

1,028,080.

C. F. SNYDER.
AIR PUMP.
APPLICATION FILED JULY 12, 1910.

Patented May 28, 1912.
2 SHEETS—SHEET 1.

Fig. 1.

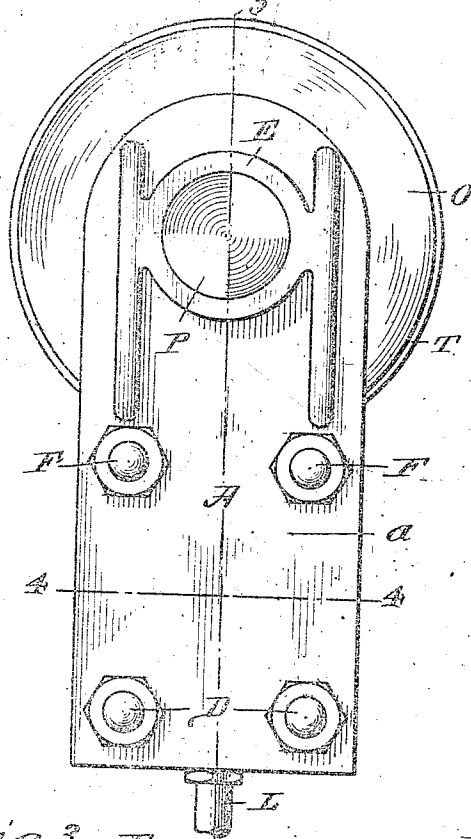


Fig. 2.

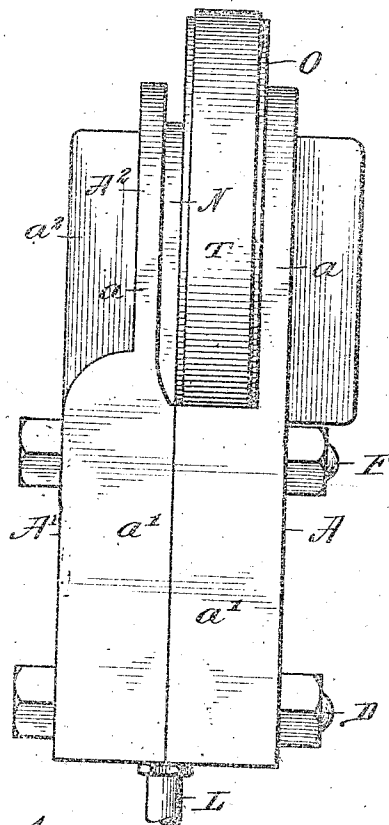


Fig. 3.

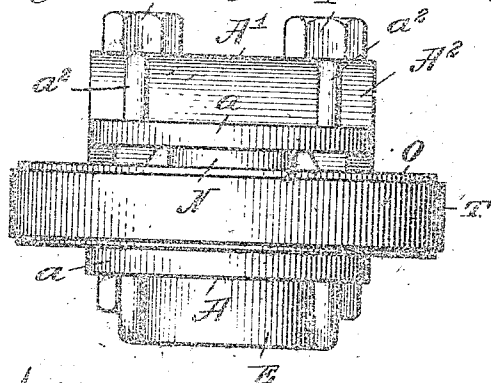
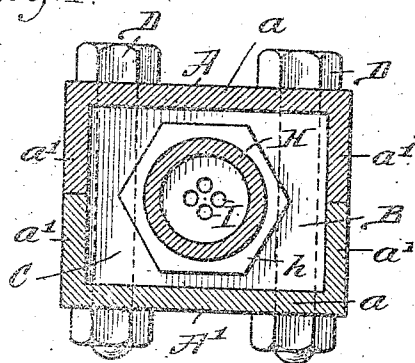


Fig. 4.

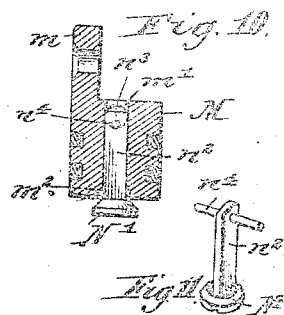
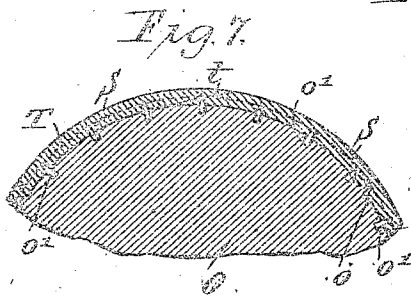
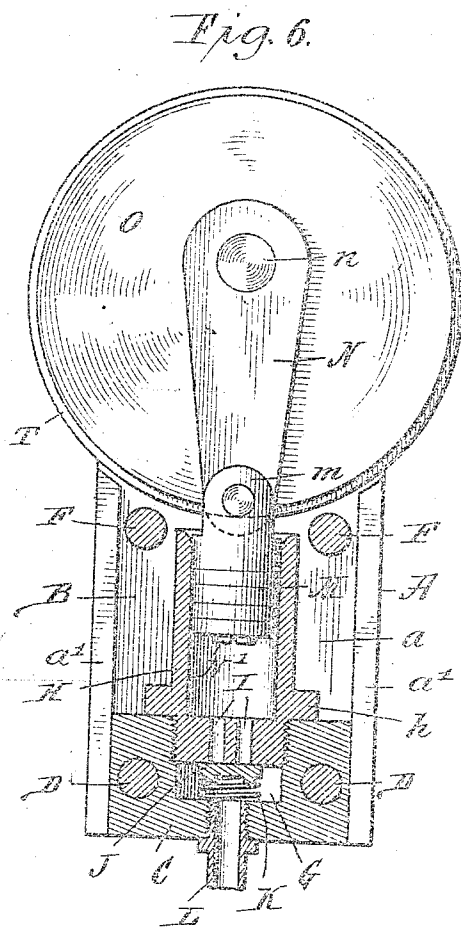


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES F. SNYDER, OF ALLEGHENY, PENNSYLVANIA.

AIR-PUMP.

1,028,080.

Specification of Letters Patent.

Patented May 28, 1912.

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To all whom it may concern:

Be it known that I, CHARLES F. SNYDER, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Air-Pumps, of which the following is a specification.

My invention relates to improvements in air pumps and particularly to air pumps adapted for use in inflating pneumatic tires of vehicle wheels.

The primary object of my invention is the production of a simple, compact and durable pump of this character, consisting of few parts and so constructed that the working parts are evenly balanced and free in action.

Another object of my invention is the provision of means whereby in bringing one of the working parts of the pump into contact with a rotating part or member of a vehicle, the pump will be actuated to inflate a tire.

A still further object is to provide a comparatively small pump which can be conveniently carried about a person, which is inexpensive, and which can be easily applied to or held in contact with the fly-wheel or other rotatable part of an engine, or to a rotatable part of transmission-mechanism driven by the engine, for the purpose of actuating a piston forming part of the pump.

With these and other objects in view, my invention consists in a pump combined with a rotatable friction-device connected with the piston of the pump; in the manner of connecting said friction-device with the piston; and of so journaling and supporting said friction-device and connecting the same with the piston that in the operation of the various parts, they are easily balanced and consequently all undue friction or binding eliminated.

It further consists in the construction, arrangement and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is a front elevation of my improved pump. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation. Fig. 4 is a transverse section taken on line 4—4, Fig. 1. Fig. 5 is a longitudinal section taken on line 5—5, Fig. 1. Fig. 6 is a longitudinal section taken on line 6—6, Fig. 5. Fig. 7 is a fragmentary section through the rotatable friction member taken on line 7, Fig. 5. Fig. 8 is a central longitudinal section through the piston. Fig.

9 is a cross section taken on line 9—9, Fig. 8. Fig. 10 is a central longitudinal section taken on line 10—10, Fig. 8. Fig. 11 is a detached perspective view of the air-inlet valve of the piston.

Referring now to the drawings in detail, like letters of reference refer to corresponding parts in the several figures.

The reference letters A, A¹ designate two castings or housing members which constitute a case or housing wherein the working parts of the pump are confined or mounted for action. These housing members lie in contact with each other and each comprises a plate *a* and inwardly directed or opposing flanges *a*¹ to provide a chamber B which is closed at its lower end by a block C. Bolts D are passed through said housing members and through the block C to form a solid connection between the three parts, as best shown in Figs. 5 and 6. The front plate *a* of the housing member A is provided near its upper end with a hollow boss E forming an extended bearing for mounting the rotatable friction member to be hereinafter described; and the rear plate *a* of the housing member A¹ is off-set at its upper end, as at A², to restrict the space between it and the front plate of the housing member A, strengthening ribs *a*² being formed on the rear plate where it is off-set.

The front and rear plates *a* are held in spaced relation by the flanges *a*¹ and retained in this condition by the bolts D and a pair of bolts F, preferably in line with and above the bolts D. The block C is chambered, as at G, the chamber being preferably cylindrical and having the upper portion of its wall screw-threaded to receive the lower screw-threaded end of a cylinder H. Said cylinder is provided with a hexagonal or other angular collar *h* which bears against the upper surface of the block C to limit the extent to which it is screwed into the chamber G and also serves as a means for applying a wrench or other tool for threading the cylinder into said chamber. Obviously, the collar need not necessarily be angular, but I have found this a convenient arrangement for the purpose intended. The cylinder H is open at one end and closed at its other end, the closed end being threaded into the chamber G and having one or more ports I for the escape of air from the cylinder. The block C may well be termed a "valve-retaining block", since in the

chamber thereof, I locate a valve J which is preferably in the form of a disk but may be otherwise formed if desired, said valve being normally held against the lower closed end of the cylinder H and serving to close the ports I therein; and for the purpose of holding said disk in normal position, a coil spring K is interposed between it and the end wall of the chamber G. Said end wall has a central threaded opening into which a tube or fitting L is threaded which serves as a means to connect a flexible tube (not shown) to the pump, the tube being of the common construction used for connection to the tire.

Held for reciprocating movement in the cylinder H, is a piston M which, as shown in the drawings, preferably has an integral extension m to which is pivotally connected one end of a pitman N having a wrist-pin n formed on or secured thereto at its other end. The piston may have the usual packing rings and it also has a central longitudinal bore m^1 , which is beveled at its inner end, as at m^2 , to provide a valve seat for an air inlet valve N^1 correspondingly beveled and provided with a flat stem N^2 fitting within the bore m^1 . By reason of said valve stem being made flat, air passages n^1 are provided on opposite sides thereof for admission of air to the cylinder H when the valve opens on the outward stroke of the piston. For the purpose of limiting the reciprocating movement of the valve N^1 , a transverse bore n^2 is provided near the outer end of the piston which intersects the longitudinal bore m^1 and passing through the stem n^2 of the air inlet valve is a pin n^4 of somewhat less diameter than the transverse bore n^2 into which opposite ends thereof extend. By making the pin n^4 smaller than the bore n^2 it is free to move therein and limits the inward movement of the valve. As the piston moves inward, the air inlet valve closes against its seat and the air within the cylinder is compressed until the pressure is sufficient to overcome the power of the spring K, whereupon the valve J is allowed to open and the air escapes from the pump. During the outward movement of the piston, the air inlet valve opens and admits air to the cylinder to be compressed on the next inward movement of the piston.

O designates a rotatable friction wheel having an axial stud or spindle P projecting from one side which is journaled in the hollow boss E of the housing member A and which is also provided with a socket R in its other side arranged eccentrically therein and in which socket the wrist-pin n is seated said wrist-pin having a conical end n^1 and the socket R being correspondingly shaped at its inner end for the purpose of eliminating friction caused by end thrust. The friction wheel O occupies the space between the

housing members A, A^1 at one end thereof and the pitman is confined in its oscillating movement between the off-set portion A^2 of the housing member A^1 and the friction wheel whereby it is guided for action in a direct line. The body of the friction wheel is provided with a peripheral groove o and in this groove are formed small sockets o^1 , preferably at regular intervals around the wheel, into which are driven pegs S, preferably of metal, having pointed projecting ends, said pegs being embedded in a leather or other friction or contact strip T set into said groove, as clearly shown in Figs. 5 and 7. In applying this friction or contact strip, it is placed at an intermediate point against the pegs S and forced into the groove o of the friction wheel and from this point, the strip is stretched around the wheel and forced into the groove progressively until the opposite ends are reached. These ends are beveled or spliced, as at t , and the beveled surfaces glued and overlapped, the entire strip being securely driven into the groove o and after the glue at the spliced ends is set, a secure friction surface results therefrom.

Minor changes in the construction of this device may be resorted to or some of the parts may be omitted, and if desired other parts may be used to cooperate therewith without departing from the spirit of my invention or sacrificing any of the advantages thereof, it being my intention to have the following claims given the broadest construction permissible by the prior art.

Having thus described my invention, what I claim is,—

1. An air-pump comprising a housing, a friction wheel rotatably mounted within said housing, a cylinder having a valve-controlled port and being confined within said housing, a piston reciprocable within said cylinder, and operative connection between said piston and said friction wheel.

2. An air-pump comprising a housing constituted by two flanged members providing a space therebetween, a valve block between said members having a valve-retaining chamber, a cylinder extending into said chamber and having a port providing communication between the interior thereof and said chamber, a valve within said valve-retaining chamber bearing against the cylinder to close said port, a tube-fitting entering said block, a piston reciprocable within said cylinder, and means for actuating said piston.

3. An air-pump comprising two cooperating housing members formed to provide a chamber therebetween, a valve-retaining block closing one end of said chamber and itself having a chamber formed centrally therein, a cylinder within said first-mentioned chamber having a port therein, a

spring-controlled valve within the chamber of said valve-retaining block serving to close said port, a piston reciprocable within said cylinder, a rotatable friction-wheel journaled in one of said housing members, and a pitman eccentrically connected to said friction-wheel at one end and being pivotally connected to said piston at its other end.

4. An air-pump comprising two cooperating housing members, each comprising a plate having inwardly-directed flanges abutting against the flanges of the cooperating plate, a cylinder situated between said housing members and inclosed thereby, said cylinder being closed at one end and having a port in said end, a spring-controlled valve normally held against said cylinder to close the port therein, a piston reciprocable within said cylinder, a rotatable friction element, and operative connection between said friction element and said piston.

5. An air-pump comprising a cylinder having a valve-controlled port, a piston reciprocable within said cylinder, a housing inclosing said parts, and a rotatable friction device partly inclosed by said housing and operatively connected with said piston.

6. An air-pump comprising two housing members, each comprising a plate having inwardly-directed flanges at their longitudinal marginal portions, the flanges of one plate abutting against those of the other, one of said plates having an off-set portion at one end and the other plate having a hollow boss providing a bearing, a rotatable friction device having a spindle projecting from one side and journaled in said bearing and a socket formed eccentrically in its other side, a cylinder confined between said housing members having a valve-controlled port, a piston reciprocable within said cylinder, and a pitman located between the off-set portion of one of said plates and the rotatable friction device, said pitman having a wrist-pin at one end seated in the socket of said friction device and its other end pivotally connected to said piston.

7. An air-pump comprising a housing, a

cylinder confined within said housing and having a port, a spring-controlled valve normally closing said port, a piston within said cylinder, a rotatable friction wheel partly inclosed by said housing and having its body provided with a peripheral groove and a friction strip fitted into said groove, and means for operatively connecting said friction wheel with the piston.

8. An air-pump comprising two housing members separated by an intervening space, a chambered block closing one end of said space, a cylinder within said space connected to said block and having a port providing communication between the chamber of said block and the interior of said cylinder, a disk valve in said chamber normally closing said port, a tube-fitting entering said block, a piston reciprocable within said cylinder and having a longitudinal extension thereon, a pitman pivotally connected at one end to said extension, and a rotatable friction element eccentrically connected to the other end of said pitman.

9. An air pump comprising two housing members, bolts connecting said housing members, a friction wheel mounted in one end of said housing members, a cylinder confined between said housing members and having one end closed and exteriorly threaded, a valve-retaining-block between said housing members provided with a chamber into which the closed end of said cylinder is threaded, a valve within said chamber controlling the escape of air from said cylinder, a coil spring serving to hold said valve against said cylinder, and a pitman confined between one of said housing members and said friction wheel and operatively connecting said piston with said friction wheel.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

CHARLES F. SNYDER.

Witnesses:

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