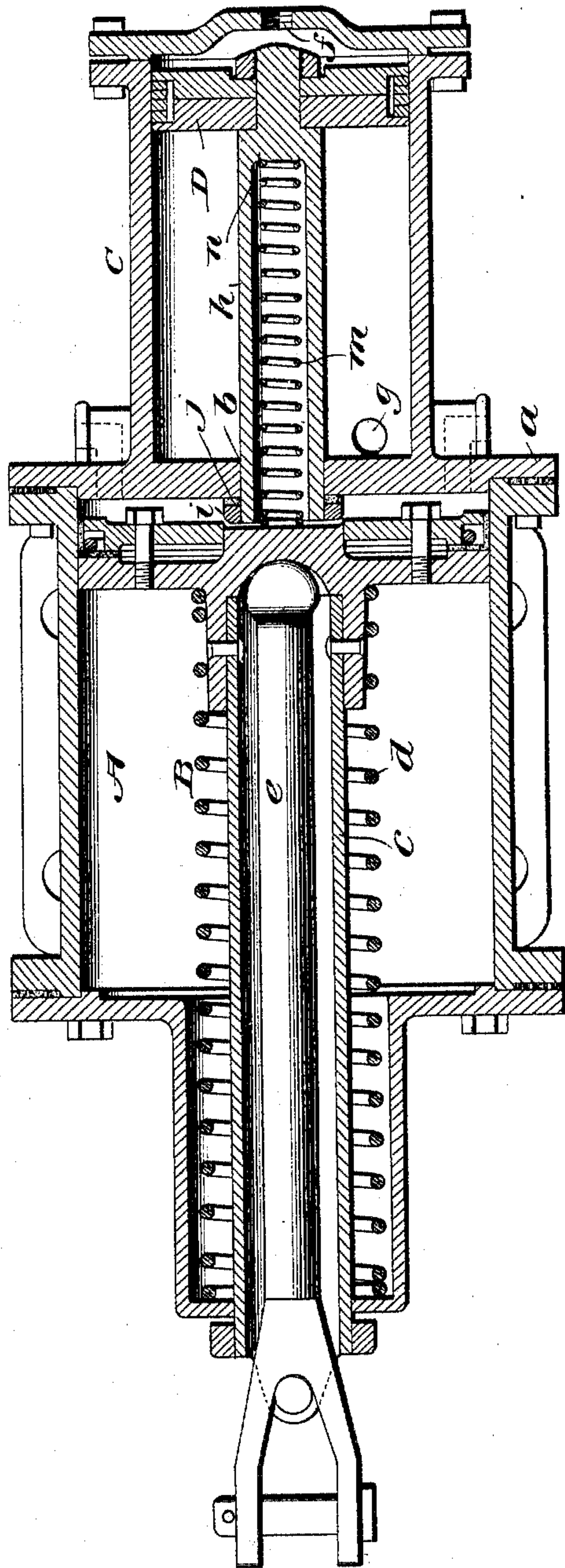


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G. W. BUTCHER.  
FLUID PRESSURE BRAKE.  
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Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE W. BUTCHER, OF SAN ANTONIO, TEXAS.

## FLUID-PRESSURE BRAKE.

SPECIFICATION forming part of Letters Patent No. 784,204, dated March 7, 1905.

Application filed November 3, 1904. Serial No. 231,283.

*To all whom it may concern:*

Be it known that I, GEORGE W. BUTCHER, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented new and useful Improvements in Fluid-Pressure Brakes, of which the following is a specification.

My invention pertains to fluid-pressure brakes, more particularly brake-cylinders; and, broadly stated, it contemplates providing a fluid-pressure brake-cylinder with auxiliary means for moving the piston therein and setting the brakes connected with the piston.

With the foregoing in mind the invention will be fully understood from the following description and claims when taken in connection with the accompanying drawing, forming part of this specification, in which the figure is a longitudinal central section of the apparatus constituting the present and preferred embodiment of my invention.

Referring by letter to the said drawing, A is the brake-cylinder of a fluid-pressure brake apparatus. The said cylinder may in general be of the ordinary construction or any other construction compatible with the purposes of my invention, but is peculiar in that it is provided in its head *a* remote from that through which the piston-rod passes with an aperture *b*. B is a piston arranged in the cylinder A and designed to be moved by fluid-pressure, preferably compressed air, in the usual manner. The said piston may also be of any suitable construction, although I prefer to provide it with the well-known hollow rod *c*, surrounded by the spring *d* and containing the rod *e* for connection with one or more brake-shoes.

On the head *a* of the cylinder A is formed, integral or otherwise fixed, the cylinder C of my auxiliary means for moving the piston B outwardly, which cylinder has a port *f* for the admission of fluid-pressure, preferably steam, and is also preferably provided with a port *g* for the escape of such water of condensation as may occur therein. In addition to the cylinder C my novel auxiliary means comprises a piston D, movable in the said cylinder, and having a hollow rod *h* extending through the aperture *b* into the cylinder A,

an enlargement *i* on the rod *h* within the said cylinder A, suitable packing *j*, carried at the inner side of the enlargement *i* and adapted to bring up against the inner side of the head *a*, and a coiled spring *m*, contained in the hollow rod *h* and interposed between an abutment *n* of the piston D and the inner face of the piston B.

In the practical use of my novel apparatus fluid-pressure, preferably compressed air, is let into and exhausted from the cylinder A in the usual manner to set and release brakes, respectively, and it will be readily noticed that my novel auxiliary means will in no way interfere with these operations. The spring *m* will, however, expand and follow the piston B on the outward stroke thereof and by so doing will retain the packing *j* under pressure against the cylinder-head *a* and preclude leakage of the compressed air through the aperture *b*.

To apply the brakes through the medium of my auxiliary means, fluid-pressure, preferably steam, is let into the cylinder C through the port *f*, when, as will be readily noted, the piston D will be forced outwardly and will in turn force the piston B outwardly and set the brakes in the same manner as the same are set by the admission of fluid-pressure to the cylinder A. To release the brakes when applied through the auxiliary means, the steam or other fluid pressure is exhausted from the cylinder C through port *f*, when the piston B will be returned to its normal position by the spring *d* and will in turn press the piston D back to its normal position.

It will be apparent from the foregoing that in the event of failure of an air-pump on a locomotive the brakes can be applied through the medium of my auxiliary means; also, that when a locomotive is left cold in a round-house, for instance, the supply-cock to the cylinder A may be opened to set the brakes, and thereby prevent the locomotive from casually moving and causing damage. At this time the supply-cock to the cylinder C may also be left open, so that when steam is generated in the locomotive the piston D will be moved outward to assure the application of the brakes and preclude casual movement of



the locomotive. It will further be apparent that precedent to an engineman getting under an engine to perform any function the brakes may be applied through my novel auxiliary means to insure safety. In conclusion it will be noted that my novel auxiliary means adds but little to the cost of a brake-cylinder and does not appreciably increase the cost of operating the brakes.

10 The term "cylinder" as herein employed is intended to comprehend a chamber of any description, inasmuch as chambers of any kind may be employed in my novel brake without involving a departure from the scope  
15 of my invention.

I have specifically described the construction and relative arrangement of the parts in the present embodiment of my invention in order to impart a definite understanding of  
20 the said embodiment. I do not desire, however, to be understood as confining myself to such specific construction and relative arrangement of parts, as such changes or modifications may be made in practice as fairly fall  
25 within the scope of my invention as claimed.

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

1. In a fluid-pressure brake apparatus, the  
30 combination of two cylinders each of which has a port for the admission of fluid-pressure, means movable in one cylinder under the action of fluid-pressure admitted thereto, and means disconnected from the first-mentioned  
35 means movable in the other cylinder, independently of said first-mentioned means, under the action of fluid-pressure admitted to said cylinder and arranged to be moved by said first-mentioned means.

40 2. In a fluid-pressure brake apparatus, the combination of two cylinders having inlets for fluid under pressure, a device movable in one cylinder under the action of fluid-pressure admitted thereto, a device movable in the other  
45 cylinder under the action of fluid-pressure admitted thereto and extending into the first-mentioned cylinder and arranged to bear against and move the first-mentioned device, packing on the second-mentioned device and  
50 in the first-mentioned cylinder, and a spring interposed between the said devices.

3. In a fluid-pressure brake apparatus, the combination of two cylinders each of which has a port for the admission of fluid-pressure,  
55 means movable in one cylinder under the action of fluid-pressure admitted thereto, and means disconnected from the first-mentioned means movable in the other cylinder, independently of said first-mentioned means, under  
60 the action of fluid-pressure admitted to said cylinder and normally arranged in engagement with said first-mentioned means, whereby said first-mentioned means is enabled to directly impart movement to the second-mentioned  
65 means.

4. In a fluid-pressure brake apparatus, the combination of two cylinders each of which has a port for the admission of fluid-pressure, means movable in one cylinder under the action of fluid-pressure admitted thereto and extending into the other cylinder, and means disconnected from the first-mentioned means movable in the other cylinder, independently of said first-mentioned means, under the action of fluid-pressure admitted to said cylinder and  
75 arranged to be moved by the portion of the first-mentioned means which extends into the second-mentioned cylinder.

5. In a fluid-pressure brake apparatus, the combination of a brake-cylinder having a port  
80 for the admission of fluid-pressure, a piston movable independently in the said cylinder, an auxiliary cylinder having a port for the admission of fluid-pressure, a device movable in the latter cylinder and extending into the first-mentioned cylinder and arranged to bear  
85 against and move the piston, packing on the said device and in the first-mentioned cylinder, and a spring interposed between the piston and the said device.

6. In a fluid-pressure brake apparatus, the combination of a brake-cylinder having a port for the admission of fluid-pressure, a piston movable independently in the said cylinder, an auxiliary cylinder having a port for the admission of fluid-pressure, a piston movable in the latter cylinder and extending into the first-mentioned cylinder so as to bear against and move the first-mentioned-piston, packing on the second-mentioned piston, within the first-mentioned cylinder, and a spring interposed between the pistons.

7. In a fluid-pressure brake apparatus, the combination of two tandem cylinders having an aperture between them and also having  
105 ports for the admission of fluid-pressure, a piston movable independently in one cylinder, a piston movable in the other cylinder and having a hollow rod extending through the aperture and into the first-mentioned cylinder so  
110 as to bear against the first-mentioned piston, an enlargement on said rod and within the first-mentioned cylinder, packing carried by the rod at the inner side of the enlargement, and a coiled spring contained in the hollow  
115 rod and interposed between the pistons.

8. In a fluid-pressure brake apparatus, the combination of a cylinder having a port for the admission of fluid-pressure, a second cylinder having a port for the admission of  
120 fluid-pressure, means movable in one cylinder under the action of fluid-pressure admitted thereto and extending into the other cylinder, means movable in the other cylinder, independently of the first-mentioned means, under  
125 the action of fluid-pressure admitted to said cylinder and arranged to be moved by the portion of the first-mentioned means which extends into the second-mentioned cylinder, a spring interposed between the two means, and  
130



packing on the first-mentioned means, within the second-mentioned cylinder.

9. In a fluid-pressure brake apparatus, the combination of a brake-cylinder having a port for the admission of fluid-pressure, an auxiliary cylinder, having a port for the admission of fluid-pressure, means movable in the auxiliary cylinder under the action of fluid-pressure, and a piston movable in the brake-cylinder, independently of the means in the auxiliary cylinder, by fluid-pressure admitted to the brake-cylinder and arranged to be moved by the means in the auxiliary cylinder.

10. In a fluid-pressure brake apparatus, the combination of two tandem cylinders each of which has a port for the admission of fluid-pressure, a piston movable in one cylinder under the action of fluid-pressure admitted to said cylinder and extending into the other cylinder, and a piston movable in such other cylinder, independently of the first-mentioned piston, under the action of fluid-pressure admitted to the cylinder and arranged to be engaged by the first-mentioned piston.

11. In a fluid-pressure brake apparatus, the combination of two tandem cylinders each of which has a port for the admission of fluid-pressure, a piston movable in one cylinder under the action of fluid-pressure admitted to

said cylinder and extending into the other cylinder, a piston movable in such other cylinder, independently of the first-mentioned piston, under the action of fluid-pressure to the cylinder and arranged to be engaged and moved by the first-mentioned piston, and a spring interposed between the two pistons.

12. In a fluid-pressure brake apparatus, the combination of two tandem cylinders each of which has a port for the admission of fluid-pressure, a piston movable in one cylinder under the action of fluid-pressure admitted to said cylinder and extending into the other cylinder, a piston movable in such other cylinder, independently of the first-mentioned piston, under the action of fluid-pressure admitted to the cylinder and arranged to be engaged by the first-mentioned piston, means for preventing the escape of fluid-pressure from the second-mentioned cylinder to the first-mentioned cylinder, and a spring interposed between the two pistons.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE W. BUTCHER.

Witnesses:

THOS. B. PALFREY,  
LEE W. EARNEST.