

No. 749,169.

PATENTED JAN. 12, 1904.

D. W. COPELAND & J. R. MONTAGUE.

CAR BRAKE.

APPLICATION FILED APR. 7, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

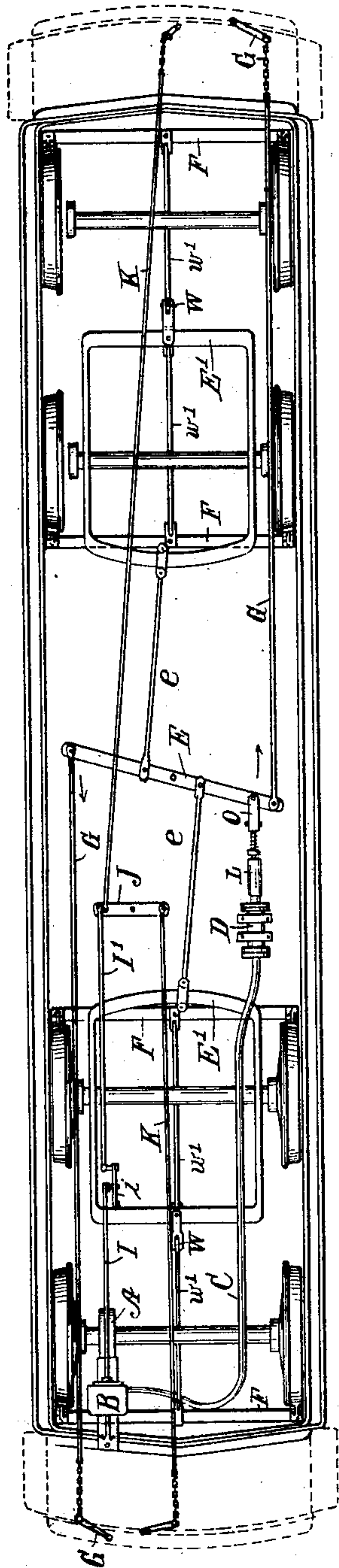


Fig. 1.

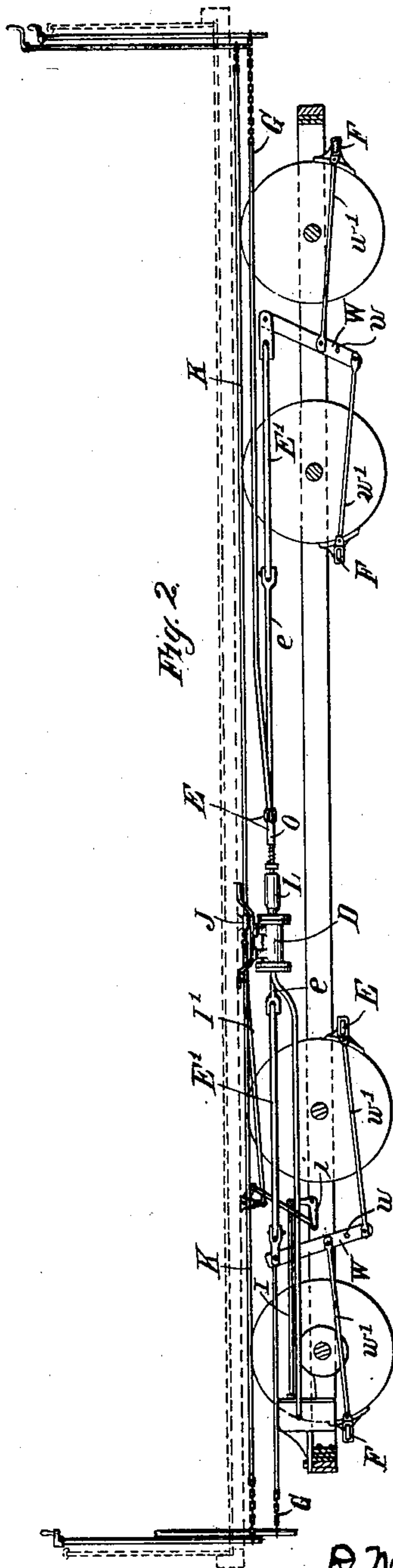


Fig. 2.

Witnesses

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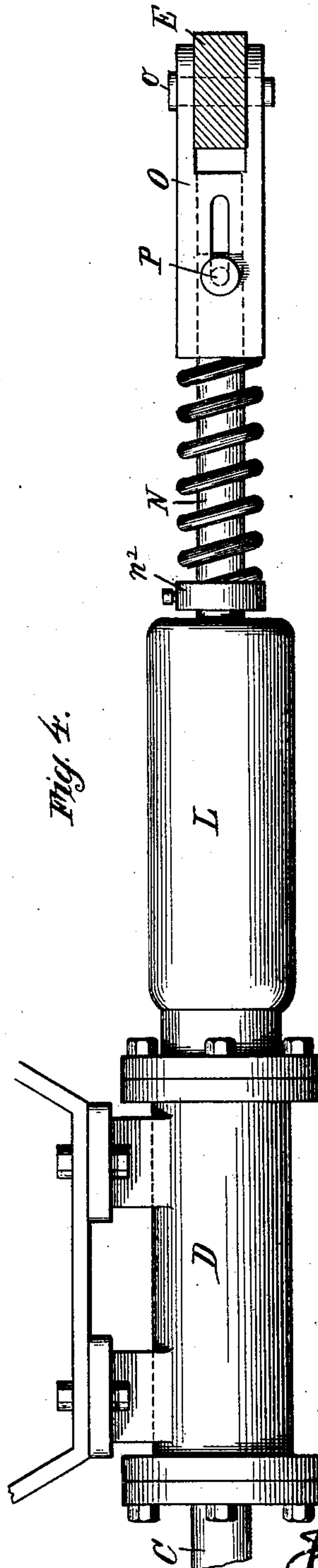
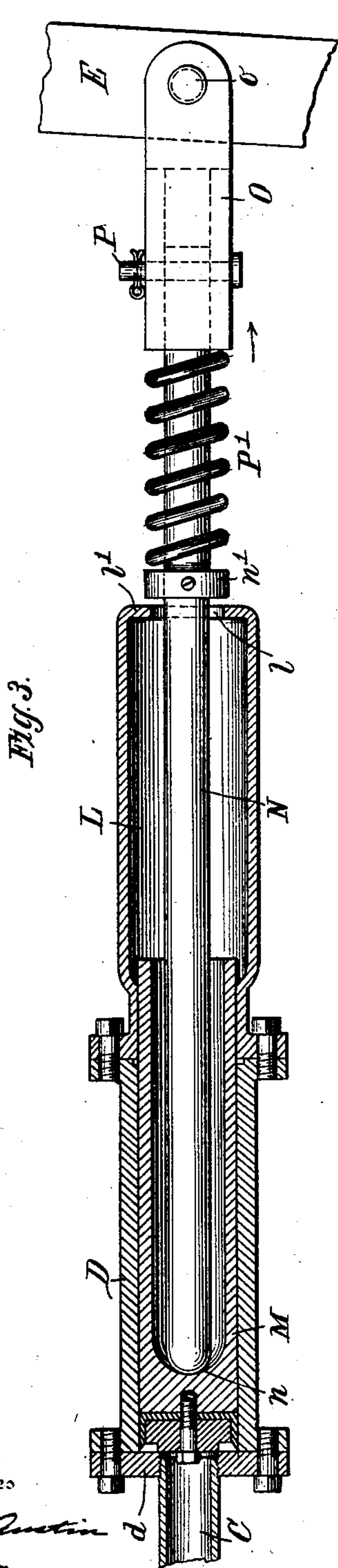
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4 SHEETS—SHEET 2.



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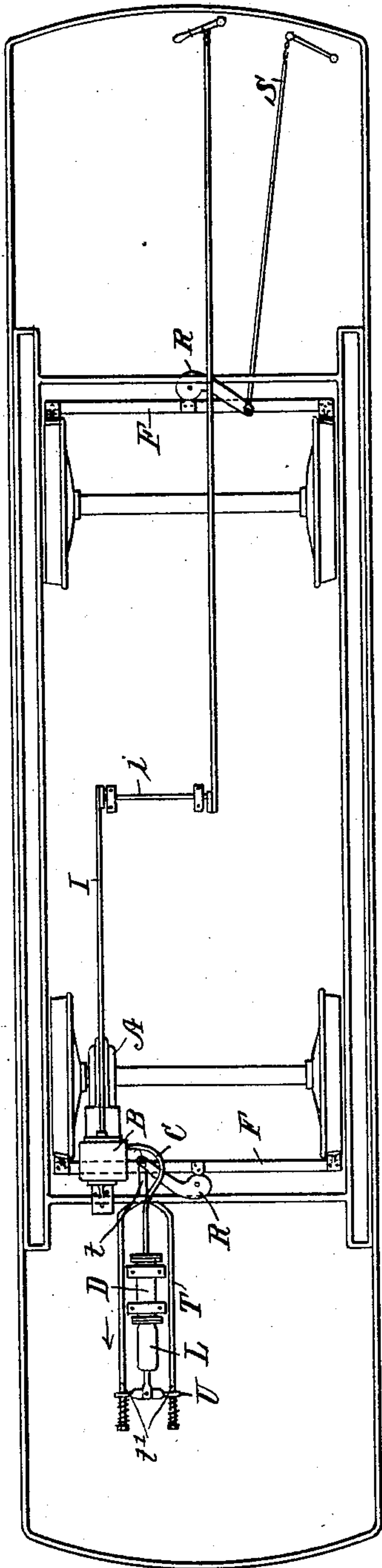
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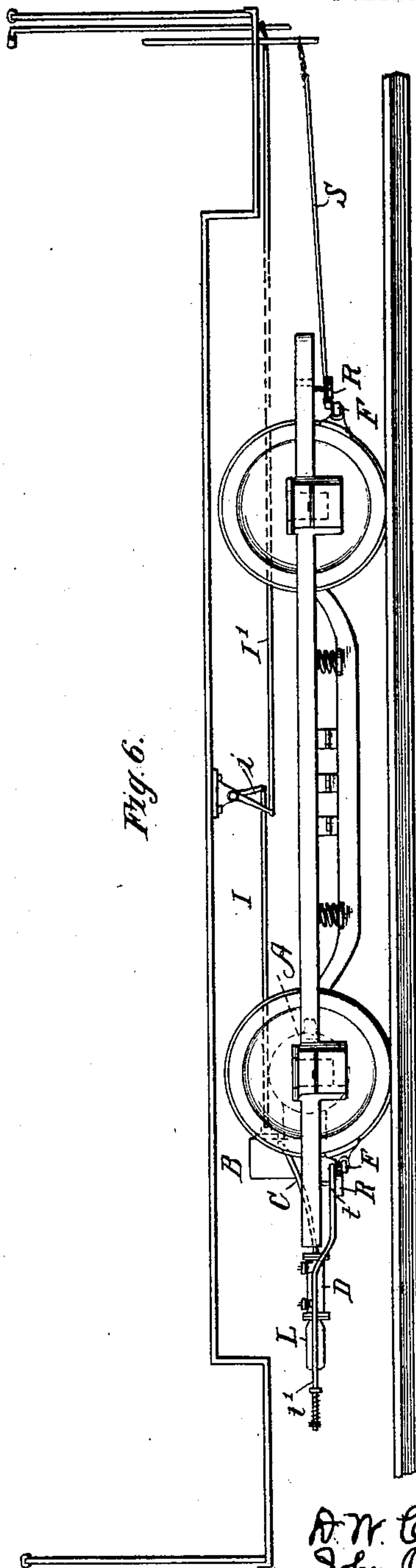
4 SHEETS—SHEET 3.

Fig. 5.



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Fig. 6.



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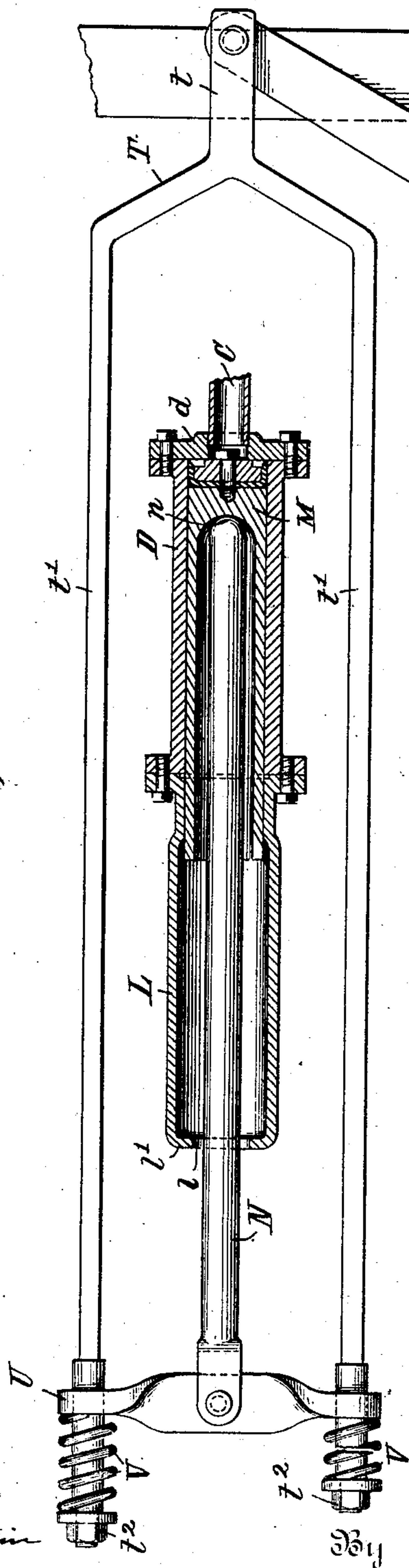
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4 SHEETS—SHEET 4.

Fig. 7.

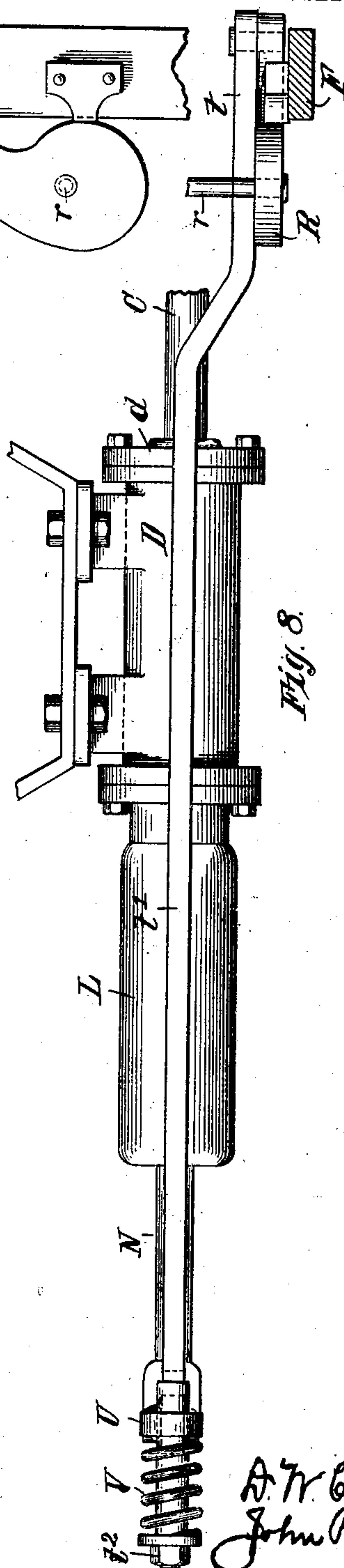


Witnesses

H. S. Austin

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Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID W. COPELAND AND JOHN R. MONTAGUE, OF SYRACUSE,
NEW YORK.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 749,169, dated January 12, 1904.

Application filed April 7, 1903. Serial No. 151,562. (No model.)

To all whom it may concern:

Be it known that we, DAVID W. COPELAND and JOHN R. MONTAGUE, both citizens of the United States, residing at Syracuse, in the
5 county of Onondaga and State of New York, have invented certain new and useful Improvements in Car-Brakes, of which the following is a specification.

Our invention relates particularly to car-
10 brakes in which fluid-pressure is employed to apply the brakes. In one type of such brakes a motor is carried by one of the car-axles that drives a pump which transmits liquid to a
15 brake-cylinder where pressure is applied to a piston connected through intermediate mechanism with the brake-shoes. Inasmuch as the fluid is non-compressible, it often occurs that the brakes are applied in too rigid a manner.

The object of our invention is to prevent
20 this; and our invention consists in providing means whereby the requisite force may be transmitted to the braking mechanism in such manner as to apply the brakes with sufficient power under all conditions, but wherein provision is made for relieving the brakes when
25 the pressure is above the maximum required. In other words, we interpose in the brake mechanism yielding or cushioning devices which permit the brake-shoes to be relieved to some
30 extent from pressure when necessary.

In the accompanying drawings, Figure 1 is a plan view of so much of two connected car-trucks as is necessary to illustrate our invention. Fig. 2 shows a side elevation thereof.
35 Figs. 3 and 4 are views, on an enlarged scale, showing the manner of connecting the brake-lever or sway-bar, the brake-rod, the piston, and the brake-cylinder. Fig. 5 is a plan view of a car truck and brake mechanism embody-
40 ing a modification of our invention. Fig. 6 shows a side elevation thereof. Figs. 7 and 8 are views on an enlarged scale, showing the manner of connecting the brake-lever with the brake-piston.

45 The mechanism may be so organized that the brake-rod or piston-rod will push the brake-lever or sway-bar, or it may exert a pulling action thereon.

In Figs. 1 to 4, inclusive, we have shown an
50 organization in which the brake-lever is

pushed by the brake-rod, while in Figs. 5 to 8, inclusive, we have shown an arrangement in which the brake-lever is pulled.

Our invention does not contemplate any material change in the construction of the car-
55 truck so long as the frame is adapted to support the operative parts of the mechanism.

The drawings show a motor A attached to one of the axles, and this motor is connected in the usual manner with a pump B. From
60 the pump extends a flexible pipe C, leading to a brake-cylinder D. In Figs. 1 and 2 the brake-cylinder is shown as arranged near the middle portion of the car between the trucks where the sway-bar or brake-lever E is lo-
65 cated. This sway-bar or brake-lever is centrally pivoted, and it is connected by rods *e* with frames E' in the two trucks. Each of these frames is connected to an upright lever W, pivoted at *w* and connected by rods *w'* 70 with the brake-beams F, which carry brake-shoes of any suitable kind. It is clear from the drawings that if the sway-bar E be moved in the direction indicated by the arrow in Fig. 1 the brake-bars will be suitably moved to ap-
75 ply the brakes to the wheels. This mechanism is of well-known construction and needs no further description. Devices G are connected with the sway-bar, by means of which the brakes may be operated by hand, if de-
80 sired, in the usual way. The pump B is of course provided with a valve, with which is connected a valve-rod I, in the present instance connected to a bell-crank lever *i*, in turn con-
85 nected with a rod I', attached to a centrally-pivoted lever J, which may be operated in any suitable way, as by rods K and suitable crank mechanism.

Our invention does not reside in any of the parts just described; but our improvements 90 are shown more particularly in Figs. 3 and 4, where it will be seen that the brake-cylinder D is closed at its rear end by a head *d*, to which the flexible pipe C is connected. The opposite end of the cylinder carries a cap L, 95 for a purpose presently to be explained.

The piston M is made quite long, preferably being, as shown, somewhat longer than the cylinder. It is hollow and is adapted to move
100 back and forth freely in the cylinder and also

into and out of the cap L, which latter is made of sufficient length to permit the piston to move to the desired extent. The brake-rod or piston-rod N is not permanently connected with the piston, but it extends into the central recess thereof, merely resting at *n* against the rear wall of this recess. The piston-rod extends through an opening *l* in the front of the cap L, and its outer end is connected with a link O, pivoted at *o* to the brake-lever or sway-bar E, as shown in Figs. 1, 3, and 4. This link is bored to allow the rod N to move back and forth to a limited extent in it, and it is slotted to receive a bolt or pin P, attached to the rod. The brake-rod has secured to it a collar *n'* just outside the cap L when the piston is at the limit of its instroke, and between this collar and the link O is interposed a coiled spring P'. The arrangement is such that when the piston M is moved outwardly toward the sway-bar E it will transmit movement to the sway-bar through the spring P', this spring being of sufficient strength to operate the sway-bar and to hold the brakes on the wheels under all ordinary conditions. When the spring is put under compression, the piston-rod will move in the link in an obvious manner, and thus we provide for a yielding pressure on the brakes rather than a rigid one, as would be the case if the piston-rod were connected directly with the sway-bar. When the piston and cylinder are arranged as shown in Fig. 3, there is danger in case of accident that the piston will be forced entirely out of the cylinder. To prevent this, the cap L is employed. Should the piston M be moved outward to an abnormal extent, its outward end would strike the flange *l'* around the opening *l*, which would cause the piston to be retained.

In Figs. 5 and 6 we have shown a single four-wheel truck. The brake-beams F are engaged by brake-levers R. At the right-hand side of Fig. 5 the brake-lever R is shown as being provided with devices S, by means of which it may be operated by hand, while on the opposite side the brake-lever R is connected with mechanism operated by a hydraulic motor and pump A B. The longer arm of this brake-lever is shown as being connected with an arm *t* of an operating-frame T. (Better shown in Fig. 7.) This frame is bifurcated, having two branches *t'* *t''*, which extend through the cross-bar U and are adapted to move relatively thereto. The branches *t'* are provided with flanged nuts *t''* at their outer ends, and between these nuts and the cross-piece are interposed spiral springs V. The cross-piece is pivotally connected with the brake-rod or piston-rod N, and this rod enters the piston M in the manner illustrated in Fig. 7. All the remaining parts of the mechanism shown in Figs. 7 and 8 are similar to those shown in Fig. 3; but it will be observed that a pulling force is exerted on

the brake-lever. When the piston M is moved outward, the springs V are put under compression, but cause the frame T to be moved outward with the piston and the lever R to be pulled about its pivot at *r*, thus moving the brake-beam F in the proper manner to apply the brakes.

It will therefore be seen that we provide cushioning devices between the brake-lever or sway-bar and piston which will allow sufficient force to be applied to operate the brakes under all conditions and prevent entirely the rigid application of force incident to other constructions.

In the claims for convenience we will define the mechanism operated by the brake-rod as the "brake" mechanism while other parts will be specifically referred to.

We claim as our invention—

1. The combination with the brake mechanism, of a brake-cylinder, means for introducing fluid-pressure therein, a piston reciprocating in the cylinder, a piston-rod bearing rigidly against the piston, and yielding connections interposed between the piston-rod and brake mechanism.

2. The combination with the brake mechanism, of a brake-cylinder, means for admitting fluid-pressure thereto, a piston reciprocating in the cylinder, a piston-rod, yielding connections between the piston-rod and the brake mechanism, and a cap for limiting the outward movement of the piston.

3. The combination with the brake mechanism, of a brake-cylinder, a piston reciprocating therein, connections between the piston and the brake mechanism, and a cap for limiting the outward movement of the piston.

4. The combination with a brake-lever or sway-bar, brake-shoes, connections between the sway-bar or brake-lever and the brake-shoes, a brake-cylinder, means for supplying fluid-pressure thereto, a piston operating in the cylinder, a link pivotally connected with the brake-lever and also connected with the piston-rod, a collar on the piston-rod, and a spring interposed between the link and the collar.

5. The combination of a brake-lever, brake-shoes, connections between the brake-lever and the brake-shoes, a brake-cylinder, means for supplying fluid-pressure thereto, a piston reciprocating in the cylinder, a piston-rod, a cross-bar connected therewith, a bifurcated frame yieldingly connected with the cross-bar, and connections between the bifurcated frame and the brake-lever.

In testimony whereof we have hereunto subscribed our names.

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JOHN R. MONTAGUE.

Witnesses:

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