

T. Hill,
Oscillating Engine,
NO. 105,204. *Patented July 12, 1870.*

Fig. 1.

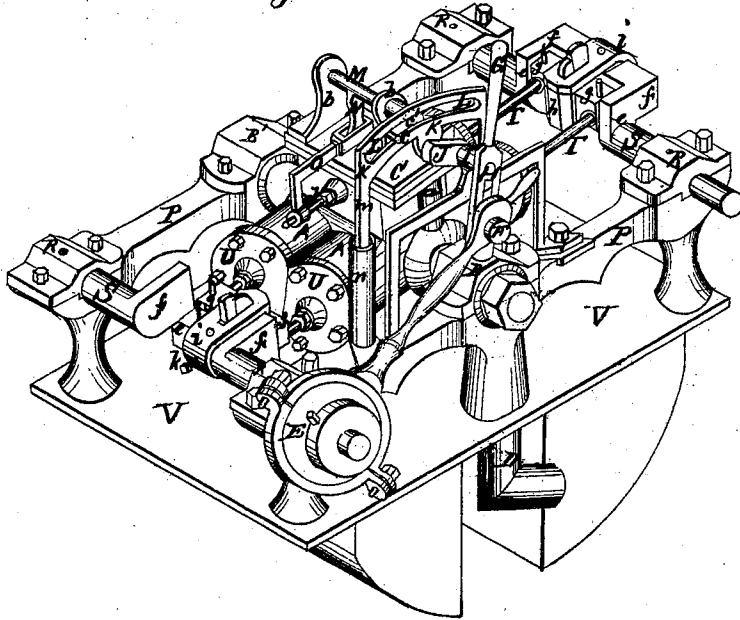
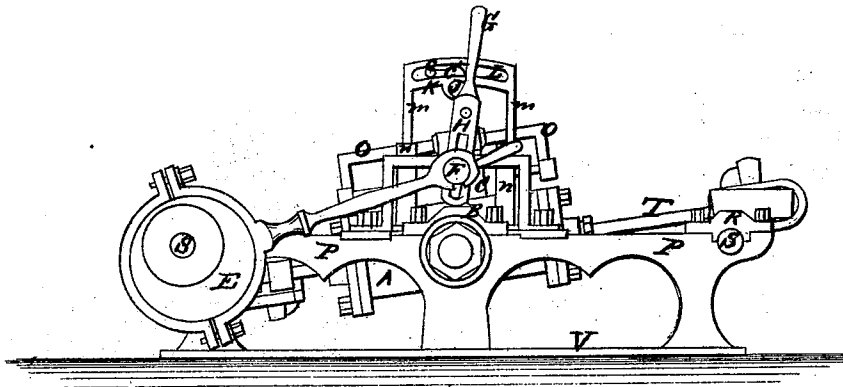


Fig. 2.



Witnesses.
Geo. H. Strong,
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UNITED STATES PATENT OFFICE.

THOMAS HILL, OF VALLEJO, CALIFORNIA.

IMPROVEMENT IN OSCILLATING ENGINES.

Specification forming part of Letters Patent No. **105,204**, dated July 12, 1870.

To all whom it may concern:

Be it known that I, THOMAS HILL, of Vallejo, county of Solano, State of California, have invented an Improved Direct-Acting Double-Cylinder Oscillating Engine; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

The nature of my invention is the construction of an improved horizontal double-cylinder oscillating engine, which is more especially applicable to double-propellers, and is intended to be used upon a steam-ram, the different features of which are made subjects of other patents for which I have made application.

My engine is constructed with two short cylinders of large diameter, placed side by side, and oscillating together on the same pair of trunnions. One steam-chest and one valve only are employed. The induction or steam ports of each cylinder are separate, but both exhaust into the same eduction-port.

The valve is operated by a peculiar mechanism, which can be arranged to cut off, as desired.

The cranks are so constructed that they balance, and cause no undue strain on the machinery.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is an isometrical view, showing the relative position of the parts. Fig. 2 is a side elevation.

A A are two cylinders, placed side by side, so as to operate together on the same pair of trunnions which turn in the boxes B B'.

Steam is admitted to the steam-chest C through the pipe D, passing through the journal, and thence to the steam-chest, through the passage *a* on the side of the chest. The exhaust-steam is conveyed away through a similar arrangement of passages upon the opposite side of the frame.

The valve-gear is operated by an eccentric, E, the rod of which hooks, in the present case,

upon the pin F, the starting-lever G extending up from the eccentric-arm H.

By introducing a link-motion the engine can be made reversible.

A short shaft passes through the box I, and carries a crank-arm, J, set at right angles with the arm H. A pin from the arm J enters a box in the frame K, so that the motion of the eccentric raises and lowers this frame, which is guided in its movements by the arms *m* moving in the slots *n*. A curved slot, L, extends across the top of the frame K, the use of which will be hereafter described.

Upon the top of the steam-chest are placed two standards, *b b*, through the upper part of which a shaft, M, extends. This shaft has a short crank-arm, *c'*, the pin of which, *c*, enters the curved slot L, before mentioned. An arm, N, extends downward and enters a slot in the yoke O. This yoke receives the ends of the valve-stem *d*, which are keyed to it, so that the combined motion of the eccentric and the oscillations of the cylinders and steam-chest gives the valve the proper motion, and, by changing the set of the arms, it may be made to cut off at any point in the stroke.

The pillow-blocks on which the trunnions rest are supported by a frame, P, at the ends of which are placed the pillow-blocks R of the two shafts S S, and the whole may rest on the bed-plate V at the bottom of the vessel.

The cranks are so bent or cast as to form two parts, *e* and *f*, which stand at right angles with each other, as shown, and the two cranks, one on each shaft, stand in such relative positions, when connected to the piston-rods, that they balance and counteract the weight of each other in their revolutions. The two pistons have each a rod, T, extending entirely through the cylinder-heads U at each end, and connected with the lugs *g g* by keys. These lugs are forged with or are fastened to the stub ends *h*.

The straps *i* are provided with set-screws *k*, by which they are made to work in exact equilibrium.

No condensers are shown; but they may be used and air-pumps connected.

By this construction I am enabled to make

my engine very compact, cheap, and little liable to get out of order, while it is very efficient.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The slotted frame K, with its guides *mm*, moved by the eccentric E through the crank-arms H and J, substantially as herein described.

2. The yoke O, attached to the valve-stem and operated by the arms N and *c'*, substantially as described.

3. The above-mentioned devices, when used for operating the valves by the combined oscillation of the cylinders and the action of the eccentric, substantially as described.

In witness whereof I have hereunto set my hand and seal.

THOMAS HILL. [L. S.]

Witnesses:

GEO. H. STRONG,
WM. GERLACH.