

(No Model.)

2 Sheets—Sheet 1.

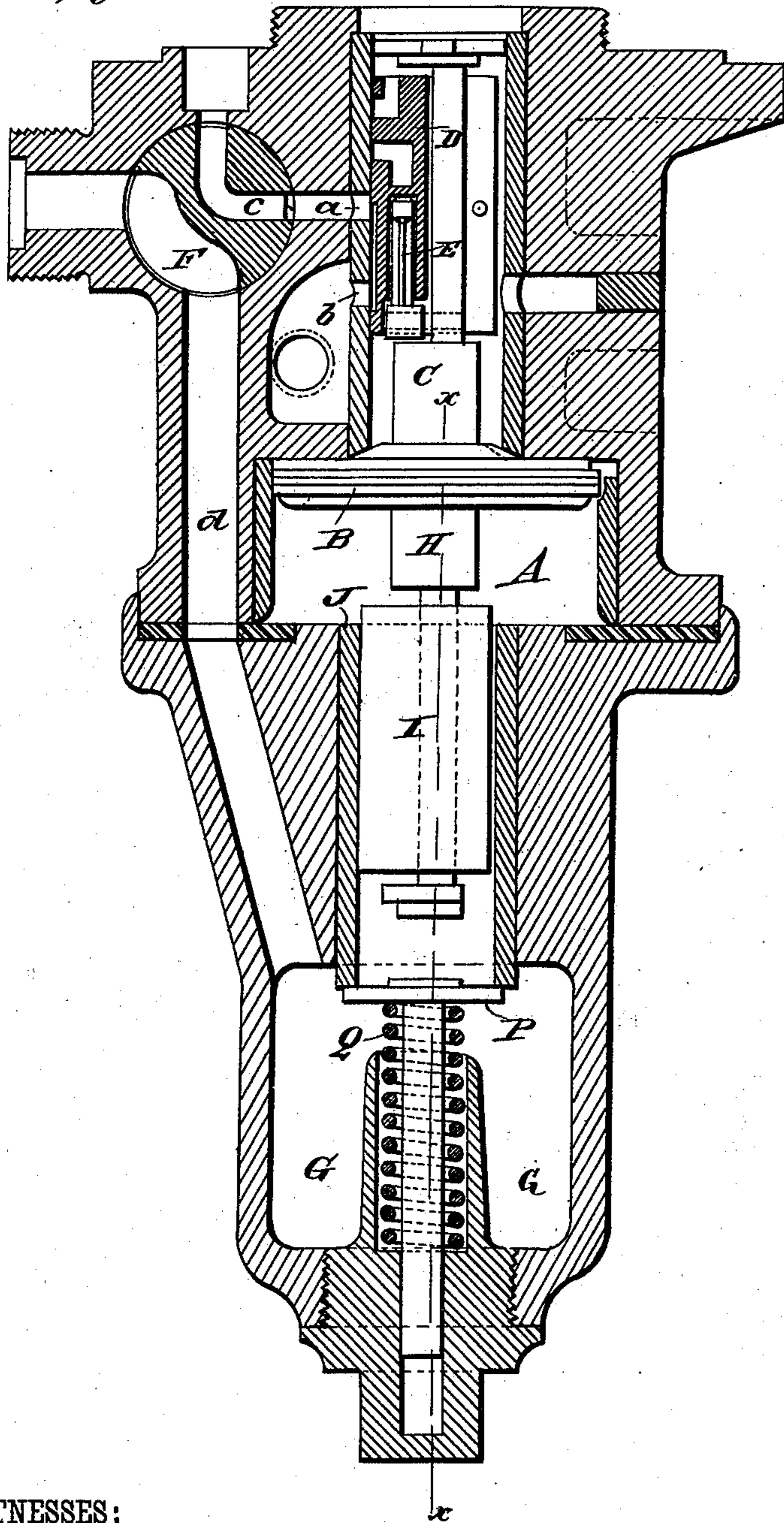
G. B. WILLIAMS.

TRIPLE VALVE FOR AIR BRAKES.

No. 384.009.

Patented June 5, 1888.

Fig. 1.



WITNESSES:

Phil. Dietrich
W. Badgwick

INVENTOR:

G. B. Williams

BY

Munn & Co.

ATTORNEYS.

(No Model.)

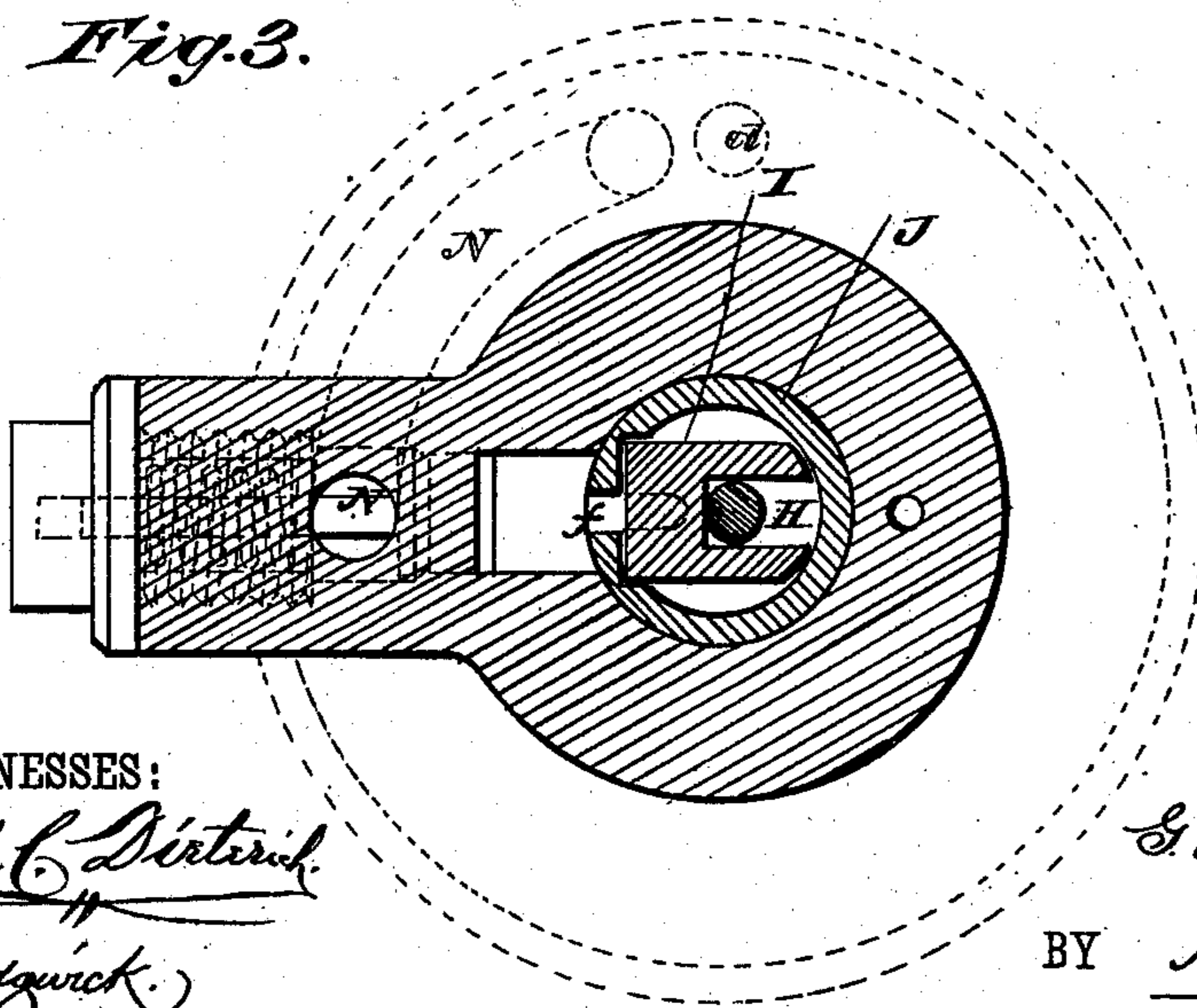
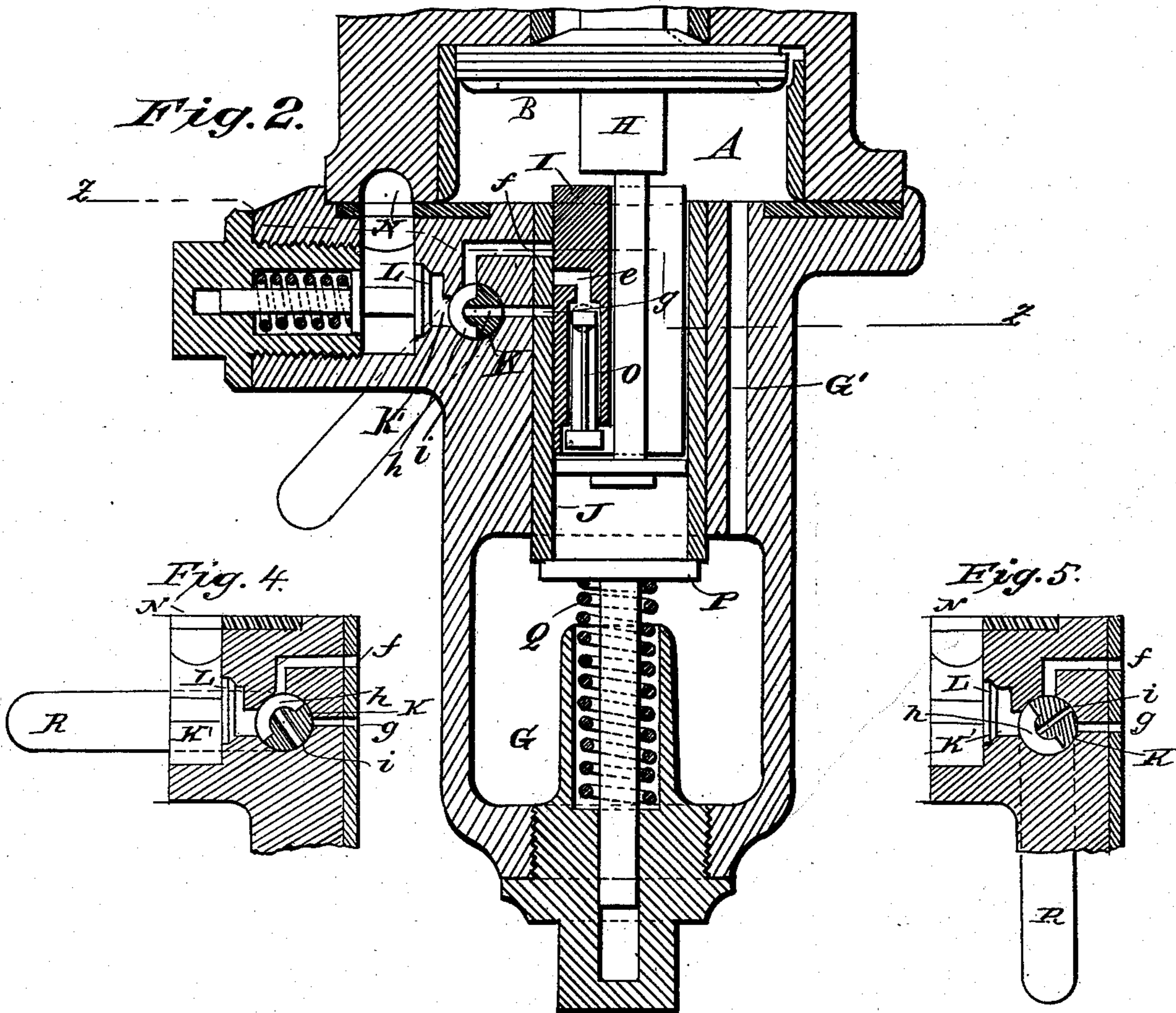
2 Sheets—Sheet 2.

G. B. WILLIAMS.

TRIPLE VALVE FOR AIR BRAKES.

No. 384,009.

Patented June 5, 1888.



WITNESSES:

Phil. C. Dietrich
A. Sedgwick

INVENTOR:

G. B. Williams
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE BAYLEY WILLIAMS, OF LA CROSSE, WISCONSIN.

TRIPLE VALVE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 384,009, dated June 5, 1888.

Application filed September 8, 1887. Serial No. 249,169. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BAYLEY WILLIAMS, of La Crosse, in the county of La Crosse and State of Wisconsin, have invented a new and Improved Triple Valve for Air-Brakes, of which the following is a full, clear, and exact description.

The invention relates to improvements in the triple valve for air-brakes shown in Patent No. 360,070 and in my application, Serial No. 249,170, filed September 8, 1887.

The invention consists in the construction and arrangement of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a central sectional elevation of my improvement. Fig. 2 is a similar view of part of same on the line *x x* of Fig. 1. Fig. 3 is a sectional plan view of my improvement on the line *z z* of Fig. 2. Figs. 4 and 5 are sectional elevations of so much of Fig. 2 as is necessary to illustrate the varying positions of the cock K.

In the cylinder A operates the piston B, provided on one side with a piston-rod, C, carrying the slide-valve D, operating over the ports *a* and *b* and carrying the graduating-valve E. The port *a* connects by a channel, *c*, of the four-way cock F with the brake-cylinder, and the port *b* connects with the exhaust. The four-way cock F also connects the train-pipe with the channel *d*, leading to the drain-cup G, connected by the aperture G' with the cylinder A, so that the air can pass from the train-pipe to the said cylinder. On the other side of the piston B is secured a piston-rod, H, carrying a slide-valve, I, held in the cylinder J, and having a port, *e*, which operates over the port *g* in cylinder J. The port *f* is uncovered only when top of slide-valve I passes below same, or an additional outlet is provided in slide-valve I to connect with same, as in slide-valve D. The ports *f* and *g* lead to channels connecting with the three-way cock K, which has a lever, R, and is provided with an opening, *i*, adapted to connect with the port *g*, and with a groove, *h*, connecting with the port

f. The three-way cock K also connects with the chamber K', in which is seated the check-valve L, controlling communication between the said chamber K' and the grooved channel N in lower surface of upper cap, which connects with the brake-cylinder just as in my application Serial No. 249,170 and in Patent No. 360,070.

In the slide-valve I is held the graduating-valve O, similar in construction to the valve E above referred to in relation to the slide-valve D. The slide-valve I has a limited free motion on its piston-rod H, so as to limit the motion of the graduating-valve O, while the slide-valve I remains stationary. The attachment of the slide-valves D and I on the piston-rods C and H of the piston B constitutes a duplex-acting triple valve, which causes the automatic air-brakes to be applied by the duplex use of air from both the train-pipe and from the auxiliary reservoir, instead of wasting the former in the ordinary way, thereby saving compressed air whenever the brakes are applied. Against the lower end of the cylinder J the stem P is held by the action of the spring Q.

The construction and function of the slide-valves D and I, in connection with the piston B, the four-way cock F, and the several ports *a*, *b*, *f*, and *g*, are the same as set forth in the application, No. 249,170, for Letters Patent above referred to.

The operation is as follows: When it is desired to have the application of the brakes commence simultaneously at the front and rear and middle of a train, then the three-way cock K is set on the several cars at the front, middle, and also at the rear of the train, so that ports *f* and *g* on such cars are both connected with chamber K', as shown in Fig. 2 of the drawings. The three-way cocks K on the remaining cars of train are set to close the ports *f* and *g*, as shown in Fig. 5, in case the cars are equally loaded. If some of the cars are heavily loaded and some are empty, then on the heavily-loaded cars the levers of three-way cock K are set so as to leave ports *f* open and close the ports *g*, as shown in Fig. 4, while on the empty cars the cock K will be set to close both ports *f* and *g*, as shown in Fig. 5. When the engineer now operates his valve and allows air to escape from the train-

pipe into the open air, there will also be an exhaust from main air-pipe into the brake-cylinder on cars on which the cock K is open, so that the brakes on such cars will be applied 5 sooner and with greater force than on cars on which the cock K is closed.

It is understood from my other application that the slide-valve I, attached to the lower end of the piston B, admits air from the train- 10 pipe to the brake-cylinder whenever the brakes are applied, the outlet *e* coming opposite the port *g* immediately the exhaust-port *b* is closed, and preferably a little sooner than the lower outlet-port in the slide-valve D comes opposite 15 the port *a*, so that the maximum quantity of air can be properly utilized in applying the brakes, which can advantageously be taken from train-pipe, and in order that the use of same may be partly graduated by the outlet *e* passing 20 the port *g* when the lower outlet in slide-valve D comes fully opposite port *a*.

In case a train is composed almost entirely of empty cars, with one block of loaded cars in same, then the central cars of the loaded 25 block and one or two rear cars of train should have the three-way cock K set as in Fig. 2, and the other loaded cars should have the cock set to close the port *g* and leave port *f* open, as in Fig. 4; but the empty cars should have 30 the cock set to close both ports, as shown in Fig. 5.

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

35 1. In a brake mechanism, the combination, with a main air-pipe, auxiliary reservoir, triple valve, and an auxiliary valve for admitting air in the application of the brake directly from the main air-pipe to the brake-cylinder at the 40 same time that air is admitted thereto from the auxiliary reservoir, of a cock controlling the admission of the air from the main air-pipe into brake-cylinder through the said auxiliary valve-passage and independently of the ordinary cock of the main valve, substantially as 45 set forth.

2. In a triple valve, the combination, with a

piston carrying the usual slide-valve on its upper end, and carrying on its lower end an auxiliary slide-valve with its graduating-valve, 50 of a cock connected with and controlling the auxiliary ports leading from main air-pipe through said auxiliary slide-valve and a check-valve to brake-cylinder, substantially as shown and described. 55

3. In a triple valve, a piston, a slide-valve operating with and above said piston, an additional slide-valve operating with and below said piston, and a cylinder in which latter slide-valve operates over the ports *f* and *g*, in 60 combination with a three-way cock adapted to be connected with the ports *f* and *g*, and a check-valve adapted to open and close the connection between said slide-valve and brake-cylinder through three-way cock, substantially 65 as shown and described.

4. In a triple valve, a piston, a slide-valve adapted to operate with and above said piston, an additional slide-valve operating with and below said piston, a cylinder having ports over 70 which latter slide-valve operates, and a graduating-valve for said auxiliary slide-valve, in combination with a cock adapted to connect with said ports in said cylinder, and a check-valve adapted to allow air to pass from main 75 air-pipe through said slide-valve and cock to brake-cylinder, but to prevent its return, substantially as shown and described.

5. In a triple valve, a piston, a slide-valve operated by and above said piston, an additional slide-valve operating with and below 80 said piston, and a graduating-valve held in the latter slide-valve, in combination with a cylinder having ports over which said slide-valve operates, a cock or valve adapted to be 85 connected with said ports, a check-valve adapted to open and close the passage leading from main air-pipe through said slide-valve, said cock, and said check-valve to brake-cylinder, substantially as shown and described.

GEORGE BAYLEY WILLIAMS.

Witnesses:

E. H. ANDREWS,
C. F. CLOYDE.