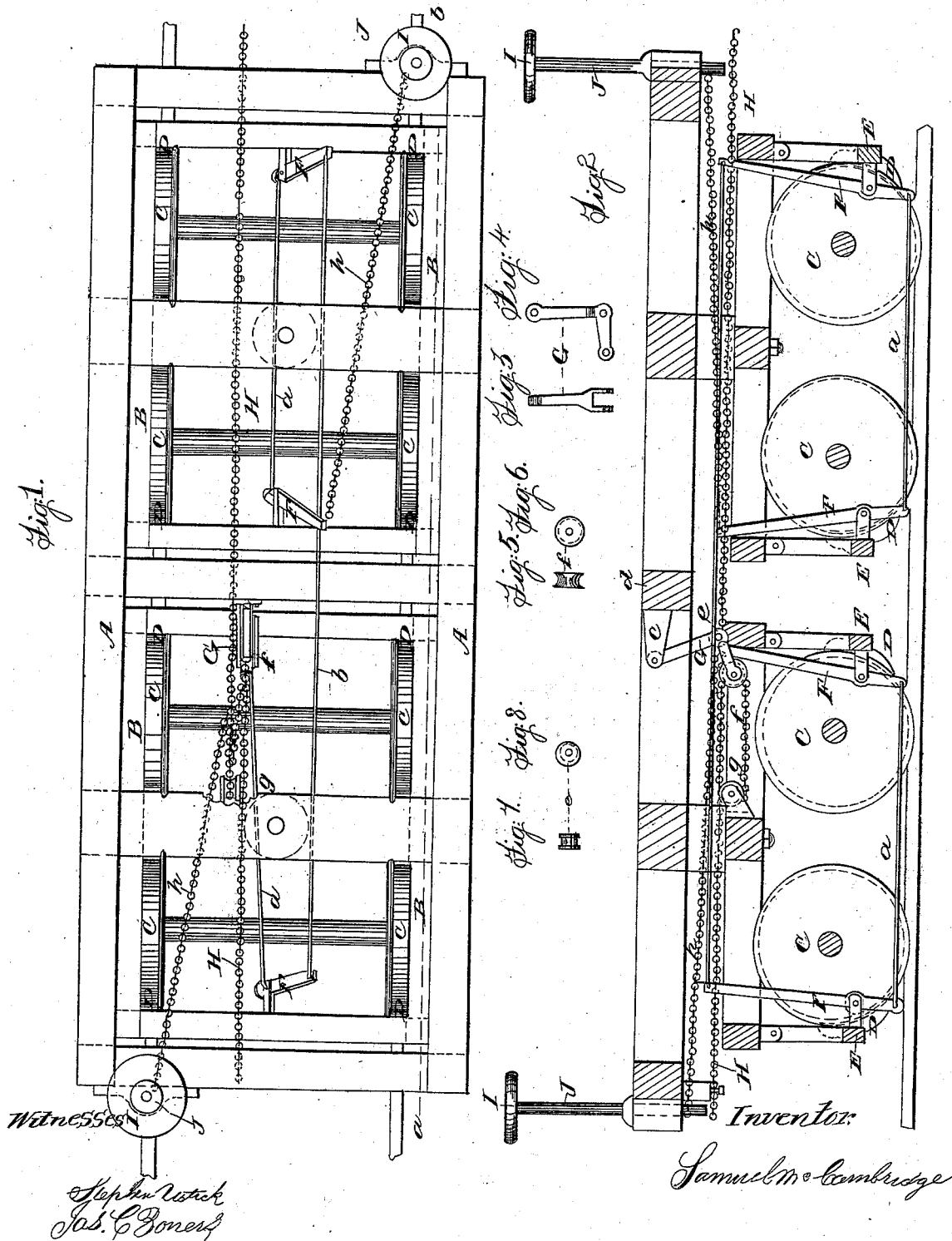


Car Brake.

Patented May 8, 1866.



UNITED STATES PATENT OFFICE.

SAMUEL McCAMBRIDGE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. 54,573, dated May 8, 1866.

To all whom it may concern:

Be it known that I, SAMUEL McCAMBRIDGE, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and Improved Mode of Operating the Brakes of a Train of Cars; and I hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention and improvement consists in operating the brake-levers of a train of cars by means of a continuous chain, which actuates an intermediate lever on each car, the chain being woven around a sheave in each intermediate lever, and a stationary sheave attached to its respective car, and being fastened at one end to the rear end of the last car of the train, and at its other end to a revolving shaft, which, at the pleasure of the engineer, is thrown into gear with an axle of the engine, to be operated thereby when the brakes should be applied to stop the train or decrease its velocity.

By the peculiar construction and arrangement of my improvement the rear car of the train is checked first, and so on in succession to the front car. Consequently the bumping of the cars incidental to other modes of operating the brakes is avoided. This, as will readily appear, increases the comfort and security of the passengers and saves much wear and tear of the cars.

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

In the accompanying drawings, Figure 1 is a plan or top view of a car below the body with my improvement attached. Fig. 2 is a vertical section of Fig. 1 at the red line *a b*. Figs. 3 and 4 are views at right angles with each other of the forked lever *G*. Figs. 5 and 6 are similar views of one of the sheaves, *f*. Figs. 7 and 8 are views of one of the grooved friction-wheels *e*.

Like letters in all the figures indicate the same parts.

A represents the base-frame of one of the cars. *B B* are the trucks, whose wheels *C* are provided with the usual check-block, *D*, at-

tached to the cross-bars *E*, the said bars being actuated by means of the levers *F*, that are connected therewith at their lower ends, and also with the longitudinal rods *a a*. The two outside levers are connected at top with the rod *b*. As this is an ordinary arrangement of the brakes and their appurtenances, I deem a more particular description unnecessary.

My improvement is a separate attachment to the cars, and adaptable not only to this arrangement of brakes, but to all other plans now in use; but for the sake of illustration I will show my plan of arranging it with the above-described plan.

G is a forked lever suspended from the hanger *c*, which is represented as bolted to the cross-bar *d* of the frame *A*, but which may be attached to the floor of the car when most convenient. Said lever is provided with a grooved friction-wheel, *e*, which bears against the upper end of the contiguous lever *F*, and also with a sheave, *f*. There is a fixed sheave, *g*, also, which is used in connection with the former in the weaving a chain, which I will presently describe. The said lever, friction-wheel, and sheave are represented in detail in Figs. 3, 4, 5, 6, 7, and 8.

H is a continuous chain, which is fastened at one end to the rear end of the last car of the train, and at its other end to a revolving shaft of my machine in connection with an axle of the engine, which machine was patented November 28, 1865.

To each car of the train a lever, *G*, with its sheave *f*, is attached, there being also a fixed sheave, *g*, arranged in relation to the car and the lever as above described.

The chain is woven over the sheaves in the following manner: Running from the rear end of the car, to which it is fastened, as represented in Figs. 1 and 2, to the sheave *f* in the end of the lever *G*, it takes a half-turn around it and runs toward the rear of the car to the fixed sheave *g*, around which it takes a half-turn, and then runs forward to the sheave *f* in the lever *G*, attached to the next car, and is in like manner woven over the sheave of the lever and the fixed sheave in the manner above described. It then runs to the sheave in the lever in the next succeeding car, and is woven as before, and the operation continued consecutively throughout the whole train of cars.

The chain is then passed over the frame of the tender and connected with a revolving shaft, which, when the brakes are to be applied, is thrown into gear with an axle of the engine, as before stated.

The operation is as follows: When the engineer wishes to stop the train or check its speed he applies a lever, which brings the chain-shaft into gear with the rear axle of the engine. The forward motion of the engine causes the chain to be wound around the said shaft to take up all its slack and operate the levers G, which, by their connection with the series of brake-levers F, operate the check-blocks D. The chain, in consequence of it being fastened to the rear car, slips over all the sheaves and draws the lever G on said car toward the fixed sheave *g*, which, by bearing against the contiguous brake-lever F, causes the check-blocks D to bear against the wheels. Thus the rear car is checked. Then the chain draws tight on the sheaves of the next car, operating the lever G and producing a like result, and so on, consecutively, the brakes are operated until the front car is checked.

The brakes may be operated by means of the hand-wheels I I, said wheels being arranged, as ordinarily, on the upper ends of the vertical shafts J J, which are provided with the chains *h h*, connected in the usual manner with the inside levers, F F.

As my improvement is very simple, and, as before stated, susceptible of being applied to any arrangement of brake-levers now in use without disturbing their connection, it is of the most practicable character.

The other plans, in which a continuous chain is used, are complicated and cannot be applied

to any ordinary brake attachments. Besides they have such a multiplicity of sheaves as to cause much slack chain, and hence an additional chain is required to take up the slack. In my arrangement, as there are but two sheaves to each car, this difficulty is obviated and the slack is quickly taken up, and the brakes consequently expeditiously applied. Besides the chain slips easily over the sheaves in consequence of their fewness of number, and operates the brakes on the rear car, to which its rear end is attached, first, and so on, consecutively checking the cars, until the front one is checked, as before stated, thereby preventing the bumping of the cars, which is such an annoyance to passengers, and which, as is well known, has sometimes caused fatal disasters, besides always causing much wear and tear to the cars.

Having thus fully described my improved mode of operating the brakes of a train of cars, what I claim therein as new, and desire to secure by Letters Patent, is—

The combination of a continuous chain with the brake-levers of a train of cars by means of the intermediate levers G and the sheaves *f* and *g*, the said parts being arranged and operating substantially upon the principle and in the manner hereinbefore described, and for the purpose specified.

In testimony that the above is my invention I have hereunto set my hand and affixed my seal this 26th day of March, 1866.

SAMUEL McCAMBRIDGE. [L. s.]

Witnesses:

STEPHEN USTICK,
JAS. C. BOWERS.