No. 638,330. Patented Dec. 5, 1899.

W. F. GOULD.

RAILWAY RAIL CHAIR.

(Application filed Feb. 3, 1899.)

(No Model.)

Fig. 1.

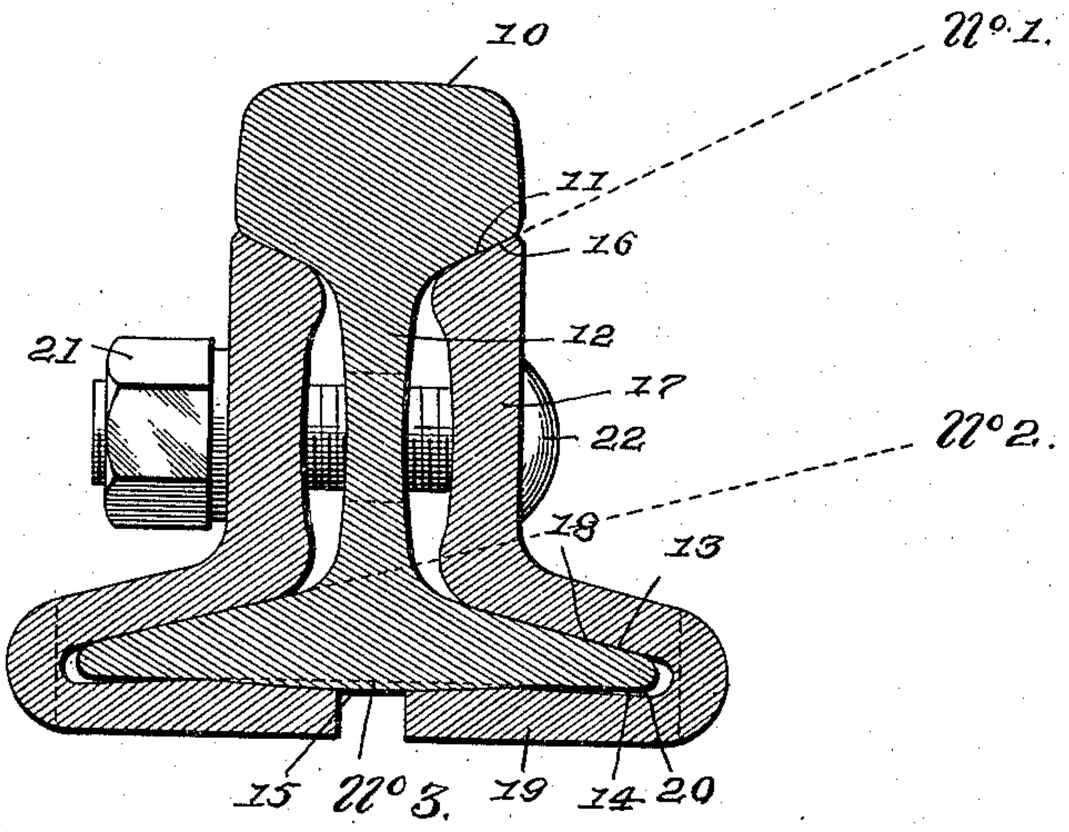
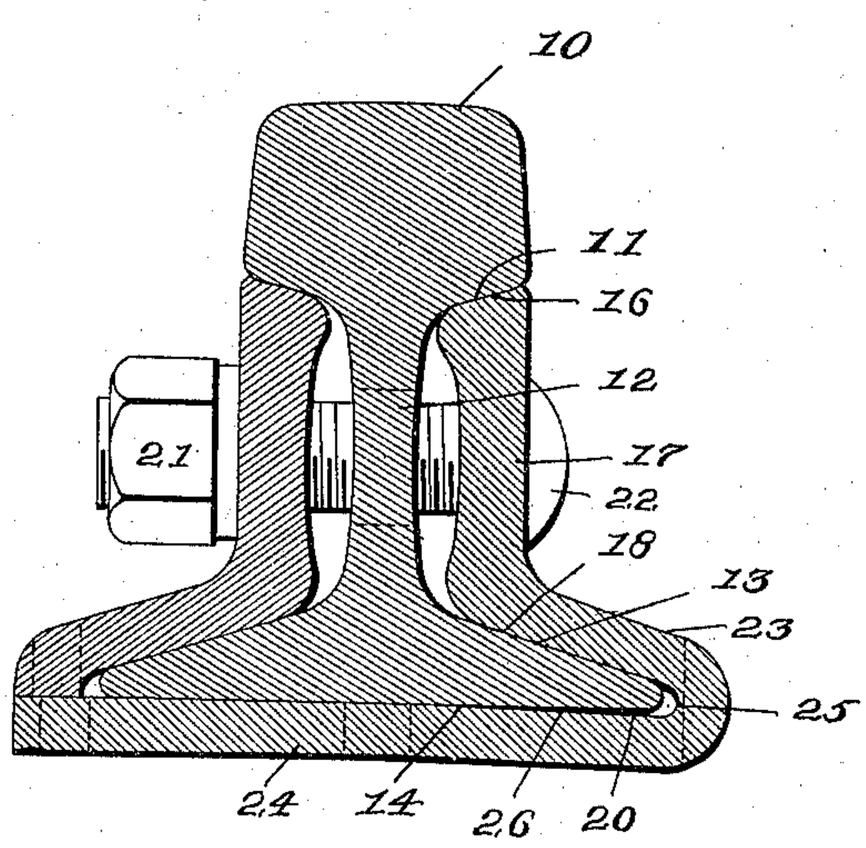


Fig. 2.



Witnesses:
R. S. Owing.
C. F. Gunther

Inventor
W. F. Gould
By J. Ralph Owing
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM F. GOULD, OF DES MOINES, IOWA.

RAILWAY-RAIL CHAIR.

SPECIFICATION forming part of Letters Patent No. 638,330, dated December 5, 1899.

Application filed February 3, 1899. Serial No. 704,367. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. GOULD, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented certain new and useful Improvements in Railway-Rail Chairs, of which the following is a specification.

This invention relates to that class of railway-rail chairs in which the top surface of the chair rests against the under surface of the ball of the rail and is parallel therewith and capable of adjustment toward the web of the rail. The chair engages also the top surface of the flange and is adjustable thereon toward the web, and the bottom of the chair engages the bottom of the rail—that is, of the class commonly known as "continuous" railway-rail joints, from the fact that they maintain two abutting rails in as near to perfect alinement vertically as may be possible.

The object of this invention is, first, to provide a device of this character that may be adjusted both vertically and horizontally to thereby compensate for wear of the rail against the chair, and to provide a chair which may be maintained at the maximum of its efficiency throughout its entire lifetime—that is to say, the chairs may be readjusted any number of times after wear between the contacting surfaces has taken place, and yet the chair will fit accurately and hold the rail securely.

Heretofore in two-part railway-chairs of this class the chair has been so shaped as to fit closely against the top surface of the flange and also closely against the entire under surface of the flange, and hence when first adjusting the chair to the rail the flange of the rail would serve as a wedge to force the said parts of the chair away from each other, resulting in the frequent breaking of the chair at the corner.

A further object is to provide a chair of this class in which the breakage of the chairs incident to driving them in position or when heavy trains pass over the rail is entirely prevented.

It has been found, further, in chairs of the class just described, that upon the occasion of a heavy train passing over the rail, the downward pressure upon the under portion of the chair caused by the wave-like motion of the rail would frequently cause the breaking of a chair at the corner.

A further object is to provide a railway-rail chair of this class in which the incline of the top surface of the chair is greater than the degree of inclination of the portion of the chair which rests upon the top surface of the flange, so that when these parts are moved jointly toward the web by means of bolts the part which is subjected to the greatest wear and which wears away most rapidly—that is, the top edge—will take up more wear than the surface which engages the top of the flange, which does not wear away so rapidly, because it is broader and because the said top surfaces are subjected to a slight lateral movement caused by a lateral sway of of the rail. Hence the chair may be made to fit the rail perfectly both at its top and bottom, even after great wear between the rail and chair have taken place and that without inclining the chair from the vertical.

My invention consists, first, in the construction of a chair of this class whereby the under portion of the chair is made to engage with the rail only at or near the longitudinal central portion of its under surface, and, further, in the construction of a railway-rail joint in which the degree of inclination of the under surface of the ball of the rail and the top surface of the chair is considerably greater than the degree of inclination of the top surface of the flange and the portion of the chair resting against it, and in certain other features of construction, arrangement, and combination of parts whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a transverse sectional view through a rail and my improved chair attached thereto, and also by means of a dotted line projected beyond the figure the degree of inclination of the under surface of the ball of the rail as contrasted with that of the top surface of the flange of the rail, which is also illustrated by means of a dotted line, and also showing by means of a dotted line at the under surface of the rail how much beyond a straight line the under surface of the rail is

bulged. Fig. 2 shows a similar view of a modified form of the chair and also shows a rail in which the incline of the under surface of the ball of the rail is different from that shown in Fig. 1, and also a rail having a flat under surface.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the ball of the rail, and 11 the under edges thereof, which edges are preferably made to incline at the angle indicated by the dotted line No. 1. The web of the rail is indicated by the numeral 12, the top surface of the flange by the numeral 13, (the inclination of which is shown by the projected dotted line No. 2,) the under surface of the rail by the numeral 14, and the bulge at the central portion of the under surface by the numeral 15, the dotted line No. 3 being used to show the amount of said bulge. It will be noted that the degree of inclination of the part 13 is considerably less than that of the part 11 and that the under surface of the rail at its central portion at 15 projects an appreciable distance below the under surface of the rail's edges.

My preferred form of railway-chair (illustrated in Fig. 1) is composed of two pieces, preferably rolled steel, which are of the same shape, so that but one will be herein particularly described. At the top of the chair is a surface 16, which is made to fit closely against the part 11 of the rail. It is important that all of this top surface engage the ball of the rail, because at this point the greatest amount of wear occurs, and it is essential that the chair should not engage the web of the rail, so that it may be moved toward the web to thereby bring new surfaces into contact when readjusted. The upright portion 17 of the chair is substantially straight and is separated from the web of the rail a considerable distance to permit of readjustment relative thereto. The part 18 of the chair rests upon the upper surface of the rail-flange and fits the same closely.

The under portion of the chair (indicated by the numeral 19) is made to engage the under surface of the rail only at the central portion—that is, a space is provided between the under surface of the rail and the chair at 20. The distance or the amount of surface that is engaged by the under portion 19 of the chair is immaterial. It is, however, essential that there be a slight opening at 20. This opening may be provided in a number of ways. I have, however, only illustrated two. In Fig. 1 a rail is shown having a bulge at 15, and an opening may be provided (in combination with this rail) at 20 by simply forming the top surface of the part 19 of the chair flat, the said bulged portion of the rail being sufficient to cause the top surface of the part 19 to stand away from the under surface of the rail at the edges of the flange, while in the device shown in Fig. 2 the under part of the chair is bent up to engage the central portion of a flat rail.

In practical use with the devices of this class which have been used heretofore and in which the chair closely engaged both surfaces of the flange it has been found that on account of the unavoidable variation in the sizes of the rails and chairs many of the chairs had to be driven into position upon the rail by means of a hammering process, and in this process it frequently happened that chairs were broken. It has been, as above suggested, impossible to make the railway-rails and the chairs of such a size that they will readily fit when the chair fits closely both the upper and lower surface of the flange, for the reason that as the rolls used in forming the rails and chairs become worn the flange of the rail becomes larger, while with the chair when the rolls become worn the opening into which the wing of the roll is admitted becomes smaller, and hence the great difference between the size of the rails and chairs, even though made by the same rolls at different periods of time. To avoid the necessity for thus driving the chairs in place, I have so constructed the under surface of the chair that it will engage the under surface of the rail-flange only at or near the central portion, and even though the said central portion bulges downwardly the chair may always be readily placed into position and then forced into place by means of the nut 21 on the bolt 22; and, further, as wear takes place between the engaging surfaces of the chair and rail it may be compensated for by further adjustment of this nut, for when this nut is operated each chair is moved toward the rail and new surfaces will be brought into contact at the under surface of the ball of the rail, the top surface of the flange of the rail, and also the under surface of the flange of the rail; and, furthermore, the amount of surface which is in contact on the base of the rail between the rail and the chair will as the wear continues and is taken up from time to time be increased, because the two surfaces will become more nearly parallel as they are worn off.

When a railway-rail joint is subjected to the strain of a heavy train passing thereover, there will be a wave-like motion of the rail, and this wave-like motion will tend to spread the parts 16 and 19 of the chair. In former devices of this kind when this wave-like motion became excessive there was, it will be obvious, a great tendency for the chair to break at the lower corner, for the reason that the flange of the rail engaged the metal of the chair at points on the top of the flange and bottom of the flange very near to the said corner. With my device it is obvious that when this wave-like motion takes place the part 19 of the chair may bend downwardly quite a considerable distance before there will be any tendency for breaking at the corner, because of the elasticity of the metal from the point where the under surface of the chair contacts with the rail to the said cor-

ner. Inasmuch as this wave-like motion only has a slight tendency to force apart the chair, the elasticity of the metal for this length is sufficient to prevent breakage at the corner.

In the modified form shown in Fig. 2 the chair indicated by the numeral 23 is provided with a bottom piece which projects under the rail and beyond the opposite edge of the rail, while the mating chair is cut off on a level with the under surface of the rail, or an ordinary rail-splice may be used. This chair 23 has its under portion 24 bent downwardly at 25, and then upwardly at 26 to engage the under surface of the rail. In this modification I have shown the rail having an angle on the under surface of its ball that is of a considerably-less degree of inclination than the one shown in Fig. 1, and I have also shown a rail flat on its under surface, thus showing that my invention may be applied to any of the ordinary forms of rail now in use.

In practical use it will be obvious that the feature of my improved chair which provides a space at 20 and causes the chair to touch the rail only on a central longitudinal line permits the chair to be properly readjusted after considerable wear has taken place, because when such wear has occurred there will be a shoulder formed at the point where the top edge of the rail-flange engages the surface 18 of the chair; and by reason of the yielding of the chair at its bottom permitted by this space 20 said shoulder may be moved to overlap the flange of the rail. Obviously, in railway-rail joints of the class in which both the top and under surfaces of the flange are parallel with and engage the surfaces of the chair, when great wear has taken place and shoulders are formed on both surfaces of the chair, as above suggested, the chair cannot be moved toward the rail unless the under portion of the chair is made to incline downwardly away from the rail, which is obviously impractical and objectionable. Furthermore, my improved form of rail permits the under part of the chair to vertically adjust itself to engage the under surface of the rail (after wear has taken place) to such an extent that the said surfaces no longer contact by simply drawing the chair toward the rail. This feature of the rail-joint, whereby the chair has a considerable amount of adjustability toward the rail, is also greatly advantageous when the straight chairs are applied to curved rails.

I am aware that heretofore railway-rail chairs have been used in which the tops of the chairs engage the web of the rail, and when they were readjusted the movement of the chair relative to the rail was rotary, it being centered at this point of contact. In such devices it is obvious that at certain stages of the adjustment the under part of the chair would touch the rail only at the central portion. This chair, however, was not, properly speaking, capable of vertical readjustment, for the reason that the greatest wear takes place upon the top surface of the chair, and after this was once worn off it could not be made to again engage the ball of the rail, where the support is most needed. My invention is to apply only to railway-chairs that move toward the rail in a substantially horizontal plane when readjusted and which therefore bring new surfaces into contact at all touching-points and are in a true sense vertically adjustable.

The feature of my invention which makes it particularly advantageous is briefly as follows: It is to be understood that these chairs are made of yielding material and are first fitted to a rail until the vertical portions of the chair firmly engage the under portion of the ball and the top of the flange. Then after wear has taken place a readjustment is necessary in order to make the chairs fit. To do this, the chairs must be drawn toward the rail a considerable distance in order that the top will move upwardly sufficiently to bring the chair in engagement with the ball of the rail. Obviously when this upward movement of the chair takes place the part below the rail cannot move upwardly. The essence of my invention consists in providing a part in the chair, at or near the corner thereof, inclined outwardly away from contact with the edge portion of the rail, so that the top portion of the chair may move upwardly while the under portion of the chair moves inwardly only without tilting either of said parts from its former position.

I claim as my invention—

1. A railway-rail chair made of a single piece of yielding material, shaped to engage a rail only at the under portion of the ball, and the top and bottom of the flange, to be capable of movement or readjustment toward the web of the rail, and having a part thereon inclined away from said flange to such a degree as to permit the part of the chair above the flange to move vertically when drawn toward the web, without tilting out of vertical alinement, and to permit the part below the flange to move horizontally toward the center of the rail without inclining from its horizontal position.

2. A railway-rail chair, made of a single piece of yielding material, and shaped to engage the under surface of the ball of the rail at some distance from the web of the rail, and to engage and lie parallel with the top surface of the flange, then extended outwardly from the edge of the flange, then downwardly below the under surface of the rail and finally upwardly to engage the under surface at or near its central portion, for the purposes stated.

3. A railway-rail joint, comprising in combination, a rail having the under surface of the rail-ball and the top surface of the rail-flange oppositely inclined at different angles, and two chairs on opposite sides of the rail, each having a vertical part with its top and under surfaces at the same angle of inclination as the parts of the rail where they engage,

and each having an integral portion to project away from the edge of the flange, then downwardly below the flange, and finally inwardly and upwardly to engage the base of the rail, substantially as and for the purposes stated.

4. The combination of a railway-rail having the central portion of its base bulged downwardly and the top surface of its flange inclined upwardly toward the web, and a two-part chair, one part being on each side of the rail and each made of yielding material and shaped to lie parallel with the under surface of the ball, the top surface of the flange and to touch the bulged portion only of the under surface of the rail, for the purposes stated.

WILLIAM F. GOULD.

Witnesses:
F. C. STUART,
THOMAS G. ORWIG.