

(No Model.)

3 Sheets—Sheet. 1.

R. THAYER.

MOTOR.

No. 309,009.

Patented Dec. 9, 1884.

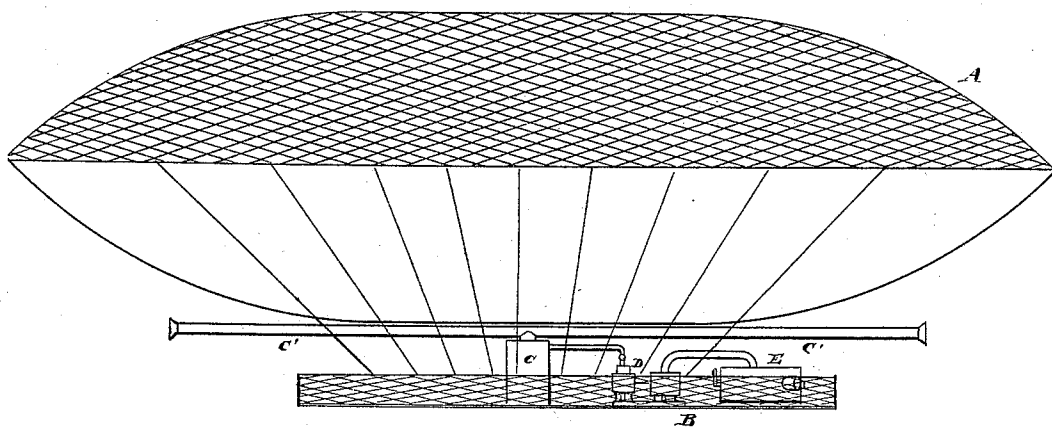


Fig. 1

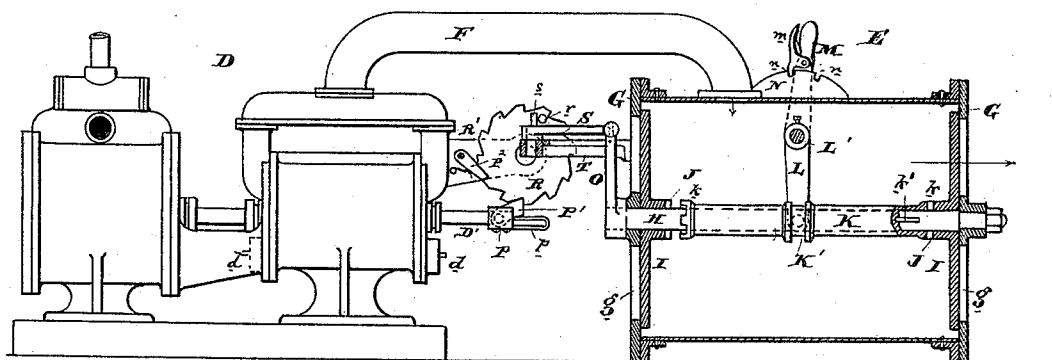


Fig. 2

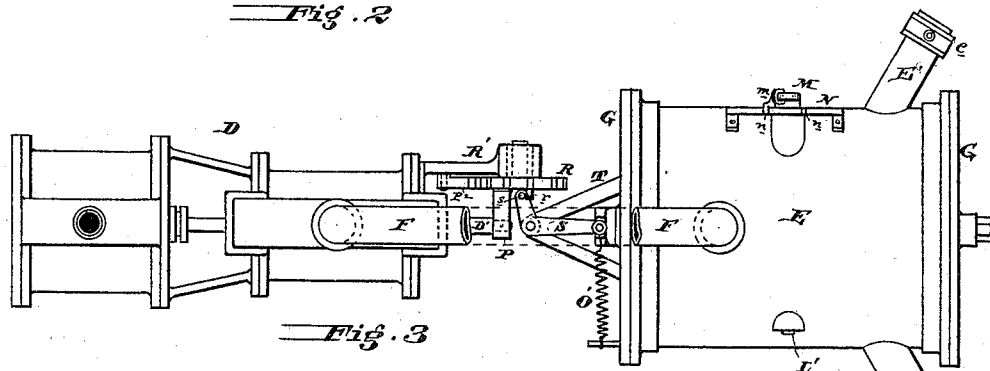


Fig. 3

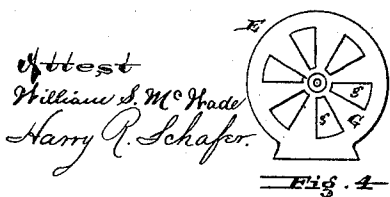


Fig. 4

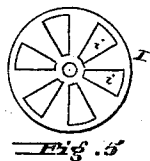


Fig. 5

Attest
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Harry Q. Schafer.

Inventor
Russell Thayer
By his atty.
Wm. S. McHade

(No Model.)

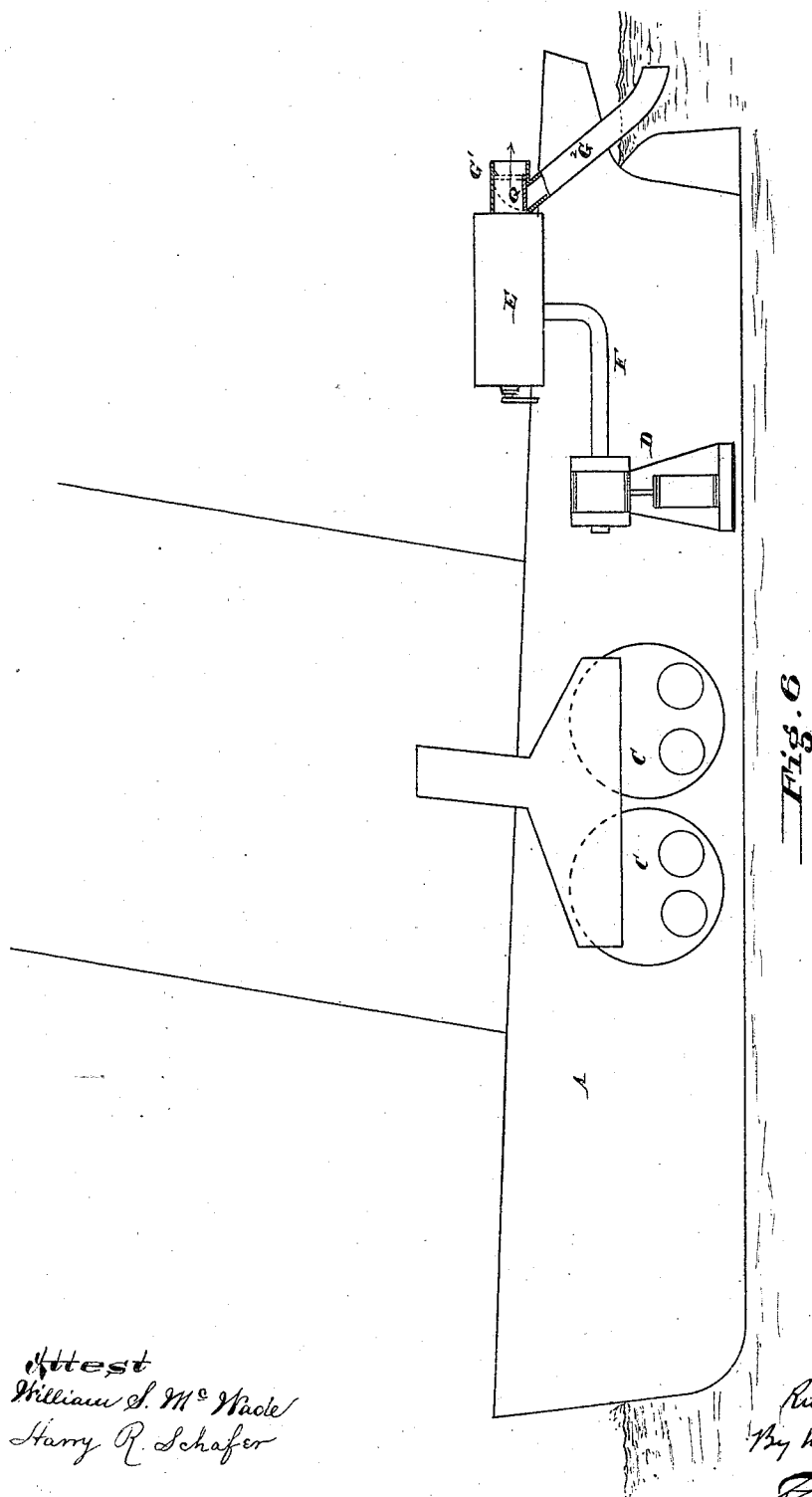
3 Sheets—Sheet 2.

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Attest
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[Signature]

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3 Sheets—Sheet 3.

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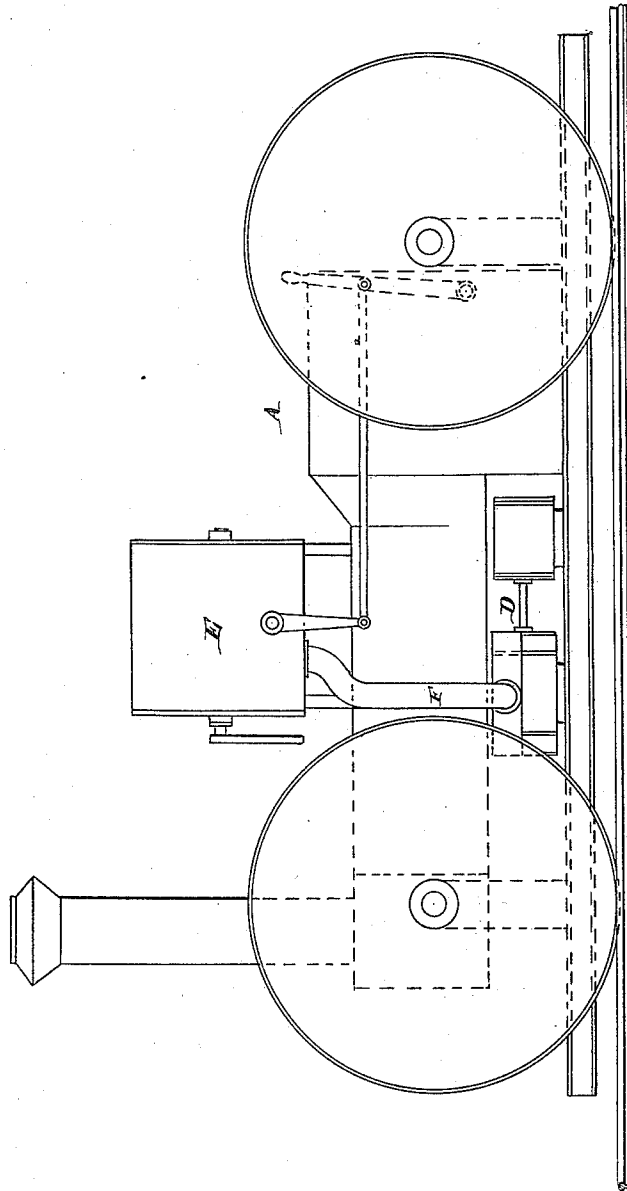


Fig. 8

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UNITED STATES PATENT OFFICE.

RUSSELL THAYER, OF PHILADELPHIA, PENNSYLVANIA.

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SPECIFICATION forming part of Letters Patent No. 309,009, dated December 9, 1884.

Application filed March 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL THAYER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Motors, of which the following is a specification.

My invention has reference to the propulsion of aerial ships, land vehicles, and marine vessels; and it consists in said aerial ships, vehicles, or vessels, provided with means to compress air, and an intermittent storage-reservoir having discharging-valves at one or both ends, said valves being intermittently operated to allow sudden discharges of the air or vapor compressed into said reservoir, whereby the forces of the air compressed in said reservoir when rendered unstable are enabled to react upon one end of said reservoir, to cause the said aerial ship, land vehicle, or marine vessel to be propelled, and in details of construction, all of which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof. By forcing the air into a reservoir so constructed that when the pressure therein reaches a certain amount a large opening would be automatically provided for the instantaneous discharge or escape of the compressed air or vapor at one end of said reservoir a very great increase in propelling power can be rendered available, for the reason that at the instant previous to the discharge from the reservoir the forces generated therein by the compressed air or gas acting against its extensive internal surface will be in a condition of stable equilibrium, but at the instant the end of the reservoir is opened these forces on that end will be released, while those on the other end are still acting, consequently at that moment the reservoir would take up a motion due to the unsupported action on the closed end, and as the reservoir is a part of the motor and the motor is a part of the entire structure to be propelled, it will move in the direction opposite to that from which the spent energy is released. By varying the area of the discharge and the pressure of the compressed air any desired force may be produced for use in propelling.

In the drawings, Figure 1 is a side elevation

of an aerial ship having my improved motor attached thereto. Fig. 2 is a side elevation (with the reservoir in section) of my improved motor. Fig. 3 is a plan view of same. Fig. 4 is an end view of the reservoir, showing the discharge-ports. Fig. 5 is a plan view of the reservoir discharge-valves. Fig. 6 is an outline of a marine ship having my improved motor applied thereto; and Fig. 7 is a side elevation of a land vehicle having my improved motor applied thereto.

A represents the aerial ship, land vehicle, or marine vessel. B is the deck or floor upon which the motor is applied. C is the boiler; C', the smoke-stack; D, the air-compressor, E, the intermittent storage-reservoir. The compressor D draws in air by valves *d* and discharges it by pipe F into the side of the reservoir E. This reservoir may be made in any manner desired, having one or both its heads G provided with discharge-valves. These heads G may have ports *g*.

H is a central shaft supported by the heads. Loosely supported upon this shaft H, and against the inner faces of heads G, are the circular valves I, having apertures *i*, to correspond with the openings *g* in the heads. These valves have clutch-hubs J. Upon the shaft H between the heads is a longitudinally-reciprocating sleeve, K, rotated or rocked with the shaft H by means of feathers *k'*. This sleeve is provided with circumferential groove K' and a clutch, *k*, on each end, which are adapted to mesh with the clutches J on valves I. This sleeve may be moved longitudinally to mesh with either of said valves by an arm, L, secured to a rock-shaft, L', and adapted to be rocked by a hand-lever, M, which may be set in either of its extreme positions by detent-pawl *m*, catching in notches *n* in segment N.

The shaft H may be intermittently rocked by hand or any suitable automatic mechanism—for instance, as shown—in which an arm O, is secured to the end of the shaft H outside the reservoir, and is drawn in one direction by a spring, O', and pulled in the other by a bell-crank lever, S, pivoted to a frame, T, and having its free arm provided with a pin, *s*.

R is a ratchet-wheel, which is supported in a bearing, R', and provided with a pin, *r*, on

its face, which is arranged to strike the pin *s* during the rotation of said ratchet-wheel. This ratchet-wheel is rotated by the pawl *P'*, pivoted to a head or block, *P*, carried by the piston-rod *D'*, the said pawl being pressed against the ratchet-wheel by a spring, *p*. The ratchet-wheel *R* is prevented from rotating in the other direction by a pawl, *P*². As shown, there are twelve teeth to the ratchet-wheel; hence the compressor will make twelve double strokes to make one revolution of said ratchet-wheel, and during one of the intermittent movements of the ratchet-wheel the pin *r* thereon strikes the pin *s*, rocking the crank *S* and suddenly opening the valve *I* by causing the shaft *H* to be rocked. As shown, it is discharging from the rear end. If, now, it is desired to move backward, the hand-lever *M* is moved and the sleeve *K* moved until its clutch meshes with the clutch *J* on the forward valve, *I*, when any movement to shaft *H* causes the discharge to take place in the opposite direction. By this means a great and stable force may be generated in the reservoir, and which may in an instant be made unstable by the opening of one of the valves *I*, allowing the forces to act mainly on one end of the reservoir.

To guide the vessel, tubular extensions *E'* may extend out of the reservoir *E* on each side, as shown in Fig. 3, and may be provided with valves *e*. By this means a constant discharge may be used, or the valves may be opened when the main discharge takes place to allow the unstable equilibrium of forces to come into play as well for steering as for propelling.

In the case of marine vessels, the air when leaving the reservoir *E* may be conveyed in all or part below the water by a pipe, *G*², (see Fig. 6,) to obtain the reactive force on the water as well as the resultant of the forces in the reservoir when the discharge takes place. The air in this instance may be controlled by a valve, *Q*, in the rear discharge-nozzle, *G'*.

I do not limit myself to the details of construction, as they may be modified in various ways without departing from my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A motor consisting of means to compress air, in combination with a storage-reservoir and valved discharging-ports at one or both ends, substantially as and for the purpose specified.

2. A motor consisting of means to compress air, in combination with a storage-reservoir and valved discharging-ports at one or both ends, and automatic mechanism to intermittently actuate said valves, substantially as and for the purpose specified.

3. A motor consisting of means to compress air, in combination with a storage-reservoir and valved discharging-ports at one or both ends, and automatic mechanism controlled by the compressor to intermittently actuate said valves after a certain number of strokes, substantially as and for the purpose specified.

4. A motor consisting of means to compress air, in combination with a storage-reservoir and valved discharging-ports at one or both ends and on its sides, substantially as and for the purpose specified.

5. A motor consisting of means to compress air, in combination with a storage-reservoir having discharging-ports at each end, valves to open or close said ports, and mechanism to render either of said valves operative, but not both at the same time, substantially as and for the purpose specified.

6. A motor consisting of means to compress air, in combination with a storage-reservoir having discharging-ports at each end, valves to open or close said ports, and mechanism to render either of said valves operative, but not both at the same time, and automatic mechanism to intermittently actuate said valve, substantially as and for the purpose specified.

7. The combination of compressor *D*, pipe *F*, reservoir *E*, having discharging-ports *g*, valves *I*, having ports *i* and clutch-teeth *J*, shaft *H*, means to intermittently rock said shaft, sleeve *K*, having clutch-teeth *k*, and means to move said sleeve, substantially as for the purpose specified.

8. The combination of compressor *D*, pipe *F*, reservoir *E*, having discharging-ports *g*, valves *I*, having ports *i* and clutch-teeth *J*, shaft *H*, means to intermittently rock said shaft, sleeve *K*, having clutch-teeth *k*, and means to move said sleeve, consisting of arm *L*, shaft *L'*, lever *M*, and means to lock said lever *M* in its extreme positions, substantially as and for the purpose specified.

9. The combination of compressor *D*, pipe *F*, reservoir *E*, having ports *g*, valves *I*, having ports *i*, shaft *H*, arm *O*, lever *S*, having pin *s*, ratchet-wheel *R*, having pin *r*, piston-rod *D'*, and pawl *P'*, substantially as and for the purpose specified.

10. The combination of the air-compressor *D*, pipe *F*, reservoir *E*, a discharging-valve, means to intermittently actuate said valve, and means to guide the discharged air in one or more directions, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

RUSSELL THAYER.

Witnesses:

R. M. HUNTER,
FRANCIS S. BROWN.