

F. E. CRANDAL.  
CAR WHEEL.

(Application filed Feb. 6, 1902.)

(No Model.)

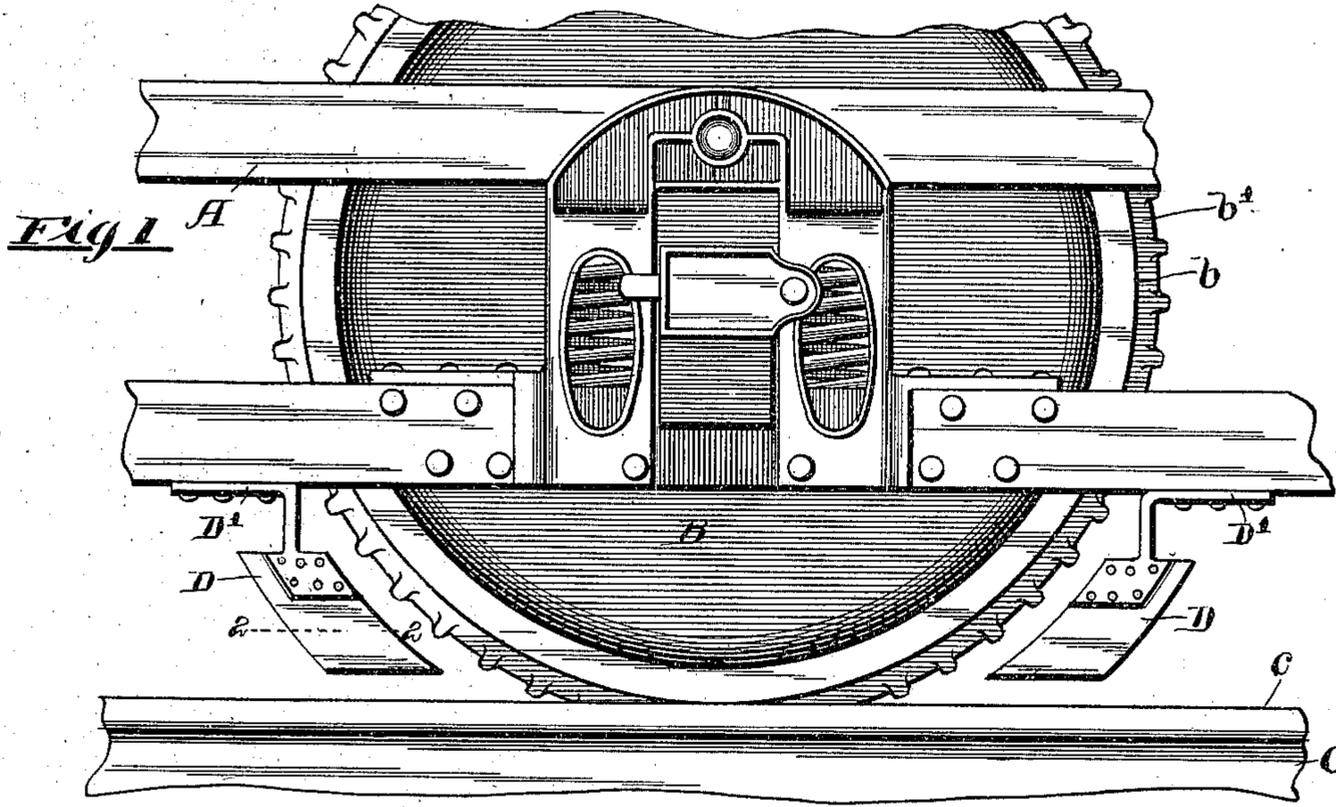


Fig 1

Fig 4

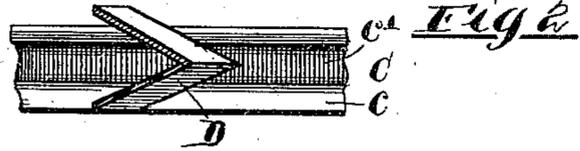


Fig 2

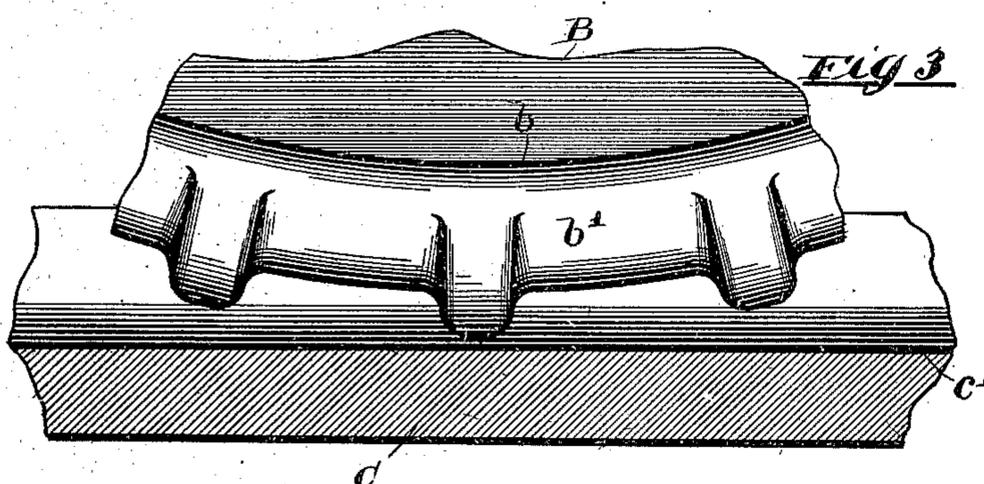


Fig 3

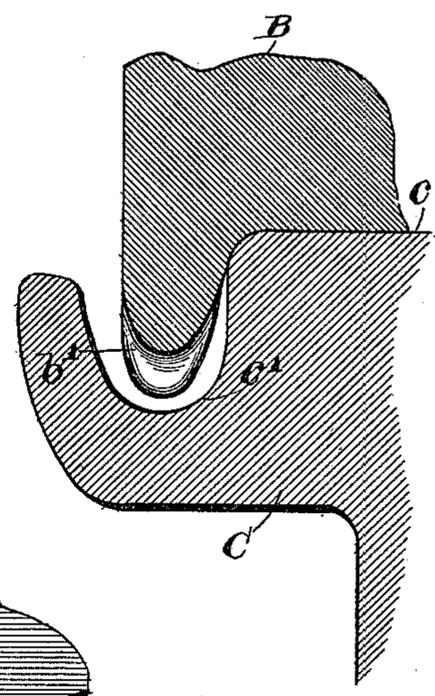
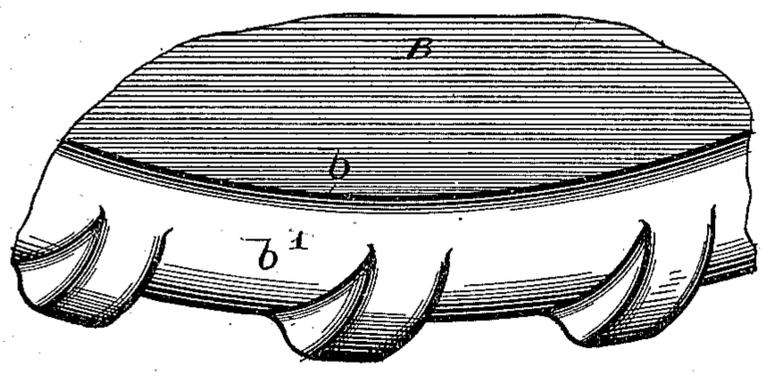


Fig 5



Witnesses:  
 Carl H. Crawford  
 William H. Hall

Inventor:  
 Frederick E. Crandal  
 by Poole & Brown  
 His Attorneys

# UNITED STATES PATENT OFFICE.

FREDERICK E. CRANDAL, OF CHICAGO, ILLINOIS, ASSIGNOR OF THREE-FIFTHS TO WILLIAM B. EWING AND JOHN A. MURPHY, OF LAGRANGE, ILLINOIS.

## CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 709,208, dated September 16, 1902.

Application filed February 6, 1902. Serial No. 92,890. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK E. CRANDAL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved construction in car-wheels, the same being more especially adapted for use in connection with the wheels of street-cars and in cases where the wheels are used in connection with grooved track-rails.

In the construction of street-railways the employment of grooved rails is preferred, especially in cities, because such rails interfere much less with ordinary vehicle traffic than do the ordinary or flange rails having a single raised tread on which the wheels rest. The use of grooved rails has, however, been found objectionable by reason of the fact that mud and dirt from the street-surface accumulate in the grooves, and the removal thereof involves a considerable expense. Moreover, the mud or dirt which accumulates in the grooves unless very frequently removed by becoming packed solidly therein tends to lift the tread portions of the wheels from the rails, so that the wheels run on their flanges. This is exceedingly objectionable in the case of electric rails of that class in which the current is returned through the rails because of the resistance to the passage of the current from the wheels to the rails.

The object of the invention is to provide a construction in the car-wheels whereby the parts of the flanges thereof which extend into the grooves of the rails act by loosening or displacing the mud or dirt accumulating in the grooves to prevent the solidification or packing of such mud or dirt therein.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claim.

As shown in the accompanying drawings, Figure 1 is a view in side elevation of part of a car-truck, together with a car-wheel, made in accordance with my invention. Fig. 2 is

an enlarged section taken through one of the grooved rails and the rim of a car-wheel resting thereon. Fig. 3 is a face view, much enlarged, of a portion of the wheel-rim. Fig. 4 is a view similar to Fig. 3, showing a modified construction in the wheel-rim. Fig. 5 illustrates a modification of the arrangement of the clearing-teeth.

As shown in the said drawings, A indicates the car-truck, and B a car-wheel such as is used for street-cars.

C indicates one of the rails of a railway-track, said rail being of a grooved form having an elevated part or tread *c* and a depressed or grooved part *c'*. The wheel B is provided with the usual tread portion *b* and flange *b'*, which latter when the wheel is resting upon the rail extends downwardly into the groove *c'* of the rail in the usual manner, as clearly shown in Fig. 4.

In the wheel illustrated as embodying my invention the flange of the rim is not smooth, as is usual in car-wheels, but is provided with a plurality of transverse grooves or depressions with intervening ribs, teeth, or elevations, the same extending transversely across the edge of the rim, either at right angles thereto or at an oblique angle. As preferably arranged and as shown in the drawings, the ribs are spaced apart a distance somewhat greater than their width and are made of the greatest length or deepest at their middle parts and are tapered or gradually lessened in height in their parts which extend inwardly at the inner and outer faces of the flange. The teeth or projections are also preferably made rounded at their edges and where they join the surface of the wheel-flange. As preferably constructed, moreover, said ribs extend inwardly on the inner face of the flange to or near the concave portion of the flange which bears against the inner edge of the rail, so that the flange will have a smooth or continuous bearing-surface for contact with the inner edge of the rail. The particular disposition and spacing of the teeth illustrated is not, however, essential, and said disposition may be varied and the teeth spaced at a less or greater distance apart as may be found expedient or desirable in practice. For instance, in Fig. 5 the teeth are

not radially arranged as in Fig. 3, but are inclined with respect to radial lines extending from the centers of said teeth to the hub of the wheel. The result obtained by the employment of teeth or projections with intervening spaces or notches on the periphery of the wheel-rim is that of preventing the compacting of the mud or dirt in the rail-groove, and thereby facilitating its removal either through the action of the wheel-flanges which enter the grooves or otherwise—that is to say, while a smooth flange will press the mud or dirt downwardly into the groove and will finally ride over or upon the compacted mass therein a toothed flange will tend to break up or loosen the material in the groove and by the action of its teeth or ribs to a greater or less extent dislodge the same. In this connection it is to be noted that a notched or toothed wheel-flange entering the groove of the rail will to some extent tend to lift from the groove the material therein. This will be understood from consideration of the fact that with respect to the point of contact of the tread of the wheel with the rail the part of the rim below the point of contact will move rearwardly as the wheel turns. As a consequence there is in fact a rearward sweeping or scraping movement of the edge of the rim which in case said edge is toothed or notched will tend to drag upwardly with it loose dirt or material from the rail-groove, and when the wheels revolve very rapidly the toothed or notched surface is liable to so dislodge or throw out a considerable portion of the material within the groove.

A special advantage gained by the use of transverse ribs of the special form described is that ribs of this form do not materially lessen the strength or durability of the flange

nor interfere with the smooth running of the wheel on the rail.

In connection with the wheel made as described I have provided upon the car-truck guards or deflectors D, extending partially beneath the wheel rim or flange thereof at both sides of the wheel and made inclined or oblique, so that any dust or dirt falling from the rim upon the said deflectors will be thrown thereby at one or both sides of the rail and prevented from reëntering the groove. The deflectors D D illustrated are made to incline in both directions from the center line thereof, or, in other words, are of V shape in cross-section; but this particular feature of construction is manifestly not essential and the deflectors may be arranged to discharge at either side of the rail as desired. The deflectors D D shown are attached by means of a supporting-bar D' to a part of the car-truck above the same.

I claim as my invention—

A wheel for railway-cars, the flange of which is provided with transverse ribs which extend inwardly from the periphery of the flange along the inner and outer faces of said flange, and which are made of greatest length at the periphery of the flange and of gradually lessening height or tapered at their end portions which so extend inwardly at the inner and outer faces of the flanges.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 22d day of January, A. D. 1902.

FREDERICK E. CRANDAL.

Witnesses:

C. CLARENCE POOLE,  
WILLIAM L. HALL.