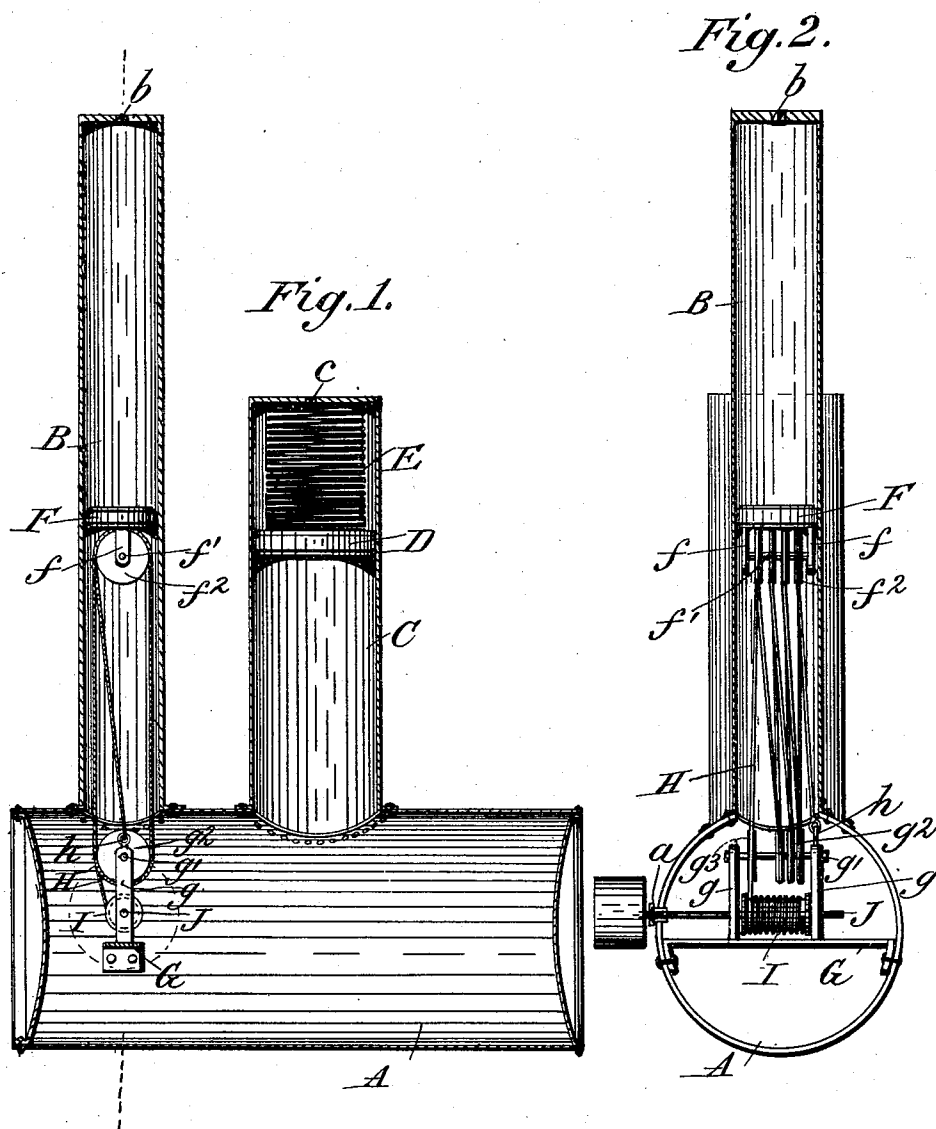


(No Model.)

W. CAWHERN.
AIR MOTOR.

No. 547,661.

Patented Oct. 8, 1895.



Witnesses
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Harold Keith

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UNITED STATES PATENT OFFICE.

WILLIAM CAWHERN, OF ATLANTA, GEORGIA.

AIR-MOTOR.

SPECIFICATION forming part of Letters Patent No. 547,661, dated October 8, 1895.

Application filed February 20, 1894. Serial No. 500,896. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CAWHERN, a citizen of the United States of America, and a resident of Atlanta, in the county of Fulton and State of Georgia, have made certain new and useful Improvements in Air-Motors; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to prime motors which are actuated by air compressed to the proper density, the object of the invention being to obtain a greater time of effective working and to compensate for the use of air and prevent same from reducing the effective pressure, the details of all of which will be hereinafter fully specified and the parts claimed as new pointed out in the claim.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of the device, showing the interior arrangement of parts. Fig. 2 is a vertical cross-section through the left-hand cylinder in Fig. 1, further illustrating the parts therein shown.

In the figures like reference-marks are employed in the designation of corresponding parts in both the views.

A is a receiver which acts as the main reservoir for the compressed air used in actuating the device. Two other cylinders B and C lead out from this cylinder A, as will be hereinafter specified. In the cylinder C is a piston D, which should fit the inner side of said cylinder and be provided with suitable packing of metal or other suitable substance, whereby an air-tight joint is insured. Situated between the upper end of the said cylinder and the piston D is a spring E, which should be of about the same tension as the air-pressure and acts to move the said piston toward its outlet into the reservoir A. If desired, this spring may be composed of several springs nested, and, if desired, the contiguous springs in the nest may be reverse-wound, in order that one will not interfere with the other. It is preferable that the capacity in cubic contents of this cylinder C should be

about the same or greater than that of the cylinder B, in order that the movement of the piston D may follow the movement of the piston F in the other cylinder. The piston F is formed of two plates with a rubber or other elastic packing clamped between them, preferably, and moves in the cylinder A, carrying on its under side two lugs f , which have pivoted on a suitable shaft f' between them grooved wheels f^2 .

Secured on the inner side of the reservoir A is a brace G, which may obviously be of any form desired and should be of such form and so braced as to put no dangerous stress on the boiler-plate of which the reservoir is composed and at the same time retain the attached parts securely in the proper places. Two uprights g are secured to the upper side of the brace G, and revolving loosely on a shaft g' sustained between these said uprights are grooved wheels g^2 , of a number sufficient to co-operate with the wheels f^2 , as will be presently understood, a wheel g^3 being also provided to act as a carrier for the rope H to the drum I. This rope H is secured at one end to a hood h and passing in succession over one of the wheels f^2 , thence to a wheel g^2 , and so on until the proper number of returns are made to give the power desired with the application of the desired number of pounds pressure of compressed air, its end passing over the carrier-wheel g^3 and then to the drum whereon the remainder is wound, to be unwound therefrom by the upward passage of the piston F. The drum I is mounted on a shaft J, which is journaled in the uprights g and passes out through the side of the reservoir A, a stuffing-box a being provided whereby an air-tight bearing is insured at the point where said shaft passes through. On the outer end of the said shaft is a pulley, wheel, or gear, as desired, for connecting machinery thereto. A plug b is screwed into a hole in the top of the cylinder B, and a small hole is drilled therein, so that the air would only pass out at that point at a sufficient rate to cause a resistance to any sudden movement of the piston F, and thus in case any of the machinery was broken the piston would only move at a moderate speed and not be suddenly forced upwardly to strike the head of the cylinder. The plug c , of simi-

lar construction, set in the head of the cylinder C, also operates in the same manner with reference to the piston D, the movement, however, of said piston causing an influx of
5 air in that cylinder.

The operation of this device is as follows: The pistons D and F being at their lower extreme positions air is pumped into the reservoir A, which forces the piston D upwardly
10 into its cylinder against the spring E, thus storing power in said spring. As soon as the air reaches its working pressure the device is then ready to operate, and upon the release of the machinery will operate to drive same
15 until the piston shall have reached its upper extreme position, unwinding the rope H from the drum I at a speed proportionate to the speed of the piston and the number of returns of said rope between the wheel f^2 and g^2 .

20 This device is particularly adaptable to pleasure vehicles, although it may be used as a motor for any purpose desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters
25 Patent of the United States, is—

The combination, in an air-motor, of a main-reservoir, a cylinder internally connected

therewith, a piston in said cylinder spring-pressed to reduce the air-space in said cylinder below said piston, a second cylinder of
30 comparatively greater length and smaller diameter also opening internally into said main-reservoir, a piston therein carrying freely revoluble on its under side a series of sheave-wheels, a bar transversely secured within the
35 main-reservoir directly under the embouchure of the last named cylinder, uprights thereon, a corresponding set of sheave-wheels mounted revolubly between said uprights, a shaft journaled on said uprights and projecting exteriorly of the main-reservoir through the side
40 thereof, a drum thereon between the said uprights, and a rope secured to one of said uprights, passing over said sheaves in succession and attached by its other end to the said
45 drum and adapted to be wound thereon, as and for the purpose specified.

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

WILLIAM CAWHERN.

Witnesses:

ALBERT P. WOOD,
EDWARD P. WOOD.