

(No Model.)

C. M. CARNAHAN.

2 Sheets—Sheet 1.

## CAR BRAKE.

Patented July 28, 1885.

No. 322,899.

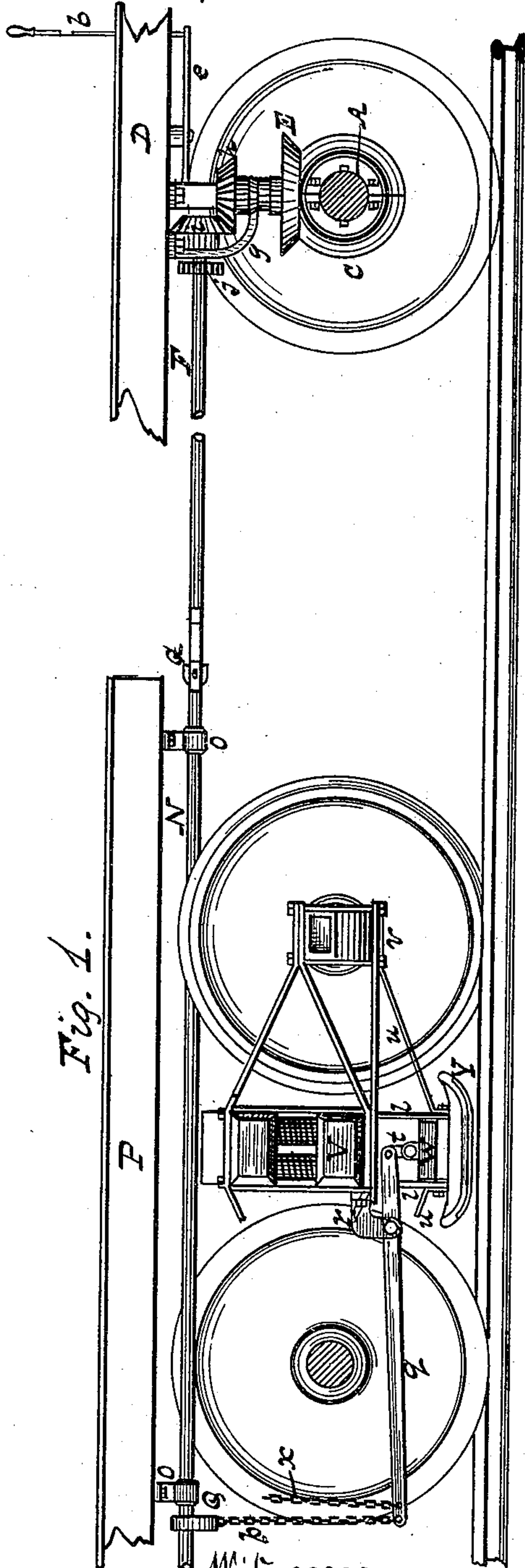


Fig. 1.

**A**

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Joshua W. Ellis  
H. M. Lewis

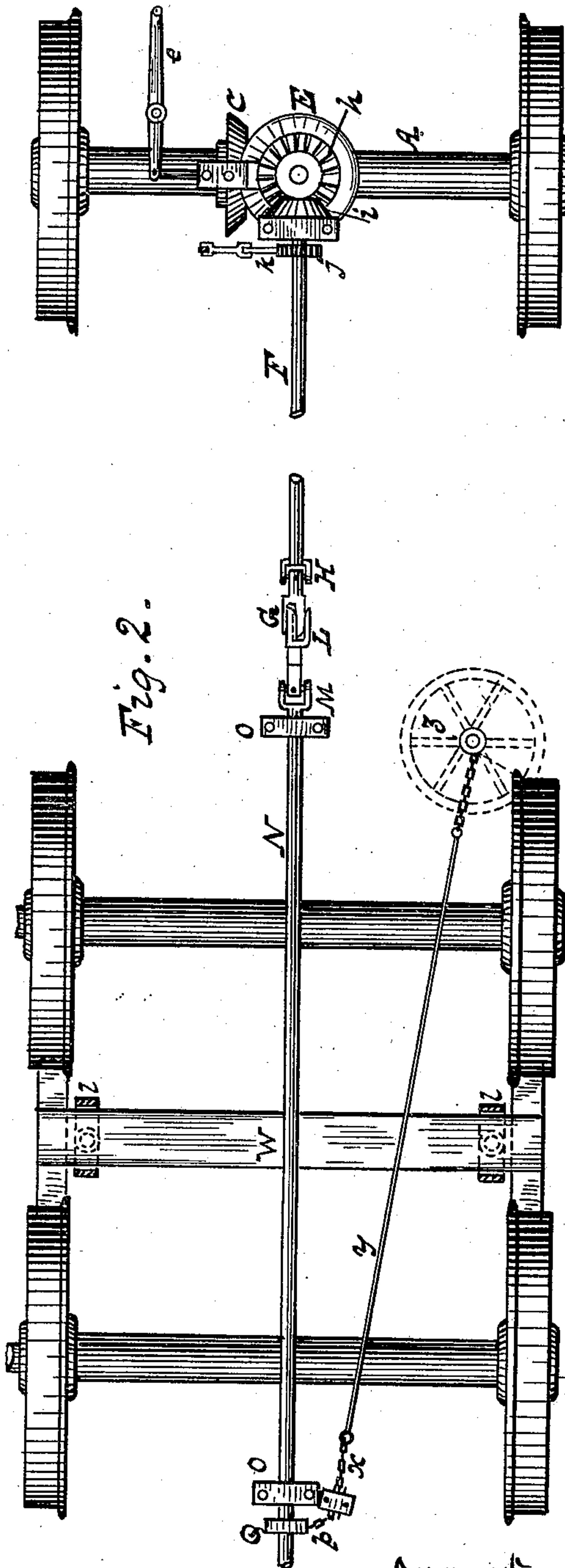


Fig. 2.

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By me M. Barnahan

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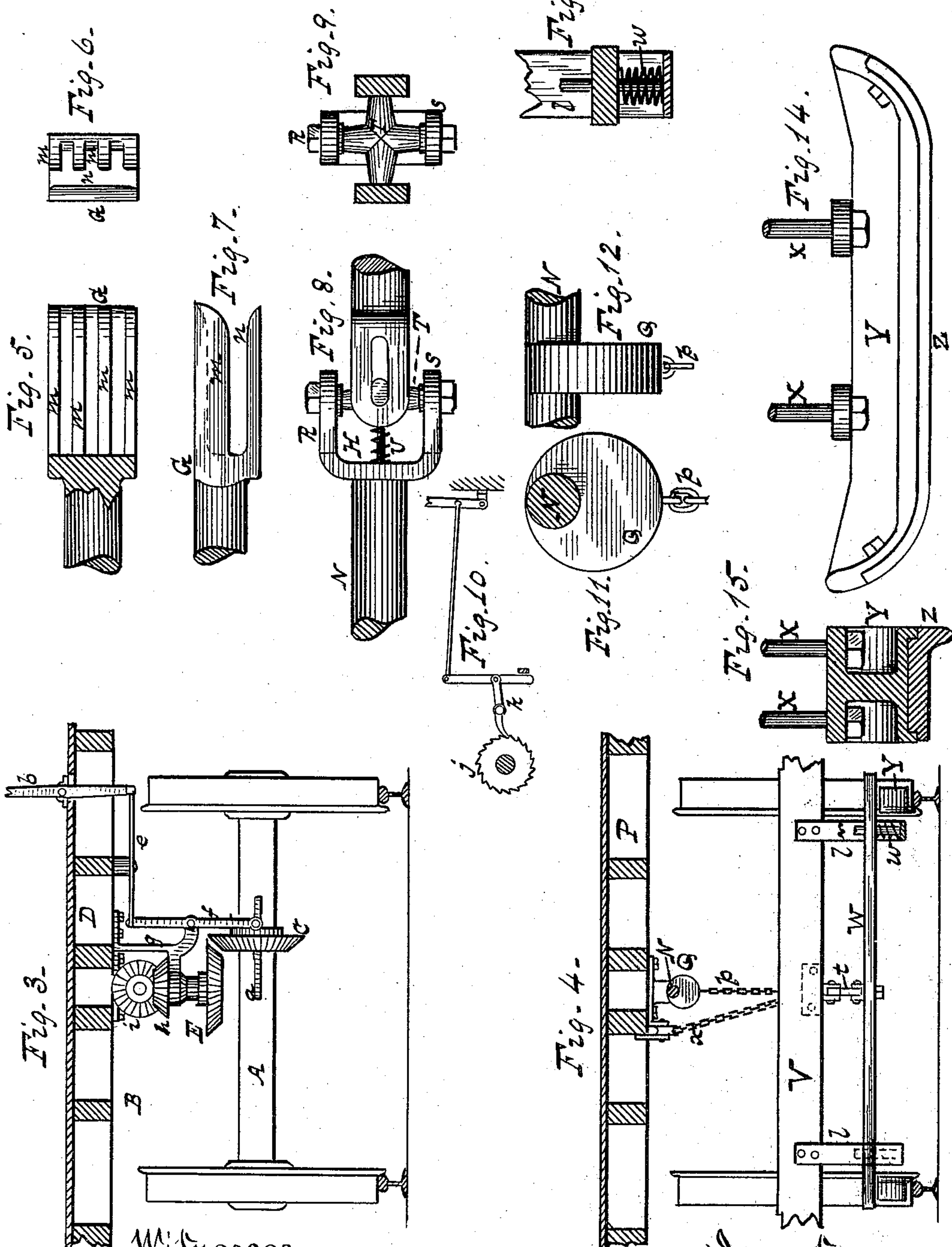
2 Sheets—Sheet 2.

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No. 322,899.

Patented July 28, 1885.



Witnesses:

Josiah H. Ellis  
H. M. Lewis

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# UNITED STATES PATENT OFFICE.

CYRUS M. CARNAHAN, OF PITTSBURG, PENNSYLVANIA.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 322,899, dated July 28, 1885.

Application filed December 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, CYRUS M. CARNAHAN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Devices for Operating Car-Brakes of that character wherein the shoe or rubber is applied directly to the railway-rail instead of to the car-wheels.

The nature of my invention will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a side elevation, partly in section, of two railway-cars, provided with my improved brake and devices for operating the same; Fig. 2, a top view of such cars, whereof the floor or platform is removed the better to exhibit the mechanism of my invention; Fig. 3, an end elevation of a car provided with the means I employ for actuating my improved brake; Fig. 4, a rear end view of a car to which the brake is applied. Figs. 5, 6, and 7 represent enlarged and detached views of a coupling devised by me for joining the adjacent ends of the brake-rod that extends along and underneath the cars; Figs. 8 and 9, a universal joint applied to said brake-rod; Fig. 10, a ratchet-wheel, together with its pawl and lever; Figs. 11 and 12, different views of a cam used in operating the brake-chain; Fig. 13, spring-lifter for the brake-shoe; Fig. 14, a side elevation of said brake-shoe; and Fig. 15, a transverse section of the same.

To construct a mechanism for operating car-brakes in accordance with my invention, I combine with the axle A of a locomotive or car, B, a bevel-faced friction-wheel, C, that by means of an intermediate spline, *a*, is caused to rotate with it, and allow of a sliding movement thereon in the direction of its axis, effected in that respect by or through the instrumentality of a hand-lever, *b*, coupled thereto by a short rod, *e*, and secondary lever *f*, supported in suitable bearings.

Extending downward beneath the frame or platform D of the car B, and rigidly affixed thereto, is a substantial hanger, *g*, carrying another bevel-faced friction-wheel, E, arranged in a plane at right angles to that on the car-axle, so that when brought together each may have a corresponding rotary movement. The

upper one, E, being driven exclusively by the frictional pressure of the other, in a manner regulated entirely by the amount of force applied to the hand-lever *b* in bringing and holding said friction-wheels C E in close contact.

Attached to the upper end of the vertical spindle of the secondary friction-wheel E, and so as to rotate therewith, is a small bevel-toothed wheel, *h*, that engages a similar toothed wheel, *i*, securely affixed on the end of a stout horizontal rod, F, supported in suitable bearings lengthwise of and beneath the body of the car, locomotive, or tender, as the case may be. On this stout rod F, and near its toothed wheel *i*, is affixed a circular ratchet, *j*, provided with a pawl, *k*, and connecting devices for operating the same by hand, as shown more particularly in the drawings, Fig. 10. The end of this rod F most remote from the circular ratchet *j* is supplied with a clutch, G, connected thereto by a gimbal or yielding joint H, consisting of two branches or forks, R S, coupled together in reverse positions by means of an intermediate cross, T, the arms of which extend through the prongs of each fork so as to make a union of the parts that are prevented from receiving undue jar or strain by having one pair of prongs slotted, and a compensating spring, U, between the other pair. This form and arrangement admit of a variety of bends or flexures that readily accommodate themselves to the irregular movements of the car. The clutch G is of peculiar shape and construction, representing a sort of hand provided with four webbed fingers or inner ribs, *m*, and a broad flat thumb, *n*, joined thereto at its base and extending outwardly therefrom, separate but parallel with the fingers, all of which are curved outwardly at their extremities, whereby they are enabled to receive and hold a similarly constructed clutch, L, attached by a gimbal-joint, M, to the adjacent end of another stout rod, N, arranged like the first in suitable hangers, O, under the body P of an opposing car. At a suitable part of this rod N is rigidly affixed, so as to turn with it, an eccentric, Q, to which is attached one end of a chain, *p*, its other end being in like manner made fast to a long lever, *q*, pivoted in a projecting bracket, *r*, bolted to the frame V of the car-truck. That portion of this long le



ver  $q$  farthest from its chain and beyond its pivotal point is connected by a short link,  $t$ , to a cross-beam,  $W$ , arranged between the wheels of the car-truck, and extending the whole width of its track. Under each end of this beam  $W$ , and secured thereto by strong bolts  $X$ , is a brake-shoe,  $Y$ , of the shape shown in the drawings, Fig. 14, which shoe is provided with a flanged sole or wearing part,  $Z$ , that may be detached when worn out and replaced by one more perfect. This brake-beam  $W$  is supported in proper position by means of vertical bars  $l$ , which are stayed rigidly and firmly in place by suitable braces,  $u$ , extending from the lower portion thereof up to that part of the truck-frame  $V$  nearest its axle-boxes  $v$ . The brake-shoes  $Y$ , although intended to operate upon the rails of the track, are held above it a short distance by the contractile force of a strong spring,  $w$ , at each end of the beam  $W$  until otherwise required. The long lever  $q$  for operating the brakes is also provided with a second chain,  $x$ , that is extended by means of a connecting-rod,  $y$ , to the stem of a hand-wheel,  $z$ , (shown by the dotted lines in Fig. 2,) whereby the brakes may be set or liberated without reference to the previously described parts the operation of which is as follows: When the car is running, if the hand-lever  $b$  be pushed in a proper direction, its connection with the bevel-faced friction-wheel  $c$  on the car-axle  $A$  will cause it to slide thereon and come in contact with its companion wheel,  $E$ , above, and by a frictional action impart a rotary movement thereto, and by means of the bevel-toothed gearing communicate a like rotary movement to the brake-rod  $F$ , which will be extended through the intervening gimbal-joints  $H$  and clutches  $G$  to the long rod  $N$  under the car next adjoining and coupled thereto. As this rod  $N$  turns on its axis it causes the eccentric  $Q$  to revolve and draw on the chain  $p$ , and so operate the lever  $q$  as to force the brake-shoes  $Y$  tightly down upon the rails of the track, and thereby quickly stop the car. When the rod  $N$  has revolved sufficiently for that purpose, the pawl  $k$  may be caused to catch the circular ratchet  $j$ , and thus continue the pressure without reference to the frictional gearing, which may then be disengaged and saved unnecessary wear by a simple reversal of the hand-lever  $b$ .

Although this construction and arrangement of parts are represented as being limited to two cars, it is clearly obvious that the operating device may be applied to a locomotive, and the brake-rods continued therefrom to the extent of several cars comprising a lengthy train, each provided, of course, with my improvement, which, when the cars are separated from the one containing the frictional gearing, may have their brakes operated and applied by means of the hand-wheel in the usual and ordinary manner.

Having thus described my invention, I claim—

1. In combination with a locomotive or railway-car, the bevel-faced frictional wheel  $C$ , affixed to an axle thereof and capable of a sliding movement thereon by means of a hand-lever, a companion friction-wheel arranged at right angles to and actuated by that on the axle, and two or more bevel-toothed gear-wheels meshing together and deriving their motion from the frictional wheels and axle, a rod extending therefrom underneath the car and coupled to a brake-lever for forcing the brake-shoes tightly down upon the rails of the track as a means for stopping the cars, and a spring for lifting and holding the shoes above the track when and as required.

2. In combination with a brake-rod having one or more gimbal or yielding joints, a clutch consisting of a sort of hand provided with four webbed fingers or inner ribs, and a broad flat thumb joined thereto at its base and extending outwardly therefrom separate but parallel with the fingers, all of which are curved outwardly at their extremities, in the manner shown, for the purposes set forth.

3. The combination of a brake-shoe that shall press upon the railway-rails, a cross-beam connecting such shoes, a spring for lifting and keeping the same above the track when not in use, a lever attached thereto and with frictional gearing, together with a means for setting and releasing the brakes by hand independent of said gearing.

4. In combination with the axle of a car, the bevel-faced friction-wheels and toothed gearing, the brake-rod provided with one or more gimbal-joints, consisting of two pairs of branches or forks coupled together in reverse positions by means of an intermediate cross, substantially as shown and described.

5. In combination with the axle of a car, the bevel-faced friction-wheels and toothed gearing, the brake-rod, provided with one or more joints, consisting of two pairs of branches or forks connected by a cross-piece, the arms of which extend through the prongs of each fork, one pair of forks being slotted and the other pair having between them a compensating spring, substantially as described and shown.

6. In combination with a brake-rod provided with a yielding joint and connecting-clutch, the brake-shoe, its connecting-lever and lowering devices, of an eccentric located on the brake-rod, a chain connecting it with said lever, and an additional chain and connecting-rod extending to a wheel or other device for operating the brake, substantially as described, and for the purpose set forth.

CYRUS M. CARNAHAN.

Witnesses:

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