

(No Model.)

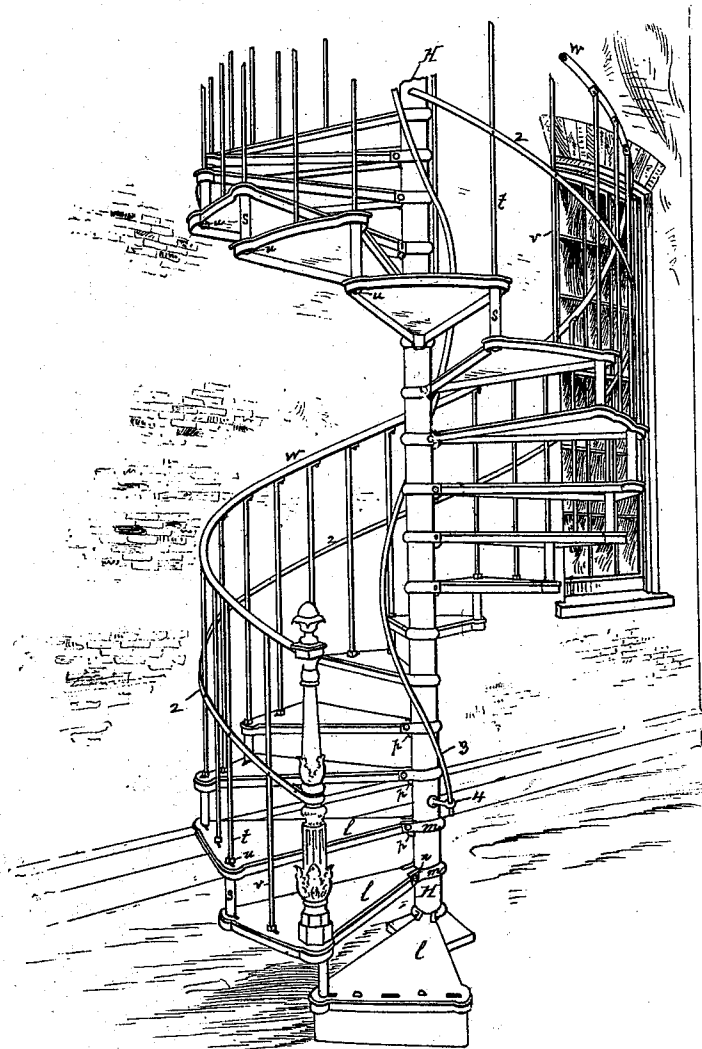
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G. V. MARSHALL.
SPIRAL STAIRWAY.

No. 400,470.

Patented Apr. 2, 1889.

Fig. 1.



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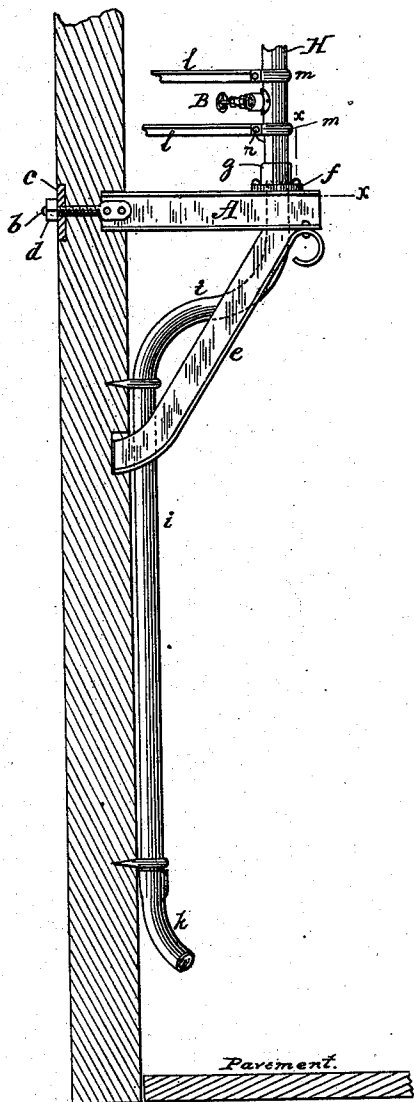


Fig. 2.

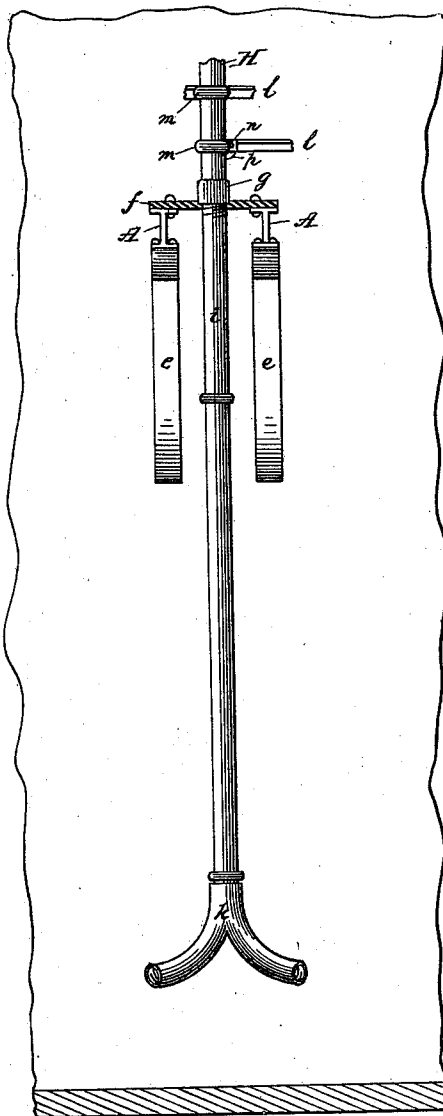
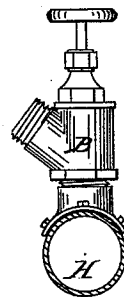


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE V. MARSHALL, OF PITTSBURG, PENNSYLVANIA.

SPIRAL STAIRWAY.

SPECIFICATION forming part of Letters Patent No. 400,470, dated April 2, 1889.

Application filed April 20, 1888. Serial No. 271,330. (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, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the construction of spiral stairways in general, but is more particularly designed for that class of spiral or winding stairways which are commonly intended for use as fire-escapes, and at the same time to afford a convenient means of conveying water under pressure to the different floors of a building in the event of a fire and calling the fire-department into service. Such stairways are always erected outside the building, and consequently, for the sake of appearance and the economy of space, it is desirable to have the construction limited to the smallest possible dimensions. It is also desirable in most cases to have the stairway proper stop at a point far enough above the ground level to be out of reach from below under ordinary conditions, while it is important to have the water-column extended to a point near the ground level so as to be immediately accessible to the fire-department.

In the present invention I have availed myself of some of the constructive features embodied and described by Letters Patent of the United States No. 340,338, issued to me on April 20, 1886.

My present invention comprises a spiral or winding stairway composed of a series of independent steps clamped directly to a continuous wrought-iron pipe closed at its upper end and provided at its lower end with a coupling, and at intermediate points at its length with valved branches.

The invention further consists in the combination and arrangement of parts, substantially as hereinafter fully described and claimed.

In the accompanying drawings, which form part of this specification, Figure 1 is a per-

spective illustrating the complete structure as it appears when extended to the ground level—a form which is commonly adopted in school buildings, asylums, and similar institutions. Fig. 2 is an elevation illustrating the form and arrangement for regular fire-escape and water purposes on buildings within city limits, where it is not desired to carry the steps down to the ground level. Fig. 3 is a front elevation of the parts shown in Fig. 2. Fig. 4 is a sectional plan of the water-column and a valved branch.

At a suitable distance above the level of the pavement I place a bracket, A, which I prefer to construct of two I-beams, which are provided with bolts *b*, riveted thereto, and are let into the wall of the building, and the bolts *b* pass through the wall of the building and through a washer-plate, *c*, inside, where they are secured by nuts *d*. Outside the building the I-beams A are supported by the braces *e*, whose ends are riveted or bolted to the beams, as shown. An anchor-plate, *f*, is fastened across the top of the two I-beams, and is centrally perforated, and provided on its upper face with a seat for the union *g*, which at this point forms the lower end of the stand-pipe H, which is ordinary seamless iron pipe, (and generally four and a half inches internal diameter.) Pipe H thence extends upwardly to the height to which it is desired to carry the structure, and forms the sole support for the stairway which is to be erected, the pipe itself being, as above described, supported by the bracket A. Into the lower end of the union *g*, I screw a shorter length of pipe, *i*, which is given a reversed bend, so as to carry it inwardly to the wall of the building and down along the wall to a point two or three feet above the pavement, where it terminates in a double-nosed coupling or a Y, *k*, which is provided with the standard threads commonly used in the fire-department—namely, two and a half inches diameter—so that two connections may be made from the fire engine or engines.

Beginning at the bracket A as a starting-point, I attach one by one the steps *l*, which are of cast-iron, and are attached fixedly to the column H by means of the clamps *m* and bolts

n, as described in my above-mentioned patent. Each step is provided with the downwardly-projecting toe-piece *p* and has around its outer periphery two or more slots or holes 5 formed vertically in the edge of the steps. The steps are distanced apart vertically by means of the short pieces of pipe *s* or tubular distance-pieces, through which and the steps are passed the balusters *t*, each baluster passing 10 through the front corner slot of the upper step, then through the distance-piece *s*, and then through the rear corner slot of the step below, and the parts are firmly held in position by the upper and lower nuts, *u*, for 15 the reception of which the lower end of each baluster is screw-threaded.

Before beginning the erection of the structure it is only necessary to know the total height and the position of the various landings or openings into the stairway, from which 20 data, knowing the thickness of each step, the length of the distance pieces *s* can be readily determined, and they are then cut accordingly. In some cases it is desirable to have 25 the balusters closer together than the distance given by the width of the segmental steps *l*, especially where the structure is to be used on a school building or similar institution for children. In such event I utilize the 30 middle one of the slots in the periphery of the steps *l* for the attachment of the intermediate balusters, *v*. The upper ends of all the balusters are bent over and bolted to the under side of the spirally-curved hand-rail *w*, 35 which, besides serving the purpose of a hand-rail, acts to brace and stiffen the entire structure. Midway between the line of the hand-rail and the steps I place the spirally-arranged guard-strip 2, which is riveted or 40 bolted to the balusters at suitable points.

In order to make the descent down the steps as convenient as possible, and to permit two persons abreast to each have a hand-rail, I 45 attach the spirally-curved inner hand-rail, 3, to the pipe II by means of the brackets 4, which are attached to pipe II, and have an eye in their outer ends, through which the hand-rail 3 passes. This hand-rail is arranged to clear the pipe II by a few inches, and substantially corresponds with the plane of the 50 outer hand-rail, *w*.

After the structure has been erected and the steps placed in position permanently, I proceed to fit the water branches at the desired points, which may be in proximity to 55 the windows of the building, or opposite doorways on the different floors, according to the character of the building to which the structure is attached, and having such points located I take the nearest step, and in the pipe 60 II, under such step, I cut a hole about two and a half inches diameter and bolt to the pipe, so as to register with the hole, a flanged and valved branch, B, placing a gasket between the fitting, so that the coupling part

or branch proper will point toward the window or doorway at which it is intended to be utilized. In this manner I provide for the delivery of water from the fire-engine 70 on the street directly through the pipe II to the particular floor in which it is wanted, and as the various branches B are each provided with its valve the delivery of water under such circumstances can be readily confined to the desired point, and as the pipe II is 75 generally four and a half inches diameter it has capacity enough for two of the ordinary hose-connections of a fire-engine, and therefore can convey the usual volume of water at the desired high pressure. Where the building 80 is high it may be necessary to use several lengths of pipe to form the column II, in which case I use ordinary unions or couplings to make the said column continuous.

It is important where the structure is to be 85 used for the conveyance of water at great pressure—such as is desirable in case of fire—that all the openings in the pipe II should be closed, except such as may be at the time 90 wanted for use. For instance, in the case of a four-story building fitted with my improvements, should the fire occur on the third floor, the fire-engine would make its attachment at the lower end of the pipe II, and ordinarily 95 a short distributing-hose would be connected to the valved branch opposite the said third floor, and all other valved branches would be closed, as also the extreme upper end of the pipe II. By this means the full pressure 100 of the water may be maintained right to the end of the distributing-hose on the third floor. If the upper end of the pipe were open, the fire-engine could of course deliver water to any of the valved branches opposite the various 105 floors; but it would produce merely a flow of water without any effective pressure, as the latter would be lost through the open upper end of the pipe.

I claim as my invention—

1. The combination, with a building, of a 110 spiral stairway outside the building, a continuous pipe constituting the direct support of said stairway and extending below the foot of the stairway and inwardly toward the building and ending at a point within reach from 115 the ground, and a bracket attached to the building at a height out of ordinary reach, forming the sole support from below for said pipe, whereby the structure can be erected on the front of a building without obstructing 120 the sidewalk.

2. The combination, with a building, of a 125 spiral stairway outside the building, a continuous pipe, constituting the direct support of said stairway, each step being independently and directly clamped to said pipe, which extends below the foot of the stairway and inwardly toward the building to a point within reach from the ground, and a bracket attached to the building at a height out of or- 130

dinary reach, forming the sole support from below for said pipe, substantially as described.

3. The combination of the steps *l*, having
5 baluster-slots at the outer corners for connection, step to step, with balusters *t*, and intermediate slots for and with the balusters *v*, substantially as described.

4. The combination of pipe *H*, supporting

the stairway, with **I**-beams *A*, plate *f*, and braces *e*, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE V. MARSHALL.

Witnesses:

C. C. LEE,

GEO. T. MARSHALL.