E. S. WESTCOTT.
Steam-Engines.

No. 216,636. Patented June 17, 1879.

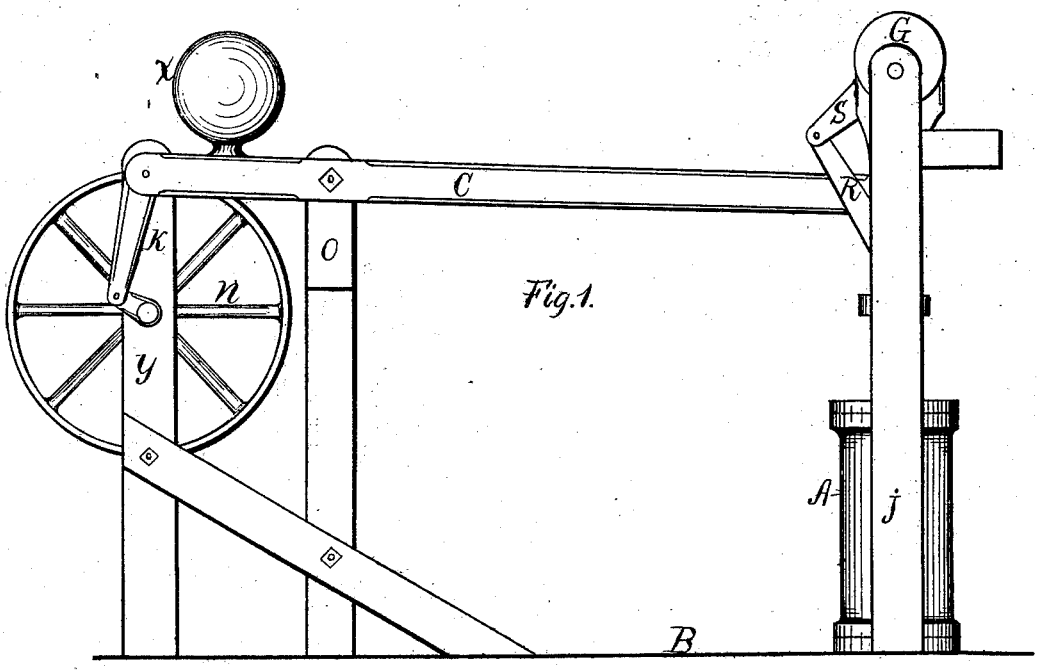

Fig. 1.

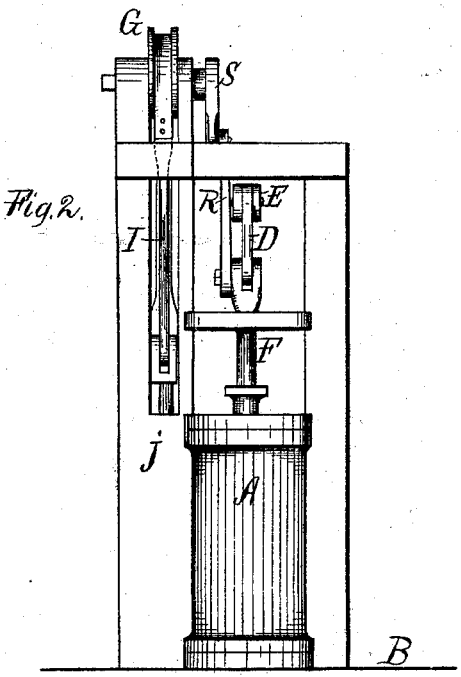

Fig. 2.

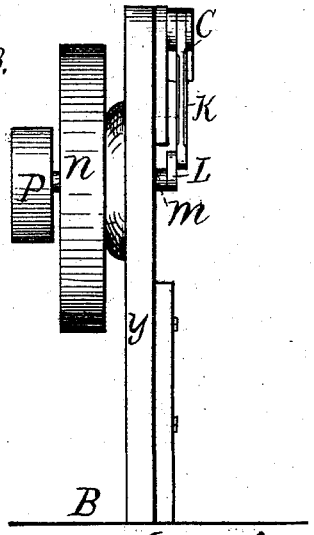

Fig. 3.

Witnesses:
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June 20th 1878.

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UNITED STATES PATENT OFFICE.

EDWIN S. WESTCOTT, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **216,636**, dated June 17, 1879; application filed April 30, 1879.

To all whom it may concern:

Be it known that I, EDWIN S. WESTCOTT, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Steam-Engines, and which I call a "lever-engine," of which the following is a specification.

The invention relates to the combination of a lever with the connecting-rod attached to the piston-rod of a power-producing engine in such a manner as to utilize the force of the lever on a pitman attached to its short end, and also attached to a crank, for the purposes of power in turning a balance-wheel and power-pulley hung on the same shaft as the crank.

Heretofore the connecting-rod of an engine attached to the piston-rod (except in a rotary engine) has been directly connected at the other end with a crank to turn a balance-wheel and power-pulley. There being no other mechanical aid to the steam-power, the cylinder was necessarily larger inside, and consumed a greater amount of steam.

The object of my invention is the use of the lever in such a manner that, for instance, instead of a seventy-five-horse-power cylinder for a seventy-five-horse-power engine, as now used, the inside dimensions of a twenty-five-horse-power cylinder, as now in use, are to be the dimensions of this cylinder for a seventy-five-horse-power lever-engine, which cylinder is to be of smaller diameter than that now in use, and longer, so as to work the lever for moving the pitman attached to the short arm and work the crank for turning the power-pulley and balance-wheel on their shaft, thus giving, with a lever of a certain length, the long arm three times the length of the short arm, and, with a certain crank and suitable balance-wheel and pulley, the power of a seventy-five-horse-power engine, with the same amount of steam now used in a twenty-five-horse-power, and the boiler needed being only one-third the size of that of the present seventy-five-horse-power engine. The cost of the engine for the amount of power is not only much less than that at present manufactured, but the saving of fuel is also an object.

The invention consists in a lever, the long arm attached to the connecting-rod of the piston-rod, said piston-rod moving in a long upright cylinder, which cylinder is firmly attached to the horizontal base, from which an upright support rises at a proper distance from the end of the long arm of the lever for its movement on a bearing or shaft-rest for a fulcrum attached to this support on which the lever plays. At the end of the short arm of the lever rises another support firmly fastened to the base, on which support is placed, at a proper distance below the short arm of the lever, and on the other side, a balance-wheel and power-pulley on a shaft extending through to the lever side, where a crank at its end is attached to a pitman, which pitman is attached to the end of the short arm of the lever, and at every pass back and forth of the piston-rod, with the force obtained at the short end of the lever, turns the balance-wheel and power-pulley; and it finally consists in the particular construction and arrangement of the engine, so as to use the lever as before and hereinafter described and set forth.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a side view of the engine. Fig. 2 is a view of the cylinder end of the engine, with its upright cylinder-eccentric, connecting and valve rods, steam-chest, and mechanism in position, as designed. Fig. 3 is a view of the opposite end of the engine in position, as designed, showing the short arm of the lever connected with the pitman attached to the balance-wheel and power-pulley crank, with the power-pulley and balance-wheel.

A is the cylinder, which is to be upright, and with its attached mechanism, as represented in Fig. 2, firmly fastened or bolted to the base or platform B. C is the lever, (which may be balanced by the ball-weight X, or in any other known manner,) the long arm of which is to be attached to the connecting-rod D at its upper end, E, the lower end of the connecting-rod being attached to the piston-rod. F is the piston-rod. G is the eccentric, from which depends the rod I, connecting with the valve-rod of the steam-chest. J is the steam-chest. K is the pitman which turns the crank S of the eccentric, moving, with the connecting-rod I, the valve-rod of the steam-chest. The short end of the lever C attaches to the pitman K at its upper end. The lower end of

the pitman is attached to the crank L, which, turning the shaft *m*, communicates motion to the power-pulley P and balance-wheel, marked *n*. O is the support of the fulcrum-bearing or shaft-rest for the lever. *y* is the support of the shaft *m* of the balance-wheel *n* and power-pulley P, which the pitman K at the end of the short arm of the lever turns with the crank L at every move of the lever up and down, the two above-mentioned supports, O and *y*, to be solid with or firmly fastened or bolted to the platform B.

The shafts or shaft-like rests, from or on which motion is made or communicated for the purposes of the engine as constructed, are all to be suitably journaled in boxes or bearings, or what will serve such like purpose.

The operation of the device is as follows: With the engine in motion, the motion of the piston-rod F, communicating motion by the connecting-rod D with the long arm of the lever C, carries the long arm of the lever up and down as the piston-rod moves up and down, and by this motion the short arm of the lever C at its end, moving alternately back and forth, carries the pitman K, and communicates motion with its crank L to the balance-wheel *n* and power-pulley P.

What I claim is—

1. The combination, with the piston of a power-producing engine, of a balanced lever having its fulcrum or shaft-rest one side of the center, combined and arranged substantially as described, and for the purposes set forth.

2. In combination with the pitman K, the crank L, the shaft *m*, the balance-wheel *n*, and the power-pulley P, combined and arranged substantially as described, and for the purposes set forth.

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Witnesses:

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