(No Model.)

A. WATSON.

BRAKE FOR RAILWAYS.

No. 409,536. Patented Aug. 20, 1889.

Fig. 1.

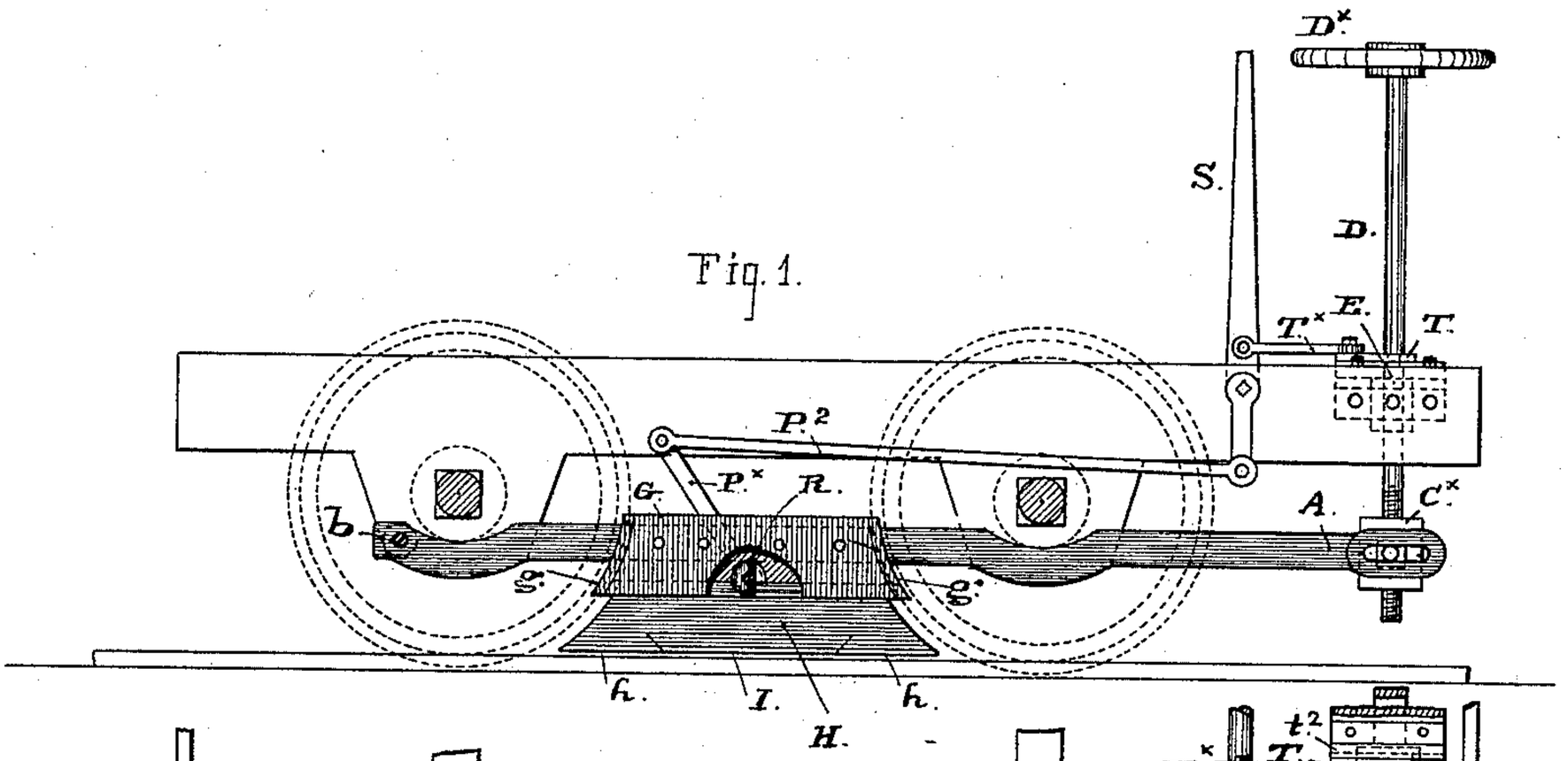


Fig. 2.

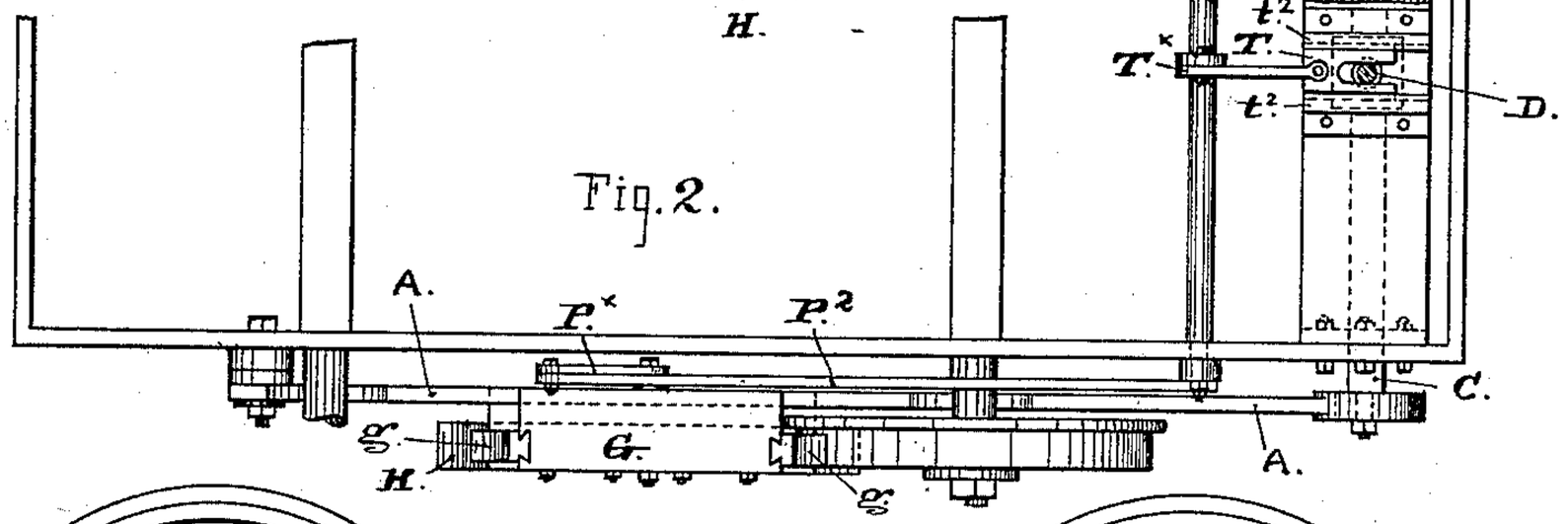


Fig. 3

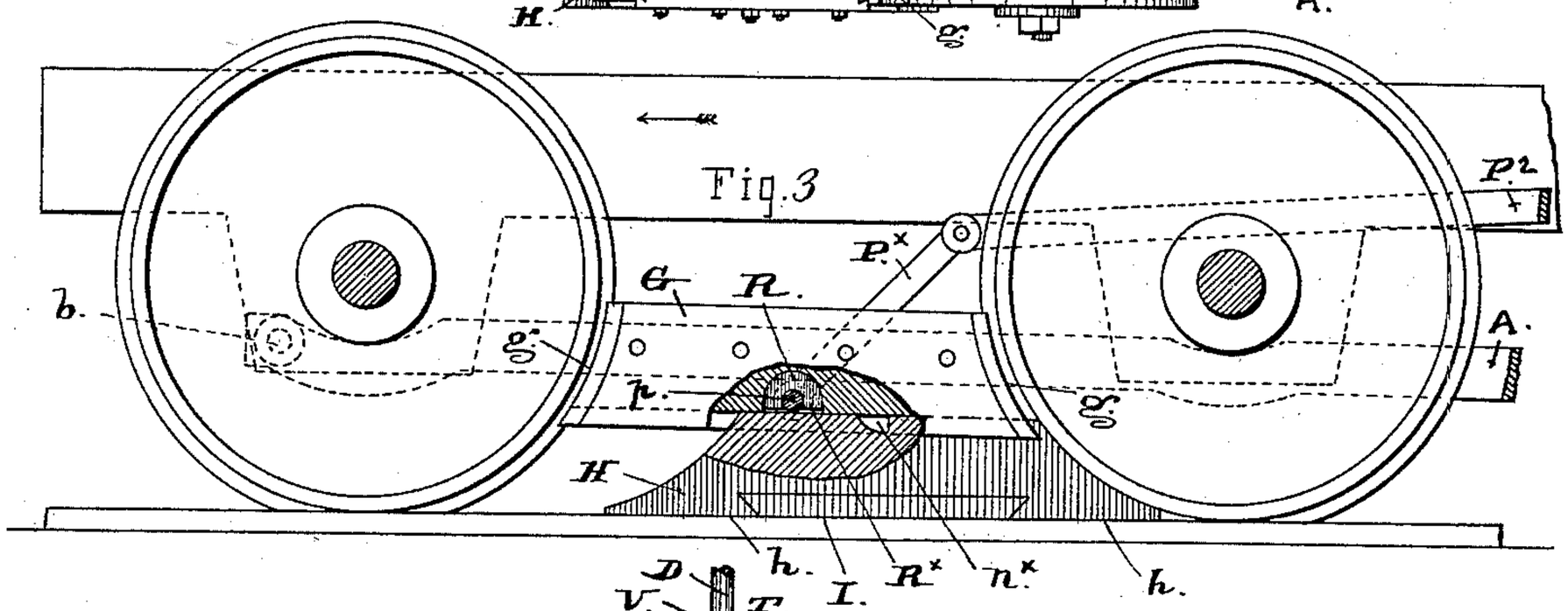


Fig. 5.

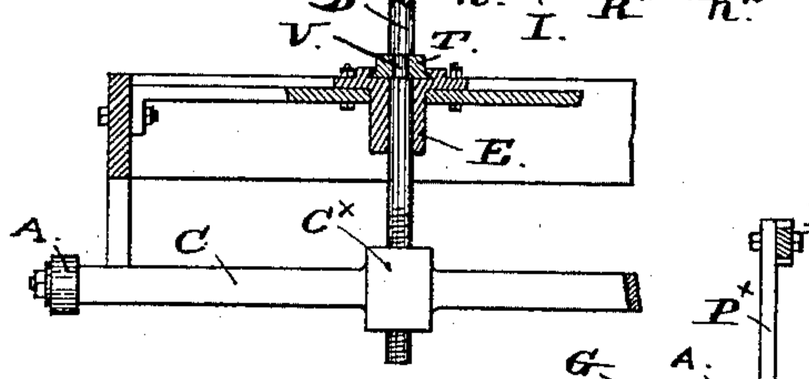
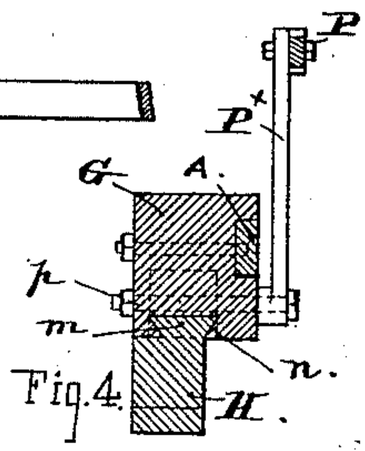


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER WATSON, OF SAN FRANCISCO, CALIFORNIA.

BRAKE FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 409,536, dated August 20, 1889.

Application filed April 10, 1889. Serial No. 306,727. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WATSON, a subject of the Queen of Great Britain, residing in the city and county of San Francisco, and State of California, have invented certain new and useful Improvements in Brakes for Railway-Cars, of which the following is a specification.

My invention has for its object to provide a powerful rapidly-acting brake for cable-railway cars, particularly for use on roads where there are steep grades; and it consists in a certain novel construction and combination of parts and mechanism, as hereinafter fully explained, producing a brake that combines in itself a wheel-brake for ordinary occasions, a track-brake for use where greater power is called for, and a wedge-brake operating both on the wheels and the track through the inertia of the car to block the wheels. Either of these special features and characteristics of the device is brought into action in a rapid manner, as circumstances or emergencies require, by means of suitable mechanism. In connection with the parts forming this brake a novel style of truck-frame for the grip-car or dummy is provided.

The nature of these improvements and the manner in which I proceed to construct and apply them to produce my invention are explained in the following description, wherein the accompanying drawings are referred to by figures and letters. In these drawings is shown a truck-frame for a grip-car, in which the wheels are mounted in boxes without springs to avoid vertical play of the frame, as such movement would interfere with the efficiency of the blocks that act like wedges under the wheels, and instead of being placed at the axle-boxes the springs are interposed between the platform or body and the truck-frame.

No parts of the grip-car above the truck-frame are illustrated, nor is the gripping apparatus shown, for the reason that the same form no part of my present invention and are already familiar in construction and operation to persons skilled in building and running cable roads, and because my improvements can be combined with any style of platform or body.

The truck-frame and the parts of the brakes and mechanism to operate them on both sides at the same time are represented in the drawings in such form as will be clearly understood by the practical mechanic.

Figure 1 shows in elevation one side of a single truck having two axles, between the wheels of which my improved brakes are placed. Fig. 2 is a one-half plan of Fig. 1. Fig. 3 represents the position of the parts when the brake is thrown into action to block the rear wheels. Fig. 4 is a cross-section taken vertically through the parts at the line $x\,x$, Fig. 3; and Fig. 5 is a section through the box or supporting-socket of the screw-shaft.

The figures show the parts only on one side of the truck-frame; but it will be understood that the construction is the same on the opposite side, and that the brake-blocks are therefore applied to both sets of wheels. The description of the parts on one side therefore answers for those on the opposite side as well.

A A are two bars pivoted at $b\,b$ to the sides of the truck-frame between it and the wheels, and from these points of attachment extending in substantially a horizontal direction toward one and the same end of the frame, where they are connected together by a cross-bar C. In the middle of this cross-bar is a nut or threaded socket $c^{\times}$, to take the screw-threaded end of an upright shaft.

D is a screw-shaft, by means of which the frame A A C is moved up and down to work the brakes. It has a hand-wheel $D^{\times}$ on the top for turning it, and it is supported on the frame by the box or socket E, as shown in Figs. 1 and 5 of the drawings.

To each bar A is bolted a brake-block G, having suitably-curved faces $g\,g$, to act against the rims of the wheels, the block being set between the two wheels on the same side of the frame and in such position that the upward movement of the bar A brings the brake shoes or surfaces $g\,g$ at opposite ends against the two wheels simultaneously. A short turn of the screw-shaft serves to throw these wheel-brakes into or out of action.

H H are blocks with curved and inclined faces on the opposite ends and flat bottoms h, with which the curved faces form acute angles, so that the opposite ends of the block are wedge-shaped. These blocks are joined to the blocks G by means of a dovetail groove m in the one and a tongue or rib n, of corresponding shape and size, on the edge of the

other, this mode of attaching one block to the other being employed for the purpose of allowing the block H to slide longitudinally, but at the same time be firmly and stiffly attached to the block G, to the bottom of which it is thus secured. The bottom face *h* of the block H forms a track-brake, and in most cases is provided with a shoe, of wood or rubber I, to receive the principal part of the wear and to increase friction upon the rail. The block is sufficiently deep to set close to the rail and to come in contact with it on the downward movement of the brake-frame. In addition to this feature the block H under each wheel-brake G is made to serve as a wedge-brake between the rear wheel and the track on extraordinary occasions where greater power to stop the car is demanded, for which purpose the bottom block is left free to slide upon the block G, and when dropped down upon the rail is caused to jam in between the thread of the rear wheel and the rail. This action is produced by the friction between the rail and the bottom face of the block in conjunction with the inertia of the car at such time when the wedge-shaped end of the block becomes drawn under and is pressed against the wheel with great force. Except when brought into play these wedge-shaped blocks are locked to the wheel-brakes and are carried up and down with them to serve as track-brakes without independent movement, and to hold them from sliding longitudinally some suitable locking device is applied that can be operated from the platform of the car to release the two blocks when they are to be used as wedges. For this purpose I employ a rotary belt or cam fixed on a short shaft that extends through the block G to the outside, where connection is made with a lever for turning it. This construction will be understood from Figs. 1, 3, and 4. The shaft *p* is capable of turning in the block G, and carries a circular bolt R, that is set within a recess of corresponding form intersecting the dovetail groove, and has a straight cut-away portion R. A lever $P^{\times}$ is fixed to the outer end of the shaft *p*, and connection of this part is made with a hand-lever S on the track by a connecting-rod P. By partially rotating the bolt R it can be set across the groove *m*, or its flat portion can be brought in line with the bottom of the groove. A notch $n^{\times}$ is made in the top of the dovetail *n*, into which the bolt is set when brought into the first-mentioned position across the groove, so that no longitudinal movement of the block H can take place until the bolt is turned out of the notch.

To use the brakes as wedges, it is necessary to loosen the blocks H H, so that they will have free movement longitudinally, and at the same time to drop them down in contact with the track, that the ends nearest the rear wheels may be crowded between the wheels and the rails by the movement of the car. At such time, then, the bolts R are turned to release the blocks, and the outer end of the brake-frame is dropped to bring the blocks down on the rails by one movement of the lever S. The bolts of the two brake-blocks are connected with the lever to be moved simultaneously, and a slotted plate T on the truck-frame, that is arranged to hold up the screw-shaft, is also connected with the lever S by the rod $T^{\times}$. This plate embraces the shaft just above the bearing E and fits in a groove V, turned in the shaft. It is held in guide-slots *t t*, and when drawn back will clear the shaft and allow it to drop perpendicularly; or, being set on the screw-shaft, the slide-plate holds it up in position to move the brake-frame in the ordinary way for using the wheel-brakes. By connecting the slide in this manner with the lever S, a single movement will instantly throw the wedges H H into position to act.

In an emergency—as when a grip breaks or parts from the propelling-cable—the essence of safety lies in the rapidity with which the brakes can be applied before the car can attain any velocity, and by arranging these wedge-brakes for instantaneous operation, as above described, I provide powerful and effective means of checking the movement of the car. The power of these brakes will increase with the steepness of the incline on which the car is traveling at the time of the accident.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The herein-described car-brake, consisting of the frame A A C, the brake-blocks G G, with faces *g g* to engage the rims of the wheels, the blocks H H, attached to said brake-blocks in such manner that they are capable of sliding independently in a longitudinal direction, a locking mechanism by which these two blocks are secured together, having connection with an operating-lever on the car, and mechanism whereby the said frame is raised and lowered to operate said sets of brake-blocks, as set forth.

2. In a car-brake, a wheel brake-block G, adapted for operation between two wheels on the same side of a truck to engage the rims of the wheels when moved upward, a track brake shoe or block H, connected to said wheel-brake by a groove and dovetail rib, and locking mechanism adapted to hold said block H, substantially as described, and to be operated from the car to release it for action, as set forth.

3. In combination with the wheel brake-blocks G G, the pivoted frame A A C, the screw-shaft D, supported on bearings on the car-track, and the holding-plate E, arranged for operation as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ALEXANDER WATSON. [L. S.]

Witnesses:
CHAS. E. KELLY,
JOS. E. FORD.