

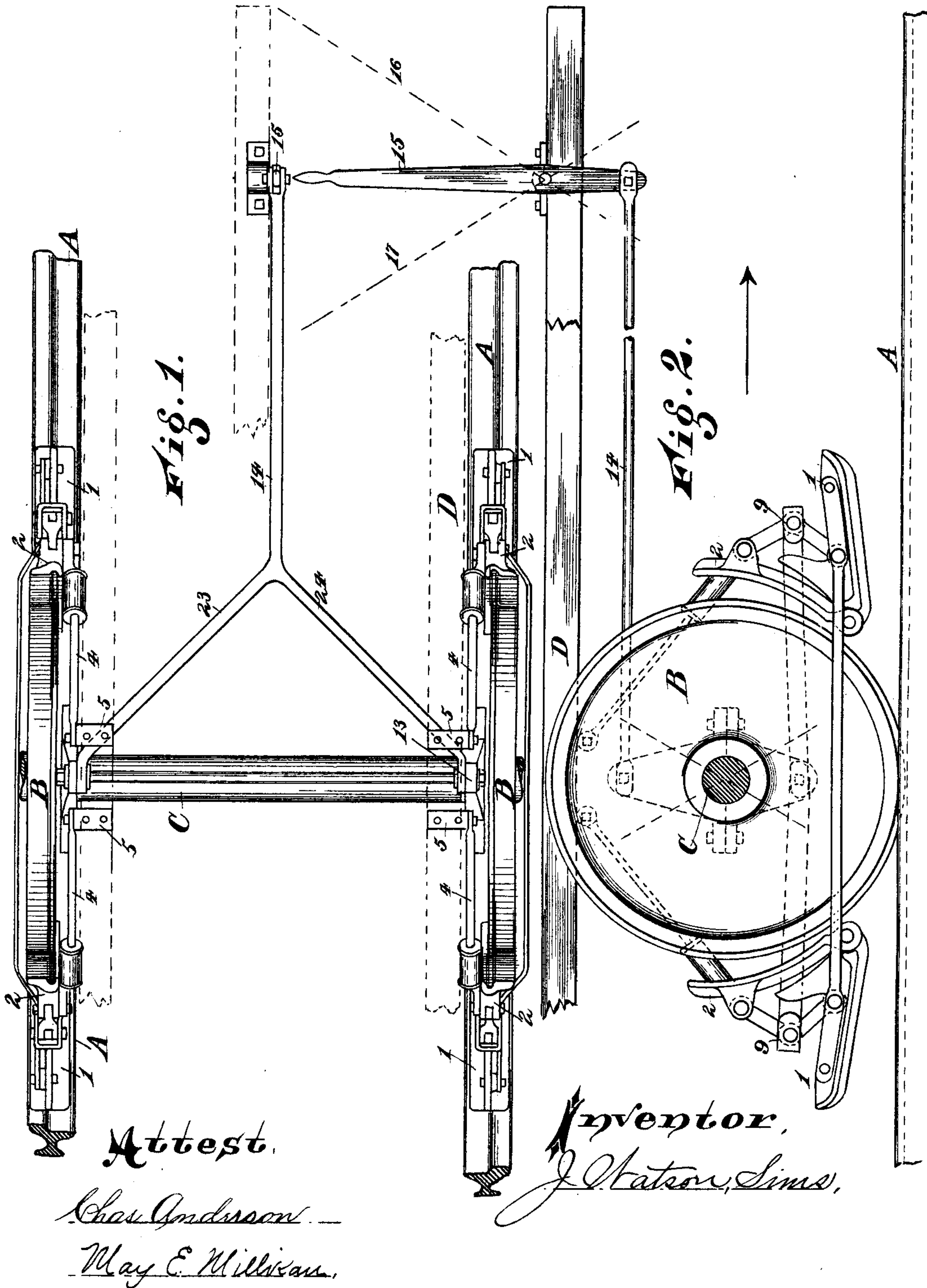
(No Model.)

2 Sheets—Sheet 1.

J. W. SIMS.
CAR BRAKE.

No. 388,731.

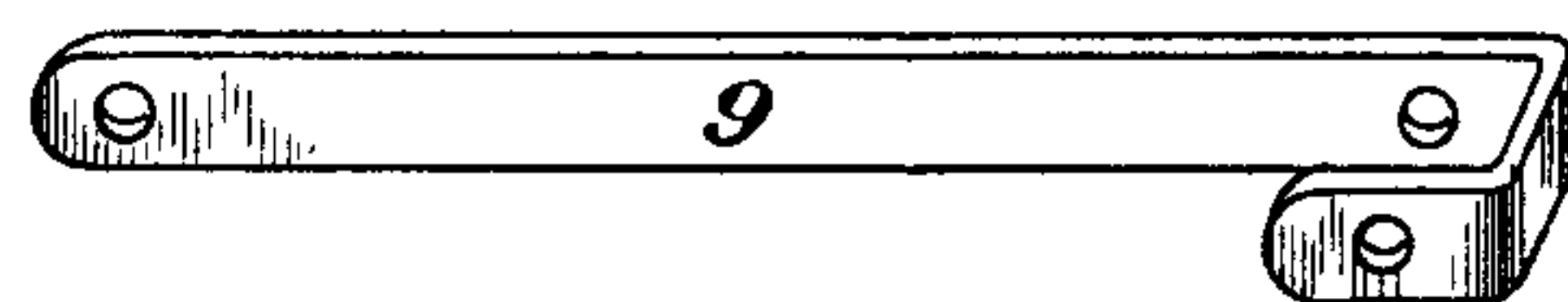
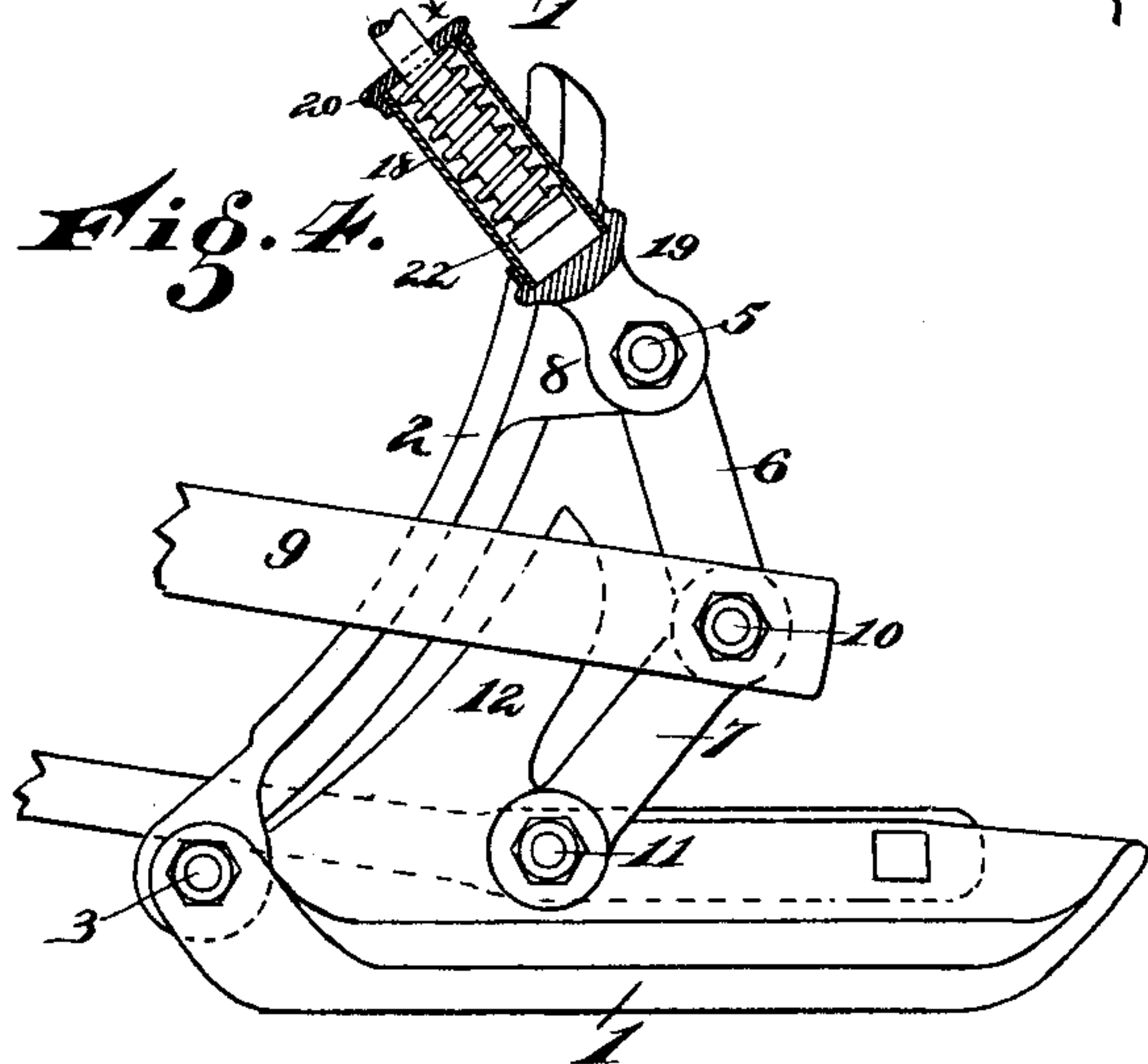
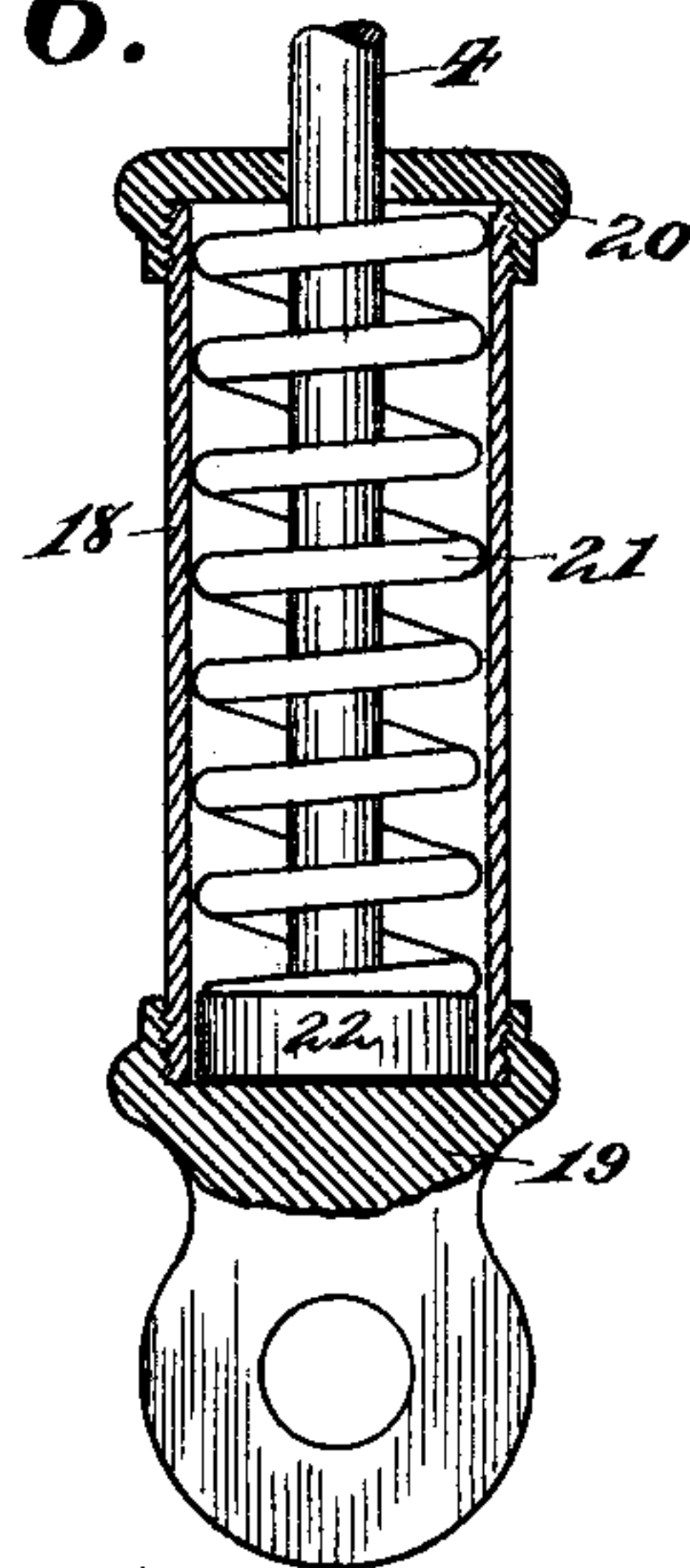
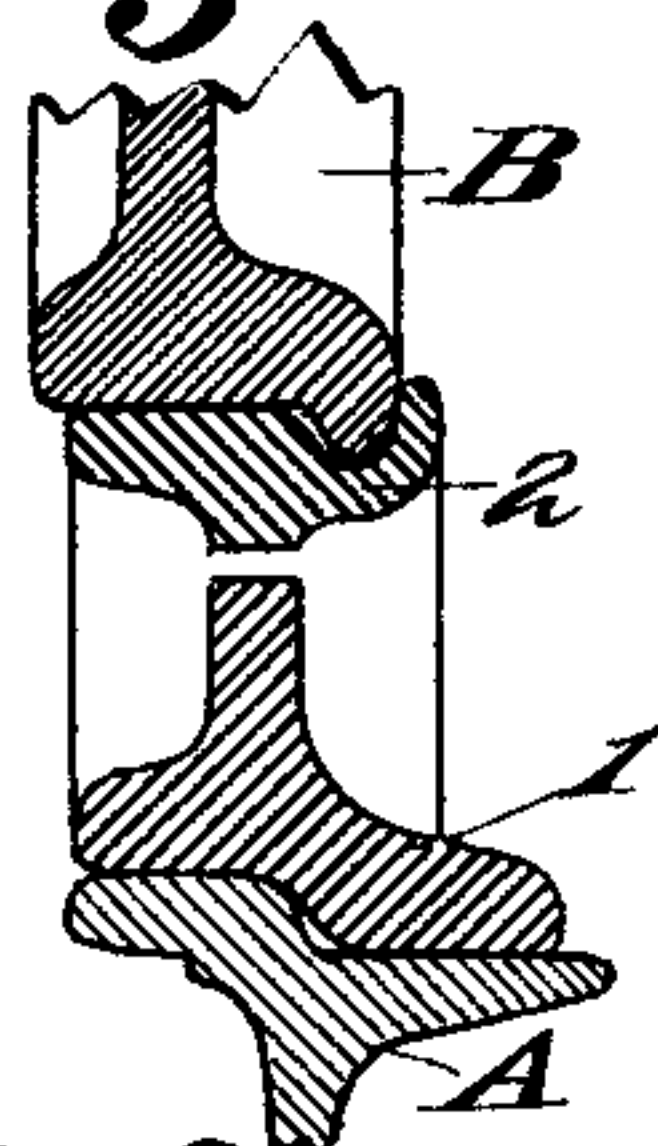
Patented Aug. 28, 1888.



2 Sheets—Sheet 2.

No. 388,731.

Patented Aug. 28, 1888.



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UNITED STATES PATENT OFFICE.

JOSEPH WATSON SIMS, OF CINCINNATI, OHIO.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 388,731, dated August 28, 1888.

Application filed December 8, 1887. Serial No. 257,292. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WATSON SIMS, a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain
5 new and useful Improvements in Car-Brakes, of which the following is a specification.

The object of my invention is to provide a car-brake for cable, electric, and other similar roads which can be operated to apply friction
10 to both the car-wheel and the track.

Another object of my invention is to provide a yielding connection or hinge-joint connecting the wheel with the track-brake, so that the application of pressure will bring them
15 both to the desired point for work.

Another object of my invention is to provide operating devices centering upon the axle of the car or other suitable point on the running-gear, so as to apply one device to each
20 side of the wheel or wheels in such a manner that the car can be braked from either side.

Another object of my invention is to sustain the shoe on a spring extension-rod, so that the oscillation of the car will not affect the brake
25 when at work.

Another object of my invention is to provide a toggle-joint lever for spreading apart the two sections of the brake, whereby a great amount of power is obtained to stop the movement of the car-wheel and the car upon the
30 track.

The various features of my invention will be fully explained in the description of the accompanying drawings, making a part of this
35 specification, in which—

Figure 1 represents a top plan view of my improvement applied to the wheels of one of the car-axles. Fig. 2 is an outside elevation. Fig. 3 is an inside elevation. Fig. 4 is a similar view with the parts enlarged and showing the spring in section. Fig. 5 is a section on
40 line *x x*, Fig. 3. Fig. 6 is an enlarged sectional view of the spring and its housing. Fig. 7 is a detail view of one of the connecting-
45 arms.

A represents the track of an ordinary street or cable road; B, the car-wheel; C, the car-axle; D, the sill of the car.

The method of connecting the car to the axle
50 is omitted in order to better illustrate the parts of my device.

1 represents a track-shoe, preferably having its lower edge conform to the surface of the rail A.

2 represents a brake-shoe, which is shown 55 in Fig. 5 as having its peripheral edge conform to the lip and tread of the car-wheel.

3 represents a hinge for connecting the brake-shoe 2 with the track-shoe 1.

In order to bring the shoe 1 down upon the
60 track and in proper position to sustain the thrust of the brake, I provide the following instrumentalities on which to suspend and operate them:

4 represents the suspension-rod, pivoted to 65 the bracket 5, attached to the sleeper of the car D. This rod is made extensible and hinged to the ear of the brake-shoe at 5.

6 7 represent links, which act as a toggle-joint lever, link 6 being hinged to the ear of
70 shoe 2 at one end and to the operating-lever 9 by the hinge-bolt 10 at the other. Link 7 is likewise hinged at its upper end to the same bolt and its lower end pivoted to the track-shoe at 11.

12 represents a lug projecting up from the track-shoe 1, which serves as a stop upon which the friction-brake 2 rests. Operating-lever 9 is hinged to the lower arm of lever 13, which,
80 as shown, journals upon the axle C in Fig. 3.

14 represents a connecting-rod hinged at one end to lever 13 and the other end to the hand-lever 15. I have shown four sets of brakes, one being applied to the front and rear side of each wheel. These are worked in
85 sets—one set, say upon the front side, serving to brake the car when it is going down an incline, the other, upon the rear side, serving to block the car when ascending an incline. These are both shown as being operated by
90 the same hand-lever, which is pushed forward in the direction of the line 16 to operate one set of brakes, and is drawn back in the direction of line 17 to operate the other set of brakes, and is set in the vertical plane to hold them
95 both normally out of use, as shown in Fig. 2. Each brake, however, is operated upon the same principle, which is as follows: As the brake is suspended by the rod 4 to the sill of the car as well as by the rod 9 upon the axle,
100 and as the car-sill D rises and falls as it is more or less loaded, and in the accommoda-

tion of the sill to the yielding of the springs, it is necessary to have the rod 4 extensible, so that the operation and position of the car-sill D will not affect the operation of the brake. I prefer the following method of making the rod 4 automatically extensible.

18 represents a spring-housing, one end of which screws into the socket of section 19 of the connecting-rod 4. The other end is provided with the cap 20, that screws upon the barrel of the housing 18. It is pierced with an orifice of the same shape and size as rod 4, so as to allow rod 4 to move in and out freely.

21 represents a coiled spring, the end of which seats against the cap 20.

22 represents the lower seat of the spring, which has a head formed on the connecting-rod 4. As the connecting-rod 4 is pulled up through the cap 20 of the housing, the spring 21 is compressed, the head rising off of its seat, which is normally at the bottom of the socket of section 19.

When it is desired to use only one set of brakes, they are held normally out of engagement by locking the lever 15. When there are two sets of brakes, one upon each side of the car-wheel, they balance the other and will be held out of position by the equilibrium of the two weights. When it is desired to operate the brakes, the hand-lever 15 is pushed or pulled, as the case may be, rocking the lever 13, that journals upon its center, and pulling the connecting-rod 9 and the links 6 7 inward toward the car-wheel. This forces the brake and brake-shoe 1 and 2 apart. At the same time the movement of connecting rod 9 brings the shoe 1 down upon the track. The link-levers 6 7 apply strain or power to the brakes 1 2, pressing one against the surface of the wheel and the other upon the surface of the track, thereby braking the car both by the friction applied to the track simultaneously with the application of friction to the car-wheel, enabling the car to be readily stopped at a very steep inclination of the track quickly and with perfect safety. The movement of the connecting-rod 9 in the act of depressing the brake brings the shoe 2 in contact with the wheel, and the lowering of the shoe 1 and 2 together extends the rod 4—that is, pulls it upward from its seat—compressing the spring 21, as shown in Fig. 4, as the inner ends of toggles 6 7 are drawn inward on their central pivot, 10, until the shoes 1 and 2 are in position. As the hand-lever 14 is pushed or pulled, as the case may be, the connecting-rod 9 is depressed, carrying both sections of the shoe downward, and the same movement draws the toggles 6 7 inward to apply pressure to the track and wheel. A reverse movement of the hand-lever opens out the toggles and releases them simultaneously with the movement to raise the shoes up to their normal position. (Shown in Fig. 2.) With this construction of shoe it makes it very easy to remove the shoe when the weight of the car is against it.

It will be noticed that directly opposite the

pivot-point 3 there is no contact with the wheel.

When the lever 9 is pushed out, the operation is as follows: The pivot 11, being nearest the center of motion, will act as the center, and shoe 2 will turn on center 3, drawing it away from contact with the wheel before shoe 1 is lifted off the track. A further movement of lever 15 will raise the shoe in the position shown in Fig. 2.

It will be also observed that this arrangement of the spring and the extensibility of the suspension-rod 4 allows the oscillation of the car-sill D without affecting the pressure of the brake. This brake is a very important improvement, as it may be used ordinarily for braking the car on any grade, and yet form a perfect safety-lock on inclined planes. It can be readily operated because of the great leverage power, and the employment of the toggle-lever system to force apart the two shoes pivoted at their front points.

It will be observed that one, two, or four brakes may all be controlled by the same lever. To accomplish this I provide a fork, 23 24, for the connecting-rod 14, one arm of which engages with the lever 13 on the axle near one of the wheels, and the other fork engaging with a similar lever suspended on the axle near the opposite wheel.

It will also be seen that the brake on one side of the wheel balances the weight of the brake on the opposite side of the wheel, when they are used in couplets, front and rear.

For ordinary purposes one set of brakes applied to the front and rear sides of the wheel will be sufficient. On heavier grades, by employing a forked lever, the two sets of brakes may be advantageously operated by one and the same lever, and a double security obtained.

Having described my invention, what I claim is—

1. The combination of the shoes 1 2, pivoted at their forward points and connected by link-levers 6 7, and hinged to a connecting-rod, 9, suspended upon the oscillating lever 13, for raising and lowering the brake and simultaneously to move the toggles, substantially as specified.

2. In combination with the brake-shoes 1 2, hinged together and suspended by an operating-lever, the suspension-rod 4, attached to the car-frame, and the link 9, connected to a lever attached to the car-axle, substantially as specified.

3. In combination with the shoe-brakes 1 2, hinged together, lever mechanism for lowering, raising, and spreading the same, and the extensible suspension-rod 4, connected to the car and to the brake-shoe, substantially as herein specified.

4. In combination with the compound shoe-brake 1 2, hinged together and operated by lever spreading and raising and lowering mechanisms, the suspension-rod 4, connected to the shoe by the spring and housing, whereby

the oscillation of the rod 4 may take place without affecting the application of power to the brake, substantially as specified.

5 5. In combination with the brake-shoes 1 2, pivoted together, the extension-rod 4, formed of two sections, one connected to the brake and the other to the platform of the car, with a housing supporting a spring to form the extensible suspension-rod, substantially as specified.
10

6. In combination with an oscillating lever, 13, journaled upon the running-gear of the car, a track and wheel brake composed of the shoes 1 and 2, pivoted together, a toggle
15 mechanism connecting said shoes with each other and with the oscillating lever 13, and means, substantially as described, for suspending the brake-shoes and operating devices, substantially as set forth.

20 7. In combination with a track and wheel brake composed of the shoes 1 and 2, pivoted together, the oscillating lever 13, journaled upon a car running-gear, a toggle mechanism connecting the shoes and oscillating lever, an
25 extensible suspension-rod. 4, the hand-lever 15, and the connecting-rod 14, substantially as described.

8. The combination, with two sets of track and wheel brakes suspended in front and rear of the wheel and composed of shoes 1 and 2, 30 pivoted together, of an oscillating lever, 13, journaled on the car running-gear, toggle links or levers connecting the shoes of each set together and connecting both sets to said oscillating lever, and means for actuating 35 said lever, substantially as described.

9. The combination of the pivotally-connected shoes 1 and 2, suspended in sets in front and rear of the car-wheels, and having bearing-surfaces conforming, respectively, to 40 the track and wheels, oscillating levers 13, journaled on the car running-gear, links or levers 6, 7, and 9, connecting said shoes to the oscillating levers, extensible suspension-rods 4, and means for actuating the oscillating 45 levers, substantially as described.

In testimony whereof I have hereunto set my hand.

J. WATSON SIMS.

Witnesses:

ROBERT ZAHNER,
M. E. MILLIKAN.