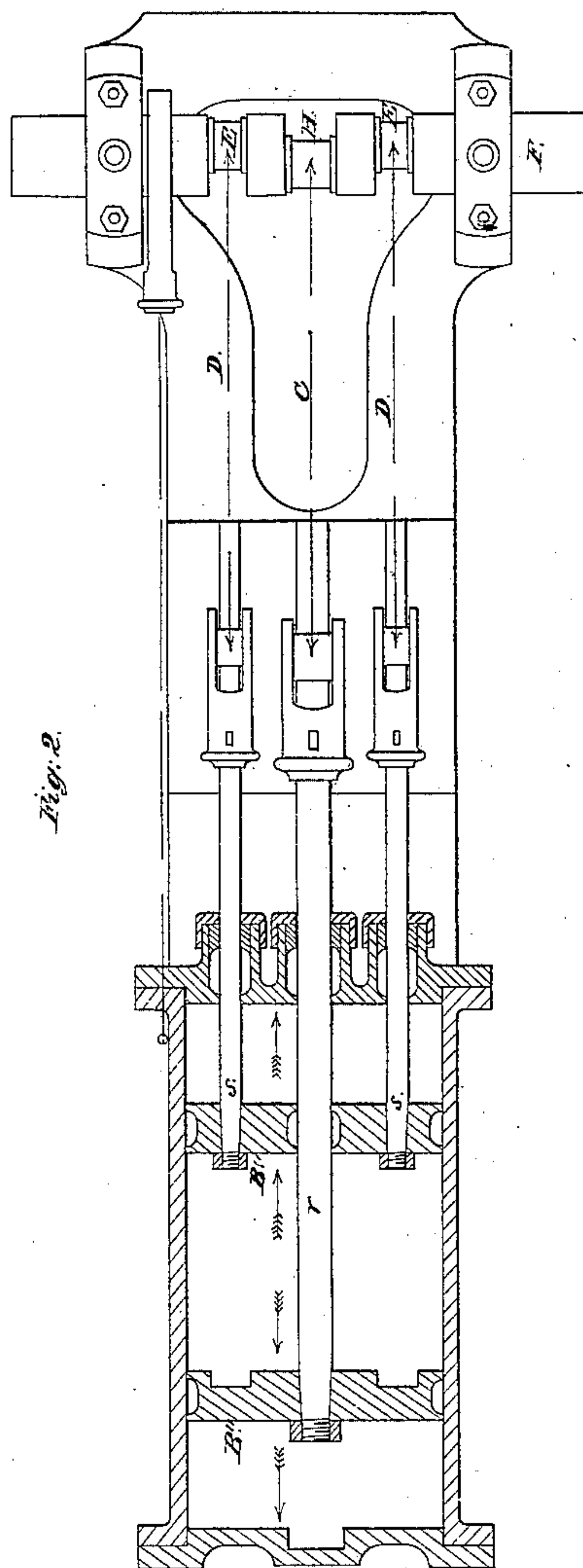
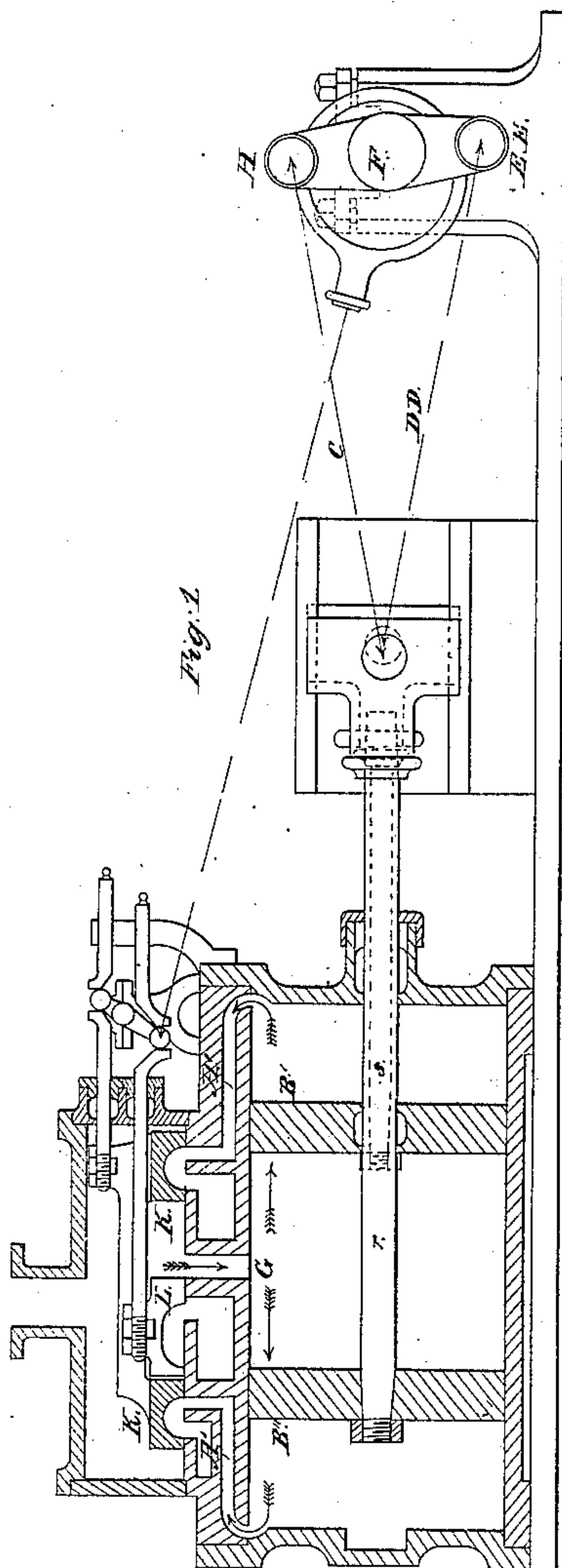


W. Wells,

Reciprocating Steam Engine,

No 30,030,

Patented Sept. 11, 1860.



Witnesses:

W. Wells.  
Daniel Pomeroy

Inventor:

Wallace Wells

# UNITED STATES PATENT OFFICE.

WALLACE WELLS, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND  
SAMUEL B. WELLS, OF SAME PLACE.

## IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 30,030, dated September 11, 1860.

*To all whom it may concern:*

Be it known that I, WALLACE WELLS, of the city, county, and State of New York, have invented certain new and useful Improvements in Engines and Machines Using Cylinders and Pistons; and I hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification.

The drawings show the application of my improvements to the steam-engine.

Figure 1 is a longitudinal elevation, and Fig. 2 a horizontal section, of the steam-engine.

The cylinder is made in any of the usual forms, with three steam-ports, two of them, A' A'', being at the ends, and the third, G, at the center.

There are two pistons, B' B'', each traversing one-half the length of the cylinder. The piston next to that end of the cylinder from which the power is to be applied has two rods, s s, working through the cylinder-head at that end at points opposite its center, arranged with the usual guides, and to these rods are attached the connecting-rods D D, of equal length, which connect with the two crank-arms E E, both of which are on the same side of the crank-shaft F. The other piston, B'', has its rod r working through the center of piston B' and through the same head of the cylinder, and is there attached to the connecting-rod C, which connects with crank-arm H, the latter being opposite to arms E E on the shaft.

The movement of the engine thus constructed is as follows: The steam, being admitted at port G, acts equally upon both pistons, driving them apart to the ends of the cylinder. It is then cut off and admitted at the ports A' A'', by which the motion of the piston is reversed and the revolution of the shaft continued. The pistons move in opposite directions with equal velocity and through equal space in the same time, each stroke or movement completing one revolution of the crank-shaft. From this combination there

results a reciprocating engine in which all the connections may be made from one end of a single cylinder directly with the opposite arms of the crank-shaft.

Among the advantages which I contemplate as resulting from this combination is that, as the engine exerts its power upon the opposite arms of the shaft equally and uniformly throughout its revolution, there will be an equilibrium in the power and weight applied to the arms of the shaft, which must greatly increase the operative and effective power and speed of the engine. This combination produces an easy balance or swing in the movement of the engine which cannot be obtained from an arrangement of the connections less simple, direct, and compact. The whole force of the steam or other motive power is expended directly on the opposite movable parts of the machine connected directly with the crank-arms, so that the engine requires no external fastening or point of resistance for the purpose of exerting its force upon the shaft. This will reduce greatly the weight and strength of material now required in the engine and its fastenings. The advantages of this combination will become most apparent in marine engines.

I do not confine myself to the use of steam or any particular motive power.

I am aware that two piston engines have been made heretofore, and I do not claim that as my invention. In all that I am aware of the connections of the engine are different from mine, being generally made from both ends of the cylinder or by the aid of levers and cams and with two cylinders.

The invention which I claim as mine, and desire to secure by Letters Patent, is—

The combination of the pistons with the connecting-rods and the crank-arms or their equivalents, arranged substantially as herein described.

WALLACE WELLS.

Witnesses:

W. WELLS,  
DANIEL POMEROX.