J. K. BOYD.

COMPOUND RAIL.

APPLICATION FILED APR. 7, 1920.

1,346,394. Patented July 13, 1920.

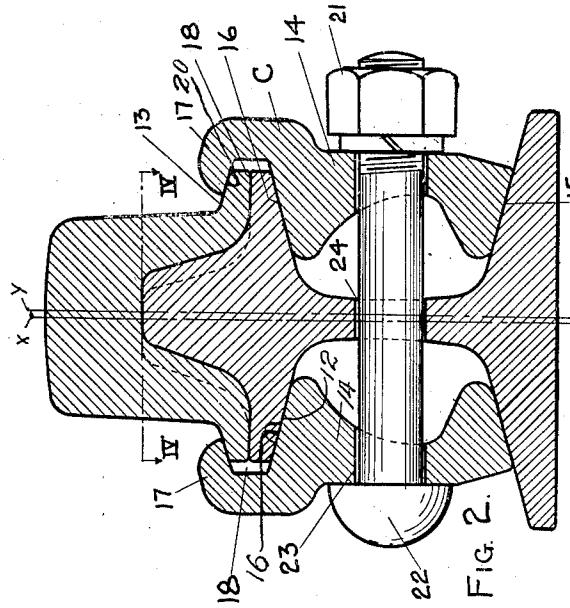


FIG. 2.

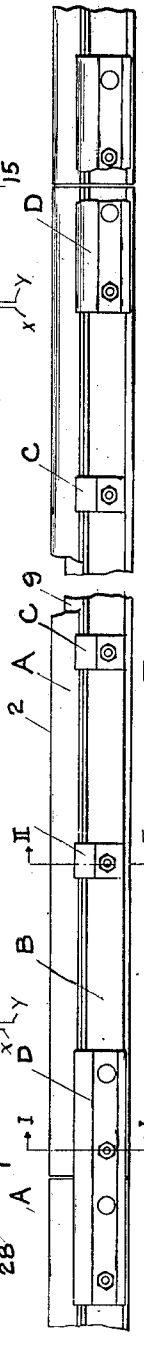


FIG. 3.

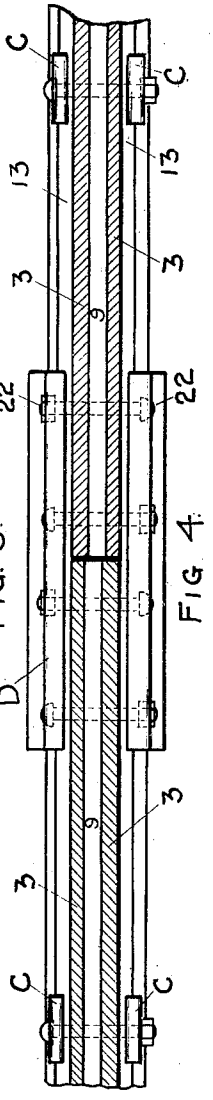


FIG. 4.

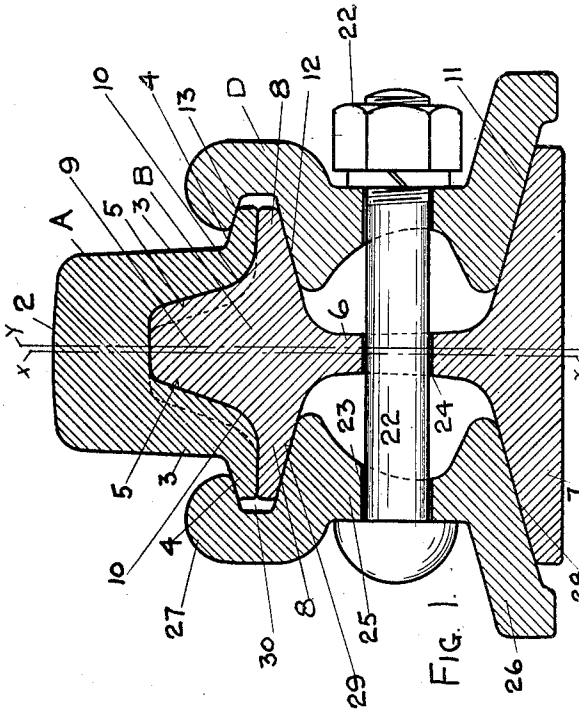


FIG. 1.

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COMPOUND RAIL.

1,346,394. Specification of Letters Patent. Patented July 13, 1920.

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To all whom it may concern:

Be it known that I, JAMES K. BOYD, a citizen of the United States, and resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Compound Rails, of which the following is a specification.

My invention relates to the construction of rails used in building the tracks of electric, steam and similar railways, and is an improvement in the construction of rails of the general class shown in my prior Patent No. 1,265,422, dated May 7, 1918.

The weight of the rolling stock of railways has enormously increased in recent years, while the strength and durability of the track rails, although being constantly increased in size, has not kept pace with the increase in the loads sustained by the rails. One reason for this is because of the impossibility of increasing the size of the head of the track rails and at the same time to "work" the metal of the rail head to the extent necessary to make the steel dense enough to have the desired wearing qualities with existing mill equipment.

In the use of compound rails it is found that the rail heads tend to creep lengthwise on and relative to the girder or base portions of such rails. This creeping action is more marked on straight stretches of railway track and becomes increasingly greater with increase in the size or weight of the loads hauled on tracks built of such rails.

The primary object of this invention is to provide a compound track rail of improved construction, whereby the desired increase in strength, rigidity and wearing qualities is obtained, and whereby the possibility of relative longitudinal movement or "creeping" between the head and girder or base of the compound rails is prevented and overcome.

Another object of the invention is to provide a compound rail having novel means whereby the parts of the rail are assembled and detachably held in assembled relation.

A further object of my invention is the provision of a compound track rail having the novel constructions, arrangements, and combinations of parts shown in the drawings, hereinafter described in detail, and particularly pointed out in the appended claims.

Referring now to the drawings, forming part of this specification, Figure 1 is a sectional end elevation showing a compound rail embodying my invention, the section being taken on the line I—I of Fig. 3.

Fig. 2 is a sectional end elevation taken on the line II—II of Fig. 3.

Fig. 3 is a side elevation on a smaller scale, showing contiguous alined track rails as assembled and joined in constructing railway tracks employing my improved rail.

Fig. 4 is a horizontal section taken on the line IV—IV of Fig. 2, showing the way in which the abutting ends of adjoining rail heads are offset to prevent creeping.

In the accompanying drawings, the head A forming the wearing surface of my improved compound rail is shown supported upon the flanged base or girder B of the rail, being fastened to the girder by means of clamping members formed by the clips C and head clamping splice bars D.

The rail head A comprises a wearing surface 2 having integrally formed marginal flanges 3—3, the lower ends 4—4 of the flanges 3—3 being turned outward, substantially at right angles to the other part of these flanges, and the flanges 3—3 forming a groove in the under surface of the head A, the so-formed groove having inwardly inclined or converging side surfaces 5, as is clearly shown in Figs. 1 and 2. The vertical axis Y—Y of the groove is offset from a vertical plane X—X midway in the overall width of the head, as is shown in Figs. 1 and 2, the groove being formed in this way for a purpose to be explained later.

The girder or stringer B of the rail comprises a vertical web 6 having oppositely extending bottom flanges 7—7 and oppositely extending top flanges 8—8 at the edges thereof.

An integral projection or ridge 9 is provided on the girder B above the flanges 8—8, this projection having inwardly and upwardly sloping side surfaces 10—10 and having a contour which preferably is made to neatly fit within the recess or groove in the lower face of the rail head A, and have a surface contact therewith. (See Figs. 1 and 2).

The vertical axis Y—Y of the projection 9 on the girder B and interfitting groove in the lower face of the head A is not coincident with the parallel vertical axis X—X of the girder B, but is slightly offset therefrom, although the outer side surfaces of

both the head A and girder B are symmetrical about the vertical axis X—X of the assembled rail, as will be seen in Figs. 1 and 2.

The flanges 7 and 8 of the girder B taper, the sloping upper surface 11 of the bottom flanges 7 and under surface of the top flanges 8 being inclined at opposite angles to provide the clearance necessary in the rolling operations. The ends 4—4 of the flanges 3 on the rail head A also taper, the sloping upper surface 13 thereof being inclined and extending in a plane parallel to the plane of the upper surfaces 11 of the bottom flanges 7.

The clamping clips C by which the rail head A is detachably secured in place on top of the girder B have a web 14 whose end or girder engaging surfaces 15, 16, are oppositely inclined at the same angle as the upper surface 11 of the bottom flanges 7 and under surface 12 of the top flanges 8 of the girder B, and the upper edge of the web 14 has a bent flange 17 which coacts with the surface 16 of the web 14 in forming a double taper groove 18. The sloping side surfaces 16 and 20 of the grooves 18 are oppositely inclined and extend in planes parallel with the surface 13 of the rail head A and surface 12 of the girder flanges 8. The grooves 18 are made deep enough to permit of adjustment so as to tightly wedge the head A in place on the girder B when the nuts 21 are tightened on the fastening bolts 22. Registering holes 23 and 24 are provided in the web of the clips and rail girder B for the bolts 22.

The clamping splice plates D have a web 25 with a foot 26 on one and a flange 27 on the other edge thereof. The sloping surfaces 28 and 29 of the splice plates D (like the corresponding surfaces of the clips C) are oppositely inclined, and have an included angle the same as that between the surfaces 11 and 12 of the girder B.

The flange 27 on the upper edge of the splice plates D is bent to form a double taper groove 30, being formed in the same manner as the groove in the clips C, and for the same purpose, and registering holes 23, 24 are provided in the web of the splice plates D and girder B for the fastening bolts 22, these bolts being held in place by nuts 22′.

The splice plates D, as will be seen in Figs. 3 and 4, are of sufficient length to provide for two bolts for each end of abutting rail girders, while the clips C preferably are comparatively short, and of only sufficient length to receive one clamping bolt. It will be obvious, however, that they may be made longer when found desirable or necessary. The clamping splice plates D fasten the rail heads A to the girders B adjacent to the abutting ends of adjoining girders, and a series of the clips C will be employed to fasten the head to the girders at separated points between the splice plates D located at the opposite ends of the girders.

It will be noted that the surfaces 15 and 28 of the clips C and splice plates D, respectively, bear on the upper inclined surfaces 11 of the bottom flanges 7 of the girder B, and that the loads put upon the rail head will be transmitted through the clips and splice plates to the bottom flanges of the rail and, through the bottom flanges 7, to the ties supporting the track rails.

The spacing of the bolt holes 24 in the web of the rail girder preferably will be a multiple of the distance between the bolt holes 23 in the splice plates D. Arranging the holes in this manner adapts a pair of the splice plates D to be applied to the rail to temporarily fasten together the ends of a broken rail girder or rail head by substituting a pair of splice plates D for two or more of the clamps C.

The heads and girders of the rails preferably will be of equal length and will be assembled so that the joints between the ends of the rail heads will be in the same transverse vertical plane as the joints between the ends of the girders. At suitably spaced intervals in the length of the track formed by these rails, a rail girder and its head will be turned end for end so as to bring the axis Y—Y of the groove in the rail head on the opposite side of the axis X—X of the adjoining rails. This, as is shown in Figs. 1 and 2, offsets the projection 9 on one rail relative to the projections 9 of the adjoining rails, and causes the ends of the rail heads to engage with the ends of the projections 9 on the rail girder and base so as to positively prevent "creeping" or relative lengthwise movement of the rail heads on the girder or base. While ordinarily it is only necessary to offset or reverse only one of a considerable number of rails in order to prevent creeping, the alternate rails of the track may be reversed when considered advisable or necessary.

The advantages of my invention will be appreciated by those skilled in the art. The head and the girder of which the rail is formed, are designed so as to be readily rolled, the contacting surfaces between the head and girder are of a contour which enables the parts to be made within the usual working limits and at the same time provide a slight "draw" on the parts in tightening the clamps and clamping splice plates on the rail, and creeping of the rail heads on the girder or bases of the rails is avoided, and is positively prevented without the use of additional parts.

The composition of the metal in the head, which may be different from that in the base or girder can be ordinary rail steel or of high carbon, alloy, or heat treated steels, of a quality not possible to use with ordinary T rails. The girder may be made of any grade of steel that affords the necessary

strength and elasticity without taking into account the wearing qualities, as is necessary in an integrally formed rail.

Modifications in the construction and arrangement of the parts may be made without departing from my invention as defined in the appended claims.

I claim:—

1. In a compound rail, the combination of a rolled steel girder, said girder having a web and top and bottom flanges with a longitudinal ridge extending above the top flanges, said ridge having upwardly converging sides, an integrally formed rolled steel head on top of said girder, said head having a longitudinal groove in the bottom thereof of the same contour as said ridge, and the vertical axis of said ridge and groove being offset with respect to the vertical axis of said girder, and means for detachably securing said girder and said head together.

2. In a compound rail, the combination of an integrally formed girder, said girder having a web and top and bottom flanges with a longitudinal ridge extending above the top flange, an integrally formed head having a groove in the bottom surface thereof, the vertical axis of said ridge and said groove being offset with respect to the vertical axis of the web of said girder, and means for securing said head to said girder.

3. In a compound rail, the combination of a girder member and a head member, said girder and head being so constructed and fitted that the head of one rail will abut the girder of the next adjoining rail to prevent creeping of said head relative to said girder.

4. In a compound rail, the combination of a girder member and a head member, detachably secured together, said girder and head being so constructed and fitted that the end surface of the head of one rail will abut the end surface of the girder member of an adjoining rail to prevent creeping of said head with relation to said girder.

In testimony whereof I have hereunto set my hand.

JAMES K. BOYD.