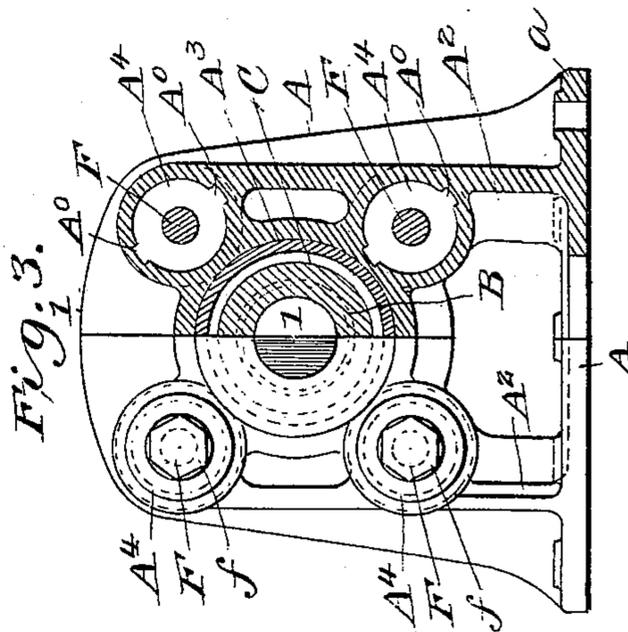
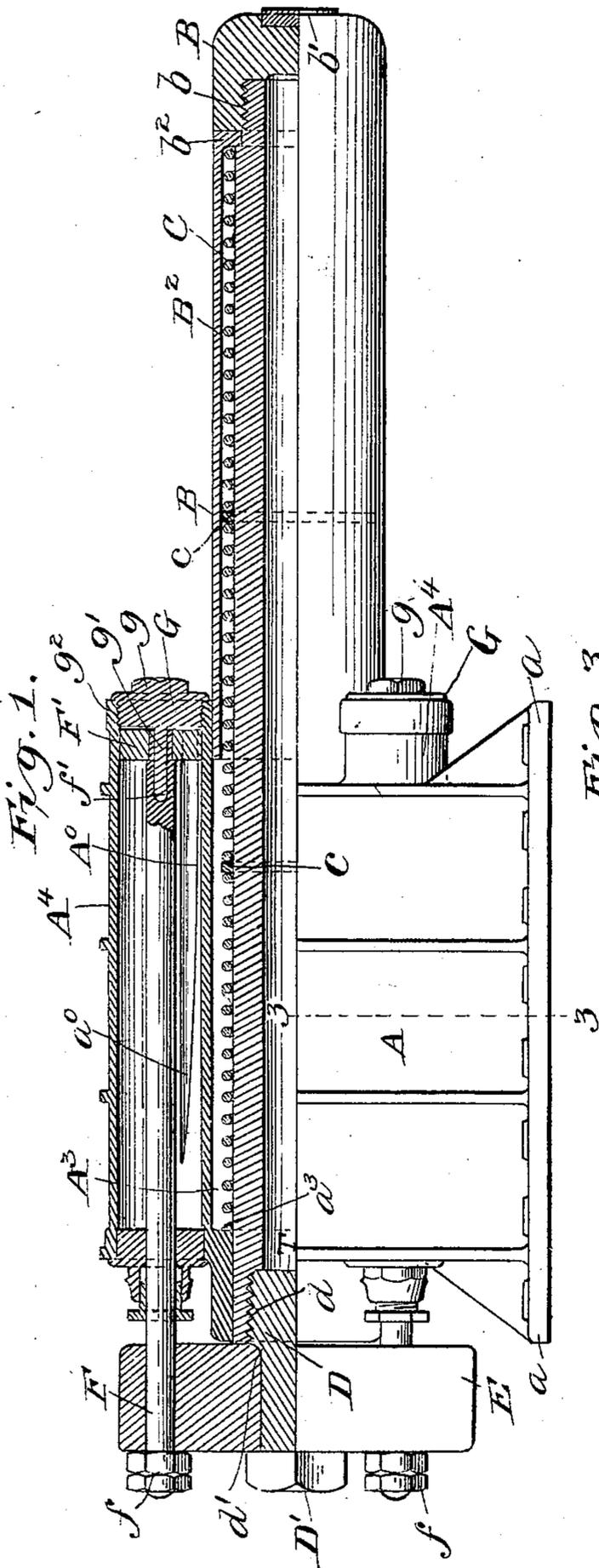


T. C. FENTON.
HYDRAULIC BUFFER.

(Application filed Mar. 6, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 2.

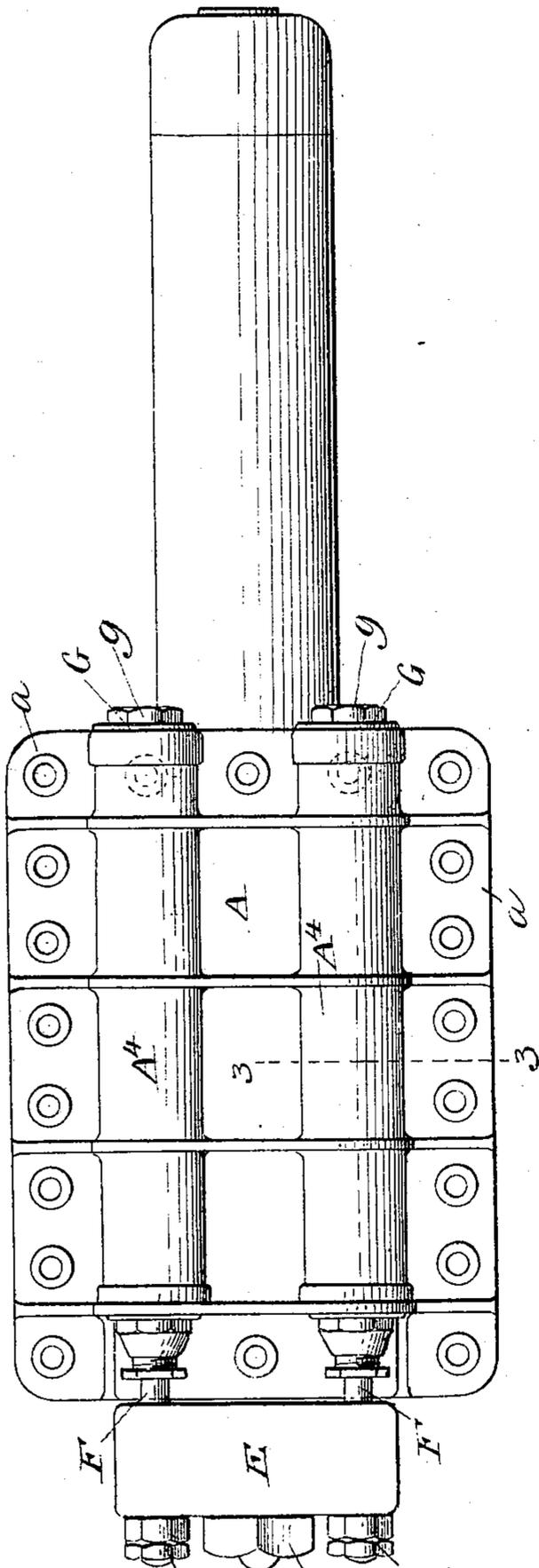
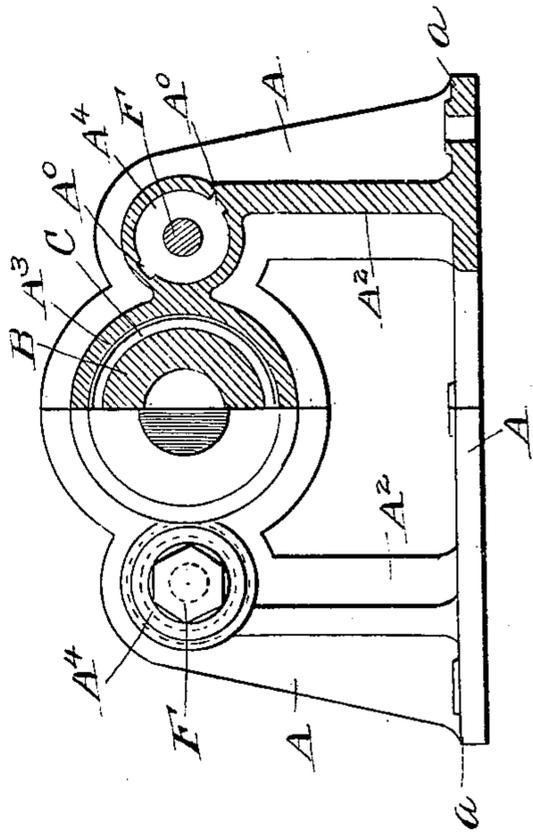


Fig. 4.



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UNITED STATES PATENT OFFICE.

THEODORE C. FENTON, OF THE UNITED STATES NAVY.

HYDRAULIC BUFFER.

SPECIFICATION forming part of Letters Patent No. 636,126, dated October 31, 1899.

Application filed March 6, 1899. Serial No. 707,972. (No model.)

To all whom it may concern:

Be it known that I, THEODORE C. FENTON, lieutenant United States Navy, stationed at Washington, in the District of Columbia, have
5 invented certain new and useful Improvements in Hydraulic Buffers; 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 ap-
10 pertains to make and use the same.

My invention relates to improvements in buffers for use at railway-stations or on rail-
way-cars or piers or for other like purposes; and it consists in providing a hydraulic
15 buffer constructed as hereinafter described and containing the novel features hereinafter claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated
20 by the same letters throughout the several views.

Figure 1 represents a side elevation, partly in central vertical section, the said section being along the line 1 1 of Fig. 3. Fig. 2 represents a plan of the buffer shown in Fig. 1; and Fig. 3 represents a front view of the buffer shown in Figs. 1 and 2, but partly in section along the line 3 3 of Figs. 1 and 2. Fig. 4 represents a front view of a modified form
30 of buffer in which there are only two recoil-cylinders instead of four, as shown in the other figures.

A represents a pedestal or frame on or in which the buffer is mounted, which is provided with flanges a at the base, by means of which the buffer may be secured to the platform of the station, the bottom of the car, or wherever desired. This pedestal or frame is provided with side brackets A^2 and central
40 sleeve A^3 , terminating in the shoulder a^3 , and with recoil-cylinders A^4 , symmetrically disposed relative to said sleeve. The said frame, including the central sleeve, the cylinders, and the side brackets, is practically cast in one, although it may be built up of several
45 pieces, if desired.

The number of the recoil-cylinders may be varied at will, but they should preferably be symmetrically disposed around the central
50 sleeve, so that there may be no tendency of the buffer to bite, due to unequal action on opposite sides. It would ordinarily be pre-

ferred to have two of these recoil-cylinders arranged on opposite sides of the central sleeve, as shown in Fig. 4. These recoil-cylinders are provided on the interior of the bore
55 with grooves A^0 , preferably parabolic near their smaller ends a^0 .

B represents a plunger which has secured thereto at b the plunger-head B' , which plunger-head is preferably faced with rubber, leather, or other yielding material b' . Surrounding this plunger is a return-spring C of sufficient strength to restore the plunger to the
60 initial position when the same is released, the said initial position being shown in Figs. 1 and 2. Owing to the mechanical difficulties in securing a long spring made in one piece this spring C is preferably made in several sections separated by annular disks e , as shown in Fig.
65 1. Surrounding this spring and provided with a shoulder b^2 , against which the forward end of said spring engages, is the hollow guide-sleeve B^2 , which travels in the sleeve A^3 of the frame A. The opposite ends of the compound spring
70 C, it will be noted, bear against the shoulder b^2 of the sleeve B^2 and against the shoulder a^3 of the sleeve A^3 .

The plunger B is preferably made hollow, as shown, and there is secured or otherwise
80 attached, as at d , to the rear end thereof the heel-piece T, which is shouldered, as at d' , to bear against the front face of the cross-head E, which cross-head is firmly secured to said
85 heel-piece by means of the nut D' . The piston-rods F are secured to this cross-head E by means of the lock-nuts f , and these piston-rods extend forward through the usual stuffing-boxes into the recoil-cylinders A^4 , the said
90 piston-rods terminating in the pistons F' and the front ends of the piston-rods being hollowed out, as at f' , to receive the buffer-lugs g' to keep the system from returning to position with a blow, which lugs project forward
95 from the cylinder-head G, screwed into the cylinder A^4 , as at g^2 . For convenience in screwing in said cylinder-heads the latter are provided with angular bosses g to engage a wrench.

The cylinders A^4 are preferably filled with
100 a mixture of water and glycerin, this not being liable to be frozen under ordinary temperatures, or other suitable fluid may be adopted, if desired.

It will be evident from inspecting the drawings that if a train strike the plunger B' it will press the same backward, dragging the piston-rods rearward and causing the fluid in the cylinders to flow from the rear side of the piston to the front side through the parabolic grooves A⁰ and gradually checking the motion of the plunger until when the piston reaches the end of the said parabolic grooves the incompressible fluid resists the further travel of the pistons and the plunger is brought to a stop.

By making the parts of sufficient strength and by proper adjustment of the size of the grooves A⁰ it will be possible to stop a rapidly-moving train within four feet, more or less, and thus to prevent the train from breaking down the buffers and running off the rails into the station, as occasionally happens in practice.

While the improved buffer is better adapted for station use, it still may be applied to individual cars and in place of the spring-operated buffer now generally in use. Thus the buffer shown in Fig. 4 may be turned upside down and bolted underneath the ordinary car, as is now done with spring-buffers.

The various cylinders should be kept full of the fluid, and ordinary means for replenishing same (not shown) may be provided.

It will be seen that by having the recoil-cylinders symmetrically grouped around a central buffer there will be no tendency to drag the buffer out of line, causing the same to bind or bite. It will be also evident that there is a straight pull backward on the piston-rods instead of a compressive strain of the same, and thus they may be made of comparatively light material.

While I have shown two grooves A⁰ on opposite sides of each cylinder, these grooves may be single or the number may be increased to three or more, as may be desired.

The various other advantages of the herein-described apparatus would readily suggest themselves to any practical mind.

It will also be found that various changes might be made in details of the apparatus which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A hydraulic buffer comprising a frame provided with a central sleeve and recoil-cylinders symmetrically disposed about said sleeve, of a plunger projecting through said sleeve, a cross-head secured to the rear end of said plunger and piston-rods for the pistons in the recoil-cylinders secured to said cross-head, substantially as described.

2. In a hydraulic buffer, the combination with a frame provided with a central sleeve and recoil-cylinders symmetrically grouped about said sleeve, of a plunger projecting forward through said sleeve, a coil-spring surrounding said plunger and normally return-

ing the same to the initial position, a cross-head secured to the rear end of said plunger, piston-rods secured to said cross-head and pistons mounted in said recoil-cylinders and secured to said piston-rods, substantially as described.

3. In a hydraulic buffer, the combination with a frame provided with a central sleeve, of recoil-cylinders grouped about said sleeve, pistons mounted in said recoil-cylinders, piston-rods secured to said pistons and projecting to the rear, a plunger mounted in said central sleeve, a spring normally returning said plunger to the forward or initial position, and a cross-head secured to said plunger and to the rear end of said piston-rods, substantially as described.

4. A hydraulic buffer comprising a frame provided with a central sleeve and recoil-cylinders symmetrically disposed about said sleeve with parabolic grooves in said recoil-cylinders, of a plunger projecting through said sleeve, a cross-head secured to the rear end of said plunger and piston-rods for the pistons in the recoil-cylinders secured to said cross-head, substantially as described.

5. In a hydraulic buffer, the combination with a frame provided with a central sleeve and recoil-cylinders symmetrically grouped about said sleeve with parabolic grooves on the interior of said recoil-cylinders, of a plunger projecting forward through said sleeve, a coil-spring surrounding said plunger and normally returning the same to the initial position, a cross-head secured to the rear end of said plunger, piston-rods secured to said cross-head and pistons mounted in said recoil-cylinders and secured to said piston-rods, substantially as described.

6. In a hydraulic buffer, the combination with a frame provided with a central sleeve of recoil-cylinders grouped about said sleeve with one or more grooves cut in the inner wall of each of said cylinders, pistons mounted in said recoil-cylinders, piston-rods secured to said pistons and projecting to the rear, a plunger mounted in said central sleeve and projecting forward therefrom, a spring normally returning said plunger to the forward or initial position, and a cross-head secured to said plunger and to the rear end of said piston-rods, substantially as described.

7. In a hydraulic buffer, the combination with a frame provided with a central sleeve and recoil-cylinders symmetrically grouped about said sleeve, of a plunger projecting forward through said sleeve, a guide-sleeve enclosing the forward portion of said plunger and held thereon, a coil-spring surrounding said plunger and bearing against shoulders on said sleeve and said guide-sleeve and normally returning the plunger to the initial position, a cross-head secured to the rear end of said plunger, piston-rods secured to said cross-head and pistons mounted in said recoil-cylinders and secured to said piston-rods, substantially as described.

8. In a hydraulic buffer, the combination
with a frame provided with a central sleeve,
of recoil-cylinders grouped about said sleeve
with one or more grooves in the inner walls
5 of each of said cylinders, pistons mounted in
said recoil-cylinders, piston-rods secured to
said pistons and projecting to the rear, a plun-
ger mounted in said central sleeve, a guide-
sleeve inclosing the forward portion of said
10 plunger and held thereon and passing rear-
wardly into said central sleeve, a spring in-
terposed between said guide-sleeve and said

central sleeve and normally returning said
plunger to the forward or initial position, and
a cross-head secured to said plunger and to 15
the rear end of said piston-rods, substantially
as described.

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

THEODORE C. FENTON.

Witnesses:

I. K. SEYMOUR,
J. L. LATIMER.