(No Model.)

E. E. KERNS.

FLUID PRESSURE BRAKE.

No. 564,522. Patented July 21, 1896.

Fig. 1.

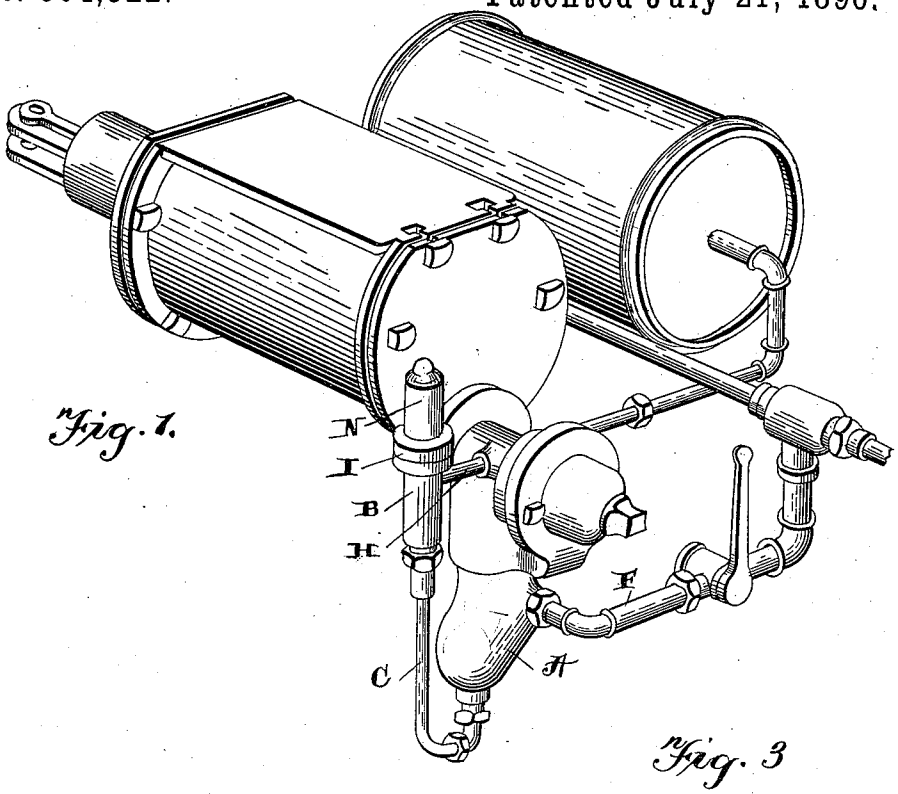


Fig. 3

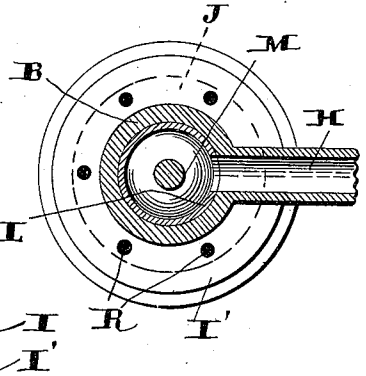
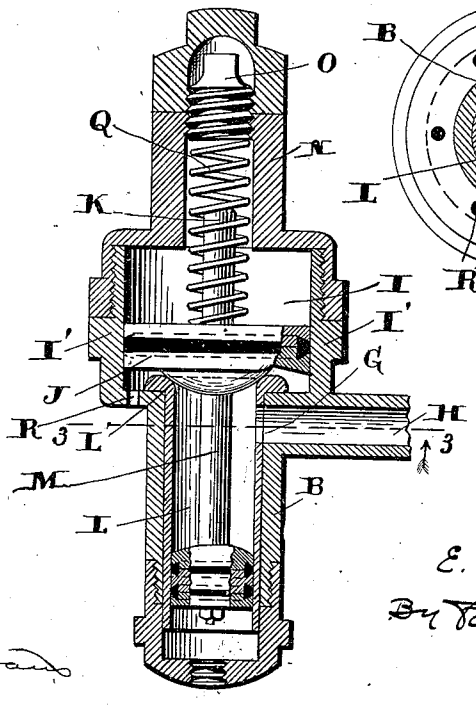


Fig. 2.



Witnesses
Geo. E. Frech.
James W. Bevan

Inventor
E. E. Kerns,
By Pattison & Pedrick,
Attorneys

THE, NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ELMER E. KERNS, OF BRADFORD, PENNSYLVANIA.

FLUID-PRESSURE BRAKE.

SPECIFICATION forming part of Letters Patent No. 564,522, dated July 21, 1896.

Application filed December 11, 1895. Serial No. 571,811. (No model.)

To all whom it may concern:

Be it known that I, ELMER E. KERNS, of Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Pressure Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

This invention pertains to fluid-pressure brakes, and relates particularly to that class of brakes in which the pressure is retained in the brake-cylinder until the same is restored in the auxiliary reservoir, when the air in the brake-cylinder is automatically released.

The present invention is designed as an improvement upon the devices shown in an application filed by me August 12, 1895, Serial No. 559,061, the object being to provide a release-valve of quicker action and of greater exhaust power.

Referring to the accompanying drawings, Figure 1 is a perspective view showing the relative position of my improved valve mechanism and the triple valve. Fig. 2 is a longitudinal sectional view of the releasing-valve. Fig. 3 is a cross-sectional view on line 3 3 of Fig. 2.

A designates the triple-valve mechanism of familiar construction. The cylinder B of my improved valve is connected by pipe C with the lower end of the triple-valve casing at a point adjacent the connection of train-pipe F. The exhaust of the triple-valve mechanism engages with the side or periphery of the cylinder B at the point G, through the medium of pipe H. At the end of cylinder B, opposite the pipe connection C, is the enlarged circular cavity or auxiliary cylinder I, made integral with cylinder B by vertical web I′, and adapted to move in this enlarged cavity or cylinder is piston-head J, secured on stem K. Cylinder B is lined with bushing L, the latter being beveled, as indicated at L′, upon the extremity extending into enlargement I, and adapted to move within this bushing-lined cylinder is the reamed-out spool-valve M, which is also mounted upon the valve-stem and abuts the piston-head J.

The inner bulb-shaped end of valve M is larger than its opposite end and the inner end L′ of bushing L forms a seat for said enlarged end, as clearly shown in Fig. 2. Thus cylinder B is effectually sealed at its inner end and the exhaust of the triple valve is confined until said valve is moved from its seat, when it is instantly released into chamber I.

In manufacture the auxiliary cylinder or enlargement I is formed in two parts and threaded together, as shown, and extending from the ends of this auxiliary cylinder or enlargement, and in line with the cylinder B, is the elongated longitudinal extension N, into which the valve-stem K projects. The interior of the extension N is screw-threaded and receives the screw-plug O, which bears against head P, the latter bearing against the outer end of coiled spring Q, confined in the longitudinal extension N and encircling the extremity of the valve-stem and bearing at its inner end against the piston-head J. The outer end of the screw-plug is provided with a wrench-hold, and by this means the tension of the spring upon the piston-head is regulated so as to obtain the desired number of pounds resistance, holding the said piston-head and spool-valve firmly against the beveled end of the bushing of cylinder B, so as to completely close or seal the latter until said pressure has been overcome by the restored pressure in the train-pipe and auxiliary reservoir acting against the opposite end of the spool-valve through pipe C. When this occurs, the valve mechanism will be moved longitudinally and the air from the triple-valve exhaust permitted to escape between the end of the bushing and the piston-head and rush outward through the plurality of apertures R in web I′. The surface of the said piston-head adjacent the spool-valve, which receives the direct pressure from the exhaust, is preferably concaved, so as to centralize the pressure, thus causing the air in a measure to reverse the motion or be deflected toward the exhaust-orifices R.

The instant the spool-valve and piston are moved the exhaust is effectually accom-

plished, the same being greatly accelerated by the exhaust-pressure upon the large area of the piston-head, which causes the latter to move backward and thus materially increase the outlet for the air.

By means of the construction here shown and described the air in the brake-cylinder is retained with the brakes set even after the train-pipe has been opened for the restoration of the pressure in the auxiliary reservoir until the pressure in the latter has been restored to the number of pounds desired, and then the exhaust will be effected practically instantaneously and automatically. As the pressure in the auxiliary reservoir and train-pipe again becomes reduced the exhaust will be automatically closed by the action of the spring and the same retained in this position until said pressure is restored, as will be understood.

I do not desire to limit myself to the exact arrangement here shown for placing in communication the train-pipe and my improved valve. The object is to control the adjustment of my improved valve by an air-pressure common to the train-pipe and the auxiliary reservoir, and hence any form of connection which will allow of the above result may be had without departing from the spirit of my invention.

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

1. The combination of communicating cylinders B and I, the latter having greater diameter than the former and provided with the exhaust-apertures R adjacent the point of communication with cylinder B, the train-pipe and triple-exhaust connections for cylinder B, a spring-held valve normally closing cylinder B and confining the triple exhaust therein, and a piston fitting and movable in cylinder I in unison with said valve, whereby when the valve is moved by train-pipe pressure to open communication between the cylinders, the air of the triple exhaust escaping into chamber I will press against and force said piston back into cylinder I and thereby increase the outlet afforded by the valve and effect a quick exhaust, substantially as shown and described.

2. In a fluid-pressure brake, the cylinder B, the train-pipe, and the triple-exhaust connection, the spool-valve movable longitudially in the cylinder and adapted to receive at one end the pressure from the train-pipe and between its ends reamed out to admit the exhaust from the triple-valve mechanism, the enlarged piston-chamber having the exhaust-ports, and the piston-head therein which moves in unison with the spool-valve and which is concaved upon its surface adjacent the spool-valve so as to deflect the exhausted air toward the exhaust-ports, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER E. KERNS.

Witnesses:
J. R. BAKER,
H. H. NORTH.