

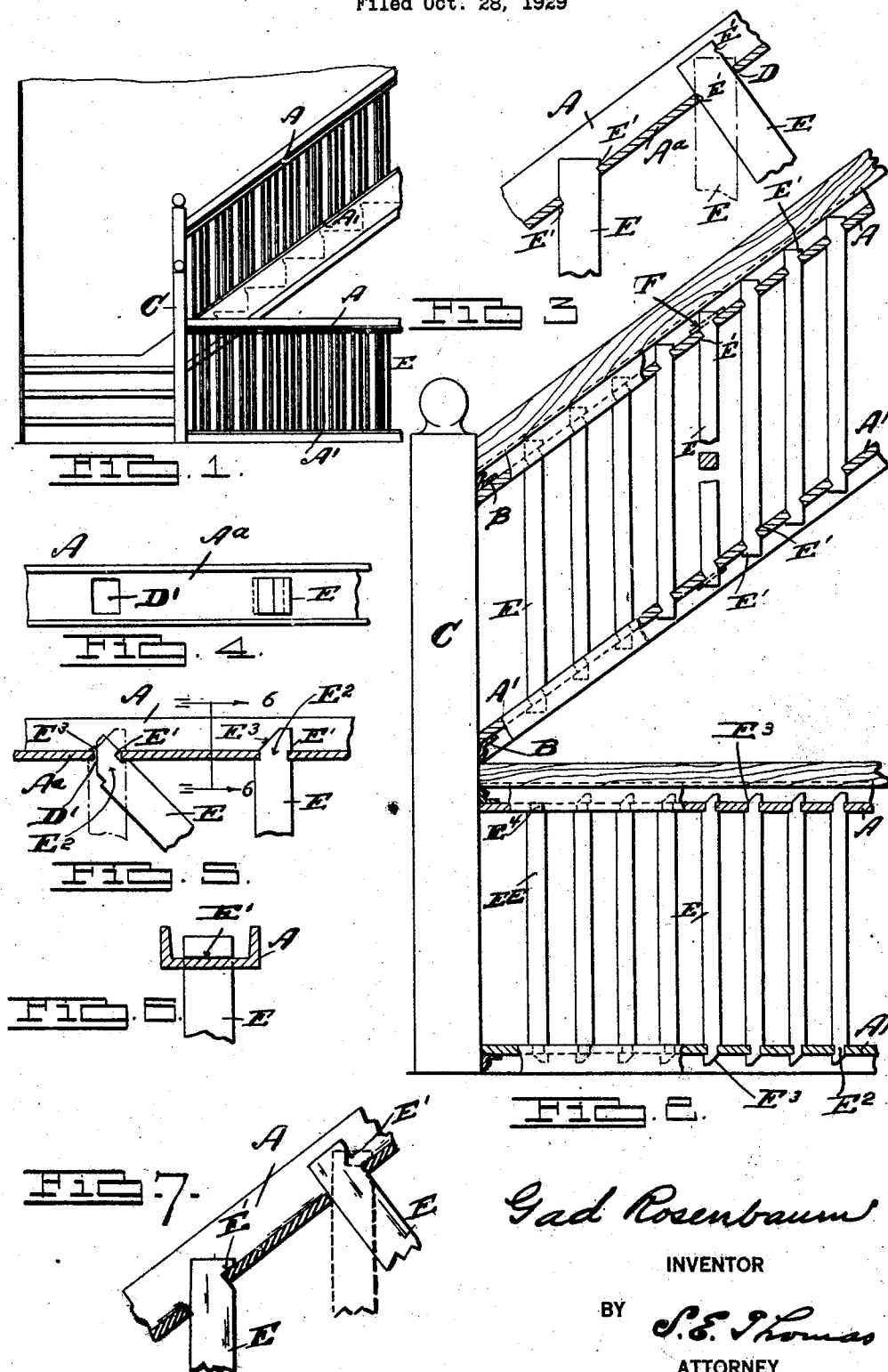
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STAIR AND BALUSTER RAILING

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STAIR AND BALUSTER RAILING

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My invention relates to an improvement in stair and baluster railings and more particularly in a novel construction of the balusters and stringers whereby they are adapted to interlock to form a unitary structure that may be assembled either at the shop, or shipped knock-down, to be erected at the building where the railing is to be installed.

The primary object of the invention is to provide an interlocking construction which upon assembly of the balusters and stringers insures a rigid unitary structure without welding or the employment of bolts or other fastening devices.

With the foregoing and other objects in view which will appear as the description proceeds, the invention further resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention herein disclosed without departing from the spirit of the same.

In the drawings accompanying this specification.

Figure 1 is a fragmentary elevation of a lobby and stair railing.

Figure 2 is a detail view on an enlarged scale of a lobby and stair railing with parts broken away and in section to more clearly disclose the construction.

Figure 3 is a fragmentary detail of a stair stringer—in longitudinal section—showing the interlocking end of a baluster as the latter would appear when interlocked with the stringer upon stairs, also a baluster as its interlocking end portion is about to enter into engagement with the stringer, and in dotted lines the position assumed by said baluster when interlocked.

Figure 4 is a fragmentary plan view of a channel member or stringer as employed in a horizontal railing, showing an opening in the stringer to receive the interlocking end of a baluster, also the end of a baluster inserted in an adjacent opening of the stringer.

Figure 5 is a vertical longitudinal sectional view through a horizontal stringer, showing a baluster in interlocking relation, also a baluster about to enter into interlocking relation

with the horizontal stringer, and in dotted lines the baluster interlocked with the stringer.

Figure 6 is a cross-sectional view of a detail of a stringer, taken on or about line 6—6 of Figure 5, showing a baluster interlocked with the stringer.

Figure 7 is a modification of the interlocking end of a stair baluster and its stringer.

Referring now to the letters of reference placed upon the drawings:

A, A¹ denote the upper and lower stringers of a stair rail respectively secured in any suitable manner,—as for example an angle plate B,—to a newel post C, at the foot of the stairs.

The web A² of the stringers are punched with a plurality of holes D in equal spaced relation to receive the ends of a plurality of balusters E,—the openings (D) in the stair rail stringers corresponding in size with a cross-section of the end of the baluster. The baluster E is inserted in the stringer at right angles to the under face of the latter as clearly indicated in Figure 2. Following the insertion of the baluster through the opening in the stringer, the baluster is swung into a vertical position—shown in full and dotted lines.

The notched portions on opposite sides of the baluster form shoulders E¹ overlapping the upper and under sides of the stringer wall. The lower end of the balusters are respectively interlocked with the lower stringer or channel rail in a similar manner to that just described. Upon the entry of the interlocking ends of the several balusters in the openings provided in the upper and lower stringers,—the balusters being at right angles to the web of the stringers,—the stringers are shifted in opposite directions in relation to each other, thereby forcing the balusters into a vertical position, and interlocking relation with the notches E¹, overlapping the upper and lower sides of the stringer walls,—see Figures 2 and 3. To maintain the balusters and stringers in their assembled relation that they may not collapse before connection with the newel posts, a pin F may be driven through an opening provided in one of the

balusters—see Figure 2—adjacent and parallel with the web of one of the stringers.

This device holds the structure rigidly in its assembly unitary relation.

5 Referring now to the horizontal railing shown in Figure 2,—the openings (D^1) in the horizontal stringers are somewhat narrower than their width and correspond in size with the cross-sectional dimension of the baluster at its contracted neck (E^2),—see Figure 4.
10 The ends of the baluster employed in the horizontal railing are bevelled that they may pass through the contracted openings in the horizontal stringers,—the bevelled portion (E^3)
15 extending from the contracted neck to the end of the baluster, see Figure 5.

It will be noted that the bevelled end of the interlocking portions at each end of the baluster are inclined in opposite directions, as
20 shown in Figure 2, in order that it may facilitate the entry of the overlapping portion of the baluster into the spaced openings in the stringer,—the hook-shaped portion on one side of the baluster overlapping the webs
25 of the respective stringer.

To secure the baluster when assembled in the stringers against collapse—before attaching the railing to the newel post, the bevel end of one of the balusters EE is cut off leaving a short stub E^4 , see Figure 2, which is
30 inserted in the opening of one of the stringers, the baluster being turned so that its bevelled end is opposed to the bevelled ends of the other balusters as clearly indicated in Figure 2. This arrangement serves to insure a
35 unitary railing and secures it against collapse.

In Figure 7, a modification of the locking end of the stair baluster is shown. It will be
40 noted that the baluster is notched only on one side. The notched portion however is relatively deeper than previously indicated.

To assemble the parts, the interlocking end portion of the baluster is thrust through an
45 opening of the same cross-sectional dimension as that of the baluster. It is then swung into the position shown in full and dotted lines. The edge of the baluster contacts on one side with the wall surrounding the opening
50 through the web of the stringer,—the shoulder formed by notching the opposite side of the baluster overlapping the web of the stringer. This modification is adapted more
55 particularly for inclined stair railings.

In this modified construction, two of the notches required in the form shown in Figure 3 have been eliminated, thereby reducing the
60 cost of manufacture.

Having now indicated the parts by reference letters, the construction and operation of the device will be readily understood without further detailed explanation.

If desired, the railing may be shipped in
65 knock-down condition, and readily assembled

at the building by any good workmen and without fastening devices for securing the balusters to the stringers;—or the parts may be assembled as a unit at the shop and shipped in that condition by the insertion of
70 the pin F , or by reversing one of the balusters in relation to the others when interlocking it with the stringers;—as previously described.

Having thus described my invention, what
75 I claim is:

1. A baluster and railing structure formed from a pair of stringers and a plurality of balusters detachably connected and interlocked with one another; the upper and lower stringers having a plurality of holes spaced
80 apart to receive the ends of the balusters when inserted through said holes at an arbitrary angle to the stringers; said balusters notched adjacent their ends to form shoulders, adapted upon entering the ends of the balusters
85 through the openings of the stringers to overlap the wall surrounding the opening of the stringers and to interlock with said stringers upon changing the initial angle of said balusters in relation to said stringers.
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2. In a structure of the character described, a pair of stringers provided with a plurality of holes spaced apart to receive the ends of a plurality of balusters; a plurality of balusters having ends adapted to enter the holes
95 in said stringers, said balusters being notched adjacent their ends to form shoulders, adapted to overlap and interlock with said stringers upon first inserting the ends of the balusters through the holes of the stringers at
100 a suitable angle, then shifting the angle of the balusters to a vertical position from the floor, whereby the shoulders of the balusters may overlap the stringers; and means for securing the assembled balusters and stringers
105 together as a unitary structure.

3. A structure as specified in claim 1 in combination with a pin extending transversely through one of said balusters, adjacent one of the stringers, whereby the assembled balusters and stringers may be secured
110 together as a unitary structure.

4. A baluster and a railing structure formed from a pair of stringers and a plurality of balusters detachably connected and interlocked with one another; the upper and lower stringers having a plurality of holes spaced apart to receive the ends of the balusters; said balusters notched at each end on
115 each side of the baluster to overlap the walls of the stringer, with one side at each end of the baluster formed on an angle extending from one of the notches to the ends of the baluster, a cross-section of the ends of the baluster being relatively narrower than their
120 width, whereby they may enter at an arbitrary angle through correspondingly shaped holes in the stringers to overlap the wall sur-
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rounding the holes in the latter upon changing the initial angle of the balusters in relation to said stringer to effect an interlocking relation; and means for securing the stringers and balusters as a unitary structure when
5 interlocked.

In testimony whereof, I sign this specification.

GAD ROSENBAUM.

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