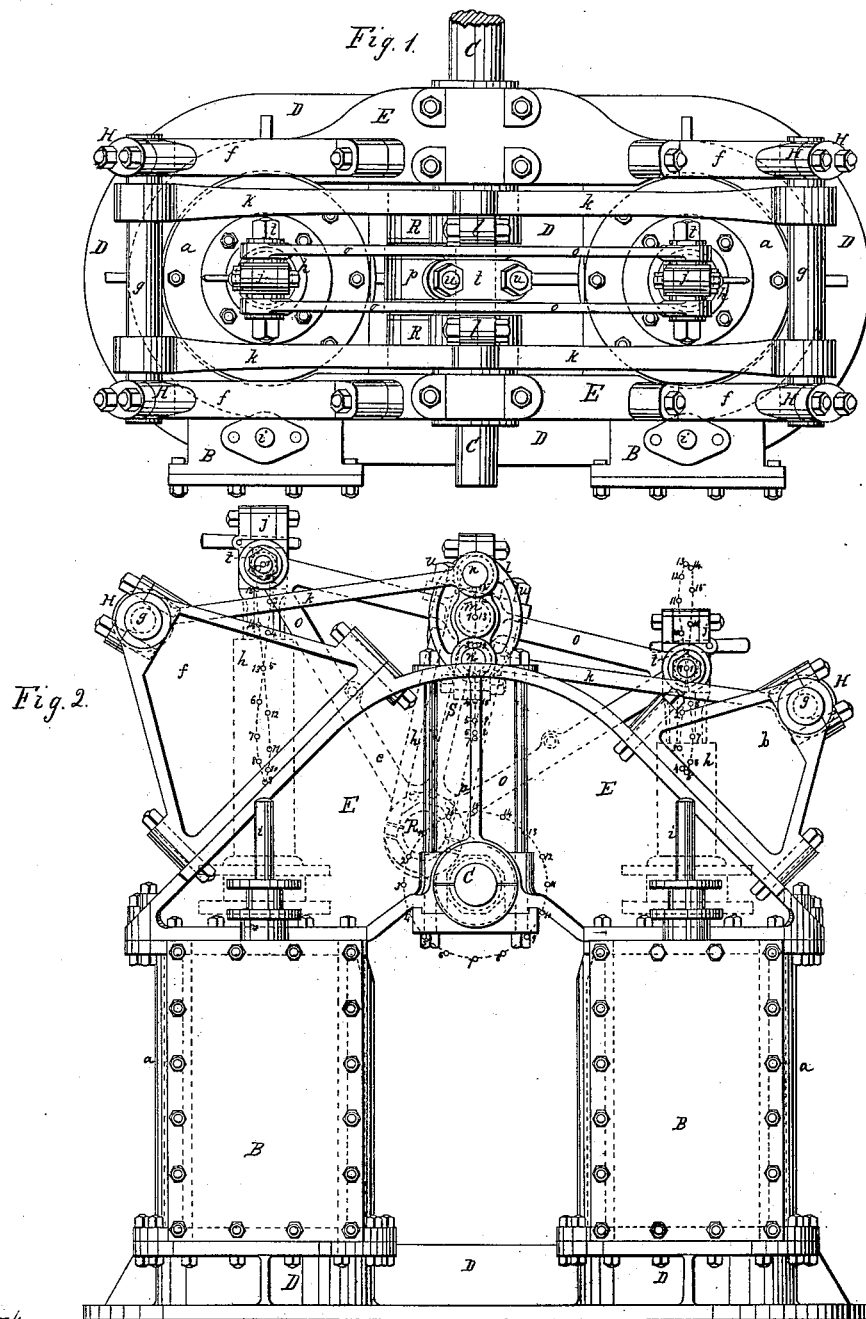


*N. W. Wheeler,*  
*Reciprocating Steam Engine,*  
*No 52,101, Patented Jan. 16, 1866.*



*Witnesses;*

*J. C. Prindle.*  
*Edwin B. Richards.*

*Inventor;*  
*Norman W. Wheeler.*

# UNITED STATES PATENT OFFICE.

NORMAN W. WHEELER, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN TRIANGULAR BEAM-ENGINES.

Specification forming part of Letters Patent No. 52,101, dated January 16, 1866.

*To all whom it may concern:*

Be it known that I, NORMAN W. WHEELER, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Triangular Beam-Engine; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, with letters of reference marked thereon, forming a part of this specification, in which—

Figure I represents a plan, and Fig. II an elevation, of such engine, like letters of reference indicating the same parts in the several figures.

In my invention two working-cylinders, *a a*, are secured upon the base-plate *D D*, with their proper pistons, valves, steam-chests *B B*, valve-rods *i i*, and piston-rods or trunks *h h* and their appurtenances, and upon the upper ends of the cylinders is erected a strong frame, *E E*, having bearings fitted on the lower side for the main shaft *c*, which carries the crank *R*, and also proper brackets *f f f f*, fitted with bearings *H H H H*, in which are mounted the shafts *g g*. Secured to the shafts *g g* are the rods *K K K K*, having pins *n n n n* in their opposite extremities, which pins are connected to each other and to the center pin of the beam *o o* in such a way as to form a parallel motion for the center pin, *m*, and cause it, when the engine is in motion, to traverse accurately, or nearly so, a vertical line over the shaft *c*. The beam *e e e* is made, by preference, in two parts, in the general form of an isosceles triangle, and united by the pins *t t* and *m*, the pin passing through a boss upon the upper end of the strut *s*, while the lower end of the strut *s* is formed in such a manner that, with the beams, a fair seat for the crank-brasses will be secured, the whole being bolted and riveted securely together. The strap *p p* passes around the crank-pin and lower brass thereof, and terminates at the uppermost part in two bolt ends at *u u*, which pass through ears formed upon the boss of the strut *s*, so that by turning the nuts *n n* the brasses of the crank may be adjusted.

To the pins *t t* are attached the working pistons, by means of the links *j j*, or their equiv-

alents, and there is applied to the engine any convenient known valve-gear and other appurtenances.

When the engine is in motion the crank will traverse around the circle shown, passing through its axis in Fig. II, and the centers of the pins *t t* will traverse the paths indicated by the dotted lines, and the respective positions of the parts will, in their successive relations to each other, correspond to the numbers marked upon the respective paths, and the pistons will traverse from end to end of the working-cylinders in their proper relations thereto, so that when one piston is at the extreme of its throw the other will be at mid-throw.

The positions last described are very accurate when the lines joining the two pins *t t* and the crank-pin *R* form the sides of an isosceles triangle whose height is equal to half the base.

It will be perceived upon inspection that the throw of the pistons is greater than the throw of the crank, which may be thought to produce unnecessary friction; but this is counterbalanced by the fact that much of the stress upon the journals is relieved, as compared with ordinary double engines, by much of the stress due to the deflection of the forces being transferred direct from member to member of the beams, and because the resultants of the forces derived from the pistons are generally more nearly in the direction of the crank motion than in ordinary engines.

This invention may be modified in various ways. For instance, the whole structure may be laid upon its sides, or the parallel motion may be replaced by simple radius-rods or by guides; or yet, again, the beam proper may be dispensed with by connecting the pins *t t* to the crank-pin by connecting-rods and extending the rods *K K K K* and attaching them to the pins *n n*; but either of these modifications would result in more or less disadvantage; but instances may occur where some of the equivalent parts may be preferable to those previously described; but a useful modification would be to reverse the beam

and place the shaft above the position in which it is shown by twice the height of the beam.

Having described my invention, I will proceed to indicate what I consider new and useful, and for which I desire to obtain Letters Patent, viz:

Connecting the working-pistons with the

crank by means of the triangular beam *o o*, links *j j*, and the parallel motion *g g* *K K K K* *l*, or their equivalents, substantially as and for the purposes described.

NORMAN W. WHEELER.

Witnesses:

EDWIN C. SHOARDS,  
F. C. PRINDLE.