United States Patent

Verderio

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[54] **SPIRAL STAIRCASE WITH ACCESS WAY**

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[52] **U.S. Cl.** **52/187**
[51] **Int. Cl.** **E04f 11/02**
[58] **Field of Search** 52/182, 187, 191

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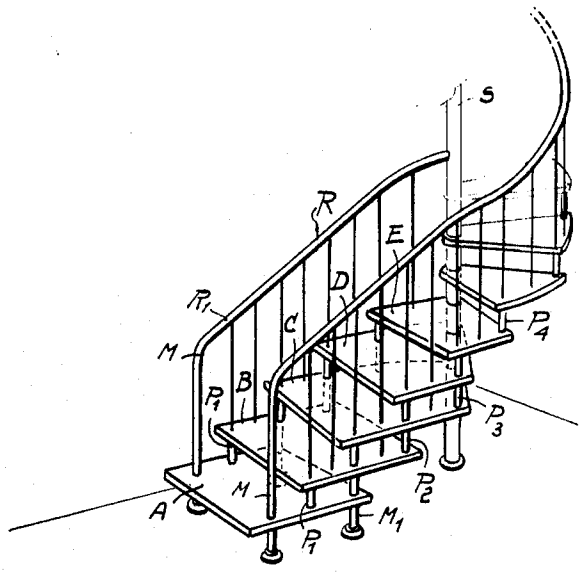
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[57] **ABSTRACT**

A spiral staircase designed to be located adjacent a wall. The staircase has a spiral section which is composed of a successive series of horizontal, progressively angularly displaced steps that extend radially outwardly equal distances from and are connected at their inner ends to a common central vertical axial support so that the spiral thereby formed is circular in plan, occupies a minimum of space and has no central inner void. In order that the entrance to and exit from the spiral staircase be disposed in convenient locations, at least one of the extremities of the staircase constitutes a series of steps that extend rectilinearly in progression from the spiral, outside of the circular area thereof as viewed in plan and constitutes an access ramp that is disposed parallel to the wall adjacent which the staircase is located. the access ramp has structure connecting the ramp in a continuous and regular manner to the spiral section so as to constitute an organic and statically integrated assembly therewith.

5 Claims, 5 Drawing Figures



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SHEET 1 OF 2

FIG. 1

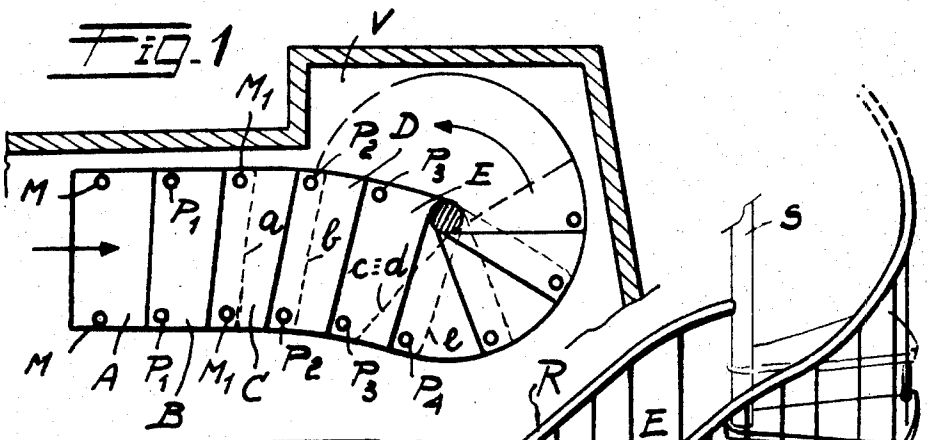


FIG. 2

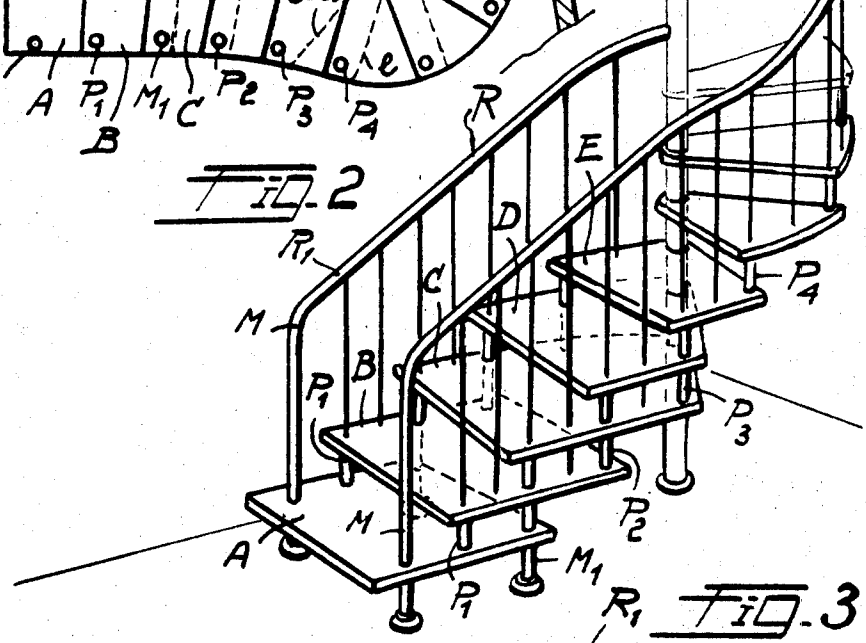


FIG. 3

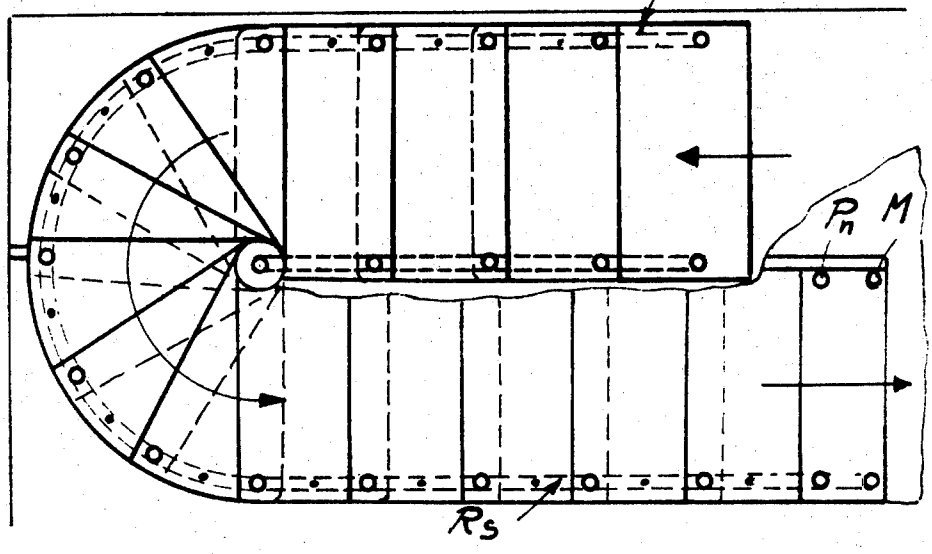


FIG. 4

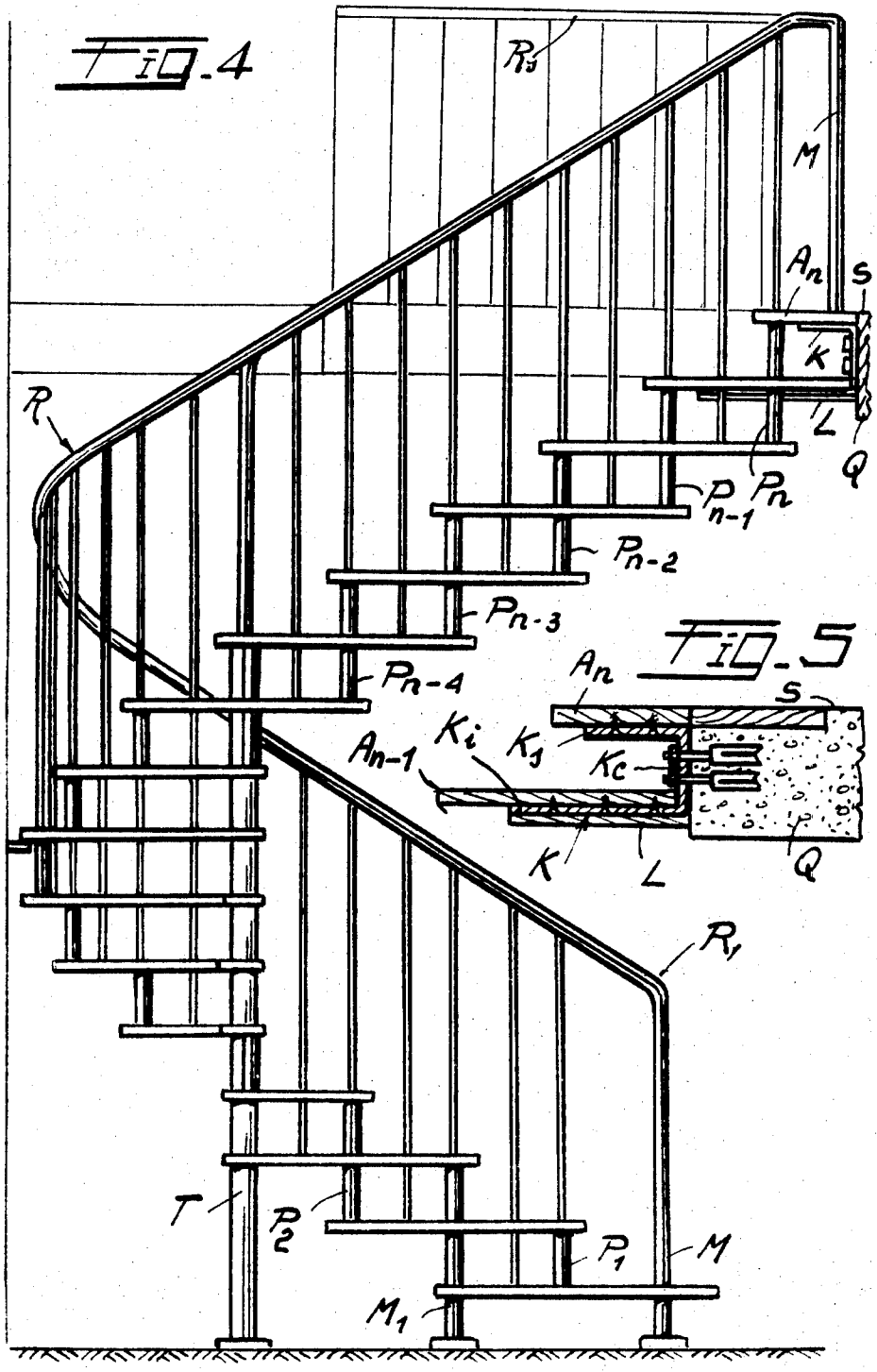


FIG. 5

SPIRAL STAIRCASE WITH ACCESS WAY

This invention relates to a spiral staircase with access way.

Spiral staircases conventionally comprise those stairways of circular surface in plan view. While this type of staircase well resolves the problem of minimum bulk, it also implicitly creates another problem, i.e. that of determining constant rotation between the first and last step for a standard step rise and tread and with reference to similarly standard heights of the rooms which it serves.

In particular, with the room and step dimensions generally adopted for the majority of dwelling houses, if often happens that if the first step at the bottom is conveniently arranged (in the sense of giving comfortable access), then the last step finds itself in an uncomfortable position, for example parallel to and at obviously short distance from a wall, because of which it may be actually impossible to leave the staircase. Vice versa if the last step is positioned in a comfortable manner it may happen that access to the staircase at the lower end is uncomfortable if not impossible.

The main object of this invention is that of obviating the disadvantages stated heretofore by the provision of a spiral staircase which suitably modified and of minimum bulk is such that its lower and upper access can be conveniently positioned.

This and other objects are attained by the spiral staircase according to the present invention which comprises at least at one of its extremities a series of steps disposed outside the conventional area of the spiral so as to constitute an access ramp arranged parallel to the wall against which it is generally placed, said access way being connected in a continuous and regular manner to the actual spiral so as to constitute an organic and statically well integrated assembly.

The steps which constitute the access way are formed from laminar members of width double that of the effective tread with the purpose of ensuring their good connection both mutually and to the vertical support of the spiral and to the supplementary lower or upper supports.

The invention will now be described in greater detail with reference to two embodiments given by way of example and illustrated in the accompanying drawings, in which:

FIG. 1 is a plan view of a first embodiment of the lower part of a spiral staircase provided with an access way according to the invention;

FIG. 2 is a perspective view of the same part of the staircase;

FIG. 3 is a plan view of a second embodiment of the staircase having two rectilinear access ways, for access and exit;

FIG. 4 is a lateral view from the side of the lower ramp of the staircase shown in FIG. 3, and

FIG. 5 is a sectional view of a detail of the anchoring of the last two steps of the upper ramp of FIG. 4.

Referring to the accompanying drawings and in particular to the first embodiment shown in FIGS. 1 and 2, the lower rectilinear access way conceived according to the present invention consists of five steps indicated from the bottom upwards by the reference letters A, B, C, D, E, which are of different structure to those of the spiral. More precisely said steps are essentially constituted of members of width double that utilized for the effective tread, for the purpose of being able to connect them together and to anchor them to the supporting structure.

The first and second steps, A and B respectively, are equal and of rectangular form, or rather in the case shown of rectangular trapezoidal form with the oblique side a or b respectively only slightly inclined. The third step C is also trapezoidal, but with the oblique side c of much greater inclination, with one side (the minor base) equal to those of A and B and the other (the major base) longer than the corresponding sides of A and B. The fourth step D is of the same form as the third, from which it differs by the width of a tread. In fact its oblique side *d* coincides in vertical projection with the corresponding side *c* of the step C, which surpasses it towards the front by one tread. Finally the fifth step E, which is similar to the first two (A and B) as regards the slight inclination of the internal side *e*, is narrower on all others.

The more or less accentuated trapezoidal form of the steps constituting the access ramp (FIG. 1) determines its layout which is inversely curved with respect to the actual spiral, this layout being required in order to utilize the space V formed by a recess in the wall.

Connection together of the steps and fixing of the steps to the supporting structure is of conventional type. It should be noted however that such connection is efficient precisely because of the considerably width of the steps. In fact because of the considerable width of the step A, supported at the front (in conventional manner) by the tubular members M which also act as railings for the handrail R, it is possible to adequately support the step B, which rests at the front by its two feet P_1 and at the back by the two members M_1 (which also serve for resting it on the floor) on the step A. The members M_1 also support the step C conventionally, separating it from and connecting it to B at the front, while at the back the feet P_2 connect and separate B to and from C, and C to and from D, with the feet P_3 acting likewise with the steps C, D and E, which on the other side are all connected to the central support of the spiral. The step E is connected externally to the successive step of the spiral by the foot P_4.

In FIGS. 3 and 4, which illustrate the second embodiment of the spiral provided with upper and lower access ramps, said ramps are perfectly rectilinear as they do not have to satisfy the requirements (space V) of the staircase of FIGS. 1 and 2. Consequently the steps of the access way, still of double width, are of rectangular form. The fixing of the steps constituting the lower ramp R_1 is precisely similar to that already shown in FIGS. 1 and 2 and consequently this description is omitted. Regarding the upper ramp R_S, the steps have the the same form and dimensions as those of the lower ramp. The mutual connections are also formed in a like manner.

The only difference, which is quite obvious, consists in the absence of the members M, M_1 for resting it on the ground (FIG. 4), which are substituted by other feet P_n, P_{n-1}, P_{n-2}, P_{n-3}, P_{n-4}, which all have the purpose of connecting each step to that above, and all of them to the last step A_n, which is well anchored to the walls.

FIG. 5 shows a detail of the anchoring of the last two steps A_n and A_{n-1}, of the upper ramp R_S shown in FIG. 4. According to the invention the two said steps, to

which the lower ones of the same ramp are connected, are supported by two or three stirrups K disposed equidistantly along the steps. More precisely said stirrups K consist of a flat bar shaped as a U with its two arms of different length. The central length K_c is fixed vertically to the wall Q by means of at least two threaded studs with nuts, sunk into the concrete. On the lower arm K, which is the longer, the penultimate step A_{n-1} is fixed and onto the upper, K_S, the shorter, is fixed the last step A_n. In addition, a covering of sheets of wood or plastic is placed below the stirrups K in order to cover them.

Next to the last step A_n is fixed the floor S.

The preceding description clearly shows the already listed advantages consequent on adoption of the invention, of which only two embodiments have been described and illustrated, but which do not form the limits of the inventive concept.

What we claim is:

1. A spiral staircase adapted to be disposed adjacent a wall, said staircase including a successive series of horizontal, progressively angularly displaced steps extending radially outwardly equal distances from and connected at their inner ends to a common central vertical axial support to form a spiral having a circular area in plan with no central inner void, said staircase further including at at least one of its extremities, a series of steps progressively extending rectilinearly from said spiral outside said circular area thereof and constituting an access ramp a substantial rearward portion of each step of said access ramp being overlapped by a substantial forward portion of at least one adjacent step of said access ramp thereabove, the last step of said access ramp adjacent to said axial support being fixed to said support, a plurality of posts, at least one of said posts extending between and being fixed to the overlapping portions of vertically adjacent steps of said access ramp, for connecting said access ramp in a continuous and regular manner to said spiral so as to constitute an organic and statically integrated assembly therewith.

2. A spiral staircase as set forth in claim 1 wherein the steps of the access ramp are of rectangular configuration in plan.

3. A spiral staircase as set forth in claim 1 wherein the steps of the access ramp are of rectangular trapezoidal configuration in plan with their oblique sides inclined with respect to their bases.

4. A spiral staircase as set forth in claim 1 wherein the access ramp is an upper ramp and in which means is included to anchor the steps constituting the uppermost two steps of the upper ramp to a wall, said anchoring means including stirrups of flat iron shaped substantially as a U with unequal horizontal arms, means fixing the base of the U to a wall and means fixing said two steps to the respective long and short arms of the stirrups.

5. A spiral staircase as set forth in claim 1, wherein a portion of each step of said access ramp is overlapped by a portion of at least two adjacent steps of said access ramp, and each post is attached to the overlapping portions of at least three adjacent steps of said access ramp.

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