May 15, 1923. 1,455,646

C. MILLARD

AIR PUMP AND GAUGE

Filed Oct. 11, 1921 2 Sheets-Sheet 1

Fig. 1.

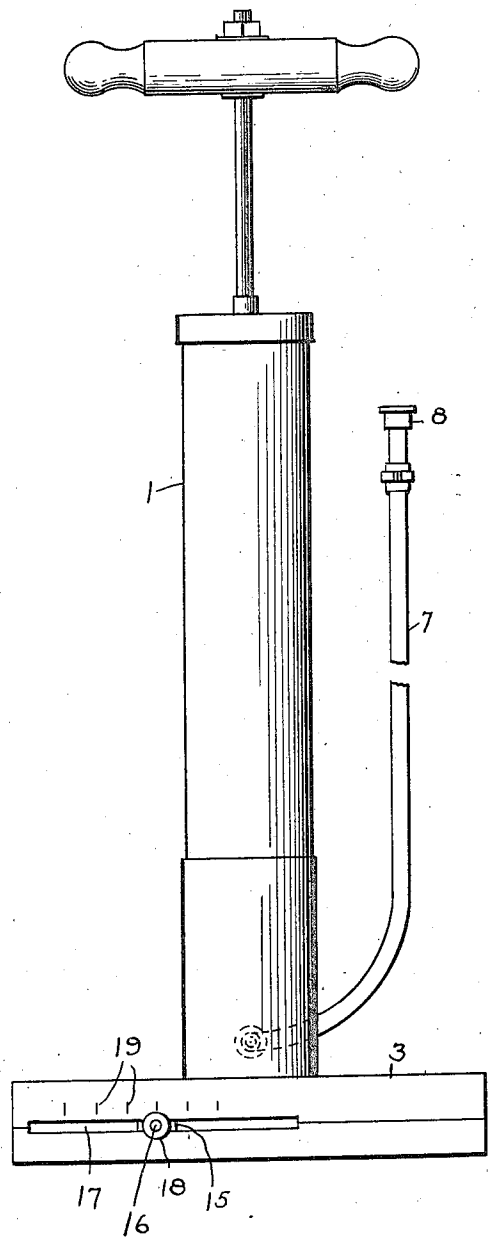
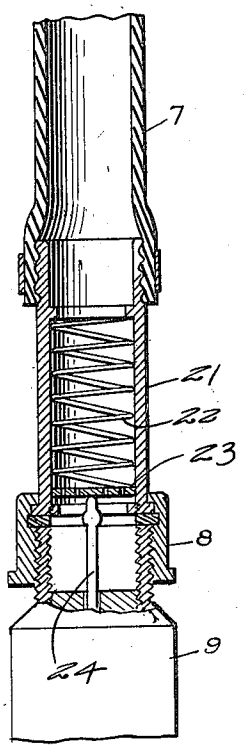


Fig. 4.



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Fig. 2

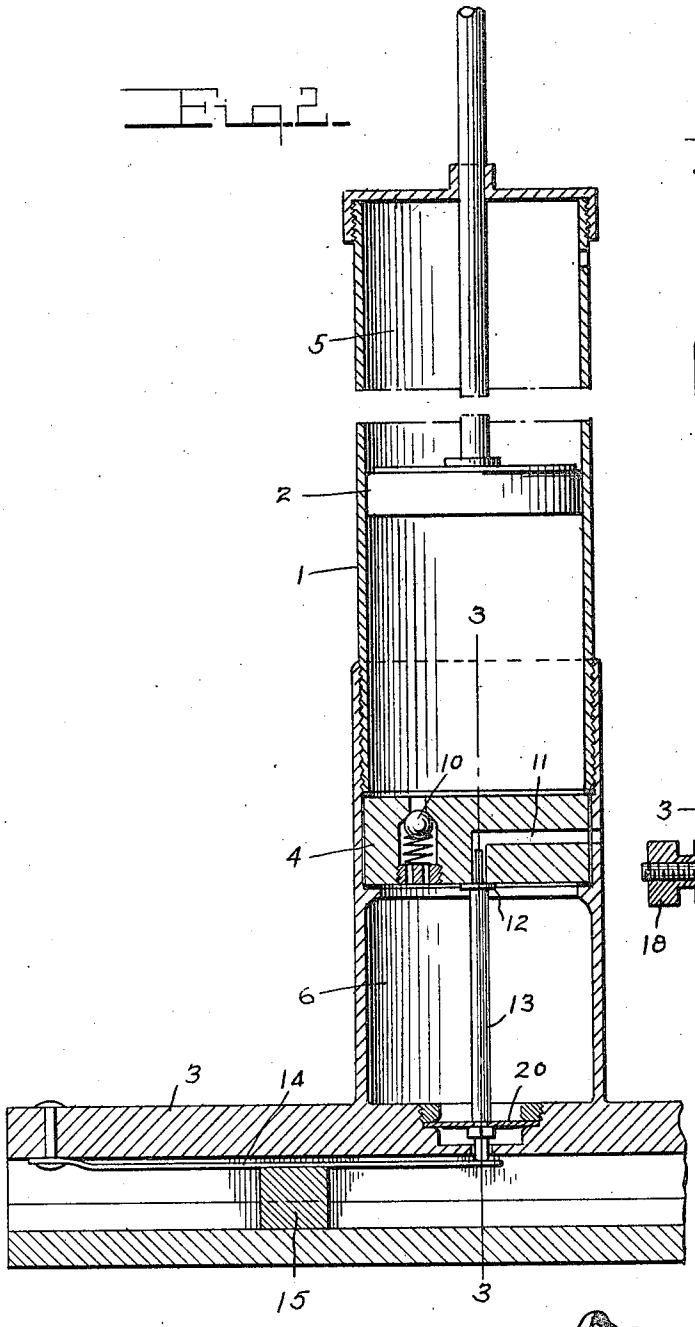
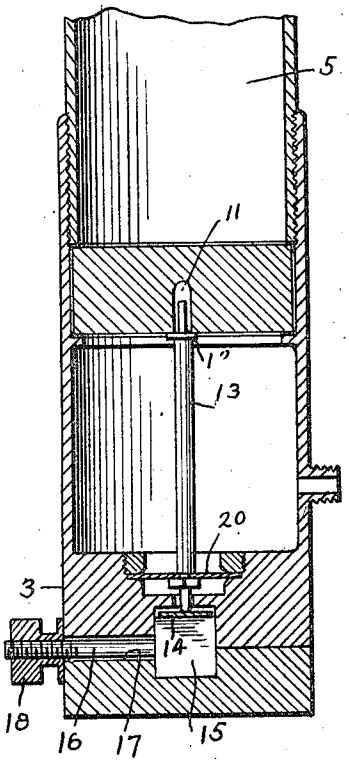


Fig. 3



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Patented May 15, 1923. 1,455,646

UNITED STATES PATENT OFFICE.

CLARENCE MILLARD, OF ARKANSAS CITY, KANSAS.

AIR PUMP AND GAUGE.

Application filed October 11, 1921. Serial No. 506,961.

To all whom it may concern:

Be it known that I, CLARENCE MILLARD, a citizen of the United States, residing at Arkansas City, in the county of Cowley and State of Kansas, have invented certain new and useful Improvements in Air Pumps and Gauges; 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 appertains to make and use the same.

The invention relates to an air pump for inflating pneumatic tires and like devices containing air under pressure.

The principal object of the invention is to prevent over inflation of the tire or like part since the pump embodies a vent which is controlled by a valve operable by the air pressure whereby when the predetermined pressure has been reached any excess resulting from the continued operation of the pump escapes.

Other objects and advantages will be apparent and suggest themselves as the nature of the invention is understood.

While the drawings illustrate an embodiment of the invention it is to be understood that in adapting the same to meet different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings forming a part of the specification,

Figure 1 is an elevation of an air pump embodying the invention.

Figure 2 is a vertical central longitudinal section thereof, an intermediate portion of the pump cylinder being broken away,

Figure 3 is a transverse section on the line 3—3 of Figure 2, and

Figure 4 is a sectional detail of the connection between the air tube and the tire valve.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The pump embodies a cylinder 1 and a piston 2 operable therein. The cylinder 1 is provided at its lower end with a base 3 whereby to form a support for the pump and enables the latter to be held by engagement of the feet with the base when the pump is in operation. A transverse partition 4 subdivides the cylinder into upper and lower chambers 5 and 6 respectively. The chamber 5 constitutes the working barrel of the pump and the chamber 6 receives the air pressure and is in communication with the tire or other part to be inflated by means of an air tube 7 which is provided with a coupling 8 to be attached to the tire valve 9 and of such construction as to hold the valve thereof open whereby the air chamber 6 of the pump has uninterrupted communication with the tire or like part so that the pressure in each is alike. The cylinder 1 is preferably of sectional formation and the partition 4 is clamped between the sections in a manner to insure a tight joint and thereby prevent escape of pressure. A valve passage 10 establishes communication between the chambers 5 and 6, a passage 11 provides escape for excessive pressure. Both passages 10 and 11 are formed in the partition 4. The vent passage 11 establishes communication between the chamber 6 and the atmosphere. An upwardly movable valve 12 closes the vent passage 11 and is carried by a stem 13 which extends through the chamber 6 and enters a depression formed in the base 3.

A flat spring 14 within the base 3 engages the lower end of the valve stem 13 and normally presses the same upwardly and closes the valve 12 to prevent escape of pressure through the vent passage 11. The effective pressure of the spring 14 may be varied to admit of inflating a tire or like part to any determinate pounds pressure. For this purpose a slide 15 is mounted in the base 3 and is movable therein to engage the spring 14 at any point in its length whereby the same is stiffened and its effective tension varied. The slide 15 is adjustable by means of a stem 16 which extends through a slot 17 formed in the base 3. A nut 18 mounted upon the projecting threaded end of the stem 16 provides convenient means for securing the slide 15 in the required adjusted position. Graduations 19 are provided along the base 3 adjacent the slot 17 and enable the slide 15 to be set to any determinate point according to the required pressure to which the tire or like part is to be inflated. The base 3 is preferably of sectional formation to admit of ready assemblage of the parts. The device is essentially a hand operated pump and in practice is manipulated in substantially the same manner as the ordinary

automobile foot pump. When it is required to inflate a tire the air tube 7 of the pump is coupled to the air valve 9 thereby establishing uninterrupted communication between the interior of the tire and the air chamber 6 of the pump. The pump is held by placing the feet upon opposite ends of the base 3 and the piston 2 is reciprocated in the usual way. On the down stroke of the piston 2 the air is forced from the chamber 5 into the chamber 6 and passes from the latter into the tire through the tube 7. On the upstroke of the piston 2 the valve in the passage 10 closes thereby preventing return of air from the chamber 6 to the chamber 5. This operation is continued until the predetermined pressure has been reached and is the same in the chamber 6 and the tire or like part being inflated. Any excessive pressure effects unseating of the valve 12 and an opening of the vent passage 11 whereby the excess escapes. The unseating of the valve 12 is effected by the air pressure in the chamber 6 acting upon a diaphragm 20 or like part connected with the valve stem 13. When the air pressure on the diaphragm 20 or like part exceeds the pressure exerted by the spring 14 to hold the valve 12 seated, said valve moves and uncovers the vent passage 11, whereby an escape for the excess of pressure is provided.

The coupling at the end of the tube 7 comprises a nipple 21 which encloses an expansible helical spring 22 and perforated disc 23. The coupling 8 has a swivel connection with the nipple 21 and when fitted to the valve stem 9 holds the valve thereof unseated by maintaining the disc 23 in contact with the stem 24 of the valve. The tension of the spring 22 is such as to overcome the tension of the spring holding the valve seated whereby to hold it open so long as the tube 7 is coupled to the stem 9.

Having thus described the invention, what I claim is:—

1. An air pump comprising a cylinder, a transverse partition sub-dividing the cylinder into two chambers, a piston operable in one of the chambers, means for connecting the other chamber with the part to be inflated, said partitions having a valve controlled passage between the two chambers and a vent passage for the escape of excessive pressure, a valve closing the vent passage and operable by excessive pressure to uncover said vent passage, a spring for holding said valve normally seated, and means for varying the effective tension of the spring whereby the pump may be set for inflating to any predetermined pounds pressure.

2. An air pump comprising a cylinder, a transverse partition sub-dividing the cylinder into upper and lower chambers and having a valved passage between the two chambers and a vent passage for the escape of excessive pressure, a valve for closing the vent passage, a base at the lower end of the cylinder receiving the lower end of said valve stem, means carried by the valve stem to be acted upon by excessive pressure to effect unseating of the valve at an opening of the vent passage, a spring disposed in said base and normally holding the valve seated and means adjustable in the base for regulating the effective tension of the spring whereby the pump may be adapted for inflating an article to any required pounds pressure.

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

CLARENCE MILLARD.

Witnesses:
T. W. HEWITT,
G. S. MCCLURE.