

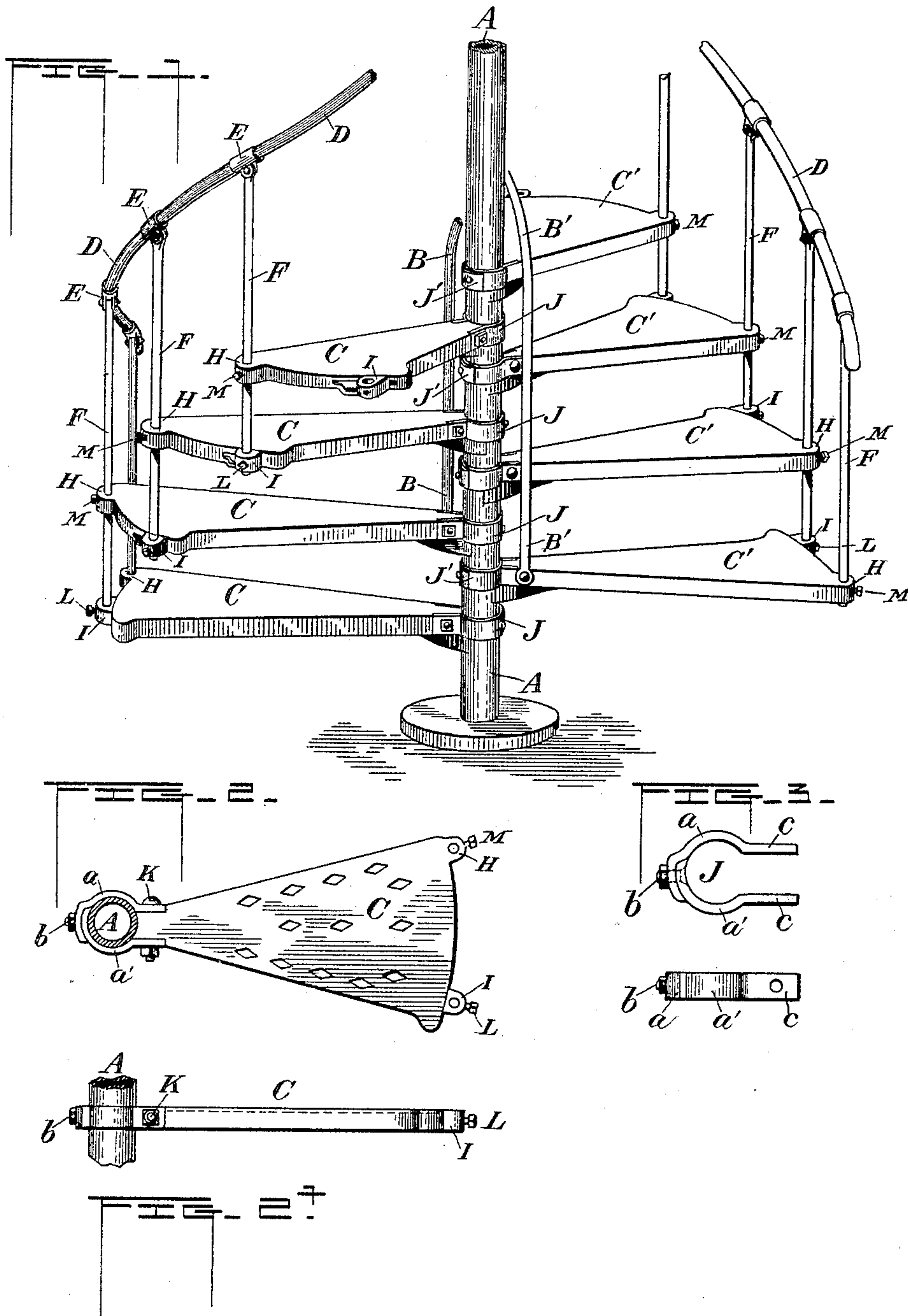
(No Model.)

2 Sheets—Sheet 1.

R. O. BELLES.  
SPIRAL STAIRWAY.

No. 424,533.

Patented Apr. 1, 1890.



WITNESSES

*N. L. Gill*  
*A. M. Harrison*

INVENTOR

*Reuben O. Belles*  
*by W. Baxendell & Sons*  
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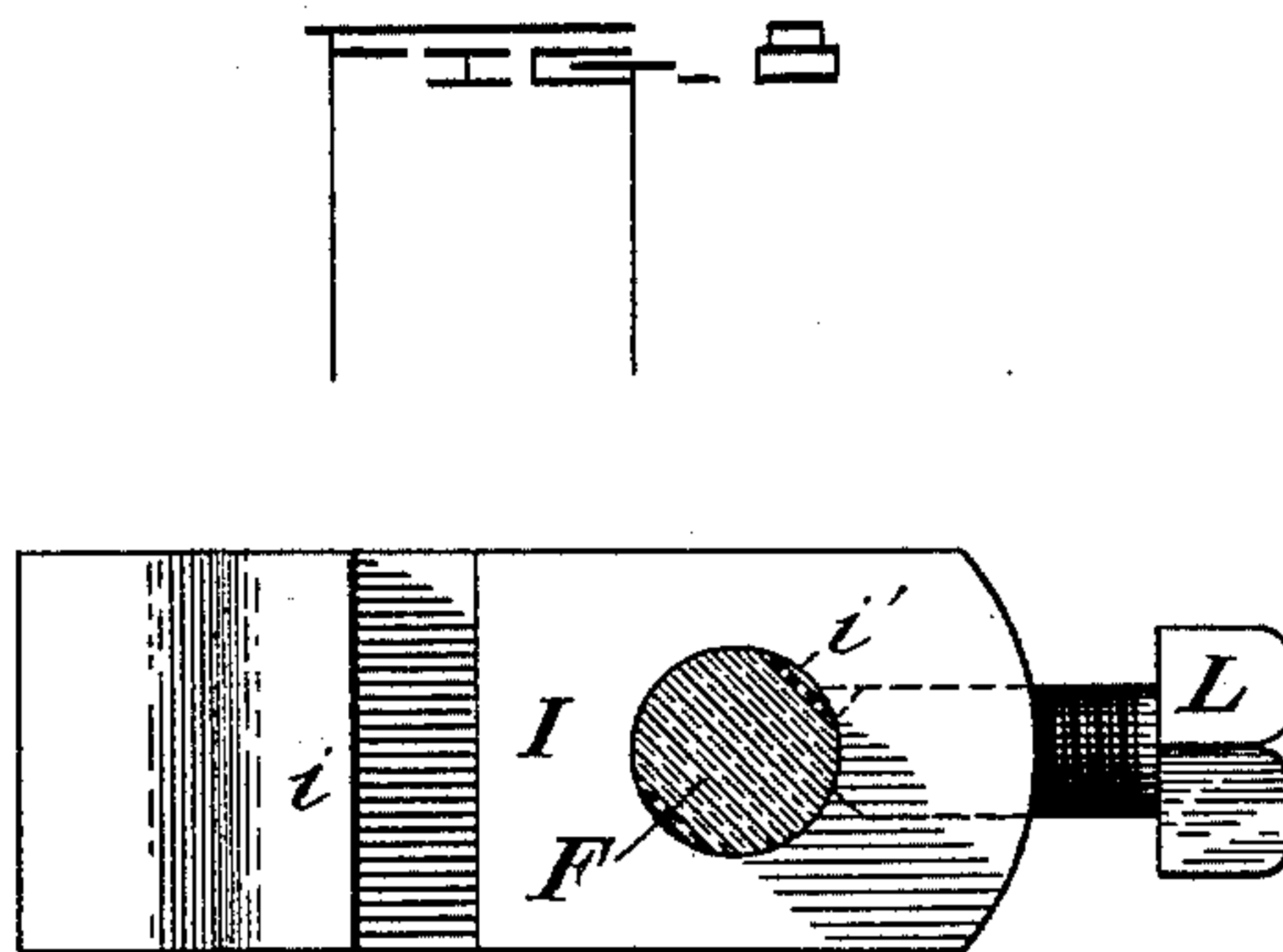
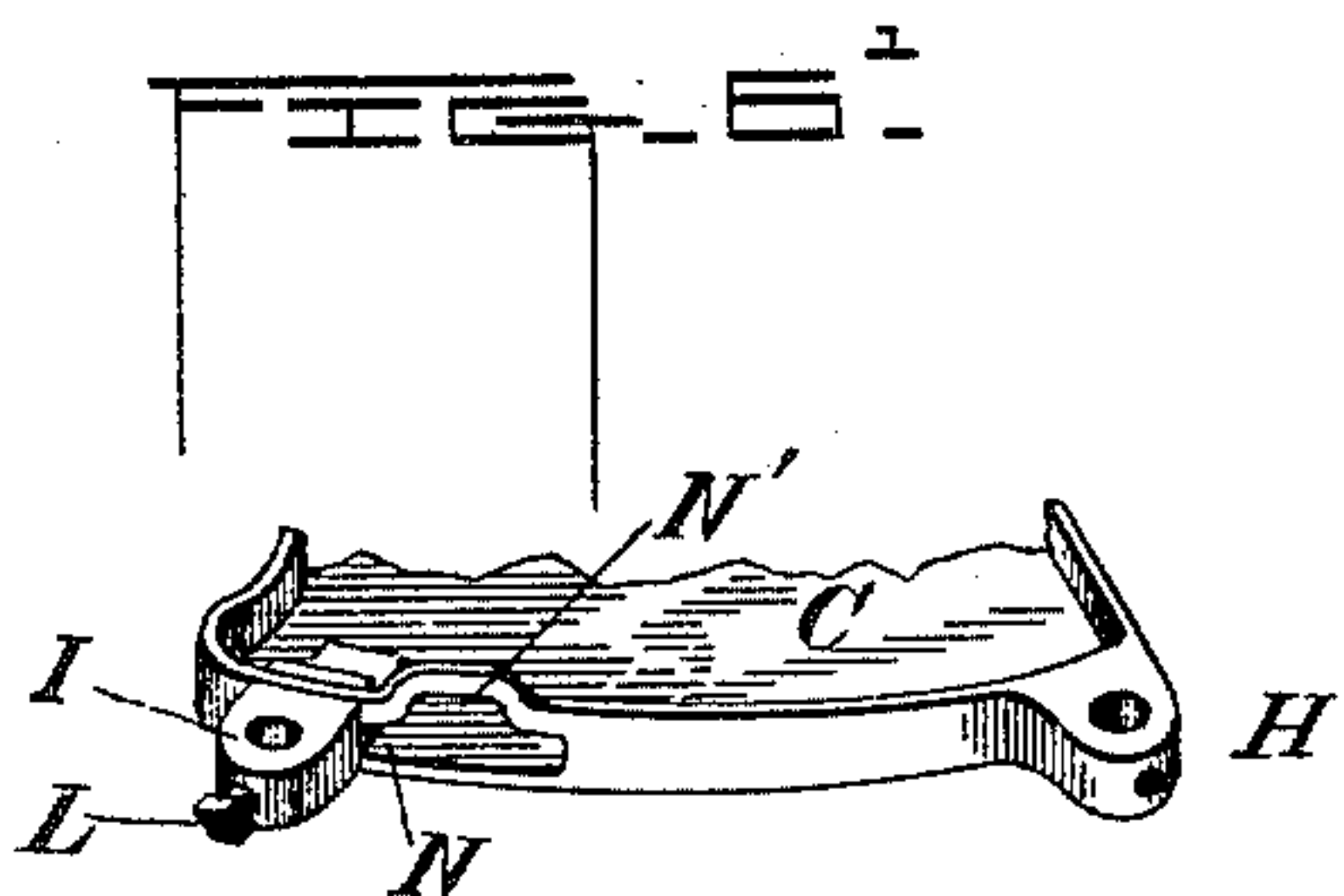
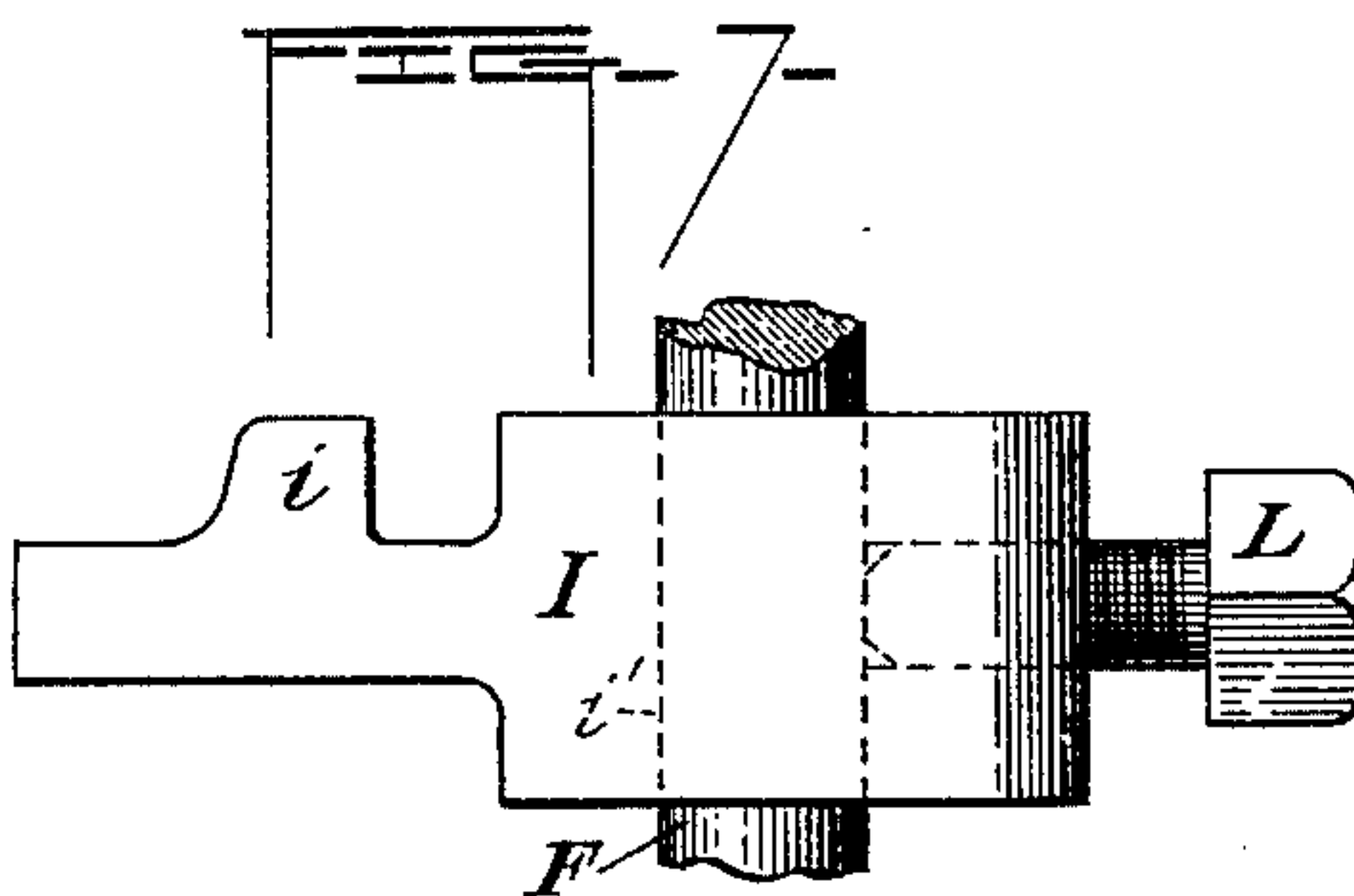
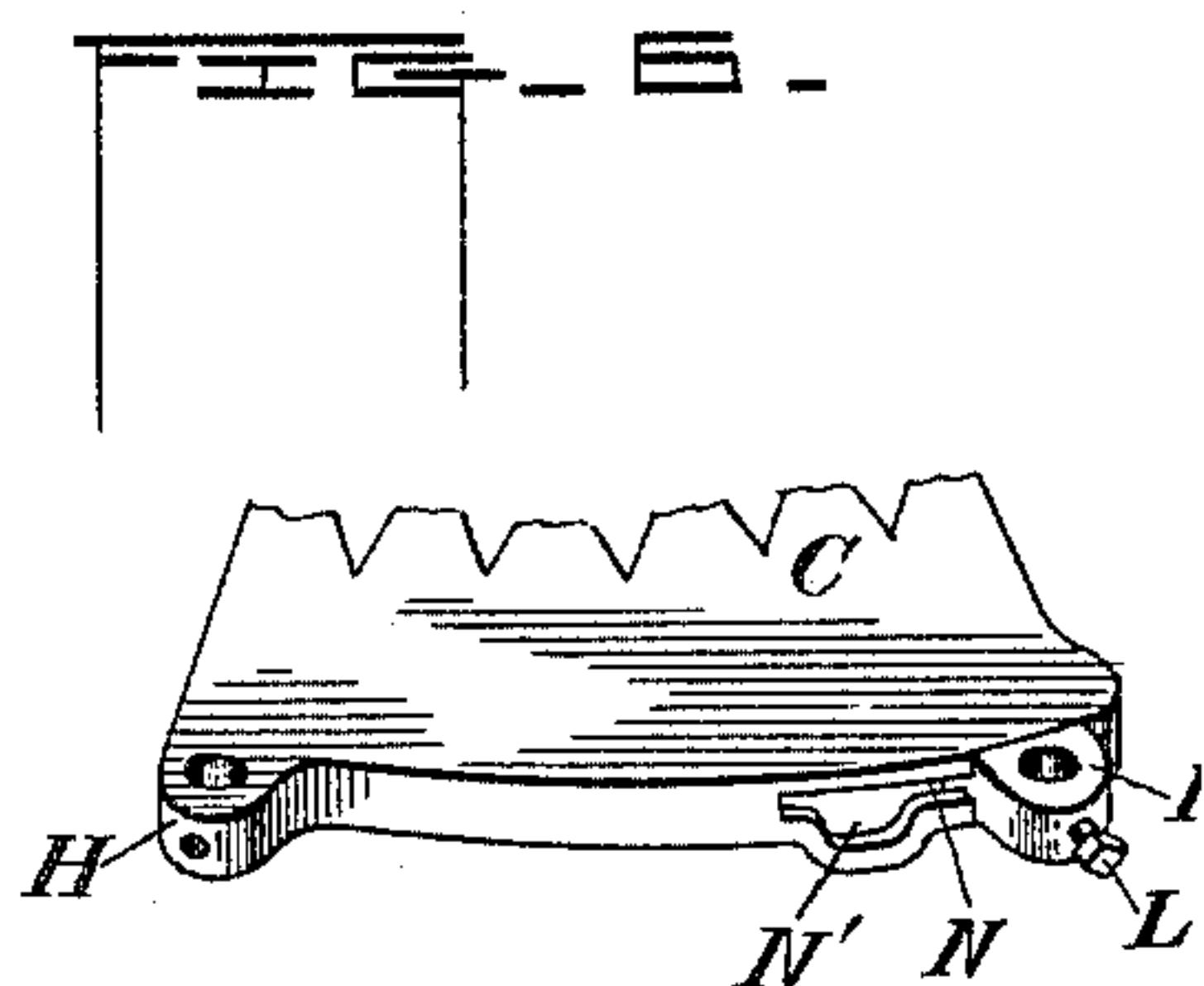
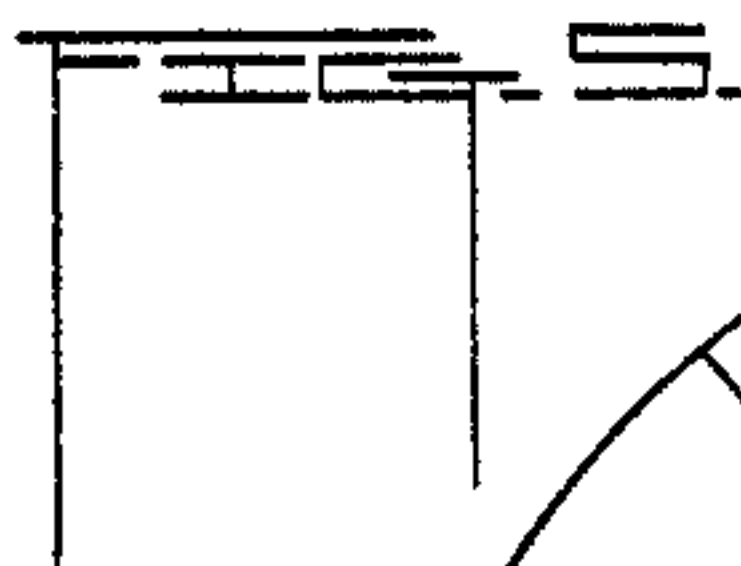
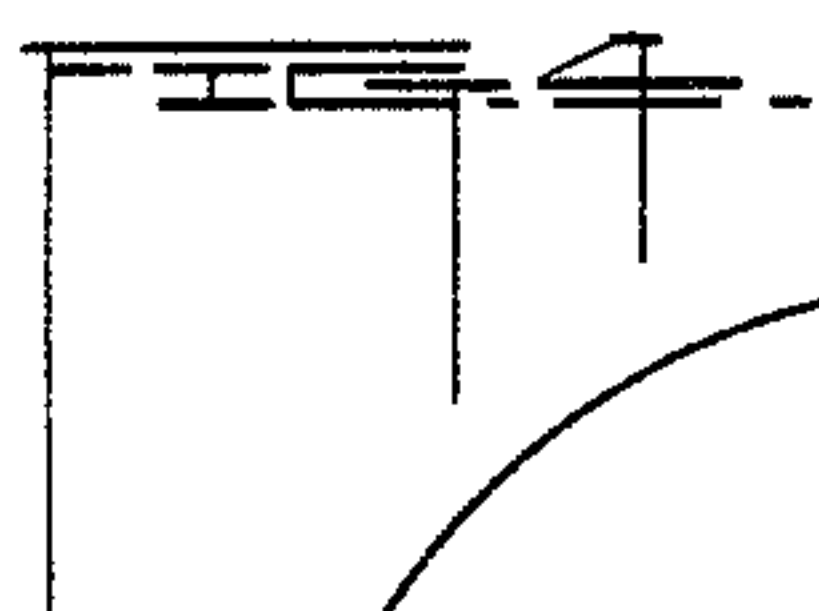
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2 Sheets—Sheet 2.

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WITNESSES

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# UNITED STATES PATENT OFFICE.

REUBEN O. BELLES, OF ALLEGHENY, PENNSYLVANIA.

## SPIRAL STAIRWAY.

SPECIFICATION forming part of Letters Patent No. 424,533, dated April 1, 1890.

Application filed October 31, 1889. Serial No. 328,873. (No model.)

*To all whom it may concern:*

Be it known that I, REUBEN O. BELLES, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Spiral Stairways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a side elevation of a stairway constructed in accordance with my invention. Fig. 2 is a horizontal section on the line II II of Fig. 1, showing one of the steps. Fig. 2' is a side view of the step. Fig. 3 shows in 15 plan and side view one of the clamps for holding the step to the central column. Fig. 4 is a plan view showing the relative arrangement of the steps. Fig. 5 is a similar view illustrating a modified construction of my 20 improvement. Fig. 6 is a perspective view of the end of one of the steps. Fig. 6' is a similar view showing the under side thereof. Fig. 7 is an enlarged side elevation of a part. Fig. 8 is a plan view thereof.

25 Like symbols of reference indicate like parts in each.

My invention consists in a system of steps formed of two or more series of stairways arranged in spiral directions around a central 30 column, the steps of the different series being arranged alternately one above the other.

Within the scope of the invention as thus stated the stairways may be constructed in a variety of ways; but that which I deem to 35 be preferable is illustrated in the said drawings, in which—

A represents the central vertical column or post, around which the stairways are arranged.

40 C C are the steps of one of the spiral stairways, which steps are preferably of triangular form and are arranged one above the other around the column A, being secured thereto by clamps J. These clamps are preferably constructed as shown in Figs. 2, 2', 45 and 3, being made of two semicircular parts *a a'*, adapted to be secured together by a bolt *b* and having projecting straps or side portions *c*, which are adapted to fit on each side 50 of the inner and smaller end of the step. In adjusting the clamps the semicircular parts *a a'* are placed around the column and united

by the bolt *b*, and the straps are drawn together upon the steps by means of the bolt K. The steps and clamps may thus be fitted 55 to or removed from the column in any order after the column has been erected in position. The steps are further supported and secured to each other by upright bars F, which are secured by clamps E to the spiral 60 railing D of the stairway and respectively pass through lugs H at the end of one step and through adjustable lugs I on the step next below. This adjustable lug I is made as 65 shown in Fig. 6, having a hole *i'* for the reception of the bar F, and having a tongue *i*, with an enlarged inner end, adapted to pass through a horizontal slot N at the rear edge of the step, said slot having an enlarged portion N', through which the enlarged end of 70 said tongue *i* may be introduced and withdrawn.

In adjusting the step on the column A, the tongue *i* of the lug I having been inserted into the enlarged portion N' of the slot N, the 75 lug I is moved laterally in the slot into the same vertical line with the lug H on the step of the same series directly above, as shown in Fig. 1. This shifting of the lug in the slot locks the lug, as shown in Figs 6 and 6', and 80 prevents its accidental displacement from the step. The lateral shifting or adjustment of the lug is effected, as convenience may require, either by moving the step horizontally on the axis of the column A or by moving 85 the lug in the slot without moving the step. The bars F are secured in the lugs H by means of set-bolt M and are secured in the lugs I by set-bolt L.

C' are the steps of the second series, which 90 steps are also arranged spirally around the column A, and their securing-clamps are arranged alternately between the clamps of the steps C, as shown in Fig. 1. The arrangement of these steps and the manner of securing them to their upright bars F are the same 95 as above described with reference to the steps C of the other series.

B B' are inside hand-rails, which extend spirally around the central column A, as 100 shown in Fig. 1.

In Fig. 4 I show in plan view two series of spiral steps arranged as shown in Fig. 1, and in Fig. 5 I show three series of steps ar-



10 ranged in a similar manner, the said steps alternating in their points of attachment to the central column. It will be understood that in the use of three series of steps the  
5 stairway must be made of a larger radius than where merely two series of steps are used.

The advantages of my invention will be appreciated by those skilled in the art.

10 By means of stairs constructed as I have described two or more series of steps may be combined in a comparatively small space and with much less cost than necessary to build the same number of series of steps independ-  
15 ently of each other.

My invention is applicable to use as a fire-escape, and in towers, or for any other purpose to which spiral steps are adapted.

20 I am aware that it is not new to arrange around a central column two series of spiral steps with the adjacent members of the separate series on the same horizontal planes; but I believe I am the first to describe a double spiral stairway in which the steps of the two  
25 series are arranged alternately.

This novel construction which I have devised affords a stairway possessing many desirable features of strength, simplicity of construction, and ease of relative adjustment of  
30 the steps.

In the use of the stairs one series of steps may conveniently be used for the purpose of ascending and the other series used for descending, so that there shall be no interference or crowding between persons going in  
35 opposite directions. The advantages in this respect in crowded public buildings are especially marked.

The advantages appertaining to the use of  
40 the devices which I show for securing the steps to the upright bars F are that by simply loosening and adjusting the set-bolts L and M and the clamps J the steps may be adjusted up or down, as desired, and by moving  
45 the lugs I in the slots N the proper position of the steps relatively to the bars F may be adjusted without difficulty.

The proportions and dimensions of the parts will be understood by reference to Fig.

1. I will state, however, that in practice I 50 have found the following dimensions to be practicable and good in a stairway composed of two series of steps, (but said dimensions may be varied by the skilled stair-builder:) diameter of compound stairway, seven feet 55 six inches; rise of the steps of each series, eight inches; width of each step at the outer end, nineteen inches.

I claim—

1. In a stairway, the combination of a cen- 60 tral column and two or more series of steps arranged spirally around the same, the steps of each of said series being secured to the column alternately relatively to the corresponding steps of the other series, and on dif- 65 ferent horizontal planes, substantially as and for the purposes described.

2. In a stairway, the combination, with steps arranged one above the other, of rods F, passing through a lug on one step and through a 70 horizontally-adjustable lug on the next succeeding step, substantially as and for the purposes described.

3. The combination, with the steps, of bars F, passing through horizontally-adjustable 75 lugs I on the steps, and set-screws, by which the bars are adjustably secured in said lugs, substantially as and for the purpose described.

4. The combination, with the upright col- 80 umn and a step, of a clamp having a divided annular portion, the parts of which encircle the column and are detachably connected by side pieces, and a bolt, by which the parts of the clamp may be drawn together and se- 85 cured to the step, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 28th day of October, A. D. 1889.

REUBEN O. BELLES.

Witnesses:

W. B. CORWIN,

THOMAS W. BAKEWELL.