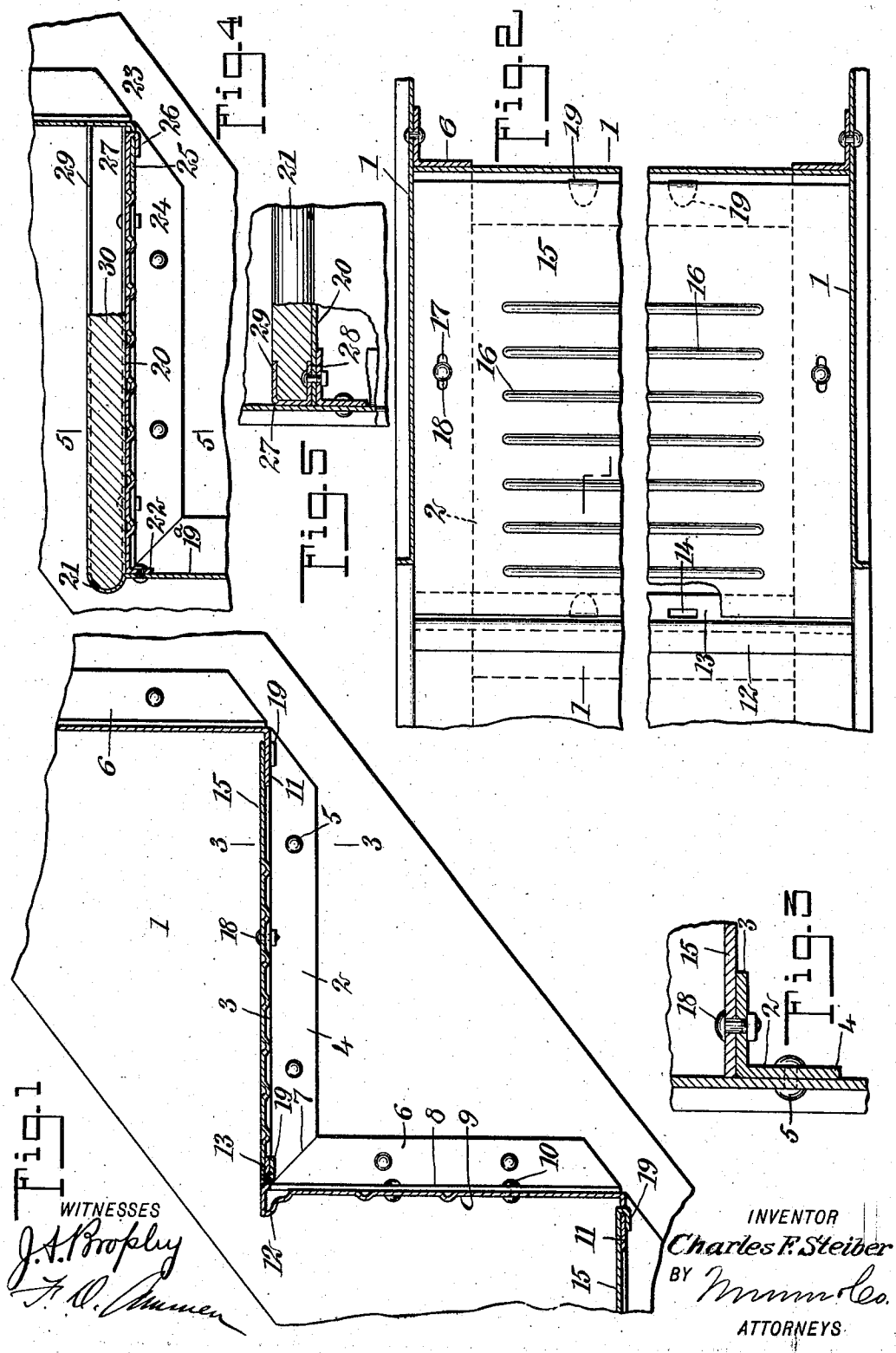
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METAL STAIR.

APPLICATION FILED OCT. 17, 1908.

**919,789.** **Patented Apr. 27, 1909.**



# UNITED STATES PATENT OFFICE.

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## METAL STAIR.

No. 918,789. Specification of Letters Patent. Patented April 27, 1909.

Application filed October 17, 1908. Serial No. 458,214.

*To all whom it may concern:*

Be it known that I, CHARLES FRIEDRICH STEIBER, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented new and Improved Metal Stairs, of which the following is a full, clear, and exact description.

This invention relates to stairs or staircases, and especially to staircases which are formed of metal.

The object of the invention is to produce a staircase which is especially adapted to be formed of steel or similar material, and the invention relates especially to the form of the separate parts and the manner in which the stairs are built up therefrom.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical cross section on the line 1—1 of Fig. 2, through the steps, illustrating the simplest form of the construction, a portion of one of the side stringers being shown; Fig. 2 is a plan of one of the steps, showing one of the risers and the side stringers in cross section, the middle portion of this view being broken away; Fig. 3 is a section on the line 3—3 of Fig. 1, illustrating the manner of attaching the tread to the side stringers; Fig. 4 is a view similar to Fig. 1, showing the preferred form of construction of the treads of the staircase; and Fig. 5 is a section taken on the line 5—5 of Fig. 4, and further illustrating the construction of the tread.

Referring more particularly to the parts, and especially to Fig. 1, 1 represents a side stringer, two or more of which are used in building the staircase. To these side stringers, horizontal gain cleats or gains 2 are attached, the same consisting simply of angle cleats having horizontal flanges 3 and webs 4 which are attached to the stringers by rivets 5, or similar fastening devices. Adjacent to the inner end of each gain, a vertical riser cleat 6 is attached by rivets, or similar fastening devices. These riser cleats are formed of angles like the gains 2, and their upper ends abut the outer ends of the gains so as to form a miter joint 7, as indicated. To the flanges 8 of the riser cleats, risers 9 are attached by rivets 10. These risers are formed of light steel which is stamped or pressed to the form shown, that is, they present vertical webs, and at the lower end of each web, a horizontal flange 11 is formed. At the upper edge of the web of each riser, an upwardly projecting nose 12 is formed. The upper portion of this nose 12 is extended rearwardly and offset downwardly so as to form a seat flange 13. These flanges 13 are provided at suitable points throughout the length thereof with slots 14; similar slots are provided in the flanges 11 at the foot of each riser. The tread 15 of the step is formed of a metal plate, the middle portion of which is ornamented and stiffened by longitudinal ribs or gutters 16 which are pressed into the material, as shown. The ends of this plate rest on the flanges 3 of the gain cleats, and are provided with slots 17 which are attached to the flanges 3 by bolts 18 respectively, as indicated. The longitudinal edges of the treads 15 are provided with integral downwardly projecting ears 19 which register with the slots 14. In assembling the staircase these ears are seated in the slots 14, and crimped on the under side, as indicated in Fig. 1. In this way the treads are securely attached to the risers and gain cleats. I prefer the slots 17 at the ends of the treads rather than simple bolt openings, because this insures that a perfect alinement at this point will take place when the treads are seated. The side stringers may be made of channels having narrow flanges, as shown.

The construction described produces a very light and neat staircase having a light tread.

Where it is desired to produce a staircase having a heavier tread, I employ the construction shown in Figs. 4 and 5. In this form of the invention the web 19ª of each riser is extended forwardly above the tread 20, and formed into a rounded nose 21 having its concave side disposed inwardly. The outer edge of the tread 20 is formed with a flange 22 which is riveted to the web 19ª, as shown. The side stringer 23 is provided with angle cleats 24 which constitute gains for the staircase, and the lower portion of each riser is provided with a flange 25, similar to the flange 11 in the form illustrated in

Fig. 1. The inner longitudinal edges of the tread 20 are provided with ears 26 which are attached to the flange 25, in the same manner as that illustrated in Fig. 1. On the inner faces of the side stringers, deep channel irons or side irons 27 are attached, as indicated in Fig. 5, the webs of the channels being disposed against the stringers. The lower flanges 28 of the side irons are bolted to the metal tread 20, and the flanges of the cleats 24. In this way side pockets are formed under the upper flanges 29 of the side irons. In all other respects the metal part of the staircase is constructed identical with the staircase shown in Fig. 1. I then fill the space over the metal tread 20 with a filler or composition tread 30. This filler may be formed of concrete, asphalt, or any other suitable material. It completely fills the space directly over the metal tread, the upper face of the filler being finished off flush with the upper faces of the flanges 29 and the upper edge of the nose 21. As indicated in Figs. 4 and 5, the material of the filler 30 extends into the cavity of the nose 21 and into the pockets formed under the flanges 29, so that the filler is securely retained in position.

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

1. A staircase having risers presenting flanges, said flanges having openings therein, and treads supported on said flanges and having integral ears projecting through said openings and clenched on the under side of said flanges.

2. A staircase having side stringers, risers connecting said side stringers, having noses formed at the upper edges thereof, and treads secured to said risers, said risers having openings, said treads having integral ears projecting down through said openings and clenched thereto.

3. A staircase having side stringers, risers connecting the same and having flanges at the lower edges, metal treads having ears, said flanges having openings receiving said ears, said treads being riveted to said risers at the outer edges thereof, said risers having noses projecting above said metal treads to retain a filler, and side irons at the inner sides of said stringers forming pockets to receive the filler.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES FRIEDRICH STEIBER.

Witnesses:

EDWARD SCHOPPE,

PETER IMHOF.