(No Model.)

F. LIGHTFOOT.

RAILROAD RAIL.

No. 294,245. Patented Feb. 26, 1884.

Fig. 1.

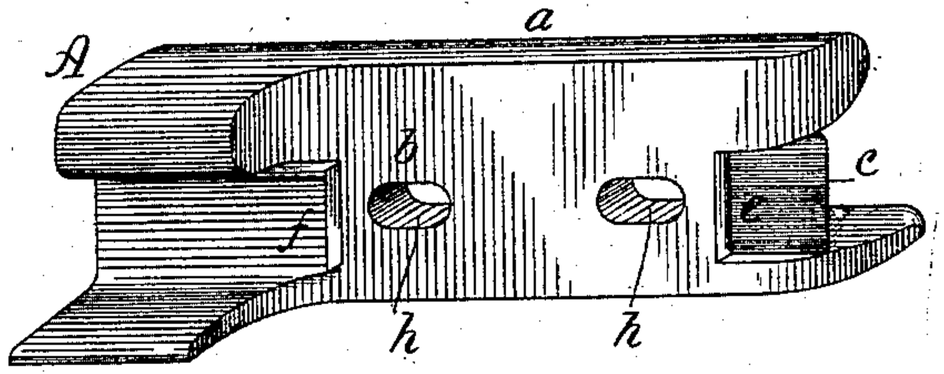


Fig. 2.

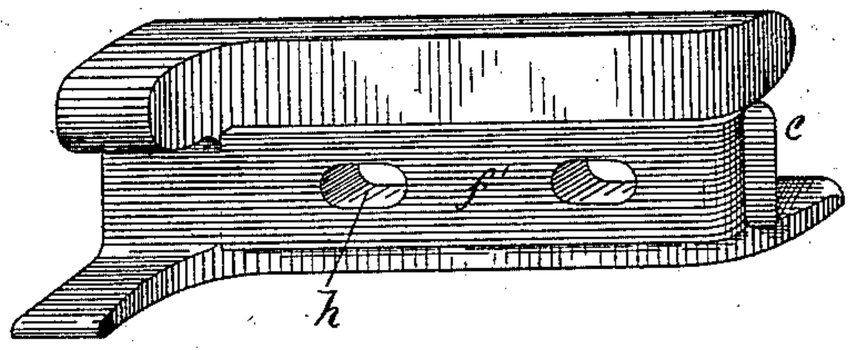


Fig. 3.

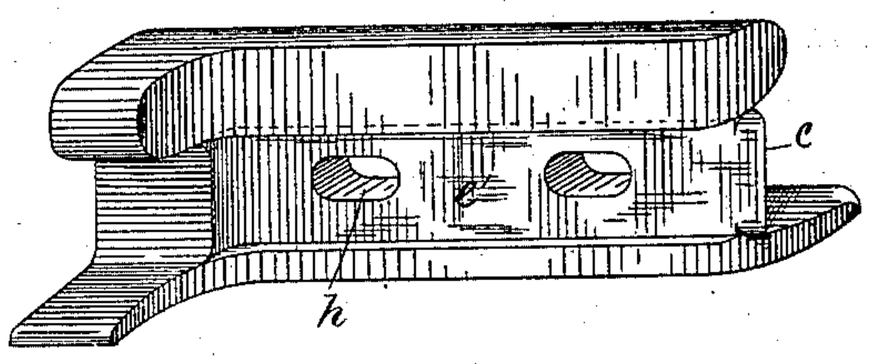


Fig. 4.

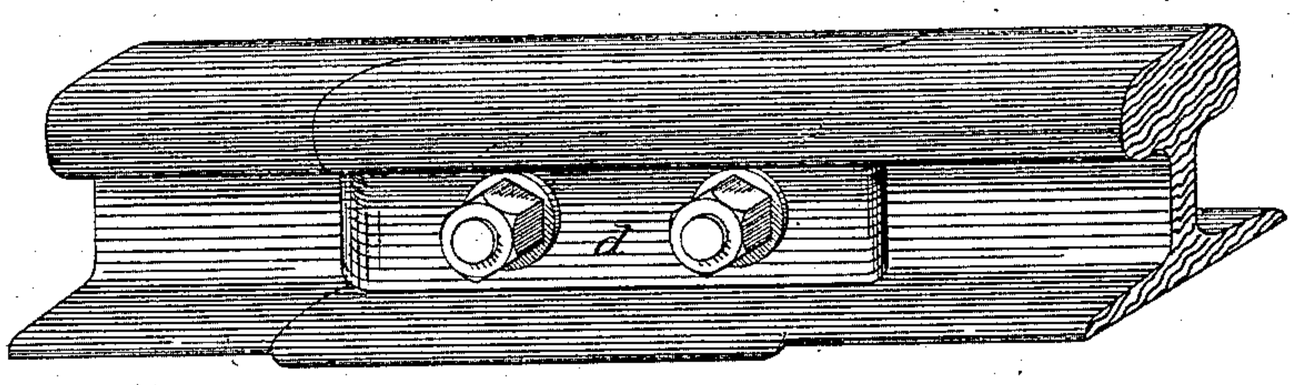


Fig. 5.

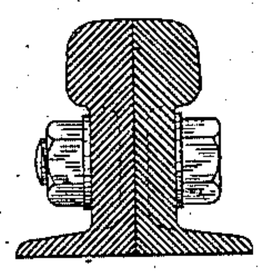
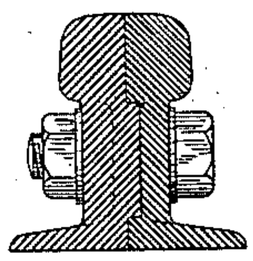


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANCIS LIGHTFOOT, OF MEDIA, PENNSYLVANIA.

RAILROAD-RAIL.

SPECIFICATION forming part of Letters Patent No. 294,245, dated February 26, 1884.

Application filed October 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS LIGHTFOOT, a citizen of the United States, residing at Media, county of Delaware, State of Pennsylvania, have invented or discovered a new and useful Improvement in Railroad-Rails; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of one end of a rail, showing one form of my improved rail-joint. Figs. 2 and 3 are perspective views of the ends of two adjoining rails, showing a modification of my rail-joint. Fig. 4 is a perspective view of two rails united in my improved rail-joint. Figs. 5 and 6 are transverse sectional views of rails as connected by the joint shown in Figs. 1, 2, and 3, respectively.

My invention relates to that class of railway-joints which are formed by reducing the ends of the rails, so that the ends of two adjoining rails pass by and lie alongside of each other, forming what is known as the "continuous-tread joint;" and my invention consists, in general terms, in the construction and combination of parts, all as more fully hereinafter described and claimed.

In an application, No. 94,716, filed May 12, 1883, I have described and claimed the process of forming a continuous-tread rail-joint, which, generally stated, consists in swaging or pressing the ends of the rail over to one side of the vertical longitudinal central plane of the rail, so that the head of the end of the rail is reduced one-half in width, and at the same time elongating the part pressed or swaged over. The portion of the metal pressed over amounts to about sixty-six per cent. and the elongated part amounts to about thirty-three per cent. of the end of the rail treated, though these proportions may be varied somewhat. While being thus swaged or pressed over and elongated the neck or web of the rail is made thicker than originally by the addition of metal forced therein, such added thickness being effected on the side opposite to that on which the swaging force is applied, all as more fully described in the before-mentioned application.

A is the body of a rail, whose end, *a*, is swaged or pressed aside by suitable dies to one-half the width of the rail, thus forming a notch or recess, *b*, in the end of the rail equal in depth to one-half the width of the rail. Into this recess fits the correspondingly-shaped end of an adjoining rail. In thus forming the ends of a rail, preferably about sixty-six per cent. of the metal is pressed over, and about thirty-three per cent. of the end is elongated, though these proportions may be varied within moderate limits and a good result still be secured. In thus pressing over and elongating the ends of the rails, the head, neck, and flange of the rail are reduced in size on one side; but a considerable portion of the metal thus taken from these parts is forced over into the neck of the rail on the side opposite that on which the pressing action has been effected; or a small part may go into the flange, and consequently the end of the rail is but very slightly weakened. By this swaging or pressing over and elongating the ends of the rails the web portion of the ends is thickened, and thereby the loss in weight and strength consequent upon the elongation of the ends is in a part counterbalanced; but the swaged and elongated ends have in cross-section a less area of metal than the original rail.

To further strengthen the ends of the rails, and also to provide means for locking the ends of two adjoining rails together as against vertical movement, the swaging-dies are so constructed as to form a projection, *f*, on that side of the ends of the rails on which the dies act. This projection *f* forms, as shown, a continuation of the web of the rail, and projects into the recess *b*.

To form a recess for the reception of the projection *f*, the head and flange of the ends of the rail are extended beyond the web, as shown, and the metal which has been added to the web is also extended, as at *c*, thus forming a recess, *e*. When two rails are placed together, the swaged and elongated ends *a* fit into the recesses *b*, and the projection *f* fits into its corresponding recess, *e*, and there is thus formed a joint between the rails having a continuous and uniform tread, and the ends of the rails are locked together as against vertical movement. The two rails are secured

laterally by bolts *g*, passing through the elongated slots *h*, as shown.

In place of forming a recess and projection on each rail, I may form a longitudinal and horizontal rib, *f'*, on one rail, and a corresponding recess, *e'*, on the other rail, as shown in Figs. 3, 4, and 6.

In a patent, No. 262,438, granted to me August 8, 1882, is shown a joint in which the joint is formed by swaging or pressing aside the ends of the rails, but without elongating the portion so swaged, the surplus metal being forced into the web and flange portions. This manner of forming the ends renders the web portion of the rail end very thick and heavy, and leaves only a shallow recess between the head and flange of the rail end, on the outside thereof, in which to place the nut-locking plate; but by elongating the swaged portion somewhat ample space is left for the reception of the nut-locking plate, and leaves the rail end symmetrical and shapely in outline.

I claim herein as my invention—

1. Railway-rails having their ends swaged or pressed aside, and at the same time thickened in the web and elongated, the swaged, thickened, and elongated ends of the adjoining rails being adapted to lap by each other, and thereby form a continuous tread equal in width to that of the rail, and equal or approximately equal in strength to the body of the rail, substantially as set forth.

2. A railway-joint consisting of two laterally-swaged rail ends lapping onto each other in or approximately in the vertical central plane of the rails, each thickened in its web, but having in cross-section a less area of metal than the original rail, substantially as set forth.

3. A railway-rail swaged or pressed aside, and having a longitudinally-projecting tongue, *c*, a recess, *e*, formed by said tongue and the head and flange of the rail, and having a projection, *f*, forming a continuation of the web on the recessed side of the rail, in combination with an adjoining rail having a similarly-formed end, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANCIS LIGHTFOOT.

Witnesses:

JOHN H. DYE,

JAMES W. SIMMONS.