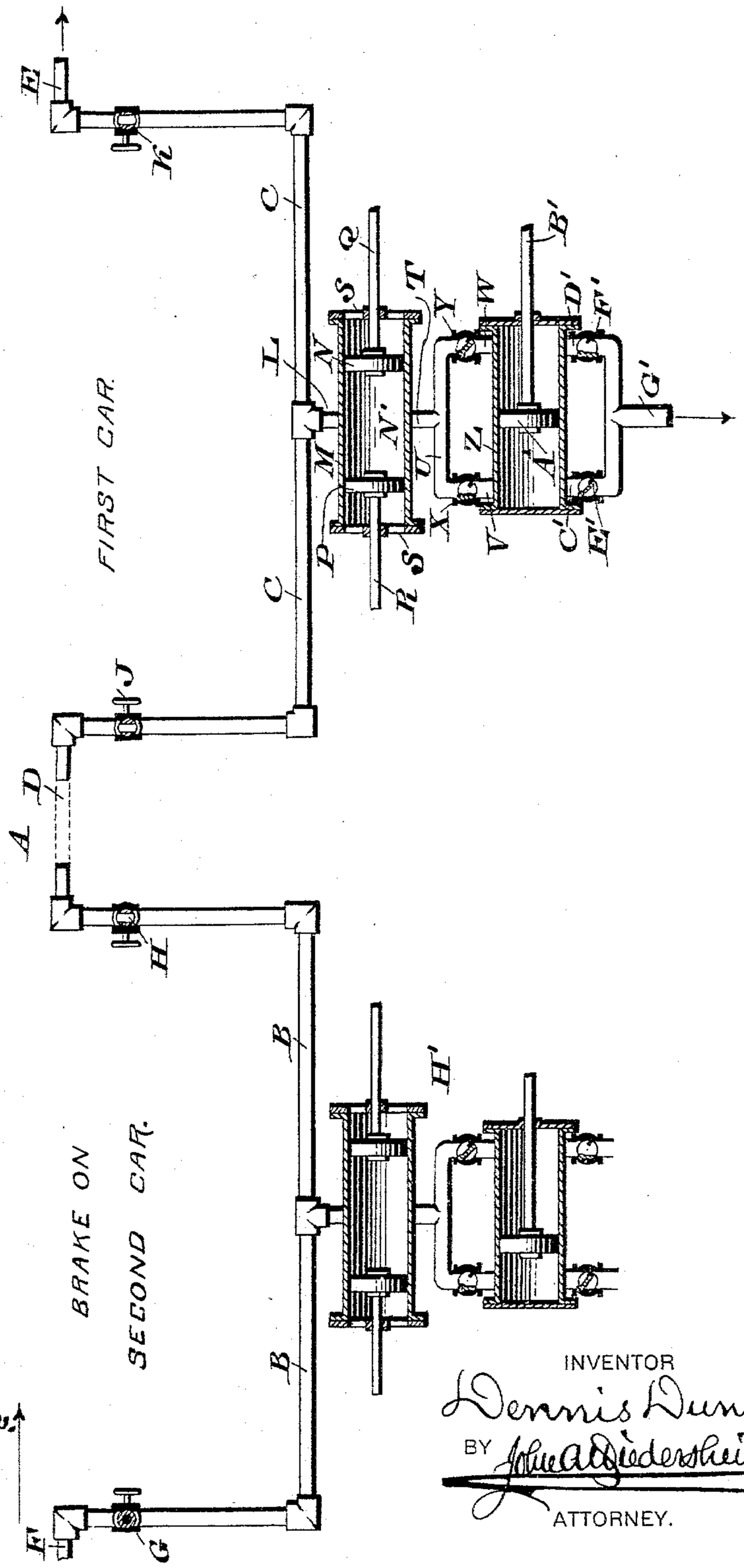
(No Model.)

D. DUNN.

FLUID PRESSURE BRAKE.

No. 564,981. Patented Aug. 4, 1896.



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FLUID-PRESSURE BRAKE.

SPECIFICATION forming part of Letters Patent No. 564,981, dated August 4, 1896.

Application filed November 15, 1895. Serial No. 569,043. (No model.)

To all whom it may concern:

Be it known that I, DENNIS DUNN, a citizen of the United States, residing at Mahanoy City, in the county of Schuylkill, State of Pennsylvania, having invented a new and useful Improvement in Fluid-Pressure Brakes, which improvement is fully set forth in the following specification and accompanying drawing.

My invention consists of a novel construction of fluid-pressure brake in which means are provided for exhausting the air from cylinders having a plurality of pistons therein, whereby upon the proper manipulation of a suitable cock a vacuum will be formed in the space between said pistons, the same having rods which have connections extending therefrom to the brake-levers, whereupon the atmospheric pressure upon the outer faces of the pistons will cause the latter to move toward each other when a vacuum is formed between them, and thus cause the brakes to be applied.

It further consists of novel details of construction, all as will be hereinafter set forth.

The figure represents a diagrammatical view of a fluid-pressure brake system embodying my invention.

Similar letters of reference indicate corresponding parts in the figure.

Referring to the drawing, A designates the system complete, the same consisting of the pipe-sections B and C, which are joined by the flexible coupling D, each of said pipe-sections having attached thereto the terminals F and E, to be hereinafter referred to.

G designates a valve or cock in an extension of said pipe B, which is located near the terminal F.

H designates a similar cock located adjacent the coupling D.

J designates another valve or cock intermediate said coupling D and the pipe-section C, the extension of said pipe C in the opposite direction being provided with a valve or cock K, intermediate said section C and the terminal E. The pipe L leads from the section C into the cylinder M, within which are mounted so as to reciprocate therein the pistons P and N, a chamber N′ thus being formed between said pistons.

Q and R designate piston-rods attached to said pistons N and P, respectively, from which rods connections are made to the brake-levers, which it has not been deemed necessary to illustrate, as the same may be of any convenient or suitable construction.

S designates heads for said cylinder M, in which suitable guides or bearings are provided for said rods Q and R, respectively, it being remembered that the said heads S are made open or provided with ports or passages therein, so that the atmospheric pressure is at all times acting upon the outer face of said pistons N and P, so as to move them toward each other in case the pressure in the chamber N′ should at any time be reduced below the normal.

T designates a pipe leading from the chamber N′ of the cylinder M into the branches U, which are connected to the pipes V and W, which lead to the cylinder Z, in which pipes are located the check-valves X and Y, the directions in which said checks seat being apparent.

Z designates the cylinder of the air pump or compressor, the same being provided with the piston A′, the piston-rod B′, the stuffing-box, and its other adjuncts, it being understood that said piston A′ can be reciprocated in any suitable manner, as from a crank or eccentric mounted upon the axle of the car or in any other convenient manner.

C′ and D′ designate the discharge-pipes for the air compressor or pump Z, the same having located therein the check-valves E′ and F′, said pipes C′ and D′ leading into one common discharge-pipe G′. It will be understood that the apparatus above described is applied to each car, the right-hand apparatus being that on the first car, and the apparatus at the left being mounted upon the second car.

The operation is as follows: If we assume the cars to be moving to the right, as indicated by the arrow at the left of the figure, the cock G must be closed and the cocks H, J, and K are opened. The piston A′ is caused to continually reciprocate, by reason of its connection with the axle of the car or other device, and it will thus be seen that air will be continually drawn through the pipes E, C, and L into the cylinder M, and thence through the

suction-pipe T into the cylinder of the pump or compressor Z, and discharged through the outer pipe G′, it being remembered that atmospheric pressure, under normal conditions, is acting upon the outer sides of the pistons P and N. If now it should be desired to apply the brake to the first car, it is only necessary for the attendant to close the valves K and J, whereupon the continued reciprocation of the piston A′ will tend to instantly exhaust the air from the chamber N′, thereby creating a vacuum in the space between said pistons, the pressure being reduced below the normal, which is ordinarily fifteen pounds to the square inch, whereupon the pistons N and P will instantly be caused to move toward each other, by reason of the exterior atmospheric pressure, and the brakes will be instantly applied.

The operation of that portion of the apparatus designated by H′, which is mounted on the second car, is substantially the same in all particulars as has been already described, it being remembered, however, that in case the cars and the brake apparatus thereon should be moving toward the left instead of to the right the valves G, H, and J would normally be open and the valve K closed, and if it should be desired to apply the brake to the second car, or the car on the left, it is only necessary to close said valves G and H, the operation hereinabove described in the act of applying the brake to the first car then taking place.

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

1. In a fluid-pressure brake system, a plurality of brake-cylinders each having open heads, a plurality of pistons in each of said cylinders, connections from each of said pistons with the brake mechanism, means for exhausting the air from the space in each of the cylinders between said pistons a valved connection intermediate said brake-cylinders, and valved conduits common to said connection and brake-cylinders, and adapted to lead to the atmosphere, substantially as described.

2. In a fluid-pressure brake system, a plurality of brake-cylinders each having open heads, a plurality of pistons in each of said cylinders connections from said pistons with the brake mechanism, means for exhausting the air from the space in each of said cylinders between said pistons, the connections B, C, D, intermediate said brake-cylinders, and the valves H and J therein, said connections B and C being extended beyond said cylinders and leading to the atmosphere, and being provided with the valves G and K, substantially as described.

3. In a fluid-pressure brake system, a series of cylinders, each having pistons with rods in opposite open heads, valved pipes leading from the spaces in said cylinders, between the said pistons, connections for said pipes, valves located in each of said connections, intermediate each cylinder and the extremity of said connections and means for exhausting the air from said spaces between said pistons in said cylinders, said parts being combined substantially as described.

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