

No. 829,107.

PATENTED AUG. 21, 1906.

S. GROSSMAN.
STAIR.

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Fig. 1.

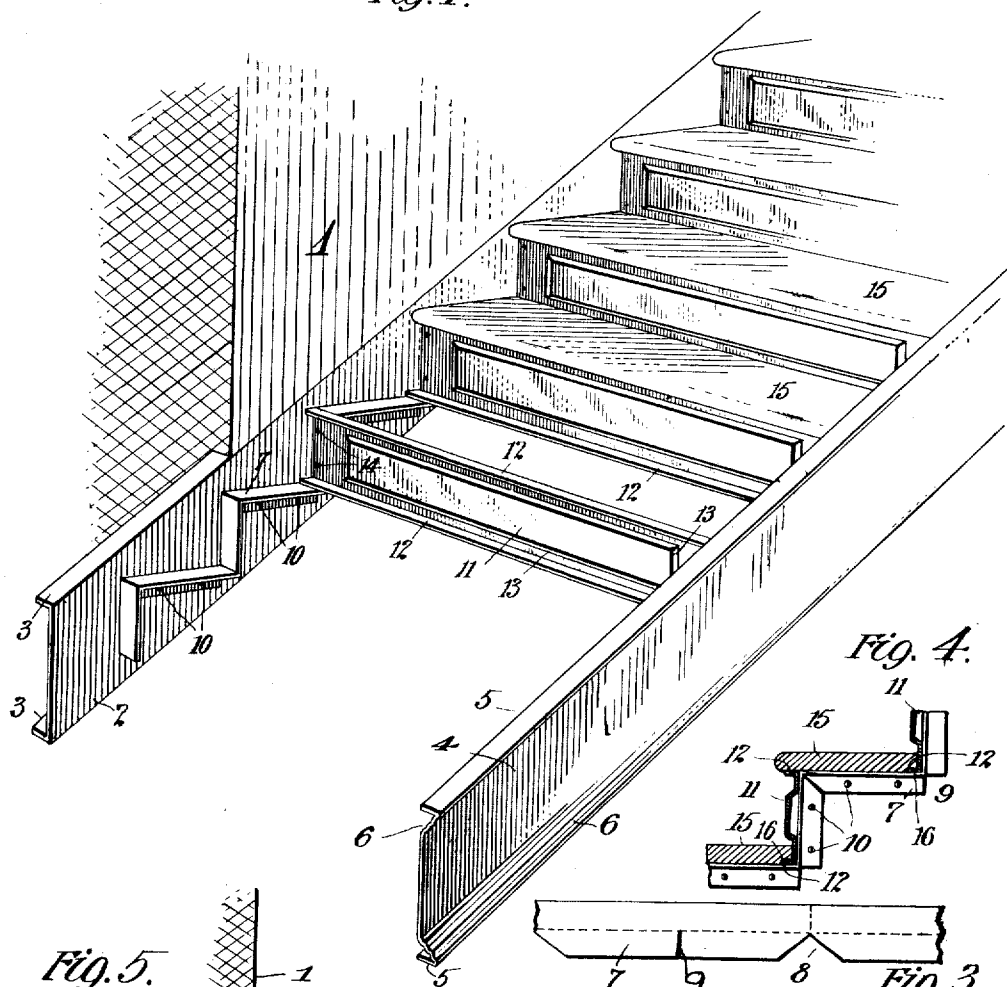


Fig. 4.

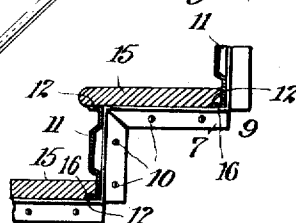


Fig. 3.

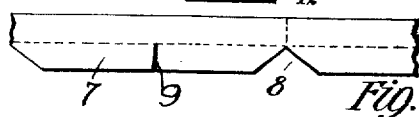


Fig. 5.

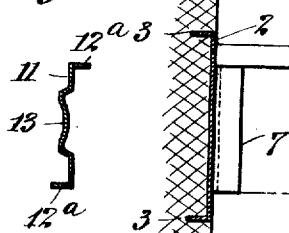
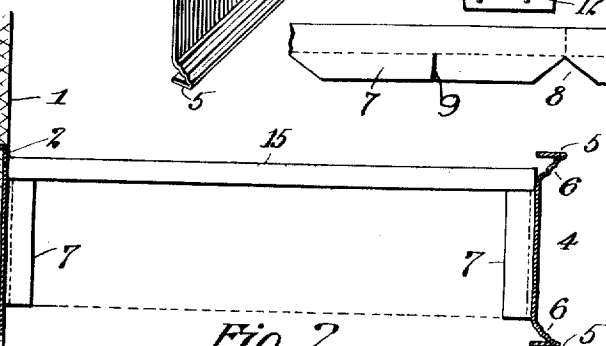


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL GROSSMAN, OF NEW YORK, N. Y.

STAIR.

No. 829,107.

Specification of Letters Patent.

Patented Aug. 21, 1906.

Application filed February 21, 1906. Serial No. 302,262.

To all whom it may concern:

Be it known that I, SAMUEL GROSSMAN, a citizen of the United States, residing in the borough of Manhattan, New York city, county and State of New York, have invented certain new and useful Improvements in Stairs, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The principal objects of my invention are to provide stairs which while having greater strength than similar structures of equal weight are fireproof, at the same time are neater in appearance and simple in construction, the various parts thereof being easily assembled and secured together in erecting the stairs in place.

The invention also seeks to utilize to the best advantages light-weight sheet metal and angle-irons and to provide a fireproof structure the weight of which may be materially reduced by the omission of the usual sheet-metal tread beneath the stone tread.

With these and other objects in view my invention consists in the various novel and peculiar arrangements and combinations of the several parts of the structure, all as hereinafter fully described and then pointed out in the claims.

I have illustrated a type of my invention in the accompanying drawings, wherein—

Figure 1 is a perspective view of my improved construction in stairs, the upper steps thereof being shown as completed, including the treads, while the lower steps are only partially constructed. Fig. 2 is a vertical cross-sectional view of one step with the riser omitted. Fig. 3 shows a metallic blank with a notch in its edge from which the continuous angle-iron is formed for supporting the risers. Fig. 4 is a sectional view taken on a vertical plane lengthwise the stairs with the stringer omitted and showing the relative positions of the angle-iron, tread, and riser. Fig. 5 is a cross-sectional view of another form of riser in which the flanges thereof are bent in opposite directions.

Referring to the drawings, in which like numbers of reference designate like parts throughout, 1 indicates a side wall against which the stairs are constructed and in which is set, flush with the face of the wall, the inner stringer 2, which is made of thin sheet

metal and has its upper and lower edges formed with an integral flange 3, projecting inwardly, so as to be embedded in the wall. The outer stringer 4 is constructed like the inner one, with the integral flanges 5 at the upper and lower edges thereof, which flanges project inwardly, the stringers being formed near each flange with strengthening and ornamental corrugations or bends 6, extending longitudinally of the stringer. The edges of the stringer are thus made hollow, at the same time appear solid from the outside thereof. This integral molding 6 on the face of the outer stringer may be varied in shape or design to suit the taste. These stringers, as stated, are made in one piece with the flanges, and the formation of these longitudinal flanges or corrugations 6 on the stringers serve to materially strengthen the same and permits of a substantial reduction in the thickness of the metal used. For example, by making the sheet-metal stringers as herein set forth I am enabled to use sheet-iron of one-sixteenth of an inch thick, and thereby materially lighten the weight of the structure, the corresponding stringers heretofore made of sheet metal ranging from three-sixteenths to one-quarter of an inch in thickness.

The side or end supports for the risers are formed from angle-irons 7, which are notched at 8 and cut at 9, so that they may be bent into a zigzag structure with right-angle bends, forming a continuous piece extending the length of the stairs. These angle-irons are formed so that one of the flanges thereof lies flatly against the inner face of its adjacent stringer, one angle-iron being secured to each stringer. The other flange of each angle-iron lies uppermost and outermost when looking toward the front of the stairs, as shown clearly in Fig. 1. As these supporting angle-irons can be bent exactly alike, they may easily be put in place, one against each of the stringers, to which they are secured by means of suitable rivets 10, extending through the vertical flange and into the body of the adjacent stringer, so as to give ample strength thereto, at the same time dispensing with bolt-heads showing upon the outside of the stringer.

The risers 11 are made of sheet-metal and are each formed with a lateral flange 12 at its upper and lower edge extending throughout the length thereof, which flanges may either both project forwardly, as shown in

Fig. 1, or the lower one may extend forwardly while the upper one projects rearwardly, as shown in Fig. 5, wherein the flanges 12^a are shown as projecting in opposite directions. The risers 11, being made of sheet metal and provided with the integral flanges 12 on the long edges thereof, are thereby given increased strength, so that the risers may be made of thinner iron than has been heretofore used in the construction of similar stairs, and thus I provide stairs which are materially lightened in weight in the risers themselves, and I am enabled to use iron one-sixteenth of an inch thick in this part of the structure. Further strength is given to the sheet-metal risers by forming each with corrugations or paneling, as at 13, which also serves to ornament the riser in addition to giving it increased strength. It will be noted that these panels 13, formed in the body of the sheet-metal risers, may be made of any shape or design that may be desired, so that the ornamental feature of such panel may be varied. At the same time the increased strength of such panel is always present. The risers are bolted, by means of bolts 14 at each end, to the vertical flange of the angle-iron 7, and the lower flange receives the rear edge of the tread 15, while the upper flange of the riser receives the forward edge of the tread 15 next above, and thus the risers support the treads by means of the flanges. In this connection it is observed that in using stone treads, such as slate or marble, I can dispense with the ordinary sheet-metal tread underneath the stone one in some cases, though where fireproof stairs are desired a sheet tread may be placed under the stone one, it being so arranged as to rest upon the riser-flanges. In cases where each riser has its upper and lower flange projecting in opposite directions, as shown in Fig. 5, such flanges would both extend over upon the horizontal part of the angle-irons, so that the tread would rest at its front edge upon the rearwardly-extending flange of one riser and at its rear edge upon the forwardly-extending flange of the next riser above, and in such case a suitable filling-piece may be inserted between the opposing edges of the flanges and beneath the tread to relieve the latter of any undue stress.

The treads 15 are each rabbeted at 16, at the back edge thereof, to fit over the lower flange 12 of the riser at the rear of the tread. In the modification, however, shown in Fig. 5, where the upper flange of the riser is turned backwardly, the flange may be placed over upon the horizontal part of the angle-iron and be on a level with the lower flange of the riser next above, and these two flanges will be in the same horizontal plane, so that the tread may rest directly upon them without cutting away any part thereof.

The stringers, with the angle-irons fastened

in proper position thereon, and the rises and treads may be taken separately to the building or place where it is desired to erect the stairs, and these simple parts may be assembled and placed into correct position without requiring any special work to be done at such place. My improved construction in stairs has the advantage of giving a better appearance to stairs which are constructed of metal, and, moreover, it possesses the important advantage of having greater strength for a given weight than other structures, and they may be made completely fireproof. As there are no bolt-heads showing upon the outside of the stringers and the steps themselves present a very finished and neat appearance, the structure may be painted to resemble hard wood with excellent effect.

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

1. Stairs comprising the combination of suitable stringers, supports located upon the inner side of said stringers, treads, and independent sheet-metal risers secured to said supports and provided with integral flanges at the upper and lower edges thereof for engaging said treads resting thereupon.

2. Stairs comprising the combination of sheet-metal stringers having longitudinally-extending strengthening ribs or corrugations formed therein, supports located upon the inner side of said stringers, treads, and independent sheet-metal risers secured to said supports and provided with integral flanges at the upper and lower edges thereof for engaging said treads.

3. Stairs comprising the combination of sheet-metal stringers having longitudinally-extending strengthening ribs or corrugations formed therein, suitably-bent angle-irons for supporting the treads and risers at each end thereof and secured by one flange to the inner side of the adjacent stringer, treads resting on the said angle-iron supports, and risers secured at their ends to said angle-iron supports, respectively.

4. Stairs comprising the combination of sheet-metal stringers having longitudinally-extending strengthening ribs or corrugations formed therein, supports located upon the inner side of said stringers, treads, and sheet-metal risers secured to said supports and provided with integral flanges at the upper and lower edges thereof for engaging said treads, the said risers being formed with strengthening-ribs or paneling thereon.

5. Stairs comprising the combination of sheet-metal stringers having longitudinally-extending strengthening ribs or corrugations formed therein, treads, supports located upon the inner side of said stringers and receiving the respective ends of said treads, and independent sheet-metal risers secured to said supports and provided with integral flanges

at the upper and lower edges thereof for engaging said treads.

5 6. Stairs comprising the combination of suitable stringers, supports located upon the inner sides of said stringers, independent sheet-metal risers secured at their respective ends to said supports on the stringers, said risers being provided at their lower edges with flanges, and treads each resting upon

the upper edge of one riser and the flange at 10 the lower edge of the riser next above.

In testimony whereof I have hereunto set my hand in the presence of the two subscribing witnesses.

SAMUEL GROSSMAN.

Witnesses:

BERNARD J. DEUTSCH,
SAMUEL B. POLLAK.