No. 673,175. Patented Apr. 30, 1901.

J. B. O'DONNELL.

FLUID PRESSURE BRAKE.

(Application filed May 26, 1900.)

(No Model.) 3 Sheets—Sheet 1.

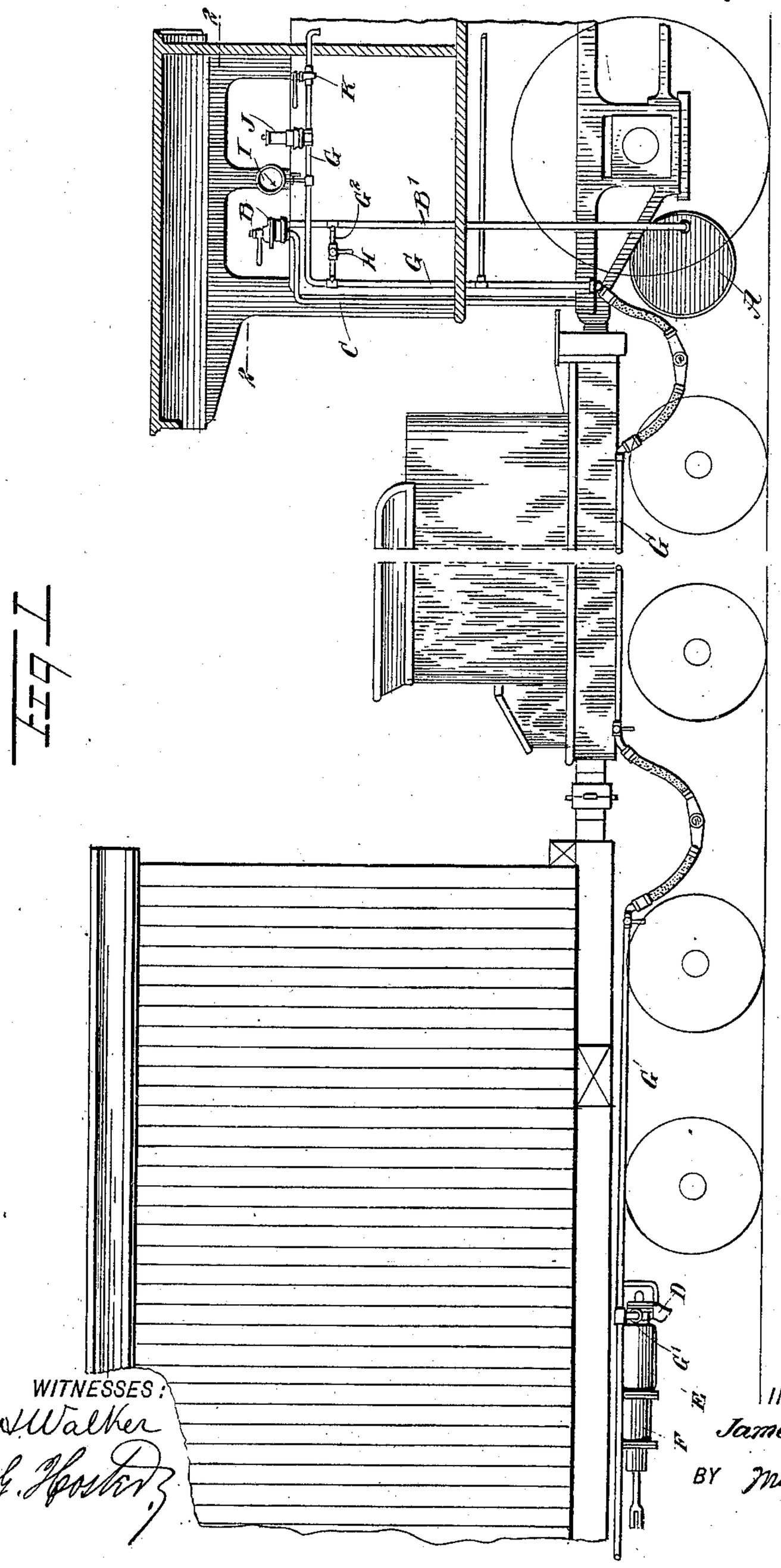

FIG. 1.

WITNESSES:
N. Walker
Rev. J. Houston

INVENTOR
James B. O'Donnell.
BY Munn & Co.
ATTORNEYS

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3 Sheets—Sheet 2.

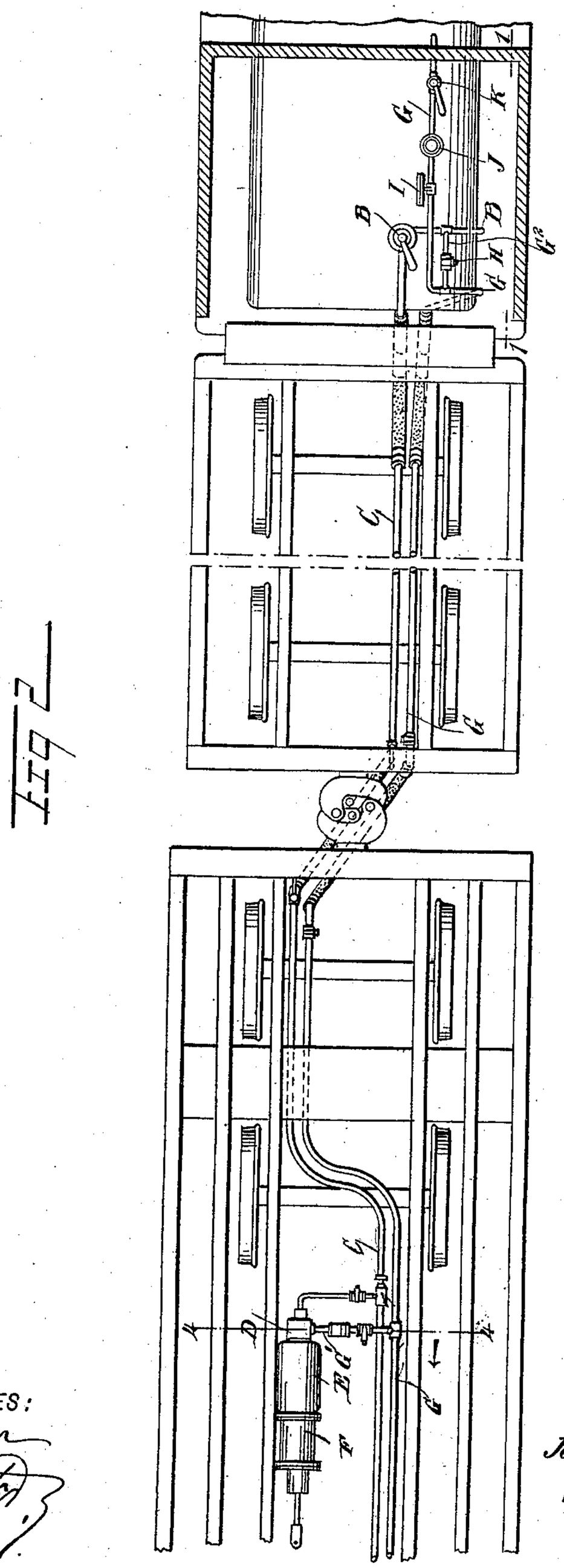

Fig 2

WITNESSES:

H. Walker

Percy Hooton

INVENTOR

James B. O'Donnell.

BY Munn & Co.

ATTORNEYS

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Fig 3

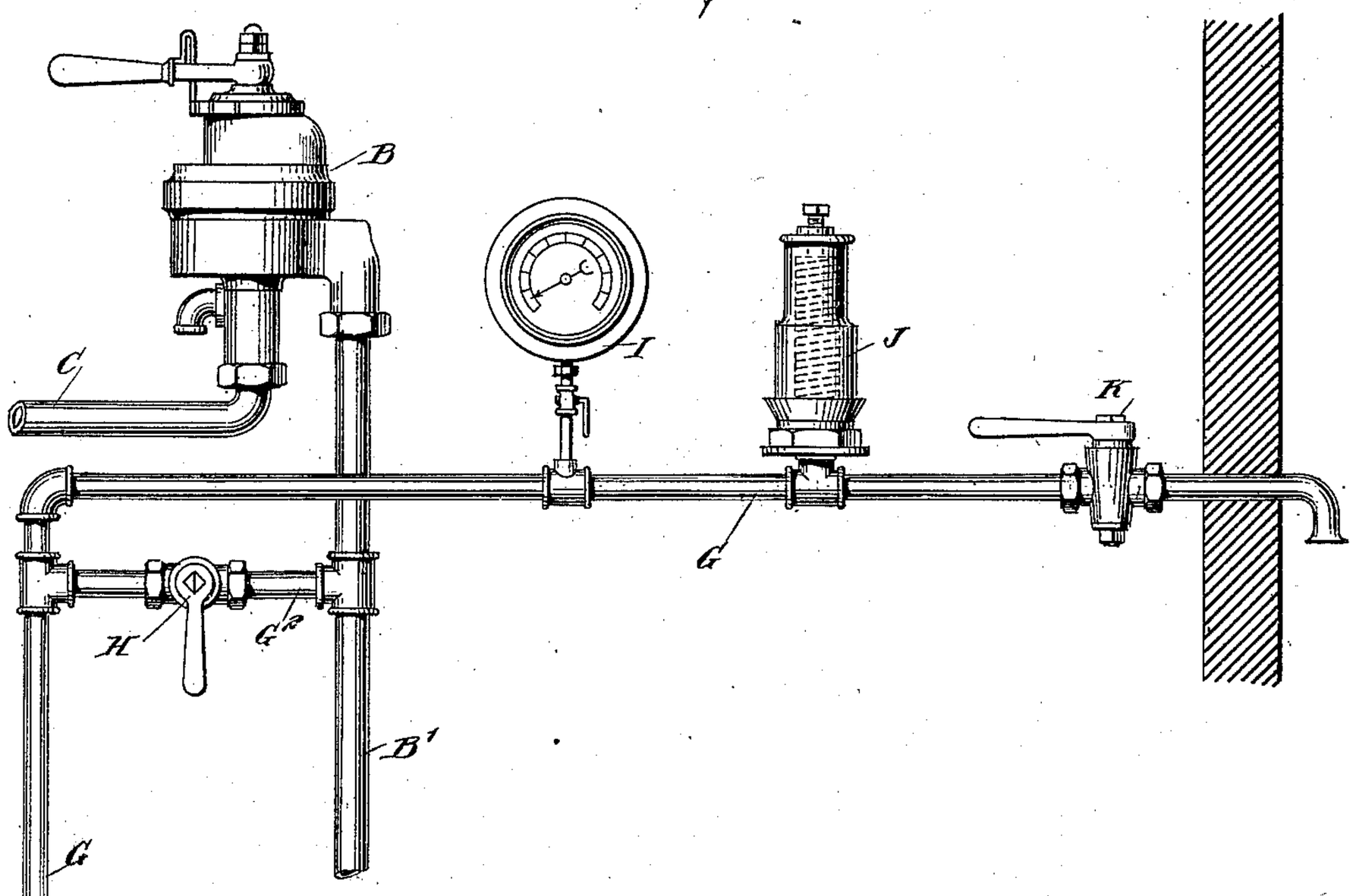
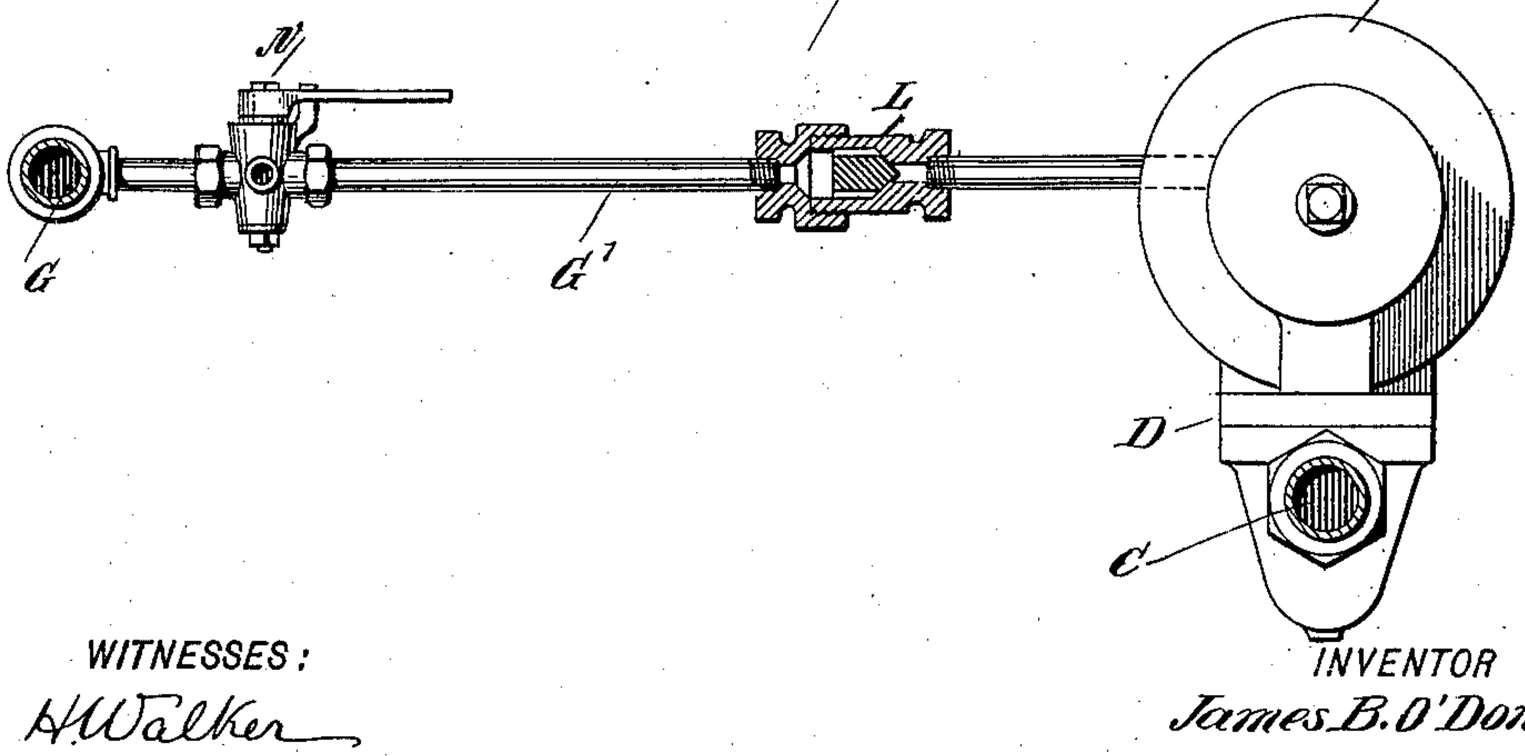


Fig 4



WITNESSES:

H. Walker

Geo. J. Hoosteg

INVENTOR

James B. O'Donnell.

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES BENEDICT O'DONNELL, OF FREELAND, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO WILLIAM P. O. THOMASON, OF SAME PLACE.

FLUID-PRESSURE BRAKE.

SPECIFICATION forming part of Letters Patent No. 673,175, dated April 30, 1901.

Application filed May 26, 1900. Serial No. 18,088. (No model.)

To all whom it may concern:

Be it known that I, JAMES BENEDICT O'DONNELL, a citizen of the United States, and a resident of Freeland, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Pressure Brakes, of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in fluid-pressure brakes whereby an engineer is enabled to recharge the auxiliary reservoir as often as required while the brakes are applied, thus giving the engineer complete control of the train, especially on heavy downgrades, and without danger of the train gaining an undesirable headway while recharging the auxiliary reservoir.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied to a freight-train, the cab of the locomotive being shown in section. Fig. 2 is a plan view of the same with the cab in section and the car-body removed. Fig. 3 is an enlarged side elevation of the equipment in the cab of the locomotive, and Fig. 4 is an enlarged cross-section of the improvement on the line 4 4 in Fig. 2.

The train on which the improvement is applied is equipped with a fluid-pressure brake of the Westinghouse type, and comprises, essentially, a main reservoir A, an engineer's valve B, a train-pipe C, a triple valve D, an auxiliary reservoir E, a brake-cylinder F, and the usual connections. The exhaust-port of the triple valve D is connected by a branch pipe G' with a retainer-pipe G, extending under the cars, preferably alongside the train-pipe C, and having suitable cut-out cocks at each end and hose connections between the cars the same as the train-pipe C. The retainer-pipe G extends into the cab of the locomotive and is connected by a branch pipe G^2 with the main air-reservoir A, either directly or by way of the pipe B', connecting the main reservoir A with the engineer's valve B.

In the branch pipe G^2 is arranged a cut-out cock H, under the control of the engineer, to enable the latter to charge the retainer-pipe with air from the main reservoir A, the pressure being indicated by a gage I on said retainer-pipe within the cab of the locomotive, it being understood that the said cut-out cock H is closed as soon as the retainer-pipe is charged with the desired pressure. In working the apparatus the retainer-pipe is charged with a pressure a few pounds less than that for the expected application of the brakes, the object being to cause the air in the retainer-pipe to act as a cushion to prevent any appreciable loss of pressure in the brake-cylinder and to allow the gage I to record the exact amount of pressure used at the time. A safety-valve J of any approved construction and set the amount of air-pressure desired (fifty pounds) prevents charging the retainer-pipe with more than the desired amount of air-pressure. The said retainer-pipe G is further provided in the cab of the locomotive with an exhaust-valve K under control of the engineer, to enable the latter to reduce the pressure in the retainer-pipe G whenever it is desired to completely release the brakes or to reduce the pressure in the brake-cylinder to a desired degree, as hereinafter more fully described. It is, however, understood that the valve K, as well as the cut-out cock H, is normally closed.

In the branch pipe G', previously referred to, (see Fig. 4,) is arranged a check-valve L, opening toward the retainer-pipe G and closing toward the triple valve D, said check-valve preventing air from passing from the retainer-pipe to the triple valve, but allowing air to pass from the brake-cylinder F, by way of the triple-valve exhaust-port, to the retainer-pipe at the time the triple valve is in release position and the auxiliary reservoir is to be recharged.

It is evident that when the brakes are applied—say on a downgrade—and the engineer recharges the auxiliary reservoir in the usual manner and the brake-cylinder is connected with the branch pipe G' by way of the

valve exhaust-port, then it is evident that the brake-cylinder pressure in passing through the valve L meets with the resisting pressure from the retainer-pipe—say fifty pounds—and hence the brakes remain applied with a fifty-pound pressure while the auxiliary reservoir is recharged. If the brake-cylinder pressure is more than fifty pounds, as it usually is, then it is evident that an equalization of pressure will take place in the retainer-pipe G when the several parts are in the position referred to, owing to the safety-valve J, located in the said retainer-pipe, and which is set at fifty pounds, as previously explained. By the arrangement described a pressure equal to the pressure of the application or applications up to the amount of pressure the safety-valve J is set for is always in the brake-cylinder while the auxiliary reservoir is recharged and the triple valve is in the position to connect the brake-cylinder with the triple-valve exhaust-port, and hence with the branch pipe G′ and the retainer-pipe G.

As soon as the engineer has recharged the auxiliary reservoir he can again apply the brakes with the full auxiliary-reservoir pressure by manipulating the engineer's valve B accordingly, it being understood that during this operation the brake-cylinder is cut off from the pipe G′ and the brake mechanism functions in the usual manner.

When it is desired to hold the brakes applied with less than fifty pounds pressure while recharging the auxiliary reservoir, it is only necessary for the engineer to open the exhaust-valve K accordingly until the desired pressure is reached. For a complete release of the brakes the valve K is correspondingly manipulated to reduce the pressure in the brake-cylinder, and when this has been done the valve K is closed and the valve H is opened, so that the retainer-pipe G is again charged from the main reservoir A with the desired pressure, the valve L thereby closing to prevent air from passing from the retainer-pipe into the brake-cylinder.

In case it is desired to "cut out" some of the rear cars in a train then the rear cut-out cock in the last car "cut in" is closed, and the hose connections for the retainer-pipe of all the cars cut out are disconnected, and the cut-out cocks of such cut-out cars are all opened to allow escape of air from the brake-cylinders to the atmosphere whenever the brakes are released. It is expressly understood that the fluid-pressure brakes of the cut-out cars all function in the usual way, the same as if the retainer-pipe were not on these cut-out cars. Any number of cars in a train may be cut in or cut out relatively to the retainer-pipe. If all the cars are cut in, then the hose-couplings of the retainer-pipe G are connected with each other and all cut-out cocks in the pipe are opened from the engine back to the rear or last cut-out cock in the line of the retainer-pipe, the said rear cut-out cock being closed. This arrangement gives a continuous pipe communication from the brake-cylinders of all the cars to the retainer-pipe and to the exhaust-valve K in the cab of the locomotive.

It is understood that the valve J may be set for a different pressure than fifty pounds; but I prefer the latter, as at this pressure the wheels will not slide on the rails. Should a connecting-hose burst on any of the connections of the retainer-pipe between cars, then the brakes can be applied as at present, as the auxiliary reservoirs are always charged, so that the train can be stopped and the hose repaired, it being understood that when such accident occurs the gage I quickly indicates the loss of pressure, thereby giving warning to the engineer that something is wrong.

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

1. In a fluid-pressure brake, a retainer-pipe extending from the cab under the several cars and extending into the cab of the locomotive, said pipe having a valved connection with the main reservoir, a branch pipe connecting the retainer-pipe with the exhaust-port of the triple valve, a check-valve in the branch pipe, said check-valve opening toward the retainer-pipe and closing toward the triple valve, and a safety or reducing valve in the retainer-pipe within the cab, substantially as described.

2. In a fluid-pressure brake, a retainer-pipe extending from the cab of a locomotive under the several cars, and having a valve connection with the main reservoir, a branch pipe connecting the retainer-pipe with the exhaust-port of the triple valve, a check-valve in the branch pipe, a safety-valve in the retainer-pipe, and an exhaust-valve also in the retainer-pipe, said safety and exhaust valves being in the cab under the control of the engineer, substantially as described.

3. In a fluid-pressure brake, the combination with the main reservoir, the engineer's valve, and the triple valve, a retainer-pipe extending from the cab of a locomotive under the several cars and having a valve connection with the pipe connecting the main reservoir with the engineer's valve, a branch pipe connecting the retainer-pipe with the exhaust-port of the triple valve, a check-valve in the branch pipe, a safety-valve in the retainer-pipe, and an exhaust-valve also in the retainer-pipe, said safety and exhaust valves being in the cab under the control of the engineer, substantially as described.

4. In a fluid-pressure brake, the combination with the main reservoir, the engineer's valve, and the triple valve, of a retainer-pipe leading from the cab of the locomotive under the car, a branch pipe G′ connecting the retainer-pipe with the exhaust-port of the triple valve, a check-valve in the branch pipe, a branch pipe G^2 connecting the retainer-pipe with the pipe connecting the main reservoir

with the engineer's valve, a gage on the retainer-pipe, a safety-valve in the retainer-pipe, and an exhaust-valve also in the retainer-pipe, said gage, safety and exhaust valves being in the cab of the locomotive, substantially as herein shown and described.

It testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES BENEDICT O'DONNELL.

Witnesses:
WM. P. O. THOMASON,
PETER MAGUGUA.