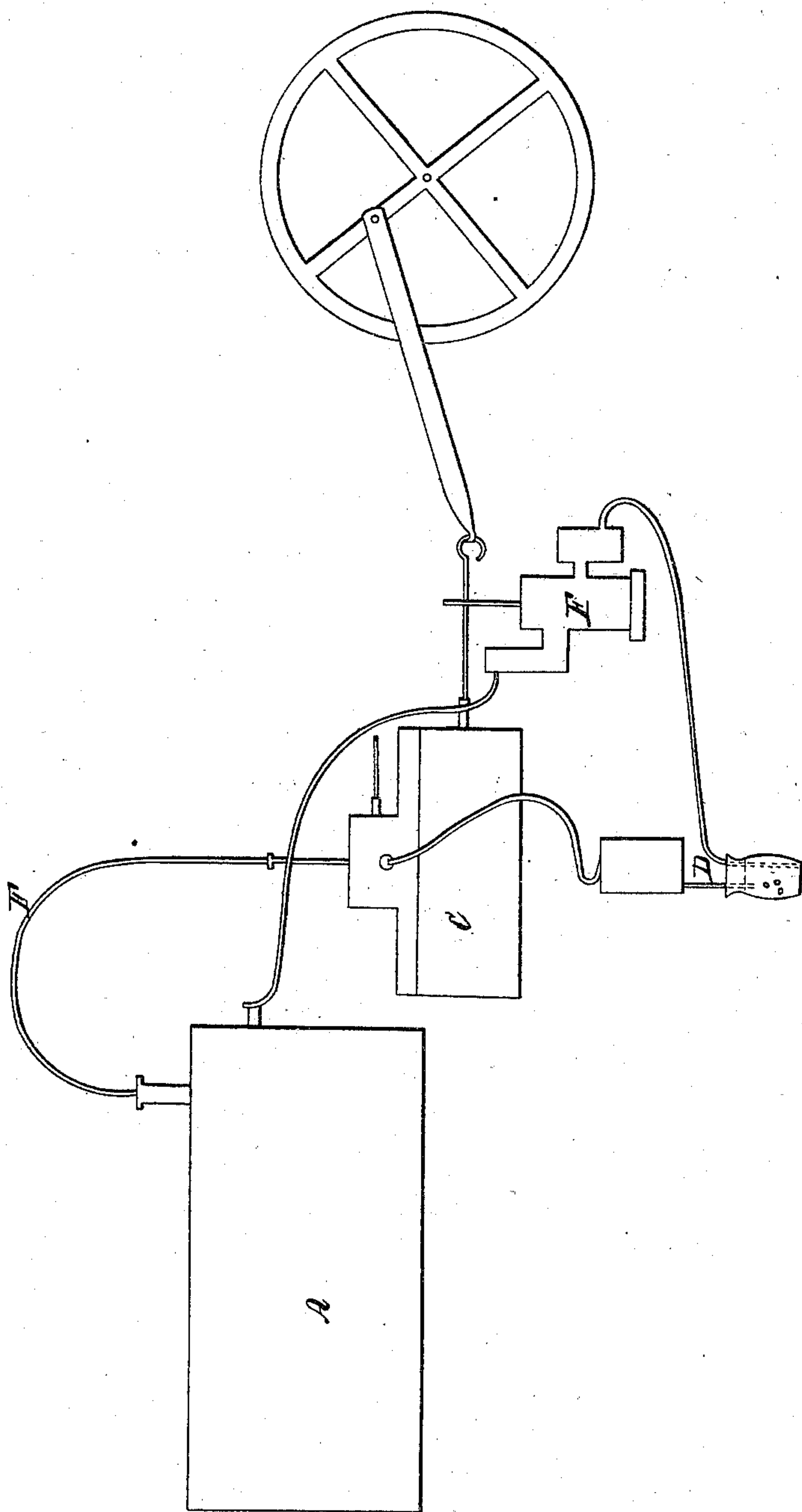


B. HUGHES.  
ACTUATING ENGINES BY BISULFURET OF CARBON.  
No. 11,553. Patented Aug. 22, 1854.



# UNITED STATES PATENT OFFICE.

BERNARD HUGHES, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN ACTUATING ENGINES BY BISULPHURET OF CARBON.

Specification forming part of Letters Patent No. **11,553**, dated August 22, 1854.

*To all whom it may concern:*

Be it known that I, BERNARD HUGHES, of the city of Rochester, in the State of New York, have invented a new and Improved Mode of Propelling Machinery; and I do hereby declare that the following is a full and exact description thereof.

The nature of my invention consists in the application of the bisulphuret of carbon in the form of vapor as a motive power.

To enable others to use my invention, I will describe its application, reference being had to the annexed drawing, forming a part of this specification, as a general illustration, in which A is a generator; C, a working-cylinder; D, a condenser; E, a pump to transfer the condensed article from the condenser to the generator, and F a conducting-pipe from the generator to the working-cylinder.

I fill a boiler of an ordinary steam-engine with this liquid and apply heat to the boiler and supply the material as fast as it evaporates by a pump; or I fill the boiler partly full of water and either inject the bisulphuret of carbon into the water heated to any temperature above  $108^{\circ}$  or I inject the bisulphuret of carbon into the vapor of water. The vapor of the bisulphuret of carbon operates precisely as steam, for which, in fact, it is a substitute; but as, on account of the cost of the material which I use, it is important that it should not be lost after it has once exerted its effect, I make use of any known means of producing a perfect condensation of the vapor after it has passed through the cylinder and performed its work to enable me to use the material over again.

The advantages of using the vapor of the bisulphuret of carbon as a motive power are as follows:

First, it boils at a temperature of  $108^{\circ}$ , while water boils at  $212^{\circ}$ , and my experiments have led me to conclude that at a temperature of  $212^{\circ}$  the expansive power of the vapor of the bisulphuret of carbon is double that of water.

Second, when water passes into a state of vapor at a temperature of  $212^{\circ}$  Fahrenheit  $1,000^{\circ}$  of heat become latent in the vapor. I have ascertained by my experiments that when the bisulphuret of carbon passes into a state of vapor at a temperature of  $108^{\circ}$  only  $144^{\circ}$  of heat become latent. Therefore, by using the vapor of the bisulphuret of carbon as a motive power a saving of fuel is effected proportionate to the difference between the quantity of heat which becomes latent in the vapor of water and the vapor of the bisulphuret of carbon.

Third, it is known that in a condensing-engine nearly one-third of the power is expended in pumping the water for the condensation of the steam. By using the vapor of the bisulphuret of carbon I am enabled to dispense with about eight-ninths of the quantity of water ordinarily used for condensing steam.

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

The application of bisulphuret of carbon to any convenient form of the steam-engine as a motive power, substantially as described, when the vapor of said substance, after it has passed through the cylinder, is condensed by any known means of producing condensation in a suitable reservoir and preserved for the future supply of the boiler, substantially as above described.

BERNARD HUGHES.

Witnesses:

JOHN L. HAYES,  
CHAS. L. ALEXANDER.