

N. GRAY.
VALVE GEAR FOR STEAM ENGINES.
APPLICATION FILED MAY 20, 1912.

1,046,772.

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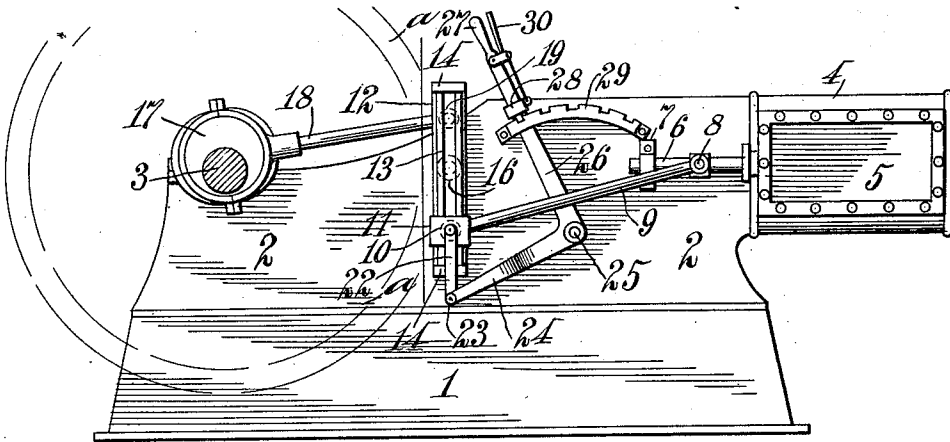


Fig. 1.

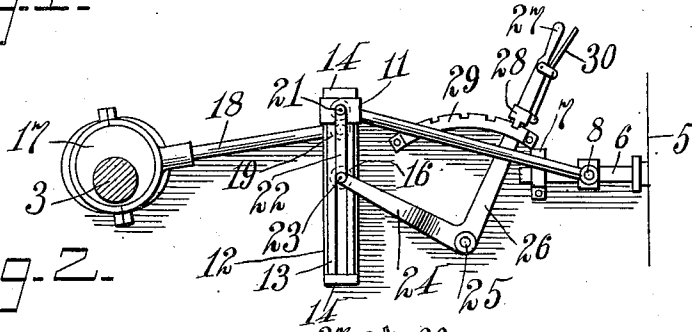


Fig. 2.

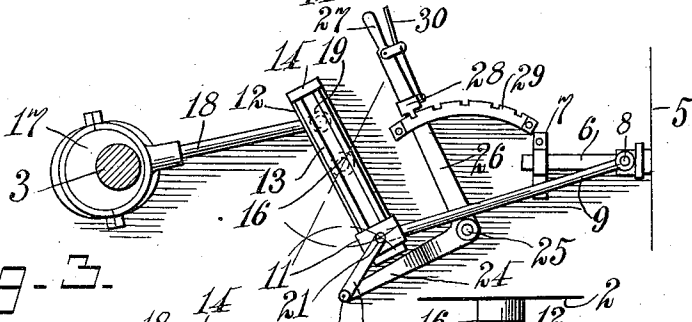


Fig. 3.

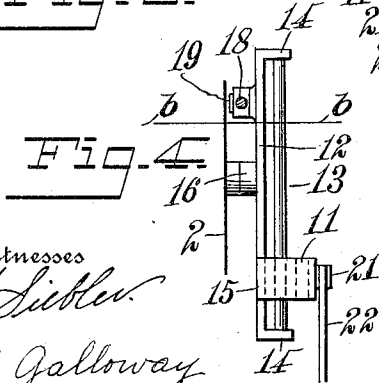


Fig. 4.

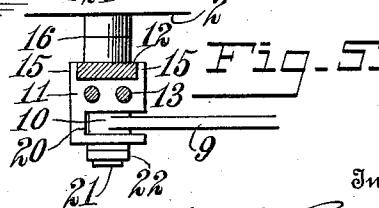


Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

NEIL GRAY, OF DAYTON, OHIO, ASSIGNOR OF ONE-THIRD TO ALBERT KASMIRSKY, OF DAYTON OHIO.

VALVE-GEAR FOR STEAM-ENGINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NEIL GRAY, citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Valve-Gears for Steam-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in reversing valve gears for steam engines and is adapted to be used either on stationary, marine or locomotive engines.

The object of the invention is to provide a valve gear that is simple in construction, efficient in operation and inexpensive to manufacture, as will more particularly appear from the following description in connection with the accompanying drawings.

Referring to the drawings, Figure 1 is a side elevation of a stationary engine supplied with my improved valve gear; Figs. 2 and 3 are detached views of the valve gear in different positions; Fig. 4 is a section on the line *a-a* of Fig. 1; and Fig. 5 is a section on the line *b-b* of Fig. 4.

In the specifications and drawings, similar reference characters indicate corresponding parts.

Referring in detail to the drawings, 1 represents a base having the frame 2 of a stationary steam engine mounted thereon. Journaled at one end of the engine frame 2 is a crank shaft 3, while attached to the other end of said frame is a cylinder 4 provided with a steam chest 5. Extending out of the steam chest 5 is a valve rod 6 which is guided in a bearing 7. Pivotally attached at 8 to the valve rod 6 is one end of a connecting rod 9 the other end of which is pivoted at 10 to a sliding block 11. The block 11 is provided with a recess 20 which receives the end of the connecting rod 9 thereby forming a rigid bearing for the rod. The block 11 is slidingly mounted on a link consisting of a straight body portion 12 and straight rods 13 which pass through the block. The rods 13 are attached to projec-

tions 14 on the ends of the body portion 12, and the block 11 is provided with projections 15 which engage the sides of the body portion 12. The said body portion 12 of the link is pivoted substantially midway of its length, for example, at point 16 to the frame 2, and is oscillated from the crank shaft 3 by an eccentric 17 mounted on the shaft 3. The eccentric 17 is provided with a connecting rod 18 one end of which is pivoted at 19 to the body portion 12 of the link.

The block 11 is shifted along the link by the following means. Pivoted at 21 to the block 11 is one end of a link 22 the other end of which is pivoted at 23 to one end of a bell-crank lever 24. The bell-crank lever 24 is pivoted at 25 to the frame 2 while the upper arm 26 thereof is provided with a grip or handle 27. The lever arm 26 is provided with a sliding clutch or block 28 in operative relation with a quadrant 29 mounted on the frame 2. The block 28 and the quadrant 29 are adapted to hold the bell-crank lever in any shifted position, and said block 28 is actuated by a finger lever 30 mounted on the handle or grip 27. When the lever arm 26 of the bell-crank lever 24 is shifted, the block 11 will be likewise shifted from a position on one side of the pivot 16 to a position on the other side of the said pivot. When the block 11 is on one side of the pivot, the valve (not shown but which is connected to the rod 6 as is well known) will be actuated to control the steam to rotate the shaft 3 in one direction, and when the block is on the other side of the pivot, the valve will be actuated to control the steam to move the shaft 3 in the opposite direction. When the block 11 is at the upper end of the link 12, the pivot 23 will coincide with the pivot 16 and the lever 24 will be undisturbed during the reciprocation of the link 12. To permit the block 11 to have a slight movement when it is at the lower end of the link thereby allowing the lever 24 to remain stationary, the portion of the link below the pivot 16 is of greater length than the portion above the pivot. When the block 11 is below the pivot 16, the said block will move from the position shown in Fig. 1 to that shown in Fig. 3, when the link 12 is oscillated.

It will be seen, that a valve gear as thus devised is simple in construction as it is operated by a single eccentric and will be effi-

cient in operation, and as the link 12 is made straight, the said link will be inexpensive to construct.

Having described my invention, I claim,
5 The combination with the valve rod, the crank shaft and the eccentric of a steam engine, of a pivoted straight link oscillated by and connected to said eccentric, one portion of said straight link on one side of its
10 pivot being of greater length than the portion on the other side of the pivot, a sliding block mounted on said straight link, a rod connecting said block and said valve rod, a connecting link pivotally attached to said

block, and a lever pivotally attached to said 15 connecting link, and adapted to move said block on said straight link, whereby said block remains stationary relatively to said link, when on the short portion of the straight link and is capable of sliding move- 20 ment without actuating said lever when on the long portion of the straight link.

In testimony whereof I affix my signature, in presence of two witnesses.

NEIL GRAY.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."