

(No Model.)

B. D. DRUEN.
METHOD OF MAKING COACH STEPS.

No. 515,954.

Patented Mar. 6, 1894.

Fig. 1

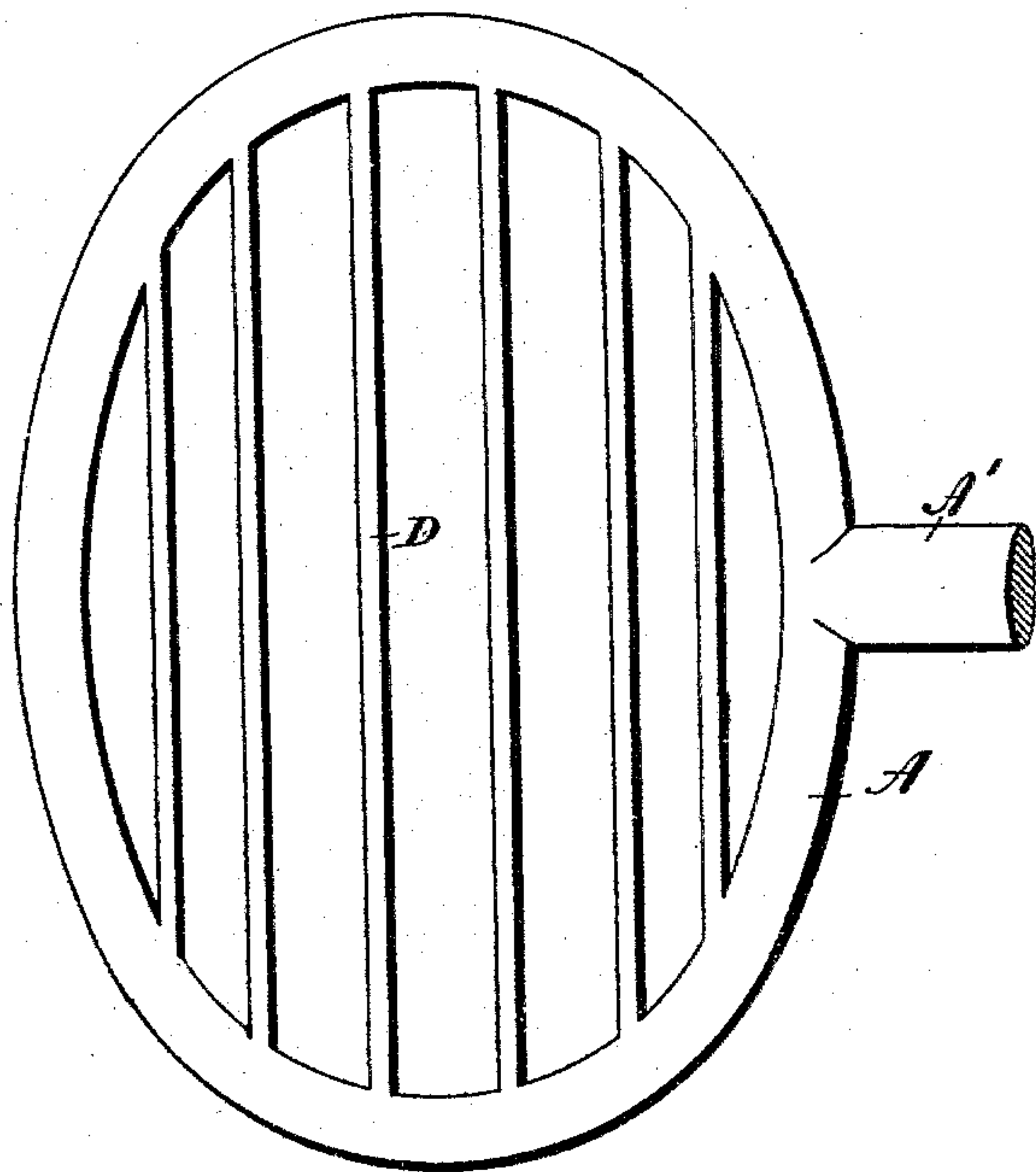


Fig. 2

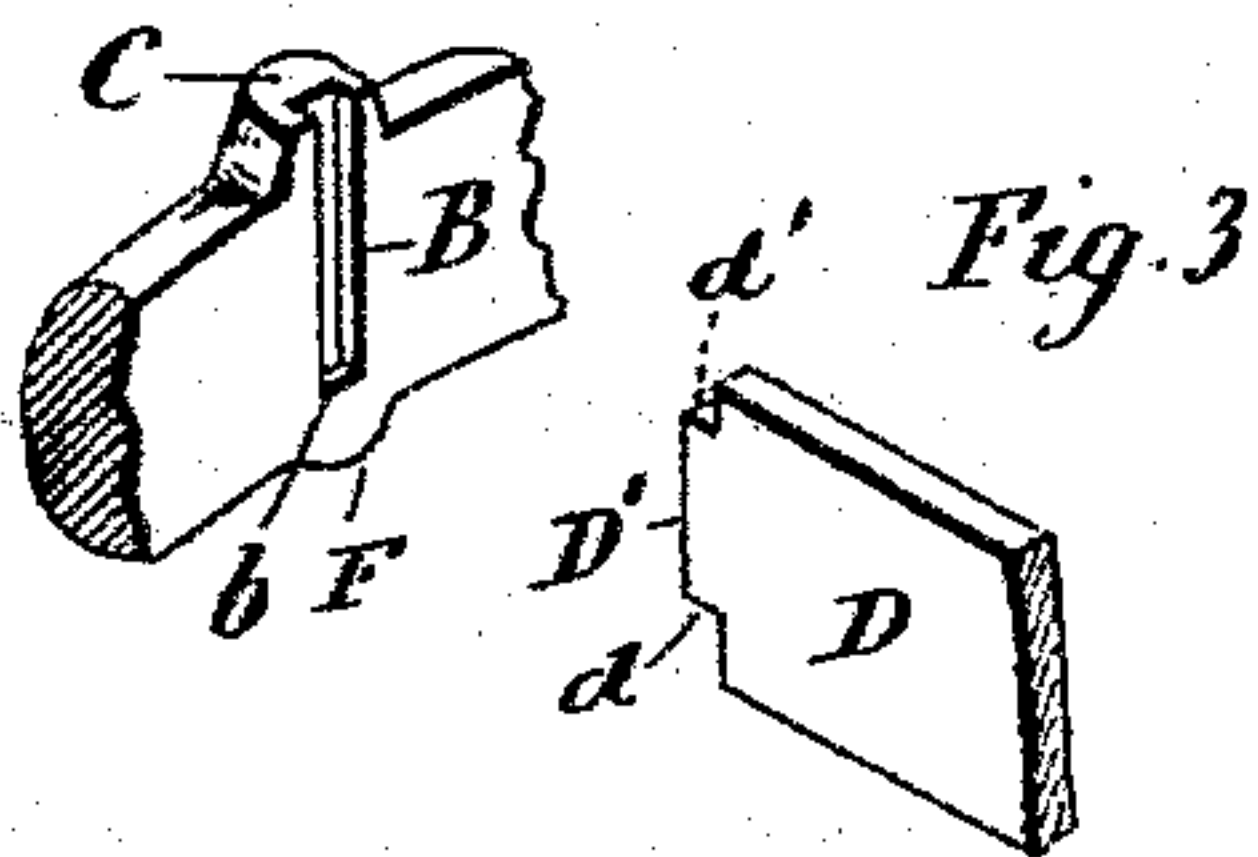


Fig. 4

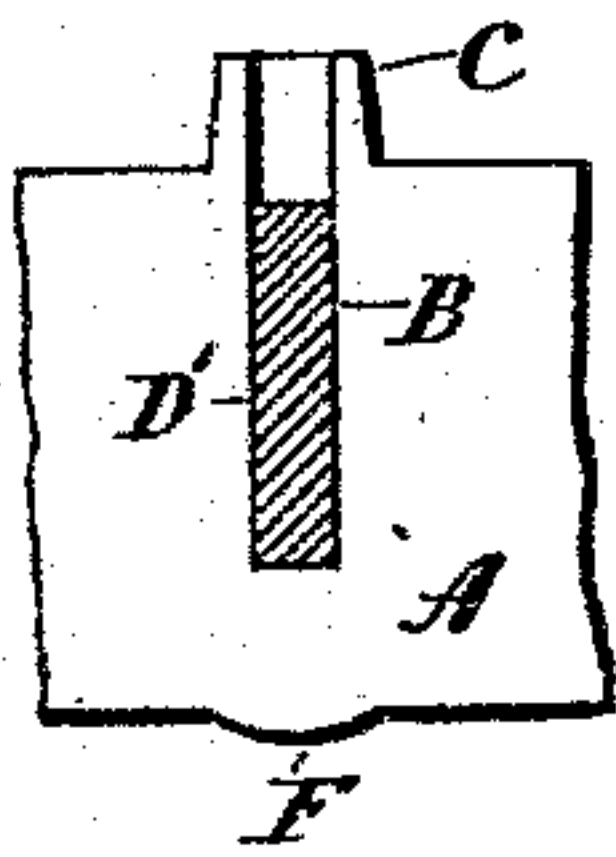


Fig. 5

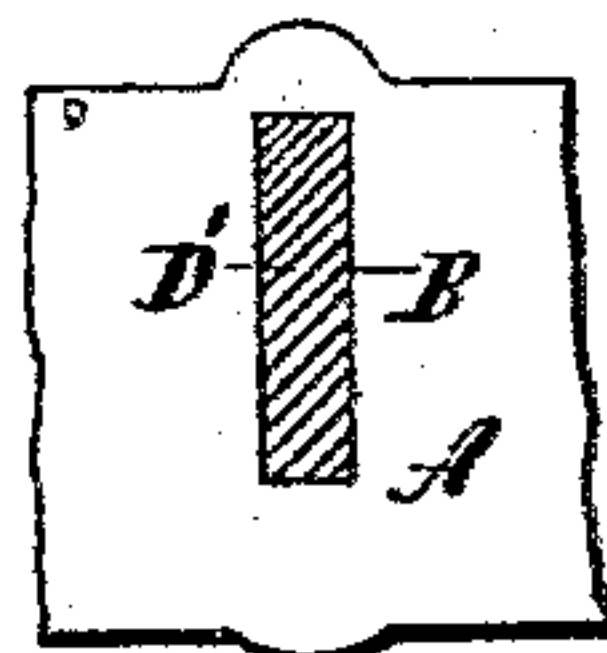


Fig. 6

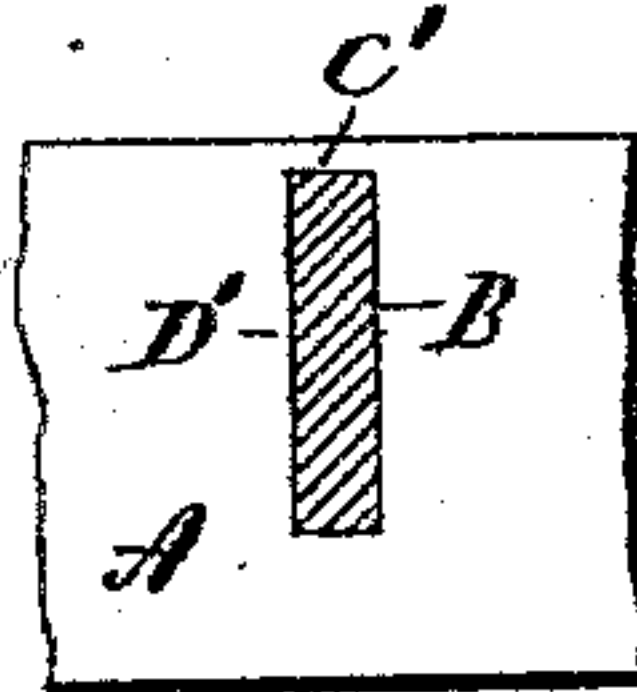
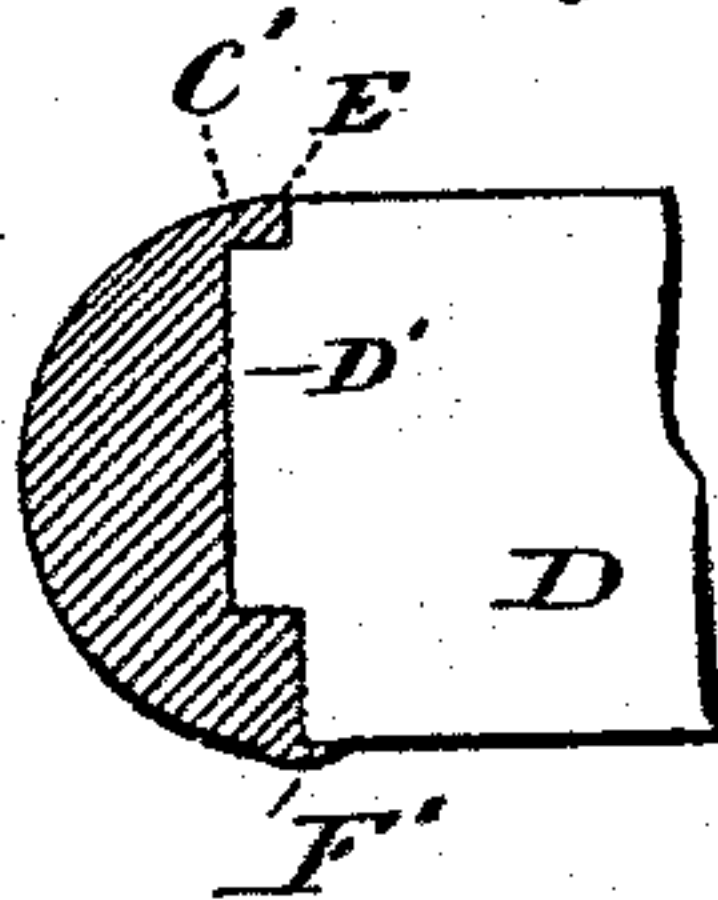


Fig. 7



Witnesses.
J. H. Shumway,
Lillian D. Kelsey.

Bernard D. Druen,
Inventor.
By atty.
Earle Seymour

UNITED STATES PATENT OFFICE.

BERNARD D. DRUEN, OF NEW HAVEN, CONNECTICUT.

METHOD OF MAKING COACH-STEPS.

SPECIFICATION forming part of Letters Patent No. 515,954, dated March 6, 1894.

Application filed October 23, 1893. Serial No. 488,845. (No specimens.)

To all whom it may concern:

Be it known that I, BERNARD D. DRUEN, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and Improved Method of Making Coach-Steps; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of one form which a coach-step constructed in accordance with my invention may assume; Fig. 2, a broken inside perspective view of a portion of the step in its blank or roughed out form; Fig. 3, a broken perspective view of one end of one of the bars; Fig. 4, a broken view showing a portion of the frame in inside elevation and the tenon of one of the bars in vertical section; Fig. 5, a similar view showing the nub upset over the upper edge of the tenon of the bar; Fig. 6, a similar view representing the same parts after the excess of material in the nub has been filed away; Fig. 7, a view showing the same portion of the frame in vertical section and the same end of the bar in side elevation.

My invention relates to an improved method of producing that class of coach-steps having a hollow frame, in which parallel horizontal bars are arranged as in a grate.

Heretofore in the construction of coach steps of this class, the upper edge of the frame has been horizontally milled to form slots for the reception of the bars, the under faces of the ends of which have been cut away to form projecting fingers corresponding in depth to the depth of the slots in which the fingers are brazed. That construction is objectionable, however, inasmuch as the frame of the step is weakened by milling it as described, as the bars are weakened by being so much cut away at their ends, and as it is impossible to very firmly secure them in place by brazing alone.

The object of my invention is to overcome the objections referred to, and to produce at a comparatively low cost of manufacture, a strong and durable step, in which the bars are so incorporated into the frame that they cannot be dislodged.

With these ends in view my invention consists in a method of making coach steps, the said method comprising certain steps as will be hereinafter described and pointed out in the claims.

As herein shown, the hollow frame A, of the step is oval in general form, and half oval in cross section, and is provided with an arm or reach A', made integral with it when it is forged, which is the method of its production. After the step has been blanked out, or roughly formed, its inner face has a number of vertical slots B, formed in it, the said slots terminating at their lower ends above the lower edge of the frame in a shoulder b, and extending at their upper ends up through a nub C, formed upon and projecting above the upper edge of the frame. There are two of these slots, of course, for each of the bars D, the slots being arranged opposite each other. The nubs C, of which one is located at the upper end of each slot, are isolated from each other and formed in forging the frame A, and must contain at least enough metal to well close the upper ends of the slots when they are reduced in finishing the step. The grate-bars D correspond in width to the depth of the frame, and are provided at their ends with tenons D' which are narrower than they are wide. When the bars are inserted into the frame, the lower edges d of the tenons rest upon the shoulders b' formed at the lower ends of the slots, while their upper edges d' fall somewhat below the upper edge of the frame, without reference to the nubs C. It will be understood, of course, that the upper edges of the bars proper are in the plane of the upper edge of the frame. Now to secure the bars in place, the nubs C are upset so as to close the upper ends of the slots, and draw over the upper edges d' of the tenons. There will be some excess of material in the nubs, and that is filed away, leaving a locking shoulder C' over the upper edges of the tenons, as very clearly shown in Figs. 6 and 7 of the drawings. It will thus be seen that the bars are positively secured within the frame by means of the shoulders b formed at the lower ends of the slots B, and the shoulders C' formed by upsetting the nubs C. The upper edge of the frame is also given a very excellent finish, because in upsetting the nubs

C, the metal is drawn over the ends of the grate bars, and when filed away, leaves a very close, and barely perceptible joint at the point E, as seen in Fig. 7. By preference
 5 also, I form small nubs F in line with the lower ends of the slots, and in finishing the step, draw these nubs down over the extreme lower edges of the bars, as shown in Fig. 7, to close the joint there formed, as at F', in the
 10 said figure. I do not, however, limit myself to forming the steps with the under nubs F, though that construction enables me to secure the highest finish in my improved step.

Although I have herein shown a step of
 15 oval outline, and half-oval section, I would have it understood that I may vary the general outline and cross section of my improved step as desired, and I would therefore have it understood that I do not limit myself to
 20 the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

I am aware that it is old to form the inner
 25 face of the rim of a car-wheel with radial slots to receive the outer ends of independently formed wheel-spokes which are secured to the rim by upsetting the same over their outer ends.

I am also aware that it is old to construct
 30 the outer ends of car-wheel spokes with surplus material adapting them to be upset over and secured to independently formed wheel-rims. I do not therefore broadly claim the
 35 formation of slots in one piece of metal to receive ends of other pieces of metal which are secured in place by closing the ends of the slots, nor the formation of one piece of metal with surplus material designed to be upset to
 40 firmly combine it with another piece of metal.

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

1. A method of making coach-steps each
 45 comprising a hollow frame and parallel bars inserted thereinto, the said method consisting in forming in the inner face of the frame, vertical slots terminating at their lower ends above the lower ends of the frame in shoulders,
 50 and extending at their upper ends up through isolated nubs formed upon the upper edge of the frame, and forming grate bars so that their upper edges will be in the plane of

the upper edge of the frame when their ends are inserted into the vertical slots therein, 55 and upsetting the said nubs upon the frame into the open upper ends of the slots for holding the grate bars therein, substantially as described.

2. A method of making coach-steps each 60 comprising a hollow frame and parallel bars inserted thereinto, the said method consisting in forming in the inner face of the frame, vertical slots terminating at their lower ends above the lower edge of the frame in shoulders, 65 and extending at their upper ends up through isolated nubs formed upon the upper edge of the frame, and constructing the grate bars at their ends with tenons narrower in width than the bars, and arranged so that 70 when the tenons are inserted into the vertical slots in the frame the upper edges of the bars will be in the plane of the upper edge of the frame, and upsetting the nubs upon the frame into the open upper ends of the slots 75 for holding the grate-bars therein, substantially as described.

3. A method of making coach-steps, each comprising a hollow frame and parallel bars 80 inserted thereinto, the said method consisting in forming in the inner face of the frame, vertical slots terminating at their lower ends above the lower edge of the frame, and extending at their upper ends up through isolated nubs formed upon the upper edge of the 85 frame, and also having small nubs upon the lower edge of the frame in line with the lower ends of the slots, and constructing the bars to conform in width to the depth of the frame, and having at their ends tenons narrower 90 than they are in width, and adapted to fit into the said slots, and upsetting the isolated nubs upon the upper edge of the frame to close the open upper ends of the slots, and upsetting the nubs formed upon the lower edge of the 95 frame to close the joints there formed between the ends of the bars and the frame, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing 100 witnesses.

BERNARD D. DRUEN.

Witnesses:

GEO. D. SEYMOUR,
 FRED C. EARLE.