

(No Model.)

C. L. BURDICK.  
PRESSURE GAGE.

No. 599,682.

Patented Mar. 1, 1898.

Fig. I.

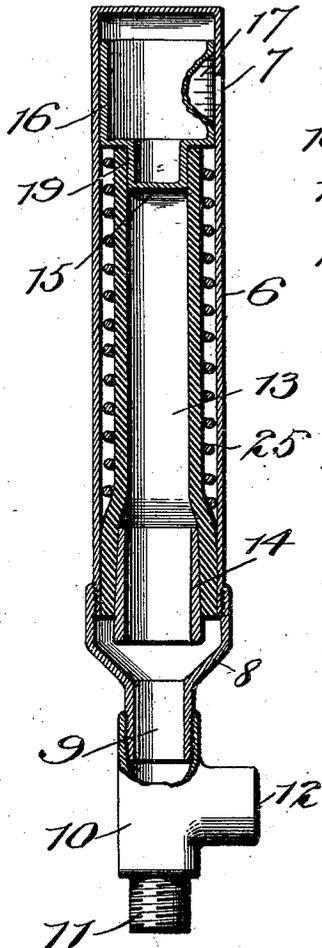


Fig. II.

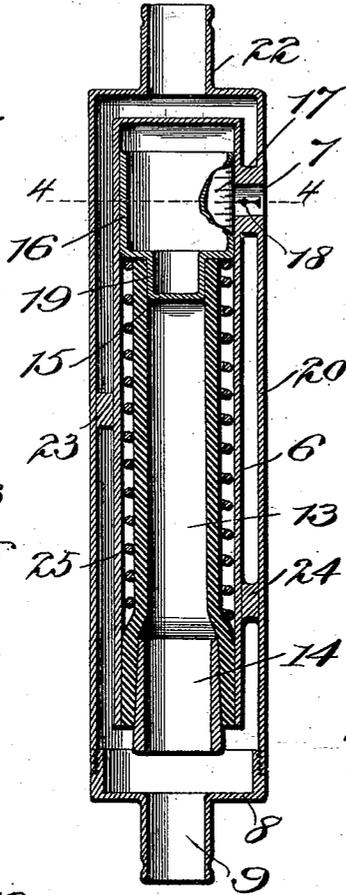


Fig. III.

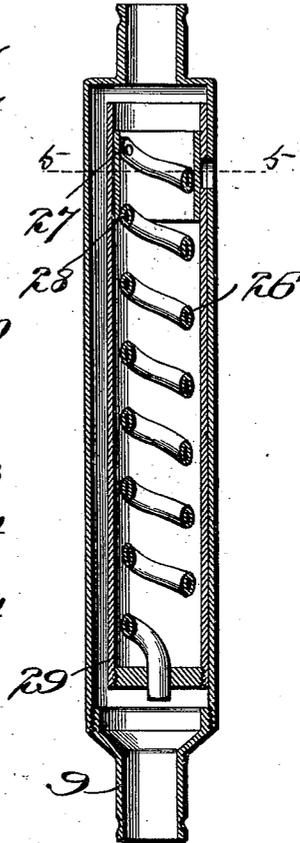


Fig. IV.

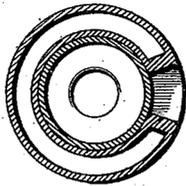


Fig. V.



Witnesses  
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# UNITED STATES PATENT OFFICE.

CHARLES LAURENCE BURDICK, OF LONDON, ENGLAND.

## PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 599,682, dated March 1, 1898.

Application filed April 29, 1897. Serial No. 634,342. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES LAURENCE BURDICK, a citizen of the United States, residing at London, England, have invented a new and useful Improvement in Pressure-Gages; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure I is a longitudinal sectional view of the main body of a pressure-gage, showing some of the principal characteristics of my invention. Fig. II is a longitudinal sectional view, part in elevation, of the same, showing additional parts of the invention. Fig. III is a longitudinal sectional view of a modification of my invention. Fig. IV represents a transverse section at the line 4 4 of Fig. II, and Fig. V represents a transverse section at the line 5 5 of Fig. III.

This invention relates in general to that class of devices by means of which the pressure of air, gas, steam, water, and other fluids may be indicated, and more particularly to piston pressure-gages; and its object is, primarily, to provide means for indicating the pressure of air in pneumatic tires and for other analogous purposes without having any joint for escape of air between movable parts of the device in connection with other minor objects, to which end my invention consists in the construction and combination of parts forming a pressure-gage hereinafter more fully described, and particularly pointed out in the claims.

6 represents a tubular casing, preferably of metal, having a window 7 in one side and provided with a cap 8, screwed onto its open end, the said cap being reduced at its outer end to form a nipple 9, which may be fitted to be screwed directly into the air-valve of a pneumatic tire or into any suitable intermediate pipe connection—such, for example, as the T-coupling 10—and this coupling may have a nipple 11 to enter the said air-valve and an opening at 12 to receive the nipple of an air-pump. The nipples 9 and 11 may profitably correspond with the regulation nipple of air-pumps.

13 represents a tube of flexible and extensible rubber or other similarly elastic material, into one end of which is inserted a ta-

pering ring 14, which serves as a spreader to force the tube 13 into air-tight contact with the casing 6 as a means of permanently yet removably sealing that point.

15 is a cap which permanently closes the free or movable end of the tube 13, forming an air-chamber whose only inlet or outlet is through the ring 14.

16 is a piston fitted to slide freely in the casing 6, past the window 7, and registering with this window may be a scale 17 of markings on the piston 16, indicating pressure in pounds per square inch, or a scale to any other standard to be read relatively to an index-line 18, marked on the casing 6. The piston 16 is permanently secured to the tube 13, as by a neck 19 of the piston entering the said tube 13, and for simplicity of construction the head 15 may be integral with the piston and neck.

For the sake of unique appearance and convenience of application for service in special cases an outer tube 20 may be provided with a cap and nipple similar to the aforesaid cap and nipple 8 9 and with a similar nipple 22 at its opposite end. The tube 20 is large enough to contain the casing 6 and the contents thereof and to permit the free passage of air past the side of the said casing 6 and within the tube 20. The casing 6 may be permanently secured at one or more points 23 24 to the outer tube.

25 represents a spiral spring surrounding and connected with the flexible tube 13 to steadily resist longitudinal extension of that tube. The resilience of the tube or chamber 13 itself may in some instances serve the purpose in view, and to this end I have further shown in Fig. III a spiral tube 26, which is to be made of resilient material, such as thin steel or possibly of stiff-rubber hose-pipe, to be sealed up, forming a head at its forward end 27, where it is connected with a piston 28, which operates like the piston 16 before described. The rear end of the tube 26 is secured to the casing 29 and open to admit air under pressure. In either case the air-chamber, whether it be 13 or 26, has longitudinally-extensible resilient walls.

The operation is as follows: If the pressure of air already in a pneumatic tire or other receptacle is to be tested, the nipple 9 may be

screwed directly into the valve-tube and the valve, being pushed open as usual by the entering nipple, admits air from the tire into this gage, and the pressure against the head 5 15 will extend the chamber, moving the piston 16 in front of the window 7 and bringing that mark of the scale 17 that indicates the pressure which caused this extension of the chamber at the index-line 18. It is to be understood that a pointer or index-line may be 10 attached to or marked on the piston 16 to register with a scale on the casing 6 alongside the window 7, which may be of the length required.

If this gage is to be used to indicate the 15 amount of pressure given to a pneumatic tire or other receptacle, the T-joint 10 may be interposed, the nipple 11 to be screwed into the tire-valve and the air-pump nipple to be screwed into the inlet 12. Then it is evident 20 that the air in entering the tire will also enter the gage-chamber and the gage will register at all times the pressure of the air.

This gage may be used for the purpose of 25 testing the strength of the tire or other receptacle, or it may be used to indicate when a given pressure has been reached in filling the tire.

It is to be understood that the tube 26 may 30 be of circular cross-section, or it may be flattened either crosswise or lengthwise of the casing. It is to be further understood that either the window and the scale beside it or the scale on the piston may be spiral or circular or longitudinal to correspond with the 35 path of motion of the piston.

This gage may be differently proportioned and made of any material suitable for service as a pressure-gage for steam, water, gas, and 40 other liquids; but for brevity the word "air" will be used in the claims to indicate any fluid adapted to be thus measured or gaged.

A chamber having a piston fitted to slide within it is not closed, because there is a joint around the piston which soon becomes worn,

and the air can leak out of that joint. Such a 45 chamber is not an equivalent of my air-chamber, which has resiliently-extensible walls and no joint between movable parts. This pressure-gage has no wearing joint to require packing, and a leak can never be caused by 50 service.

Having thus fully described my invention, what I believe to be new, and desire to secure by Letters Patent, is the following:

1. In pressure-gages, a casing open at one 55 end and having a window in one side; an air-chamber having resilient longitudinally-extensible walls, fitted loosely within the casing and open at its rear end and there connected with the open end of the said casing, the other 60 end of the chamber being closed and provided with a piston to slide within the casing past the said window, the casing at the window and the said piston constituting the two elements of a registering device, one of the said ele- 65 ments being provided with a scale and the other with a registry-line or a pointer to register with the scale, substantially as described.

2. In pressure-gages, an air-chamber hav- 70 ing resilient extensible walls, a piston, and an opening to admit air; a casing fitted freely around the chamber and piston and secured to the end of the chamber opposite to the piston; an outer tube surrounding the casing and 75 having an opening for connection with other tubes at each end, and an air-passage from end to end outside of the said casing; a window through the outer tube and casing beside the said piston, and a registering device at the window for the piston, substantially as de- 80 scribed.

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

CHARLES LAURENCE BURDICK.

Witnesses:

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