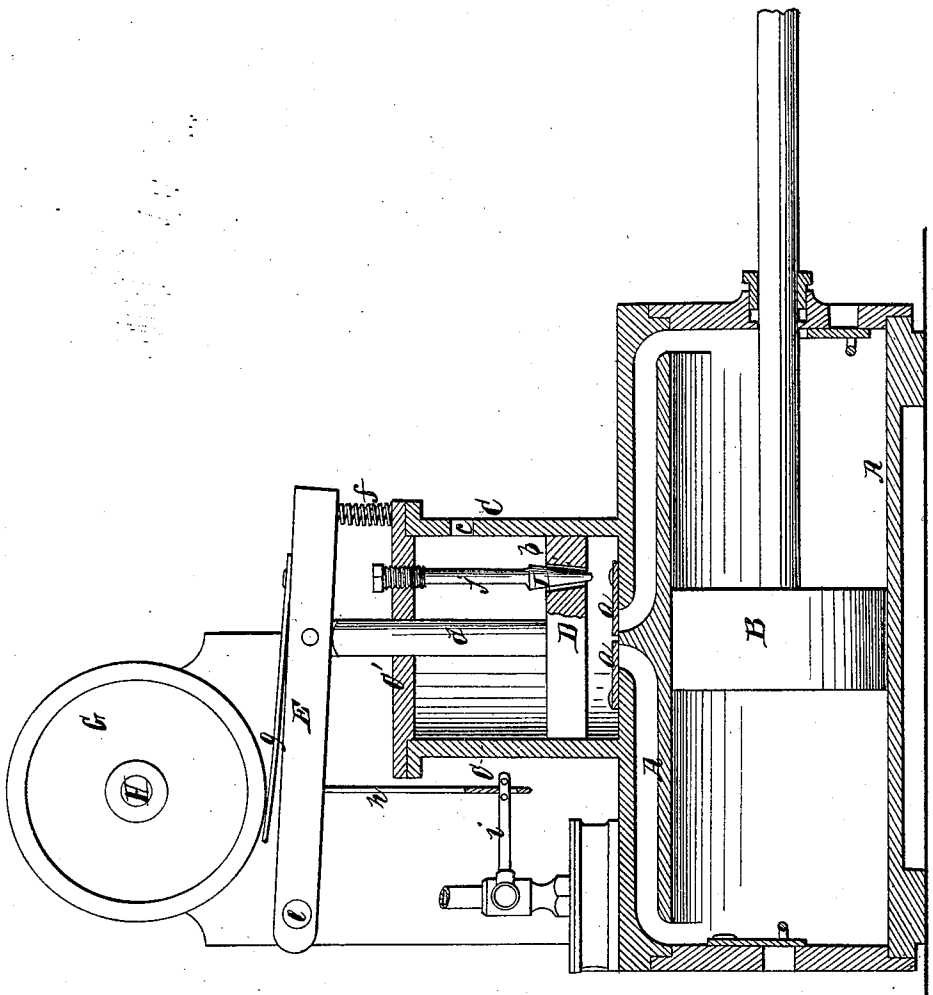
B. Mackerly,

Governor.

No. 42,956. Patented May 31, 1864.



Witnesses.
J. W. Coombs
Geo. Reed

Inventor.
B. Mackerly
per Munn & Co
attys

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

BENJAMIN MACKERLEY, OF PAINT P. O., OHIO.

IMPROVEMENT IN ATMOSPHERIC JOURNALS.

Specification forming part of Letters Patent No. **42,956**, dated May 31, 1864.

To all whom it may concern:

Be it known that I, BENJAMIN MACKERLEY, of Paint P O., in the county of Highland and State of Ohio, have invented a new and Improved Atmospheric Regulator for Regulating the Speed of Steam-Engines and other Motors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable any person skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, said drawings representing a vertical section of a regulator constructed according to my invention.

This regulator is composed, principally, of an air-pump or bellows, which is driven by the motor to be regulated for the purpose of forcing air into a cylinder containing a piston, upon which the pressure of the air so forced into the cylinder acts to bring into operation a friction-brake, or to operate upon a throttle or other valve, as may be required, to control the speed of the engine or motor.

The invention consists, first, in a stationary valve, applied within the air-cylinder to operate in combination with a hole in the piston thereof for the purpose of regulating the escape of the compressed air through the said hole, and thereby making the regulator more sensitive and its action quicker.

It also consists in a novel mode of applying a friction-brake in combination with such regulator to act upon the fly-wheel or other wheel upon the shaft of the motor.

A is an air-compressing pump of ordinary construction, having its piston B driven by the motor to be regulated. C is the regulating-cylinder, so placed that the delivery-valves *a a* of the air-pump deliver their air into the bottom or below the regulating-piston D, which is fitted air-tight to the said cylinder. *b* is the hole in the said piston through which the compressed air escapes from the portion of cylider below to the portion above the piston, and *c* is an opening in the upper part of the cylinder for the escape of air therefrom. I is the stationary valve applied within the hole *b* in the piston D. This valve is of taper form, its smaller end being downward, and is attached to a spindle, *j*, which is screwed through the upper head, C, of the cylinder, and which is adjustable higher or lower for the purpose to be hereinafter described. The piston D is furnished with a rod, *d*, which works through a guide on the head of the cylinder C, and which is connected with a lever, E, which is arranged to work upon a fixed fulcrum-pin, *e*. This lever has applied to it a spiral or other spring, *f*, or a weight, the object of which is to counteract in a desirable degree the upward pressure of the air upon the piston D. To the upper surface of the lever E there is secured a spring, *g*, which constitutes the break for acting upon the peripherical surface of the fly or other wheel, G, which is fast upon the main shaft H of the motor, or upon any other shaft geared therewith. The lever E is also connected by a rod, *h*, with a throttle-valve, *i*, in such manner that as the said lever E is raised by the upward pressure of the air on the piston D the opening of the said valve will be reduced, and that as the said pressure is overcome by the spring E or weight and the lever E depressed the opening of the valve will be increased.

The operation of the regulator is as follows: The compressed air forced into the lower part of the cylinder C by the air-pump or bellows presses up the piston D and escapes through the hole *b* and out by the opening *c*. If the speed of the motor be increased by throwing off some of its work, or any other cause, the increased pressure of air upon the under side of the piston D instantly raises it and so reduces the opening between the valve I and the sides of the hole *b*, thereby checking the pressure of the air through the hole and producing a further increase of the pressure of the air under the said piston and an increased upward movement thereof, and the lever E, moving upward with the said piston *h*, produces or increases the pressure of the brake-spring *g* upon the wheel G and so checks the movement of the motor, while the said lever, operating also upon the valve-lever *i*, reduces the opening of the throttle or other regulating valve of the motor and further checks the motion in the requisite degree. On the contrary, in case of the speed of the motor being too much reduced, the diminished pressure of air upon the under side of the piston D causes it to be depressed by the action of the spring F, and the lever E, being thus drawn down, the pressure of the brake-spring *g* upon the wheel G is removed or reduced,

and the opening of the throttle or regulating valve of the motor is increased until the proper speed is obtained. The valve I serves as a means of adjusting the action of the regulator and varying the speed of the engine. By screwing down the said valve to reduce the opening *b* and to reduce the escape of air from under the piston the speed of the motor is reduced, and by screwing it up an opposite effect is produced.

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

1. The adjustable stationary valve I, applied, in combination with the hole *b*, in the piston D of an atmospheric regulator, substantially as and for the purpose herein specified.

2. The lever E and brake-spring *g*, applied in combination with the piston of the atmospheric regulator, substantially as and for the purpose herein described.

BENJAMIN MACKERLEY.

Witnesses:

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