

June 12, 1928.

1,673,178

N. BOIS

STAIR STRUCTURE

Filed Oct. 19, 1927

3 Sheets-Sheet 1

Fig. 1.

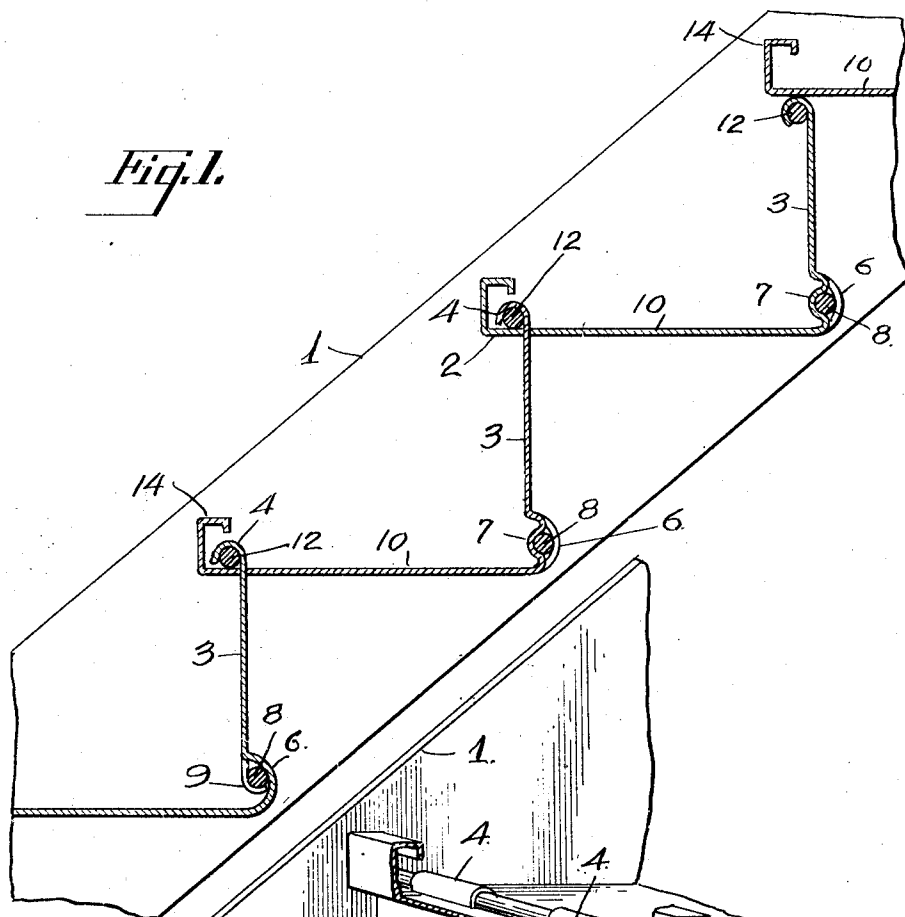
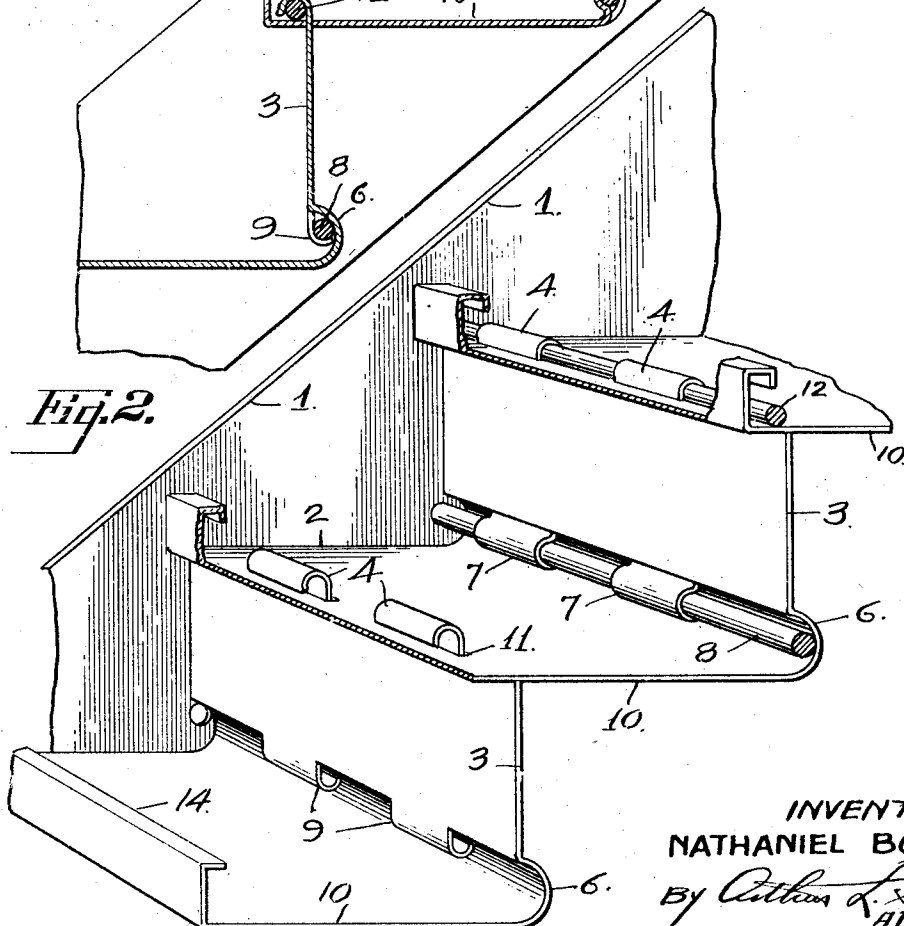


Fig. 2.



INVENTOR.
NATHANIEL BOIS.
By *Arthur L. Slee*
ATTY.

June 12, 1928.

1,673,178

N. BOIS

STAIR STRUCTURE

Filed Oct. 19, 1927

3 Sheets-Sheet 2

Fig. 3.

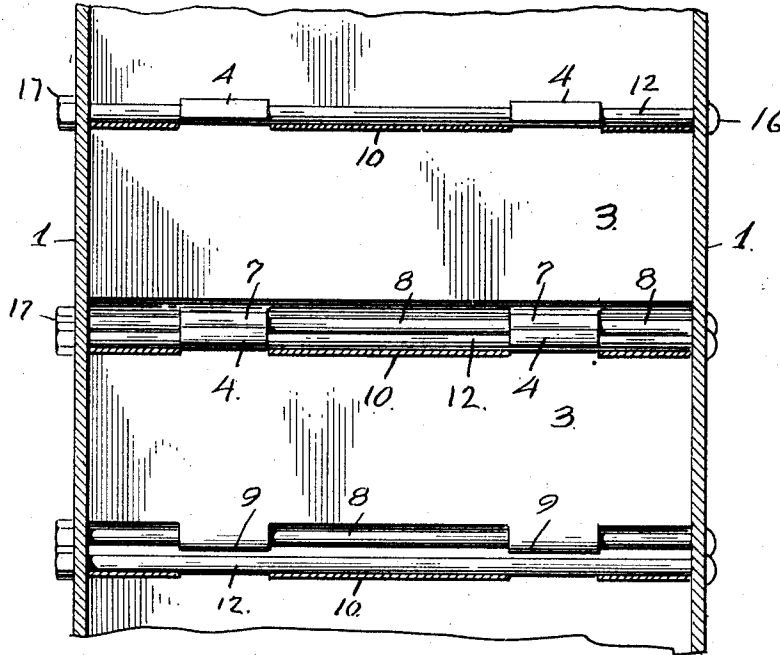


Fig. 4.

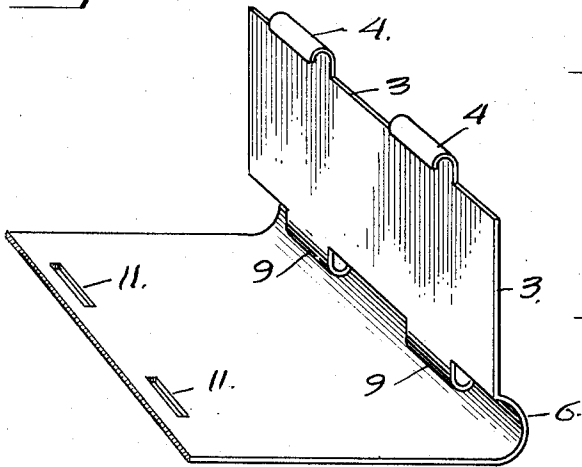


Fig. 5.

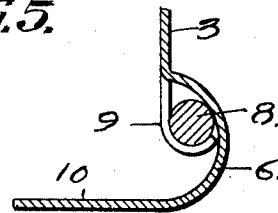
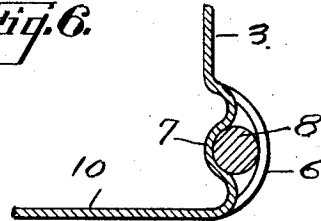


Fig. 6.



INVENTOR.
NATHANIEL BOIS.

By *Cuthbert L. Slee.*
ATTY.

June 12, 1928.

1,673,178

N. BOIS

STAIR STRUCTURE

Filed Oct. 19, 1927

3 Sheets-Sheet 3

Fig. 7.

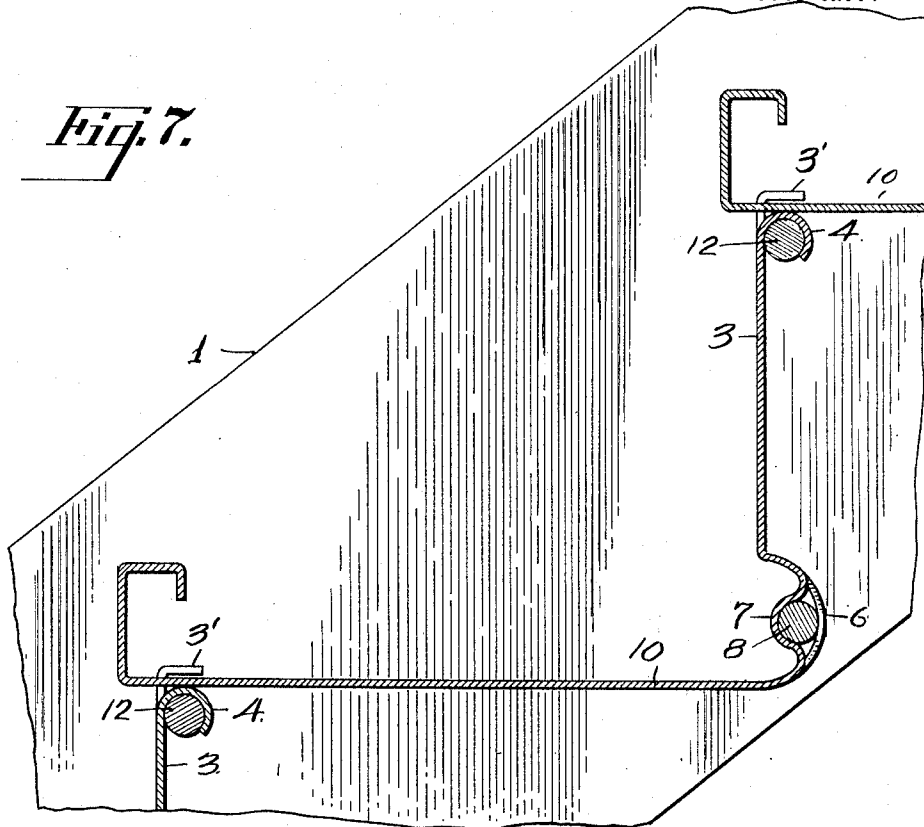


Fig. 8.

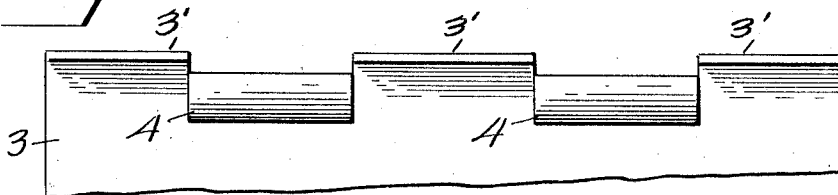
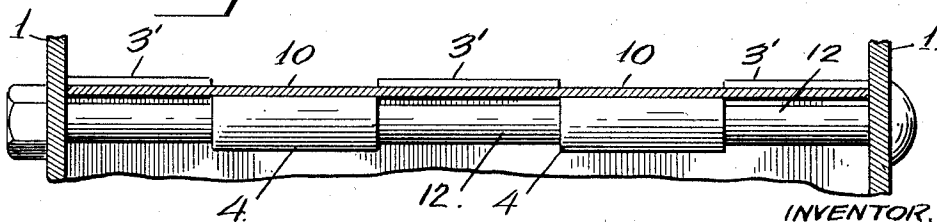


Fig. 9.



INVENTOR.

NATHANIEL BOIS.

By *Arthur H. Slee*
ATTY.

UNITED STATES PATENT OFFICE.

NATHANIEL BOIS, OF SAN FRANCISCO, CALIFORNIA.

STAIR STRUCTURE.

Application filed October 19, 1927. Serial No. 227,254.

My invention relates to improvements in stair structures wherein stair forms mounted between a pair of stringers operate in conjunction with each other and with tie rods between said stringers, for combining the whole into an interlocked stair.

The primary object of the present invention is to provide a new and improved stair structure.

Another object is to provide a new and improved structure of the character described wherein a plurality of integrally formed risers and treads are provided with improved engaging means for engaging adjacent treads and risers whereby said treads and risers may be effectively locked together.

A further object is to provide a plurality of improved stair forms having engaging means for connecting them, said engaging means being also arranged to be engaged by tie-rods to lock said forms in engaging relation and to support the same between a pair of stringers.

A still further object is to provide a new and improved stair form of the type set forth, and having a simple, effective and economical structure easily made and assembled into engaging relation with each other.

A still further object is to provide a new and improved stair structure wherein all of the stair forms are effectively locked together and supported between a pair of stringers by means of the tie-rods connecting said stringers.

I accomplish these and other objects by means of the improved device disclosed in the drawings forming a part of the present application wherein like characters of reference are used to designate similar parts throughout the specification and drawings, and in which—

Fig. 1 is a broken vertical sectional view of my improved stair structure;

Fig. 2 is a broken perspective view, partly in section, with the near stringer removed;

Fig. 3 is a broken front elevation, partly in section;

Fig. 4 is a perspective view of one stair form;

Figs. 5 and 6 are sectional detailed views;

Fig. 7 is an enlarged broken sectional view of a modified form of the invention;

Fig. 8 is an elevation of the top of the riser of Fig. 7, shown detached from the stair structure; and

Fig. 9 is a sectional view disclosing the

manner in which the parts of Fig. 7 are held together.

Referring to the drawings the numeral 1 is used to designate a pair of inclined stringers between which are mounted, in a manner hereinafter more fully set forth, a plurality of integrally formed treads and risers, or stair forms 2. Each form is provided with a riser 3 having hooked lugs 4 formed integrally with the top of said riser 3, and an arcuate recess 6 extending rearwardly from the lower portion of said riser 3. A pair of struck up apertured lugs 7 are formed within each recess 6 to engage a supporting tie-rod 8. Instead of the struck up apertured lugs 7 struck up hooks 9 may be provided, as disclosed in Fig. 5 of the drawings, which hooks 9 will be equally effective in engaging its respective tie-rod 8.

Each stair form 2 is also provided with a tread 10, and adjacent the front end or portion of each tread 10, suitable apertures 11 are provided, as disclosed in Fig. 4 of the drawings, through which apertures 11 the hooked lugs 4 of the riser 3 below the tread 10 may be passed to thereby engage said tread and a tie-rod 12 resting upon said tread 10 and extending between the stringers 1.

The front edges of the treads 10 may be turned up as at 14 to form a pocket on said tread 10 in conjunction with the arcuate recess 6 of said form, as hereinbefore described.

The tie-rods 12 are the real supports as they engage the hooked lugs 4 on the top edge of the risers 3 and support said riser. As the tread above said riser rests upon it, it is obvious that the said tie-rod also supports the said tread.

The tie-rods 8 and 12 are provided with heads 16 at one end and with suitable nuts 17 at their opposite ends whereby the stringers 1 may be securely and rigidly connected together with the stair forms 2 between them acting as separators, whereby said stair forms 2 are also rigidly held between said stringers 1 by said tie-rods as well as being supported thereby.

In operation the forms are mounted between the stringers 1 and after one form is in position and supported by the tie-rod 8 the hooked lugs 4 of the riser 3 are passed through their respective apertures 11 in the adjacent tread and the tie-rod 12 is then passed between the hooked lugs 4 of said

riser 3 and the tread 11 thereby locking said tread and riser in engaging relation, as disclosed in Figs 1 and 2 of the drawings. Successive stair forms 2 are similarly assembled until the whole structure is completed. After assembly the nuts 17 are screwed up tightly to draw the stringers 1 tightly and rigidly against the ends of the stair forms 2 thereby providing a rigid structure throughout.

If desired, instead of inserting the hooked lugs 4 through an adjacent tread, the entire top edge of the riser may be rolled to form a hook and the adjacent tread may rest upon said rolled edge and be supported thereby as disclosed in the upper right hand corner of Fig. 1 of the drawings.

This will dispense with the apertures in the tread and at the same time the tread resting on said riser will also be supported by the tie-rod 8 passing through the apertured struck-up lugs 7 or hooks 9, as the case may be, at the rear edge of the said tread.

In Fig. 7, 8 and 9 I have disclosed a modified form of the invention wherein the hooks 4 on top of the riser 3 engage the rod 12 which in this case lies under the tread 10 of the form 2 above it and additional flat or lateral members 3' extend through the apertures 11 and are utilized to engage the top surface of the tread 10 and prevent the same from separating from its respective supporting rod 12.

In this form of the invention the same simple arrangement of the top of the riser 3 is maintained. The top edge of said riser is slit for a slight portion, as disclosed in Fig. 8 of the drawings and two of the portions are bent or rolled into the hooks 4 while the intervening portions are bent laterally to form the flat lateral members 3' to extend above the tread 10 of the form above it.

The assembled structure of this modification is more clearly shown in longitudinal section in Fig. 9 of the drawings.

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

1. In a stair structure, a stair form comprising integrally formed riser and tread members, the said riser being provided at the top edge thereof with hooks to engage a tie-rod, and each tread being provided with apertures through which said hooks may be projected from below, whereby said forms may be locked together and supported by a tie-rod above the tread and engaging the hooks of the risers passing through the apertures in said tread.

2. In a stair structure, a stair form comprising integrally formed riser and tread members, the said riser being provided at the top edge thereof with hooks to engage

a tie-rod, and each tread being provided with apertures through which said hooks may be projected from below, whereby said forms may be locked together and supported by a tie-rod above the tread and engaging the hooks of the risers passing through the apertures in said tread; and struck-up apertured lugs formed adjacent the junction of said tread with its riser, to receive a second tie-rod whereby said form may be supported between a pair of stringers by said tie-rods.

3. A stair form comprising an integrally formed tread and riser, said riser being provided at the top thereof with hooked lugs to engage a tie-rod, and provided near the bottom thereof with an arcuate recess extending rearwardly of said form, and further provided within said recess with struck-up apertured lugs to engage a tie-rod, the tread on said form being provided with an up-turned front edge to form a pocket with the arcuate recess, and further provided with apertures to receive hooked lugs from a riser below it.

4. A stair structure comprising a pair of stringers; stair forms mounted between said stringers, each form comprising a tread having hooked lugs formed on the top thereof to engage a tie-rod, and each tread being provided with apertures through which the hooked lugs of a riser below it may be projected; and tie-rods supporting the stair forms and connecting the stringers and passing through the hooked lugs of the risers and above the tread above said riser whereby said risers may be locked in engaging relation with each other and supported between the stringers by said tie-rods.

5. A stair form comprising a pair of stringers; a plurality of stair forms mounted between said stringers and each comprising a riser and a tread formed integrally therewith, the top of each riser being provided with a hooked portion for engaging a tie-rod and apertured struck-up lugs at the lower portion of each riser for engaging a second tie-rod, the tread of each stair form resting upon the top of the adjacent riser below it; and tie-rods connecting the stringers and engaging the hooked portions and apertured lugs of the stair forms to support the same between said stringers.

6. A stair structure comprising a pair of stringers; tie-rods connected between the stringers; and stair forms mounted between the stringers each form consisting of an integrally formed tread and riser and provided with struck-up lugs formed thereon along the juncture of the tread and riser to engage adjacent tie-rods, said tie-rods being arranged to support the forms and to connect the stringers and forms rigidly together.

7. A stair structure comprising a pair of stringers; tie-rods connected between the

stringers; stair forms mounted between the stringers and provided with struck-up lugs formed thereon to engage adjacent tie-rods, said tie-rods being arranged to support the forms and to connect the stringers and forms rigidly together; and means formed upon each stair form to engage an adjacent form to lock said forms to tie-rods and to each other.

10 8. A stair structure comprising a pair of stringers; a plurality of stair forms each consisting of an integrally formed tread and riser provided with struck-up lugs formed thereon, each lug being shaped to receive
15 a tie-rod; and tie-rods connected between the stringers and engaging the lugs to support the forms and to connect the stringers and forms rigidly together.

20 9. A stair structure comprising a pair of stringers; a plurality of stair forms each consisting of an integrally formed tread and riser provided with struck-up lugs formed thereon, each lug being shaped to receive a tie-rod; tie-rods connected between the
25 stringers and engaging the lugs to support the forms and to connect the stringers and forms rigidly together; and lugs formed upon each form receivable through apertures formed in an adjacent form for locking said
30 forms together.

10. In a stair structure, a stair form comprising an integrally formed tread and riser, said form having a concave recess formed along the juncture of the tread and riser,
35 and being provided with lugs struck up from the recess to receive a tie-rod.

11. In a stair structure, a stair form comprising an integrally formed tread and riser, said form having struck up lugs formed
40 along the juncture of the tread and riser

and also having hooks arranged to be moved through apertures in an adjacent form, said lugs and hooks being arranged to receive tie-rods for supporting the forms.

12. In a stair structure, a stair form comprising integrally formed tread and riser portions, each form being provided with hook portions arranged to be inserted through corresponding apertures formed in the adjacent portion of an adjacent form, said hook portions being arranged to receive and engage tie-rods arranged to lock the forms in engaging relation and to support the forms.

13. In a stair structure, a stair form comprising integrally formed tread and riser portions, each form being provided with hook portions arranged to be inserted through corresponding apertures formed in the adjacent portion of an adjacent form, and also having a rearwardly offset recess formed along the juncture of the tread and riser portions of each form; tie-rods engaged by the hook portions to lock the forms together and to support the forms; and tie-rods engaged within the recesses to further support the forms.

14. In a stair structure, a stair form comprising integrally formed tread and riser portions, each form being provided with a recess formed along the juncture of the tread and riser portions and extending the full length of the form; and a tie-rod extending longitudinally within the recess and forming a support upon which the recessed portion of the form is seated.

In witness whereof I hereunto set my signature.

NATHANIEL BOIS.