

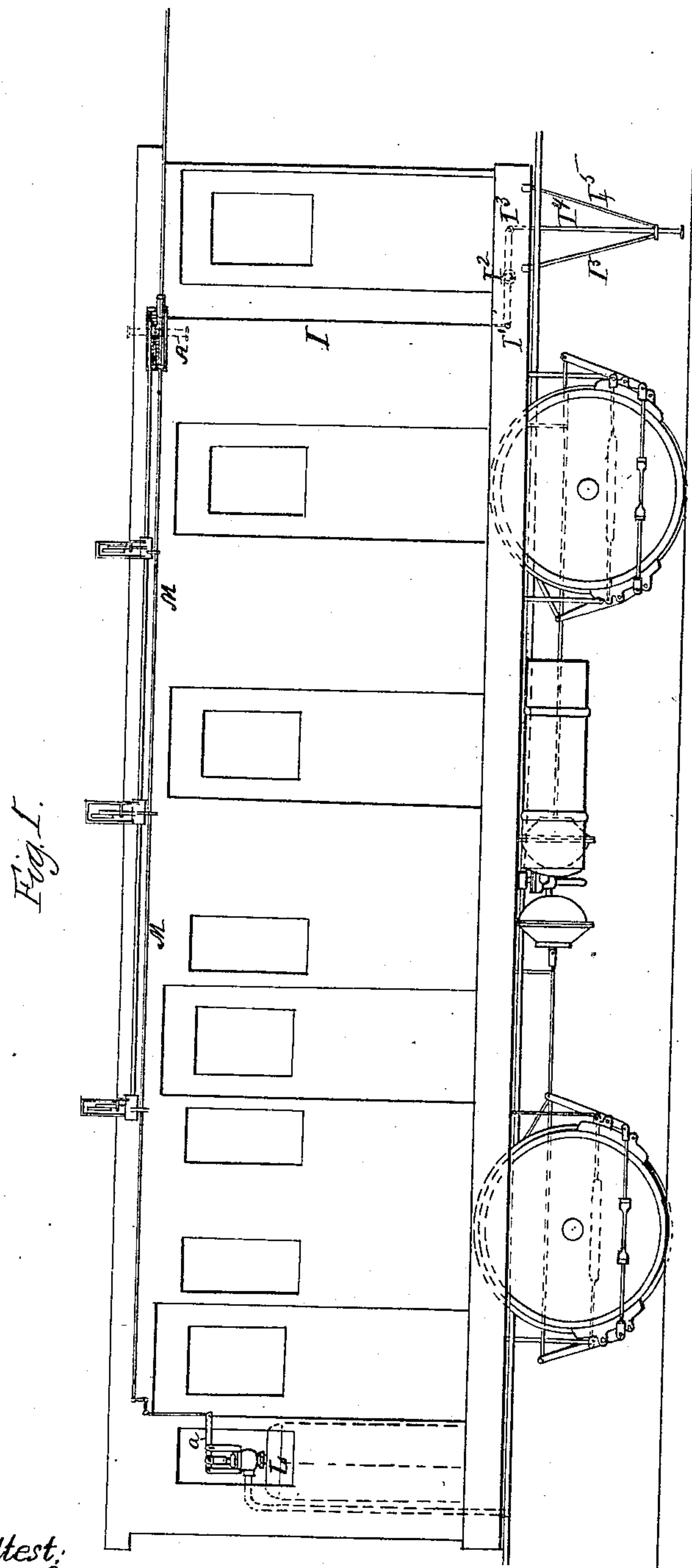
(No Model.)

2 Sheets—Sheet 1.

F. W. EAMES.  
Vacuum Brake Apparatus.

No. 241,328.

Patented May 10, 1881.



Attest:

James O. Macerion  
R. C. Hannay

*Inventor.*

F. W. Eames  
by Hammett & Brock  
Atty's.

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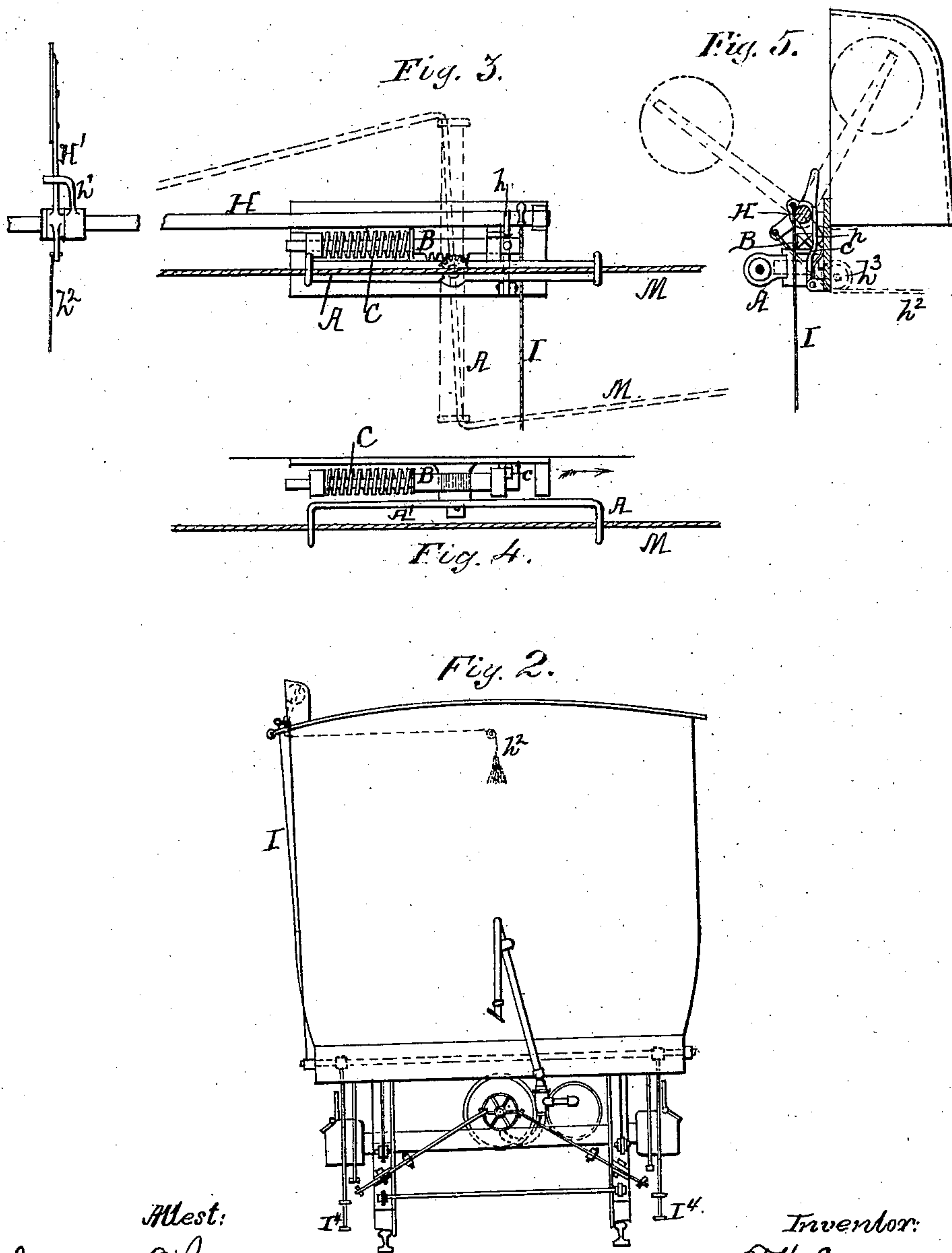
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# UNITED STATES PATENT OFFICE.

FREDERICK W. EAMES, OF WATERTOWN, NEW YORK.

## VACUUM-BRAKE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 241,328, dated May 10, 1881.

Application filed October 29, 1880. (No model.) Patented in England October 19, 1878.

*To all whom it may concern:*

Be it known that I, FREDERICK W. EAMES, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Vacuum-Brake Apparatus, (Case F;) and I do hereby 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 drawings, and to letters or figures of reference marked thereon, which form a part of this specification, the same having been patented to me by the government of Great Britain by Letters Patent No. 4,172, dated October 19, 1878.

My invention relates to apparatus for working vacuum-brakes; and it consists in the construction and arrangement of a device or devices located on each car of the train, whereby from any car either the ejector on the locomotive may be set in action or the valve of a reserve reservoir on the rear of the train opened, or both operated for the purpose of setting the brakes in action. A signal device may also be used in connection with the device above referred to, to show from which car or compartment of the car the brakes have been applied. These devices may be operated by the passengers or train-men.

My invention also consists in a device by means of which, upon the accidental derailment of any member of the train, the brakes may be automatically set in action.

Figure 1 represents a side elevation of a car to which my improvements have been applied, and Fig. 2 an end view of the same. Fig. 3 represents, on an enlarged scale, a side elevation of the device for bringing the cord under tension; Fig. 4, a plan view, and Fig. 5 an end view and partial section, of the same.

The cord which is used to apply the brakes I bring under the control of the passengers and train-men by threading it through the eyes of a swivel-bar, with which each carriage is provided, as shown in the figures.

In these figures, A is a swivel-bar, through the eyes of which the cord M is passed. This bar is mounted upon a horizontal stud-pin, and at its hub it carries a ring of spur-teeth, which

gear into a horizontal rack, B, which slides in fixed guides on the side of the car. A tendency is given to this rack-bar, by means of a coiled spring, C, to move in the direction of the arrow, Fig. 4; but this is restrained by means of a catch, c, which, dropping into a notch in the bar, holds it fast in the position shown in the drawings and retains the swivel-bar A in the position shown by full lines in the drawings, Fig. 3. By withdrawing this catch c the coiled spring B will be free to act, and thrusting forward the rack-bar it will cause the swivel-bar A to take the dotted position of Fig. 3, and thereby pull upon the cord M and set the brakes in action by admitting steam to the air-ejector on the engine, and by lifting the valve of the vacuum-chamber L in the rear of the train. The spring-catch c is brought into action when the apparatus is adjusted before starting the train. To provide for its being thrown out of action the following contrivance is adopted:

H represents a horizontal shaft extending from end to end of the car, and free to rock in bearings provided at the side of the car, near the roof, to receive it. This shaft carries a tappet, h, in line with the spring-catch c, and capable, when the shaft is rocked, of bearing against and pressing back the catch clear of the locking-notch in the rack-bar. Keyed to this shaft H is a series of bent fingers, h', one for each compartment of the car, or, where the car is composed of one compartment, for different sections of the car; and mounted loosely on the shaft, by the side of each bent finger, is a rock-lever, H', which carries at its upper end a signal-disk, hidden from view by a hood until the lever is brought into action. To the lower end of this rock-lever is attached a cord, h<sup>2</sup>, which passes under a guide-pulley, h<sup>3</sup>, and thence to a pulley or guide inside the car, from which it depends (see Fig. 2) in full view of the passengers. In order to put on the brakes it is only necessary for a passenger to pull this cord and rock the lever H'. The effect of this movement of the lever will be to press on the bent lever h' and rock the shaft H in its bearings, thereby pressing the tappet h against the spring-catch c and releasing the rack-bar B. The spring of the rack-bar when coming into action will move the bar, as before explained,



and with it the swivel-bar A, which, taking the dotted position of Fig. 3, will draw the cord M to tension in both directions, and thus simultaneously cause the air-ejector apparatus of the engine and the vacuum-reservoir on the rear or train-men's car to put the brakes in action. Where the car is constructed with a series of compartments, each compartment of the cars composing the train is similarly provided with a signal-disk lever, H'. It will be understood that the compartment from which the motion for putting on the brakes emanated will be indicated to the train-men by its signal-disk being thrown into view. This signal will be replaced by the train-men to its normal position when restoring the other parts of the apparatus.

The above-described mechanism I also propose to connect, by suitable rods and levers, with pendent rods, in order that when a train has run off the track one or the other of these rods, on meeting with an obstruction, may set the mechanism in action and apply the brakes. This contrivance is illustrated in Figs. 1 and 2, where I represents a cord pendent from a short arm on the rock-shaft H. This cord I connects with an arm, I', of a rock-shaft, I<sup>2</sup>, mounted in bearings in the car-framing. From this rock-shaft projects an arm, I<sup>3</sup>, from which depends a rod, I<sup>4</sup>, that reaches to near the ground, the same being prevented from swinging with the motion of the car by means of stay-guides I<sup>5</sup>.

Supposing, now, a car fitted with this device to run off the track, the pendent rod I<sup>4</sup> will strike the ground or some obstacle, and thereby rock the shaft I<sup>2</sup>, cause the cord I to be pulled down, and by this means the shaft H will be rocked, and the apparatus shown at Figs. 3, 4, and 5 thrown into action, as before described.

It will be understood that each car of the train will be similarly provided with my improvement, as heretofore set forth and described.

Having described my invention, what I claim as new is—

1. In a brake apparatus, the combination of arm A, carrying the cord M, with the bar B and its spring C, arranged for operation by suitable mechanism therefor, substantially as set forth.

2. In a brake apparatus, the centrally-pivoted arm A, carrying the cord M, and adapted to be operated so as to bring both ends of the cord under tension when it is desired to apply the brakes, substantially as specified.

3. In a brake apparatus, in combination with arm A, carrying the cord M, the bar B and its spring C, spring-catch c, and shaft H, carrying a tappet, h, substantially as set forth.

4. In a brake apparatus, in combination with arm A, carrying the cord M, the bar B and its spring C, spring-catch c, shaft H, carrying tappet h and finger h', and the rock-shaft H', carrying a signal, and having attached thereto a cord or other device for operating it, substantially as specified.

5. In a brake apparatus, the combination of arm A, carrying the cord M, with the bar B and its spring C, shaft H carrying a signal device, substantially as set forth.

6. In a brake apparatus, the pendent rod I<sup>4</sup>, connected with suitable mechanism for operating the cord M in the event of the derailment of the car, substantially as specified.

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

FRED. W. EAMES.

Witnesses:

CHAS. D. BINGHAM,  
E. D. EAMES.