C. POTTER, Jr., & J. F. HUBBARD.

Double Rack for Reciprocating Motions.

No. 210,709. Patented Dec. 10, 1878.

Fig. 3.

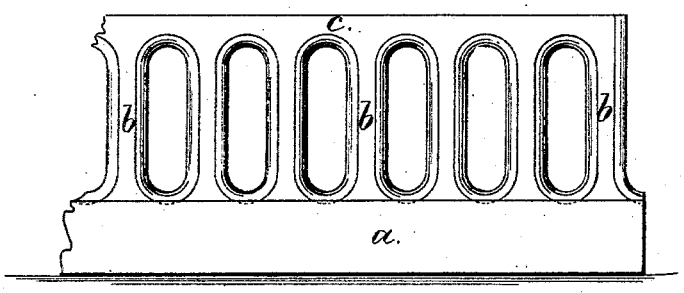


Fig. 5.

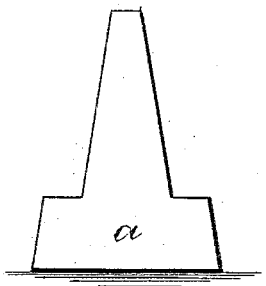


Fig. 1.

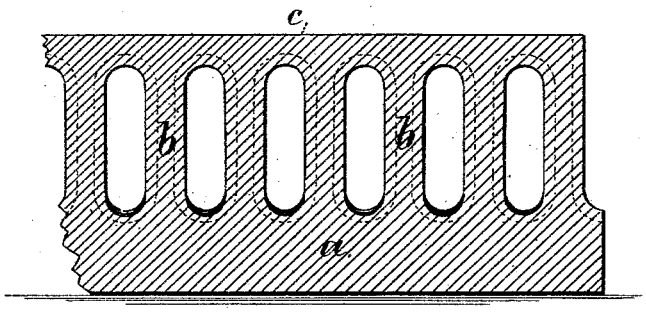


Fig. 2.

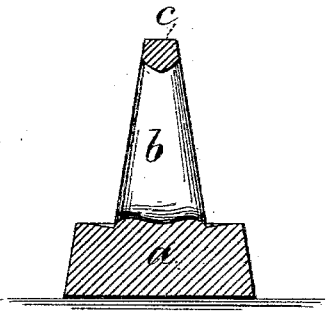
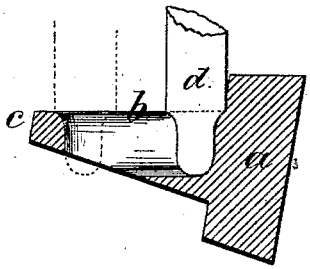


Fig. 4.



Witnesses

Chas. H. Smith

Geo. T. Pinckney

Inventors.

Charles Potter Jr.

James F. Hubbard

per Samuel W. Serrell

Atty

UNITED STATES PATENT OFFICE.

CHARLES POTTER, JR., AND JAMES F. HUBBARD, OF PLAINFIELD, N. J.

IMPROVEMENT IN DOUBLE RACKS FOR RECIPROCATING MOTIONS.

Specification forming part of Letters Patent No. **210,709**, dated December 10, 1878; application filed July 2, 1878.

To all whom it may concern:

Be it known that we, CHARLES POTTER, JR., and JAMES F. HUBBARD, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Double Racks for Reciprocating Motions, of which the following is a specification:

In printing-presses, mangles, and other machinery, it is customary to employ a straight rack with teeth, into which the teeth of a pinion gear, so that end motion will be given to the rack by the pinion as it revolves, and when the end tooth of the rack reaches the pinion, such pinion passes around the same and gives an opposite movement to the rack, and in this manner a constant reciprocation is given to the rack and the bed or other device with which the same is connected.

Racks of this character have been made of separate pins, also of a bar slotted from the edge, so as to leave the projecting pins to form the rack-teeth. In order to prevent these pins or teeth becoming injured or bent, their outer ends have been connected by a stay or longitudinal bar, and to lessen the expense of construction these rack-bars have been cast with mortises between the teeth and the stay or rack bar at the ends of such teeth.

In machinery such as printing-presses, where great accuracy is required, the contraction of the cast-iron bar in cooling varies the ultimate length of the same, so that the cast-iron rack-bars heretofore constructed have required considerable filing and fitting by hand labor, and often are not accurate.

Our invention relates to an improvement in the rack-bar itself, having certain peculiarities which render it much more perfect and better adapted to the use to which it is to be applied.

In the drawing, Figure 1 is a longitudinal section of a portion of a rack-bar. Fig. 2 is a cross-section of the same, and Fig. 3 is a side view.

The base of the rack is made as a bar, *a*, of a size and shape adapted to the press or other machine to which it is to be attached. The teeth *b* and stay *c* are of one piece of metal with the base *a*.

The bar is to be planed or finished up in the sectional form shown in Fig. 4, and it is solid, without any holes through it. We then bore through the bar holes of a diameter corresponding to the width of the mortise, and at a distance apart corresponding to the pitch of the teeth.

The bar is held upon a planing or gear-cutting machine in the position shown in Fig. 5, and a laterally cutting and reaming tool of the general character shown at *d* is introduced and revolved, to bevel the edges of the hole, and by a lateral movement of the rack-bar or of the tool the mortise is made in the metal, with the rounded edges shown in the complete article, Fig. 3; and after the rack has thus been cut on one side it is to be turned over and the other side similarly cut.

This method of manufacture insures perfect accuracy in the teeth of the rack-bar. It allows for the rack-bar being cast in one piece, and the stay being of the same metal as the teeth and base, it renders hand-finishing unnecessary. It rounds the surfaces of the teeth to the proper shape for the teeth of the pinion, and it avoids all difficulty from inaccuracy in the length of the rack-bar due to contraction of the metal in cooling.

We claim as our invention—

The double rack-bar of one piece of metal, slotted transversely, with the edges and ends of the slots rounded at both sides, and having the stay that connects the ends of the teeth all formed of one piece of metal, the same being a new article of manufacture, as specified.

Signed by us this 28th day of June, 1878.

CHARLES POTTER, JR.
JAMES F. HUBBARD.

Witnesses:

HORACE W. FISH,
E. W. WICKERSHAM.