2 Sheets—Sheet 1.

G. F. LYNCH.

Car Brake.

No. 52,063.

Patented Jan. 16, 1866.

Fig. 2.

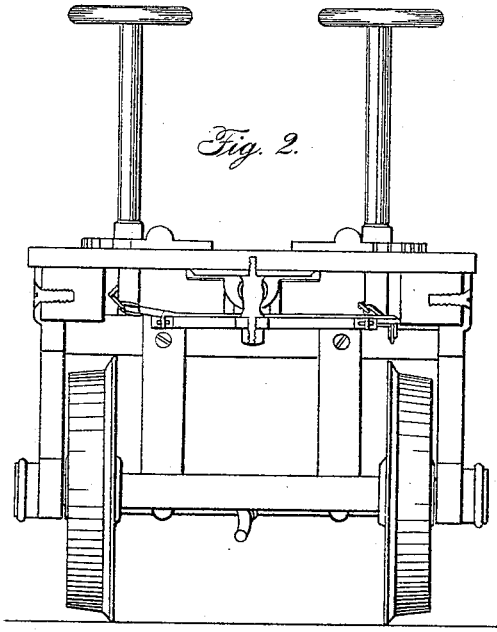
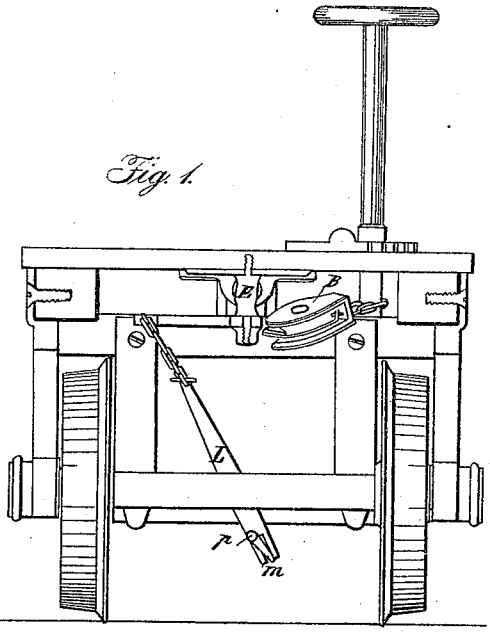
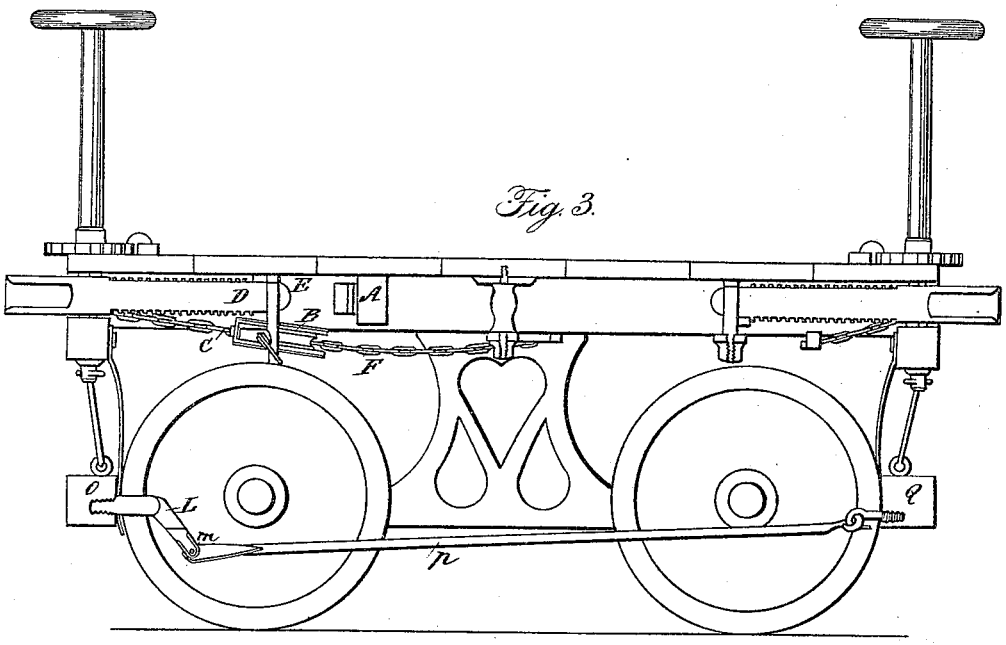


Fig. 1.



Sectional Views

Fig. 3.



Witnesses:

James Shirley
S. B. Wesker

Inventor:

George F. Lynch

2 Sheets—Sheet 2.

G. F. LYNCH.

Car Brake.

No. 52,063. Patented Jan. 16, 1866.

d

Fig. 1.

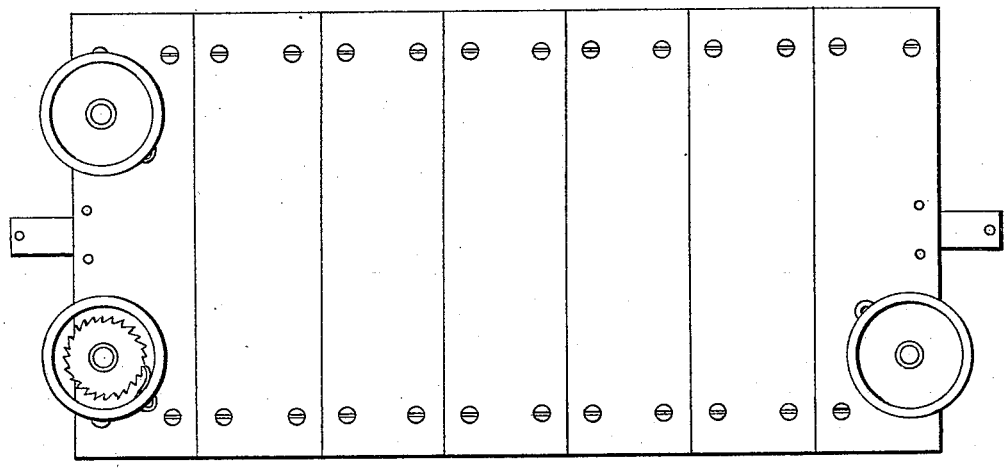
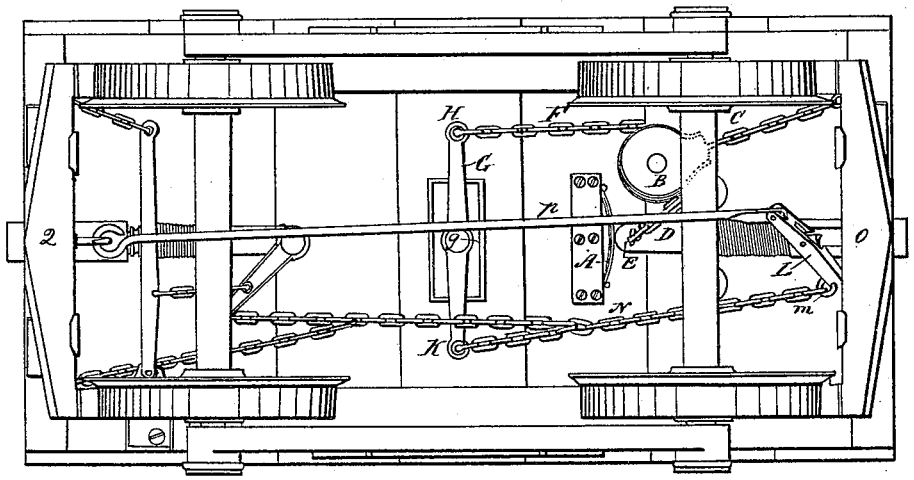


Fig. 2.



Witnesses:

James Hockey
J. Marker

Inventor:

George F. Lynch

UNITED STATES PATENT OFFICE.

GEORGE F. LYNCH, OF MILWAUKEE, WISCONSIN.

IMPROVED CAR-BRAKE.

Specification forming part of Letters Patent No. **52,963**, dated January 16, 1866.

To all whom it may concern:

Be it known that I, GEORGE F. LYNCH, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in the Method of Operating Railroad-Car Brakes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in so connecting the brakes of railroad-cars with their respective bumpers that each car of a train shall automatically apply its own brakes by means of the force of its own momentum operating upon and through its forward bumper for the time, whenever that is brought in contact and impact with a bumper or other appendage of the preceding car, tender, or locomotive in any sudden and dangerous emergency. Hence I denominate my invention "the automatic safety-brake."

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my cars in any of the known styles and forms, and supply them with the ordinary steam or hand brakes, or both, and the ordinary bumpers and other appendages of such cars, in the usual manner, except that I make the bumper-bars longer, so that their heads may project a little farther and their stems pass farther inwardly and to the requisite distance under the car-body. I also make the bumper-springs less stiff or resistant and more extensively compressible longitudinally. In addition to the ordinary bumper-springs so altered, I also supply each bumper with another spring, to ease up its motion when forced suddenly inward. This latter spring is secured to a cross timber or sill in the frame of the car-bottom or to a block firmly attached to the car-bottom, substantially as shown at A, Fig. 2, Plate 1, and Fig. 3, Plate 2, of the drawings, and in the positions and relations to the bumpers there shown, so that when the bumpers project to their ordinary working position, their inner ends or points shall stand clear of the springs, but so that when forced inward their points shall come in contact with the springs before the bars have completed their inward motion, and thereby have their motion retarded and the shock upon them and the car eased up and relieved.

Fig. 2, Plate 1 of the drawings above referred to, is a plane inverted view of the bottom of a car, of four wheels, (with the ordinary brakes set and the bumpers forced in,) showing substantially the additional appendages, means, or devices which I employ in my invention, as above and hereinafter described.

Fig. 3, Plate 2, is a vertical longitudinal section of the car, showing the bumpers projected.

Next, instead of the ordinary upper and continuous brake chains and rod, as ordinarily employed, I connect the common standing brake-rod at the brake-worm (by means of a short strong chain attached thereto in the usual mode) with the hook or ring of the pulley-box and pulley B in the manner shown at C, Fig. 2, Plate 1. Then to the inner end or point of bumper-bar D, at E, same figure and plate, I securely attach another strong chain, F, which I pass through pulley-box B and over the pulley therein, substantially as shown in said Fig. 2. This chain F (or, instead thereof, a chain and rod united in the usual manner) must be long enough, with torsion and slack, to extend from its connection with the bumper-bar over the pulley named, and thence to the middle of the car-bottom between the two sets of trucks, where it is to be connected with and secured to one end of vibrating cross-lever or equalizer G, substantially as shown at H, same figure. Cross-lever G must be firmly secured at its center to the bottom of the car-body or to a beam-frame in the bottom, substantially as shown at I, same figure. The opposite end of cross-lever G, at K, is then to be connected with the upper end of brake-lever L, at M, by means of another strong chain or rod, N, as shown substantially in same figure. Brake-lever L is connected at its fulcrum, in the usual manner, with brake O, and its lower end is connected, by means of the common under brake-rod P, with brake Q, at the opposite end of the trucks, substantially as shown in same figure and plate.

So far this description serves to describe my improved method of connecting the bumper and brakes and of operating the brakes of one set of trucks only; but it is deemed unnecessary to continue the description, as it is self-

apparent and will be readily seen that in order to apply the invention to the second set of trucks at the other end of the car it will only be necessary to duplicate reversely the method and means already described in a like relative position to the second set of trucks and opposite bumper, and to connect the whole system by chains (or chains and rods combined) with the respective and appropriate ends of cross-lever or equalizer G.

To operate my invention (or rather to enable it to operate automatically) the brakes are to be set and left braced by the pawls of their ratchet-wheels in such a position that they will stand or rest clear of the car-wheels, while the brake-chains connecting the standing brake-rods and pulley-boxes are taut, and the bumpers are projected to their usual working limits. This I term the "safety position" of the brakes. They are maintained in this position by means of the ordinary springs for the purpose with which car-trucks are usually provided. Now, in this position and condition of things, the train of cars being in motion with ordinary speed, the operation of my invention is this: Whenever impact is produced or occasioned upon the forward bumper of the leading car sufficient to force that bumper in, all the force of that car's momentum is received upon its forward bumper, and is transmitted through it to chain or chain and rod F, and through that successively and instantaneously to cross-lever or equalizer G, chain or rod N, brake-lever L, and brake-rod P to both brakes O and Q, setting them to the wheels with a pressure limited only by the momentum of the car itself. This pressure, it is believed, would ordinarily very nearly set or stop the revolutions of the car-wheels. It would certainly quite do so in cases of emergency, when the train was moving with ordinary speed and the engine was suddenly reversed to avoid impending accident. It would at least always check the speed of the car very materially. This check of speed would occasion a similar impact upon the forward bumper of the next succeeding car, and consequently set its brakes and thereby check its speed. So, successively and almost instantaneously, the same effect and result would be produced and accomplished upon and transmitted to each car of the train, how long soever it might be, the principle being that the momentum of each car transmits through its own bumpers to its brakes a force or pressure sufficient to effect its own braking whenever its bumpers are brought into impact either with the preceding car, tender, or locomotive. On this principle and by these means properly applied a long train may be stopped in the same time and space required to stop the locomotive and tender.

My invention may be applied for the ordinary braking of trains at the stations in the following manner: At the proper time and point, when approaching a station, let the steam be shut off from the motive power of the train, and let the engineer, by means of a steam-brake, or the fireman, by means of the hand-brake, so set the brakes of the tender as to occasion impact upon the forward bumper of the first car in the train sufficient to force the bumpers inward. This is all the engineer or fireman need do. Each successive car in the train will accomplish the balance of the process desired for itself.

Of course, when the train is to be backed the brakes must be thrown off by hand, as now done, until the train has resumed its forward movement, when they should again be set to the safety position before mentioned. In this position, attached and connected as described, and all their parts and attachments of sufficient yet practical strength, the brakes are ever faithful, never absent sentinels, ready to act with the certainty of a law of nature, and with a power and celerity which the brakeman can never exert in the moment of peril and impending calamity.

The device shown by the system of levers and chains to the left of cross-lever G of the drawings is not designed to illustrate any part of my invention, but simply an equivalent means or device for transmitting power to the brakes by and through the bumpers of the cars.

I do not claim as any part of my invention a railroad-car brake of any description whatever or any improvement whatever in railroad-car brakes of themselves; but

What I do claim as my invention, and seek to secure by Letters Patent, is—

Connecting the brakes of railroad-cars with their own bumpers respectively in such a manner that each car of a train of cars in motion shall automatically apply its own brakes by means of the force of its momentum operating upon and through its forward bumper for the time being whenever that bumper is brought in contact and impact with a bumper or other part or appendage of the preceding car, tender, or locomotive, substantially as herein described, employing for that purpose the aforesaid means of connection between the brakes and bumpers.

GEORGE F. LYNCH.

Witnesses:

JAMES HICKCOX,

I. P. WALKER.