

No. 643,899.

Patented Feb. 20, 1900.

W. J. HILL.
VALVE GEAR FOR ENGINES.

(Application filed Apr. 19, 1899.)

(No Model.)

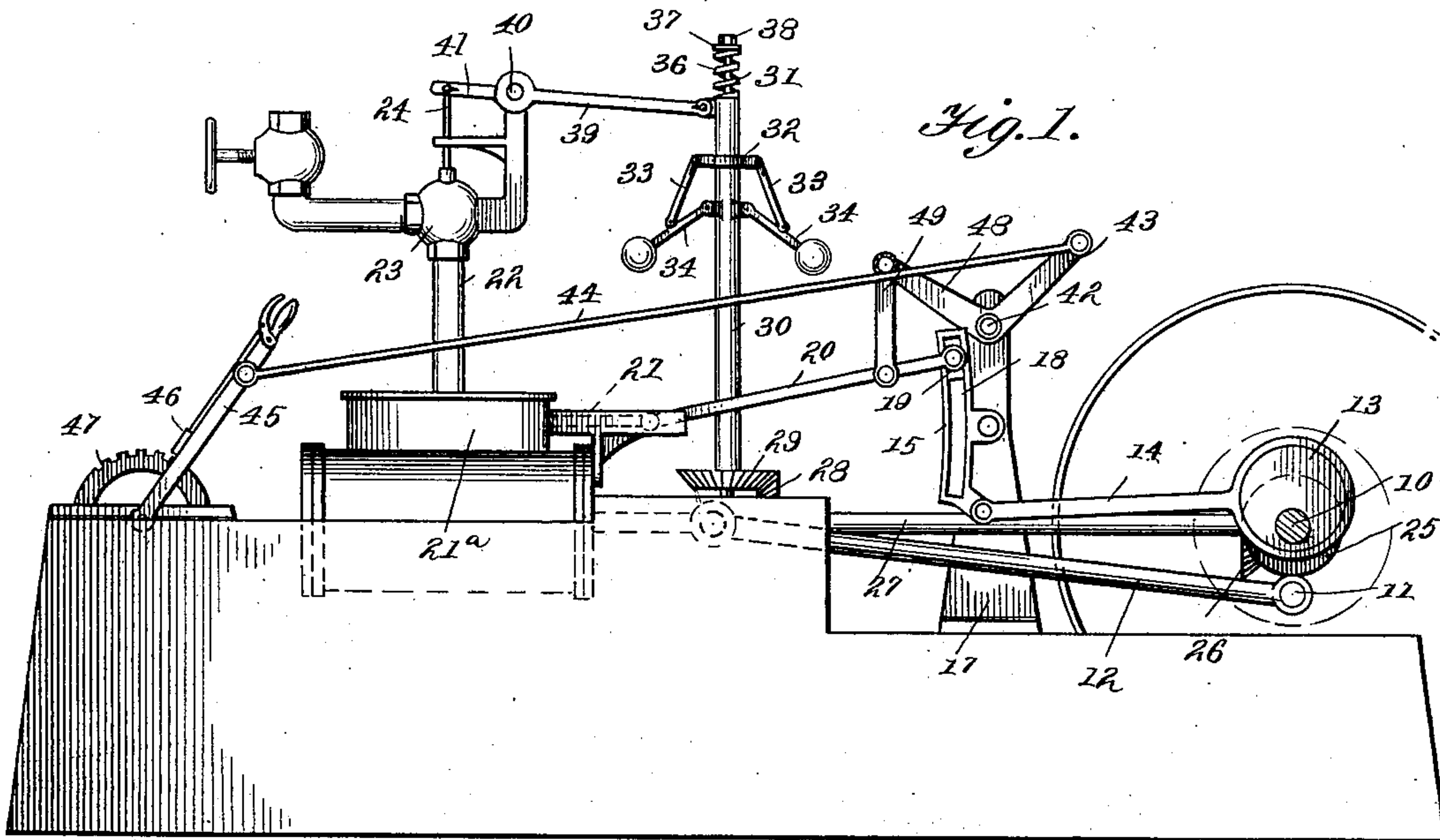


Fig. 2.

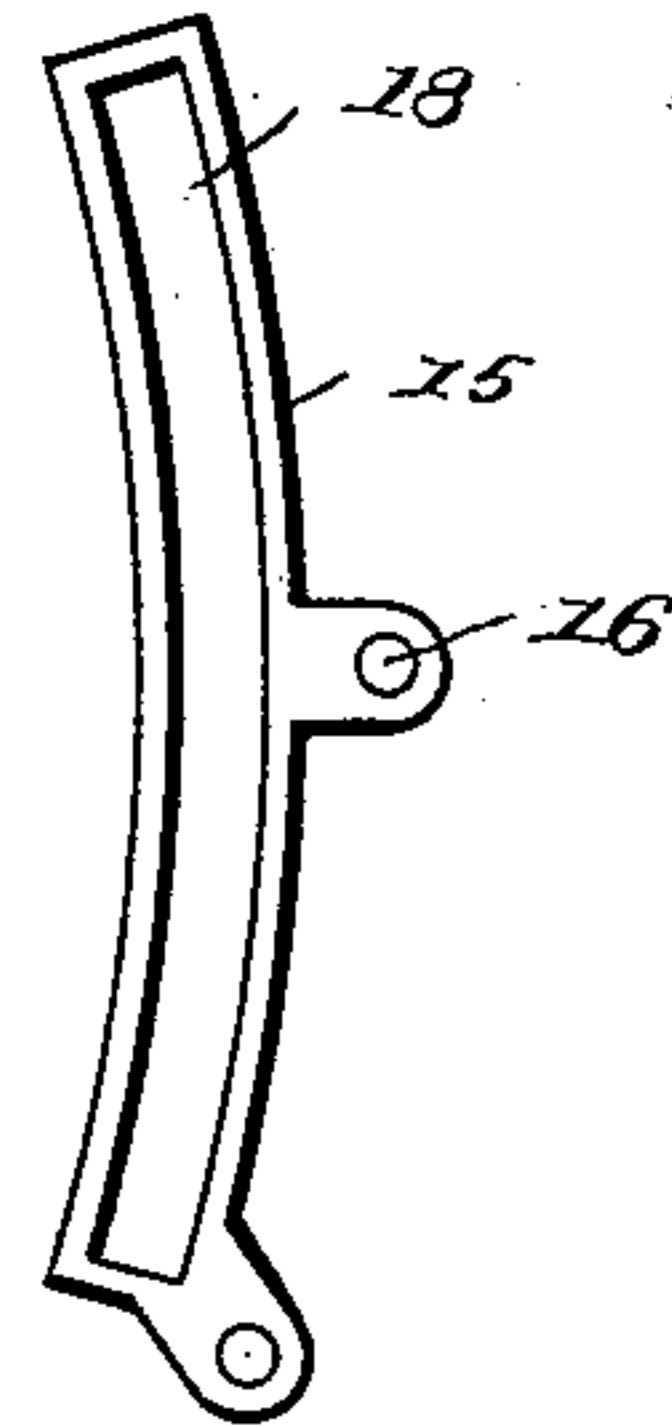
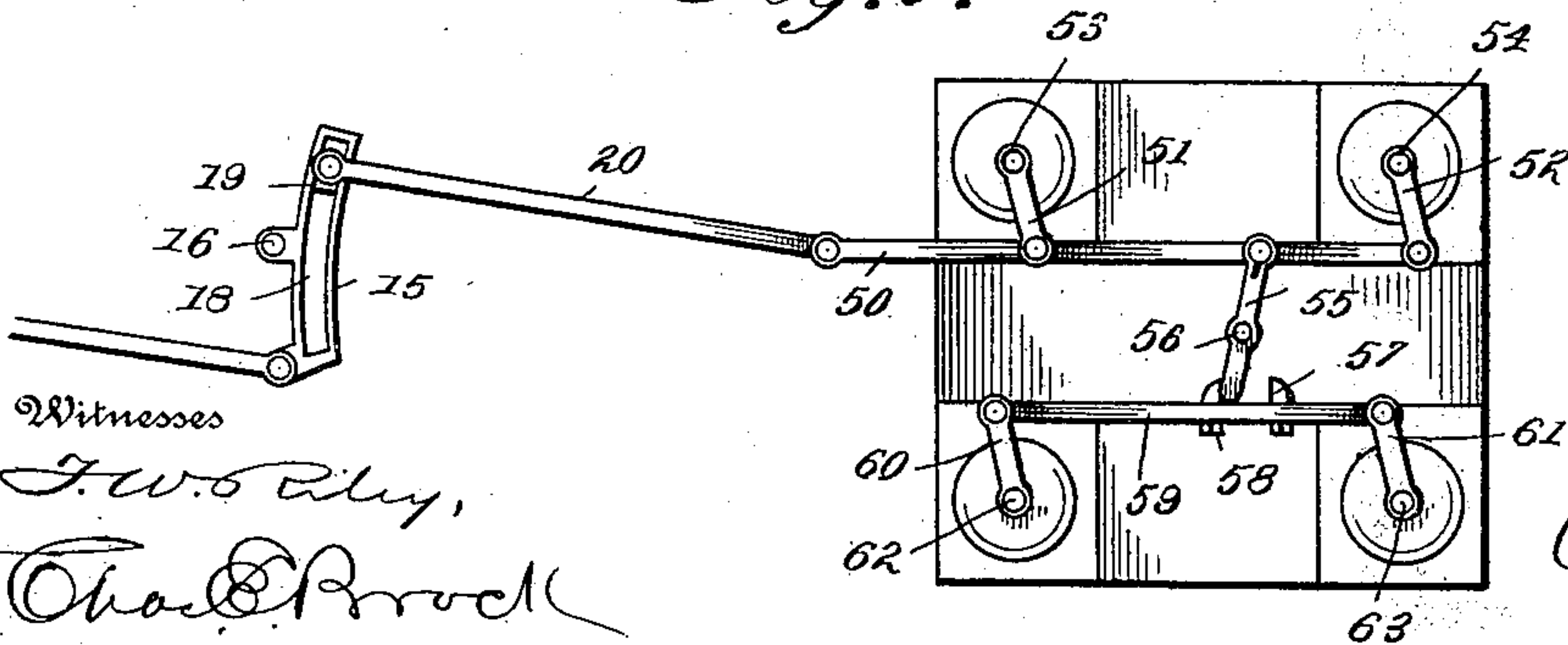


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM JOSEPH HILL, OF ELKMONT, ALABAMA, ASSIGNOR OF ONE-HALF
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VALVE-GEAR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 643,899, dated February 20, 1900.

Application filed April 19, 1899. Serial No. 713,647. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JOSEPH HILL, a citizen of the United States, residing at Elkmont, in the county of Limestone and State of Alabama, have invented a new and useful Valve-Gear for Steam-Engines, of which the following is a specification.

My invention relates to valve-gears for all kinds of steam-engines, and has for its object to provide an exceedingly cheap, strong, durable, and reliable valve-gear adapted for use on stationary, locomotive, or marine engines.

With this object in view my invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described and afterward pointed out in the appended claim.

In order to enable others skilled in the art to which my invention most nearly appertains to make and use the same, I will now proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a view in side elevation of a valve-gear constructed in accordance with my invention applied upon a stationary engine. Fig. 2 is a detail view of the curved slotted lever in side elevation. Fig. 3 is a detail view illustrating the manner of arranging my invention to operate rotary valves.

Like numerals of reference mark the same parts wherever they occur in the various figures of the drawings.

Referring to the drawings by numerals, 10 indicates the main shaft of an engine, provided with a crank-pin 11 to receive a pitman 12, connected in the usual manner with the ordinary piston-rod, by means of which the shaft is rotated. On the shaft is an eccentric 13, the strap of which carries the eccentric-rod 14, pivotally connected at its outer end to the lower end of a curved slotted lever 15, pivoted at 16 to an upright 17. In the curved slot 18 of lever 15 is a sliding block 19, to which is pivotally connected the valve-rod 20, pivoted at its outer end to the valve-stem 21. (Shown in Fig. 1 in dotted lines.)

21^a indicates the steam-chest, into which discharges the steam-pipe 22, provided with a governor-valve 23, having a vertical stem 24.

At the upper end of upright 17 is pivoted

at 42 an elbow-lever, one arm 43 of which is pivotally connected to a long rod 44, pivotally connected at its opposite end to a reversing-lever 45, provided with a spring-pawl 46 to engage a curved rack 47. The other arm 48 of the elbow-lever is connected by a link 49 with the valve-rod 20.

In the rotary valve-gear illustrated in Fig. 3 the valve-rod 20 is pivotally connected to one end of a bar 50, which is pivotally connected with the radial arms 51 and 52 of rotary valve-stems 53 and 54. The bar 50 is also connected by a slotted pivotal joint with a lever 55, pivoted to the steam-chest at 56, the opposite end of the lever projecting between two stops 57 and 58, adjustably mounted on a bar 59, pivotally connected to the ends of radial bars 60 and 61, projecting from rotary valve-stems 62 and 63.

The construction of my invention will be readily understood from the foregoing description, and its operation may be described as follows: The revolution of the main shaft will through the eccentric 13 cause the slotted lever 15 to be oscillated, thus through the pitman 20 causing the valve-stem 21 to be reciprocated, thus alternately opening and closing the valves between the steam-chest and cylinder. When the reversing-lever 45 is moved to the opposite end of its stroke, the rod 44 will rock the elbow-lever, causing the sliding block 19 to move below the pivotal point of lever 15, thus reversing the action of the valves.

From the foregoing it will be apparent that I have provided a simple, cheap, durable, and reliable valve-gear applicable to all engines (stationary, locomotive, or marine) using reciprocating slide-valves, and in Fig. 3 I have shown how the same gear may be applied to operate rotary valves. In this application of the invention the movement of rod 20 will reciprocate bar 50, by means of which the stems 53 and 54 of rotary valves will be turned, and by means of the pivoted lever 55 the other bar 59 is also reciprocated, causing valve-stems 62 and 63 to be operated.

The action of the rotary valves may be regulated both as to time and extent by adjusting the stops 57 and 58 farther apart or closer together.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

5 In a valve-gear, the combination with rotary valves, having stems, radial arms thereon, a bar pivotally connected to the outer ends of said radial bars, the valve-rod pivotally connected with the bar, a second set of rotary valves having stems, radial arms on the stems,
10 a bar pivotally connected with the outer ends

of said arms, adjustable stops on the bar, and a centrally-pivoted lever having one end connected with the bar of the first set of valves and the other end projecting between the adjustable stops, substantially as described. 15

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Witnesses:

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