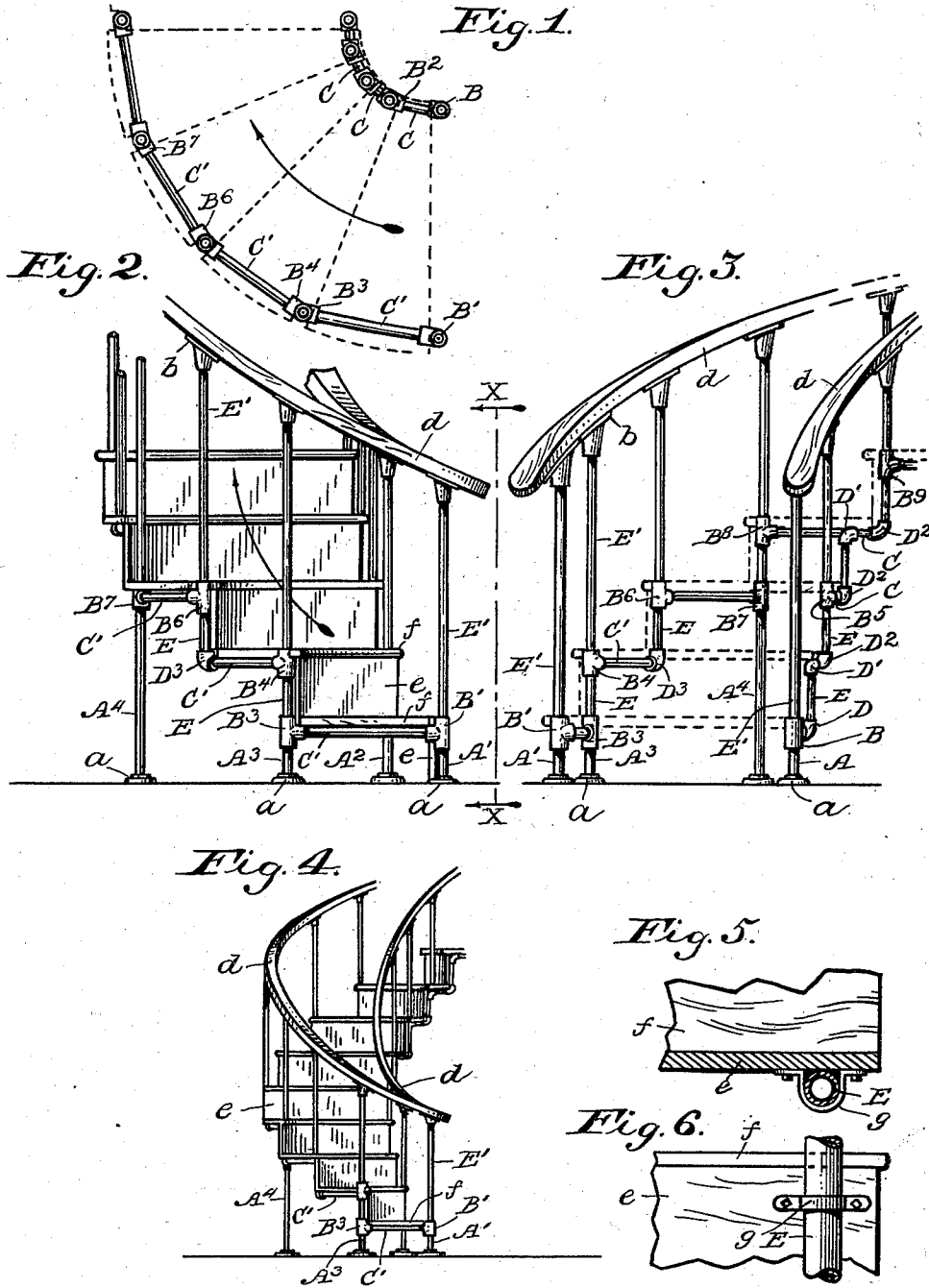


H. SNIDER.
WINDING STAIRCASE.

(Application filed Nov. 25, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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2 Sheets—Sheet 2.

Fig. 7.

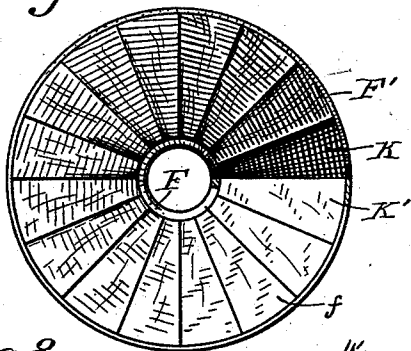


Fig. 8.

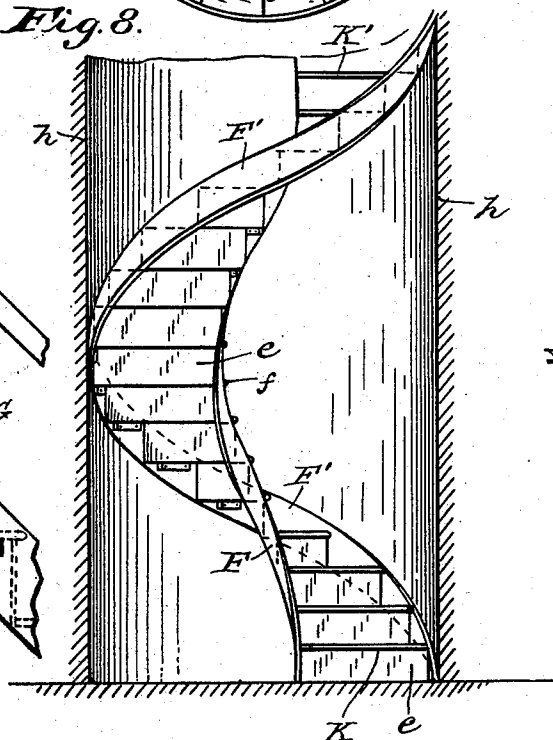


Fig. 9.

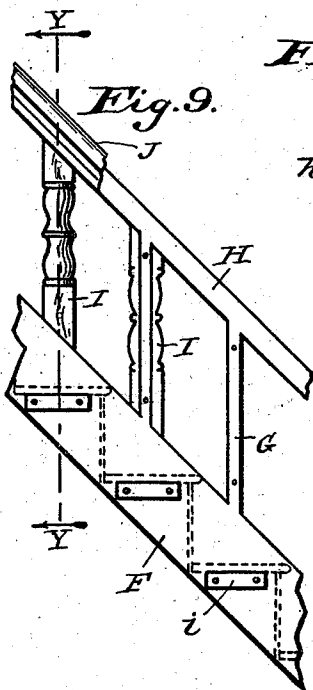
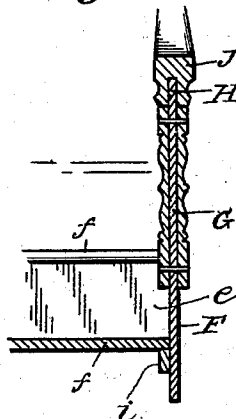


Fig. 10.



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UNITED STATES PATENT OFFICE.

HARRISON SNIDER, OF INDIANAPOLIS, INDIANA.

WINDING STAIRCASE.

SPECIFICATION forming part of Letters Patent No. 705,794, dated July 29, 1902.

Application filed November 25, 1901. Serial No. 83,553. (No model.)

To all whom it may concern:

Be it known that I, HARRISON SNIDER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Winding Staircases, of which the following is a specification.

The invention relates to the class of staircases that are designed to be erected on limited floor areas; and it has particular reference to the means whereby the inner or narrower ends of the steps of circular staircases are supported, the object being to eliminate the objectionable center post or column, which is obstructive when it is desired to carry such articles on the stairs as may have too much bulk to enter the passage-way usually provided between the center post and the outer wall at which the broader ends of the steps may be supported.

Another object is to provide cheap, durable, and fireproof stringer-boards or their equivalents for supporting the steps, whether the staircase be winding or straight.

These and other apparent objects are accomplished by the construction illustrated in the accompanying drawings, forming part of this specification, to which reference may be had, and in which similar reference characters designate corresponding parts in the several figures thereof.

Referring to the drawings, Figure 1 represents a fragmentary top plan of winding-stair "stringer-boards" (the term being employed as though they were composed of wood) constructed of sections of iron pipe and pipe-fittings, the dotted lines indicating the plans of the treads; Fig. 2, a fragmentary perspective view of the stairs having the sectional stringer-boards; Fig. 3, a fragmentary perspective view as seen when looking toward the front of the lower step in Fig. 2, as from the line X X in the direction indicated by the arrows, the positions of the riser-boards and treads being indicated only by dotted lines; Fig. 4, a fragmentary perspective view similar to Fig. 2, but including a greater portion of the stairs; Fig. 5, a fragmentary horizontal sectional view, and Fig. 6 a fragmentary rear elevation, showing the clips for securing the riser-boards to the pipe-sections comprised in the stringer-boards; Fig. 7, a top view of a

circular staircase constructed in accord with my invention and showing the open central support for the steps; Fig. 8, a vertical transverse sectional view showing the winding stairs in a circular shaft or well; Fig. 9, a fragmentary detail view of a metallic stringer-board and integral balusters and rail before having been bent to shape, and Fig. 10 a fragmentary sectional view taken on a line Y Y in Fig. 9.

In Figs. 7, 8, 9, and 10 the stringer-boards are represented as being composed of rolled metal plates bent to the required forms.

In practically carrying out my invention I may employ either the pipe sectional form or the metal-plate form of stringer-boards, the main object of the invention being attained by bending the inner stringer substantially as though it were wound around a cylinder as a vine winds around a pole and the cylinder then withdrawn, so that the immediate part that supports any given step does not rise appreciably above the step in the same vertical plane, and even when balusters are used there will be some clear space above and at the inner side thereof below the under side of the returning steps at the opposite side of the stair space or well. In the construction illustrated the inner stringer-board is supposed to be wound around an imaginary axial cylinder of considerably greater diameter than that of a center-post were one employed in construction, and therefore with the same diameter of well the narrower and useless ends of the steps are shortened, leaving as much of the wider portions as can be used practically.

When employing the pipe sections and fittings in construction, flanges *a* are set upon the floor, and short upright sections of pipe *A A' A² A³* are screwed into the flanges, forming legs to support the stringers. Upon the upper ends of said short sections are screwed pipe-T's *B B' B² B³*. On the inner stringer, however, instead of the *T B²* and section *A²*, with its flange, I may use an *L D*, connected by a horizontal pipe-section *C* to the *T B*. The *T*'s *B'* and *B³* have their side openings opposing each other, and a horizontal pipe-section *C'* connects these *T*'s. An upright pipe-section *E* somewhat longer than the section *A* is screwed into the *L D* (or into a *T*,

if used) and an L D' is attached to its upper end and to it is attached a short horizontal section C, to which is connected an L D², to which is attached an upright section E, this having a T B⁵ connected to its upper end, to which is attached a horizontal section C, the same having an L D² connected to it, and so on, another T, B⁹, being employed where it may be desired in similar positions as the L's D' are used, the latter being sometimes dispensed with on the inner stringer if it is desired to have balusters close together, the balusters E' being erected upon the T's, as B B⁵ B⁹, similar T's being substituted for the L's D' when it is desired to have a baluster at each step. The outer stringer is similarly formed of the upright sections A' A², the sections C', arranged horizontally, the T's B' B³ B⁴ B⁶ B⁷ B⁸, the L's D⁹, the upright sections E, and a suitable number of posts A⁴. The balusters E' have oblique-angled flanges *b* secured to their upper ends, to which the rails *d* are secured. Riser-boards *e* are secured to the sections E by means of clamps *g*, and treads *f* are suitably secured either to the horizontal sections C C' or to the connecting pipe-fittings.

It will be understood that variations may be made from the particular arrangement of parts shown in the drawings.

When employing the plate form of stringer-boards F F', they are preferably composed of short sections first rolled to the proper twisted form and then spliced together, in some cases the plates being built up of two or more thicknesses or laminated. Cleats *i* are employed upon which to rest the treads of the stairs. When balusters G are desired, they are preferably formed integrally, as is also the rail H, finishing-pieces I and J being employed to cover and ornament the iron plates.

In Figs. 7 and 8, K indicates the lower step, K' the upper step, and *f* the intermediate steps, *h* being the inclosing wall of the stairway, and it will be seen that if a person ascend the steps he may carry an article reaching nearly from side to side of the wall across the stringer F.

Many modifications may be obviously suggested in the details of construction within the scope of my invention, which, as will be seen, refers more particularly to the central or inner support for the steps, which is substantially a twining column having an open or hollow axis.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A staircase including stringers comprising socket base-flanges, sections of piping ver-

tical upon the flanges, L's upon the sections of piping, sections of piping attached horizontally to the L's, L's attached to the horizontal sections of piping, and sections of piping extending vertically from the L's and attached thereto, the horizontal sections of piping being supported by the L's, and the L's supported by the vertical sections of piping, substantially as set forth.

2. A staircase including stringers comprising socket base-flanges, sections of piping vertical upon the flanges, T's upon the sections of piping, sections of piping having oblique-angled flanges and vertical upon the T's, sections of piping attached horizontally to the T's, L's attached to the horizontal sections of piping, sections of piping extending vertically from the L's and attached thereto, the horizontal sections of piping being supported by the L's and the T's, and the L's supported by the vertical sections of piping, and hand-rails attached to the oblique-angled flanges, substantially as set forth.

3. A staircase comprising base-flanges, vertical pipe-sections attached to the flanges, T's attached to the vertical pipe-sections, pipe balusters attached to the T's, a hand-rail mounted upon the pipe balusters, horizontal pipe-sections attached to and supported by the T's, L's attached to and supported by the horizontal pipe-sections, vertical pipe-sections attached to and supported by the L's, and tread members supported upon the horizontal pipe-sections, substantially as set forth.

4. A staircase comprising vertical pipe-sections, L's, and horizontal pipe-sections, alternately, connected together, the vertical sections forming the risers and the horizontal sections forming the treads of the stringers, riser-boards attached to the vertical pipe-sections, and tread-boards mounted upon the horizontal pipe-sections, substantially as set forth.

5. A staircase comprising stringers composed of vertical pipe-sections, T's, L's, horizontal pipe-sections in pairs of unequal lengths, and base-flanges, the vertical sections being supported by the base-flanges and the L's and the T's, and the horizontal sections by the T's and the L's; riser-boards attached to the vertical pipe-sections, and tread-boards mounted on the horizontal sections, each tread-board on a long and a short section, substantially as set forth.

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

HARRISON SNIDER.

Witnesses:

WM. H. PAYNE,
E. T. SILVIUS.