No. 896,985. PATENTED AUG. 25, 1908.

E. GATHMANN.

RAILWAY RAIL.

APPLICATION FILED JUNE 14, 1907.

Fig. 2.

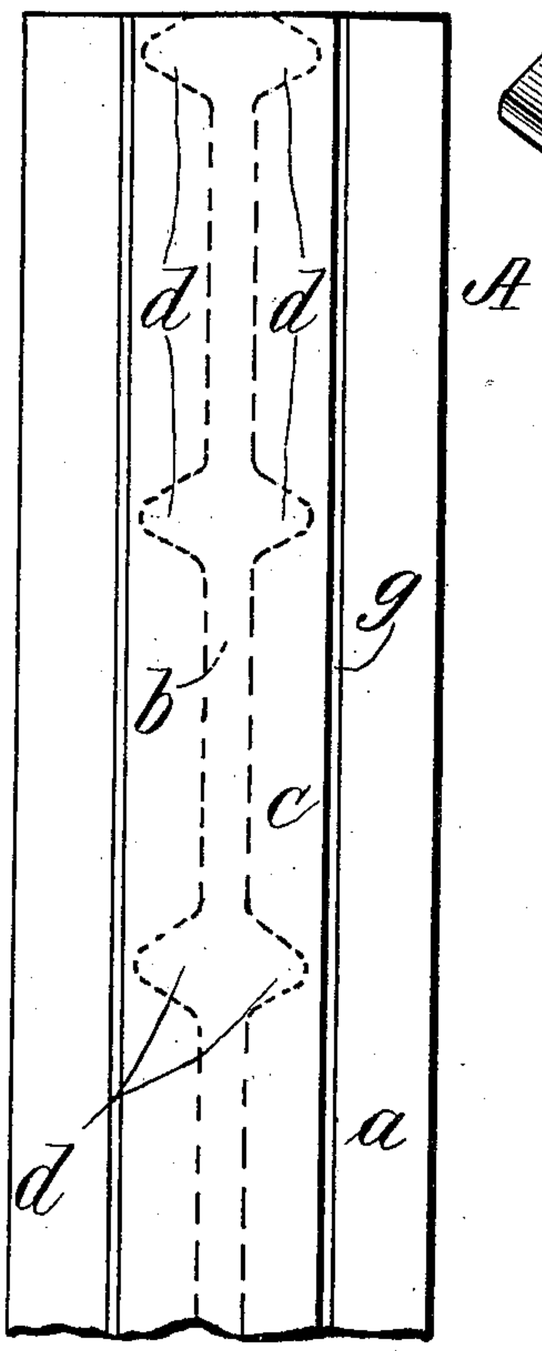


Fig. 1.

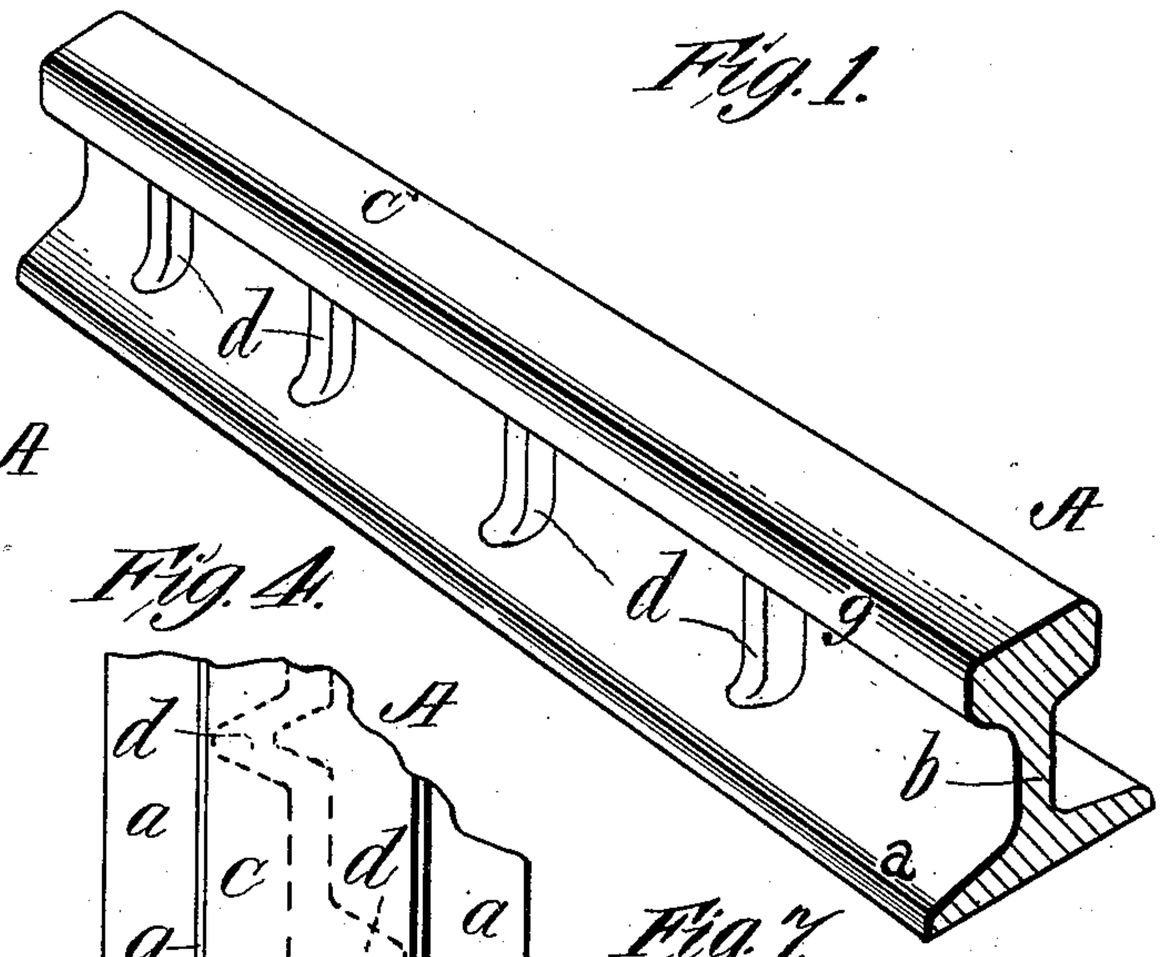


Fig. 4.

Fig. 7.

Fig. 5.

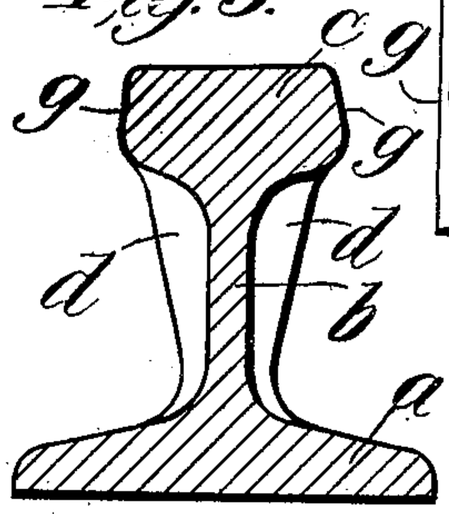


Fig. 3.

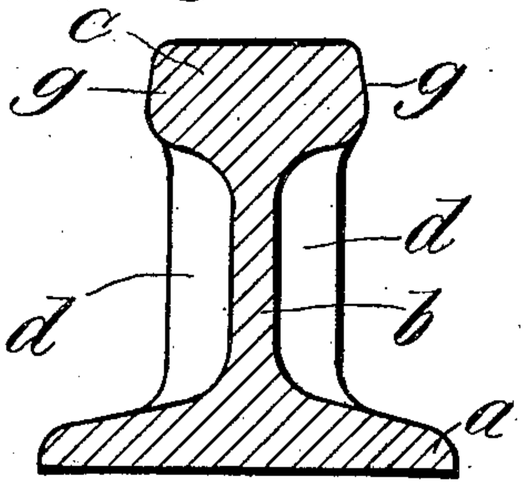


Fig. 6.

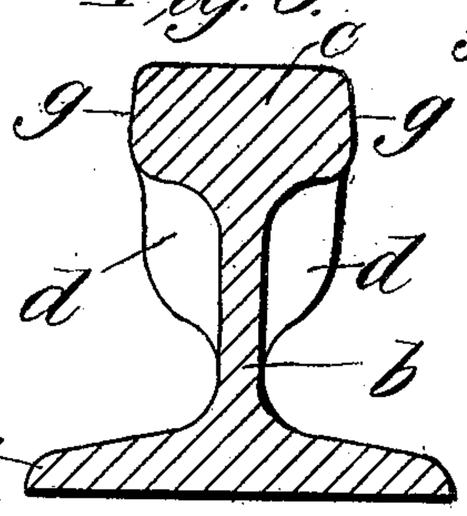
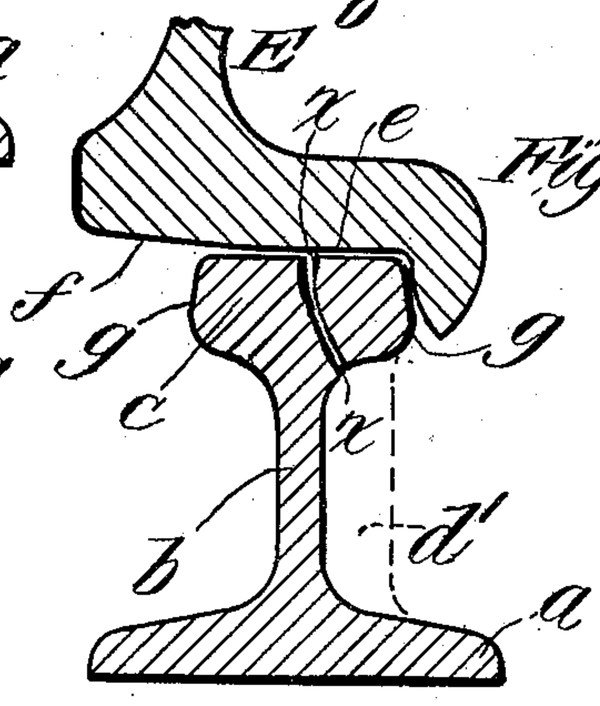


Fig. 8.



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RAILWAY-RAIL.

No. 896,985. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed June 14, 1907. Serial No. 379,069.

To all whom it may concern:

Be it known that I, EMIL GATHMANN, a citizen of the United States, residing at Bethlehem, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Railway-Rails, of which the following is a specification.

My invention relates to an improvement in the structural form of the T variety of rails employed in railway-tracks, whereby the structural strength and wearing quality of rail is much increased without any material increase of weight and cost of rail.

The head of the present standard form of T rail is a beam fixed at one end and subjected to variable loads at the other end, as rolling-stock passes over the same, it being well known that by far the greater wear and stress occur on the inner or gage-line side of the head flange of the rail. Although the web of the latest 90 to 100 lb. rails has material cross section to sustain the weight and pounding of the heaviest rolling stock passing over the same, if such weight were evenly and centrally distributed on the section of the web; such an even distribution of weight and pounding action of rolling stock however rarely occurs, as the contact of the wheels of rolling stock and consequent impact of weight of the same is mostly on the inner or gage-line side of rails, the head flange of the rail, as previously stated, thus becoming a beam fixed at one end and unsupported at the other end, carrying a variable load as rolling stock oscillates within the gage-line clearance.

Many accidents have occurred during the past few years due to the shearing out of sections of the inner side of the head flange of rails, and the object of my invention is to prevent or reduce in a very material measure the occurrence of such breaking of the head flange of rails. To this end I construct a rail having at short intervals along the inner side of the rail, integral with the head flange and web of the rail, vertical supporting or reinforcing ribs or webs, whereby the inner head flange of the rail which has heretofore been a beam supported at one end only, obtains additional support at two sides at short intervals, it being thus actually supported at three sides.

In the accompanying drawings Figure 1 is a perspective view of my rail showing integral head flange supporting ribs on the inner or gage-line side of the rail. Fig. 2 is a plan view of my rail. Fig. 3 is a transverse section of Fig. 2. Fig. 4 is a plan view of a portion of my rail showing a modified construction of supporting ribs. Fig. 5 is a transverse section of Fig. 4. Fig. 6 is a transverse section of another modified construction. Fig. 7 is a horizontal section of preferred form of supporting rib looking upward against the head flange of the rail. Fig. 8 is a transverse section illustrative only, of the usual form of rail and wheel tread of rolling stock, a supporting rib being indicated on the gage-line side in dotted lines.

The rail A may have its base *a*, web *b*, and flange head *c* of normal relative proportions, although the web *b* may be made somewhat lighter than is usual without diminution of supporting strength of the rail, in proportion to the sectional area increase obtained by the integrally formed supporting or reinforcing ribs *d* when the same are continuous from the head flange *c* to the base flange *a*. The supporting or reinforcing ribs *d*, which are formed integrally with the rail, need only be provided on the inner or gage-line side of tracks, but as most rails are usually reversible, I prefer and have shown the ribs *d* on both sides of the rails, so that either side may be used as the inner or gage-line side. The apices of the supporting ribs *d* extend to practically the lower edge of the cheek *g* of the head flange *c*, in order to insure a maximum supporting moment to the same; when however a web *b* of sufficient strength is used it is not necessary that the ribs *d* continue from the head *c* to the base *a* and they may then be tapered and of less cross section, or altogether discontinued towards the bottom of the rail, as shown in Figs. 5 and 6 respectively.

The ribs *d* are preferably of such cross section that they may readily be formed by the usual rolling processes employed in making rails without producing great stress and violence to the metal. Consecutive rolling could be employed to gradually raise the ribs to the required height.

Fig. 7 shows a preferred form of cross section wherein it will be seen that the ribs are of a wedge-shaped contour, being practically of an equilateral triangular shape with rounded lines at the apices and bases.

In Fig. 8, which is illustrative merely, I show the principal form of rail breaking or shearing, the danger of which it is the object

of my invention to prevent or to greatly reduce by means of the reinforcements obtained by my design of supporting ribs. The rib d^1, dotted lines in Fig. 8, shows how additional support reinforces the head flange and is adapted to transmit weights and strains due to rolling stock to the web *b* and base *a* of the rail, thus insuring against sudden shearing, breaks or tearing, *x*—*x* as indicated in the drawing.

The wheel E of rolling stock is usually made with a thread surface composed of two planes, as indicated at *e* and *f*, to allow for difference in peripheral speed of the wheels upon the rails at curves of road. The greatest strains and weights are, however, most always transmitted to the inner or gage-line of the rail, which I reinforce by my construction, thus strengthening this weak point.

Increased height, which is always the great desideratum in railway-rails, can be readily obtained by my construction, as the ribs *d* materially stiffen the web *b*, in addition to reinforcing the head flange *c*, and said web may be made considerably higher without increase of section of rail, or decrease in its stiffness and resistance to lateral pounding.

A further advantage of my construction lies in the fact that a higher carbon steel can be utilized in my construction, which steel is harder and much more resisting and lasting under heavy wear of rolling stock, and this without introducing any element of brittleness, such as have been found to occur in the head flange of usual T section of rail containing higher contents of carbon than .50–.60 per cent. as the web-shaped ribs *d* spaced, for instance, in a 90 lb. rail at from 6 to 8 inches, render it practically impossible to break or shear off the head flange *c* under the most severe service conditions.

Many modifications as to the arrangement of the ribs may suggest themselves to those familiar with the art. For instance, the ribs may be staggered as shown in Fig. 4, and may be tapered in various forms from the head to the base flange as shown in Figs. 5 and 6. In carrying out my invention it is however necessary that the supporting ribs have a practically wedge-shaped cross section rounded at the apices and bottom as shown in the drawing, as otherwise such ribs would be very difficult to produce by the rolling processes with which rails are commercially made.

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

1. A T railway rail having integrally formed therewith, at intervals on both sides of the web, vertical supporting ribs whereby the head flange of the rail is reinforced against shearing or bending action, the ribs having a cross section approximating practically an equilateral triangle with its apices and bases rounded as and for the purpose described.

2. A rolled steel T railway rail having integrally formed therewith, at intervals, a series of vertical supporting ribs for the head flange of the rail, the said ribs being of wedge shaped cross section, the apices of the wedge running into and merging with the lower radius formed at the cheek of head flange of rail on both sides of the web, as and for the purpose shown and described.

3. The combination of the rail head flange *c*, base flange *a*, web *b*, and strengthening ribs *d*, said ribs having a triangular cross section and merging into the head flange *c* by rounded contours at or near the cheeks of the same, and into the web *b* of the rail and on both sides thereof as herein shown and described for the purpose set forth.

4. A T railway rail having integrally formed therewith, at intervals, on the gage-line side of the rail, a series of stiffening ribs extending from or near the gage-line cheek of the head flange inwardly to the web of the rail, the said ribs being also provided on the opposite side of the web, whereby either cheek of the head flange may be used as the gage-line side of rail.

EMIL GATHMANN.

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