No. 666,183. Patented Jan. 15, 1901.

# F. L. CLARK.

## ELECTROMAGNETIC BRAKE.

(Application filed May 14, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

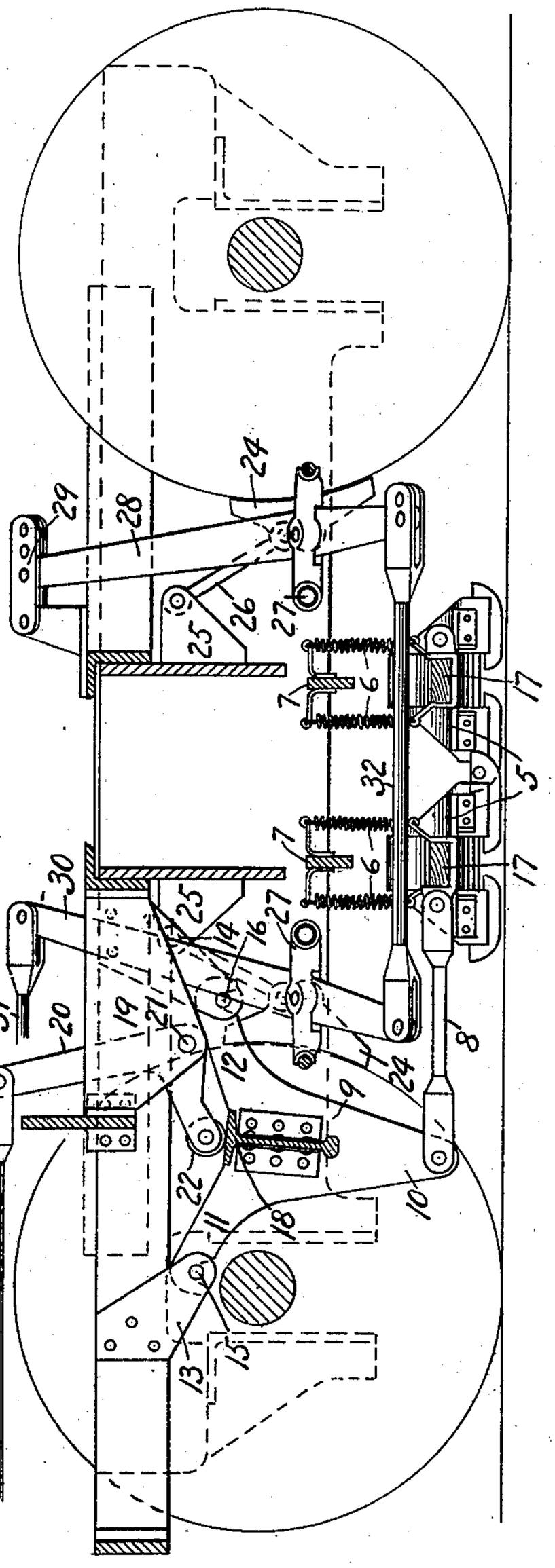


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Fig. 2

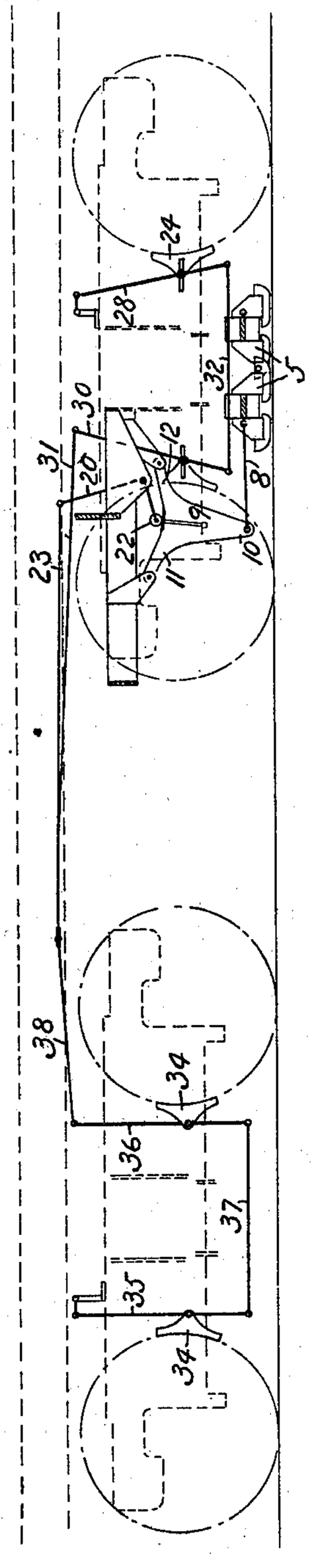
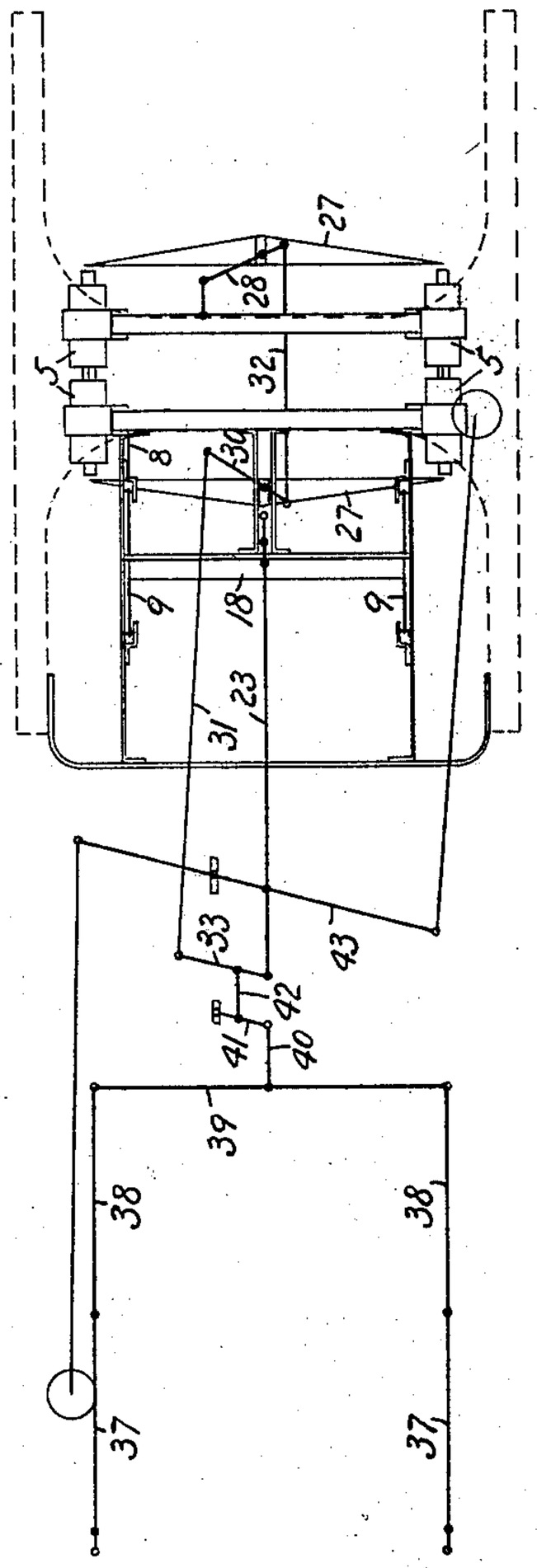



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## ELECTROMAGNETIC BRAKE.

SPECIFICATION forming part of Letters Patent No. 666,183, dated January 15, 1901.

Application filed May 14, 1900. Serial No. 16,546. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS L. CLARK, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Electromagnetic Brakes, of which improvement the following is a specification.

My invention relates to electric brake mechanism for cars, and particularly to that class of brakes in which both rail-shoes and wheel-shoes are employed.

The object of my invention is to provide an improved means whereby the application of the rail-shoe will operate to set the wheel-shoes when the car is running in either direction, and it is adapted to be applied either to cars having four wheels or to cars having a double truck at each end of the car.

I have illustrated my improved construction in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a car-truck, showing my improvement applied thereto. Fig. 2 is a side view in diagram, showing my improvement applied to two double trucks; and Fig. 3 is a plan view of the construction shown in Fig. 2, also in diagram.

Referring to Fig. 1, the magnetic rail-shoe 5 is suspended by means of springs 6, which are attached to cross-bars 7 of the truck-frame. These shoes are suspended in close proximity to the rail, and the shoes on opposite sides of the truck are connected by cross-bars 17. The thrust-rod 8 is secured at one end to the rail-shoe 5 or to the cross-bar 17 and at the other end by a pivotal connection to the lever 9. The lever 9 is provided with a depending portion 10 and two oppositely-projecting arms 11 and 12. Secured to the truck-frame in line with the lever are two brackets 13 and 14, which are provided with bearing-pins 15 and 16, on which are hung the two arms 11 and 12 of lever 9. Slots are formed on the under side of the arms 11 and 12 to accommodate the bearing-pins. The thrust-rod 8 is connected to the lower portion 10 of the lever 9, and as it is moved in either direction the lever 9 is adapted to turn about either bearing-pin 15 or 16, according to which direction it is moved. This constitutes a lever having a shifting fulcrum, one fulcrum being used when the lever is moved in one direction and the other or opposite fulcrum being used when the lever is moved in the opposite direction. There are two levers 9, located on opposite sides of the truck, and they are joined by a cross-beam 18, so that they are caused to move together. Bracket-plates 19 are secured to the upper part of the truck-frame, and between them is pivoted the lever 20 at the point 21. The lower arm of this lever is provided with a roller 22, that is adapted to bear upon the upper surface of the top flange of the cross-beam 18, which connects the levers 9. The upper end of the lever 20 is pivotally secured to the pull-rod 23 of the brake mechanism. The wheel-shoes 24 of this truck are suspended from brackets 25 by pivoted links 26 and are connected together crosswise of the truck by brake-beams 27. To the middle portion of one brake-beam is pivotally secured the brake-lever 28, which has a fixed fulcrum 29 at its upper end. The brake-lever 30 is pivotally secured to the other brake-beam 27, and its upper end is connected to the rod 31. The lower ends of levers 28 and 30 are connected together by means of rod 32. The rods 23 and 31 are connected to opposite arms of cross-lever 33, which is pivoted between said ends, so that the rod 31 will always be moved in the opposite direction to that of pull-rod 23.

When my device is applied to a car with only four wheels, the lever 33 will be pivoted to some stationary part of the car-body or truck-frame, and the rod 42, with its connections to the brake-rigging for the other truck, will be omitted.

In the application of my device to a car having two double trucks, as shown in Figs. 2 and 3, the wheel-shoes 34 of the other truck are provided with brake-levers 35 and 36, which are connected together at their lower ends by rod 37. The upper end of lever 35 has a fixed fulcrum, while the upper end of lever 36 is connected to the rod 38. The rods 38 on opposite sides are joined by beam or yoke 39, which is connected to pull-rod 40, pivoted to lever 41. Levers 41 and 33 are

joined by rod 42, which also forms the fulcrum for lever 33. Another lever 43 is attached at one point to rod 23 and is connected at its ends with devices adapted to be operated by hand. The lever 43 is also pivoted at another point to some part of the car-body, so that by applying the hand-operated devices which are connected to the outer ends of the lever 43 the rod 23 may be moved to apply the brakes.

The operation of the device is as follows: Supposing the car to be moving toward the right and the magnetic rail-shoe to be applied, then the thrust by means of bar 8 will move the lower end 10 of lever 9 toward the left, turning said lever about the point 16 as a fulcrum. The cross-beam 18 will thereby be raised and the arm of lever 20, having roller 22, will be forced upwardly, thus turning lever 20 about its pivot 21 and drawing the rod 23 toward the right. The rod 31 will then be drawn toward the left by means of lever 33, and the brake-shoes 24 will be applied to the wheels. An equal force will also be exerted to apply the brake-shoes 34 to the wheels of the other truck by the brake-levers 35 and 36 and the rods 38, 40, and 42. If the car be moving toward the left when the rail-shoe is applied, the rod 8 will exert a pull upon the lower end of the lever 9, turning it about the point 15 as a fulcrum. In this case the arm of lever 20 carrying the roller will be forced upwardly, and the rod 23 will again be moved to the right the same as before. It will thus be seen that the pull-rod 23, by which the wheel-shoes are operated, will be moved in the same direction (to the right) by the application of the rail-shoe when the car is moving in either direction.

I have provided a mechanism which requires but one single connection to the rail-shoe for operating the wheel-shoes when the car is moving in either direction, and while I have shown a lever having a shifting fulcrum as a specific means I do not limit myself to this specific construction, but wish to cover any similar means which is adapted to be moved in opposite directions by a single connection to the rail-shoe to apply the wheel-shoes when the car is moving in either direction.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A brake mechanism for cars, comprising a rail-shoe, wheel-shoes for the wheels, a single connection for the rail-shoe and means operated by this single connection for applying the wheel-shoes by the longitudinal movement of the rail-shoe when the car is moving in either direction.

2. In a brake mechanism for cars, a rail-shoe, wheel-shoes for the wheels, mechanism adapted to be moved in either direction to apply the wheel-shoes by the longitudinal movement of the rail-shoe, and a single connection to the rail-shoe for operating said mechanism.

3. In a brake mechanism for cars, a rail-shoe, wheel-shoes for the wheels, a lever having a shifting fulcrum for operating the wheel-shoes and a connection from the lever to the rail-shoe.

4. In a brake mechanism for cars, a lever having a shifting fulcrum for operating the brake-shoes and means for moving the lever in either direction.

5. In a brake mechanism for cars, a rail-shoe, wheel-shoes for the wheels, a lever having a shifting fulcrum, means operated always in the same direction by said lever for applying the wheel-shoes and means for turning the lever in one direction on one fulcrum and in the opposite direction on the other fulcrum.

6. In a brake mechanism for cars, a rail-shoe, wheel-shoes for the wheels, a lever having a shifting fulcrum, another lever connected to the wheel-shoes and adapted to be operated in the same direction by the lever having the shifting fulcrum when it is turned upon either fulcrum and a rail-shoe for actuating the lever having the shifting fulcrum in either direction according to the direction of the motion of the car.

7. In a brake mechanism for cars, a lever provided with two oppositely-projecting arms, each having a fulcrum, another lever operated by the first-mentioned lever for applying the wheel-shoes and a rail-shoe for actuating the first-mentioned lever in either direction.

In testimony whereof I have hereunto set my hand.

FRANCIS L. CLARK.

Witnesses:
R. F. EMERY,
JAS. B. MACDONALD.