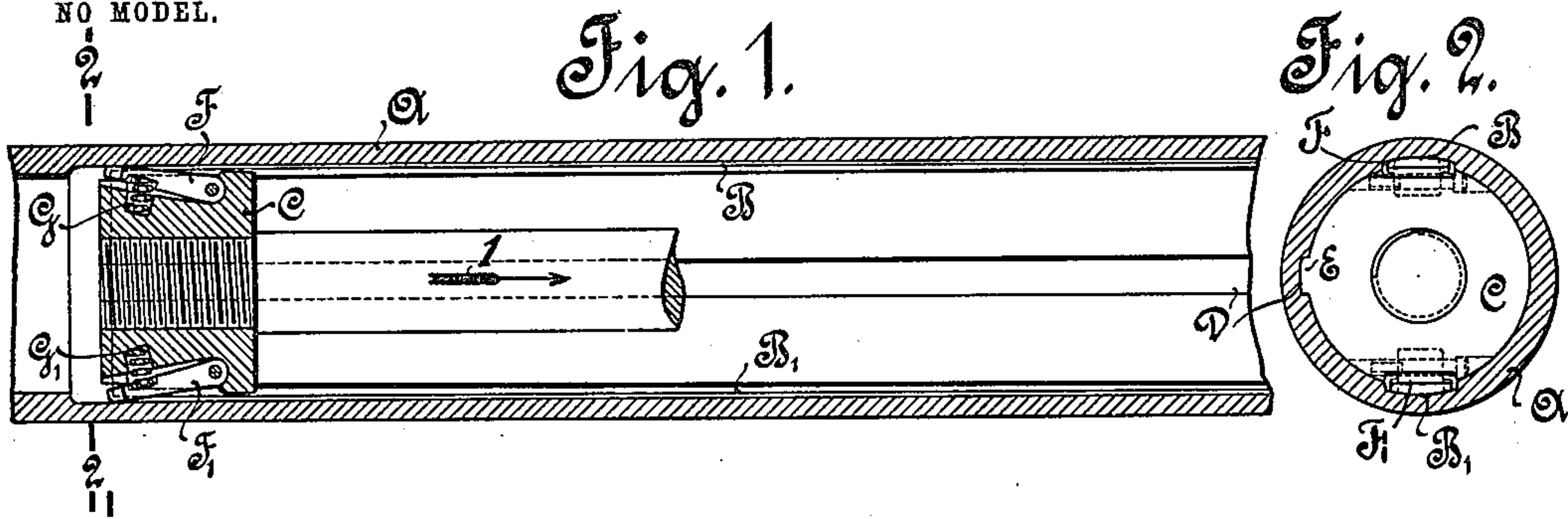


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A. RESOW & O. LAUBER.
FLUID BRAKE FOR GUNS.
APPLICATION FILED AUG. 18, 1900.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

ADOLF RESOW, OF ESSEN-ON-THE-RUHR, AND OTTO LAUBER, OF ALTENDORF, GERMANY, ASSIGNORS TO FRIED. KRUPP, OF ESSEN-ON-THE-RUHR, GERMANY.

FLUID-BRAKE FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 751,684, dated February 9, 1904.

Application filed August 18, 1900. Serial No. 27,339. (No model.)

To all whom it may concern:

Be it known that we, ADOLF RESOW, residing at Essen-on-the-Ruhr, and OTTO LAUBER, residing at Altendorf, near Essen-on-the-Ruhr, Germany, both citizens of the German Empire, have invented certain new and useful Improvements in Fluid-Brakes for Guns, of which the following is a specification.

This invention has reference to improvements in fluid-brakes for guns in which the reciprocating brake-piston displaces the liquid contained within the brake-cylinder through a space between the piston and the walls of the cylinder from one side of the piston to the other. The transfer of liquid from one side of the piston to the other takes place in such brakes through channels formed either in the wall of the cylinder or in the periphery of the piston. If the channels are formed in the walls of the cylinder, the cross-section thereof is gradually diminished in the direction of the recoil—that is, in the backward movement of the piston. If, however, the channels are formed in the piston, said channels are engaged by rails which are located on the walls of the cylinder and have an increased cross-section in the direction of the recoil or backward movement of the piston.

The present invention has a special reference to a construction for the purpose of braking the running out of the gun in fluid-brakes of the kind described, by means of which the usual running-out brake-cylinder may be omitted, and consequently the production of a fluid-brake with but a single piston and without any piston-packing is made possible.

The nature of our invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 represents a longitudinal section of a fluid-brake embodying our invention, part being broken away. Fig. 2 is a cross-section on the line 2 2, Fig. 1, seen from the left of Fig. 1.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

Referring at present to Figs. 1 and 2 of the drawings, the letter A designates the brake-cylinder, which is provided on its inner wall with two diametrically opposite channels extending substantially throughout the length of the cylinder and having a constant width, but a gradually-decreasing depth. The depth of said channels decreases in the direction of arrow 1, shown in Fig. 1—that is to say, in the direction of the recoil of the gun or the backward movement of the brake-piston C. The throttling device is in this instance applied as follows: Opposite to the channels B B' the piston C is provided with depressions in which are located two throttling-bodies F F', made in the form of flat valves and adapted to swing about suitable pivots outwardly and inwardly with respect to the piston. The depressions are made deep enough to permit the throttling-bodies to move inwardly far enough to become flush with the periphery of the cylinder or to fall slightly below the same. The throttling-bodies are subjected to the action of springs G G', tending to turn the same outwardly and into the channels B B'. The width of said bodies is made slightly less than that of the channels B B', so that when the said bodies lie within the channels the free cross-section of the latter is almost entirely closed. In the inner wall of the cylinder is also formed a narrow guide-groove D, into which projects a lug E on the piston C, which prevents the piston from turning and insures the reengagement of the throttling-bodies with the channels when they move outwardly after depression. The piston-rod is in connection with the recoiling parts of the gun. When a shot is fired, the piston C moves backward in the direction of arrow 1 and forces the liquid in front of it to the other side of the cylinder through the channels B B'. During this backward movement of the piston the throttling-bodies F F' are forced inwardly against the action of the springs G G' by the pressure of the liquid passing over the same, so that the full cross-section of the channels is available for the passage of liquid. In consequence of this the liquid passes freely through

the channels B B', but is gradually throttled in view of the decreasing cross-section of the channels previously described. When the recoil is ended, the piston is driven forward in view of the energy stored in springs or in other ways during the recoil, as usual. As soon as the reversal takes place the throttling-bodies F F' are forced by the pressure of the springs G G' and the pressure of the liquid into the channels B B'. Consequently in all positions of the piston during the forward or running-out movement only a fractional part of the cross-section of the channels is free for the passage of liquid from one side of the piston to the other, and consequently the liquid is heavily throttled and a smooth running-out of the returning parts of the gun is accomplished.

It will of course be understood that instead of a plurality of channels B and B' one channel of sufficient cross-section may be employed.

What we claim as new is—

1. In a fluid-brake in which the fluid in the cylinder passes from one side of the piston to the other through a suitable channel in the inner wall of the cylinder, means adapted to enter the channel to restrict its cross-section, throttling the fluid, moving with the piston, and inclined in the direction of movement of the piston so that it seats and unseats by the fluid-pressure within the channel.

2. In a fluid-brake in which the liquid in the cylinder passes from one side of the piston to the other through a suitable channel, the combination of a throttling device consisting of a flap hinged to the piston to swing in-

wardly and outwardly with respect to the same and arranged contiguous with the channel so as to be thrown inwardly to clear the channel and outwardly to restrict the cross-section of the same according to the direction of the movement of the piston, substantially as described.

3. In a fluid-brake in which the liquid in the cylinder passes from one side of the piston to the other through a suitable channel, the combination of a throttling device consisting of a flap hinged to the piston to swing inwardly and outwardly with respect to the same, and a spring acting on the flap to force the same outwardly into the channel, substantially as described.

4. In a fluid-brake in which the liquid in the cylinder passes from one side of the piston to the other through a plurality of channels, the combination of a throttling device consisting of a plurality of flaps hinged to the piston to swing inwardly and outwardly with respect to the same and arranged contiguous with the channels so as to be thrown inwardly to clear the channels and outwardly to restrict the cross-section of the same according to the direction of the movement of the piston, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

ADOLF RESOW.
OTTO LAUBER.

Witnesses:

WILLIAM ESSENWEIN,
PETER LIEBER.