

F. A. SAWYER, 2d.
Step for Carriages.

3 Sheets—Sheet 1.

No. 220,666.

Patented Oct. 14, 1879.

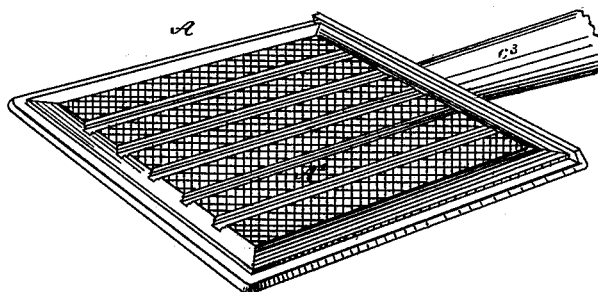


Fig. 1.

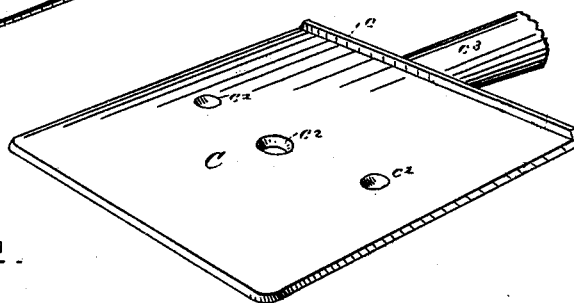
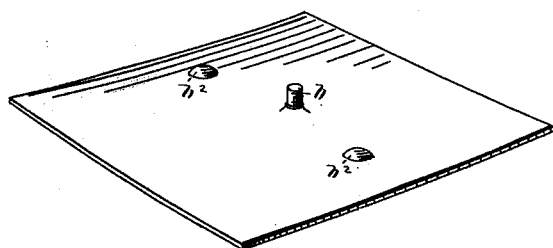


Fig 2.

WITNESSES

Geo. F. Walker
A. J. Dettinger

INVENTOR-

Francis A. Sawyer, 2d.
by his attys
Clark & Raymond

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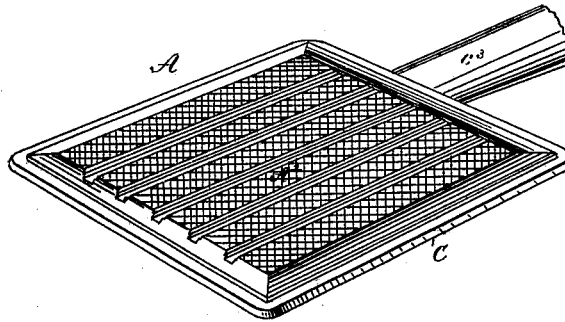


Fig. 3.

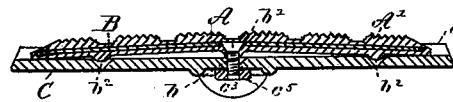


Fig. 4.

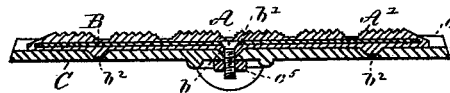


Fig. 5.

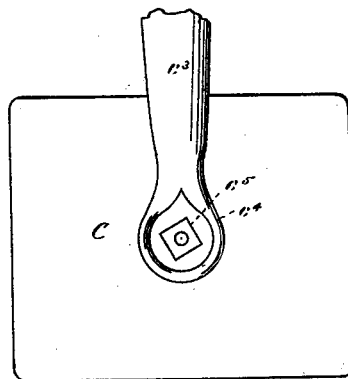


Fig. 6.

WITNESSES

Geo. F. Walker
A. J. Oettinger

INVENTOR

Francis A. Sawyer & Co.
by his attys
Clark & Raymond

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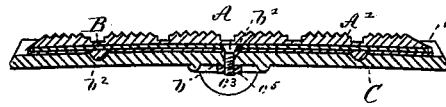


Fig-7-

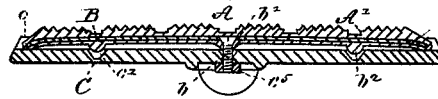


Fig. 8-

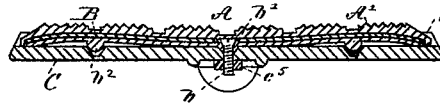


Fig-9-

WITNESSES

Geo. F. Walker
A. J. Oettinger.

INVENTOR

Francis A. Sawyer.
by his atty
Clarke & Raymond.

UNITED STATES PATENT OFFICE.

FRANCIS A. SAWYER, 2D, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE RUBBER STEP MANUFACTURING COMPANY.

IMPROVEMENT IN STEPS FOR CARRIAGES.

Specification forming part of Letters Patent No. **220,666**, dated October 14, 1879; application filed June 7, 1879.

To all whom it may concern:

Be it known that I, FRANCIS A. SAWYER, 2d, of Boston, in the county of Suffolk, in the Commonwealth of Massachusetts, have invented an Improvement in Carriage-Steps, of which the following is a specification.

This invention is an improvement on that described in my application for Letters Patent filed the 21st day of April, 1879; and it consists in details in construction whereby a molded tread can be easily and securely fastened to a carriage-step having a plane surface, and be readily removed therefrom.

In the drawings, Figure 1 is a perspective of my invention. Fig. 2 represents a perspective of the tread inverted and the carriage-step plate. Fig. 3 is a perspective of a carriage-step. Figs. 4 and 5 are cross-sections, illustrating the construction. Fig. 6 is a plan of the bottom of the step. Figs. 7, 8, and 9 illustrate modifications in construction.

In the application referred to the carriage-step is furnished with a depressed panel, and the tread is molded to a shape corresponding to that of the panel in length and width, and is fastened therein by any suitable mechanical means.

This construction necessitates the forming of the panel in the step-plate, and an exact shaping of the tread thereto, a process which requires considerable precision and necessity of adjustment to successfully practice.

By this improvement, while the principal features of the invention remain the same, the process is simplified and somewhat cheapened.

The tread A is made of some suitable vulcanizable or formative material A', molded to or upon the metal plate B, which should extend as near the edge of the tread, particularly at the front and sides, as possible. It is provided with a bolt, b, which preferably passes through the countersunk hole b' in the metal plate, the upper portion of the head of the bolt being substantially on a level with the upper surface of the plate. The vulcanizable or formative compound A' is united to the plate under pressure, covering the head of the bolt, and is forced between it and the sides of and through the hole, closing around the shank

of the bolt beneath the plate, and knitting into the threads thereon if they extend sufficiently close to the edge of the bolt, substantially as shown in Fig. 4, thereby effecting the clamping of the bolt to the plate and preventing it from being pushed through the upper molded covering by accident.

Any other suitable method of fastening the bolt to the plate, however, may be used. It is desirable that the entire edge of the tread be more firmly held to the step than any other portion, in order that the lateral thrust of the foot in stepping thereon may be resisted along the line where the greatest injury to the tread would occur if such a provision were not made to guard against it. This result I effect by crowning the tread so that the center is higher than the edge, and so that its lower outer edge shall be the only portion which comes in contact with the step-plate before it is bolted thereon. This crowning or shaping of the tread is obtained by striking up the metal plate B to the desired form, either before or after the treading-surface is molded thereto.

It is necessary that the tread be so secured to the plate that it cannot turn or work loose, and for the purposes of economy and simplicity but one fastening-bolt should be used. This object can be secured by forming the carriage step or plate C with a wall, c, upon one edge, preferably the back, against which the edge of the tread shall abut, as shown in Fig. 1, or by providing the projections b² upon the under surface of the tread, and recesses c¹ on the step-plate, into which the projections fit when the tread is fastened; or the shank of the bolt may be square and the hole c² in the step-plate c, through which it passes, of corresponding shape.

To provide room for the material which oozes through the bolt-hole in the plate B and forms around the shank, as above explained, the upper edge of the bolt-hole c² in the step-plate may be countersunk.

The step-plate C is further furnished with a short shank, c³, preferably forged therewith, and a wall, c⁴, which may or may not be continuous, and which surrounds the bolt-hole c² on the under side of the step, and serves to

protect the bolt and nut from injury, as well as to conceal them, and thereby make the step more slightly and symmetrical.

When the tread is placed upon the step-plate preparatory to fastening it, it should bear the relation thereto shown in Fig. 4. The nut c^5 is then turned until the entire under surface of the tread is brought in contact with the step. The metal plate B, however, should be so shaped and have such a location in relation to the under surface of the tread and to the upper surface of the step-plate as not to be flattened enough in the fastening to remove the proper bearing of the outer under edge of the tread on the step-plate.

The molded treading-surface A' covers the head of the bolt and the upper surface of the metal plate B, to which it is vulcanized or otherwise secured.

Of course a flat metal plate could be used in lieu of the crowned plate B; but in order to avoid the rucking of the edge of the tread by lateral thrust it would have to be quite thick, and consequently heavy, and more expensive. At the same time it would be almost impossible to attain such a tight joint between the outer under edge of the tread and the surface of the step as that secured by causing the strain which binds the tread to the step to come principally along its edges, as is the case with the crowned tread; and it is quite important that this joint should be substantially water-tight, for if dampness penetrates between them the step-plate may be seriously injured by rust.

The side and front edges of the step-plate must extend beyond the outer edge of the tread, as shown in Figs. 1, 3, 4, and 5, to prevent plate B from being bent upward, and to protect the tread-edge from abrasion and from receiving the full force of a lateral foot-thrust.

The edge of the tread should be beveled from or near its outer limit inwardly, so that the treading-surface shall rise gradually from the step-plate.

A coat or two of varnish, paint, or shellac applied on the surface of the step-plate outside the tread and along the edge thereof will effectually seal the joint between them.

If desirable, a cement having white lead for a base, or compounded from pitch and gutta-percha, or other suitable composition, may be used with the fastening device described, to assist in securing the tread to the plate and in sealing the joint.

In Fig. 7 I show a modification in construction, in which the step-plate is somewhat crowned upon its upper surface, and upon which the tread is fastened, in which case it is de-

sirable that the tread should have such a convexity of its under surface as to cause the outer edge to assume a position to the plate such as described above.

In Figs. 8 and 9 is shown another modification, in which the edge of the metal plate B is bent downwardly.

The object of this construction is the same as that above enumerated, and only shows one other of the numerous ways by which the edge of the tread is so firmly held to the step that the tread cannot be displaced and the metal plate bent upward by lateral foot-thrusts, which are almost wholly relieved by the projecting portion of the metal step-plate to which the tread is attached.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a carriage-step, the combination of a metal step-plate having a plane surface with a molded tread fastened thereon, substantially as described, the metal plate along the sides and at the front extending sufficiently to form a guard in protecting the edge of the tread, all substantially as set forth.

2. In a carriage-step, the combination of the step-plate C, having the end wall, c , the shank c^1 , and the bolt-hole c^2 , with the tread A, bolt b , and nut c^3 , all substantially as and for the purposes described.

3. In combination with the step-plate C, provided with the bolt-hole c^2 and the guard c^4 , formed upon the under surface of the plate to surround the bolt-hole, the tread A, bolt b , and nut c^3 , all substantially as and for the purposes described.

4. The combination, in a carriage-step, of a tread provided with a central fastening-bolt, B, and the steady-pins or projections b^2 with the carriage-step plate C, having a central bolt-hole, c^2 , recesses c^1 , and nut c^3 , all substantially as described.

5. The combination, in a carriage-step, of a carriage-plate, C, having a plane surface, with a molded crowned tread consisting of the crowned metal plate B and a treading-surface, as described, and fastened to said carriage-plate in such a manner that its edge shall be more firmly held against said carriage-plate than any other portion thereof by means of the bolt b and nut c^3 , or other equivalent fastening for bringing the crowned portion of the tread in contact with the surface of the carriage-plate, for the purposes set forth.

FRANCIS A. SAWYER, 2d.

Witnesses:

F. F. RAYMOND, 2d,
A. J. OETTINGER.