

No. 709,030.

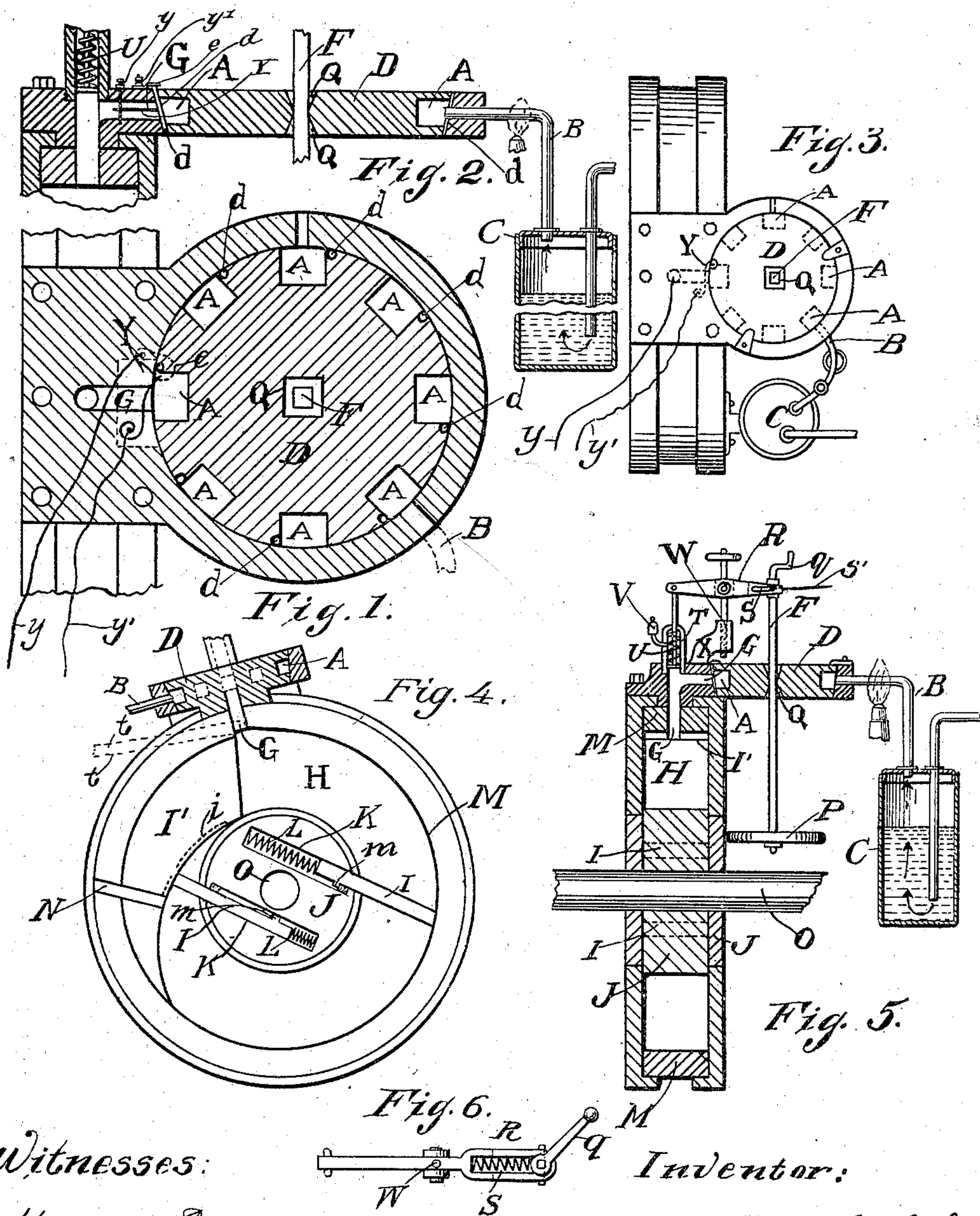
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A. McCAHON.

COMBINATION AIR AND VAPOR MOTOR.

(Application filed Aug. 27, 1900.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## COMBINATION AIR AND VAPOR MOTOR.

SPECIFICATION forming part of Letters Patent No. 709,030, dated September 16, 1902.

Application filed August 27, 1900. Serial No. 28,155. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER MCCAHOON, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Combination Air and Vapor Motors; and I do 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 the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a motor that will operate without an eccentric and from which greater power can be obtained on a given quantity of fuel than from other motors. This power is preferably obtained by the use of vapor, although the device may be adapted to compressed air or steam. It is suited to use for railway-cars, street-cars, steamboats, carriages, bicycles, tricycles, and other means of locomotion.

I attain my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of a horizontal section of the feed-disk; Fig. 2, a longitudinal section of said disk; Fig. 3, a top plan of the motor and an oil-tank shown in connection therewith; Fig. 4, an interior view of the motor with the outer plate removed. Fig. 5 is a vertical section of the motor. Fig. 6 is a detail view of the connections for shifting wheel P.

Similar letters refer to similar parts throughout the several views.

The gas which I preferably use as the propelling power is fed into disk-pockets A A through a pipe B, attached to a gasoline-tank C. (Shown in Fig. 3.) This tank is never entirely filled, the top being left as a compressed-air space. The gas may be generated in the same manner as in a gasoline-stove. Disk D turns on an upright shaft F. Each disk-pocket after being filled with gas as it moves around registers with opening G. Disk-pockets A A are provided with copper wires *dd*. Spring Y (shown in Fig. 1) is of steel, copper, or any suitable material. As the disk turns this spring drags upon the edge of the disk until it con-

tacts with copper wire *d*, which makes a complete electric circuit with the storage battery. When said spring Y leaves said wire *d*, thus breaking circuit, a spark of fire is caused, which ignites the gas in the contacting pocket A, and an explosion results. This is repeated as the disk continues to turn and spring Y contacts and leaves each wire *d*. Spring Y is also provided with a copper wire *y*, which connects with a storage battery. Another wire *y'* leads to a copper plate *e* for the purpose of making a complete circuit with the storage battery when wire *d* is brought into contact with said plate *e*. If necessary, additional springs Y may be used to insure sparks. The pressure caused by each explosion passes down through opening G into vapor-chamber H.

I I are plungers let into hub J through channels K K. Each plunger is provided with a spring L to keep the plunger in perfect contact with the outer rim or casing M. The force or pressure caused by the repeated explosions from pockets A A filling chamber H through opening G drives plungers I I around against said rim, said chamber being thus filled with vapor. As the plunger each time passes hole N an accumulation of said vapor escapes. It is immaterial at what point plungers I I may be when the explosions occur, because there is not at any time a channel open from the opening or feed G to the hole or escape N in chamber H, and it is therefore impossible for the explosions to occur without performing their object.

I' is the plunger-guide, and in the inner rim of said plunger-guide there is a narrow slot or furrow *i*, extending from hole N to the point of contact of said rim with the hub for escape for the accumulated fluid that may be in the triangular space between said hole and point of contact of said guide and hub when the plunger is passing around said space. Owing to the fact that chamber H is higher on one side of port G than at the other side of said port, (see Fig. 4,) the plunger, as it moves forward a considerable space after leaving port G, does not reach to the rim, and said port is never wholly closed. Consequently the plunger effects but little until it again contacts with the rim, and chamber H is thus always open for the receipt of explo-



sions through port G, and these explosions occur regardless of the positions occupied by the plungers.

Hub J is keyed to axle O, which is the driving element and to which may be attached any number of wheels, pulleys, &c. At one side of hub J a friction-wheel P, Fig. 5, preferably of rubber, is attached to square vertical shaft F. This shaft passes loosely through a square opening Q in the center of disk D and is provided at its upper end with a small crank *q*. An arm or lever R, to which the upper end of shaft F is fastened, has an adjustable slotted opening S, which is provided with a rod S' for the purpose of permitting wheel P to be shifted in and out of contact with hub J. The hole Q in disk D is larger at top and bottom than at its center to allow shaft F to work back and forth at will.

When there is too much vapor in chamber H, it passes up into a safety-valve T, which is provided with a spring and plunger U. The escaping vapor raises plunger U and escapes through safety-prop V. The upper end of plunger U is attached to the end of the lever. When this plunger by the action of the vapor is raised up and down, it changes the position of friction-wheel P on hub J, which regulates the speed of the feed-disk D. It will be seen that the nearer wheel P approaches main axle O the slower the motor will run. Lever R may be raised or lowered by means of screw W, which is threaded into arm or lug X for the purpose of increasing or decreasing the speed of disk D. Elastic bumpers *m* are attached to the bottom ends of plungers I I for the purpose of preventing the plungers from knocking against the outer rim as the plungers spring into chamber H after passing the plunger-guide. Chamber H at this point is higher than elsewhere.

It will be readily seen that it is simply necessary to turn crank *q* in order to set disk D in motion and that the explosions having been started by the means before indicated the vapor is at once secured by which the motor will continue to operate as long as pockets A A are kept supplied with gas. If desired, another motor may be attached by means of pipe connections at hole or escape N and operated by the escaped vapor.

What I claim, and desire to secure by Letters Patent, is—

1. The combination in a motor of a vapor-chamber, and the plungers and plunger-guide therein, of a square vertical shaft, of the friction-wheel carried on the bottom thereof, of the main axle and the hub keyed thereto and adapted to contact with said friction-wheel, of a horizontal disk carried by said shaft through a square opening in the center of said disk enlarged at both top and bottom, of the disk-pockets, an aperture leading into the

vapor-chamber and with which the disk-pockets are arranged to successively register during the motion of said disk, of the wires thereon, of the spring arranged to contact therewith, of the pipe connection between said pockets and the gasolene-tank which pipe is provided with any suitable means for heating and generating the gas therein, and the means through which to transmit the pressure caused by the explosions into the vapor-chamber from said disk-pockets as each pocket registers with the aperture provided, substantially as described and shown.

2. The combination with a gasolene-tank, a square shaft, of a disk, rotated thereby, of the pockets thereon and their copper wires, of a pipe attached to said tank and contacting with the passage into said pockets, of the hub and its axle and the vapor-chambers surrounding the same, of the plungers and their springs and the channels through which said plungers are let into said hub, of the plunger-guide, of the surrounding rim, of the opening through said rim to permit the pressure caused by the explosions in said pockets to enter said vapor-chamber, of the copper plates connected with said disk-pockets, of the spring, of the copper wire adapted to form connection between said spring and a storage battery and of the wire connecting with said plate and adapted to make complete circuit with the storage battery when the disk-pocket wire is brought into contact with said plate and secure explosion, substantially as described and for the purpose specified.

3. The combination with a gasolene-tank and its connecting-pipe of a disk rotated by a square vertical shaft, of the gas-pockets on said disk, of the disk-pocket wires, of the copper plate, of the spring and the connecting-wires to make complete circuit with a storage battery and cause explosions of gas as the pockets revolve, of an inclosed circular vapor-chamber, of the hub through the center thereof, of the plungers and the spring ends thereof let into said hub, of the elastic bumpers on said plungers, of the plunger-guide, of the means through which power is transmitted from the disk-pockets after explosions of the gas into said vapor-chamber, of a square vertical shaft, of a friction-wheel carried horizontally at the lower end thereof, of a lever connected at one end with the upper end of said shaft and of a safety-valve and its plunger having connection with the other end of said lever, and of the air-escapes, all substantially as described.

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

ALEXANDER MCCAHERN.

Witnesses:

S. R. GARVIN,  
FRED SMITH.