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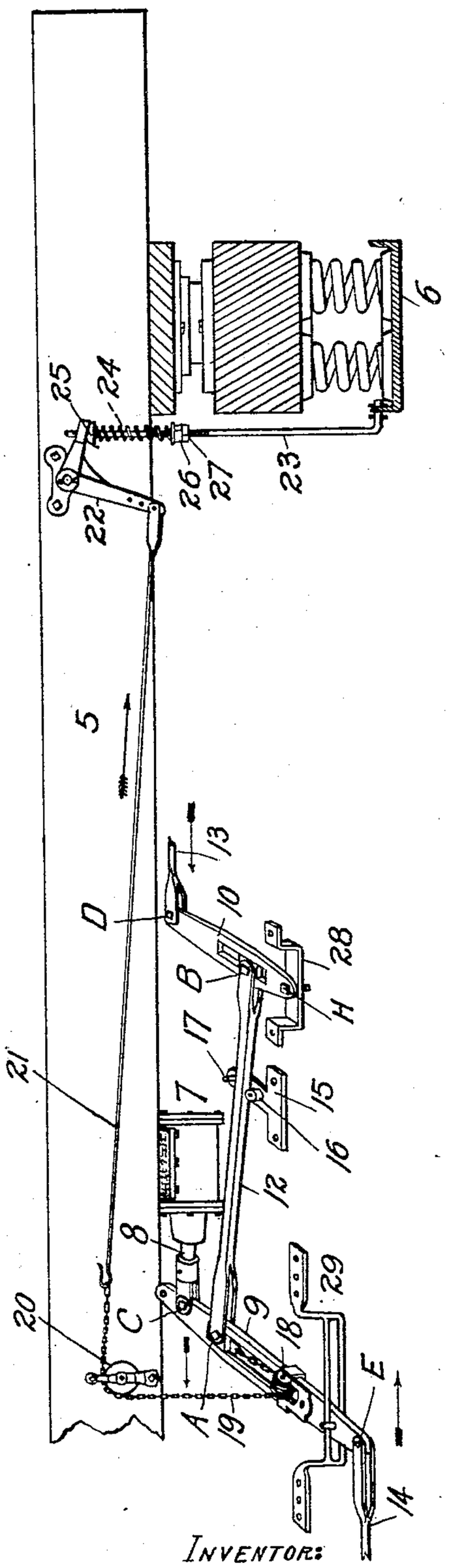
W. H. SAUVAGE.

AUTOMATIC BRAKE MECHANISM.

(Application filed Nov. 19, 1900.)

(No Model.)



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AUTOMATIC BRAKE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 684,313, dated October 8, 1901.

Application filed November 19, 1900. Serial No. 37,031. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SAUVAGE, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Brake Mechanisms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon, which forms a part of this specification.

My invention relates to improvements in automatic brake mechanism, my object being to vary the braking force whereby it shall be proportionate to the weight of the load.

It is well-known that in air-brake mechanism when the braking force is regulated with reference to the gravity of the empty car the power of the brakes is not sufficient to perform the work required when the car is loaded, and accidents often result from this cause. If the brake mechanism were so regulated as to be sufficient for the car when loaded, the wheels would be made to slide when the car is empty, resulting in forming flat places on the tread of the wheels and making repairs necessary. By virtue of my improvement the braking force is automatically regulated by gravity, whereby it becomes exactly proportionate to the weight of the car whether it is empty or loaded and regardless of the degree of the load.

My improvement consists of means for changing automatically and as circumstances may require the relative location of the fulcrum, the weight, and the power on the brake-levers, the term "weight" in this particular instance meaning exerted braking force, while the term "power" means the applied braking force—that is to say, the braking force applied to the lever or levers.

The invention will now be described in detail, reference being made to the accompanying drawing, in which the brake-levers and their connection are shown in perspective and the other parts in elevation and section.

In the view let the numeral 5 designate the spring-supported car-body, and 6 the sand-board or a relatively stationary part, above which the car-body vibrates vertically.

The numeral 7 designates the brake-cylinder, 8 the push-rod of the cylinder-piston, 9 the main or cylinder lever, 10 another lever, 12 the rod connecting the two levers, and 13 and 14 the brake-rods, of the Westinghouse air-brake system, only such changes being made as are necessary to cause the said mechanism to harmonize with my improvements. The extremities of the rod 12 may be movably connected with the levers 9 and 10 in any suitable manner. As shown in the drawing, the levers are slotted to permit the desired range of movement. The forked extremities of the rod straddle the levers, and bolts connecting the fork-arms pass through the slots in the levers, whereby the rod extremities are held in place and permitted to slide on the levers. Any other suitable arrangement to accomplish the desired purpose may, however, be employed. The brake-rods 13 and 14 are connected with the extremities of the respective levers in the usual or any suitable manner. Located intermediate the extremities of the rod 12 is a stationary plate 15, provided with two projections or stops 16 and 17, between which the rod passes. The stop 16 consists of an antifrictional roller forming a fulcrum for the rod, whereby as one end of the rod is shifted in one direction the other end is correspondingly shifted in the opposite direction, the relative movement of the two extremities being controlled by the location of the plate 15.

Suitably mounted on the lever 9 is a roller 18. A chain connected with one extremity of the rod 12 passes under the roller 18 and thence upwardly and over a pulley 20, mounted on the body of the car, its extremity remote from the rod 12 being connected with a rod 21, whose opposite extremity is connected with one arm of a bell-crank lever 22, fulcrumed on the body of the car, and whose opposite arm is open to receive the upper extremity of a rod 23, which is provided with a stop 25, engaging the upper extremity of a relatively stiff coil-spring 24, whose lower extremity engages a tension-nut 26, screwed upon the threaded portion of the rod. The tension-nut is engaged by a jam or lock nut 27,

located below it. The lever 10 is fulcrumed on a stationary bracket 28, while the lever 9 passes through a slot in a stationary guide-bracket 29, which prevents the lever from moving upwardly during the operation of the mechanism, as hereinafter explained. The stationary parts 15, 28, and 29 are supposed to be attached to the bottom of the car and are provided with openings for the insertion of fastening devices.

For convenience of explanation the extremities of the rod 12 will be designated A and B, respectively, the point where the push-rod 8 is connected with the lever 9 will be designated C, the points where the brake-rods 13 and 14 are connected with their levers will be designated D and E, respectively, and the fulcrum of the lever 10 will be designated H.

As shown in the drawing, the extremities of the rod 12 are supposed to be in the proper relative position for applying the brakes to the car when empty or when the minimum braking force is required. I will assume that the distance from A to C is half the distance from A to E and that the distance from B to D is twice the distance from B to H. Now it is evident that while the rod 12 is in this position if four thousand pounds (which is assumed to be the braking power of the cylinder) be applied by the cylinder push-rod at the point C two thousand pounds will be exerted at E, six thousand pounds at the fulcrum-point A, six thousand pounds at the point B of the lever 10, and two thousand pounds at the point D of said lever. Now if the load be placed on the car the car-body will be depressed and the bell-crank lever moved to pull the rod 21 in the direction indicated by the arrow, whereby the rod extremity A will be moved toward the point E and the rod extremity B toward the point D, the degree of these movements depending upon the weight of the load or the distance of the downward movement of the spring-supported car-body. If the car is loaded to its maximum capacity, I will assume that the degree of this movement will be such that the distance from C to A is just equal to the distance from A to E and the distance from B to H is just equal to the distance from B to D. In this case there will be four thousand pounds braking force exerted at E, eight thousand pounds at the fulcrum-point A, and four thousand pounds at D, thus doubling the braking force exerted on the rods 13 and 14, and consequently on the brake-shoes. (Not shown.) The spring 24 compensates for the vibration of the parts and allows the lever 22 to yield after the extremities of the rod 12 have been shifted to their limit of movement. It is evident that when the car is unloaded and the car-body returns to its normal elevation the rod 12 may be returned to its normal position for empty-car service by suitable means. (Not shown.)

It must be understood that I do not limit the invention to any special mechanical means for varying the position of the brake-lever fulcrum with reference to the points where the braking force is applied and transmitted, it being evident that many different constructions may be employed for this purpose without in any way departing from the spirit of the invention.

Having thus described my invention, what I claim is—

1. The combination of the car-body and the brake-cylinder, of two levers adapted to receive the force from the brake-cylinder, a rod connecting the two levers and whose extremities are movable thereon, a bearing intermediate the extremities of the rod, said bearing performing the function of a fulcrum, and suitable means for automatically actuating the rod as the car-body vibrates whereby the positions of its extremities are shifted in opposite directions to vary the braking force.

2. The combination with a spring-supported car-body and the brake-cylinder, of two levers adapted to receive the power from the brake-cylinder, a roller mounted on one lever, a rod whose extremities are movably connected with the two levers, a bearing engaging the said rod and performing the function of a fulcrum, a bell-crank lever fulcrumed on the car-body, a rod connected with one arm of said lever, said rod being supported on a relatively stationary part of the car, a rod connected with the other arm of the bell-crank lever, a pulley mounted on the car, a flexible connection between the last-named rod and the extremity of the rod connecting the levers, said flexible connection engaging the roller on the one lever, and the pulley on the car, whereby as the car-body vibrates the extremities of the rod connecting the cylinder-levers, are shifted to vary the braking force.

3. The combination with the spring-supported car-body, and the brake-cylinder, of two cylinder-levers, brake-rods connected with the lever, a rod connecting the two levers, one extremity of the rod being movably connected with one lever between the cylinder push-rod and the brake-rod, the other extremity of the connecting-rod being movably connected with the other lever between its fulcrum and its brake-rod, a bearing interposed between the extremities of the connecting-rod, and means connected with the last-named rod and with the car-body for actuating the same to shift its extremities in opposite directions whereby the braking force is varied to conform to the gravity of the load.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. SAUVAGE.

Witnesses:
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