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PATENTED JAN. 30, 1906.

B. T. BURCHARDI.
FLUID BRAKE MECHANISM.
APPLICATION FILED APR. 12, 1905.

Fig. 1

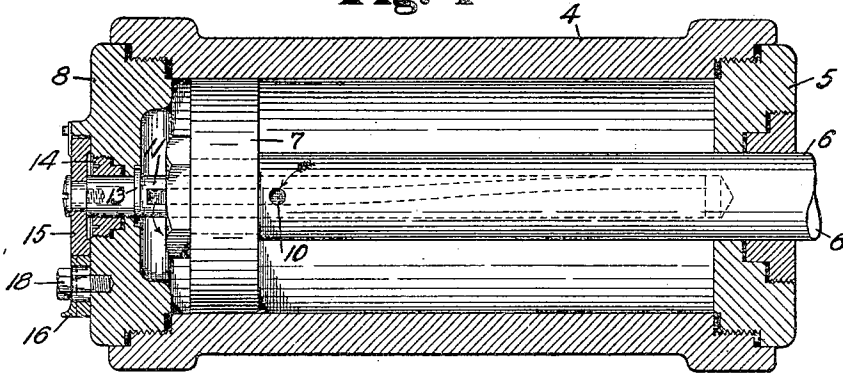


Fig. 2

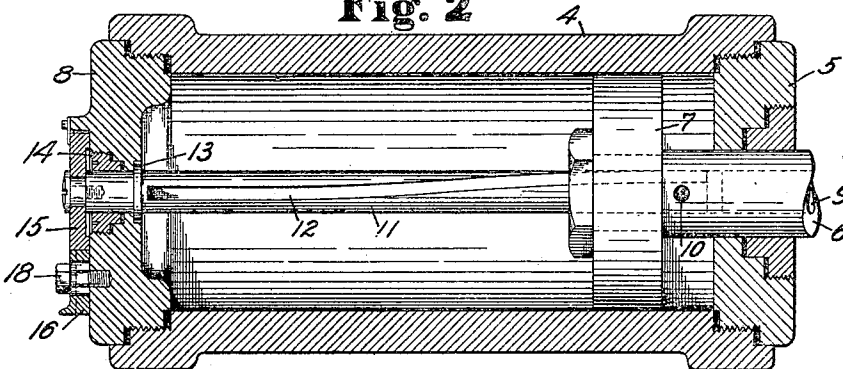
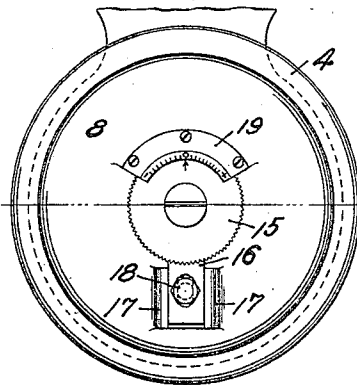


Fig. 3



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FLUID-BRAKE MECHANISM.

No. 811,198.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed April 12, 1905. Serial No. 255,203.

To all whom it may concern:

Be it known that I, BERNHARD T. BURCHARDI, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Fluid-Brake Mechanism, of which the following is a specification.

This invention relates to an improvement in fluid-brake mechanism, and particularly to the type used to check the recoil of guns.

Many of the brake mechanisms now in use on gun-mounts have means for adjusting the flow of the fluid from one side of the piston to the other under normal or testing conditions, or what may be termed the "normal" flow of the fluid. These means are of such a character, however, that the adjustment must be made during the test and before the gun goes into service.

It has been found that in service there is a variation in the flow of the fluid, due to change of temperature, variation in ammunition, and other causes.

It is one of the objects of this invention to provide means for adjusting the throttling device to compensate for variations in the flow of the fluid under varying conditions. The fluid in recoil mechanisms is forced into the cylinder under considerable pressure, and the cylinder must be kept full. It is impracticable to open the cylinder in the field to readjust the recoil-throttling device when the flow of the fluid varies.

Another object of this invention is therefore to provide means connected with the throttling device and mounted outside the brake mechanism where the gunner can reach it to adjust the throttling device to meet the varying conditions.

With these and other objects in view the invention consists in certain constructions and combinations, which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 illustrates in section so much of one form of fluid-brake mechanism as is necessary to an understanding of the invention. Fig. 2 is a similar section showing the parts in different relation; and Fig. 3 is an end view of a recoil-cylinder, showing the position of parts of the invention in one embodiment.

In the device selected to illustrate the in-

vention there is provided a cylinder 4, one end of which is closed by a head 5, which has an aperture therein through which a piston-rod 6 slides. The end of the rod 6 within the cylinder is secured to a piston 7, which fits the cylinder snugly. The other end of the cylinder 4 is closed by a head 8 in the usual manner, which head will be hereinafter more fully described.

It is to be understood that the cylinder is secured to the carriage and the piston-rod to the gun, or vice versa, in the conventional manner. These connections being unnecessary to an understanding of this invention are omitted.

A throttling device is provided arranged to control the normal flow of the fluid and may be widely varied in construction. Preferably it will consist of a sliding throttling member, which may be of any approved construction, and a normally stationary throttling member coöperating with the sliding member. The normally stationary member will preferably extend to the outside of the brake mechanism.

In the device illustrated the sliding member is formed by the piston-rod 6, which is provided with an axial chamber 9, which is in open communication with the cylinder on one side of the piston 7 by means of an aperture 10, formed in the wall of the chamber.

The normally stationary member lies in the chamber 9 and coöperates with the aperture 10 to control the normal flow of the fluid from one side of the piston to the other, and this member may vary widely in construction. As shown, it consists of a cylindrical stem 11, having a groove or channel 12 formed thereon, preferably partially parallel to the axis of the stem and in part spirally with respect to the stem's axis, the purpose of the parallel portion being to permit the piston to pass the point of maximum flow before the throttling begins.

Referring to Fig. 1, it will be seen that the aperture 10 lies over the parallel portion of the channel 12. When the gun is fired, the piston recedes from the head 8 and the fluid lying between the piston and head 5 begins to flow through the aperture 10 and groove 12 to that portion of the cylinder between the piston and head 8. As the piston recedes the aperture moves on a line parallel with the axis of the stem 11 and gradually runs out of register with the helical portion of the channel 12 until the aperture is fully

closed in the position shown in Fig. 2 and the piston stopped.

The usual means, a system of springs, may be employed to return the gun to battery; but since this means is not necessary to an understanding of this invention illustration of such means is omitted.

So much of the invention already described is adjusted in the usual manner to control the flow of the fluid from one side of the piston to the other or the normal flow of the fluid before the gun goes into service.

For adjusting the throttling device to compensate for variations in the flow of the fluid in service means are provided connected with said device and mounted outside the brake mechanism, and this means may vary widely in construction.

As shown, the stem 11 has an annular flange 13 formed thereon, which contacts with the inner side of the head 8, before referred to. The stem 11 is extended beyond the flange 13 to the outside of the head 8, passing through a stuffing-box 14, screwed or otherwise secured to the head 8. Upon the outer end of the stem 11 there is secured the means for adjusting the throttling device, which consists in the construction illustrated of a wheel 15, preferably having a milled edge.

Means are provided for preventing accidental displacement of the wheel 15, which, as shown, consists of a clamp 16, mounted to slide between lugs 17 17, formed on the cylinder-head 8 and which is held in place by a screw 18, one edge of the clamp being preferably milled to fit the edge of the wheel 15.

A graduated index 19 is provided, is mounted on the head 8, and coöperates with the wheel 15 to indicate to the gunner the adjustment necessary under certain conditions.

It will be readily understood that when the wheel 15 is turned in either direction the throttling device will be adjusted as may be found necessary.

Changes and variations may be made in the construction without departing from the invention. The invention, therefore, is not to be restricted to the specific structure shown nor to the specific use described, as it may be used in connection with mechanisms other than recoil-brakes—such, for instance, as hydraulic elevators.

What is claimed is—

1. In a fluid-brake mechanism, the combination with a sliding throttling member hav-

ing an aperture therein in open communication with the cylinder on one side of the piston, of a cylindrical throttling-stem having formed therein a channel partly parallel to the axis of the stem and partly helical arranged to coöperate with the aperture to control the flow of fluid from one side of the piston to the other, substantially as described.

2. In a fluid-brake mechanism, the combination with a sliding throttling member having an aperture therein in open communication with the cylinder on one side of the piston, of a cylindrical throttling-stem having formed therein a channel partly parallel to the axis of the stem and partly helical arranged to coöperate with the aperture to control the flow of the fluid, and means connected with said stem and mounted on the outside of the brake mechanism for adjusting it with respect to the aperture, substantially as described.

3. In a fluid-brake mechanism, the combination with a cylinder, of a piston working therein a piston-rod secured to said piston said rod having a chamber formed therein and an aperture in the wall of the chamber in open communication with the cylinder on one side of the piston, and a cylindrical throttling-stem lying in said chamber and having formed therein a channel partly parallel to the axis of the stem and partly helical arranged to coöperate with the aperture to control the flow of fluid from one side of the piston to the other, substantially as described.

4. In a fluid-brake mechanism, the combination with a cylinder, of a piston working therein, a piston-rod secured to said piston said rod having a chamber formed therein and an aperture in the wall of the chamber in open communication with the cylinder on one side of the piston, a cylindrical throttling-stem lying in said chamber and having formed therein a channel partly parallel to the axis of the stem and partly helical arranged to coöperate with the aperture to control the flow of the fluid, and means connected with said stem and mounted on the outside of the brake mechanism for adjusting it with respect to the aperture, substantially as described.

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

BERNHARD T. BURCHARDI.

Witnesses:

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