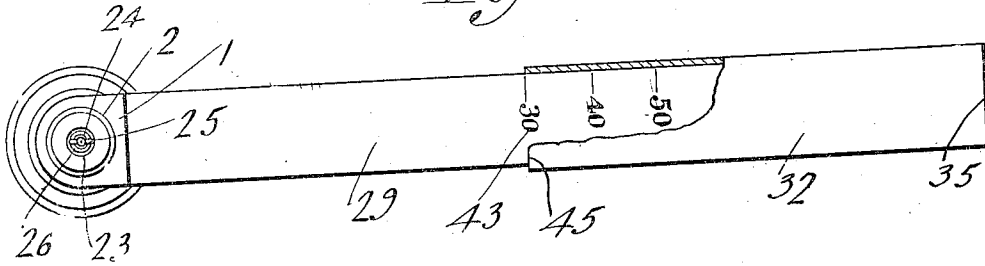


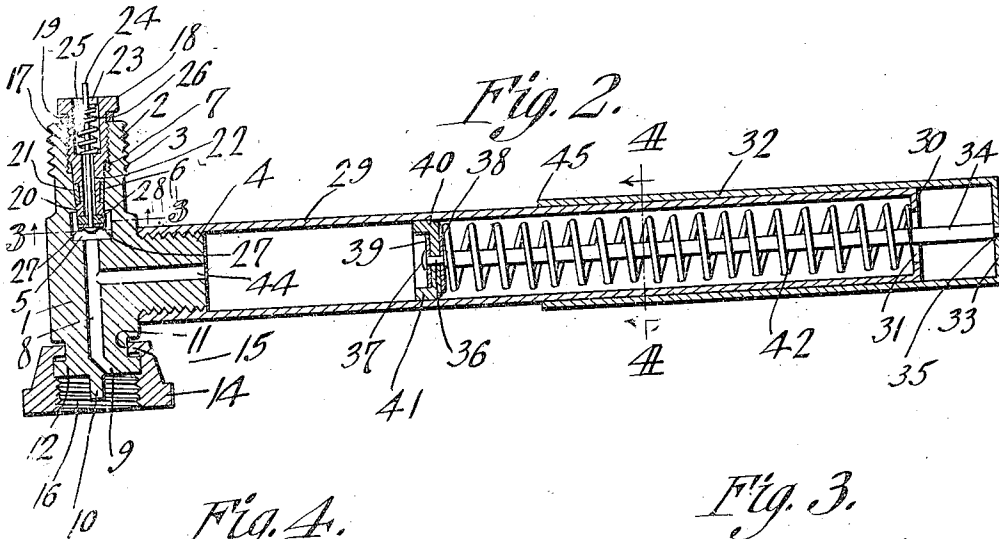
Patented Dec. 31, 1918.

1,289,451.

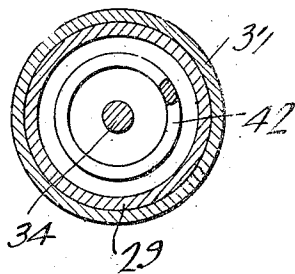
*Fig. 1.*



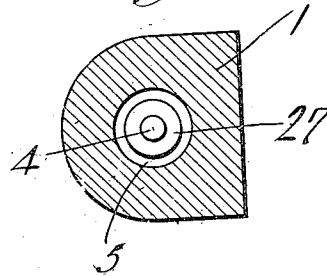
*Fig. 2.*



*Fig. 4.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

MARTIN A. HOUGEN, OF MINNEAPOLIS, MINNESOTA.

AIR-GAGE.

1,289,451.

Specification of Letters Patent.

Patented Dec. 31, 1918.

Application filed August 1, 1917. Serial No. 183,924.

*To all whom it may concern:*

Be it known that I, MARTIN A. HOUGEN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Air-Gage, of which the following is a specification.

The device forming the subject matter of this application is adapted to be interposed between an air pump and the nipple of a vehicle tire, for the purpose of ascertaining at any time what pressure has been attained in the tire.

The invention aims to improve the valve structure of the device, to improve the gage portion of the structure, and to combine these instrumentalities in an implement which will be portable and capable of being handled conveniently and readily.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows in top plan, a gage constructed in accordance with the present invention, parts being broken away;

Fig. 2 is a longitudinal section of the structure shown in Fig. 1, parts appearing in elevation;

Fig. 3 is a cross section on the line 3—3 of Fig. 2; and

Fig. 4 is a cross section on the line 4—4 of Fig. 2.

In carrying out the present invention, there is provided a body 1 including a reduced neck 2 which is externally threaded as shown at 3 so that it may be connected readily with the coupling of an air pump (not shown). The body 1 has a rectangular extension 4. In the interior of the body 1 there is fashioned a chamber 5 communicating with a tapered bore 6 in the neck 2. The bore 6 opens into an enlarged recess 7 located at the end of the neck 2. A passage 8 communicates with the chamber 5

and has a lateral mouth 9 opening through one end of the body 1. The said end of the body 1 is provided with a projection 10 which serves to unseat the valve in the tire nipple, the laterally deflected mouth 9 of the passage 8 opening to one side of the projection 10. The body 1 is circumscribed by a groove 11 defining a flange 12. The numeral 14 denotes a nut having a rib 15 journaled in the groove 11. The nut 14 is internally threaded as shown at 16, so that it may be engaged with the valve nipple of a tire, the nut 14 being rotatable on the body 1 as will be manifest from Fig. 2. The passage 8 communicates with a lateral passage 44, opening through the end of the extension 4.

The numeral 17 designates a valve casing threaded into the recess 7 in the end of the neck 2. The casing 17 is provided at its outer end with a flange 18, and interposed between the flange 18 and the end of the neck 2 is a resilient packing gasket 19, to prevent the leakage of air at this point. The valve casing 17 has a tapered extension 20, and when the valve casing 17 is threaded into the neck 2, the tapered extension 20 is firmly seated in the tapered bore 6, an air-tight joint being afforded, particularly because the tapered extension 20 is supplied with a circumscribing packing ring 21 which is compressed against the wall of the bore 6. The extension 20 of the valve casing 17 is provided with a bore 22, the upper end of which is enlarged as shown at 23. Mounted to slide in the bore 22 is a plunger rod 24 equipped at its upper end with an abutment 25. A compression spring 26 surrounds a portion of the plunger 24, one end of the spring engaging the abutment 25, and the other end of the spring engaging the valve casing 17 at the inner end of the enlarged portion 23 of the bore 22. The inner end of the plunger 24 carries a plate 27 against which abuts a washer 28, the washer 28 bearing against the inner end of the tapered extension 20 of the valve casing 17, under the action of the spring 26.

A main tube 29 is threaded or otherwise secured to the extension 4 of the body 1. The tube 29 includes an end wall 30 having an opening 31. Mounted to slide on the outside of the main tube 29 is an auxiliary tube 32 including an end wall 33. One end of a rod 34 is secured as shown at 35 to the end

wall 33 of the auxiliary tube 32. The rod 34 passes through the opening 31 in the end of the tube 29. At its inner end, the rod 34 is reduced to form a stem 36 defining a shoulder at the inner end of the body portion of the rod 34. The stem 36 has a head 37. A plate 38 abuts against the shoulder above defined, and a plate 39 is engaged by the head 37. Interposed between the plates 38 and 39, and bound therebetween, is a piston 40 preferably made of resilient material, the piston 40 having a flange 41 projecting toward the extension 4, and fitting closely but slidably against the inner surface of the tube 29. Disposed within the contour of the tube 29 is a strong compression spring 42, one end of which abuts against the end wall 30 of the tube 29, the other end of which abuts against the plate 38. The outer surface of the tube 29 is graduated as shown at 43, and the end 45 of the tube 32 is adapted to cooperate with the graduations 43, in a manner which will be clearly understood from the drawings.

In practical operation, the body 1 is connected with the valve tube of a tire, by threading the nut 14 onto the valve tube of the tire. The projection 10 opens the valve of the tire. The tube of an air pump may be connected with the threaded neck 2. When air is forced forwardly by the air pump, the plunger 24 will move endwise, and the washer 28 on the inner end of the tire will be unseated from the end of the tubular extension 20 of the valve casing 17. Then air will flow into the tire which is being pumped up, through the enlarged portion 23 of the bore 22, through the bore 22, through the chamber 5, the passage 8 and its lateral mouth 9. At the same time, pressure will be communicated to the interior of the main tube 29, through the passage 44 in the extension 4. The air pressure within the tube 29 will be communicated to the piston head 40, and the spring 42 will be compressed, the auxiliary tube 32 sliding on the outside of the main tube 29, and the end 45 of the auxiliary tube coacting with the graduations 43, to indicate the pressure which is being attained in the tire as it is pumped up.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a

body having a bore opening at one end 55 through one end of the body, the body being provided with an enlarged chamber into which the other end of the bore opens, the body including a tapered bore opening into the chamber, the tapered bore having an enlarged extension located adjacent one end of the body; a valve casing threaded into the enlarged extension and including a tapered neck fitting in the tapered bore, the casing having an opening therethrough; a valve 65 comprising a stem slidable in the opening of the casing and a head on the stem and located in the chamber, the head coacting with the inner end of the tapered neck of the casing and being spaced peripherally from the wall of the chamber; and spring means for holding the valve in closed position.

2. In a device of the class described, a body including a lateral extension, the body and the extension being equipped with communicating bores, the bore of the body opening at one end through one end of the body, the body being provided with an enlarged chamber into which the other end of the bore of the body opens, the body including a tapered bore opening into the chamber, the tapered bore having an enlarged extension located adjacent one end of the body; a valve casing threaded into the enlarged extension and including a tapered neck fitting in the tapered bore; a packing washer surrounding the tapered neck and compressed against the wall of the tapered bore, the valve casing having an opening therethrough, the opening being of different diameters to define a shoulder; a rod slidable in the opening; a spring surrounding the rod and abutting against the shoulder; an abutment on the rod and engaging the spring; a head on the rod and located in the enlarged chamber, the head coacting with the inner end of the tapered neck of the valve casing and being spaced peripherally from the wall of the chamber; and a pressure gage assembled with the lateral extension of the body.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MARTIN A. HOUGEN.

Witnesses:

MARGARET E. GOULD,  
ANN J. DYEDAHL.