

G. W. BROOKS.
FIREPROOF STAIR.
APPLICATION FILED AUG. 10, 1912.

1,064,050.

Patented June 10, 1913.

2 SHEETS—SHEET 1.

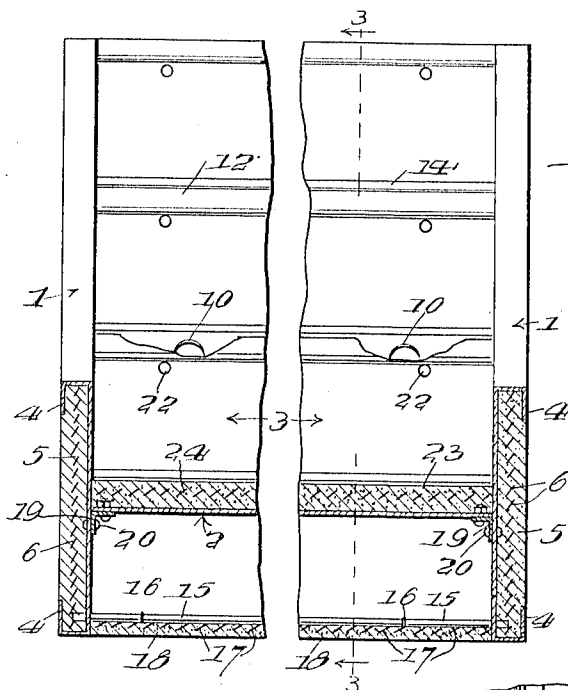


Fig. 1.

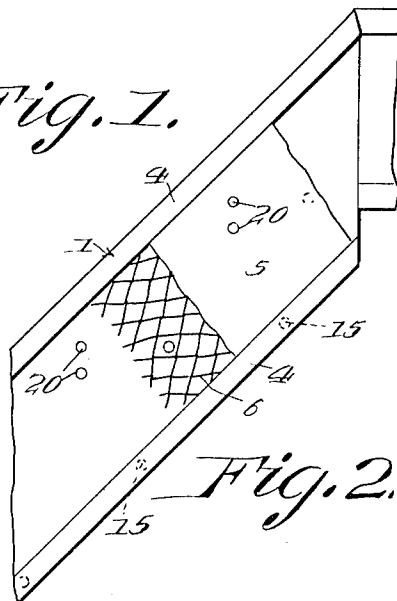


Fig. 2.

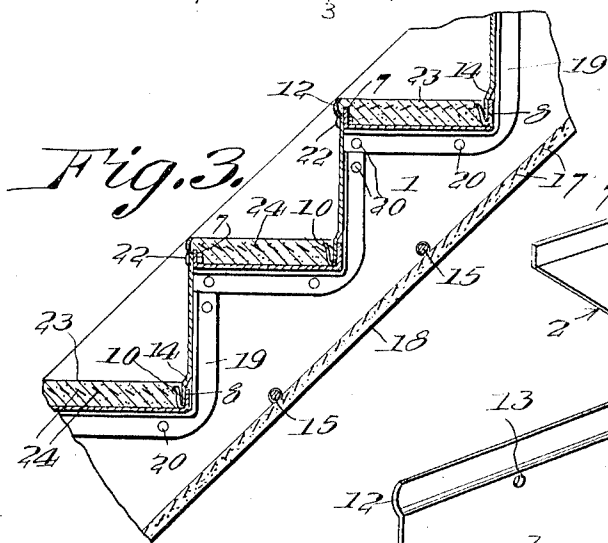


Fig. 3.

Fig. 4.

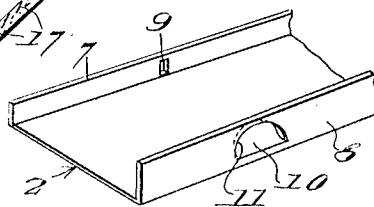
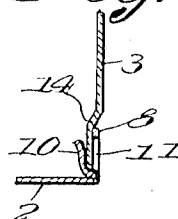


Fig. 5.

Fig. 6.



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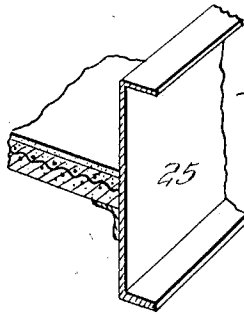


Fig. 7.

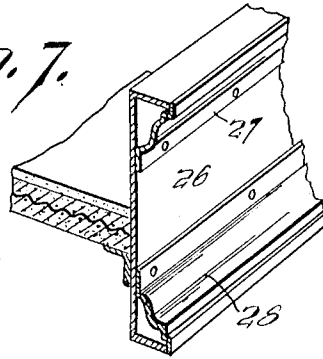


Fig. 8.

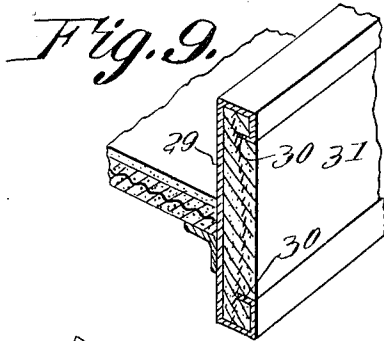


Fig. 9.

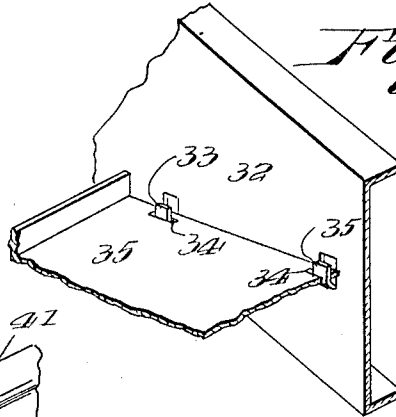


Fig. 10.

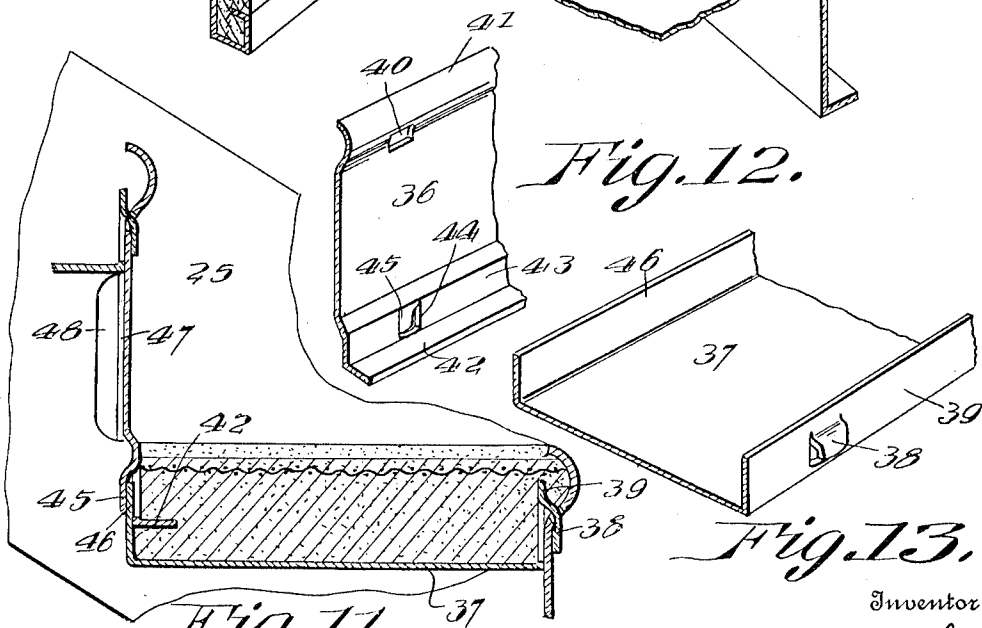


Fig. 11.

Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE.

GEORGE W. BROOKS, OF TOPEKA, KANSAS.

FIREPROOF STAIR.

1,064,050.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed August 10, 1912. Serial No. 714,394.

To all whom it may concern:

Be it known that I, GEORGE W. BROOKS, a citizen of the United States of America, and resident of Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Fireproof Stairs, of which the following is a specification.

This invention relates to certain new and useful improvements in fireproof stairs of that class in which iron or other suitable metal, in this instance preferably pressed steel, is employed in the construction of the stairs, combined with concrete or cement or the like, and it has for its objects among others to provide a simple, light, strong, durable and efficient stair, the parts of which may be readily assembled.

The stringer is formed of a sheet of metal bent into such shape as to leave a projection, behind which is placed reinforcing steel or other suitable material. When concrete is applied, the projection forms a binder which holds the concrete securely in place. The stair treads are made separately, thus permitting of their being made of heavy material, to give the necessary strength to wide treads. The stair riser is made adjustable so as to be raised or lowered to suit the finished floor line and is securely locked or retained in place. The riser is formed in such manner as to leave only the edge of the steel exposed to wear, thus avoiding the flat surface heretofore necessary, which was exposed to wear, soon becoming smooth and slippery. The riser has an offset at the top of the concrete which eliminates a sharp corner and prevents accumulation of dirt and renders the stairs more sanitary.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a top plan view of a number of stairs, with portions broken away and parts in section, constructed in accordance with the present invention. Fig. 2 is a side elevation with parts broken away. Fig. 3 is a longitudinal section as on the line 3—3 of Fig. 1. Fig. 4 is a perspective detail

showing a portion of one of the stair treads. Fig. 5 is a perspective detail showing a portion of one of the risers. Fig. 6 is a detail in vertical section showing the interengagement of the riser and tread. Fig. 7 is a sectional detail showing a plain bent channel stringer. Fig. 8 is a similar view of another form of stringer. Fig. 9 is a similar view showing a modified form of cement filled stringer. Fig. 10 is a perspective view of a modified form of tread and riser support. Fig. 11 is a vertical section of a modification. Fig. 12 is a detail in perspective section of the form of riser seen in Fig. 11. Fig. 13 is a perspective detail of the tread shown in Fig. 11.

Like numerals of reference indicate like parts throughout the several views.

Referring to the drawings, 1 designates the stair stringers, 2 the tread proper and 3 the riser. These constitute the improved stair and these parts are constructed and arranged respectively as follows: Each stringer is formed from a sheet of metal bent into the required shape, that in the present form being provided with projections 4, 4 forming channels, as seen in Fig. 1, which are subsequently filled with cement or concrete or the like 5 which may or may not be reinforced by reinforcing steel or the like 6. In Fig. 2, a portion of this reinforcing metal is shown, the concrete being omitted. When these channels are filled with concrete, cement or the like, the projecting flanges 4 form a binder which holds the concrete securely in place, as will be understood upon reference to Fig. 1.

The stair treads 2 are made separately, thus allowing them to be made of heavier material, to give the necessary strength for wide treads. They are formed at the front edge with a vertical flange 7 and at the rear edge with a wider upstanding flange 8, as seen best in Fig. 4. The front flange 7 is provided with the requisite number of vertical slots 9 for a purpose soon to be described. The rear flange 8 is provided with a prong or tongue 10 which is pressed out of the said flange, as seen in Figs. 4 and 6, 11 in Fig. 6 indicating the space from which the tongue has been stamped or pressed.

The riser 3 is formed at its upper edge with an outwardly curved portion 12, as seen best in Figs. 3 and 5. This is so

formed as to leave only the edge of the riser exposed to wear, as will be seen upon reference to Fig. 3. This avoids flat surfaces as heretofore, which have been exposed to wear and which soon becomes smooth and slippery and thus liable to cause accidents. The riser is provided near its upper end with a plurality of openings, as 13, for the passage of the rivets or other means which secures it to the front flange of the tread. Near its lower end the riser is provided with an offset portion 14, as seen clearly in Figs. 3, 5 and 6.

In assembling the parts, the stringers are placed in position and opposite stringers are connected by suitable rods 15 which may pass through eyes or loops or the like 16 and through the adjacent inner sides of the stringers, as seen in Figs. 1 and 3. These eyes or loops may be on the reinforcing metal now to be described. Reinforcing metal 17 is applied to the under side of the stringers, beneath the treads, as seen in Figs. 1 and 3, and then concrete, cement or the like 18 is placed in position, as seen in said views.

Angle strips 19 are secured to the inner faces of the stringers by rivets or the like 20, as seen in Figs. 1 and 3, each strip of angle iron or steel 19 extending the full height of a riser and beneath the next lower tread. The treads rest upon the horizontal portions of these angle irons. The risers are placed in position. The lower end of the riser, which latter is provided with a terminal flange 21 for this purpose, is received between the tongue 10 and the flange 8, as seen in Figs. 3 and 6. This tongue forms a projection which holds the concrete permanently in place, forming a lock therefor, as will be readily understood upon reference to Fig. 3. While the prong is herein shown and has been referred to as projecting from the tread, it is evident that it might project from the riser and accomplish the same end. This prong or tongue serves also to form a grip to hold the lower end of the riser, but in connection with the vertical slots 9 in the front flange of the tread allows vertical movement or adjustment so that it can be adapted to the various heights between floors, to suit the finished floor line.

The offset 14 in the riser eliminates a sharp corner which would tend to allow the accumulation of dirt. This arrangement, as will be readily understood upon reference to Fig. 3, avoids any joint at this point and thus is more sanitary.

After the treads are in place and the risers affixed in position, the front flanges 7 and the upper portions of the risers are fixed in position by means of bolts or the like 22 which pass through the openings 13 in the upper portions of the risers, as seen

in Fig. 3. The concrete or cement 23 is then placed in position upon the treads, as seen in Figs. 1 and 3, reinforcing metal 24 being employed or not, as may be desired.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages. For instance, I may employ other forms of stringers such as shown in Figs. 7, 8 and 9, 25 in Fig. 7 designating a plain bent channel stringer for use next to the wall. 26 in Fig. 8 designates a steel plate stringer ornamented by drawn or rolled steel moldings 27 and 28 riveted to the plate. This type of stringer is designed principally for the face stringer where an ornamented effect is desired. 29 in Fig. 9 designates a stringer somewhat similar to that shown in Fig. 1, but having the return flanges 30, the cement 31 being retained by these flanges. This style of stringer is preferred in many instances because it is easier to finish the cement filling against the $\frac{3}{4}$ inch return flange than it is to finish it against the edge of the steel as shown in Fig. 1.

In Fig. 10 the stringer 32 has the struck-up tongues or lugs 33 which are received in the slots or openings 34 in the tread 35. This eliminates the use of the bent angle strips 19 for carrying the treads and risers, which bent angle strip is shown in position in Figs. 1 and 3.

36 in Fig. 12 designates a modified form of riser and 37 in Fig. 12 shows a modified form of tread. This construction allows of the assembling of the stairs without the use of bolts. In this form lugs 38 are struck-up or stamped out of the upwardly bent flange 39 of the tread adapted to engage in a slot 40 in the riser near the upper edge thereof and adjacent the curved portion 41. The riser near its lower end is provided with a horizontal flange 42, as seen in Fig. 12, and a vertical member 43 provided with an opening 44 and a tongue or lug 45 adapted to fit over the upwardly bent flange 46 at the rear of the tread.

Referring to Fig. 11 there will be seen a lug 47 pressed out from the stringer 25, 48 designating the opening from which the said lug is stamped. This lug extends beyond the inner face of the stringer and serves to prevent passage of light between the end of the riser and the inside face of the stringer. This construction is to be used with the plastered or cemented type of stringers such as shown in Figs. 1 and 10.

These and other similar variations I should consider as coming within the scope of the protection prayed.

What is claimed as new is:—

1. In fireproof stairs, a tread having a projecting tongue, and a riser independent of the tread and having at its lower end a flange for cooperation with said tongue and

an offset portion adjacent said flange, the lower edge of the riser being engaged by said tongue.

2. In fireproof stairs, a tread having a flange and an inwardly bent tongue stamped therefrom, and a riser independent of the tread and having at its lower edge a flange held between said tongue and flange of the tread for coöperation with said tongue.

3. In fireproof stairs, a tread having a flange and a tongue stamped therefrom, a riser independent of the tread and having at its lower edge a flange for coöperation with said tongue, and an offset portion adjacent said flange the lower edge of said riser being received between the tongue and flange of the tread.

4. In fireproof stairs, a tread having a flange and a tongue stamped therefrom, a riser independent of the tread and having at its lower edge a flange for coöperation with said tongue, and an offset portion adjacent said flange the lower edge of said riser being received between the tongue and flange of the tread, said tread having a flange at its front edge provided with vertical slots.

5. In fireproof stairs, a tread, and a riser independent thereof, the lower edge of said riser and the rear edge of the tread being provided with integral interlocking tongue

and flange said tongue projecting upward and forming a projecting lock for the concrete.

6. In fireproof stairs, a tread, a riser independent thereof, means integral with the tread and projecting outwardly from the rear face thereof to form a lock for the cement and permitting of adjustment of the riser to suit the finished floor line, said tread having a front vertical flange with vertical slot, and the riser having an outwardly curved portion at its upper edge and an opening to receive means coöperating with the vertical slot of the front flange of the tread.

7. In fireproof stairs, treads formed separately from each other, separately formed risers, integral interlocking means on said treads and risers, portions of which project upward above the tread to form locks for the cement and means connecting the fronts of the treads with the upper ends of the risers and permitting of vertical adjustment to suit the finished floor line.

Signed by me at Topeka, Kans., this 2nd day of August 1912.

GEO. W. BROOKS.

Witnesses:

HENRY F. BROOKS,
THEO. W. COCHRAN.