(No Model.)

A. A. LANGLEY.

RAILWAY BUFFER STOP

No. 271,478. Patented Jan. 30, 1883.

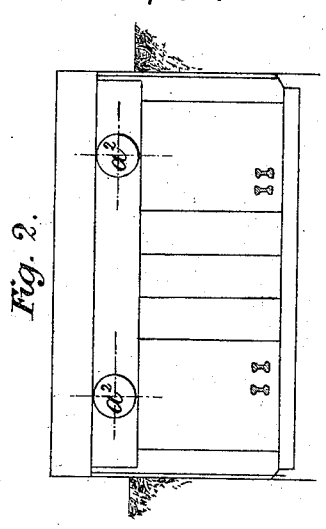

Fig. 2.

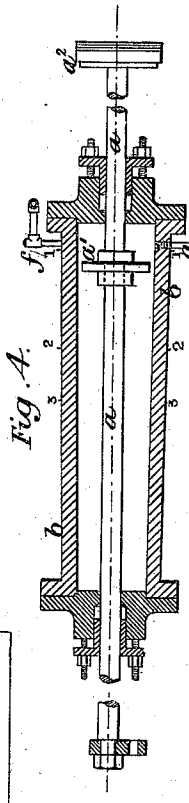

Fig. A.

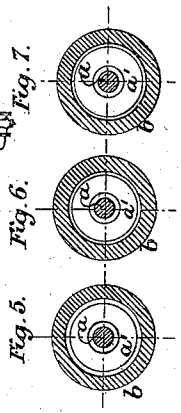

Fig. 7. Fig. 6. Fig. 5.

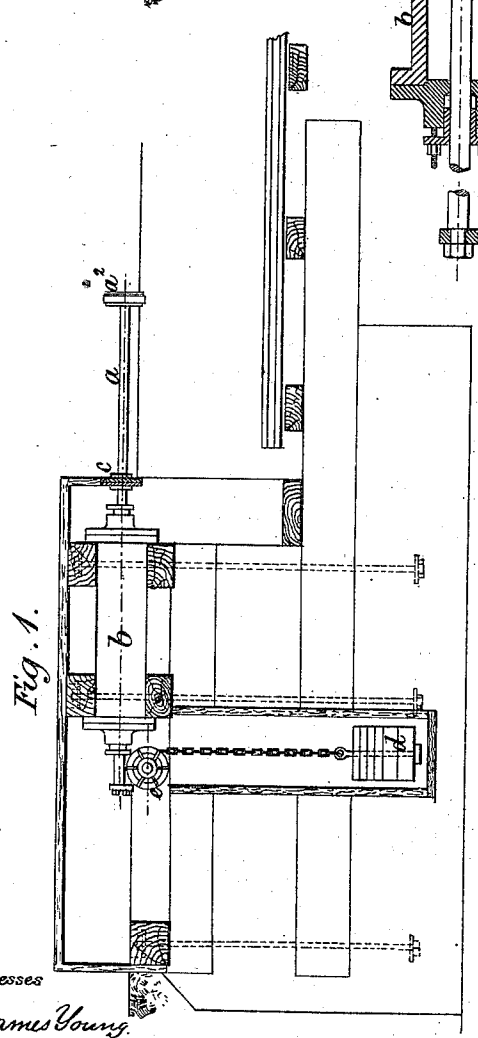

Fig. 1.

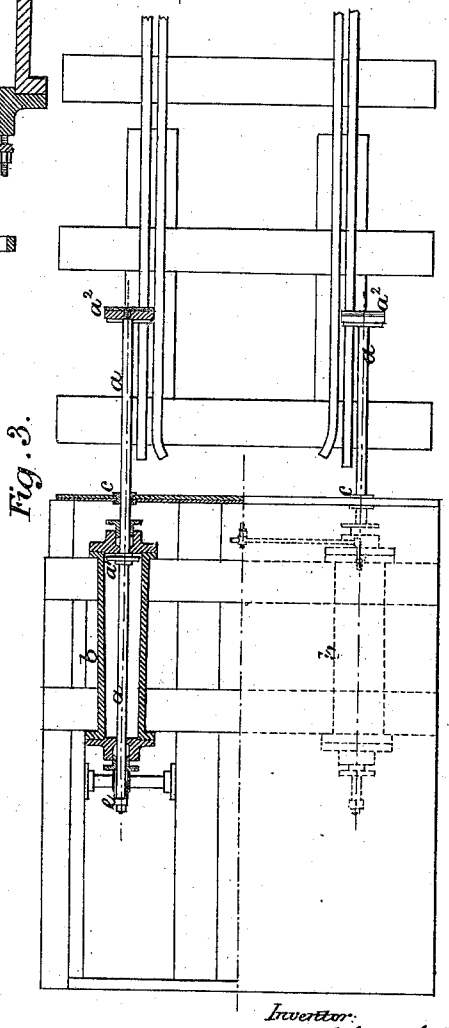

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALFRED ANDREW LANGLEY, OF 10 KENT TERRACE, CLARENCE GATE, REGENT'S PARK, COUNTY OF MIDDLESEX, ENGLAND.

RAILWAY-BUFFER STOP.

SPECIFICATION forming part of Letters Patent No. 271,478, dated January 30, 1883.

Application filed October 9, 1882. (No model.) Patented in England October 30, 1880, No. 4,449.

To all whom it may concern:

Be it known that I, ALFRED ANDREW LANGLEY, a subject of the Queen of Great Britain, residing at 10 Kent Terrace, Clarence Gate, Regent's Park, in the county of Middlesex, England, have invented certain new and useful Improvements in Railway-Buffer Stops, (for which I have received Letters Patent in Great Britain, No. 4,449, dated 30th October, 1880,) of which the following is a specification.

This invention has for its object improvements in railway-buffer stops.

In order to prevent railway carriages and trains overrunning the end of a siding or line of railway, I provide hydraulic buffer-stops, by means of which I am able to bring them to rest with less shock and risk of breakage than results from the use of buffer-stops of other and ordinary constructions.

My hydraulic buffer-stop consists of a pair of cylinders mounted horizontally and aligned with the buffers of the carriages on the railway. A piston-rod passes through each cylinder and through stuffing-boxes at the cylinder ends. The pistons within the hydraulic cylinders do not fit tightly; but nevertheless they offer considerable resistance to the rapid transference of water from one end of the cylinder to the other, and by an appropriate formation of the parts the resistance is maintained approximately uniform throughout the stroke. A weight suspended in a pit by a chain is employed to draw the pistons forward in the cylinders and keep the apparatus in position, ready to meet the impacts or shocks which it is intended to receive. When impact takes place the pistons are driven back, and as they recede they offer a resistance which gradually brings the carriage or carriages to rest, and this buffer-stop causes no rebound. The arrangement may be varied by the substitution of a single cylinder with guides on either side for the pair of cylinders described above.

In order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a longitudinal and vertical section. Fig. 2 is a front elevation. Fig. 3 is a plan, partly in section, of the apparatus complete. Fig. 4 is a longitudinal section of one of the cylinders, shown separately, to a larger scale. Figs. 5, 6, and 7 are transverse sections of the cylinder, taken on the lines 1 1, Fig. 4, 2 2, Fig. 4, and 3 3, Fig. 4, respectively.

a a are piston-rods, having upon them pistons *a' a'*. The pistons are contained within the cylinders *b b*, and the piston-rods pass through stuffing-boxes in the cylinder ends.

a^2 a^2 are buffer-heads upon the piston-rods to receive the impact of a train or carriage running against the buffer-stop.

In place of separate buffer-heads, the piston-rods may be connected by a cross balk or beam passing from the one to the other. They may also, if desired, be supported and guided by guide-wheels running on the rails; but I prefer to employ stationary guides at *c c*, as shown.

d d are weights attached to the hinder ends of the piston-rods by chains, which are led around the guide-pulleys *e e*. When the pistons are driven back the weights are raised, and after the shock the weights bring the pistons gradually back to the position in which they should stand ready for action.

The cylinders *b b* are charged with water or liquid, and there is room all round the pistons *a' a'* for the liquid to pass them. Now, the resistance offered by the liquid to the movement of the pistons will depend on two things—viz., the velocity of the movement and the amount of space between the piston and the cylinder. Now, the velocity of movement will always be greatest at the commencement of the stroke, and should be reduced to nothing by the time that the stroke is complete. Nevertheless the resistance offered should remain as nearly constant as may be. It should not be excessive at the commencement of the stroke, and when the stroke has been nearly completed the resistance should remain sufficient for the buffer-stop to be thoroughly effective. These conditions the use of the loose piston enables me to satisfy in a very simple manner. I do not bore the cylinder parallel, but taper in the proportions which the drawings indicate, so that as the piston is forced back the space by which the liquid has to pass between it and the cylinder diminishes, and a compensation is so

made for the smaller speed of the piston. The same effect may be obtained by fixing taper strips within a parallel cylinder.

f f are pipes provided with stop-cocks, and passing to a cistern from which liquid is supplied to keep the cylinders full.

g g are pipes, also with cocks upon them, which are only opened when it is desired to empty the cylinders.

The cylinders *b b* may, if desired, be connected by a cross-pipe, which will insure an equality of pressure between them.

Having thus described the nature of my said invention and the manner of performing the same, I would have it understood that I claim—

1. The combination of the cylinder charged with liquid, the piston of a diameter less than that of the interior of the cylinder, and the head upon the piston-rod, substantially as and for the purpose hereinbefore set forth.

2. The combination of the hydraulic cylinder, the piston of a diameter less than that of the interior of the cylinder, the piston-rod passing through the cylinder, the weight, its chain, and the guide-pulley, substantially as and for the purpose hereinbefore set forth.

3. The combination of the hydraulic cylinder of gradually-diminishing interior diameter from front to rear, the piston of diameter less than that of the interior of the cylinder, the piston-rod, and its head, substantially as and for the purpose hereinbefore set forth.

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