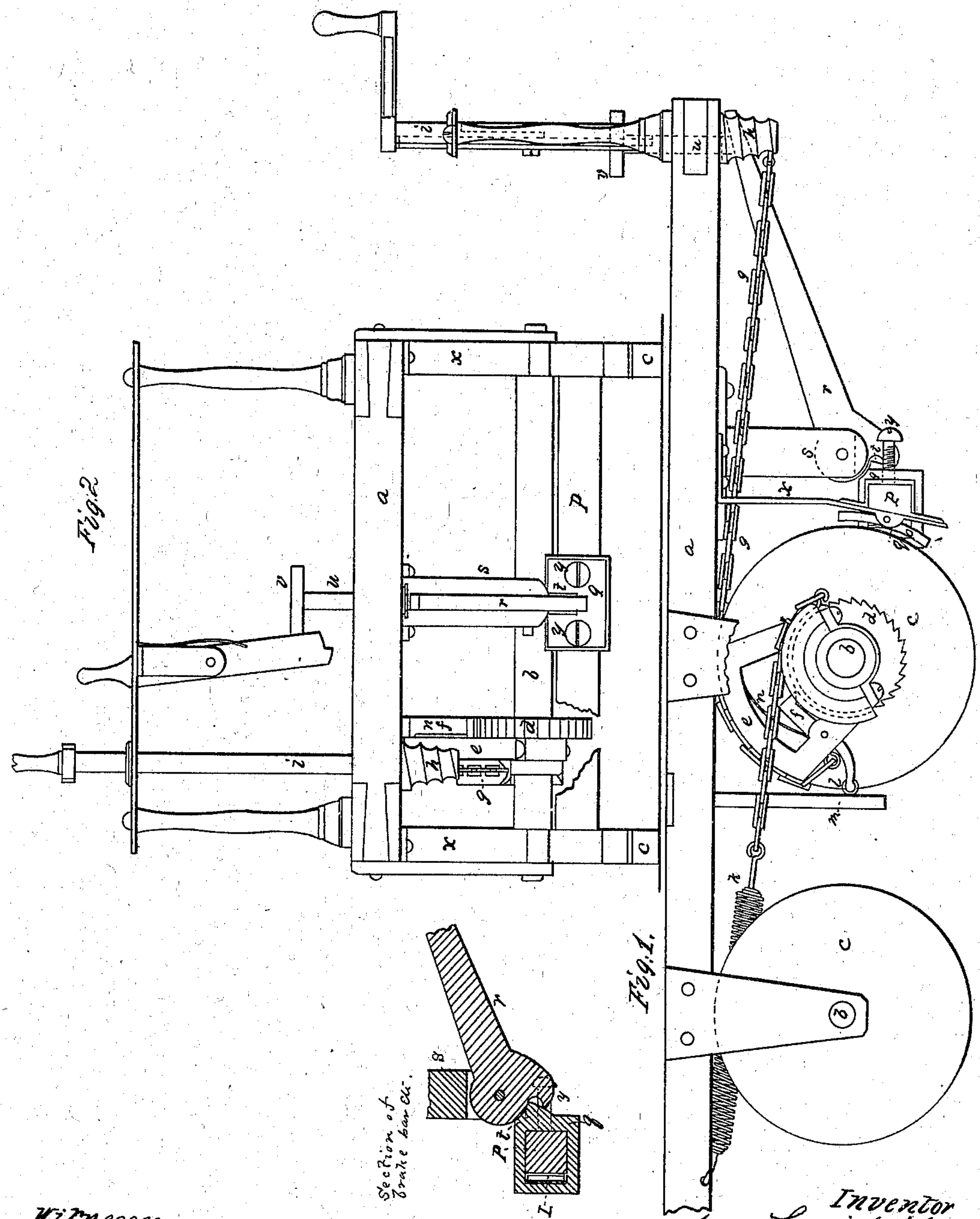
W. S. HALL.
RAILWAY CAR.

No. 48,553. Patented July 4, 1865.



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WM. SMITH HALL, OF QUINCY, MASSACHUSETTS.

IMPROVEMENT IN RAILWAY-CARS.

Specification forming part of Letters Patent No. **48,553**, dated July 4, 1865.

To all whom it may concern:

Be it known that I, WILLIAM SMITH HALL, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Railway-Cars; and I do hereby declare that the following, taken in connection with the drawings which accompanying and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to a method of starting and propelling railway-cars, and to the combination therewith of a brake mechanism to be operated by foot.

It is well known that upon horse-railways much injury occurs to horses in overcoming the inertia in starting the car from a state of rest, on account of the sudden and abrupt strain. Various methods have been devised for obviating this difficulty, such as the use of the power exerted by a spring coiled around the axle by the momentum of the running car, the attachment of the pole of the car to ratchet mechanism operating upon one or more of the wheels, and the employment of a ratchet mechanism to be operated from the platform of the car. This last method has been practiced or proposed for use upon horse-railway cars, and also upon steam-cars, and part of my invention relates more particularly to a peculiar mechanism to be operated from the platform of a horse or steam railway-car, to assist in starting and in propelling the same. My method has advantages over these mentioned both in its greater simplicity and effectiveness, and from its capability of being operated continuously to impel the car forward, instead of being confined to a limited extent of movement of the pole or to the limited power of a spring and from its equal applicability to the trucks of steam and horse railway-cars.

Figure 1 of the drawings represents a side elevation of a car-truck, showing my invention embodied thereon. Fig. 2 is an end elevation thereof. One of the wheels of the axle to which the ratchet mechanism is applied is removed to show the parts beyond.

a denotes the truck-frame; *b*, the axles; *c*, the wheels; *d*, a ratchet fixed to one of the axles. This axle also bears a rocker segment-lever, *e*, which turns loosely upon it, and is kept from sliding laterally upon the axle in any convenient manner. Hung upon this segment and engaging with the ratchet at proper times is a pawl, *f*, and to the periphery of the segment one end of a chain, *g*, is fastened, the other end being attached to the bottom of a cone-pulley, *h*, on the foot of a vertical shaft, *i*, which has a crank at its upper end, as seen in Fig. 1. The segment-lever is held normally in position, as seen in Fig. 1, by a spring, *k*, having one end connected to the truck and the other end attached to the segment by a chain or otherwise, and when in this position the impelling-tooth of the pawl is held out of engagement with the ratchet, this being effected by an extension of the pawl (which carries a friction-roll, *l*) and a projection, *m*, against which the roll bears. The tooth of the pawl is pressed down toward and against the ratchet by a spring, *n*, as will be readily understood.

When it is desired to start the car the crank is turned, winding the chain on the pulley *h*, turning the segment *e*, the first effect of which is to draw the friction-roll *l* away from the projection *m*, when its spring *n* engages the tooth of the pawl with the teeth of the ratchet, the continued winding of the chain impelling the pawl and ratchet and communicating advance movement to the car. Release of the crank causes the spring *k* to draw back the segment to its normal position, when the operation of turning the crank to wind the chain and impel the car may be repeated and continued as long as may be necessary to move the car the required distance, or to overcome the inertia sufficiently to enable the horse to start easily with the moving car. It will be observed that the arrangement of the chain in the segment-groove is such as to obtain the best possible disposition of the mechanism for exertion of the power necessary to start the car, the power being exerted through the chain upon a lever, (formed by the periphery and sides of the segment, the axle being the fulcrum,) the chain drawing tangentially upon the lever during its entire forward movement.

It will also be obvious that by the employment of the chain instead of a rigid lever or bar to operate the pawl, this mechanism can be applied to steam railway-cars in which the movement of the car body and truck with relation to each other renders it impossible to employ such bars, rods, or levers to commu-

nicate power from the platform to the ratchet mechanism.

In connection with this mechanism I employ a brake apparatus arranged and constructed to be operated by foot, as follows:

o o denote the brake-shoes, having cylindrical bearing-surfaces and being so hung as to swivel upon joint-pins, having bearings in the cross-bar *p*, which is hung or suspended from the truck *a* by springs *x* in such manner as to be capable of movement toward and away from the wheels. A bearing-plate, *q*, is applied to the center of this cross-bar by a strap which encompasses the bar, and the plate is pressed forward by a lever, *r*, hung in a post, *s*, depending from the bottom of the truck *a*. The short arm of the lever acts against an incline, *t*, on the plate *q*, while the long arm extends out to the end of the truck, as seen in Fig. 1, the lower end of a rod, *u*, there resting upon it, this rod sliding freely up and down through the truck-frame, and having upon its top a foot-piece, *v*. The springs *x* hold the shoes away from the tread or periphery of the wheels while the car is running, as seen in Fig. 1.

When it is wished to stop the car the driver, without releasing the reins, depresses the foot-piece *v* and with it the long arm of the lever *r*, the short arm of which acts upon the incline *t*, pressing forward the plate *q* and bar *p*, causing the shoes to impinge against the wheel-peripheries. To avoid unequal wear of these shoes they are so hung as to swivel, by which construction it will be obvious that the whole surface of the shoes is caused to impinge with uniform stress upon the wheels.

To enable the shoes to be pressed with the same force against the wheels as they become worn, the bearing-plate *q* is applied to the bar by means of adjusting-screws *y* and a spring, *z*. This spring serves to hold the plate up against or toward the bar, while by means of the screws the bearing-surface of the plate is fed outward from the bar *p* as the shoes are worn, so that the same depression of the lever *r* may effect the same degree of impingement of the shoes upon the wheels. A spring-catch, *j*, serves to keep the foot-piece *v* and lever *r* depressed, and the brakes upon the wheels, when necessary, this catch springing over the foot-piece when it is depressed to or nearly to its extent of movement, and being released thereform by lateral pressure on its top or by side movement of the foot, as will be readily understood.

It is often desirable upon horse-cars (as when stopping upon upgrades) to combine the movement of the brake mechanism and the starting mechanism. Thus, when the car has been stopped upon an upgrade by the brake, the driver can simultaneously release the foot-piece *v* and turn the crank upon the top of the shaft *i*, by which the ratchet mechanism is operated and the retrograde movement of the car prevented, the strength of the horses being in such case made more easily and much less injuriously available than when they have to overcome the inertia of the car from a state of rest, and oftentimes have even to overcome the retrograde movement.

I do not claim the employment of a ratchet mechanism to start a car, nor operating such mechanism from the platform of the car; neither do I claim the use of rods or levers extending lengthwise of the car for actuating the ratchet, as such would not answer the purpose of my invention.

I claim—

1. The employment of the ratchet mechanism, when operated to start the car, by a chain winding upon a crank-shaft or pulley, substantially as set forth.

2. The method of disengaging the pawl from the ratchet, substantially as shown.

3. Combining with the starting apparatus a brake mechanism operated by foot, substantially as shown and described.

In witness whereof I have hereunto set my hand this 25th day of March, A. D. 1865.

WILLIAM SMITH HALL.

Witnesses:

J. B. CROSBY,

F. GOULD.