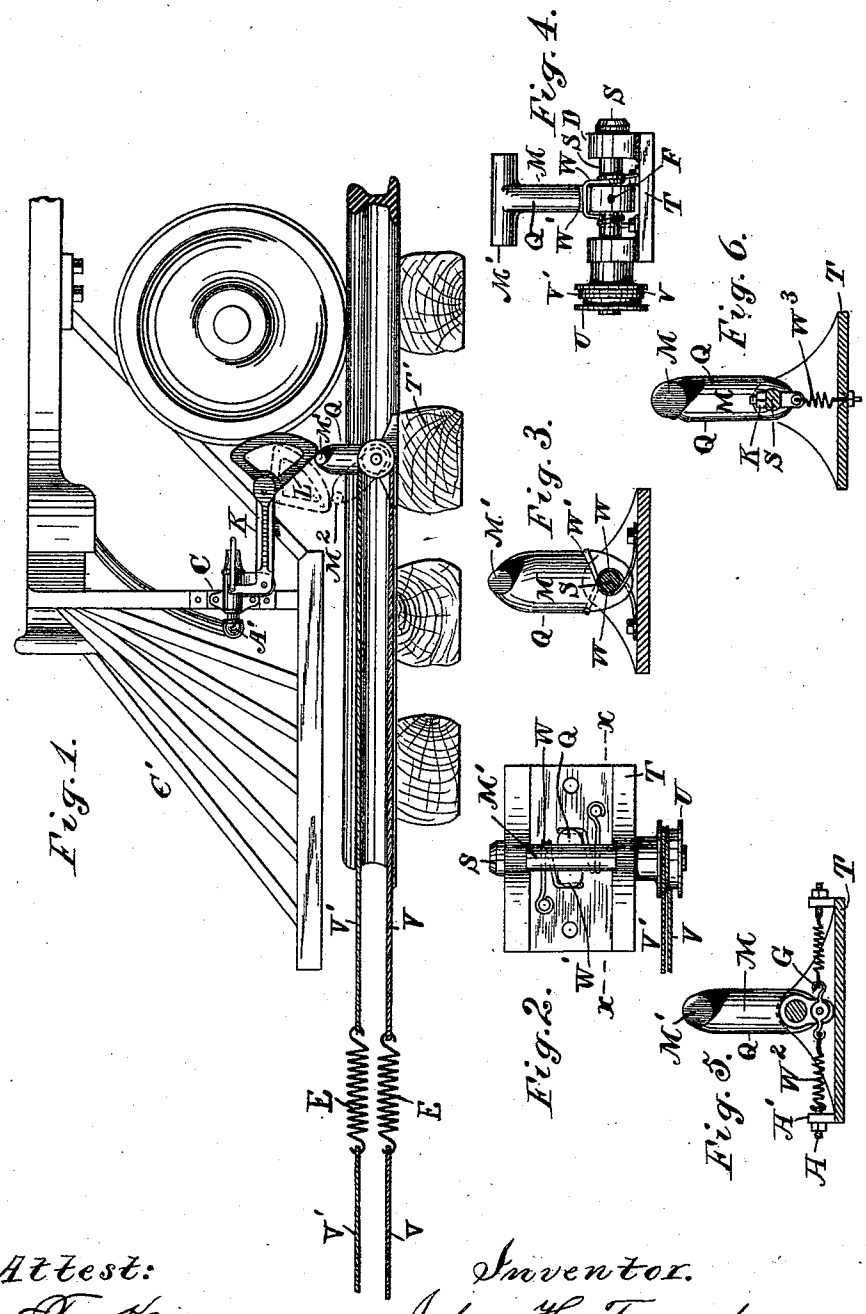
(No Model.)

J. H. FOX.

DOG FOR ACTUATING AIR BRAKES.

No. 530,939. Patented Dec. 18, 1894.



Attest:
Edw. F. Kinsey.
Jacob Marx.

Inventor.
John H. Fox, per
Thomas L. Crane, Atty.

UNITED STATES PATENT OFFICE.

JOHN H. FOX, OF JERSEY CITY, NEW JERSEY.

DOG FOR ACTUATING AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 530,939, dated December 18, 1894.

Application filed June 18, 1894. Serial No. 514,943. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. FOX, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Dogs for Actuating Air-Brakes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present improvements relate to that class of dog or tripping arm which is mounted movably at the side of a railway track to engage a lever projected from a brake valve upon a moving train, and the object of the present improvements is to furnish a means for positively setting the tripping arm or dog in an operative position automatically whenever its connections with the switch or draw bridge are broken.

The invention consists of a rotatable shaft mounted in a bearing by the side of the railway, and connected with a tread lever, switch, or draw bridge, by rods, cords, or other suitable connections having safety springs therein; the shaft having the tripping arm attached rigidly thereto, and the shaft being provided with two springs exerting a balanced pressure upon the same in opposite directions, to hold the shaft normally in a given position irrespective of the connections to the switch or draw bridge.

It has been common heretofore to set the dog quite close to the outer side of the track rails, as near as the pilot would permit, to avoid projecting the lever of the brake valve much beyond the line of the pilot, where it might encounter accidental obstructions. With such an arrangement of the dog, a snow plow which is often made wider than the pilot to clear a path for the cars, is liable to encounter the dog and to break the same unless it be flexibly supported.

To enable the dog to yield in case its shaft was connected with a switch or draw bridge, I have heretofore, as set forth in my Patent No. 457,313, granted August 4, 1891, jointed the dog or tripping arm to such shaft by an auxiliary arm and provided springs to hold the two arms in a straight line. With such construction, the springs exerted no positive control over the shaft, and I have found that where the connections between the shaft and draw bridge became broken neither the shaft nor the springs would maintain the dog in an operative position. I have therefore devised the present improvements, in which I apply two springs to the shaft and adjust them to exert a balanced pressure in opposite directions, to hold the shaft normally in a given position irrespective of the connections to the switch or draw bridge. With such construction, I avoid the division of the dog or arm into two parts and the consequent liability to derangement, but the rigid connection of the entire arm with the shaft would then operate to rupture the connections when the arm was pressed downward by a snow plow. The springs applied to the shaft would of course yield when the dog was thus pressed, but the rotation of the shaft would unavoidably move the connections, and I therefore insert in the connecting rods or cords safety springs strong enough to actuate the dog properly; but adapted to yield when the dog-shaft is abnormally rotated. Any class of springs may be used which are adapted to exert a balanced pressure upon the shaft, provided the connections to the tread-lever, switch or draw bridge are furnished with safety springs as just described.

Heretofore, the head of the tripping arm has been made of T-shape, to intercept the brake lever with certainty; as the locomotive carrying the brake valve is liable to lurch from side to side when passing the arm. The arm has also been projected above the rail several inches to avoid extending the brake lever downward below the bottom of the pilot; and a snow plow, which is commonly moved in close proximity to the rails, is therefore liable to strike the tripping arm and to break the latter if the edge of the plow should engage the arm beneath the T-head. My present invention prevents such engagement of the plow with the T-head, by means of ribs upon opposite sides of the tripping arm, to to receive the impact of the snow plow and thus push the arm downward before the plow engages the T-head.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a side elevation of a locomotive pilot with the valve and its operative devices. Fig. 2 is a plan of the dog with its shaft, bear-

ing, and connections. Fig. 3 is a front elevation of the same in section on line *x*, *x*, in Fig. 2; and Fig. 4 is a side elevation of the same. Figs. 5 and 6 are views like Fig. 3, showing alternative constructions for the spring to actuate the shaft.

In Fig. 1, the valve C is shown mounted upon the pilot C′ and connected by pipe A′ with the air-brake system. The valve is shown provided with brake-valve lever K having a segmental trip L pivoted upon its outer end to engage with the head M′ of the dog M. The operation of such segmental trip is described, and the same claimed in my patent application, Serial No. 497,885, filed January 24, 1894; but forms no part of the present invention.

The dog shown herein is adapted to operate with a brake-valve lever of any suitable construction.

T designates the bearing for the dog, which is shown in Fig. 1 attached to one of the rail sleepers T′. The bearing is formed with two lugs D through which the dog shaft S is extended, and provided upon its outer end with pulley U having cords V and V′ extended from opposite sides of the same. The cords are suitably connected with the moving part of a tread-lever, switch or draw bridge, and the safety springs E are shown as spiral coils with eyes at opposite ends inserted in such cords at any suitable point.

The dog consists of a rigid bar M attached to the shaft, as by pin F, and provided at the top, if desired, with a T head M′. The bar M is made of much greater width than thickness to form ribs Q upon opposite sides of the head, which ribs are adapted to receive the impact of a snow plow or other object moving close to the rails, and operate to throw the dog downward before such object can engage with the under side of the T-head.

A space is shown in Figs. 2 and 4, between the arm M and each of the lugs D through which the shaft is extended, and in such spaces spring rods or wires W are coiled around the shaft and their lower ends extended in opposite directions to rest upon the foot of the bearing T. The other ends of the coils may be secured in any suitable manner to move with the shaft, and are shown locked in notches W′ upon opposite sides of the arm M. The springs are adjusted to exert a perfectly balanced pressure upon the shaft when it is held in its normal position, with the arm upright to engage the trip or brake valve lever, and are made of suitable strength to actuate such trip or lever without materially yielding; although they may operate to slightly diminish the shock when the trip contacts with the head of the dog. The securing of the springs at one end to the shaft, or to the arm, causes the shaft to tighten one spring and to loosen the other when moved in either direction from the normal position and the free ends of the springs may be attached to the foot of the bearing by the bolts F′, or permitted to slide thereon if preferred. A spring rod of light weight or cross section is adapted to exert a greater resistance, if attached to the foot, as shown in Fig. 3 than if arranged to merely rest thereon.

In Fig. 5, an alternative arrangement for the springs is shown, a crank G being secured to the shaft and projected downward toward the foot T of the bearing; with cylindrical coil springs W^2 attached to the eye of the crank upon opposite sides. The outer ends of the springs are furnished with tightening screws H extended through lugs H′ upon the foot T; by which the springs may be readily adjusted to hold the shaft normally in the desired position.

In Fig. 6, a single spring W^3 is shown applied to the shaft in a suitable manner to perform the necessary functions. In this construction a bolt with eye J at its lower end is shown extended through the shaft S with tightening nut K upon the top. A spiral spring W^3 is extended downward from the eye and attached at its lower end to the foot T. The oscillation of the shaft S in either direction operates to stretch the spring; which thus tends to draw the shaft back to its normal position. It is therefore immaterial how the spring or springs be arranged to control the shaft if the connections be broken. It will be understood that if the connections were suitably attached to a draw bridge, the connections would, when the draw bridge was opened, hold the dog independently of the springs W, W^2 or W^3 in the position shown in full lines in Fig. 1, so as to engage the trip or brake-valve lever; but when the draw bridge was closed or in readiness for a train to pass over the same, the draw bridge switch or tread-lever would, by its connections, overcome the tension of the springs W, W^2 or W^3, and shift the dog to an inoperative position, as indicated by dotted lines M^2 in Fig. 1.

The safety springs E are inserted in the connections V, V′, to prevent the rupture of the connections when the dog or tripping arm is accidentally depressed; as by the contact of a snow plow or other object moving closer to the rails, or of greater width than the ordinary engine pilot; which the dog is suitably arranged to clear.

From the above description it will be seen that the present improvements provide means for positively actuating the air brakes in case of accident to the connections of the dog, and also furnish, in the ribs Q, a means of preventing the head of the dog from catching upon a snow plow.

Having thus set forth the nature of my invention, what I claim herein is—

1. The device for automatically actuating the lever of an air brake valve mounted upon a railway train, comprising a bearing, with rotatable shaft having suitable connections, as the pulley U and cords or rods V, V′ for rotating the shaft, the safety springs E inserted in the cords or rods, a rigid tripping

arm attached to the shaft, and a spring or springs exerting a balanced pressure upon the shaft in opposite directions and operating to hold the shaft normally in a given position irrespective of the connections, as and for the purpose set forth.

2. The device for automatically actuating the lever of an air brake valve mounted upon a railway train, comprising a bearing with rotatable shaft having suitable connections, as the pulley U and cords or rods V, V′ for rotating the shaft, the safety springs E inserted in the cords or rods, a rigid tripping arm attached to the shaft, and two spiral springs W wound about the shaft and attached to the rigid arm, with their lower ends resting upon the bearing at opposite sides of the shaft, substantially as set forth.

3. The device for automatically actuating the lever of an air brake valve mounted upon a railway train, comprising the bearing T arranged adjacent to the track with shaft S rotatable therein, means, as the pulley U and cords or rods V, V′, for rotating the shaft, the safety springs E inserted in such connections, the rigid tripping arm M attached to the shaft, the two spiral springs W wound about the shaft in opposite directions with their upper ends fitted to notches W′ in the edges of the rigid arm, and their lower ends attached to the bearing at opposite sides of the shaft, as and for the purpose set forth.

4. The device for automatically actuating the lever of an air brake valve mounted upon a railway train, comprising the bearing T, with rotatable shaft S having suitable connections, as the pulley U and cords or rods V, V′, for rotating the shaft, the safety springs E inserted in the cords or rods, a rigid tripping arm attached to the shaft and having the T-head projected from its sides in the direction of the shaft, and having upon its edges the ribs Q projected beyond the sides of the T-head to engage a snow plow, substantially as herein set forth.

5. The device for automatically actuating the lever of an air brake valve mounted upon a railway train, comprising a bearing with shaft mounted movably adjacent to the track, the tripping arm M having the T-head M′, and provided at opposite sides below the head with the ribs Q projecting beyond the sides of the head, springs fulcrumed upon the bearing and operating normally to hold the arm in the path of the trip, and suitable connections, as to a switch or draw bridge, for shifting the arm to an inoperative position, and thereby setting the springs so as to erect the arm automatically if such connections be broken, as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN H. FOX.

Witnesses:
L. LEE,
THOMAS S. CRANE.