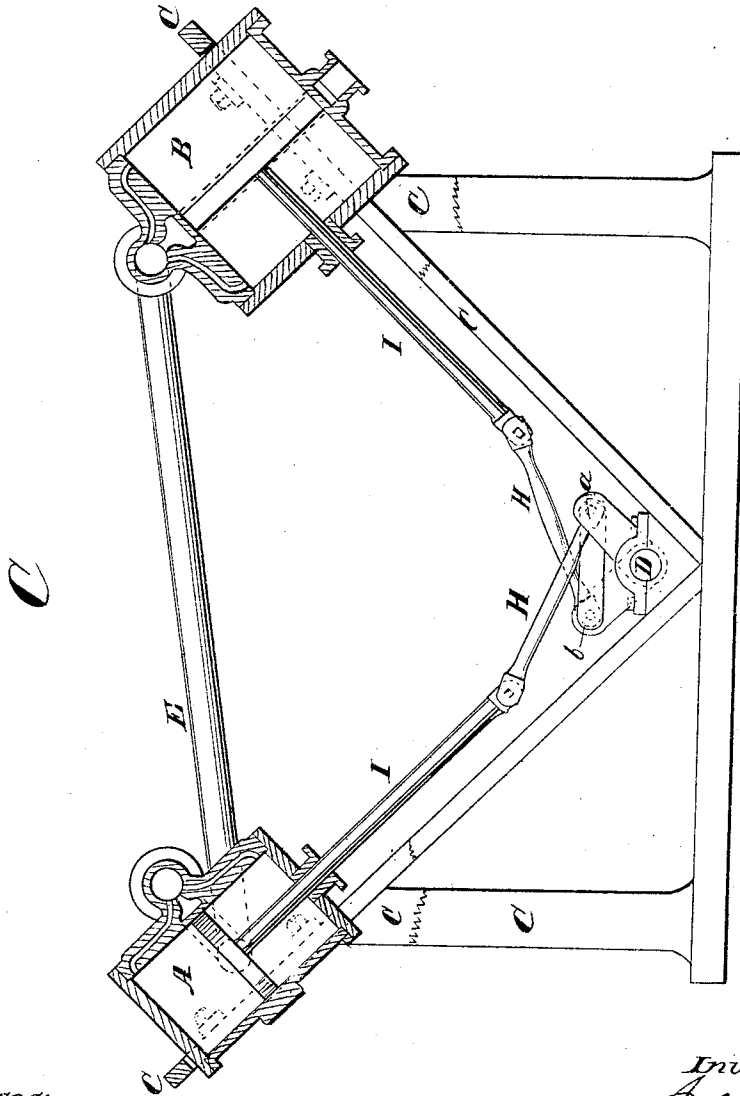


J. L. LAY.
STEAM ENGINE.

No. 66,973.

Patented July 23, 1867.



Witnesses:
Jay Keyser
Albert Haight

Inventor:
John L. Lay,
by *J. Traser & Co.*
Attys.

United States Patent Office.

JOHN L. LAY, OF BUFFALO, NEW YORK, ASSIGNOR TO HIMSELF AND
H. O. PERRY, OF SAME PLACE.

Letters Patent No. 66,973, dated July 23, 1867.

IMPROVEMENT IN STEAM ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN L. LAY, of the city of Buffalo, in the county of Erie, and State of New York, have invented a certain new and improved Inclined Compound Engine; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, which represents a side elevation thereof, with the cylinders in section.

My invention consists in the arrangements of a high and low-pressure cylinder, in which the steam is first used in the high-pressure, and then exhausted into the lower-pressure cylinder, and worked expansively in the manner hereinafter described.

In the drawings, A represents the high-pressure, and B the low-pressure cylinder of larger size, each supported by a suitable frame, C, in an inclined position, as shown, the piston-rods I I of both connected by means of ordinary connecting-rods H H, with the cranks *a b* set at corresponding angles on the shaft D. Steam direct from the boiler is employed in cylinder A, the exhaust therefrom leading through the pipe E to cylinder B, where the steam is again used expansively, the pistons of both moving at the same speed, and together actuating the shaft D.

One of the chief advantages of my arrangement is, that in vessels which are provided with two inclined high-pressure engines, it enables the same to be readily converted into a compound high and low-pressure engine; by substituting for one of the cylinders a low-pressure cylinder, and connecting the two by the exhaust pipe E, as before described. This requires little or no change in the working machinery, and involves but a trifling expense compared with that required to remove the old, and substitute and arrange a new engine entire. My arrangement also brings the centre of gravity of the engine and connecting machinery lower in the hold than when arranged vertically one above the other, which, in that class of vessels which are propelled by means of a screw, becomes an advantage of considerable importance.

What I claim as my invention, is—

The arrangement of a high and low-pressure cylinder A and B, inclined as described, and connected by the pipe E, in combination with the double crank-shaft D, connected with and operated by both, substantially in the manner and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN L. LAY.

Witnesses:

JAY HYATT,
J. R. DRAKE.