids in securing the upper step in position. The ends of the step 40 are bent down, forming flanges 47, which are secured to the web member 15, by means of suitable rivets 48 and the front flange 42 is secured to the member 17 in like manner, by means of a rivet 49.

The lower step 50 is formed of sheet metal, in substantially the same way as that described for the upper step 40. The step 50 is seated on the upper flange 51 of web member 14 and it is provided with the downwardly turned portions 52 and 53 and the inwardly turned portions 54 and 55, as shown. The rivets 56 secure the end flanges 57 to the web member 14 and the rivets 58 secure the front flange or downwardly bent portion 53 to the flanges 18 on the end frames.

I preferably provide feet 60 for the ladder, which feet consist of aluminum castings fitted in the angle of the leg portions 61 of the side frame members 6 for supporting the load when a person stands thereon.

In order that the ladder may be moved

about as desired, when no weight is upon it, I have provided rollers 65, 65 journaled in U-shaped brackets 66, 66, by means of pins 67, 67, these U-shaped brackets being secured at their upper ends, by means of rivets 68, 68, to leaf spring members 69, 69, secured by bolts 70, 70, to the inside of the channel members 71, 71, extending laterally of the ladder from one side member 6 to the other and secured thereto by rivets or bolts 72. This arrangement is clearly shown in Figures 4 and 5.

The spring members are of such strength, and the latter structure is of such weight, that when nothing is upon the latter it will be held off the floor, as shown in Figure 4. Furthermore, the strength of the spring members is limited to such a point that when a person steps upon the ladder they will flex to permit the feet of the ladder to rest firmly on the floor. Each end of the leaf spring 69 passes through the upwardly disposed U-shaped bracket 73 having washers 74, which are secured to the side portions 75 of the channel member 71, by means of a pivot bolt 76. The purpose of this arrangement is to limit the movement or flexing of the spring 69, so that when the ladder is lifted or moved about, by means of the handles 45, the rollers will not extend below their normal rolling position, illustrated in Figure 4. The position which the structure assumes relative to the floor when weight is placed upon it is indicated in dotted lines in Figure 4.

Two channel member assemblies, of the type shown in Figure 5, are employed with each ladder, as shown in Figure 3, extending transversely of the front and rear portions thereof. From Figure 1 it will be noted that the rear portions 8 and 9 of the end members 6 are formed so as to slope forwardly toward the top, for the purpose of clearing the swing-open doors of the lower vault boxes even though the base of the ladder touches the wall.

I claim:—

1. A step or ladder comprising end spiders, means for supporting said spiders in spaced relation, roller assemblies on which said ladder is adapted to be moved, each of said assemblies comprising a channel member rigidly secured to said spiders, a leaf spring in said channel member, rollers secured adjacent the ends of said spring, and means for limiting the downward flexing of said spring.

2. A step or ladder comprising a frame, feet on said frame for supporting said ladder, roller assemblies on said frame on which the ladder is adapted to be moved, each of said assemblies comprising a channel member rigidly secured to said frame, a leaf spring in said channel member, rollers secured adjacent the ends of said spring, and means for limiting downward flexing of said spring.

3. A step or ladder comprising a frame, end members for said frame, means for securing said end members in spaced relation, tread members on said frame, roller assemblies for supporting said frame, said roller assemblies comprising channel members rigidly secured to said end members, a leaf spring in each of said channel members, a U-shaped bracket secured adjacent each end of said leaf spring, rollers journaled in said U-shaped brackets, and means secured within said channel members for limiting the flexing of the spring.

4. A step or ladder comprising a frame, a pair of channel members mounted at the bottom of said frame, leaf springs mounted in each of said channel members, and a roller carried by each of said leaf springs.

5. A step or ladder comprising a framework including a downwardly opening channel member at the bottom thereof, a leaf spring anchored within said channel member with its free end adapted to work inwardly and outwardly of said channel member, and a roller mounted on said free end of said leaf spring.

6. A step or ladder comprising integral metal side spiders, cross members connecting said spiders, the cross members at the bottoms thereof being in the form of downwardly opening channels, and rollers resiliently mounted from within said channels.

In witness whereof, I hereunto subscribe my name this 26th day of June, 1928.

EMIL A. STRAUSS. 100

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