(No Model.)

W. M. CALDWELL & J. BEWSHER.

RAILWAY TRACTION SYSTEM.

No. 574,599. Patented Jan. 5, 1897.

Fig. 1.

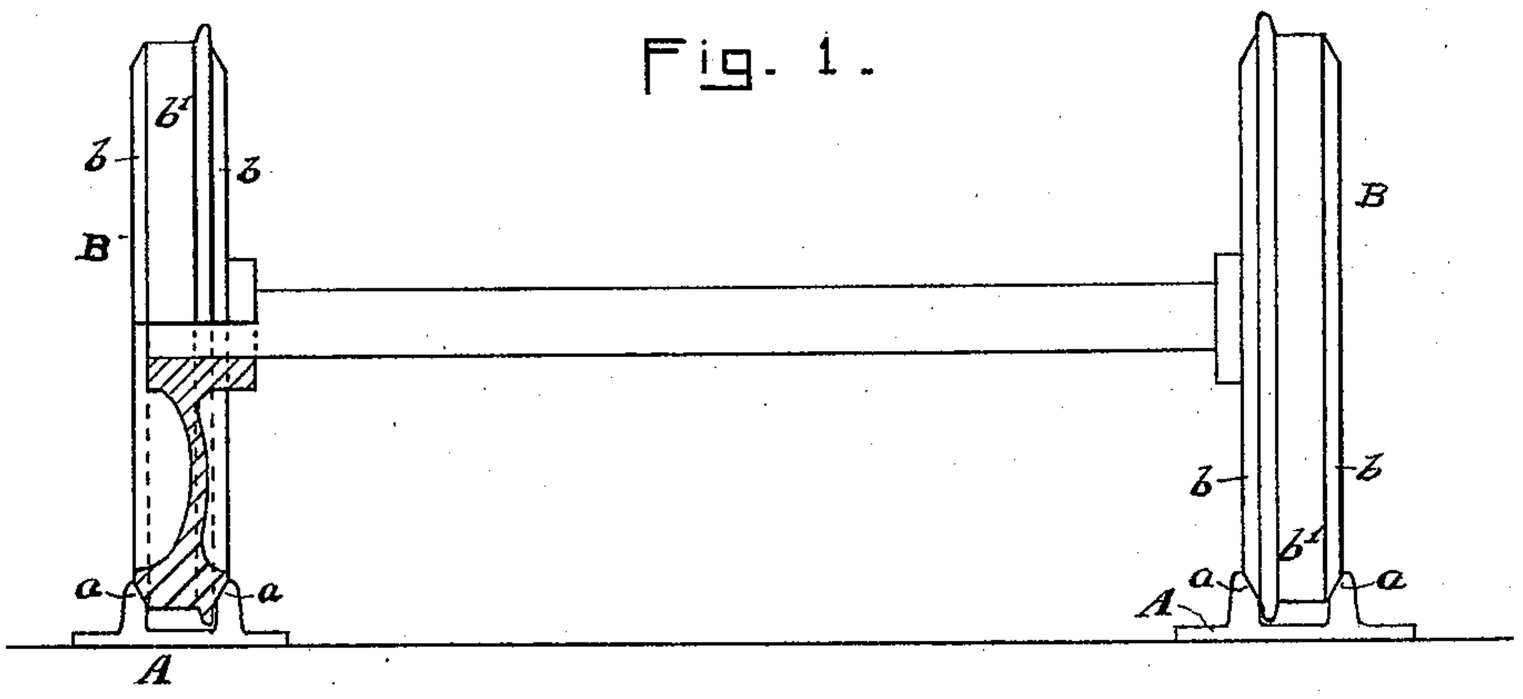

Fig. 2.

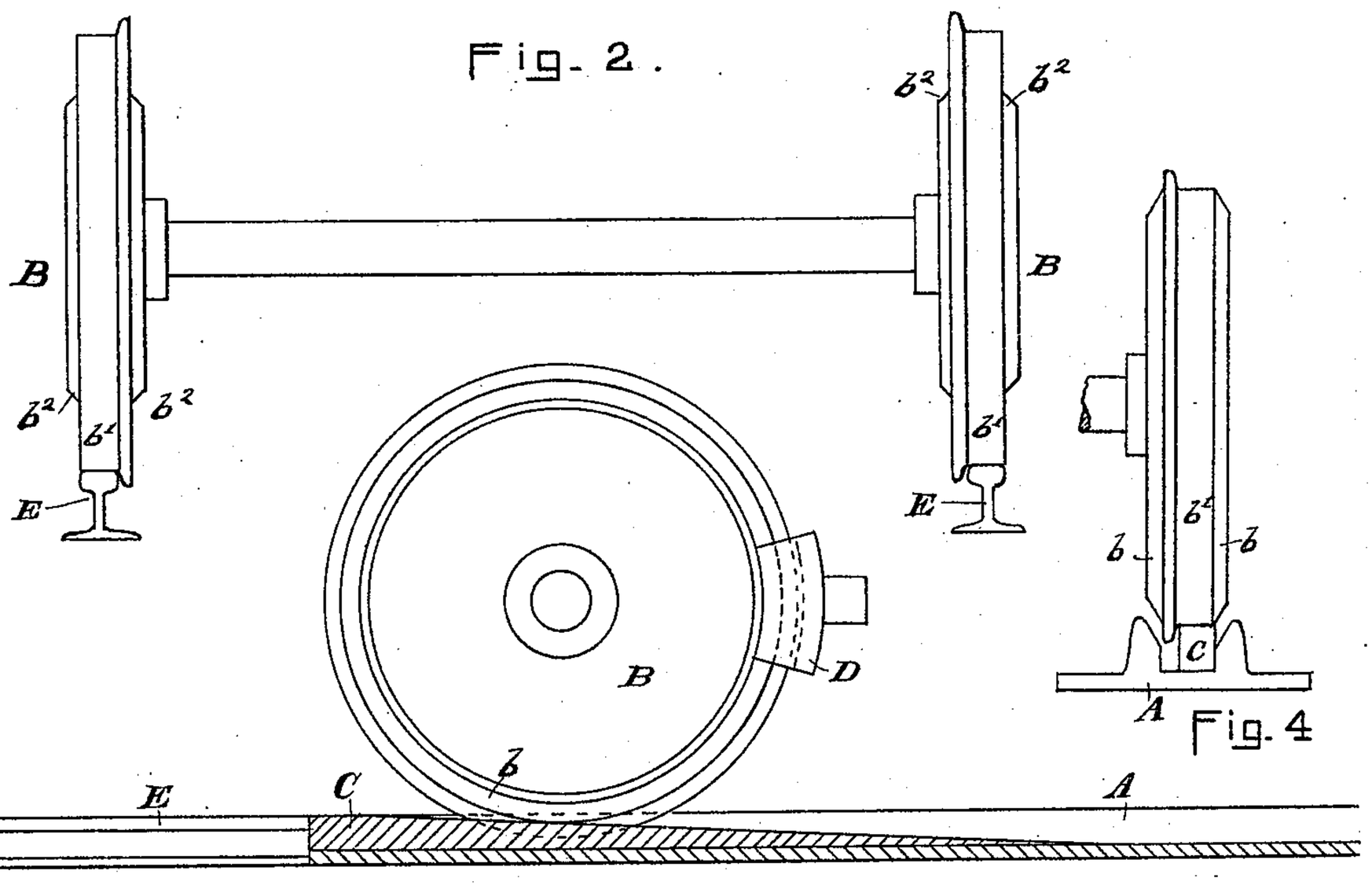

Fig. 4

Fig. 3.

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UNITED STATES PATENT OFFICE.

WELLON M. CALDWELL AND JAMES BEWSHER, OF SEATTLE, WASHINGTON.

RAILWAY TRACTION SYSTEM.

SPECIFICATION forming part of Letters Patent No. 574,599, dated January 5, 1897.

Application filed May 18, 1896. Serial No. 591,905. (No model.)

To all whom it may concern:

Be it known that we, WELLON M. CALDWELL and JAMES BEWSHER, citizens of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Railway Traction Systems; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in traction systems or means by which a greater tractive power may be communicated from the wheel to the rail than is possible by the usual methods.

It consists, essentially, of a grooved rail having the inner surfaces of the sides at an angle with each other and a corresponding wheel having beveled surfaces which fit between the sides of the rails and by reason of their wedge shape have a stronger frictional contact than is possible on a rail having a level top bearing-surface.

It also consists of the means by which the same wheels may be run upon ordinary rails and the transfer from one style of rails to the other made without jar.

Figure 1 represents a pair of car-wheels resting upon the rails, both being of our improved style. Fig. 2 is a pair of wheels resting upon common T-rails and showing the beveled surfaces as considerably smaller in diameter than the wheel-tread. Fig. 3 is a side view of a wheel, showing the manner of passing from the grooved to the common rail, the grooved rail being shown in longitudinal section. Fig. 4 is an end view of the same.

In locating railways, especially street-railways, it is often necessary or desirable to include in the route hills which are impossible of being operated by ordinary traction or so steep as to make their operation in this manner very difficult and hazardous. The object of our invention is to enable such grades to be safely operated with the ordinary motive power by increasing the frictional grip of the wheel upon the rail. This is accomplished by making the rail trough-shaped, with the inner surfaces of the sides converging toward the bottom on a regular angle and by making the outer portion of the wheel to fit between these surfaces and be wedged between them, thus increasing the normal pressure and the friction.

The wheels B are provided with a tread b' and flange the same as an ordinary wheel, so that they may be run on any style of rail now ordinarily in use. This is shown in Fig. 2. It is intended to use the ordinary rails in this manner for such parts of the line as can be satisfactorily worked in this way. Upon such portions where the grade is too heavy to be operated thus the grooved rails A, similar to those shown in Fig. 1, will be laid. The angle of the surfaces a may be anything found desirable under the circumstances of each case. We have shown it as sixty degrees with the horizontal in Fig. 1.

Until the hill is reached the system is operated exactly as an ordinary railway, the bearing of the wheel upon the rail being upon the ordinary tread. When the hill-section and the grooved rails are reached, however, the wheels run off of the common rail and into the groove of the grooved rail. The wheel is then supported entirely by the bearing of the conical tread-surfaces b upon the sloping sides a of the rail, the groove in the rail being deep enough to prevent any bearing upon either the flange or the circumferential tread b' of the wheel. In consequence of the wedging action of the wheels between the sides of the rail the friction is largely increased.

In running from one style of rail to another a frog C, Fig. 3, is used. This consists of an inclined plane or wedge placed within the groove of the trough-shaped or grooved rail and rising to the level of the top of the ordinary rail. If the ordinary rail should be placed lower than the grooved rail, this might not be needed, but where the tops of the two coincide something of this sort is needed. The tread of the wheel runs up or down upon this inclined plane and transfers the wheel easily and smoothly from one style of rail to the other.

In Fig. 2 we have shown the conical bearing-surfaces b^2 as being placed at some distance within the circumference of the wheel. In this case the rail would have to be grooved to a corresponding depth. This will give the motive power a considerable advantage and

increase the pull thereof. We have also shown the conical surface as at an angle of forty-five degrees instead of sixty degrees, as in the other figure. The angle may be made anything desired. The brake-shoes used upon these wheels would be shaped in cross-section the same as the rail, overlapping the sides of the wheel and engaging the conical surfaces thereof, as shown at D, Fig. 3.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a railway traction system, the combination of a trough-shaped rail in which the inner surfaces of opposite sides form a downwardly-converging angle, and an ordinary T-rail with ends abutting said trough-shaped rail, with wheels having a cylindrical tread, a flange, and a beveled tread upon each side the cylindrical tread at an angle to correspond with the angle of the sides of the trough, and an incline placed within the trough-shaped rail and adapted to raise the wheel from engagement with the inclined surfaces, substantially as shown and described.

2. In a railway traction system, the combination of a track composed in parts of a rail adapted to a wheel of cylindrical tread, and in parts of a rail which is trough-shaped having the inner surfaces of opposite sides forming a downwardly-converging angle, with rolling-stock having wheels which have a cylindrical tread and also have a conical tread upon each side of the same and within the circumference, the same being adapted to engage the angular surfaces of the trough-shaped rail, and an incline placed within the trough of one rail and adapted to engage the cylindrical tread on the wheel and raise it to the level of the other rail, substantially as shown and described.

3. The combination of a trough-shaped rail having complementary and downwardly-converging tread-surfaces, and a rail having a horizontal upper tread-surface, with a frog or incline placed within the trough of the first-named rail, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

WELLON M. CALDWELL.
JAMES BEWSHER.

Witnesses:
H. L. REYNOLDS,
THOMAS T. LITTELL.