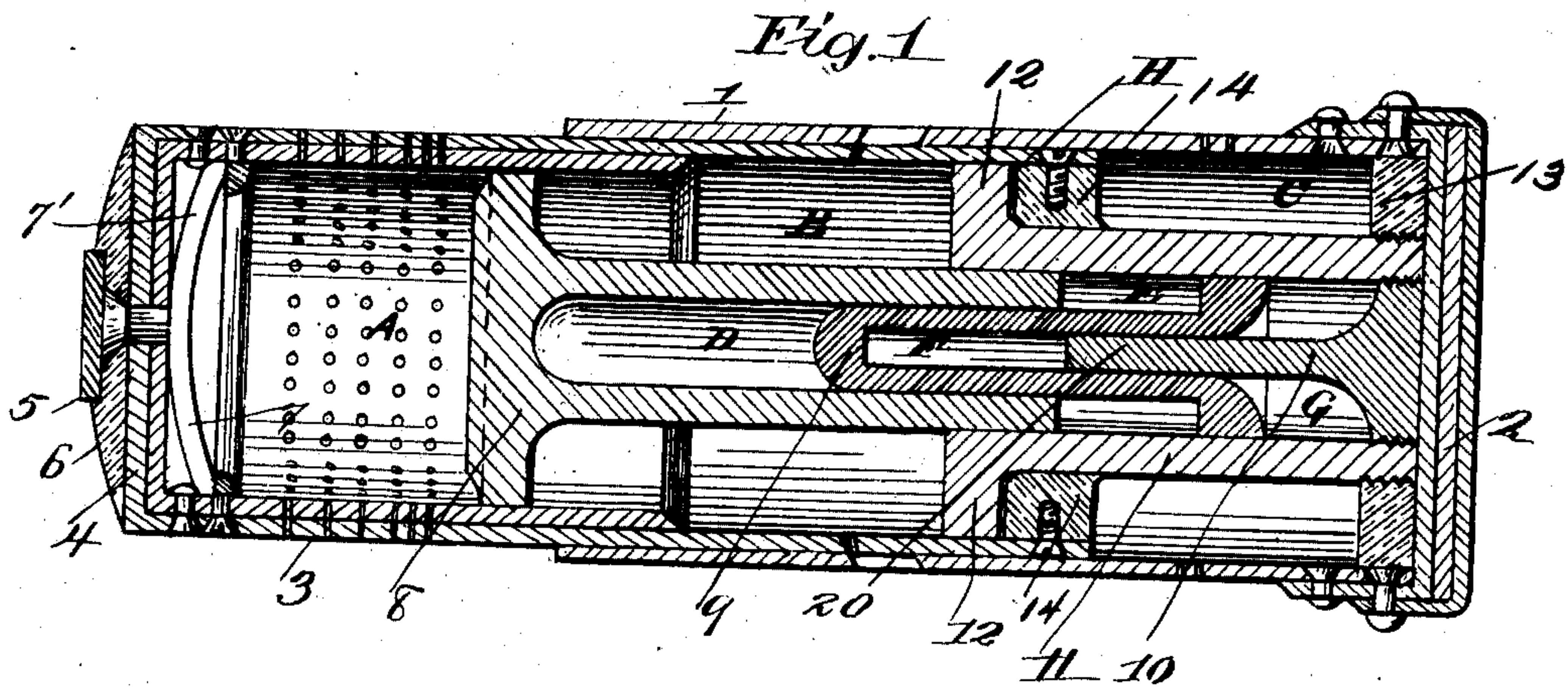


No. 879,198.

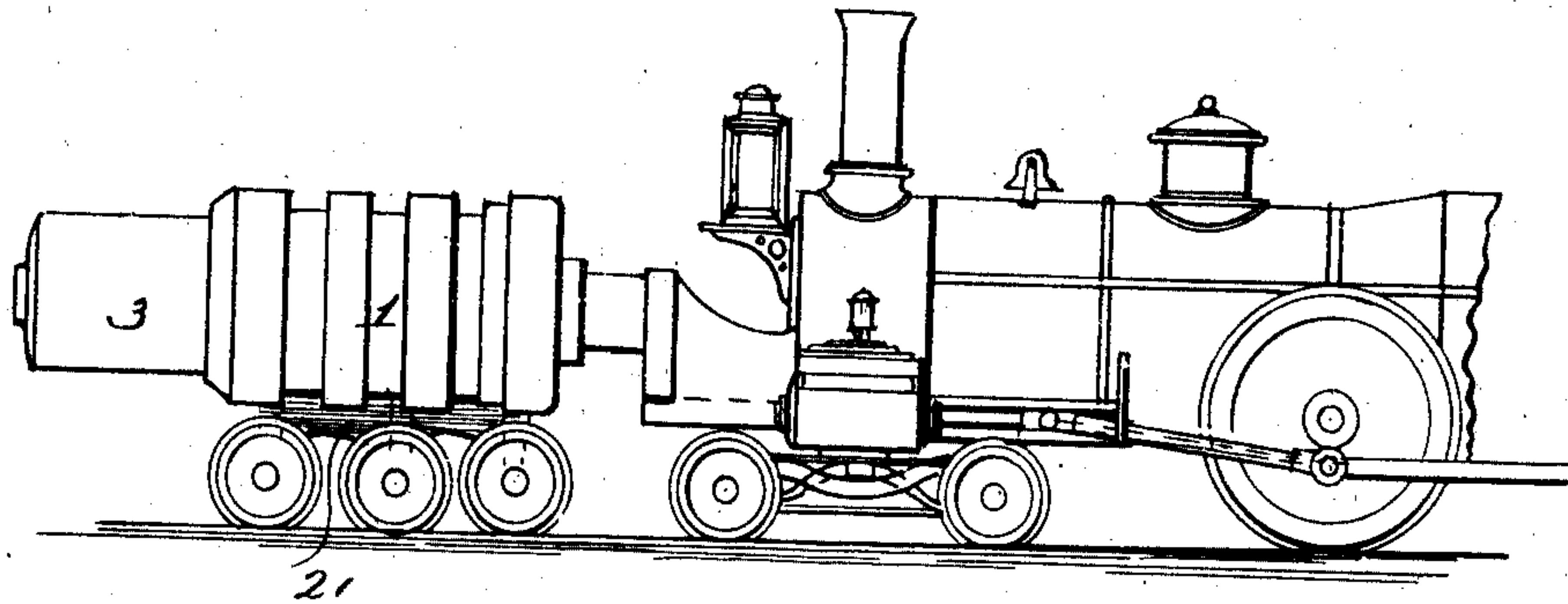
PATENTED FEB. 18, 1908.

B. F. SCHIRMER.  
BUFFING DEVICE.

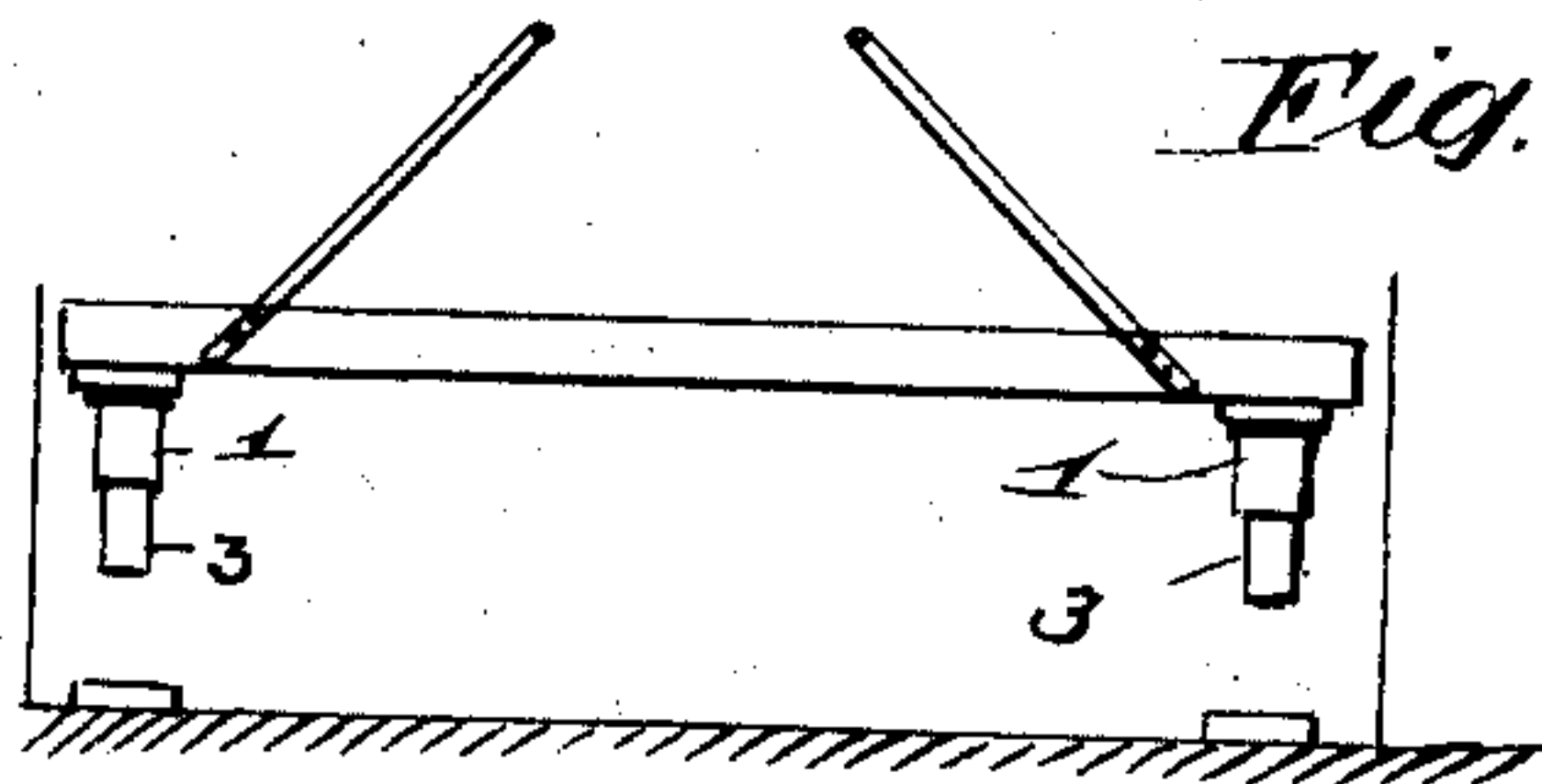
APPLICATION FILED APR. 19, 1908.



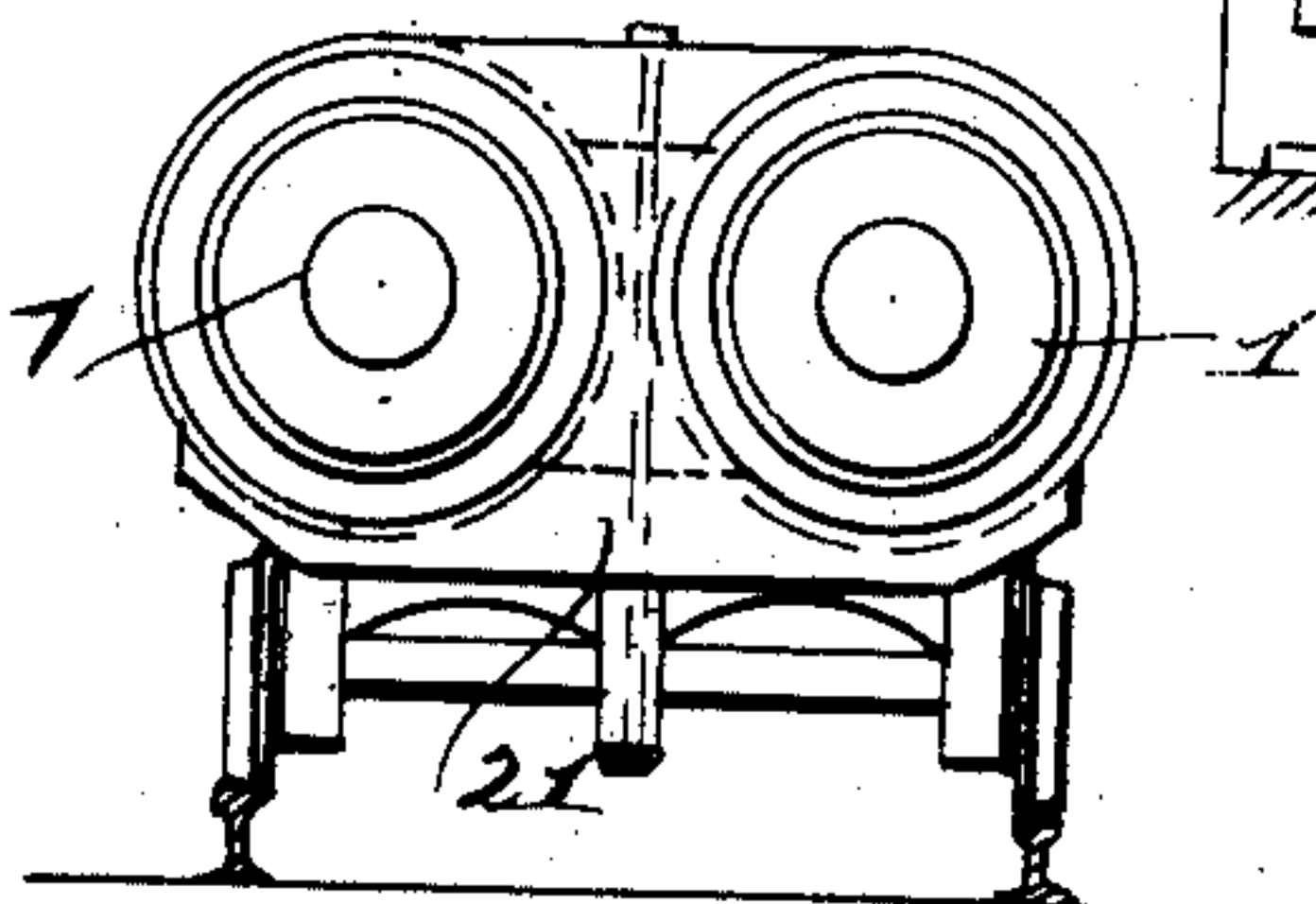
*Fig. 2.*



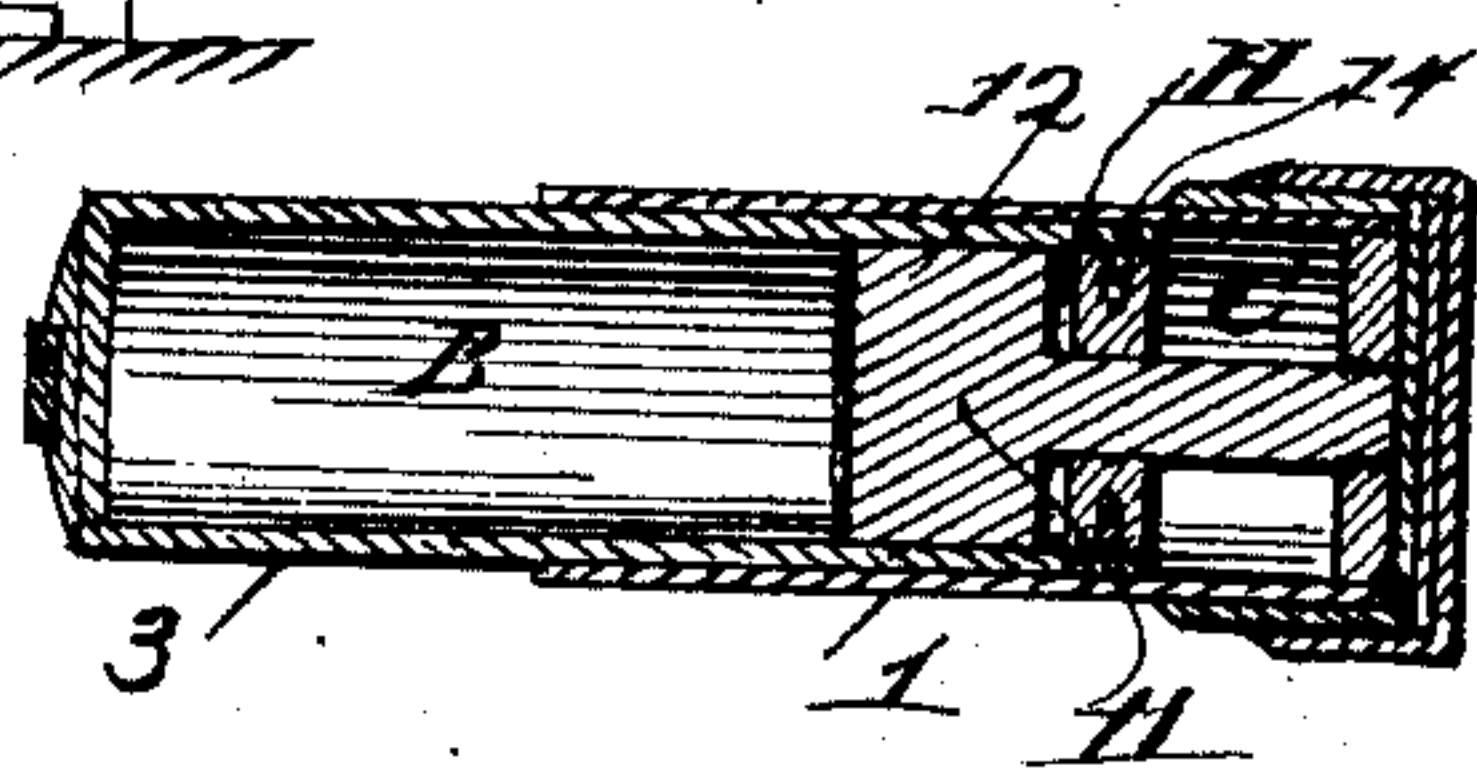
*Fig. 4.*



*Fig. 3*



*Fig. 5.*



Witnesses  
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Geo. S. Cole

Inventor  
Baldwin F. Schirmer  
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# UNITED STATES PATENT OFFICE.

BALDWIN F. SCHIRMER, OF INDIANAPOLIS, INDIANA.

## BUFFING DEVICE.

No. 879,198.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed April 19, 1906. Serial No 312,659.

*To all whom it may concern:*

Be it known that I, BALDWIN F. SCHIRMER, a citizen of the United States, and resident of Indianapolis, county of Marion, State of Indiana, have invented certain new and useful Improvements in Buffing Devices, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide a pneumatic buffer to lessen the shock or force of impact of a swiftly moving object. And a further object is to provide the buffer with resistances of constantly increasing intensity so that the shock caused by the force of the collision of the moving object with another object may be gradually absorbed and overcome before destroying or greatly injuring the moving object or any load carried thereon.

The invention is applicable to use upon vehicles, such as railway locomotives or carriages, or motor cars, upon elevators to prevent injury to the human load when the elevator falls suddenly, or it can be placed upon stationary buffers or in any situations where safety to life and limb and preservation of fragile loads are endangered by concussion, and in all situations where the effect of impact of a moving load or projectile must be reduced to a minimum.

I accomplish these objects and obtain the previously described advantages and such other advantages as may hereinafter appear by means of the multiple system of compression and vacuum chambers arranged to present constantly increasing resistance to the progress of the projectile.

The invention further consists in the combination and arrangement of the chambers, and successively acting pistons therein, and construction of the various details, as hereinafter described, shown in the accompanying drawings, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal central section of a buffing device showing telescoping cylinders, and consecutively acting pistons therein, one piston telescoping within the other, and also showing a vacuum chamber caused to open as one cylinder moves backward within the other, Fig. 2 shows in side elevation an application of the device to the front of a locomotive; Fig. 3 shows the device of Fig. 2 in

end elevation, Fig. 4 shows the device applied to the lower surface of an elevator platform, Fig. 5 shows a longitudinal section of a simple form of buffer.

In these views 1 is an outer cylinder closed at the inner end and reinforced at 2 to sustain the shock, 3 is a cylinder telescoping therein and provided with an outer closed extremity 4 arranged to receive the impact. To lessen the concussion this closed extremity is preferably provided with contact plates of soft metal such as lead 5 and copper 6, upon a solid steel backing 7 integral with or secured rigidly to the steel cylinder 3. Heavy spring bars 7' within this head also sustain and lessen the effect of the force of impact upon the buffer.

Within the pair of cylinders 1 and 3 are shown the pistons 8, 9, 10 and 11, which have stems organized to be telescoping or one to move within the other. These are shown to comprise, first, a piston 12 having a reduced hollow stem 11, which abuts against the head 2 of the cylinder 1. Second, a loose piston 8 which has a reduced hollow stem, the end of which is inserted in the hollow stem 11, of the fixed piston. Third, a piston 9 within the hollow stem 11 of the fixed piston, and having also a hollow stem in which is inserted the fixed piston 20 secured to the stem 10 or to the cylinder head. An inwardly extending annular flange 14 on the inner end of the cylinder 3 engages the inner face or flange 12 of the piston and when these parts are separated a vacuum or suction chamber 4 is produced between them. This arrangement also provides a series of compression chambers arranged to gradually come into use and increase the resistance to a blow upon the cylinder 31.

In Fig. 1 seven compression chambers are shown, the one designated A being in advance of the large piston 8, and arranged to receive the first direct shock upon the outer piston head. As the air within this chamber is suddenly compressed, the piston 8 will gradually be forced back under the accumulating pressure, until the air in the annular chamber B is compressed, and this chamber will form a second buffer intensifying the resistance of the concussion. A third chamber C is also shown between the flanges 13 and 14, and as the cylinder 3 is pressed further in, the air in this chamber is also compressed, affording still greater and continued resistance. An inner piston 9 separates the chamber formed by the interior of the cylinder 11 into



two parts, viz. chambers E and G, and the piston 9 is inserted within the chamber D within the larger piston 8, thus three or more compression chambers are formed and the piston 9 is forced inward to close the chamber C as the air in the chamber D is compressed by the piston 8. Thus a pressure increasing continuously in intensity is produced until the parts come together and the severity of the shock is much reduced or completely absorbed. A central stem 20 inserted in the smaller piston 9 also compresses the air in the central chamber F and provides a final resistance. As the flanges 12 and 14 move apart a vacuum chamber is formed resisting the separation of the flanges. This vacuum adds another factor to the resistance to impact. The flange 13 is designed to provide a broad base to the inner cylinder, and that and the head may be integral or constructed in any convenient manner desired.

This device may be much simplified by leaving out some of the portions. For instance in Fig. 5 some of the pistons are omitted and the buffer comprises the outer cylinder 1, the telescoping cylinder 3 and the flanged inner piston 11. This provides two compression chambers B and C, and a vacuum chamber H obtained by the separation of the flanges 12 and 14. In this form the device is applicable to many simple uses, such as springs for vehicles, or analogous uses.

In Fig. 2 the buffers are shown mounted upon a truck bolster 21 arranged to run upon the track in front of a locomotive.

Having described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a buffing device, the combination of two cylinders closed each at one end, and the open end of one cylinder inserted into the open end of the other cylinder, a head of hard metal for one cylinder and a composite head for the other cylinder, comprising an inner wall of hard metal and outer contact plates of soft metals, substantially as described.

2. In a buffing device, the combination with cylinders, provided each with one head, and the open end of one cylinder inserted within the open end of the other cylinder, of a multiple number of pistons having reduced and hollow stems, housed within the telescoping cylinders, the stem of one piston being inserted within the stem of another cylin-

der, and air passages in the walls of the telescoping cylinders arranged substantially as and for the purpose set forth.

3. In a buffing device, a pair of telescoping cylinders, each having a closed head, and the open end of one cylinder inserted in the open end of the other cylinder, and a series of pistons housed within the cylinders, one of said pistons being fixed, hollow stems for said pistons, the stem of one piston being inserted in the stem of another piston, the said cylinders and pistons being movable upon each other.

4. In a buffer, the combination with a pair of cylinders each closed at one end, and the open end of one cylinder inserted within the open end of the other cylinder, of a piston, having a reduced stem abutting against the closed end of the larger cylinder, a flange upon the inner end of the smaller cylinder, against which the inner face of the piston abuts, whereby a vacuum or suction chamber is formed when the flange and piston are separated, and whereby compression chambers are formed between the flanges and heads of the cylinders, when the cylinders are forced together, and air passages in the pair of cylinders, arranged intermediate between said flanges and closed cylinder ends.

5. The combination with a pair of cylinders having each a closed head, and having the open end of one cylinder inserted in the other, of a fixed piston and reduced hollow stem therefor, said stem abutting against the head of the larger cylinder, an annular flange in the open end of the smaller cylinder, adapted to engage the inner face of said piston, a loose piston in the smaller cylinder having also a hollow stem inserted in the hollow stem of the fixed piston, a second loose piston inserted in the stem of the fixed piston, and provided with a hollow stem inserted in the stem of the first mentioned loose piston, and a second fixed piston within the said fixed piston, and a stem therefor inserted in the stem of the second loose piston, and air passages in the sides of the pair of telescoping cylinders, substantially as and for the purpose set forth.

In testimony whereof I hereunto set my hand this 27th day of March, 1906.

BALDWIN F. SCHIRMER.

Witnesses:

GROSVENOR CALKINS,  
L. J. CARR.