(No Model.)

G. V. MARSHALL.

SPIRAL STAIRWAY.

No. 340,338. Patented Apr. 20, 1886.

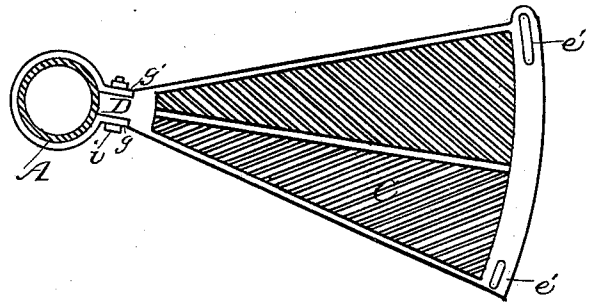

Fig. 1

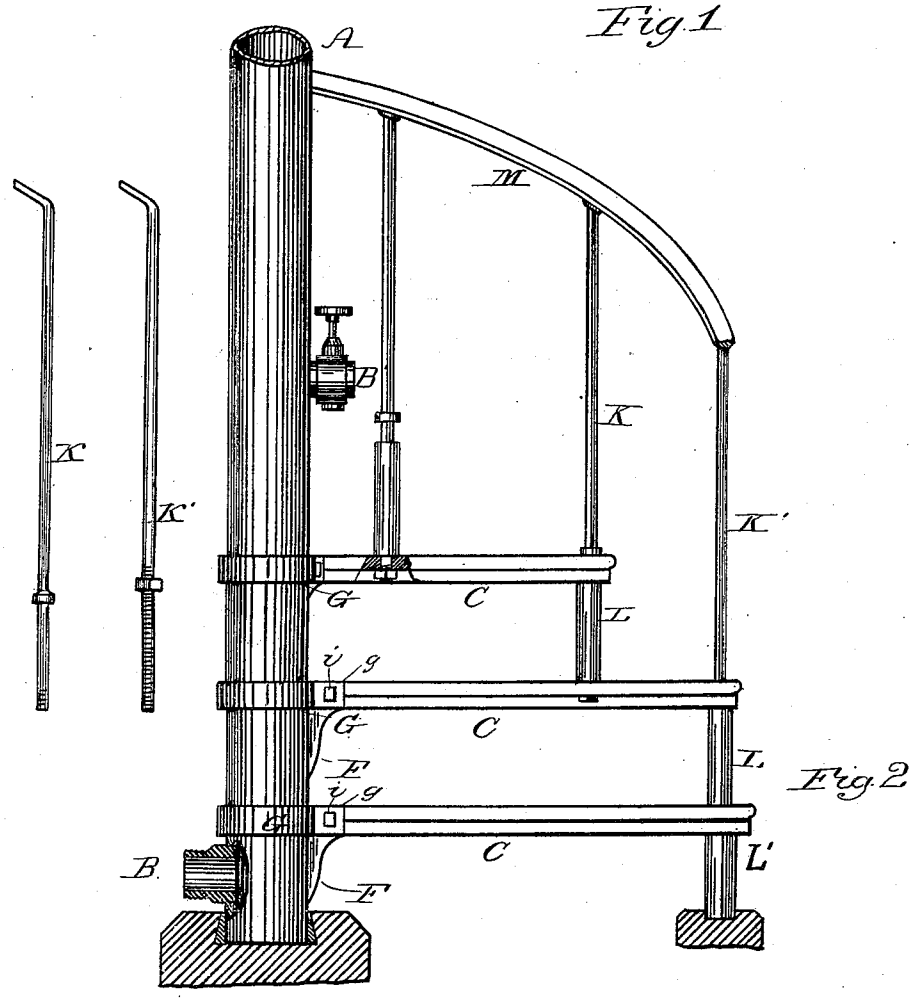

Fig. 2

WITNESSES:

A. A. Moore,
R. E. Grant

INVENTOR

George V. Marshall
BY
Connolly & Co
ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE V. MARSHALL, OF PITTSBURG, PENNSYLVANIA.

SPIRAL STAIRWAY.

SPECIFICATION forming part of Letters Patent No. 340,338, dated April 20, 1886.

Application filed February 8, 1886. Serial No. 191,188. (No model.)

To all whom it may concern:

Be it known that I, GEORGE V. MARSHALL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Spiral Stairways; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to spiral stairways, and has for its object to provide a spiral stairway which can be attached to the outside of buildings without specially detailing its sizes or referring particularly to the architectural features of the building.

This invention therefore consists, first, in a spiral stairway made independent of the building to which it is to be attached, and so constructed that it can be perfectly fitted to buildings having different heights of floors or arrangement of exit-doors; secondly, in a spiral stairway adapted to be attached to the exterior of buildings, and so constructed that it will be capable of attachment to buildings having different heights of floors without special construction of each separate stairway; thirdly, in the construction, combination, and arrangements of parts, more fully hereinafter described and specifically claimed.

In the construction of metal stairways as heretofore usually practiced the central pillar or standard has been a round column extending the entire length of the stairway, or several sections bolted or coupled together. The steps were constructed of cast-iron, with an eye made integral therewith on their inner end, the eye being slipped onto the central column, and fastened in position thereon by bolts or set-screws. This construction necessitated the slipping on of all the steps from one end of the column. The rise of the steps was regulated by a panel either cast with or attached to the front edge of the step, or by bracket-panels connecting the steps along the circumference of the spiral. This stairway is not alone expensive in construction, but the rise of all the steps must be uniform, or else different panels or brackets must be constructed where any inequality occurs, and before they can be made all facts as to size, &c., must be exactly known. This inequality in the rise is of very frequent occurrence in the one set of series of stairways—as, for instance, where a platform is formed outside a door or window—and where the stairway is to go to a distance or point not having shop facilities it is often impossible to do the work properly.

Referring to the accompanying drawings, Figure 1 is a top view, and Fig. 2 a front view, of my improved stairway or fire-escape.

A designates the central support, which is constructed of a hollow column, preferably of wrought-iron and circular in cross-section. This column is provided at any desired points with couplings B B', &c., for attaching fire-hose or water-mains, and it is anchored to the ground, so as to retain its vertical position. The steps proper are usually of cast-iron, or, if desired, they may be otherwise, and are so formed as to represent a segment of a circle. On the inner or narrower end is formed a tenon, D. To the inner end of the step C is also attached a bracket, F, (or it may be formed integral therewith,) the inner side of which is at right angles with the top of the step. At or near the two outer corners of the step are formed slots or bolt-holes *e' e'*.

G represents a band of iron of sufficient dimensions to embrace the column and to allow its ends *g g'* to reach to and clasp the tenon D. This band has bolt-holes through its ends, to permit a bolt, *i*, to be passed from one to the other through the bolt-hole in the tenon *d*.

K K' are the balusters, which pass through, at their lower ends, the bolt holes or slots *e'* in front of one and the rear of the step below it, and are fastened beneath the said lower step.

L L' are distance pieces or washers, of metal—for instance, gas-pipe—which surround the baluster between each step and regulate the height between the steps, at the same time supporting the outer edge of the step under which they are placed, and serve to rigidly connect all the steps together.

M represents the hand-rail, which can be formed of any desirable material and attached to the balustrades in any suitable manner.

The construction or mode of butting together the stairway is as follows: The central column is raised to a vertical position and held in that condition. One of the balusters is then placed in position, its lower end rest-

ing on the ground or anchored in a suitable block of stone, one of the pieces, L′, having been previously slipped onto the balusters, its lower end also resting on the ground or on the block of stone. The first step is then placed in position, the baluster passing through the bolt hole or slot *e′* in front of the step. A nut is then screwed down tight on the baluster against the top of the step. The balusters are preferably formed with a struck-up shoulder or welded ring, which abuts against the top of the step, and in that case a single nut is placed on the lower end of the baluster, and is drawn against the bottom of the step. After the step is placed in position, as above described, the band G is placed around the column, and its ends being drawn together by the bolt *i*, which passes through the bolt-holes in G and the bolt-hole in D, the step is firmly held in position against the side of the column, the bracket F serving as an additional brace to retain the step in a horizontal position, and to lessen the strain on the band G and the bolt *i*. The end of the baluster, its nut or collar, the distance-piece, and the draw-nut thus become a means of tightly connecting adjoining steps all the way up the stairs, and serve to brace and stiffen the whole structure. The other steps are placed in position in the same manner till the entire stairway is completed, without having to slip the steps one after the other down from the upper end of the column. Where it is necessary to increase or decrease the rise of any of the steps, it is only necessary to increase or shorten the length of the metal pieces L, as they regulate the rise of each step. This can be readily done on the spot with a pipe-cutter. If in coming to a gallery or landing it is found the final step will not face around or comes too far, the proper position can be attained in a few moments by circular adjustment of one or more of the steps below it by means of the slots *e′ e′*. Hence by these ready-made adjustments I am enabled to erect a complete stairway which at any point will exactly match levels of buildings without any plans or measurements further than knowing the total height and location of landings. All changes can be made with one form and size of the step pattern, the only variable part being the distance-pieces of gas-pipe.

I have shown the balusters as the means of connecting step to step, because I prefer that as the simplest way; but the steps can be connected by rods or bolts, and the balusters supported in any desirable manner.

I am aware that it is not new to provide a spiral stairway having a central hollow supporting-column designed and adapted for the conveyance of water; hence I do not broadly claim the same as my invention.

What I claim as new is—

1. In a spiral stairway, the combination of a central column with a series of steps attached thereto by means of bands or clamps surrounding the pillar and bolted to the step, the outer ends of the successive steps being fastened together, substantially as described.

2. In a spiral stairway, the combination, with a central column having a series of steps attached thereto, of balusters having removable collars surrounding their lower ends, said ends passing through the front edge of a step and the back edge of the next lower step and fastened thereto, whereby the series of steps are mutually supported and braced, substantially as described.

3. In a spiral stairway, the combination, with a central column having a series of steps attached thereto by bands or clamps which encircle said column and are attached to said steps, of balusters which pass from one step to the next and through surrounding collars or distance-pieces, which support the outer edges of the steps, said balusters having retaining-nuts at the lower end, substantially as described.

4. In a spiral stairway, the combination, with the central hollow column, A, having couplings B B′, of a series of steps supported by said column and held in position thereon by clamps or bands G, and supported at their outer ends by balusters K, encircling collars L, and retaining-nuts, substantially as described.

5. In a spiral stairway, the combination of two successive steps attached to the central pillar, having overlapping edges and coinciding slots or holes *e′ e′*, with a connecting rod, bolt, or baluster passing through said slots or holes, distance-pieces L, and a nut or nuts adapted to screw on said rod, bolt, or baluster and draw both steps tightly against the ends of said distance-pieces, substantially as described.

6. In a spiral stairway, the combination of two successive steps adjustably attached to the central column, having one or more coinciding elongated slots, *e′*, with a connecting-bolt or tie-rod passing vertically through the outer slot of one step and the inner slot of the step below, and one or more clamping-nuts, substantially as described, whereby the steps may be independently adjusted in the circular direction.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of February, 1886.

GEO. V. MARSHALL.

Witnesses:
T. J. McTIGHE,
THOS. J. BRAY.