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Patented Jan. 17, 1899.

C. J. LAW.

COIN CONTROLLED AIR PUMP FOR BICYCLE TIRES.

(Application filed Mar. 21, 1898.)

(No Model.)

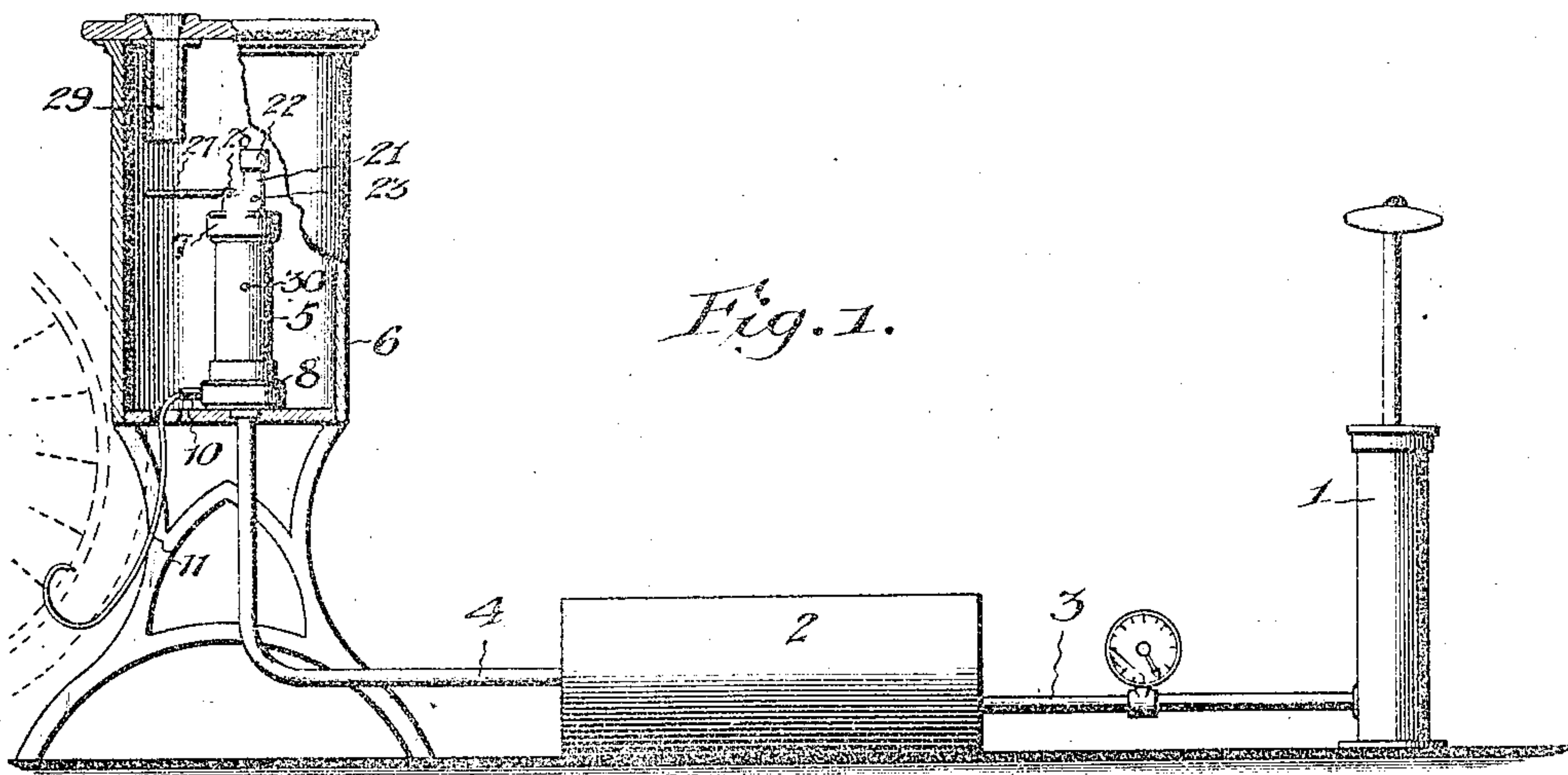


Fig. 1.

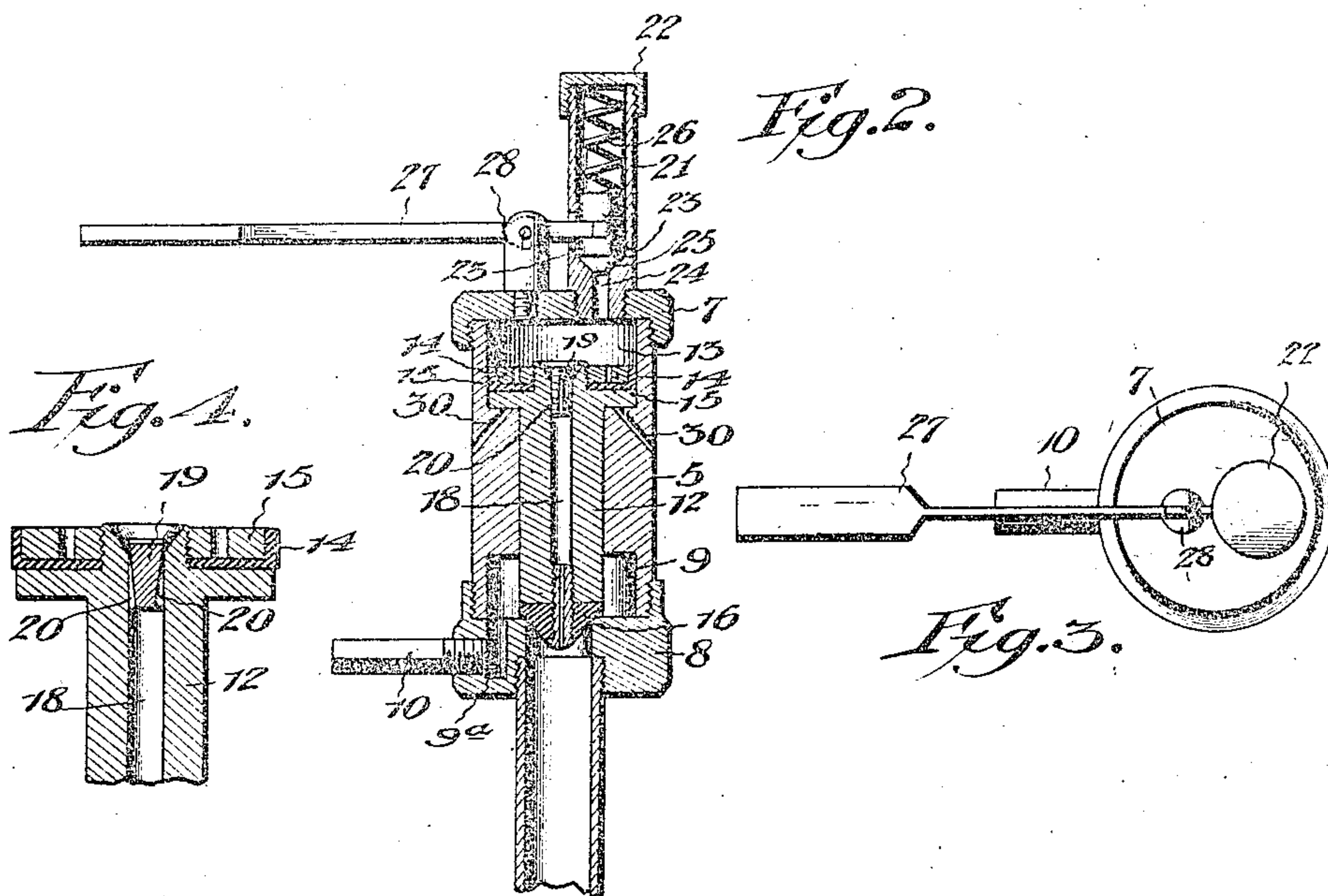


Fig. 2.

Fig. 4.

Fig. 3.

Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES J. LAW, OF MERCER, PENNSYLVANIA.

## COIN-CONTROLLED AIR-PUMP FOR BICYCLE-TIRES

SPECIFICATION forming part of Letters Patent No. 617,811, dated January 17, 1899.

Application filed March 21, 1898. Serial No. 674,670. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES J. LAW, a citizen of the United States, residing at Mercer, in the county of Mercer and State of Pennsylvania, have invented a new and useful Coin-Controlled Air-Pump for Bicycle-Tires, of which the following is a specification.

The invention relates to improvements in coin-controlled air-pumps for bicycle-tires.

One object of the present invention is to improve the construction of a coin-controlled apparatus for inflating bicycle-tires and to provide a simple and comparatively inexpensive device adapted, after properly connecting a bicycle-tire to a supply pipe or tube, to be automatically operated by a coin to permit the proper amount of air to be released for inflating the tire.

A further object of the invention is to provide a simple and efficient device for shutting off the supply of air after a quantity has been released by the action of a coin and to enable such device to be readily adjusted so that the proper time will lapse between the opening of the valve and the shutting off of the supply of air in order that a tire may be properly inflated.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a side elevation, partly in section, of a coin-controlled tire-inflating device constructed in accordance with this invention. Fig. 2 is an enlarged sectional view of the coin-operated valve mechanism. Fig. 3 is a plan view of the same. Fig. 4 is an enlarged detail sectional view of the upper portion of the piston and the adjusting-screw for regulating the admission of air above the same.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates an air-pump which may be either of the hand or hydraulic form, and it is connected with a tank or reservoir 2 by a pipe 3, which is designed to be provided at a point between the tank and the pump with a

suitable gage for indicating the pressure of the air within the tank or reservoir.

The tank or receptacle 2 is connected by a feed-pipe 4 with a cylinder 5, arranged within a coin-receptacle 6 and having upper and lower heads 7 and 8, the lower head being connected to the feed-pipe 4. The cylinder is provided at its lower end with a chamber 9, with which communicates a short tube 10, adapted to receive a supply-pipe 11, and the latter, which extends through the bottom wall of the receptacle 6, is constructed of rubber or other suitable material and is provided at its outer end with a suitable coupling adapted to engage the valve of a bicycle-wheel, as illustrated in dotted lines in Fig. 1 of the accompanying drawings.

Within the cylinder 5 is arranged a piston 12, which is loosely fitted into the cylinder, and upon its head, within an upper cylinder-chamber 13, is secured a leather cup or packing-ring 14, which is held in place by a nut 15.

The central portion of the opening or space within the cylinder is reduced between the chambers 9 and 13, the piston fitting the reduced central portion. The upper end of the piston is enlarged and is of the same diameter as the chamber 13, and the lower end of the piston is provided with a valve 16 for shutting off the supply of air by closing the communication between the feed-pipe 4 and the supply-pipe 10. The supply-pipe 10 is disposed horizontally, as clearly illustrated in Fig. 2 of the accompanying drawings, and communicates with an extension 9<sup>a</sup> of the chamber 9. The feed-pipe screws into a threaded opening of the lower head 8 of the cylinder, and the valve 16, which is tapering or conical, fits on a corresponding seat and is secured to the piston by a hollow screw 17.

The piston is hollow and has a central air-passage 18 extending through it to admit air to the chamber 13 at a point above the enlarged upper end of the piston, and as the upper surface of the piston is greater than the area of the lower end the pressure on the upper end will be greater than that on the lower end and will operate to hold the piston on its seat and close the valve.

After the piston is operated by a coin, as



hereinafter described, by being relieved of the pressure at its upper end air is gradually admitted through the passage 18 to the upper chamber 13 of the cylinder, and when the pressure upon the upper end of the piston becomes greater than that on the lower end the valve will again close.

The admission of air to the chamber above the piston is controlled by an adjusting-screw 19, and the upper end of the passage 18 is slightly flared or conical, as clearly shown in Fig. 4 of the accompanying drawings. The screw is provided with tapering longitudinal slots 20, extending a suitable distance up the sides of the screw and adapted to regulate by adjusting the screw the size of the air-passage and the admission of air above the piston.

A small cylinder or casing 21, which is closed at its upper end by a cap 22, is mounted upon the upper head 7 of the cylinder, and the walls of this small cylindrical casing are provided with small ports 23 for the escape of air. An opening or passage-way 24 at the lower end of the cylindrical casing communicates with the upper chamber 13 of the cylinder 5, and at the upper end of this passage 24 is formed a seat for a valve 25, which is retained in its closed position by a small spiral spring 26, located above the valve and exerting only a slight pressure on the same.

The valve 25 is raised from its seat to permit the air above the piston to escape by means of a lever 27, having one end attached to the valve and fulcrumed near the same on a post 28. The post 28 is mounted upon the upper head of the cylinder 5, and the outer end of the lever 27 is enlarged and arranged beneath a coin-chute 29 of the receptacle 6, so that when a coin is dropped into the chute it will strike the lever 27 and operate the same sufficiently to relieve the upper end of the piston of pressure, so that the pressure in the tank or reservoir, operating on the lower end of the piston, will open the valve and release a quantity of air. The spring 26, which holds the valve closed, also operates to return the lever 27 to its normal position.

Any pressure that may be generated on the under side of the upper end or head of the piston in the upper chamber 13 by leakage between the walls of the cylinder and the piston will be relieved by means of small holes 30, forming inclined passages extending from the bottom of the upper chamber 13 through the walls of the cylinder and communicating with the atmosphere.

The air-pressure found by experience to be most suitable for tire-inflating is about forty pounds, and the time in which the valve is open when the coin falls upon the lever and when it drops from the same to allow the lever to resume its normal position is sufficient to fill a tire.

The invention has the following advantages: The coin-controlled pump for inflating tires

is simple and comparatively inexpensive in construction and is adapted when a coin is deposited in it to release automatically a quantity of air sufficient to inflate the tire of a bicycle-wheel, and the supply of air is shut off after a sufficient quantity has been released. The piston which carries the valve is automatic in its operation, and the screw may be adjusted so that the time occupied by the piston in closing may be readily regulated.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. In a device of the class described, the combination of a cylinder having supply and feed pipes, a piston arranged within the cylinder and adapted to shut off communication between the pipes, a casing mounted upon the cylinder and having an escape-port, a valve arranged within the casing, a lever fulcrumed between its ends and having one end carrying the valve, its other end being arranged to be operated by a coin to open the said valve, and a spring arranged within the casing and engaging the valve and holding the same on its seat, substantially as and for the purpose described.

2. In a device of the class described, the combination of a hollow piston having one end enlarged and provided at its other end with a valve for controlling the supply of air to the discharge-pipe, and coin-controlled mechanism for relieving the enlarged end of the piston of pressure, substantially as and for the purpose described.

3. In a device of the class described, the combination with a receptacle or casing, a cylinder arranged within the same, feed and supply pipes communicating with the cylinder, a piston arranged within the cylinder and carrying a valve at one end for normally shutting off communication between the feed and supply pipes, the other end of the piston being of greater area than the valve end, whereby the pressure on the piston will hold it normally closed, and coin-controlled mechanism for relieving the enlarged end of the piston of pressure, whereby the valve will be caused to open, substantially as described.

4. In a device of the class described, the combination of a cylinder, feed and supply pipes communicating with the same, a hollow piston having one end enlarged and provided at its other end with a valve normally shutting off communication between the supply and feed pipes, coin-controlled mechanism for relieving the larger end of the piston of pressure, and an adjusting device for regulating the admission of air to the larger end of the piston, substantially as described.

5. In a device of the class described, the combination of a cylinder, feed and supply pipes communicating with the cylinder, a hollow piston having one end larger than the



other and carrying a valve adapted to shut off communication between the pipes, an adjusting-screw mounted in the passage of the hollow piston and provided with a tapering opening, and coin-controlled mechanism for relieving the larger end of the piston of pressure, substantially as described.

6. In a device of the class described, the combination of a cylinder provided at its ends with chambers 9 and 13, supply and feed pipes communicating with the chamber 9, a hollow piston having one end enlarged and arranged in the chamber 13, a valve carried by the other end of the piston and adapted to shut off communication between the pipes, a coin-operated lever, and a valve connected with and operated by the lever and arranged to relieve the enlarged end of the piston of pressure, substantially as described.

7. In a device of the class described, the combination of a cylinder, supply and feed pipes communicating with the same, a piston arranged within the cylinder and carrying a valve arranged to shut off communication between the pipes, a casing mounted upon the cylinder, communicating therewith and having an escape-port, a valve arranged within the casing, a coin-operated lever connected

with the valve of the casing, and means for holding the valve of the casing closed, substantially as described.

8. In a device of the class described, the combination of a cylinder having a chamber at one end and provided with air-passages extending from the same to the exterior of the cylinder, a hollow piston arranged within the cylinder and having an enlarged end located in the chamber above the air-passages, a valve carried by the piston, and coin-controlled mechanism for relieving the pressure in the said chamber, substantially as described.

9. In a device of the class described, the combination of a cylinder, supply and feed pipes, a hollow piston arranged within the cylinder and carrying a valve for shutting off communication between the pipes, and a coin-operated lever carrying a valve for controlling the pressure above the hollow piston, substantially as described.

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

CHARLES J. LAW.

Witnesses:

R. G. MADGE,  
P. E. SHIPLER.