Aug. 9, 1932. J. AMANN 1,870,598

STAIR STRUCTURE

Filed April 8, 1931

Fig. 1.

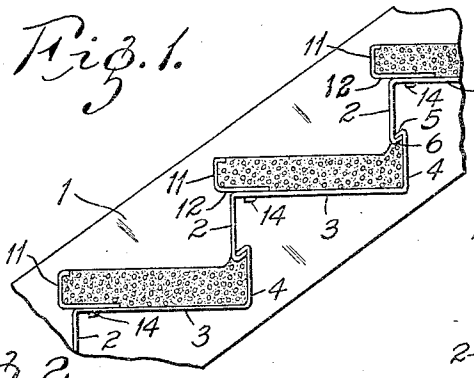


Fig. 3.

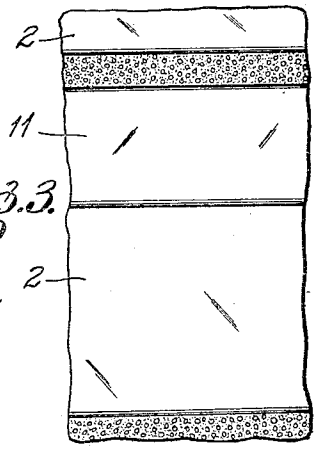


Fig. 2.

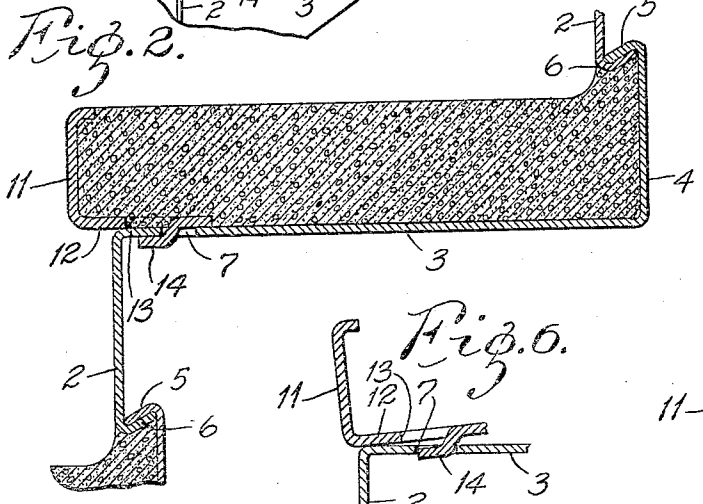


Fig. 4.

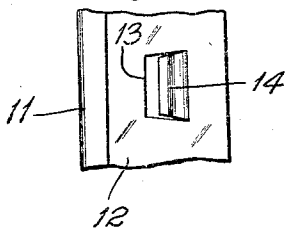


Fig. 6.

Fig. 5.

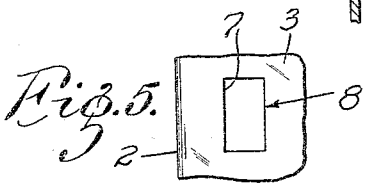


Fig. 7.

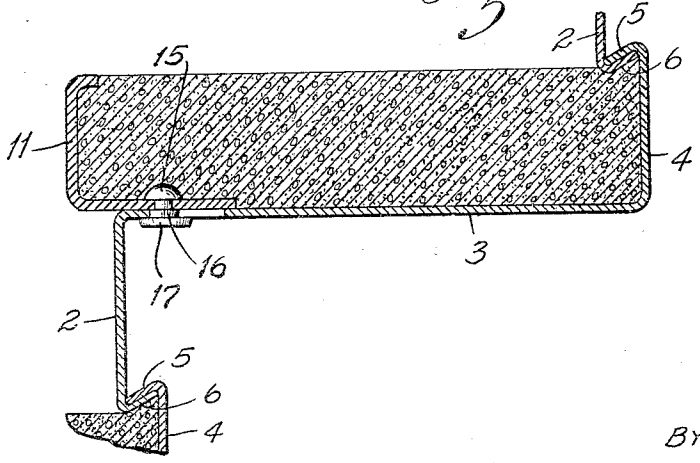
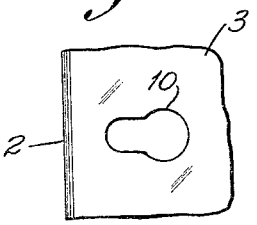


Fig. 8.



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UNITED STATES PATENT OFFICE

JOHN AMANN, OF ST. LOUIS, MISSOURI

STAIR STRUCTURE

Application filed April 8, 1931. Serial No. 528,588.

This invention relates to stair structures, and more particularly to a stair structure built of metal and concrete.

The primary object of this invention is the development of a metal and concrete stair structure whereby the metal portion of the structure constitutes a complete, practical and serviceable stairway, which can be used during the process of construction of a building, so that a temporary stairway is not necessary, nor is it necessary to provide temporary treads; and, which also provides a metal nosing that slidably interlocks with the metal tread when the concrete is poured, so that when the concrete is poured, the nosing forms a complete protection to the front upper corner and face of the concrete.

A further object of this invention is to provide a metal nosing which is firmly and rigidly held in place without the use of rivets or bolts.

A still further object of this invention is to provide a combined metal tread and riser that interlocks with the adjacent metal treads and risers without the use of bolts or rivets.

Other objects and advantages of this invention will be apparent from the specification, claims and drawing, in which:—

Fig. 1 is a side elevation of a section of my improved stair structure.

Fig. 2 is an enlarged side view of a section of my improved stair structure, showing a preferred method of interlocking the nose-piece.

Fig. 3 is a front view of my improved stair structure.

Fig. 4 is a bottom view of an interlocking slot through the sub-tread.

Fig. 5 is a modified form of the slot shown in Fig. 4.

Fig. 6 is a view of the nosepiece being interlocked with the sub-tread.

Fig. 7 is a side view showing a modified form of locking the nose-piece in place.

Fig. 8 is another modification of the slot shown in Fig. 4.

In the construction of new buildings, it is very desirable and advantageous to have the stairways built simultaneously with the erection of the walls, partitions, floors, etc., in order that they may be used by workmen and for the handling of materials. Where the nose-piece is permanently attached at the factory to the front edge of the step, it is necessary to build up the step with boards during the process of constructing the building, and even in this case, the nose-piece is frequently deformed and injured, as well as providing an extra hazard to workmen passing up and down.

To avoid this difficulty and to protect the steps against damage, the construction herein described has been devised.

My preferred method of construction provides metal stringers 1 to which the steps are rigidly attached by bolts or rivets, or other suitable fastening means neither shown or claimed herein. The risers 2, preferably made of sheet metal, are integral with the sub-tread 3, which is turned upwardly at right angles, as indicated at 4 to form both a protection for the rear side of the concrete step and to form an interlocking member or hook 5, which engages a similar hook 6 on the lower end of the next above adjacent riser 2, so that the steps are rigidly held in place and held together without the use of bolts or rivets.

Near the front edge of the sub-tread 3, a perforation 7 is provided, which may take the form of a quadrangular slot as shown at 8 in Fig. 5, or it may be a quadrangular slot in which the metal is severed on three sides and pressed downward to form a lip 9, as shown in Fig. 8; or, it may take the form of two circles of different diameters joined together as indicated by 10 in Fig. 8; or any other form desired that will perform the function of interlocking with a slidable nose-piece 11.

As illustrated in Fig. 2, the nose-piece is designed to protect the front edge of the concrete step and its upper end is turned inwardly at right angles so as to form a protecting metal edge upon the front upper marginal edges of the step or concrete tread.

The lower portion 12 of the nose-piece is turned inwardly at right angles and is provided with an opening 13 near its inner end adapted to register with the perforation 7 in the sub-tread when the nose-piece 11 is

moved inwardly before the concrete is poured.

Through the perforations 7 and 13, a locking member 14 is provided of a shape somewhat like an inverted Z. When the nose-piece 11 is moved inwardly, so that the slots 7 and 13 register, the locking member 14 is inserted and then the nose-piece is slided outwardly until the inner end of the nose-piece lies beneath the upper end of the locking member 14.

A modified form of the same locking method consists of a perforation 10, shown in Fig. 8, near the front edge of the sub-tread and a locking member 15 cylindrical in form and having a shoulder 16 and a head 17, which is inserted through the larger diameter of the perforation 10 and then slidably moved outward so that the shoulder 16 engages the smaller diameter of the perforation 10.

It is obvious that various other forms of locking members and perforations could be used to carry out the same purpose.

When the nose-piece 11 is put into position, the sub-tread 3, the nose-piece 11 and the upwardly turned rear portion of the sub-tread provide a form into which concrete is poured, the ends being closed by the stringers 1.

Another modified form of nose-piece, not shown in the drawing, would consist of bending the longer leg of nose-piece downwardly so as to form a lock to engage the slotted portion 9, shown in Fig. 4.

It is to be observed that in each one of the locking means shown or described, it is necessary that the nose-piece be moved inwardly and then slidably withdrawn forward until the locking members properly engage, and when the concrete is poured and sets, the locking members are firmly held in place and the nose-piece is held rigidly against the front side of the concrete step. Therefore, applicant wishes it understood that he does not confine himself to either of the locking means herein shown, but intends to claim any interlocking means for the nose-piece and for the connection of the sub-tread with the riser that involves a sliding movement to engage them.

Having fully described my invention, what I claim as new and useful and desire to protect by Letters Patent is:

1. A stair structure of the class described, comprising side stringers, metal step treads slotted near their front edges, curvilinear members adapted to cover the front and top marginal edges of a concrete tread superimposed upon said metal treads, said curvilinear members having their lower ends slotted and turned at rightangles to the vertical, so that the slot in said curvilinear member registers with the slot in said tread, a curvilinear locking member adapted to engage the slot in said curvilinear member at one end and also to engage the slot in said tread when said curvilinear member is moved inwardly beyond the normal front edge of said tread and interlock said curvilinear member and said tread when said curvilinear member is slidably moved outwardly to its normal position.

2. A stair structure of the class described, comprising metal side supports, combined metal and concrete steps consisting of metal sub-treads turned upwardly at rightangles and terminating in an inwardly turned hook at their inner ends adapting them to interlock with a mating hook of the riser next above adjacent, said sub-tread having its front marginal edge turned downwardly at rightangles and terminating with an inwardly turned hook, thereby to form a riser for the next below adjacent step, said last-named hook being adapted to interlock with said first-named hook of the next below adjacent step, a slotted curvilinear nose-piece slidably interlockable with a companion slot in said sub-tread, a concrete upper tread superimposed upon said sub-tread adapted to hold said nose-piece permanently in locked position.

3. A stair structure of the class described, comprising metal side stringers, integral sub-treads and risers slotted to receive one end of an interlocking member, an independent interlocking member adapted to slidably join said integral sub-treads and risers with next adjacent sub-treads and risers, a metal nose-piece slidably interlockable with said metal sub-treads, a lockable member adapted to slidably interlock said nose-piece and said sub-tread, a concrete tread superimposed upon said metal sub-tread, having its front and its upper front edge protected by said metal nose-piece and having its rear and its upper marginal edge protected by the upturned portion of said metal tread.

In testimony whereof I have hereunto affixed my signature this 20th day of March, 1931.

JOHN AMANN.