

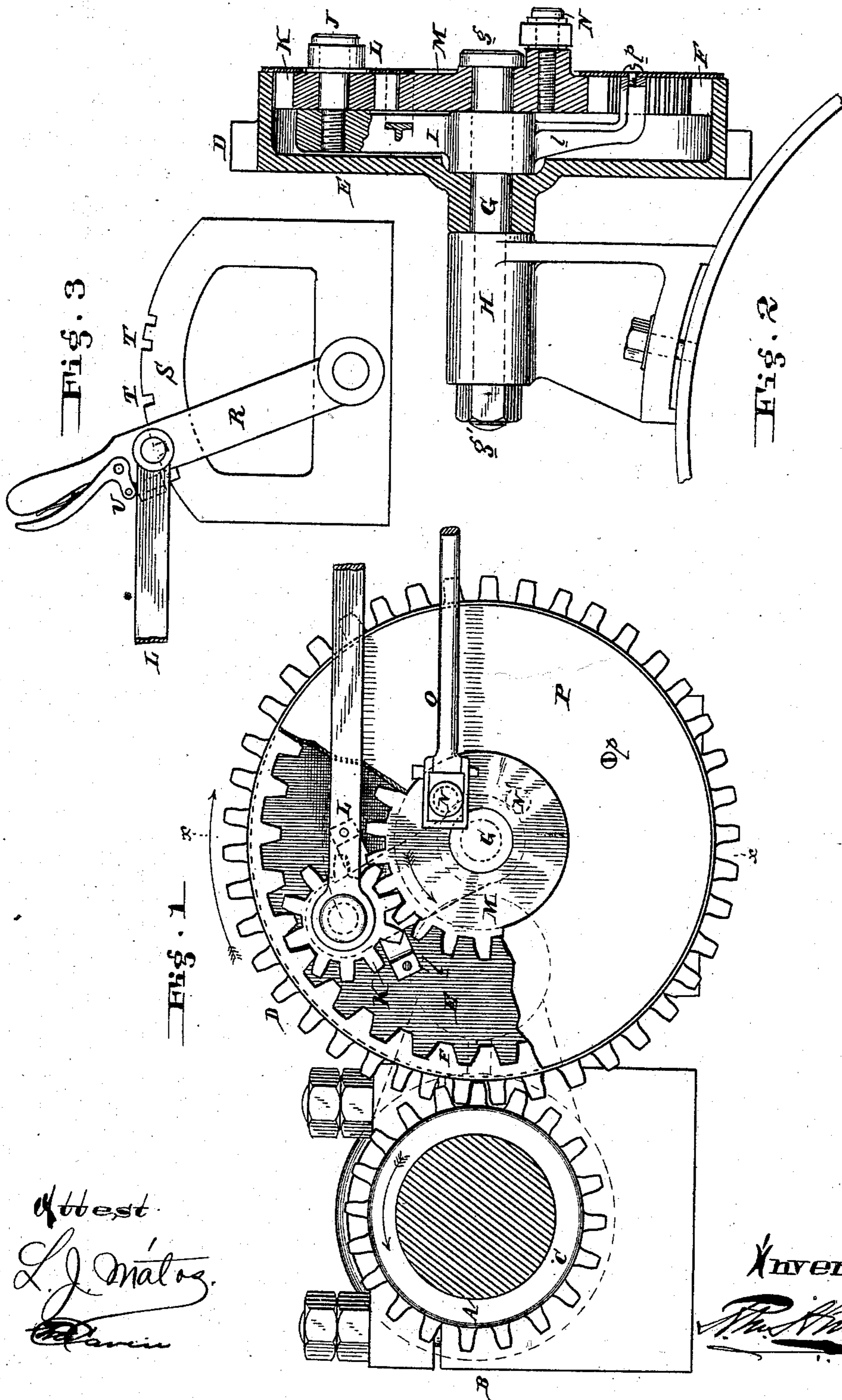
(No Model.)

R. M. HUNTER.

VALVE GEAR.

No. 272,053.

Patented Feb. 13, 1883.



Attest
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[Signature]

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UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 272,053, dated February 13, 1883.

Application filed December 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Valve-Gears, of which the following is a specification.

My invention has reference to valve-gear for steam-engines; and it consists in combination of spur-wheels in gear with a pinion on the crank-shaft and adapted to reciprocate the valve-rod; further, in the arrangement of such gear mechanism with means to so alter the positions of the parts with relation to each other that the engine may be reversed or the point of cut-off may be changed, and in details of construction, all of which is fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

The object of this invention is to dispense with the usual and expensive link-motion and eccentrics, and substitute therefor a simple and equally efficient spur-wheel mechanism, thereby greatly reducing the cost of manufacture. This improvement is particularly adapted to portable and traction engines used for operating farm machinery.

In the drawings, Figure 1 is a side elevation of my improved valve-gear with part broken away. Fig. 2 is a vertical section of same on line *x x*, and Fig. 3 is an elevation of the means to reverse the engine or change the cut-off.

A is the crank-shaft. B is its bearings. The crank is shown in dotted lines. C is a spur-wheel, secured fast to the crank-shaft A. D is a spur-wheel of twice the diameter of wheel C, and meshes therewith. The wheel D is provided with a solid back, E, and internal teeth, F. A pin or stud, G, is bolted fast to the bracket H by nut *g'*, and carries the wheel D, which is free to revolve thereon. Loosely pivoted on pin G at its end, and kept in place by head *g*, is a spur-wheel, M, of half the diameter of spur-wheel F, and carries the crank-pin N, which works the valve-rod O. An intermediate spur-wheel, K, meshes with both wheels M and F, and is secured to an arm, I, loosely journaled on pin G, between the hubs of wheels D and M, by a pin, J, which also holds the end of the reversing-rod L. This arm I may be provided with lugs or ex-

tensions *l*, to which a plate or cover, P, may be secured by screws *p*. This plate is stationary and covers up the internal gearing, and if made of polished sheet metal—as brass—will give a highly finished and ornamental appearance, while the gearings themselves may be in their rough condition. If desired, the cover or plate P may be secured to the bracket H or other stationary part. The other end of the reversing-rod L is pivoted to a pivoted arm, R, which may be set and held in various positions by a rack, S, having notches T and catch V, while the wheels D and F are described as having twice the number of teeth, respectively, as the wheels C and M. This proportion may be varied in any manner desired, provided the valve-crank wheel M makes one revolution for every revolution of the crank-shaft.

With the mechanism as shown, the engine running forward and the arrows indicate the direction of rotation of the various wheels. By drawing back the arm R, the arm I and its pinion K change their positions, and thus cause the valve-crank pin N, with its wheel, to be thrown back to the position indicated by N', causing the engine to be reversed. By the same operation the point of cut-off may be varied.

I do not limit myself to the exact construction shown, as the device may be modified in various ways without departing from my invention.

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

1. Valve-gear which consists of shaft A and its pinion C, in combination with spur-wheels D F M, supported upon stationary axes, spur-wheel K, arranged to mesh with wheels F M, and adapted to be adjusted about said wheel M, crank-pin N in wheel M, arm I, valve-rod O, and means to adjust said arm in any desired position, substantially as and for the purpose specified.

2. Valve-gear which consists of shaft A and its pinion C, in combination with spur-wheels D, F, K, and M, valve crank-pin N, arm I, pivoted to the axes of wheels F and M, valve-rod O, plate P, and means to adjust said arm in any desired position, substantially as and for the purpose specified.

3. The combination of crank-shaft A and its pinion C with a spur-wheel, M, carrying valve crank-pin N, said pinion and spur-wheel being arranged upon separate axes and of any desired diameters, connecting means to cause said wheels to revolve with uniform velocities, and a valve-rod, substantially as and for the purpose specified.

4. The combination of crank-shaft A and its pinion C with a spur-wheel, M, provided with a valve-crank pin, N, said pinion and spur-wheel being arranged upon separate axes and of unequal diameters, connecting gearing to cause said wheels to rotate with uniform velocities, a valve-rod, and mechanism to change the relative positions of said wheels about their respective axes, substantially as and for the purpose specified.

5. The shaft A and its spur-wheel C, in combination with spur-wheel D, having solid back, pin G, bracket H, teeth F, forming an internal spur-wheel, F, to wheel D, spur-wheels M and K, located within wheel D, arm L, pin J, crank-pin N, valve-rod O, and reversing-rod L, substantially as and for the purpose specified.

6. The shaft A and its spur-wheel C, in com-

bination with spur-wheels D, F, K, and M, the latter of which is upon a different axis from that upon which wheel C is located, and is adapted to carry the valve-rod crank-pin, crank pin N, valve-rod O, and means to move said spur-wheel K about the center of wheel M and hold it in any desired position, substantially as and for the purpose specified.

7. Valve-gear which consists of shaft A and its pinion C, in combination with spur-wheel D, made to form a case, spur-wheel M, located within said case, connecting gearing also located on or within said case, and adapted to rotate spur-wheel M through the agency of wheels C D, crank-pin N, and a plate adapted to cover the open side of said wheel D to inclose or cover up part or all the connecting gearing, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

R. M. HUNTER.

Witnesses:

R. S. CHILD, Jr.,
W. McWADE.