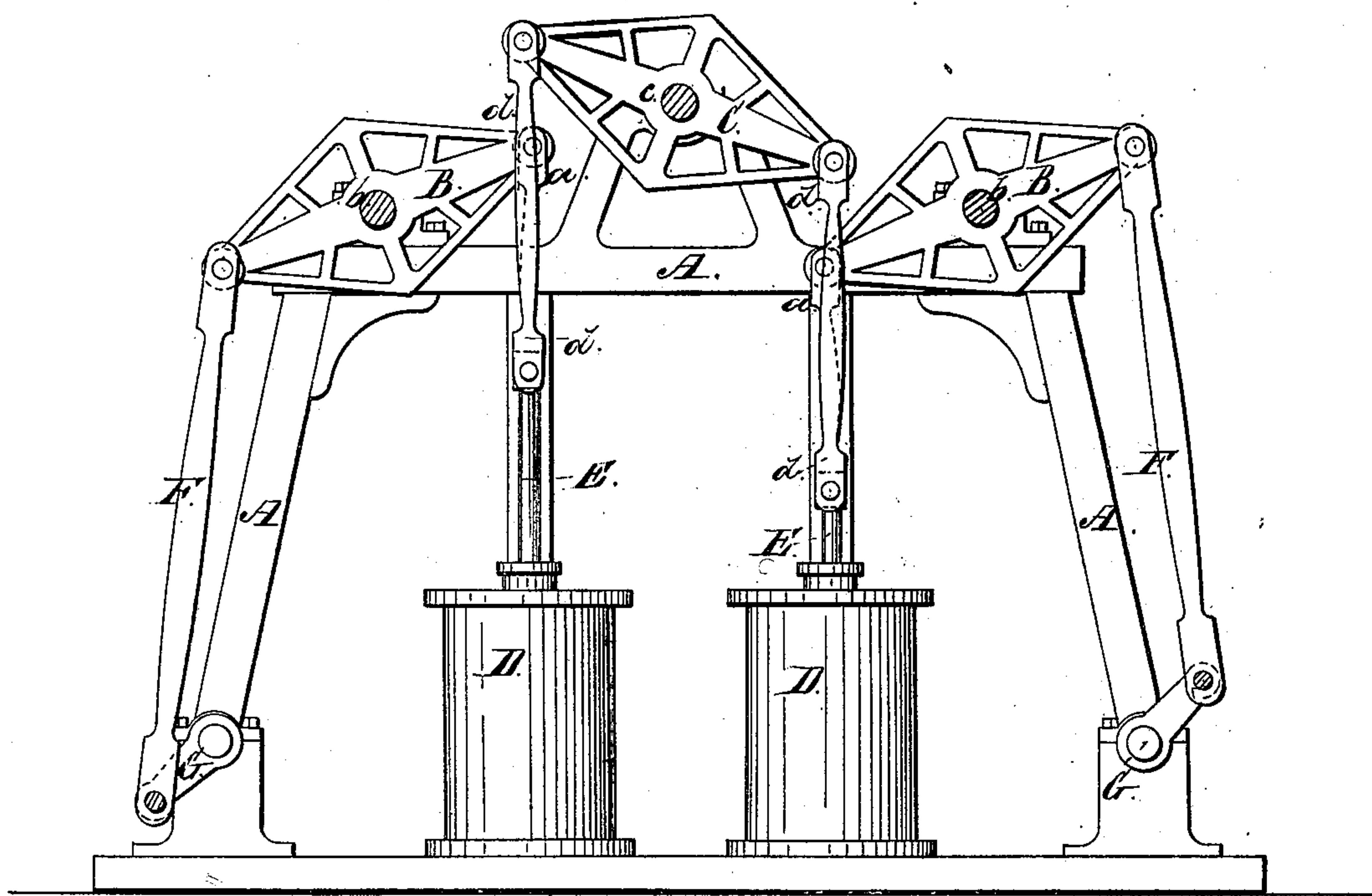


*T. Doyle,*  
*Reciprocating Steam Engine,*  
*No. 13,748, Patented Nov. 6, 1855.*



# UNITED STATES PATENT OFFICE.

THOS. DOYLE, OF NEW YORK, N. Y.

## ARRANGEMENT OF TWO-BEAM ENGINES WITH PARALLEL SHAFTS.

Specification of Letters Patent No. 13,748, dated November 6, 1855.

*To all whom it may concern:*

Be it known that I, THOMAS DOYLE, of the city, county, and State of New York, have invented a new mode of Connecting  
5 Steam-Engines for the Purpose of Driving Parallel Shafts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part  
10 of this specification, which represents a side elevation, partly in section, of double engine connected according to my invention.

This invention consists in the arrangement of two beam engines in line with each  
15 other—that is to say with their beams in the same plane—and with the cylinder ends of the engines contiguous to each other, and connecting their piston rods or beams by an intermediate beam. By this means the two  
20 shafts which are parallel with and at some distance from each other are caused to rotate at a uniform speed. The main object of this invention is its application to drive two pairs of paddle wheels to propel a ves-  
25 sel, but it may also be used for driving two parallel shafts for other purposes.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

30 A, A, is a strong framework supporting the bearings for the centers  $b, b$ , of the engine beams B, B, and intermediate beam C.

D, D, are the cylinders, the centers of which are at a distance apart about equal  
35 to the engine beams.

E, E, are the piston rods which are connected with the beams B, B, in the usual manner by links  $a, a$ .

E, F, are the connecting rods and G, G, the crank shafts.

The intermediate beam C, is of a length  
40 to correspond with the distance between the cylinders and consequently of about the same length as the engine beams. Its center  $c$ , is placed at an equal distance from both  
45 engine beam centers  $b, b$ , and is placed higher than the latter centers in order that the intermediate beam may work clear of the engine beams. The connection between  
50 each engine and the intermediate beam is effected by means of two long links  $d, d$ .

With the above method of connecting the engines the cranks of the two shafts are always kept in opposite positions and when  
55 one piston is descending the other is always ascending.

This mode of connecting the engines forms a simple and efficient arrangement for driving two shafts to which it causes the power  
60 to be transmitted equally if the resistance be equal or always in proportion to the relative amount of resistance.

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

The arrangement of two beam engines in  
65 line with their cylinders contiguous to each other, and the connection of the piston ends of the beams by an intermediate beam C, substantially as and for the purpose herein set forth.

THOMAS DOYLE.

Witnesses:

JOS. GEO. MASON,  
WM. TUSCHE.