G. W. SHANK.
REVERSING VALVE GEAR FOR ENGINES.
APPLICATION FILED SEPT. 15, 1910.
Patented Dec. 26, 1911.

Inventor
George W. Shank.

Witnesses

By
Victor J. Evans
Attorney
GEORGE W. SHANK, OF MONCURE, NORTH CAROLINA.

REVERSING VALVE-GEAR FOR ENGINES.


Application filed September 15, 1910. Serial No. 582,339.

To all whom it may concern:

Be it known that I, George W. Shank, a citizen of the United States, residing at Moncure, in the county of Chatham and State of North Carolina, have invented new and useful Improvements in Reversing Valve-Gears for Engines, of which the following is a specification.

This invention relates to engine valve gear of the reversing type.

The invention has for one of its objects to improve and simplify the construction and operation of mechanism of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use and composed of comparatively few parts.

Another object of the invention is the employment of a novel arrangement of operating eccentrics and an adjustable rocker whereby the point of cut-off can be varied, the engine reversed and a quick movement imparted to the valve as the same covers or uncovers the admission and exhaust ports so that wire drawing of the steam and back pressure will be reduced to a minimum.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a side view of the valve gear set in position for forward driving. Fig. 2 is a similar view, showing the valve gear in its other extreme position. Fig. 3 is a diagrammatic view of the operating eccentrics and rocker that imparts movement to the valve rod. Fig. 4 is an edge view of the rocker actuating eccentrics.

Similar reference characters are employed to designate corresponding parts throughout the several views.

Referring to the drawing A designates the bed of an engine which has at one end a cylinder 1 provided with a steam chest 2, to and from which steam passes through the inlet and exhaust pipes 3 and 4 respectively, there being an ordinary slide valve (not shown) in the steam chest for controlling the admission and exhaust of the operating fluid. The stem 5 of the valve reciprocates through the stuffing box 6 and the forward end slides in a bearing 7 on the bed of the engine.

The crank shaft 8 is provided with a pair of eccentrics 9 and 10, which impart movement to the slide valve. These eccentrics are connected to each other for oscillating a rocker or link 11, which is pivoted on a stud 12 carried by a block 13, the said block sliding in a guide or slot 14 arranged on the bed A concentrically with the crank shaft 8 of the engine. The block is connected by a link 15 with a bell crank reversing lever 16 fulcrumed at 17 on the engine bed. The link or rocker 11 has an arcuate slot 18 in which slides a block 19 that carries a pivot stud which extends into an opening 21 in the forward end of the valve rod 5. In order to reduce friction between the rocker and eccentric parts a and a' and two eccentric portions b and b', the portions a and a' being of different radii. The eccentrics are arranged on the shaft so that the concentric portions of greater radii are approximately diametrically opposite, although the axes x and x' and y and y' of the two eccentrics are displaced from each other approximately thirty degrees. By angularly displacing the eccentrics in this manner the rocker can have a relatively fixed axis on which to oscillate, while at the same time the rollers 22 and 23 will maintain their engagement with the eccentrics. The eccentric portions of the eccentrics cause the oscillation of the rocker and hence the sliding movement of the valve, while the concentric portions of the eccentrics maintain the rocker idle and the slide valve stationary during the major portion of the exhaust and admission period. The eccentric portions of the cam cause the slide valve to move quickly so that wire drawing of the incoming steam will be reduced to a minimum. The effective throw of the rocker can be varied by manipulating the lever 16 for varying the point of cut-off and furthermore the engine can be stopped or reversed by the same lever.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily ap-
parent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention what is claimed as new, is:—

1. In a reversing valve gear, the combination of a rotating shaft, a pair of similar cams on the shaft angularly displaced one hundred and eighty degrees, a stationary arcuate guide concentric with the shaft, a rocker, means slidable in the guide and connected with the center of the rocker, a device for shifting the said means and rocker, devices located at opposite sides of the rocking axis of the rocker and respectively engaging the cams continuously, a reciprocating valve rod, said rocker having an arcuate slot curved reversely to the said arcuate guide, a reciprocating valve rod, and means slidably in the slot of the rocker for connecting the valve rod with the latter.

3. In a reversing valve gear, the combination of a pair of cams arranged on a common axis and each having oppositely-disposed concentric portions of different radii and intermediate eccentric portions, the portions of greater radii being disposed at opposite sides of the center of rotation, a stationary guideway concentric with the axis of the cams, a member slidably in the guideway, a rocker centrally pivoted on the member, rollers mounted on the rocker at opposite sides of the rocking axis thereof for contacting respectively with the cams continuously, a slide valve rod, means for slidably mounting the rod and preventing movement transverse to the axis thereof, and means for hingedly and slidably connecting the rod with the rocker.

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

GEORGE W. SHANK.

Witnesses:
J. L. Womble,
W. C. Maddox.

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