(No Model.) 2 Sheets—Sheet 1

C. VAN DUSEN.

AIR BRAKE FOR RAILROAD CARS.

No. 269,747. Patented Dec. 26, 1882.

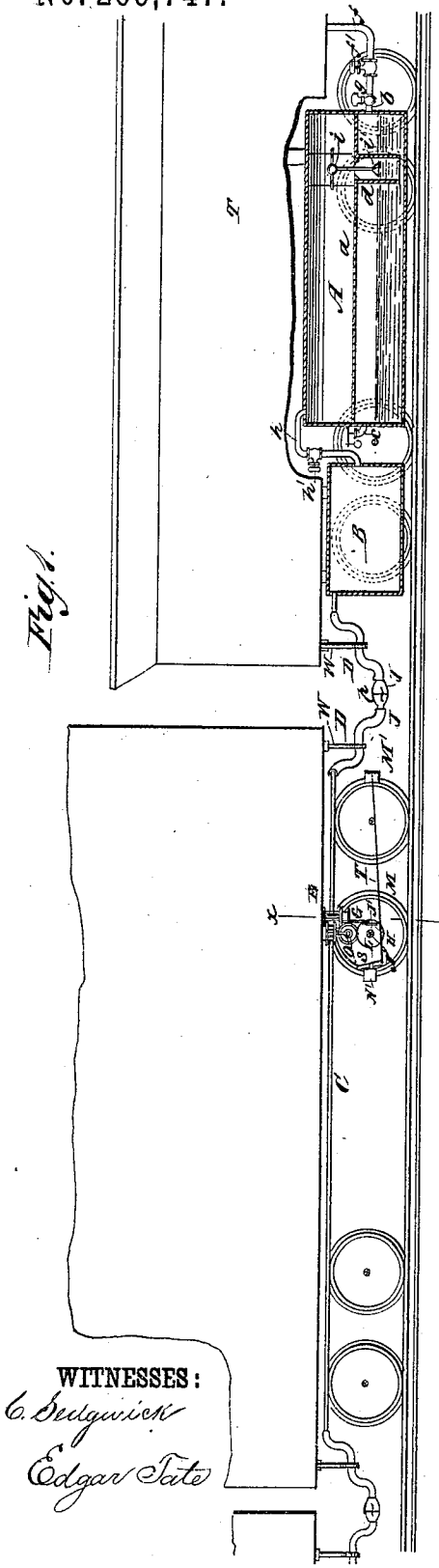

Fig. 1.

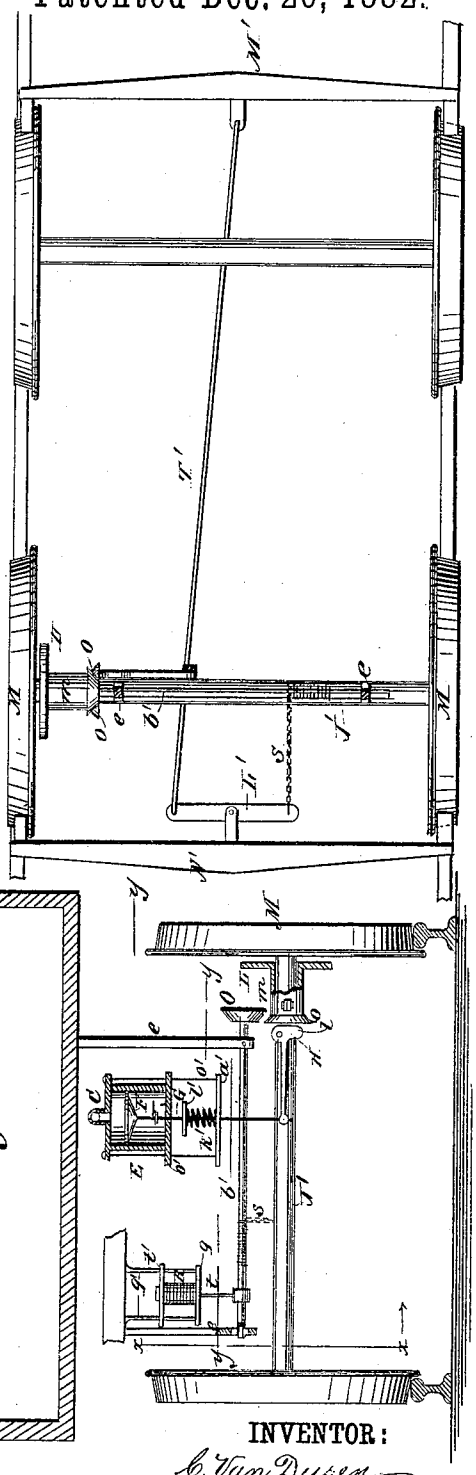

Fig. 3.

Fig. 2.

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Fig. 4.

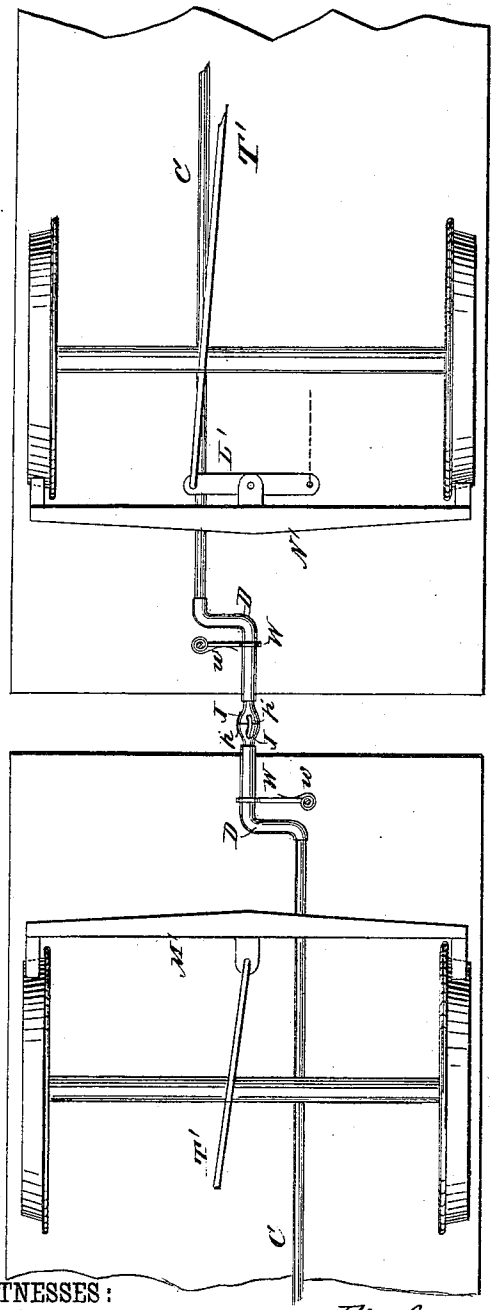


Fig. 5.

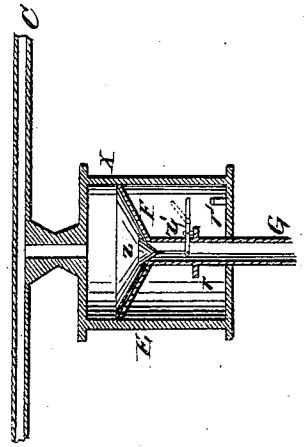
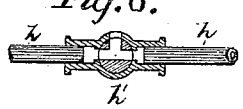


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES VAN DUSEN, OF NEW ALBANY, INDIANA, ASSIGNOR TO HIMSELF AND WILLIAM L. BREYFOGLE, OF LOUISVILLE, KENTUCKY.

AIR-BRAKE FOR RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 269,747, dated December 26, 1882.

Application filed May 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES VAN DUSEN, of New Albany, in the county of Floyd and State of Indiana, have invented a new and Improved Air-Brake for Railroad-Cars, of which the following is a full, clear, and exact description.

The object of this invention is to provide a device for applying the brakes to railroad-cars, which shall be entirely under the control of the engineer, and which shall be simple and efficient in action, cheap and durable of construction, and not liable to get out of order.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 shows in sectional elevation my improved automatic brake applied to a car and locomotive-tender, on line *x x*, Fig. 2. Fig. 2 is a sectional elevation taken on the line *x x* of Fig. 1. Fig. 3 is a detailed plan view taken on the line *y y*, Fig. 2. Fig. 4 is an inverted plan view of the trucks and bottoms of two cars, showing the hose-coupling, pipes, &c., when coupled. Fig. 5 is a detailed sectional elevation of one of the drums or cylinders and the pipes. Fig. 6 is a detail, partly in section, of the pipe and its cock which connects the water and air reservoirs.

The power to work the brakes is obtained by friction wheels or disks applied to the wheel or axle of the car. These friction wheels or disks are applied and controlled by means of certain mechanical contrivances operated by compressed air or other pressure, the supply of which is at the engine and governed by the engineer. This pressure may be obtained in any of the ordinary known ways. The means I prefer to emply for getting this pressure may be described as follows:

The cylindrical reservoir A is suspended in any convenient place and by any suitable means beneath the tender T. It is by preference constructed of boiler-iron strong enough to bear the steam-pressure in the engine-boiler, and is divided horizontally by the tight partition *a*. The lower half of the reservoir is filled with water (kept hot by steam or otherwise) to the height of the entrance of the pipe *b*. The only communication between the upper and lower half of the reservoir is through the large pipe *d*, which reaches nearly to the bottom of the lower half of the reservoir. *c* is a safety-valve, placed at the end of the reservoir for regulating the pressure in the lower half of the reservoir, and may be set to act at a pressure of, say, from fifteen to twenty pounds to the square inch.

Leading from the engine-boiler is the steam-pipe *f*, which may be opened and closed by the cut-off valve *f'*. Between this valve *f'* and the reservoir is fitted in the pipe *f* the drip-cock *g*, which opens when the valve *f'* is closed and closes when the valve *f'* is opened to allow the surplus water which may accumulate in the lower half of the reservoir by condensation of steam to pass off, thus always keeping the water in the reservoir at the level of the pipe-entrance *b*. When the steam is turned on by opening the cock *f'* it fills the lower part of the reservoir A and drives the water therein up through the large pipe *d*, nearly filling the upper half of the reservoir, and forcing the air confined therein through the pipe *h* into the small reservoir B and the hose or metal pipe C running beneath the train. The reservoir B is intended for a reserve supply, and might be dispensed with.

In order to prevent steam or water being forced through the pipe *h*, a floating hollow metal ball, *i*, is placed in the large pipe *d*, which rises with the water, carrying with it the valve *i'*, which closes the pipe *d* when the upper half of the reservoir is full, preventing the further passage of either steam or water through the pipe *d*.

If by reason of leakage of pipes or from any other cause an additional supply of air is required for applying the brakes, the three-way cock, *h'*, in the pipe *h* may be turned, which will shut off the reservoir B and allow air from the outside to enter the reservoir A. At this time, the steam being turned off by the cock *f'* and the drip-cock *g* opened, the water in the upper part of the reservoir will sink to the lower half of the reservoir by force of gravity. The cock *h'* now being turned to close the outside opening and open the pipe *h*, and steam turned on again, an additional supply of

air for applying the brakes is furnished. In ordinary use, however, one supply of air is sufficient, and when the brakes are to be released, by shutting off the steam and opening the drip-cock *g* the water in the upper half of the reservoir will be forced to the lower half by gravity and the pressure of air confined in the reservoir B and the pipes C behind, and thus the pressure is relieved.

The pipes C C under the cars are connected between the cars by the rubber hose or tubing D D and metal couplings J J, and through these pipes and rubber hose or tubing the compressed air is conveyed the whole length of the train and supplied to the brake-operating drums or cylinders E under each car, which are connected with the pipes C. These couplings are provided with valves, and to the outside of each are attached springs P, which pass over the outside of the other coupling when the two are brought together and keep the couplings together. The couplings, however, form no part of the present invention; but I reserve to myself the right to make a separate application for Letters Patent therefor at some future time.

In each of the cylinders E are placed the hollow piston-heads F, connected with the piston-rods G. The piston-heads are fitted air-tight in the cylinders, and the rods are attached at their outer ends by slot and pin or other flexible joint to the ends of the eccentric or cam levers H, pivoted in suitable hangers attached to the truck-frame.

Upon the axle J′ is placed the friction-wheel or disk L, formed at the outer end of the sleeve *m*, which fits loosely upon the axle, the opposite end of the sleeve being formed with the beveled flange *o*. The sleeve is adapted to have longitudinal movement upon the axle, and is so arranged relative to the toe *l* of the eccentric or cam lever H that when compressed air enters the cylinder E above or behind the piston-head F the outward movement of the piston-rod G will force the toe *l* against the flange *o* and force the friction-wheel L against the inner surface of the car-wheel M of the car-truck, which causes the friction-wheel, sleeve, and beveled flange *o* to revolve, which applies the brakes, as hereinafter described.

Z is a valve placed in the hollow connecting-rod G, which closes the rod when compressed air is admitted to the drum or cylinder, and is adapted to be unseated for permitting the escape of the compressed air by the lever Z′, attached to the stem of the valve, as shown in Fig. 5. This lever is pivoted to the collar *r*, as shown in Fig. 5, and is hip-jointed, as shown in dotted lines in said figure, so that its outer end will drop under the loop *r′* when the piston reaches its lowest point. This loop will retain the lever upon the upward movement of the piston F, and thus lift the valve and permit the escape of the air from the drum. When the lever leaves the loop the weight of the valve will cause it to drop to its seat again.

Upon the piston-rod G is secured the flange *l′*, and secured to the cylinder E by means of the rod *o′ o′* is the plate *a′*. Between this flange and the plate *a′* is placed, upon the piston-rod, the coiled spring *k′*, so that when the piston-rod is forced out by the compressed air in the cylinder the spring *k′* will be compressed with considerable force between the said flange and plate, storing up sufficient power in the spring, so that when the air-pressure is removed the tension of the spring will force back the piston-rod G, bringing the lever H with it, thus releasing the friction-wheel L from contact with the car-wheel M and permitting the brake-shoes to move to their natural position out of contact with the car-wheels.

Instead of placing spring *k′* upon the connecting-rod outside of the drum, the same might be placed upon the rod inside of the drum, between the flange *r* and the head of the drum, and dispense with the rods *o′ o′*, plate *a′*, and flange *l′*.

The means for applying the brakes when the friction-wheel L is forced against the car-wheel consist of the beveled wheel O, attached to the frame of the car-truck in suitable hangers, *e e*, arranged so that the edge of the beveled wheel O will normally stand near the beveled flange *o* on the sleeve *m*. To the center of this wheel O is attached the arm or axle *b′*, which is held in the hangers *e e* in such manner as to allow the said arm *b′* to have a slight horizontal movement. Attached to this arm or axle *b′* is the brake-chain *s*, which is also attached to one end of the ordinary lever, L′, pivoted to the center of the brake bar N′. The opposite end of the lever L′ is connected by the rod T′ to the center of the other brake-bar, M′, in the ordinary manner, as shown in Fig. 3.

The operation of these parts is as follows: When the eccentric lever H is moved, as above described, by the piston-rod G, and forces the friction wheel or disk L against the car-wheel M, the flange *o* will at the same time be forced against the beveled wheel O, which, if the car is in motion, will cause the wheel O and its arm or axle *b′* to revolve, winding the brake-chain *s* upon the said arm or axle, causing the brake-bars N′ and M′ to be brought forcibly toward each other, and the friction-shoes thereon to be applied to the car-wheels, and thus retard and stop the cars. In order to prevent injury to the brake by continued action of the friction-wheel L after the brakes are applied and before the train is stopped, the end of the axle or arm *b′* is made to yield slightly by means of the spring R, of metal or rubber, placed upon the rod *t*, attached to the outer end of the said axle or arm *b′*. The spring R is retained by the plate *q*, and is compressed by the sliding plate *t′*, attached to the upper end of the rod *t*, and the plate *t′* is held by the headed rods *q′ q′*, attached to suitable supports firmly attached to the frame of the truck or bottom of the car, so that when the spring R is compressed the rod *t* will be drawn out, permitting one

end of the arm or axle b' to have vertical movement enough to diminish the surface contact of the wheel O with the flange o, and thus relieve the strain without entirely releasing the brakes.

W is a take-up lever, pivoted to the car or truck, for holding in reserve ten or twelve inches of the rubber tubing D, to obviate difficulty should there be more play between the cars than usual, the lever serving to hold the tubing horizontally at right angles to the pipes C, the end of the tubing coming out between the cars as near the middle as possible, so that any strain which might otherwise break the tubing simply pulls the tubing and turns the lever on its pivot, and thus prevents injury to any part by giving up the slack. The spring w (shown in Fig. 4) on the pivot of the lever W keeps the lever in its position and causes it to draw up the slack when the strain is removed.

I do not confine myself to the use of compressed air for operating the brake, as steam might be admitted through the pipes C to the cylinder E, and by making a few obvious changes the brake will operate equally well where the action of the parts is produced by the formation of a vacuum more or less complete in the reservoir A.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a car-brake, the reservoir A, having the partition a dividing the reservoir into upper and lower compartments, and having the pipe communication d in combination with steam-pipe f, communicating with the lower compartment, and the pipe h, leading from the upper compartment, as and for the purpose specified.

2. The combination, with the lower compartment of the reservoir A, of the steam-pipe f, provided with the valve f' and the drip-cock g, for regulating the height of the water in said compartment, substantially as set forth.

3. The reservoir A, having the partition a, pipe d, float i, and valve i', for automatically cutting off the flow of water from the lower to the upper compartment of the reservoir, substantially as described.

4. The piston-head F and the hollow connecting-rod G, in combination with the valve Z, jointed lever Z', and the loop r', substantially as and for the purposes set forth.

5. The sleeve m, formed with disk L and flange o, in combination with the lever H, cylinder E, piston-head F, and connecting-rod G, substantially as and for the purposes described.

6. The combination, with the sleeve m, friction-disk L, and flange o, and the lever H, of the wheel O, provided with the arm or axle b', substantially as and for the purposes described.

7. The combination of the wheel O and arm or axle b', adapted to have slight horizontal movement, with the spring R, held in a suitable frame, substantially as and for the purposes set forth.

8. The combination, with the wheel O, arm or axle b', and spring R, of the disk L, flange o, and lever H, substantially as described.

9. The combination, with the cylinder E and the piston-head F, of the connecting-rod G, having flange l', and the spring k', held by a suitable frame attached to the cylinder, substantially as set forth.

10. The combination, with the reservoir A, divided into compartments, of the pipe C, cylinder E, piston-head F, connecting-rod G, lever H, disk L, flange o, wheel O, and arm or axle b', substantially as described.

11. In combination with the reservoir A and pipe C, the intermediate reservoir, B, as and for the purposes set forth.

12. The reservoir A, divided into compartments, combined with pipe h, having the double-acting cock h', whereby an additional supply of air may be admitted to the reservoir, as and for the purposes set forth.

13. The horizontally-pivoted lever W and spring w, in combination with the hose-connections D, substantially as and for the purposes set forth.

CHARLES VAN DUSEN.

Witnesses:
J. S. BEELER,
E. T. CROSIER.