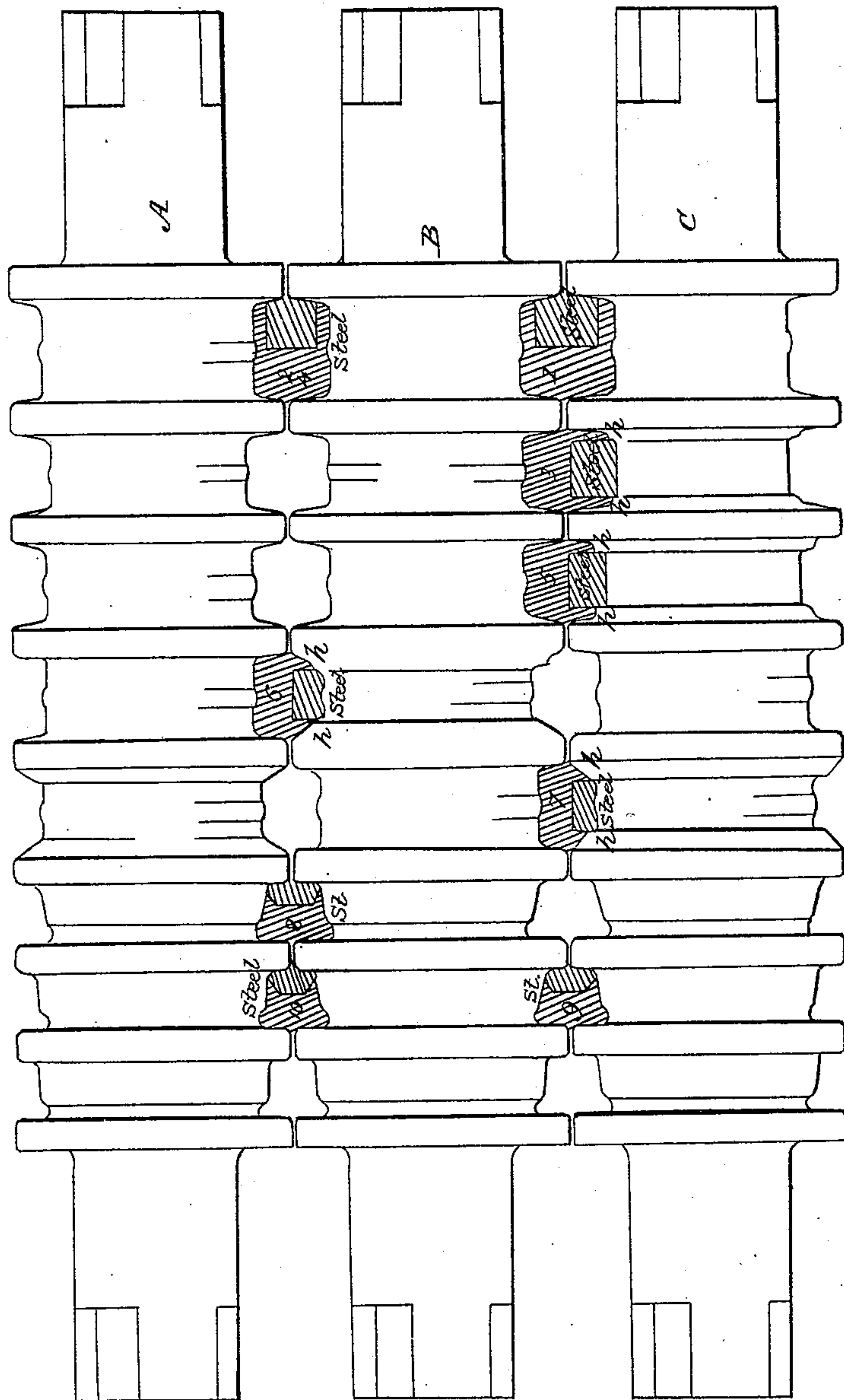


S. L. POTTER.  
Rolling Railroad Rails.

No. 68,233.

Patented Aug. 27, 1867.



Witnesses.  
John Bennett  
H. A. Graham

Inventor.  
Samuel L. Potter

# United States Patent Office.

SAMUEL L. POTTER, OF WYANDOTTE, MICHIGAN.

*Letters Patent No. 68,233, dated August 27, 1867.*

## IMPROVEMENT IN ROLLS FOR ROLLING RAILROAD RAILS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, SAMUEL L. POTTER, of Wyandotte, in the county of Wayne, and State of Michigan, have invented a new and useful Improvement in Rolls for Rolling Steel-Faced Rails; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which are made a part of this specification, and in which—

Figure 1 represents a front elevation of a set of rolls, such as I have employed in carrying out my invention.

Figure 2 is a transverse section of a pile prepared for rolling steel-headed rails.

Figure 3 represents a transverse section of a steel-headed rail produced by my improved rolls.

Figure 4 is a transverse section of a rail produced from a similar pile or fagot without my improvement in the rolls.

The object of this invention is to give the steel bar which is embedded in the rail such a prominence that it will receive the wear of the flange as well as the tread of the wheel. The steel bar is so built into the rail-pile that it will be protected by the surrounding iron from the intensity of the heating-furnace.

The peculiarity of this invention consists in means for making the steel occupy the upper surface and sides of the head of the completed rails, as also sufficient of a core to give it stamina. The means employed for this purpose are rolls with peculiar grooves, by which either a portion of the iron is crowded or pressed back, or a portion of the steel swaged around the iron, so as in either case to expose a durable surface of steel on those parts of the rail which are subject to the greatest wear and violence. The rail is passed through between the rolls in the succession of openings formed by their counterpart grooves. It is modified by each transit, and up to a certain point the process does not differ from that in common use.

I have found that the mode of operation hitherto employed, while it is effective in embedding and welding a bar of steel in the rail which is embraced by the iron, and occupies the central portion of the tread, yet the rail was faulty in this respect, that the laterally projecting portions exposed to the flange of the wheel, and even to that part of the wheel where the flange and tread of the wheel meet in a curve, was formed of iron, and therefore became crushed, battered, worn, and broken, while the central steel portion remained in good order. It is therefore my object in the present invention to so roll the rail that all or nearly all that portion exposed to the contact of the wheels shall be of steel; that is, that the whole tread and a distance down the head on each side shall be of steel. The section, fig. 4, shows the rail as made by the former process, and fig. 3 shows the preferable form as effected by the devices, the subject of the present specification. The portion marked "steel" in each affords a ready means of comparison of results.

In the drawings, fig. 1 represents a set of rolls, A B C being the upper, middle, and lower rolls respectively. The successive grooves in the rolls differ in sectional area and in outline. Their design is to bring the heated rail-pile, by a succession of passes, to the required form. The series shown in the drawing is not conclusive, but brings the inchoate rail to a certain condition. Some of the grooves have peculiar fillets or shoulders *h h*, which have the effect of either crowding or pressing back the iron from the head toward the base of the rail, or swaging the steel over and around the iron, as may be preferred. As viewed in the drawing, the lower series of grooves are adapted for the passage of the iron through the roll away from the spectator, and the upper series for its retransit towards the spectator, the iron receiving an attenuating squeeze in each passage. The lines in each space indicate the position of the steel in the pile or rail in each case. In some it will be seen to occupy the lower side, and in others an edge. To make my rail, I pass it in the direction formerly stated, through the grooves, in the order of the numbers. In one case it passes through the same space twice, as will be seen by the numbers 2 and 4. In the grooves 3 and 5, the space between the shoulders *h h* is intended to receive the steel surface and allow it by protrusion into the said space to become more prominent, and to push back the envelope of iron. The fillets or shoulders may at the same time serve to swage the steel over the iron, so that it will partially envelope the latter. The succession (3, 5) shows this feature increasingly apparent. The rail is passed through the rolls with the steel down, the steel being thereby adapted to be supported by guide-plates to prevent bending. The rail is therefore passed back again through 2 after 3, to get it on the right side of rolls to pass through 5, the more prominent fillets in which complete the crowding back of the iron. These peculiar fillets or shoulders may be provided in either of the three rolls, or in all and in any number of grooves found

desirable. After undergoing the succession of operations between these rolls, the rail passes to another set, which imparts its final shape.

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

The fillets or shoulders *h h*, formed in one or more of the rolls, and in any desired number of grooves therein, so as by pressure upon the rail to cause the steel to become prominent substantially as and for the purpose described.

SAMUEL L. POTTER.

Witnesses:

JOHN BENNETT,  
H. A. GRAHAM.