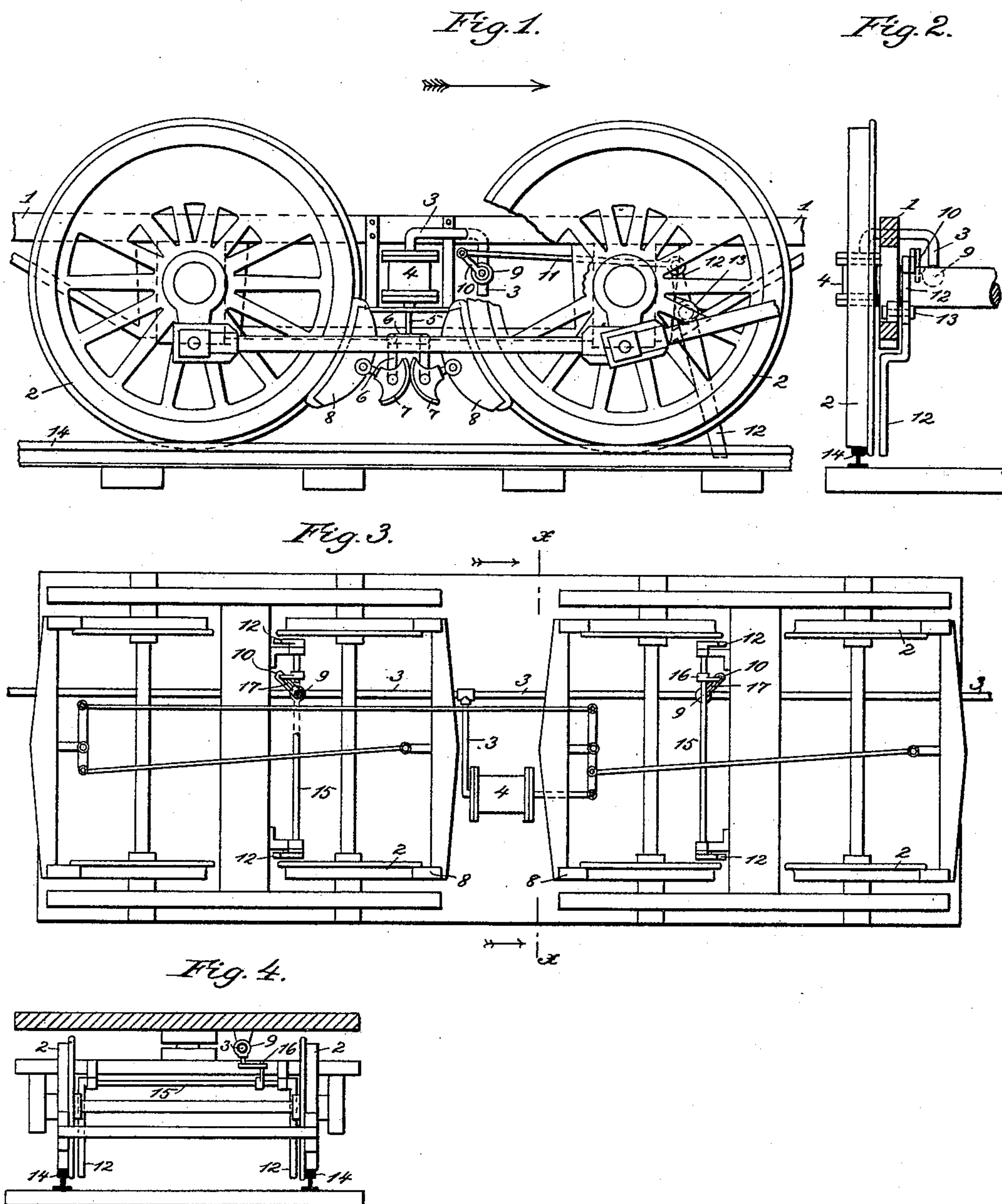


(No Model.)

E. D. GRAFF.
MEANS FOR ACTUATING AIR BRAKES.

No. 436,233.

Patented Sept. 9, 1890.



WITNESSES:

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EDWIN D. GRAFF, OF NEW YORK, N. Y.

MEANS FOR ACTUATING AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 436,233, dated September 9, 1890.

Application filed May 19, 1890. Serial No. 352,358. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. GRAFF, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Means for Actuating Air-Brakes, of which the following is a specification.

As is well known, derailment of a train in motion is of frequent occurrence and is attended with enormous destruction of life and property, owing principally to the absence of any means for automatically applying the brakes at the initial moment of derailment and before any parting of the couplings of the cars takes place.

My invention has for its main object to reduce to the minimum the liability of serious accident to life and property by reason of derailment, and relates to a means for automatically actuating the air-brakes the instant the locomotive or any of the cars is derailed and while the train is still intact or in a continuous unbroken condition.

My invention consists in certain details of arrangement and combinations of devices, all as will be hereinafter more fully described, and particularly pointed out in the appended claims.

30 In the accompanying drawings, Figure 1 is a side elevation of a portion of a locomotive embodying my invention, part of one of the driving-wheels being broken away to afford a better view. Fig. 2 is a front elevation thereof, partly in section. Fig. 3 is a bottom plan view of a railway-car having my invention applied thereto in a modified form. Fig. 35 4 is a vertical cross-section thereof, taken at the line xx of Fig. 3 and looking in the direction of the small arrows.

40 In the several views the same part will be found designated by the same numeral of reference.

45 Referring to Figs. 1 and 2, 1 designates the truck-frame, and 2 the driving-wheels.

3 represents an air-pipe extending from a reservoir (not shown) and communicating with a cylinder 4, which contains a piston, whose rod 5 is connected to a series of levers 50 6, that are in turn jointed to two levers 7, which are pivoted each to a brake-shoe 8, all in about the usual manner.

To the air-pipe 3, or a branch thereof at some suitable locality, is fitted a cock or valve 9, provided with an arm 10, to which is pivoted 55 one end of a link 11, whose other end is pivoted to the upper end of a lever 12, fulcrumed at 13, and extending down to about a level with the flange of the wheel and preferably slightly below the top surface of the railway-track 14. 60 This lever 12, I prefer to make comparatively thin, and to arrange it parallel with the side of the wheel and quite close thereto, in order that it may readily pass through switches without being affected. The head or front of 65 the locomotive is supposed to be in the direction of the arrow at Fig. 1, and inasmuch as it is generally connected to travel head first I prefer to hang the lever 12 so that its lower end inclines forwardly beyond the line of its 70 fulcrum.

In the operation of the contrivance shown at Figs. 1 and 2 it will be understood that the instant the locomotive leaves the track the lower end of the lever strikes the ground and 75 is forced rearwardly, the upper end of the lever moving forwardly at the same time, and through the link 11 and arm 10 operating to turn and open the cock or valve and allow the compressed air in the pipe 3 to escape, or in 80 a vacuum system allowing the air to enter. Immediately this occurs the piston in the brake-cylinder operates to apply the brake-shoes to the wheels of the locomotive, and 85 simultaneously the brake-shoes of all of the cars of the train are caused to act upon their respective wheels, it being supposed herein that the Westinghouse or other approved continuous-brake system is used upon the train.

Referring to Figs. 3 and 4, an arm or lever 90 12 is shown on each side of the car, and these are connected together by a rock-shaft 15, mounted in bearings depending from the truck-frame. Upon said rock-shaft is a rock- 95 er-arm 16, whose upper free end occupies a slot 17 in the arm 10 of the cock or valve 9, which is fitted in the air-pipe 3. In this modification of my invention I prefer to have a pair of the arms or levers 12 near each end of the car and each pair inclined in opposite 100 directions, so as to provide for the actuation of the air-brake in either direction of movement of the car.

In operation the car is assumed to be run-

ning in the direction of the arrow, and in the event of its derailment either the pin will break or the staple will pull out or break, thus permitting the spring to act upon and
5 open the valve or cock in the air-pipe, which operation, it will be understood, will produce an instantaneous application of the brakes.

From the foregoing it will be seen that I have provided a means whereby the moment
10 the locomotive or any of the cars of a train is derailed the air-brake mechanism is automatically actuated in a manner to apply the brake-shoes to stop the train quite as effectively as if the air-brakes were set in operation by the
15 engineer in the usual way.

By providing a means for automatically throwing the air-brakes into operation at the instant one of the vehicles of the train leaves the track, instead of relying upon the engi-
20 neer or other train-man or upon the breaking apart or detachment of the cars, a great desideratum is effected, for the train may be stopped much quicker after derailment, and hence with less liability of loss of life or prop-
25 erty.

I do not limit the use of my invention in connection with the Westinghouse air-brake system, as it may be employed equally well with any other system of air-brakes.

30 What I claim as new, and desire to secure by Letters Patent, is—

1. In a wheeled vehicle or train of vehicles, the combination, with the air-pipe of a suitable air-brake system, of a valve or cock, an approximately-vertical arm or lever having a
35 horizontal pivot or fulcrum and having its lower end depending in proximity to the earth, and a link or arm permanently connecting the said lever to the valve or cock, whereby upon derailment of the train the lower end
40 of the lever may be vibrated rearwardly longitudinally of the train by contact with the earth and the upper end thereof thrown forwardly and by the link or arm to turn or move the cock or valve in the air-pipe, as set
45 forth.

2. In a wheeled vehicle, the combination, with a suitable air-brake system, of two valves or cocks in the air-pipe of the vehicle and two
50 depending arms or levers having horizontal pivots or fulcrums and inclined in opposite directions and connected to operate said valves or cocks in substantially the manner set forth.

Signed at New York city, in the county of
55 New York and State of New York, this 17th day of May, A. D. 1890.

EDWIN D. GRAFF.

Witnesses:

ABRAHAM M. GRAFF,
M. E. LEES.

It is hereby certified that in Letters Patent No. 436,233, granted September 9, 1890, upon the application of Edwin D. Graff, of New York, N. Y., for an improvement in "Means for Actuating Air-Brakes," errors appear in the printed specification requiring correction as follows: After line 103, page 1, the following paragraph should be inserted, to wit: *The operation of the contrivance shown at Figs. 3 and 4 is substantially the same as that above described with reference to Figs. 1 and 2. Should the car jump the track, the cock or valve 9 would be instantly opened by the movements of the arms or levers and their connections, and the brake-shoes would be applied to the wheels by the action of the friction within its cylinder and by the movements of the brake-levers and brake-beams.* The paragraph commencing with line 104, page 1, and terminating with line 7, page 2, should be stricken out, and in line 44, page 2, the words *positive connection operate* should be inserted after the word "arm"; and that the said Letters Patent should be read with these corrections therein to conform to the papers pertaining to the case in the Patent Office.

Signed, countersigned, and sealed this 14th day of October, A. D. 1890.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

C. E. MITCHELL,
Commissioner of Patents.