

O. BOLTON, Jr.

Utilizing Gas as a Motive-Power.

No. 143,954.

Patented Oct. 28, 1873.

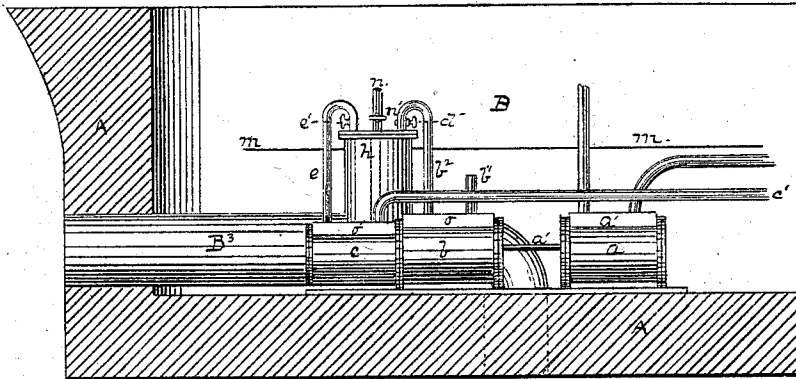


Fig. 1.

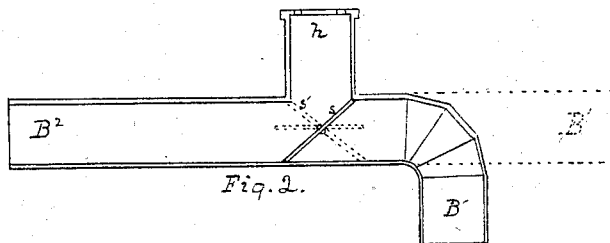


Fig. 2.

WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

OGDEN BOLTON, JR., OF CHARTIERS TOWNSHIP, ALLEGHENY COUNTY,
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IMPROVEMENT IN UTILIZING GAS AS A MOTIVE POWER.

Specification forming part of Letters Patent No. **143,954**, dated October 28, 1873; application filed July 17, 1873.

To all whom it may concern:

Be it known that I, OGDEN BOLTON, JR., of Chartiers township, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Utilizing Gas as a Motive Power; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a sectional view of the stern of a vessel with my improved apparatus arranged therein. Fig. 2 is a sectional view, in outline, of the water-pipe, combustion-chamber, and valve.

Like letters of reference indicate like parts in each.

My improvement relates to that class of engines commonly known as gas-engines, in which the explosive power of the gas is made use of as the prime motor. By my improvement I employ any suitable explosive compound—either gaseous, liquid, or solid—in a close chamber, but, instead of the force of the gas evolved by the explosion operating against a piston, it acts against a column or body of water or other fluid, which forms one side of the chamber, said column of water, by being forced out, performing the function of the ordinary piston and stem, as a means of communicating motion. The apparatus is so constructed, as hereinafter described, that the chamber in which the explosion is effected will, between each two explosions, be refilled or recharged with water from some source other than that at which it is ejected, so that the operation may be carried on continuously.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and operation, both in connection with explosive gases and explosive solids.

In Fig. 1, A represents a section through the stern of a boat, B, and showing the water-pipe B³. At a I have shown the cylinder of an ordinary steam-engine, the piston-stem a' of which operates a pumping piston or plunger in the air-pump b, and a like piston or plunger

in the gas-pump c. The steam-engine a is provided with the usual valves in the valve-chest a', and the usual steam and exhaust pipes, as indicated. The air-pump b receives air through the pipe b¹, and, by the piston or plunger therein, such air is forced intermittently, by the pipe b², into the chamber h. The gas-pump c receives its gas from any suitable gas-generator by a pipe, c', and such gas is forced into the chamber h intermittently by the piston or pump plunger through the pipe c. These pumps are provided with any suitable arrangement of valves in the valve-chests o o'; or, for cutting off the supply of air and gas to the chamber h at suitable intervals, cocks may be employed, as shown at d' and e'. The pipe n, opened and closed by a cock, n', allows the gas to escape intermittently from the chamber h after each explosion. The explosive gas or compound thus introduced into the chamber h is exploded by means of electric wires m, or by other known means usually employed for such purposes. The water-pipe B³ may extend from end to end of the vessel, or open externally thereto, at any desired point in front and rear of the exploding-chamber h. It receives water at one end and discharges it at the other, and the direction of the flow of the water is changed at pleasure, according to the direction in which it is desired to propel the vessel, by means of any suitable valve device, such as is shown in Fig. 2. The apparatus is arranged, preferably, so that the top of the chamber h shall come below the water-level or water-line. Then, the valve s of Fig. 2 being shifted to the position shown at s' by dotted lines, the water entering at the port B¹ will fill the chamber h. The operation of the pumping apparatus described will then force into the upper part of the chamber h a charge of air and gas, in any desired quantity, and in such proportion as to make a highly-explosive compound. By means of the electric wires indicated this compound is exploded, the valve s, however, being first shifted to the position indicated at full lines in Fig. 2. The explosion of the gas in the chamber h will then force out the water at the port B² with the

result of impelling the boat forward. After the force of the exploded gas is exhausted, or nearly so, the pipe *n* is opened, the gases in the chamber *h* allowed to escape, and the operation is repeated.

In order to reverse the motion of the boat, it is only necessary to shift the valve of Fig. 2 so as to take in water at the port B², in filling the chamber *h*, and force it out at the opposite port.

The apparatus described is particularly designed for the use of hydrogen gas, which, when mixed with air, gives a highly-explosive compound; but the air and gas may be mixed before being charged into the chamber *h*; or any other suitable gas or gaseous compound of an explosive character may be employed in lieu thereof. Nor do I limit myself to any particular means for charging the chamber *h*, or exploding the gas therein, or allowing its escape.

Any desired number or sets of such apparatus may be employed in one vessel, either side by side or in suitable position to produce motion in the same or in different directions.

The motion thus imparted to the water by means of the explosion I also utilize as a means of communicating power to drive machinery, by combining with the discharge-pipe any suit-

able form of water-wheel in such position that the water as ejected will act on the wheel, in the usual way. And for the gaseous explosives described I substitute, in some cases, any known suitable fluid or solid (as distinguished from gaseous) explosive, and effect the explosion thereof by any known appropriate means. But these elements of my improvement, namely, the combination of a water-wheel with the exit-pipe, and the particular construction of the apparatus with reference to the explosion of fluid or solid explosives, will form the subject-matter of separate patents.

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

The combination of a chamber for the explosion of gaseous or non-gaseous explosives, an independent supply-pipe for supplying water thereto between explosions, and a pipe for communicating, by water-pressure, the power of the explosion, substantially in the manner set forth.

In testimony whereof I, the said OGDEN BOLTON, Jr., have hereunto set my hand.

OGDEN BOLTON, JR.

Witnesses:

ALEX. H. MILLER, Jr.,
JAMES I. KAY.