Aug. 21, 1928.

1,681,879

W. E. PUTNAM

STEPLADDER

Filed Jan. 21, 1927 2 Sheets-Sheet 1

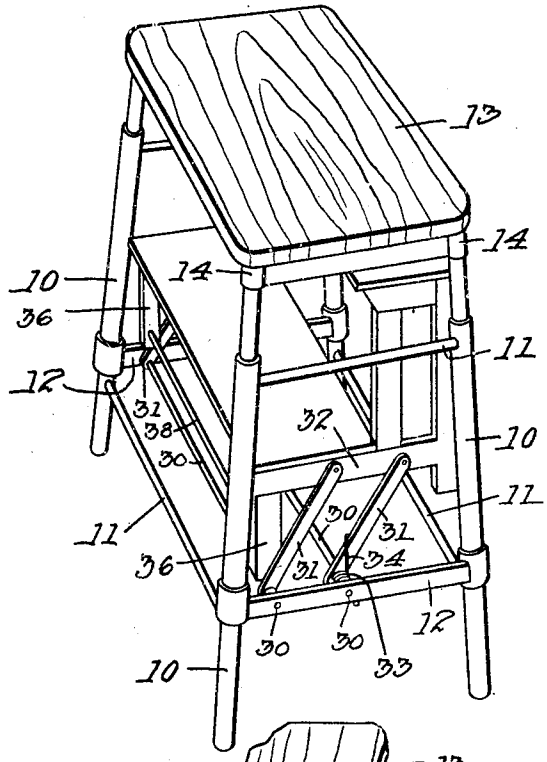


Fig. 1.

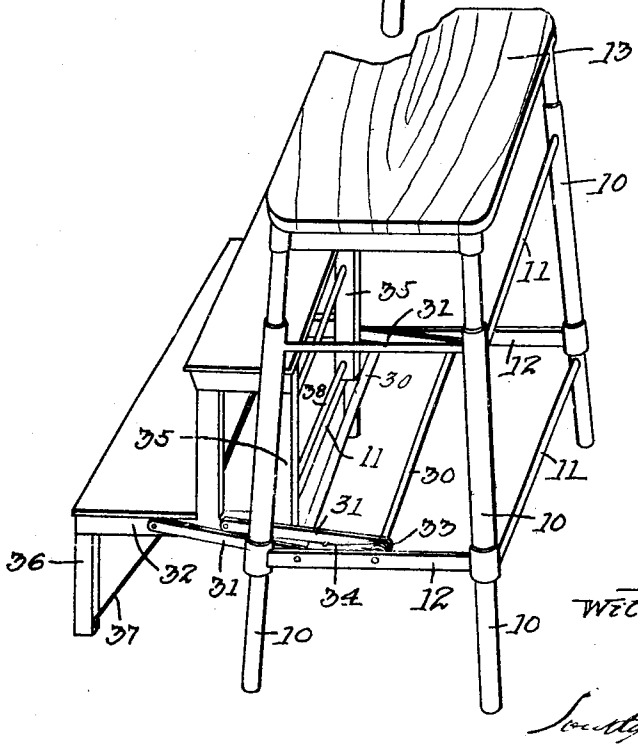


Fig. 2.

Inventor
Willis E. Putnam
By Attorneys

Scott Lyde Fay & Harby

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W. E. PUTNAM

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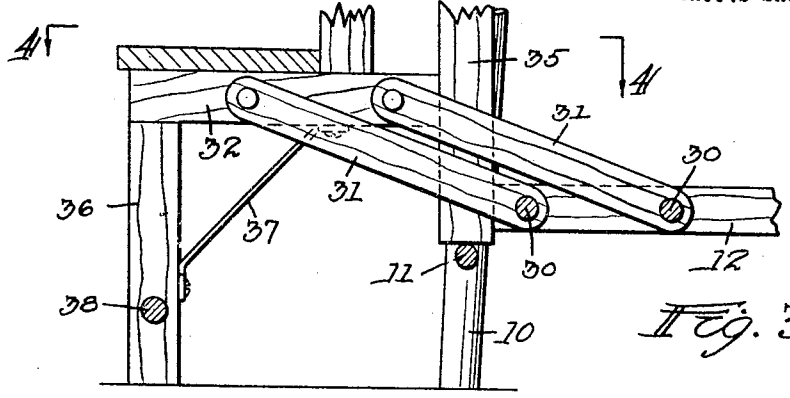


Fig. 3.

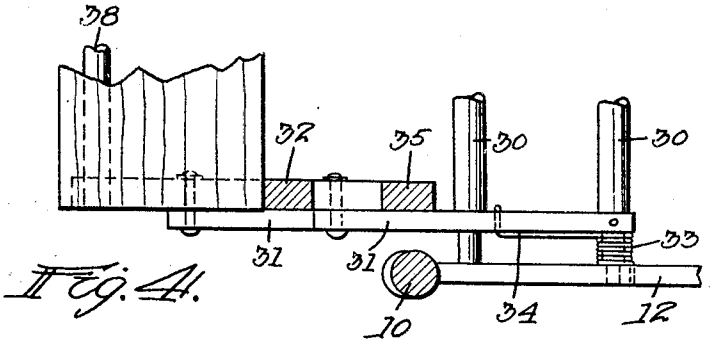


Fig. 4.

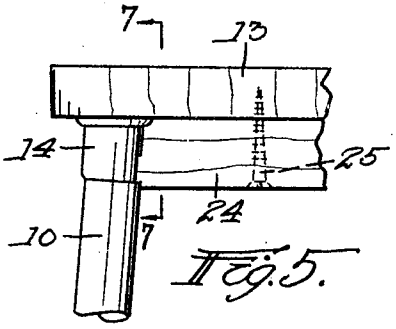


Fig. 5.

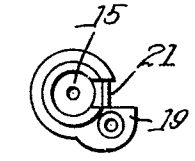


Fig. 6.

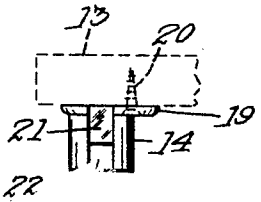


Fig. 7.

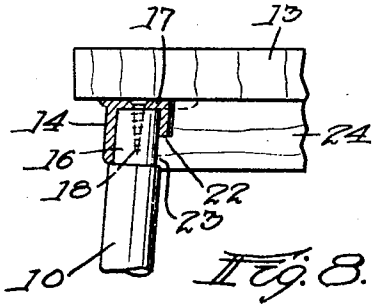


Fig. 8.

Inventor
Willis E. Putnam
By Attorneys

Southgate Fay & Hendricks.

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UNITED STATES PATENT OFFICE.

WILLIS E. PUTNAM, OF WORCESTER, MASSACHUSETTS.

STEPLADDER.

Application filed January 21, 1927. Serial No. 162,624.

This invention relates to a household article capable of being used either as a seat or as a step-ladder. The seat may be in the form of a stool, chair, settee or the like.

The principal objects of the invention are to provide an article of furniture of the above mentioned kind in which the stool itself, chair, or the like, can be made of very rigid construction and the steps are merely an attachment to it so that if, in the use of the steps, they get loose in any way, they will not affect the rigidity and strength of the stool; to provide a folding step-ladder in which the steps can be lifted up into the inside in a very convenient way and in which the top step or top of the stool is always the most rigid part of the device even after long usage; to provide a device of this kind in which the step or steps, while folded up, will not drop out by gravity, no matter what side up the stool is held; to provide a folding step construction in which a step or steps are formed as one element and in which they are very easily folded up within the body of the article of furniture, when not in use; to provide means for assisting in that operation so that not all the weight of the steps has to be lifted by the user for that purpose; to provide a construction which is light and durable; and to provide a corner piece for connecting the top with the legs which will add very much to the rigidity and durability of the device.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a perspective view of a stool constructed in accordance with this invention and showing the steps folded up inside and the device in condition for use as a stool;

Fig. 2 is a perspective view showing the steps drawn outside so that the device is in condition for use as a step-ladder;

Fig. 3 is a side view of a part of the device showing connections between the steps and the stool;

Fig. 4 is a sectional view of the same on the line 4—4 of Fig. 3;

Fig. 5 is a side view of one corner showing the metallic leg attaching device;

Fig. 6 is a bottom plan view of the metallic leg attachment by itself;

Fig. 7 is a side view of the same; and

Fig. 8 is a vertical sectional view through the center of the leg and fastening device.

This article of furniture is made so as to provide a very practical stool or chair which will not have any excessive weight and yet contain a plurality of steps adapted to be folded down to enable the device to be used as a step-ladder. As the stool forms the basis of an article as a piece of furniture I will first describe that by itself.

It contains four legs 10 as usual, these being shown as round and connected across by round wooden rods 11 at the sides and rear and one near the bottom in front, leaving an open space on the front above this front rod 11. Cross bars 12 are located at the sides near the bottom. On the top of the legs is secured a top 13 which constitutes the seat of the stool, chair, or the like. I have shown it rectangular in form but I do not wish to be limited to that form except as expressed in the claims.

For the purpose of securing the top to the legs, I provide attachments 14 for each of the several legs. They can be made of castings, forgings, die castings, etc. Each one is provided with a recess 15 extending upwardly from the bottom and slightly inclined for receiving the reduced upper end 16 of the leg. At the top of this recess is a horizontal wall 17 which is perforated to provide for allowing the insertion of a screw 18 therethrough into the top 16 of the leg to secure these parts in position. It will be understood, however, that the end 16 fits tightly in the recess 15 so that the parts are secured very firmly together at this point.

The attachment 14 is provided with an integral ear 19 having a perforation therethrough for a screw 20 which secures it from the underside to the top 13. This attachment 14 is provided also with a rectangular recess 21 extending through or along the edge of the ear 19 and with a perforation 22 also rectangular and located in alignment with a flat surface forming one edge of the recess 21.

The recesses and flat surfaces are for the purpose of receiving an end 23 of a bar 24 which extends across the stool at each end and in contact with the under side of the top 13. This bar is secured to the top by screws 25. These two bars thus project into the castings 14 at their opposite ends and come up tight against the ends 16 of the legs and also against the flat surface of the recesses 21. Being secured firmly to the under side of the top 13 and projecting in this way

into the castings 14 they very much strengthen the whole device and provide a stool which, even without the other features to be described later, is so strong and durable as to be in itself an article suitable to place on the market and I wish it understood that the stool or chair, or the like, as an article of manufacture, constitutes a feature of this invention.

For the purpose of converting the stool into a step-ladder additional mechanism is provided. The cross bars 12 at the bottom are each provided with two cross rods 30. On each of these is pivoted a wooden link 31. These links are parallel with each other at all times and pivoted to a step frame 32 forming a parallel motion which will keep not only the links parallel with each other, but the bottom of the step frame 32 horizontal at all times. There are two pairs of links 31, one at each end of the stool. On one of the rods 30 is a coil spring 33 having an arm 34 extending up and engaging over the corresponding link and having the other end extending outwardly under the bar 12 to normally assist in swinging this link backwardly into the space in the stool in which it is shown in Fig. 1.

The step frame 32 is shown as formed of the two steps and rear vertical members 35 and legs 36 and as having struts 37 and cross rods 38, which further strengthen it. This frame is a unit and is shown in the form illustrated as having two steps although it can be made with one or more.

It is obvious that with the parts in a folded position as shown in Fig. 1 the device constitutes a very good and durable stool or chair. Now if it is desired to use it as a step-ladder, the most convenient way is to grasp the upper step and bring it to the front which brings it to the position shown in Fig. 2. The legs 36 rests firmly on the floor and the two rear uprights 35 come down firmly on one of the cross rods 11. In this way the steps are supported in a simple and positive manner and the links 31 and their connected parts have nothing to do with supporting the steps. Therefore no strain of importance comes upon them. The uprights 35 rest on the rod 11 at points near its ends where it is firmly supported in the legs.

It will be noted that the spring 33 offers resistance to the swinging of the steps out from within the stool but that the weight of the steps is sufficient to overcome it along toward the end of the motion outwardly. The spring always tends to raise the steps but is not strong enough to move them from the extended position shown in Fig. 2. In returning the steps, no help from the spring is obserevd until the links 31 go practically up to vertical position; then the spring will itself swing the step frame over all the way to the back where it comes against one of the upper cross rods 11 and rests against it.

On account of this spring action, the user can pick up this step-ladder by any corner or hold it at any angle and the steps will not drop out accidentally. This is an important feature because when using it as a stool it can be carried around, the same as any other stool, without paying any attention to the fact that the steps are located within it. In spite of the fact that the stool contains within it a pair of steps, the whole structure is comparatively light and is very strong and durable.

Although I have illustrated and described only a single form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In an article of furniture, a step ladder having a top and legs constituting a frame, a step frame having a parallel motion and pivotal connection with the legs near the bottom and adapted to swing into the interior of the frame, said step ladder having a rod across it near the rear connecting two legs and constituting a stop for the step frame, and yielding means for normally tending to swing the step frame upwardly into the frame against said rod.

2. In an article of furniture, a step ladder having a top and four legs, a bar on each side near the bottom connecting the side legs, a pair of pivot studs supported by said bar, a pair of parallel links pivoted on said studs, and a step frame pivotally connected to the ends of said links, whereby the frame can be swung into the space between the legs and out of it to cooperate with the top of the step-ladder.

3. In an article of furniture, a step ladder having a top and four legs, a bar on each side near the bottom connecting the side legs, a pair of pivot studs supported by said bar, a pair of links pivoted on said studs, a step frame pivotally connected to the ends of said links at points a distance apart equal to the distance apart of said studs, whereby the frame is connected to said bars by a parallel motion and can be swung thereabout into the space between the legs and out to cooperate with the top of the step-ladder, and a spring coiled on one of said studs and having an arm engaging the corresponding link to prevent the step frame from falling out when the step ladder is in an inclined position.

In testimony whereof I have hereunto affixed my signature.

WILLIS E. PUTNAM.