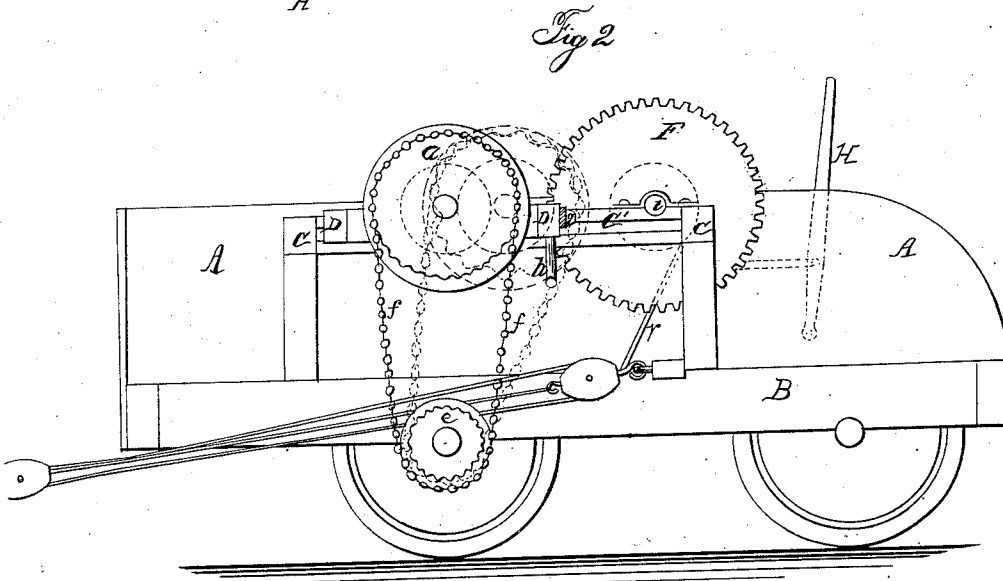
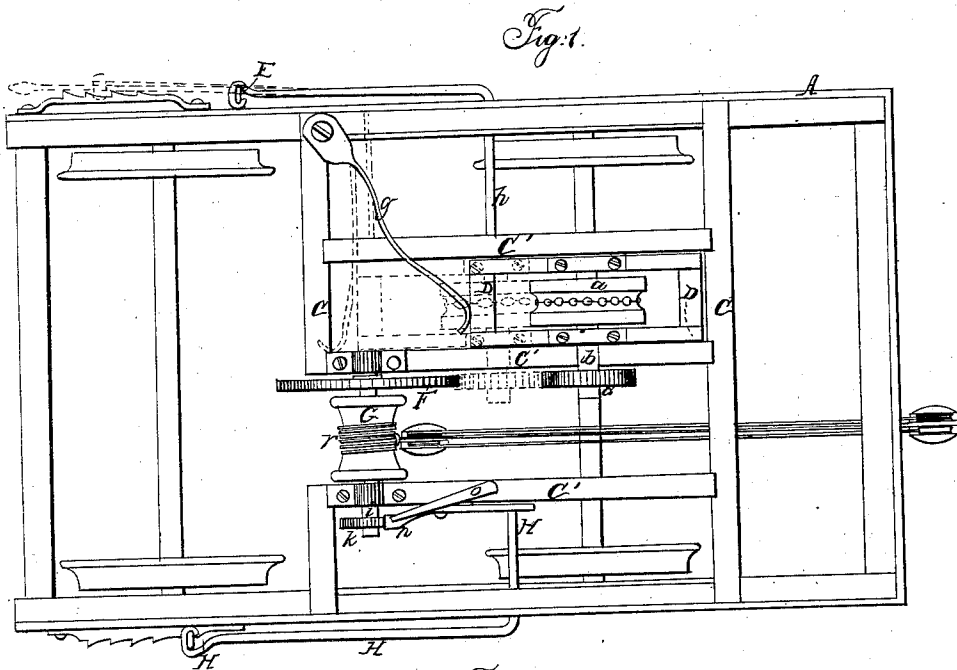


J. W. SWALES.

Car-Brake.

No. 94,525.

Patented Sept. 7, 1869.



Witnesses.
Geo H. Stone
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JOHN W. SWALES, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 94,525, dated September 7, 1869.

IMPROVED RAILWAY-CAR BRAKE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JOHN W. SWALES, of the city and county of San Francisco, State of California, have invented an Improved Car-Brake; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvement, without further invention or experiment.

My invention relates to an improved self-acting car-brake, for the purpose of checking the velocity and finally stopping a train of cars when in motion. It is estimated that more than half the total number of fatal accidents which occur upon railroads arise from collision, owing principally to the present form of brake, on account of time necessarily consumed in signalling and putting on the brakes. In this invention, I propose to place the brakes of the entire train directly under the supervision of the engineer, so that in case of accident, by merely taking a step he can put on the brakes throughout the entire length of the train, and thus be enabled to come to a stop in a very short distance. This I propose to do by means of one continuous chain extending the entire length of the train, beneath the cars, so arranged as to be disconnected at the same time the cars are uncoupled. The chain is connected with a mechanism placed in the bottom of the tender-car, and properly concealed. This mechanism is connected with the axle of either the front or rear wheels of the tender, by means of a chain passing around a chain-pulley on the axle, and a similar chain-pulley arranged in a sliding frame above. When the train is in motion the chain hangs loosely around the lower pulley, but when it is desired to check the speed of the train the sliding frame is moved forward by means of a lever, placed at the front end of the tender, which, at the same instant, tightens the chain upon the pulleys, and throws a pinion, attached to the shaft upon which the upper pulley revolves, into gear with a toothed wheel, which carries a shaft around which the chain is wound, which operates the brakes upon the entire train.

In order to give a better explanation and illustration of the construction and operation of my invention, reference is had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a plan.

Figure 2 is a side sectional view.

Similar letters of reference in each of the figures indicate like parts.

A is the tender of an engine, which is placed directly in the rear of the locomotive, and carries the necessary fuel and water for producing steam.

Longitudinally through the centre of this tender, I place an extra timber, B, intended to strengthen the car, and give a support to the axles when the strain

is upon them. In the bottom of this tender, near the rear end, I place the mechanism which operates the brakes of the train, in such a manner that it will occupy but a small space, and be concealed from view by a flooring, and the wood or fuel placed upon it.

The mechanism consists of a frame-work placed across the tender, consisting of the timbers C C, and cross-timbers C' C'.

Between two of the cross-timbers C' C' is a small frame, D, which moves in ways in the sides of the timbers, and carries the chain-pulley a.

This pulley is placed upon a shaft, b, which has at its end the pinion d.

Upon the car-axle, beneath the frame, is a rag-wheel, e, much smaller than the one, a, in the frame above, and a chain, f, passes around the two pulleys.

The frame D is held to its proper position directly over the axle, by a strong spring, g, when the car is in motion, in which position the chain f hangs loosely around the rag-pulley e, which, being much smaller than the above, allows it to hang without interfering with the movement of the axle in any manner.

A rod, h, is attached to the frame D, and passes out through an opening in the side of the car, where it is attached to a lever, E, placed near the front of the car, and within easy reach of the engineer. By drawing this lever forward, and confining it in a rack on the side of the tender, the frame D is moved forward, thus, at the same instant, tightening the chain around the two pulleys, and throwing the pinion d into gear with the gear-wheel F.

The gear-wheel F is placed upon the shaft i, which bears in the cross-timber C' C', carrying between these timbers a drum, G, and at its opposite end the ratchet-wheel k.

A pawl, n, is placed so as to engage with the teeth of the ratchet k, and is held in place by a spring, o, and operated by a lever, H, placed on the opposite side of the car from the lever E.

The chain r is attached to the drum G, around which it is wound when the pinion d is in gear with the wheel F, being arranged on the proper fall and tackle. This chain or cable extends to the rear of the tender, where it is provided with suitable apparatus for connecting it to the brake-chains on the following car, and so on through the entire train.

When the train is in motion, and it is desired to check its speed, or stop it entirely, the engineer or his assistant can, by taking a single step, throw the lever E into the rack on the side of the car. This carries the pinion d forward so as to engage with the wheel F, which thus puts on the brakes throughout the entire train, giving a gradually-increasing strain until the desired power is applied, when the lever E is thrown off, thus disconnecting the gearing which operates the brakes. The dog n catches in the teeth

of the ratchet and prevents the drum from unwinding, holding the brakes to their place until the train is stopped. When the train is again ready to be put in motion, the lever H is thrown forward into the rack on the side of the car. This raises the dog *n*, and releases the drum, which is immediately unwound by the strain upon it, leaving everything free and ready to move forward.

But little space is occupied with the mechanism, and the carrying capacity of the tender is not seriously interfered with.

In case of danger, the engineer can, without signaling to have the brakes put down, throw the lever in the rack without for a minute leaving his position, and when the amount of chain desired to give the necessary friction for stopping the train has been wound upon the drum, the same movement will disconnect this mechanism, and leave the brakes bearing against the wheels.

The mechanism by which this is effected is concealed from view, and involves no extra expense to any of the cars except the tender. The whole is so arranged that there is no liability of its getting out of order, and there is but little danger of breaking or fracturing any of the parts, unless the winding-movement is allowed to continue too long, which can also be avoided by arranging to have the lever thrown back when a certain length of chain has been wound around the drum. It may be found desirable to substitute friction-wheels in place of the pinion and gear-wheel for communicating motion from the axle to the

drum which winds the chain, in which case the danger of breaking or fracturing some portion of the machinery will be much lessened.

In cases of danger, some mechanism of this kind is absolutely necessary, as the brakemen are frequently so terrified that they do not attend to their duty, and the engineer himself often fails to give a distinct or proper signal, which results in frequent serious and fatal accidents.

The additional cost of this mechanism to the train will be but slight in all the cars except the tender, as the old form of brake need not be disturbed, the addition of the continuous chain being all that is requisite.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The sliding frame D, operated by the lever E, and spring *g*, and carrying the pulley *a*, and pinion *d* upon the shaft *b*, substantially as and for the purpose above described.

2. In combination with the sliding frame D, carrying the pulley *a* and pinion *d*, the arrangement of the endless chain *f*, upon the pulleys *a* and *e*, whereby said chain is tightened at the same time that the pinion *d* is thrown into gear, substantially as described.

In witness whereof, I have hereunto set my hand and seal.

JOHN W. SWALES. [L. S.]

Witnesses:

J. L. BOONE,

WILLIAM STAINFORTH.