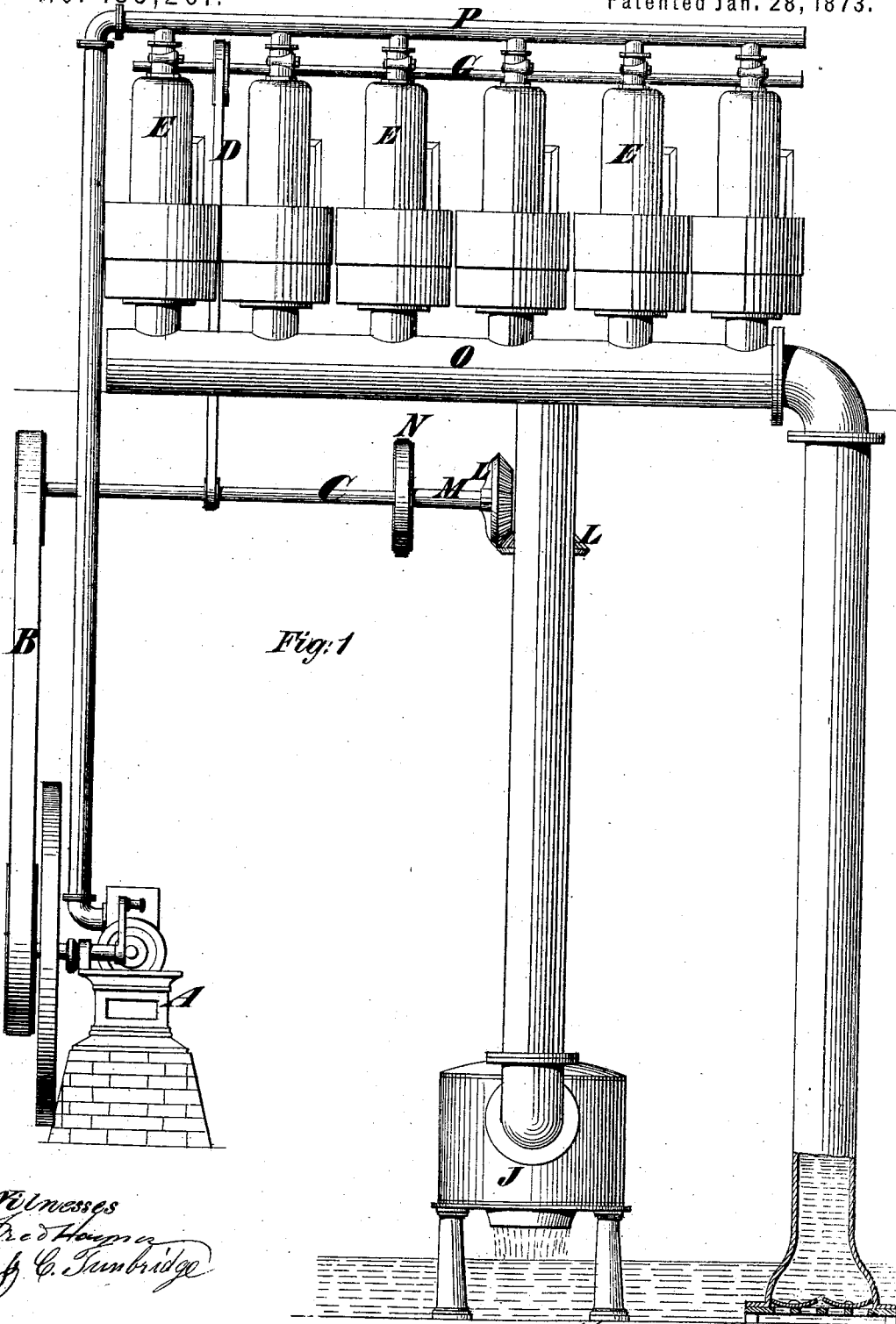


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Steam Vacuum-Pumps.

No. 135,201.

Patented Jan. 28, 1873.



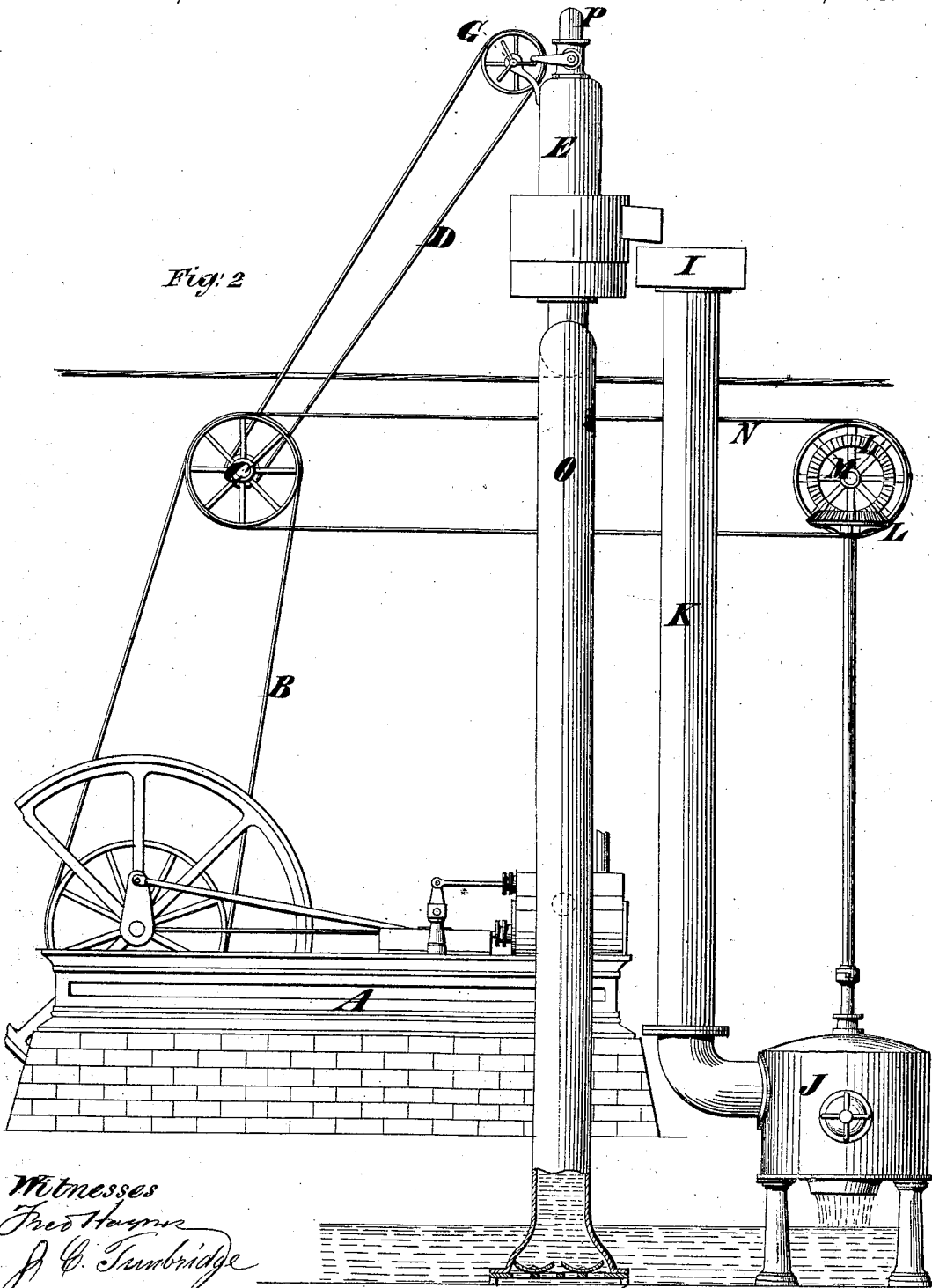
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# UNITED STATES PATENT OFFICE.

WILLIAM BURDON, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. 135,201, dated January 28, 1873.

Z'.

*To all whom it may concern:*

Be it known that I, WILLIAM BURDON, of Brooklyn, in the county of Kings and State of New York, have invented a Combination of a Steam-Engine, a Steam Vacuum-Pump, and a Water-Wheel, of which the following is a specification:

This invention consists in a steam-engine, a steam vacuum-pump, and a water-wheel, when so combined that the exhaust steam from the steam-engine is used to operate the pumps, and the latter supplies water to the wheel to drive it, whereby the exhaust steam of the engine is utilized, and by means of the aforesaid pump and wheel, made to form an auxiliary to the engine, and a very economical and effective motive power is produced.

In the accompanying drawing, Figure 1 is a view looking endwise at the engine and sidewise at the pumps and water-wheel, and Fig. 2 is a view taken at right angles to the former.

Similar letters of reference indicate corresponding parts in both figures.

A is the steam-engine, which is or may be of any known form. Its power is communicated by a belt, B, and suitable pulleys, to a counter-shaft, C. Another belt, D, connects this counter-shaft C with the valve-operating shaft G of the pumps E E, which are arranged some distance above the engine, on an upper floor of a building, for instance. They are the same as described in an application previously filed by me for Letters Patent, consisting of a series of vacuum-vessels whose steam inlet-valves are shifted by tappets on the shaft G, before mentioned, to admit steam to them one after the other in regular succession, so that one of the pumps is always in full operation, and a steady stream is constantly kept up. Steam is conducted to them from the engine A by a pipe, P, which extends along the top of the whole series.

The water to be pumped is situated in the lower floor of the building, and is conveyed to the pumps through a pipe, O, which, like the steam-pipe P, just mentioned, extends along the whole series. All these pumps discharge into curbs or discharge-boxes, with which they are pro-

vided, and these all deliver into an adjacent trough, I, from which the water is conveyed to the water-wheel J by a single pipe, K.

The water-wheel represented is one of the class known as turbines. The water enters its case or shell at one side, and is discharged through the bottom. The shaft of this wheel is geared by miter-wheels L L with a counter-shaft, M, from which power is communicated by a belt, N, to the counter-shaft C, to which the power of the engine is also communicated, as I previously mentioned.

Steam is conducted in the ordinary manner from a steam-generator to the engine A, and when exhausted from the latter is conveyed to the pumps E E. By being condensed in the pumps one after another, it causes water to be forced up into them, and then, by being afterward admitted, it destroys the vacuums and permits the pumps to discharge successively. The water delivered from the pumps is conducted to the wheel J, and by operating it forms an auxiliary to the engine.

It is evident that if I utilize exhaust steam of an engine to the production of additional power, I have a clear gain, because I utilize that which ordinarily is considered of no account. I therefore produce an extremely economical and effective motive power, which can be made for a considerably less sum than almost any now in use.

My only reason for arranging the pumps in an elevated position is that I may obtain a good head of water for driving the water-wheel.

The same water may be pumped up over and over again where desirable.

What I claim as my invention is—

A steam-engine, a steam vacuum-pump, and a water-wheel so combined that the exhaust steam from the engine is used to operate the pump, and the latter is made to supply the water-wheel with water, whereby the exhaust steam is converted into an auxiliary to the engine, substantially as and for the purpose herein set forth.

WM. BURDON.

Witnesses:

MICHAEL RYAN,  
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