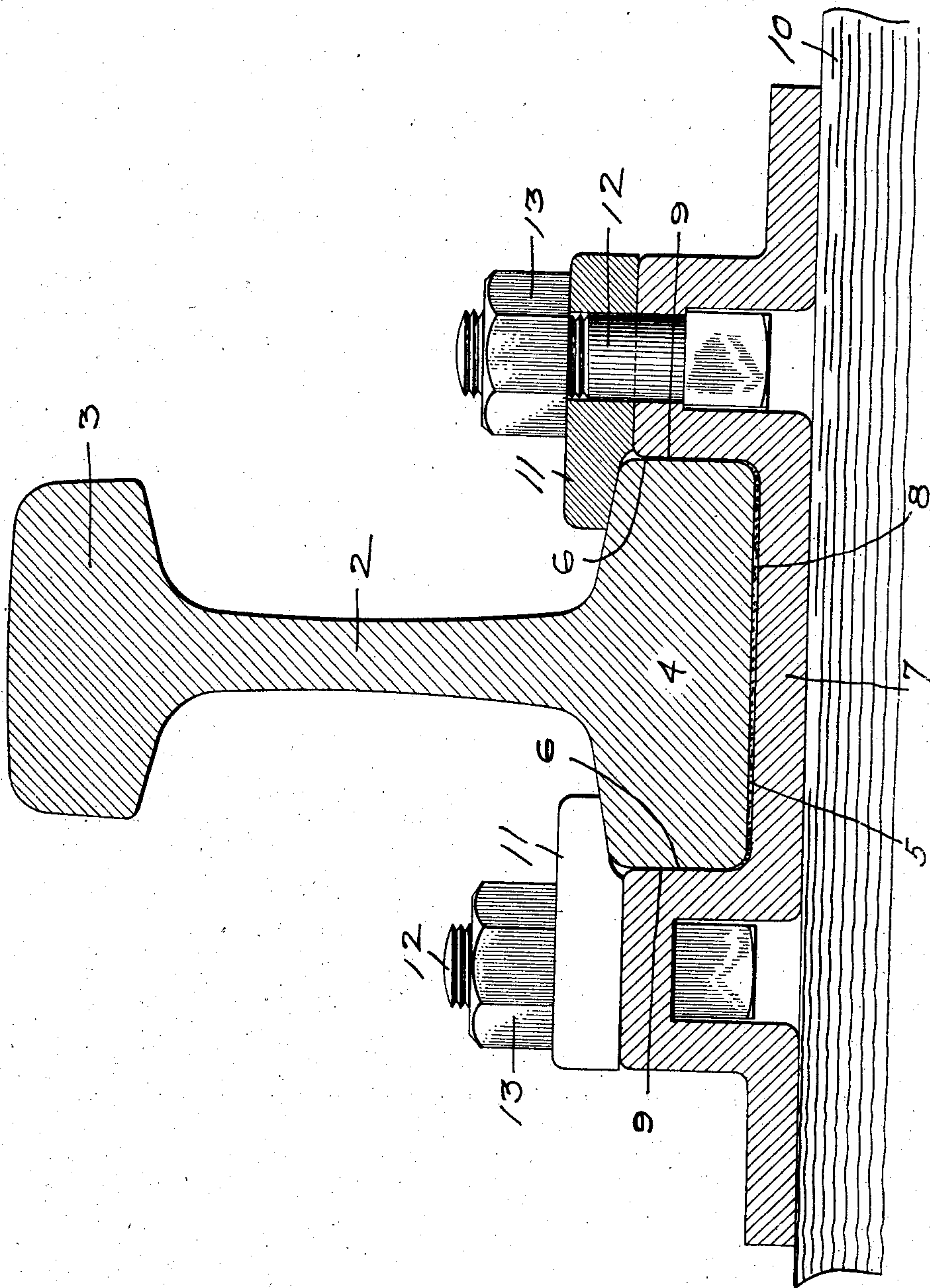


No. 835,063.

PATENTED NOV. 6, 1906.

W. GOLDIE.  
RAILROAD RAIL.  
APPLICATION FILED APR. 24, 1905.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM GOLDIE, OF WILKINSBURG, PENNSYLVANIA.

## RAILROAD-RAIL.

No. 835,063.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed April 24, 1905. Serial No. 257,137.

*To all whom it may concern:*

Be it known that I, WILLIAM GOLDIE, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Railroad-Rails; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to railroad-rails, its object being to provide a rail of the highest practicable degree of stiffness to sustain the loads to which the tracks are now subjected through the increased weight of locomotives, cars and the loads carried therein, and the increased speed of trains.

The practically universal practice in the making of railroad-rails has been to form the rail with a larger volume or bulk of metal in the head than in the base, the idea being that the head wears under the traffic and that provision is made for such wear by increasing the bulk of metal in the head. The rail of the present invention embodies a radically different principle and one which is believed to greatly increase the stiffness and strength of the rail as well as its wearing qualities.

It consists, generally stated, in a railroad-rail having a web portion, a head, and a rail-base, the rail-base containing a larger portion of metal than the head and having thick vertical edge portions, such rail thus providing greater strength in the lower or tension member of the girder than in the upper or compression member thereof, which is believed to be the true principle of construction in carrying heavy loads and imparting stiffness to the rail for that purpose, while the larger bulk of metal in the rail-base will cool more slowly, and therefore anneal to greater extent, than the metal in the head, so that a harder steel may be employed in the rail-body without fear of cracking in use, and therefore a rail of greater wearing qualities be obtained.

It also consists in a rail having a head, web portion, and base, the body of said base being formed with practically rectangular thick edge portions, and combining with the same a rail-supporting chair or base-bar having a practically rectangular seat corresponding in shape to said rail-base and adapted to receive the same, so that when the square-based rail rests in the rectangular seat of the support it cannot be forced from such seat by lateral pressure or strain, and the rail and support form practically one combined rail, which, through the support can have a wide bear-

ing upon the tie, and so distribute the load thereon.

The accompanying drawing shows a vertical cross-section of a rail embodying my invention. The rail shown in the said drawing has the web portion 2, the head portion 3, and the base portion 4. The head portion 3 is illustrated in the figure as of the standard width, though reduced somewhat in thickness to increase the rapidity of cooling the same after rolling. It may be formed of any suitable section.

The rail-base 4 is made of any suitable section, the preferred section being illustrated, the rail-base having the flat lower face 5 and the vertical edge portions 6, forming a practically rectangular rail-base, as illustrated. The rail-base 4 contains a greater body or bulk of metal than the rail-head 3, the relative bulk of metal in the rail-base being increased according to the desired stiffness in the rail-body, the bulk of metal in the rail-base being at least ten per cent. more than the bulk of metal in the rail-head and such relative bulk being increased as found desirable. For this purpose and to properly distribute the metal in the rail without materially increasing its weight it will be seen that the rail-head, as illustrated, is reduced somewhat in thickness, while the rail-base itself is reduced considerably in width and the bulk of the metal thus taken from the rail-head and obtained by reduction in width of the rail-base with suitable addition thereto is concentrated in the thick narrow rail-base in such way as to provide a rectangular thick base forming the lower chord or tension member of the girder, which necessarily carries the great body of the weight of the passing train.

As illustrated in the drawing, showing the full-sized rail, the rail-base is made about an inch thick in its edge portions and over an inch thick in the central portions thereof, while the body of the rail-base is about three inches in width, such proportions being considered about correct for a rail of about eighty pounds to the yard.

The rail above described may be secured to the ties in any suitable way, and when so secured in place and properly supported it is evident that the track formed will have much greater stiffness than the rail of standard section, because of the relative increase in bulk of metal in the lower or tension member of the girder to which the load carried on the upper or compression member thereof is



transmitted. Such stiffness is increased as the relative amount of metal in the rail-base is increased, if properly distributed. A rail of the above construction can also be formed with greater wearing qualities than a rail of standard section in proportion to the percentage of carbon, manganese, or other hardening elements, and the proportion of such hardening elements in the steel from which the rail is formed can be increased. This advantage is obtained from the fact that in the cooling of the rail as rolled the head will cool more rapidly than the base, and the more rapid the cooling of the head the greater the hardness of the surface metal thereof, while as the base cools more slowly on account of the greater body of metal therein and the distribution of the metal to give a narrow thick form of rail-base such rail-base will become annealed, and thereby increased in toughness and strength to withstand loads, and instead of there being liability of the cracking of the edges of the base under the shocks and blows of the passing train such annealed rail-base thus becomes an element of relatively greater strength therein, making it possible to employ a steel of higher wearing qualities, and so obtain greater wearing qualities in the rail-head.

As above stated, I prefer to employ a rail-base with thick vertical or practically square edge portions. Such form of rail-base has special advantages when employed in connection with a suitable form of rail-supporting chair or base-bar, which will envelop the rail-base and sustain the same against lateral strain. In the accompanying drawing I have illustrated such a rail-support 7, which may either have the form of separate chairs to be secured to the ties or of a continuous underrunning base-bar, as described in an application of even date herewith, Serial No. 257,138. It will be seen that this rail-support has a seat corresponding in shape to the rail-base, having a flat base 8 and vertical side walls 9, into which the rail-base fits. As the rectangular rail-base is thus enveloped by the correspondingly-formed rail-support and the support secured to the rail-tie 10, it is evident that because of the angular connection between rail and support it is impossible to turn the rail-base in the seat of the support, and hence no side pressure upon the head of the rail can force

the rail out of the seat in the support, and the rail and support become in practical effect a combined rail. As the support can be made of any desired width, the load upon the rail is thus distributed over a large surface upon the tie, and cutting or wear of the tie through lateral strains upon the rail is thus largely overcome. For precautionary purposes the rail may be secured in the support by means of suitable fastening devices, such as clips 11, held in place by suitable bolts 12 and nuts 13. When the improved rail is employed with the underrunning base-bar having a seat enveloping the head, as above described and as described in said application of even date herewith, Serial No. 257,138, it is evident that the stiffness of the track is still further increased through the body of the base-bar and the vertical portions thereof, which form stiffening-ribs.

What I claim is—

1. A railroad-rail having a web portion, a head, and a base, the rail-base containing a larger portion of metal than the head and having thick vertical edge portions.
2. A railroad-rail having a web portion, a head, and a base, the rail-base being made narrow and thick and containing a larger portion of metal than the head.
3. A railroad-rail having a web portion, a head, and a base, the rail-base being formed practically rectangular in cross-section and having a larger portion of metal than the head.
4. The combination of a railroad-rail having a web portion, a head and a base, the rail-base being formed with thick vertical edge portions, and a rail-support having an angular seat corresponding in shape to said rail-base and adapted to receive and envelop the lower face and edge portions of the same.
5. The combination of a railroad-rail having a web portion, a head and a thick rectangular base, and a rail-support having a rectangular seat adapted to receive and envelop the lower face and edge portions of the square rail-base.

In testimony whereof I, the said WILLIAM GOLDIE, have hereunto set my hand.

WILLIAM GOLDIE.

Witnesses:

JAMES I. KAY,  
ROBERT C. TOTTEN.