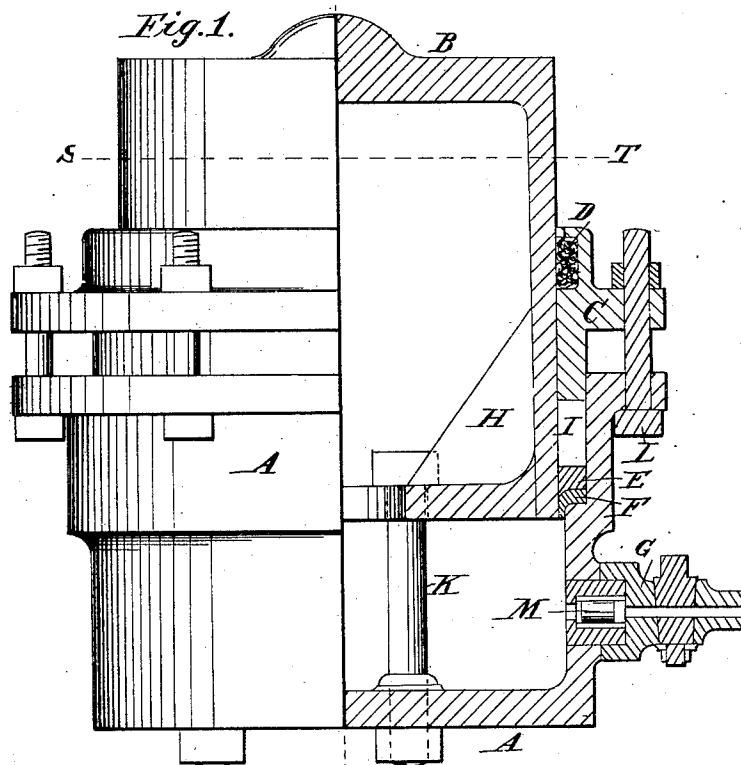
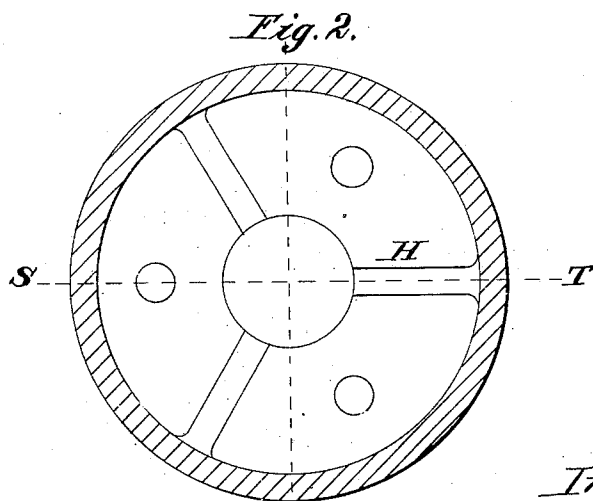


D. B. STROPE.
PNEUMATIC SPRING.

No. 65,135.

Patented May 28, 1867.



Witnesses:

Charles H. Blauvelt
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Inventor:

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United States Patent Office.

D. B. STROPE, OF FORT WAYNE, INDIANA.

Letters Patent No. 65,135, dated May 28, 1867.

IMPROVED PNEUMATIC SPRING.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, D. B. STROPE, of Fort Wayne, county of Allen, and State of Indiana, have invented a new and useful Improvement in Pneumatic Springs; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

This invention relates to that class of pneumatic springs in which compressed air is used as the elastic medium, and oil or other liquid as a cushion for the piston to rest upon, when, in consequence of the weight placed upon it, the air becomes incapable of supporting such weight.

The invention consists in the construction of the cylinder and piston in such a manner that the oil and air are introduced to the outer cylinder through a cock and valve provided for the purpose, and from thence to the piston, which is hollow, closed at both its ends, but having an aperture through its lower head, through which its interior communicates with the reservoir or space below it in the outer cylinder, and through which the oil and air pass, as above stated, to the interior of the piston.

Figure 1 of the drawings is an elevation, partly in section, of the entire device, showing the exterior and interior cylinders, with stuffing-box and packing for preventing the escape of air between the surfaces of such cylinders, and also the bolts for tightening such packing, the cock or tube through which the cylinders are supplied, and the stops which prevent the interior cylinder from being forced out of the outer one when the weight is removed from the spring.

Figure 2 is an end view of the interior cylinder or piston on the line of S T in fig. 1, showing the aperture through which it is supplied with air.

A is the outer cylinder, having its upper end enlarged to form a packing-box for the reception of suitable packing, and is provided with a flange through which bolts pass for tightening such packing. B is the piston, which moves vertically within the cylinder and passes through the packing-box and packing above referred to, and projects above all to receive the load which is to be placed upon it. C is the gland for compressing the packing within the packing-box. I is the fibrous packing, of hemp, flax, or other fibrous material. E is a brass or other suitable metallic ring placed underneath the fibrous packing. F is a packing-ring, of rubber, leather, or other suitable material, placed beneath the metallic ring and the bottom of the packing-box. This ring has a lip or flange turned down upon its inner periphery in such a manner that when air is compressed into the outer cylinder it will press against the lower edge of and behind the flange, and thus prevent the escape of the air by keeping said flange in close contact with the piston. H are ribs or bearers placed within the piston for the purpose of strengthening its lower head, and similar ones may be placed upon its upper head if found desirable. K are studs, which have a collar formed upon the lower portion of them, with another section extending below such collar, of sufficient length to allow of their being passed through the lower head of the outer cylinder, and of their receiving a nut outside of said cylinder for keeping them in their position and making a tight joint around them to prevent the escape of the contents of the cylinder. These studs also pass up through the lower head of the piston, but fit therein so loosely as to permit of its moving freely up and down thereon. Upon the upper end of these studs, and within the piston, nuts are secured, which are to prevent the piston from being forced out of the cylinder when the same is filled with the requisite pressure of air, and when from any cause the load upon such piston is removed. D is an additional packing placed in a recess formed in a projection upon the upper or outer portion of the cylinder, and is designed both as an additional security against leakage of air and as a guide for the piston. L are bolts with nuts upon them, which pass through flanges upon the upper end of the outer cylinder and upon the gland, for the purpose of compressing the packing, as above described. G is a cock placed near the lower head of the outer cylinder, having its key of usual construction, for shutting off communication between the atmosphere and the interior of the cylinder. M is a valve connected in connection with the above-described cock, and is intended as an additional security against leakage. The construction of this valve is such that when it is desirable to fill the outer cylinder, and the passage through the key of the cock has been so placed as to register with the passage in its body, the valve will be forced against its inner vent and the air will pass around it and through apertures in its inner vent into the cylinder; but when the pressure from without is severed it will close against its outer vent, and then, when

the key has been again turned in the cock, so as to close the aperture through it, a double security against leakage is afforded.

The operation of this device is as follows: The parts having been constructed and placed as above described, a quantity of oil, say two gallons, more or less, according to the dimensions of the cylinder and piston, (the lower end of the piston should always be submerged in oil or other liquid,) is passed through the cock and valve into the cylinder, after which the air-compressing device, which is usually an air-pump, is applied to the outer end of the cock, or to a flexible tube or hose attached thereto, and air is forced in until the requisite pressure is obtained, when the key in the cock is closed and the valve allowed to close against its outer vent, as above described. This being done, the spring is ready for use, and may be applied to railroad cars, locomotives, land carriages, and to any other position where it is necessary to support heavy weights upon an elastic medium.

Some of the advantages claimed for this spring are, that owing to its freedom from liability to leak, in consequence of the arrangement of the packing, it may be manufactured and filled at any place, and transported to any other place for use, and be ready for immediate application upon its arrival. Another and probably the greatest advantage is, that owing to its peculiar construction it never loses its elasticity, for the reason that when the load placed upon it becomes so great as to force the piston down into the oil in the outer cylinder the piston is filled with air and the oil will be forced into the piston, and then further compresses the air contained therein, thus, under the most unfavorable circumstances, furnishing an elastic spring.

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

1. The construction and arrangement of the hollow piston, in its relation to the oil contained in the reservoir or outer cylinder, in the manner and for the purpose herein described.
2. I claim the combination of the packing D, elastic packing I, metallic packing-ring E, and elastic flange or packing F, with the gland C and piston B.
3. I claim the combination of the studs K, cylinder A, and piston B, substantially as shown and described.
4. I claim the combination of the cock G, valve M, and cylinder A, when arranged substantially as shown and described.

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

Witnesses:

JOHN D. BLOOR,
JOHN S. HOLLINGSHEAD.

D. B. STROPE.