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CAR BRAKE.

No. 249,039. Patented Nov. 1, 1881.

Fig 1.

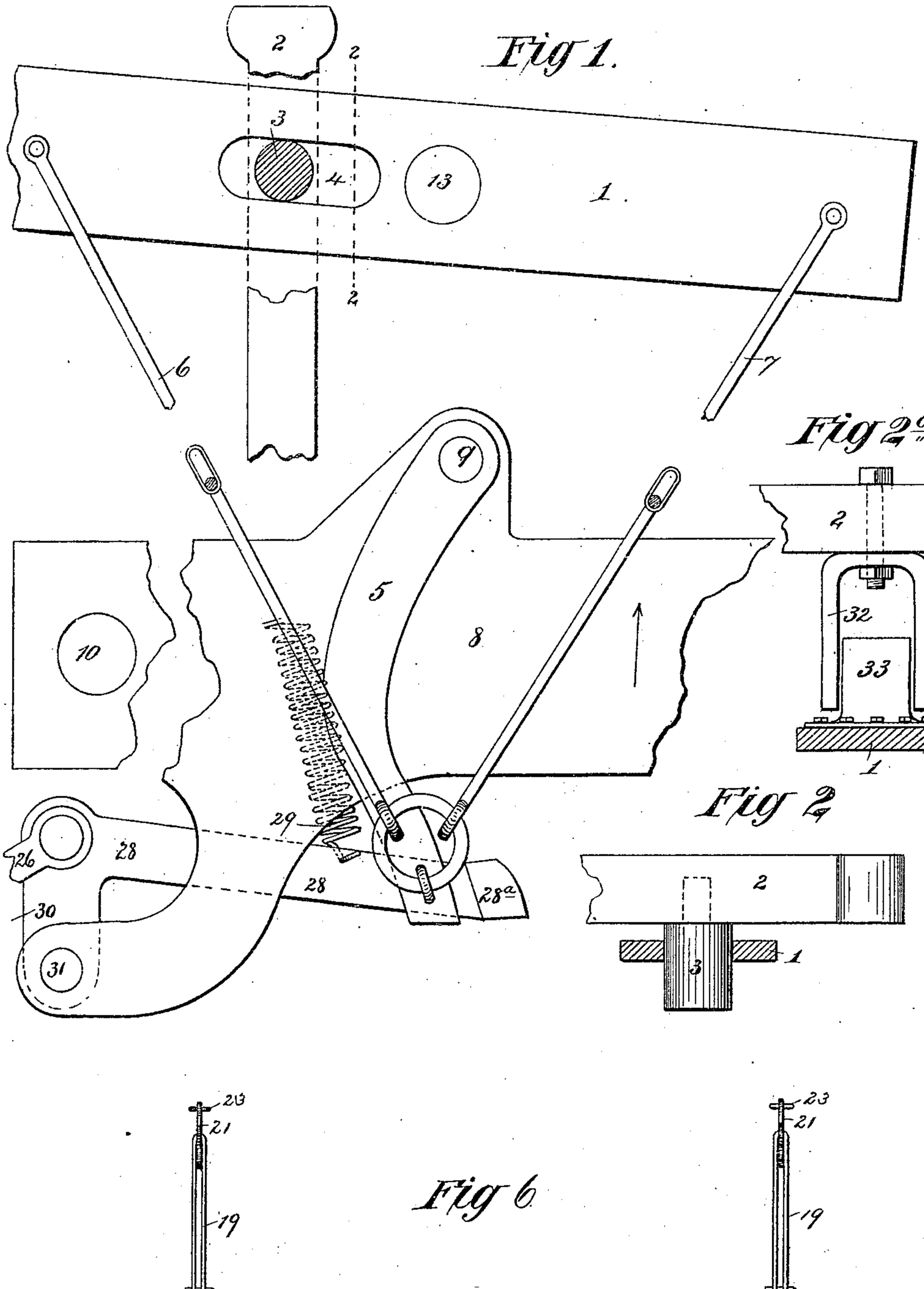

Fig 2a

Fig 2

Fig 6

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Fig 3.

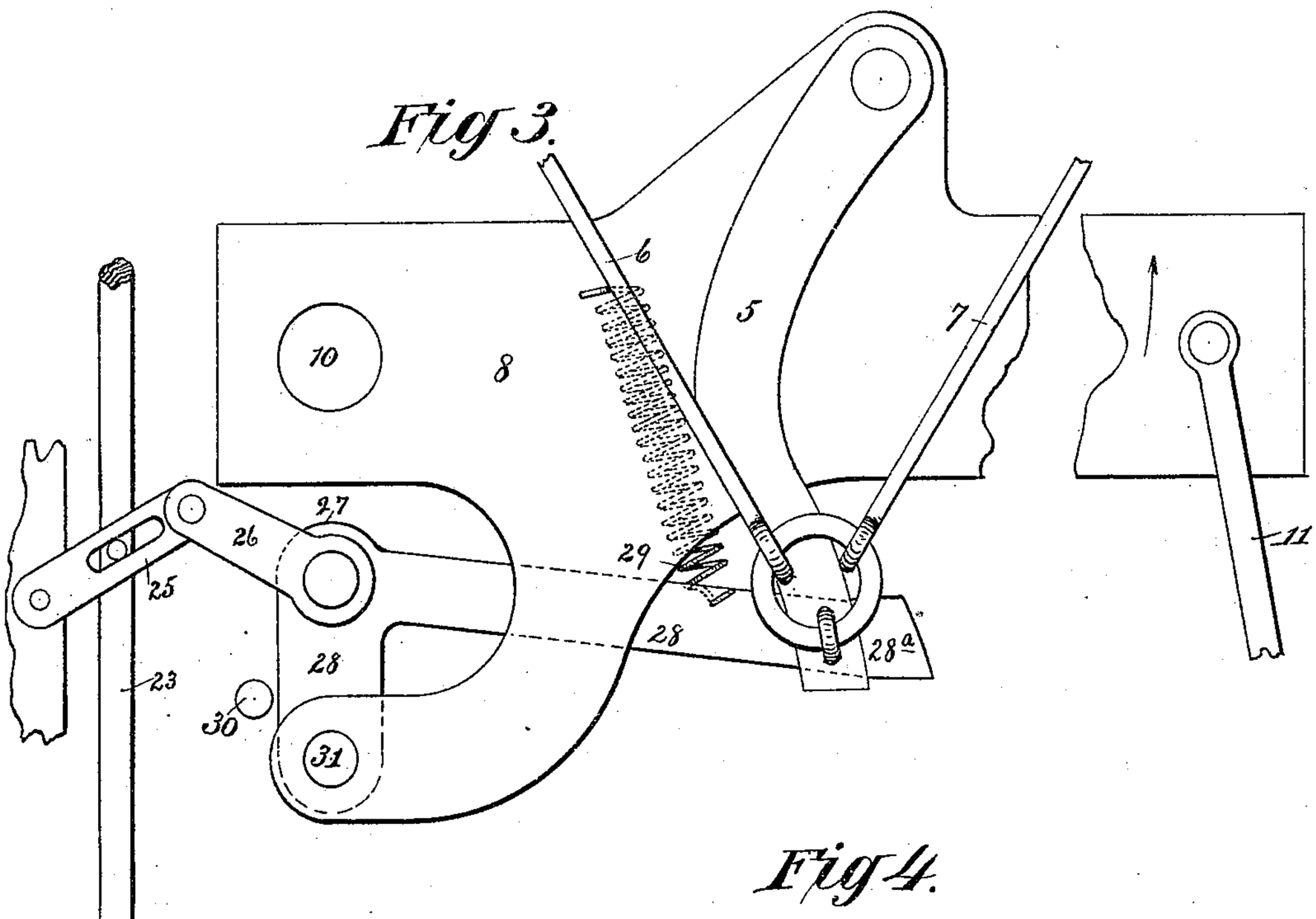

Fig 4.

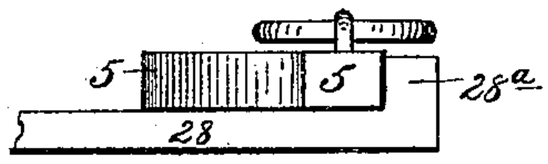

Fig 5

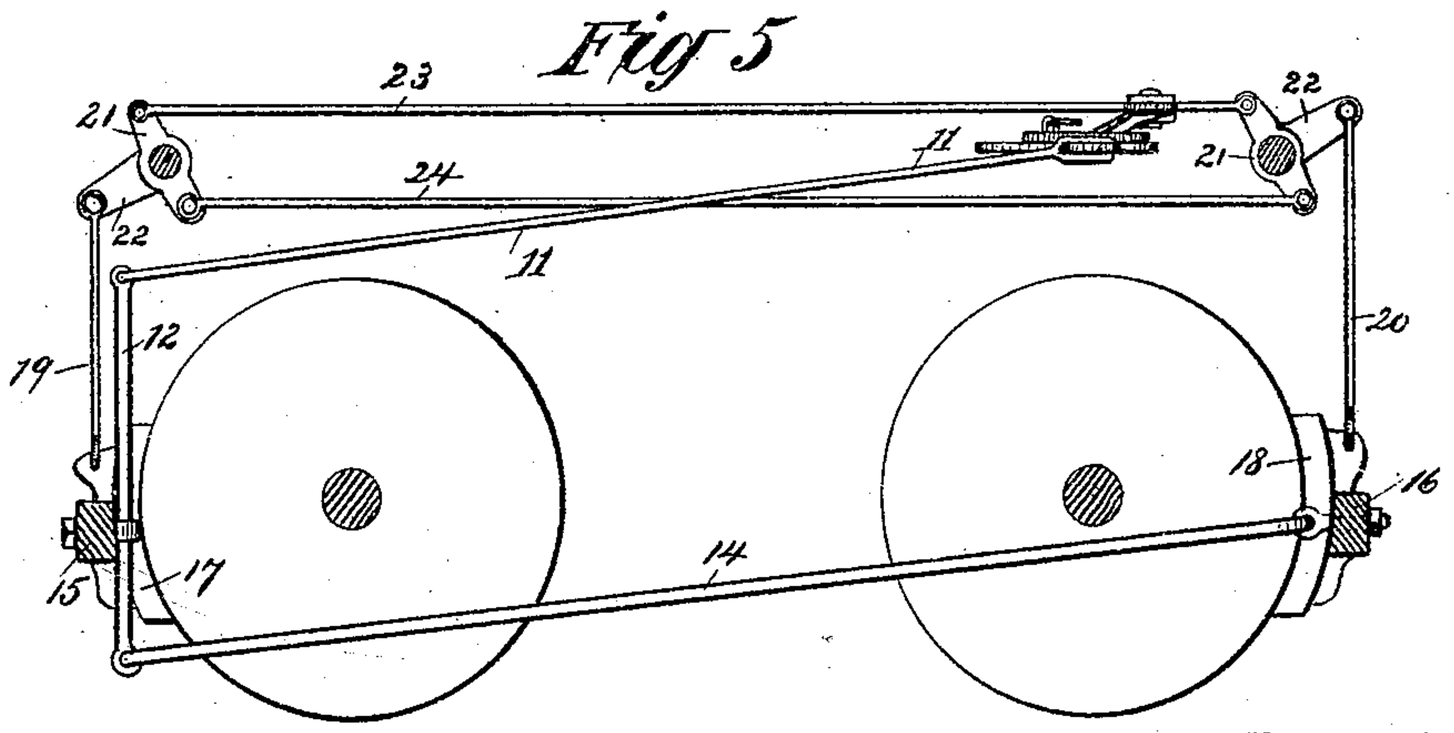

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Fig 7.

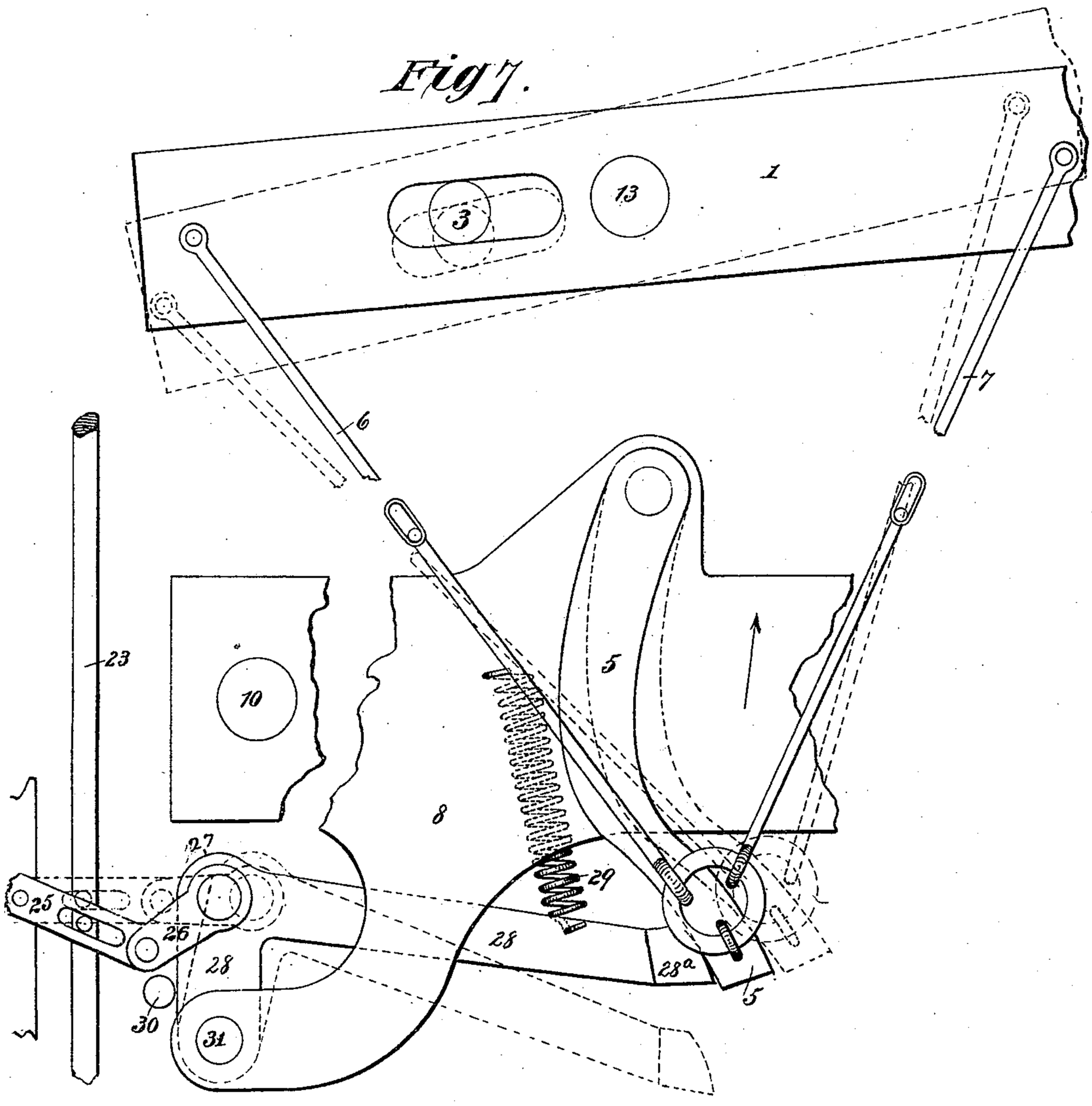

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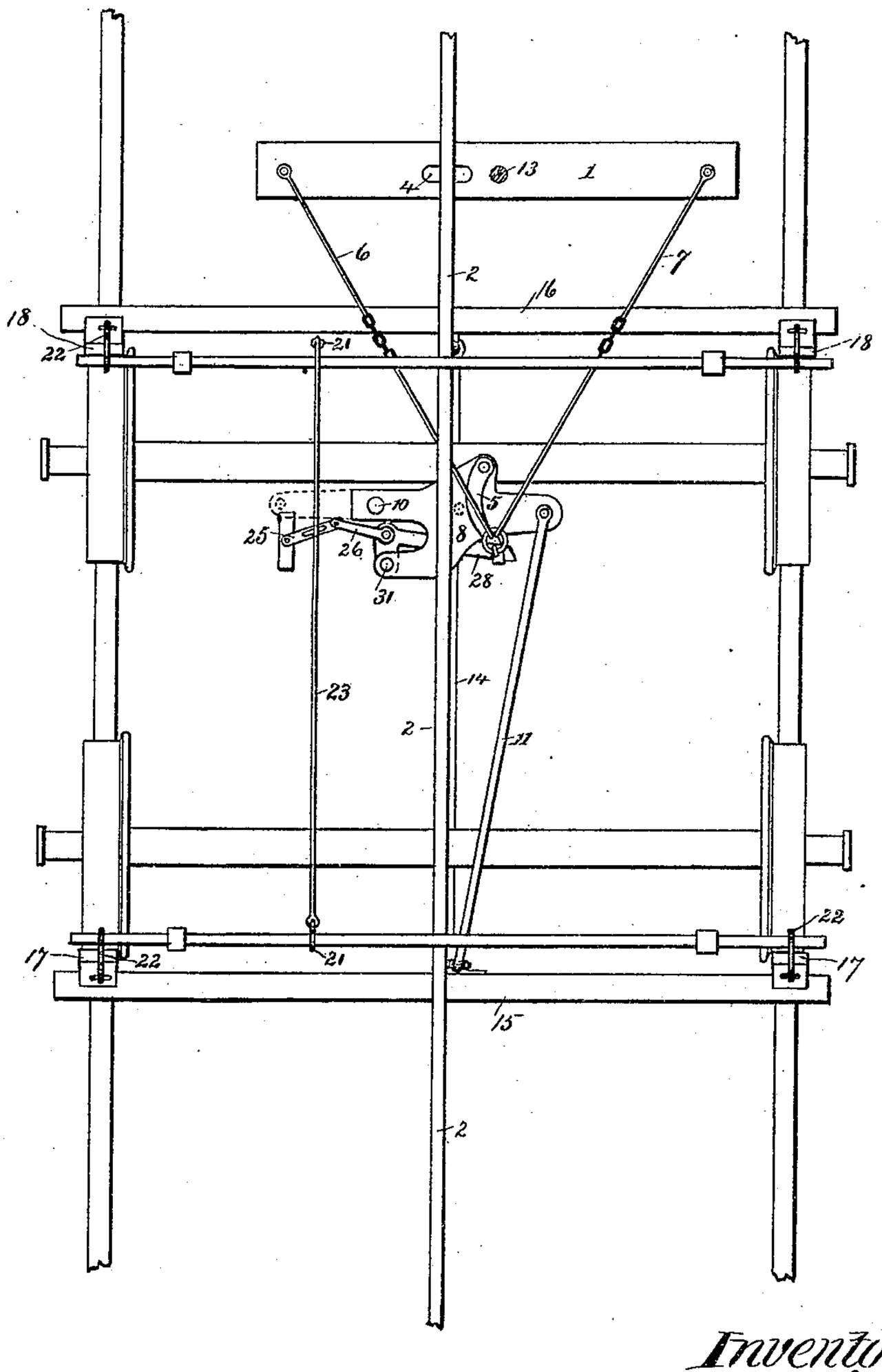
Fig 8.



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CAR BRAKE.

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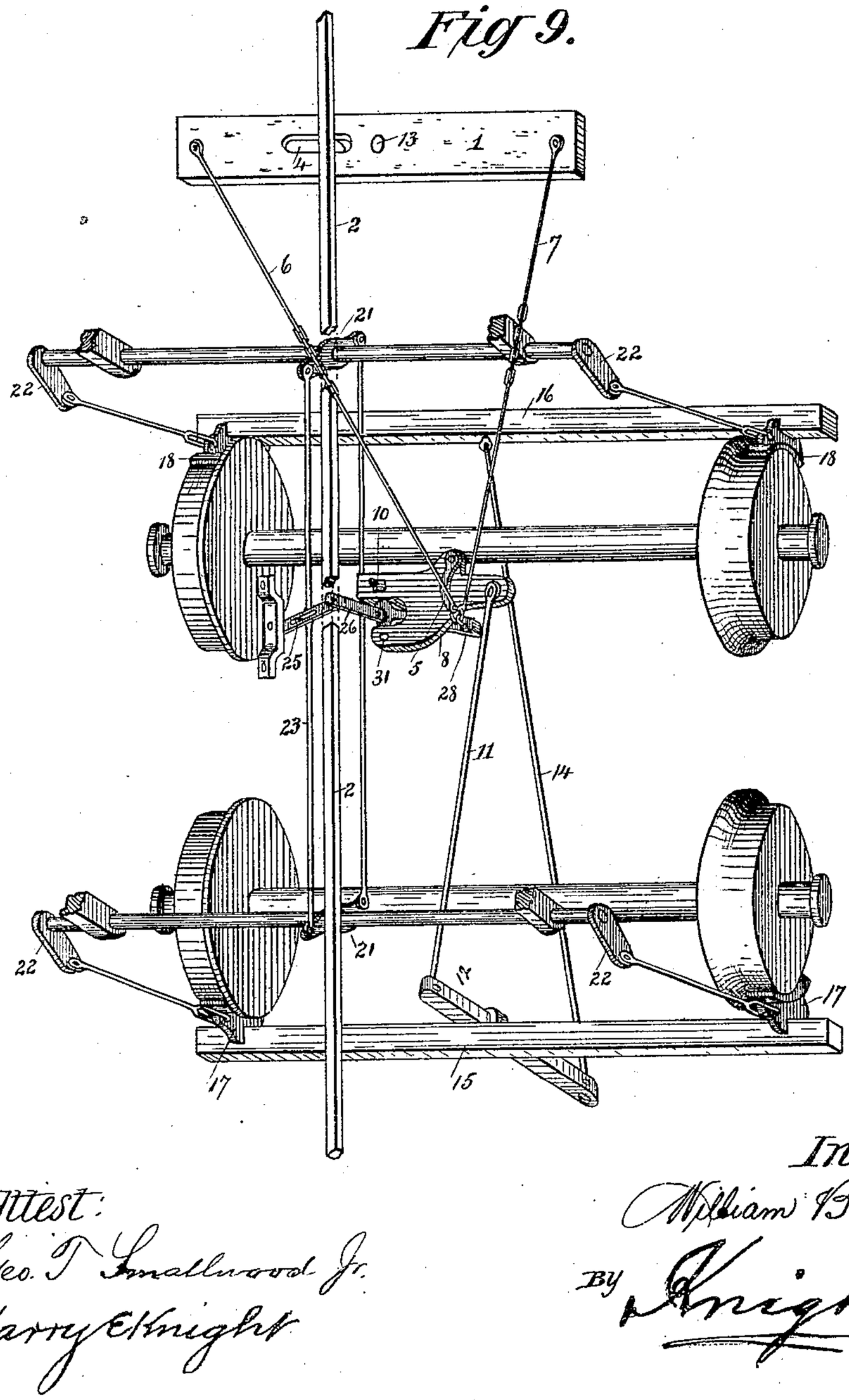
Fig 9.



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UNITED STATES PATENT OFFICE.

WILLIAM B. GUERNSEY, OF NORWICH, NEW YORK.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 249,039, dated November 1, 1881.

Application filed May 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. GUERNSEY, a citizen of the United States, residing at Norwich, in the county of Chenango and State of New York, have invented Improvements in Automatic Car-Brakes, of which the following is a specification.

The invention relates to mechanism to effect the application of the brakes of a railroad-car by means of the draw-bar or its equivalent.

Heretofore such brakes have been made so as to be serviceable in the movement of the car in one direction only, or so as to require special non-automatic adjustment, or so as to demand a definite and somewhat high rate of speed to actuate the mechanism when reversible and automatic in acting. The first is objectionable, as it is unavailable in more than one-half of the service of the car to which it may be applied. The second is objectionable, as it calls for personal attention when the appliance is desired to act with the motion of the car reversed, and this personal attention is often unavailable in the operation of railroad-train service. The third method is objectionable from the fact that the action of such a brake is needed oftener while running at low rates of speed than at high ones—as, for instance, when running through the corporate limits of towns and cities where high speed is prohibited.

The object of my invention is to provide a brake that will act at any rate of speed, with the car running in either direction, and by the extension as well as the compression of the draw-bar.

The invention consists of an arrangement of levers attached to the draw-bar so that they are operated by its movements in either direction, and connected with the brake-shoes so as to apply them to the wheels of the car, an escapement being combined with the levers, so as to sever temporarily the connection of the levers with the brakes when the wheels begin to revolve in a direction opposite that in which they have revolved previously, and automatically establish a reversed connection, which will cause the opposite movement of the draw-bar to apply the brakes. The brake-shoes are so hung that they have a limited arc of movement in the direction in which the wheels revolve, by which movement they actuate the escapement device that determines the adjustment of the system of levers to actuate the brakes appropriately to the direction in which the car is moving. Also, in the combination, with the brake-shoe beams, balanced substantially as hereinafter described, of a spring or its mechanical equivalent, tending to keep the beams or shoes in their acquired position on one or the other side of their center of permitted movement.

In the accompanying drawings, Figure 1 is a plan of compound levers and their accessories for transmitting movement to the brakes from the draw-bar, the parts being shown in the positions which they occupy when the train is moving forward with brakes off. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 2ª is a section of the same or corresponding parts, showing a modification in the mode of connecting the draw-bar and transmitting-lever, as hereinafter described. Fig. 3 is a plan of the transmitting-levers, showing the positions when the brakes are applied under a forward movement of the train, and showing also their connection with the governing-rod. Fig. 4 is an end elevation of the dog or detent, showing it engaged with the regulating-lever, as hereinafter described. Fig. 5 is a sectional elevation, on a smaller scale, of the balanced brake-beams and their connections and accessories, showing also the wheels on one side of the truck and the brake-shoes applied. Fig. 6 is a front elevation of one of the brake-beams with the shoes and suspension-links. Fig. 7 is a plan illustrating, in full and dotted lines, the respective positions of the compound levers when the brakes are on and off when the train is backing. Fig. 8 is a plan view on a smaller scale, showing the connected brake system. Fig. 9 is a perspective view thereof.

The impelling or transmitting lever 1 is fulcrumed at 13 and driven from the draw-bar 2 through the medium of a pin, 3, working in a longitudinal slot, 4, in said lever, or by other suitable means, and causing the lever to move around its center 13 with every longitudinal movement of the draw-bar out or in.

In Fig. 2ª I have shown a modification in which the draw-bar and transmitting-lever are connected by a spring-clip, 32, on one engaging with a stud or lug, 33, on the other. This avoids the weakening effect of the slot 4 and

affords any desirable elasticity, so as to limit the strain which can be applied to the brake-shoes. A spring may be introduced at any other part of the system for this purpose. The governing-lever 5 is connected by ties 6 7 with the impelling-lever 1 on each side of its fulcrum 13, so as to swing in unison with it. The said governing-lever is pivoted at 9 to a multiplying-lever, 8, which latter is fulcrumed at 10 to a stationary point on the car-body, and at its free end is connected by the brake rod or chain 11 with the brake-staff 12, said staff being fulcrumed to one brake-beam, 15, and connected at its lower end by the rod 14 with the other brake-beam, 16.

17 and 18 represent the shoes, attached to the brake-beams 15 and 16 in customary manner. The brake-beams 15 and 16 are hung by suspension-rods 19 and 20 to the horizontal arms 21 22 of double bell-crank levers, the vertical arms of which are connected together, as shown in Fig. 5, by rods 23 24, so as to form a balanced suspension attachment for the brake-beams, causing one to rise as the other falls, and vice versa. One of the rods 23 24 of the balanced suspension system of the brake-beams is connected by a slotted lever, 25, and a pivoted arm, 26, with the elbow 27 of an L-shaped dog, 28, fulcrumed at 31 to the lever 8, and formed at its free end with a lug or offset, 28^a, Fig. 4, to engage on either side of the swinging lever 5. A spring, 29, tends to draw the L-shaped dog 28, with its short arm or elbow, against the fixed stud 30. The pitman 26, as it is moved past its center in either direction by the limited vertical motion imparted to the brake-shoes by the wheels each time their movement is reversed, has the effect to thrust the dog out from the lever 5, as indicated by dotted lines in Fig. 7, and restore it immediately to its normal position. The spring 29, acting on the dog 28, tends to hold the arm 26 at either extremity of its stroke, and consequently holds the balanced shoes with a moderate pressure at either end of their stroke to which they may have been carried by the reversed movement of the wheels.

The operation is as follows: When the cars are in motion the dog or pawl 28 is always engaged upon one or the other side of the regulating-lever 5, such position being maintained by the spring 29. It is evident that the lever 5 is free to move in the direction opposite to such engagement without effect upon the main or multiplying lever 8; but if moved in the direction of the lug or obstruction 28^a it must carry the lever 8 with it. The outer end of said lever 8 being connected to the brake-staff 12, it follows that the movement of the lever 8 serves to apply the brakes. The outward and inward motions of the draw-bar 2 cause the transmitting-lever 1 to swing upon its center 13. This swinging motion of the lever 1 is communicated through the chain 6 or 7 to the lever 5, and through the intervention of the lug 28^a its movements in one direction will be communicated to the multiplying-lever 8. Thus while the cars are moving ahead, with draw-bars drawn out, the lever 5 is drawn by the chain 6 and swings clear of lug 28^a, as shown in Fig. 1, and no braking effect is had; but if the draw-bar be then pushed in by checking the speed of engine, the lever 5 is pulled over in the opposite direction by the chain 7 against the lug 28^a, as shown in Fig. 3, and in its further movement carries the lever 8 with it, thereby applying the brakes and releasing them when the draw-bar is again pulled out. This condition of readiness to receive and apply braking power from the draw-bar to the brake-lever remains unaltered so long as the train continues to move in the same direction, either with or without intermediate periods of rest.

If, after the cars have stopped, it is desired to back the same, and the draw-bar is accordingly pushed in, the brakes would be applied as before; but as the wheels now tend to move in the reverse direction, and are not restrained by the shoes, which are free to so turn with them through limited arcs, they will in their movement, acting through the hangers 19 20, bell-cranks 21 22, rod 23, slotted lever 25, and pivoted arm 26, throw out the dog 28 from its engagement with the lever 5, discharging the shoes from the wheels, and permitting the lever 5 under constraint of the draw-bar to swing over to the position shown in Fig. 7, so that the dog, being restored to its normal position by the pitman 26 passing its center, will be ready to engage upon the opposite side of said lever.

The dog 28 is shown in dotted outline in the position it assumes for an instant while the pivoted arm 26 passes its center, so as to release the lever, but it does not rest in this projected position. The dotted outline of levers 1 and 5 and their connecting-chains 6 7 indicate the positions assumed by these parts while the draw-bar is pushing backward (as in backing the train) after the release of the lever 5 from dog 28. If, now, the draw-bar be pulled out for the purpose of checking the backward motion, the parts will assume the positions shown in full lines in Fig. 7, the lever 5 resting against the outer face of the lug 28^a of dog 28, so that the pull of the draw-bar, acting through the oscillating lever 1 and chain 6, will draw the free end of the lever 8 forward and apply the brakes as before; but after the wheels have come to rest any pull on the draw-bar will turn them forward, the brake-shoes moving with them without resistance until the limit of circular motion of the shoes with the wheels is reached, and this movement of the shoes, acting through the connections and pitman 26, as before, again throws the dog 28 out, as shown in dotted lines in Fig. 7, so that the pull of the draw-bar will draw the lever 5 to the position shown in Fig. 1, and, the dog being restored to its normal position, the parts will be in position to apply the brakes by the thrust of the draw-bar, as first described with reference to Fig. 3.

The stop 30 limits the movement of the shoes in either direction.

The lever 1 may be driven through the medium of a spring, as shown in Fig. 2ª, or a spring may be elsewhere inserted, so as to limit the total amount of strain which can be brought upon the brake-shoes. Whenever the lever 8 is pulled in the direction of the arrow it will apply the brakes. This will be done by the inward motion of the draw-bar whenever the dog or pawl 28 and regulating-lever 5 are in position shown in Figs. 1 and 3, and by the outward motion of draw-bar whenever said pawl and lever are in the position shown in Fig. 7.

I define a "double-acting brake" as one which, being properly set, causes the application of the brakes by either drawing out or pushing in the draw-bar, according to which way the cars are moving; and I define a "reversal-governor" as one which governs or determines the application or non-application of the brakes by the reversal of direction of motion and not by the fact or rapidity of motion. In my invention I have combined such a reversal-governor with a double-acting brake.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of a double-acting draw-bar brake and a reversal-governor actuated by brake-shoes having permissible arcs of movement around their respective wheel-axles, and causing the draw-bar to apply the braking-pressure by a reverse movement whether the cars are moving forward or backward, as explained.

2. The combination of the double-acting draw-bar 2, transmitting-lever 1, governing-lever 5, secondary lever 8, pawl or dog 28, brake-beams 15 16, shoes 17 18, and balancing arms and rods 19 20 21 22 23 24, substantially as and for the purposes set forth.

3. The combination, with a draw-bar brake, of a governor having brake bars and shoes adapted to be carried around with the wheels through limited arcs for the purpose of determining the direction of motion of the draw-bar by which the braking-pressure shall be applied, and provided with one or more springs or weights tending to keep the said brake-shoes on one or the other side of their center of permitted motion.

4. The combination of the draw-bar 2, levers 1 and 5, connecting rods or chains 6 7, dog 28, and pivoted arm 26, connecting said dog with the brake-beam attachment, substantially as herein described, whereby the movement of the dog 28 out of engagement with the lever 5, caused by reversal of direction of wheel-friction, shall be accompanied by a pull on the said lever, moving it out of re-engagement with the dog on the same side.

5. A double-acting draw-bar brake, in combination with a reversal-governor actuated by friction on the tread of the wheels, and determining by reversal of the rotation of the wheels the direction of strain on draw-bar which shall apply the braking-pressure.

6. In a double-acting draw-bar brake, the combination of a transmitting-lever and a reversing device governed by a change in wheel-rotation, whereby an inward thrust of the draw-bar when the car is moving forward or a pull on the draw-bar when the car is moving backward is caused to actuate said transmitting-lever in one and the same direction.

7. The combination, with the transmitting-lever 8 and governing-lever 5, of a dog or pawl, 28, and a reversing device acting by a change in rotation of the wheels from either direction to the other to throw said dog or pawl out of its normal position and restore it thereto.

8. The combination of a main or transmitting lever, a governing-lever, a pawl or dog for controlling the latter, and an actuating-lever pivoted to the dog in line with the fulcrum of the main lever, so that the movement of the main lever may not affect the position of the pawl or dog relatively thereto.

9. The combination, with a draw-bar brake, of an escapement controlling and determining the action of the draw-bar on the brakes, when such escapement is operated automatically and by each change in direction of wheel-rotation, substantially as described.

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Witnesses:
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HARRY E. KNIGHT.