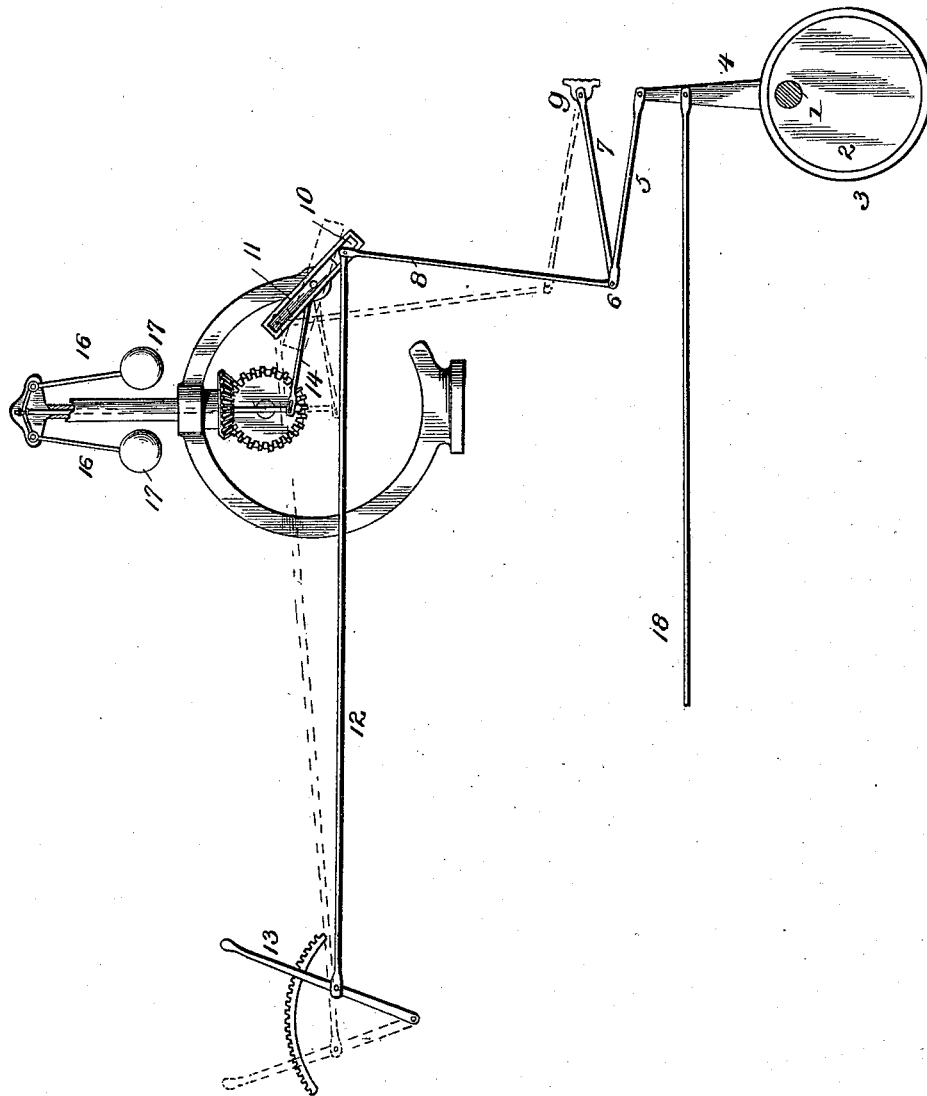


(No Model.)

F. M. WALKER.
VALVE GEAR.

No. 490,693.

Patented Jan. 31, 1893.



Witnesses

John D. Smith
Thos. Robertson

Inventor

Francis M. Walker

By *T. J. W. Robertson, atty.*

UNITED STATES PATENT OFFICE.

FRANCIS M. WALKER, OF NEWARK, OHIO, ASSIGNOR OF ONE-HALF TO
JAMES H. SMITH, OF SAME PLACE.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 490,693, dated January 31, 1893.

Application filed May 14, 1892. Serial No. 433,009. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. WALKER, a citizen of the United States, residing at Newark, Licking county, Ohio, have invented certain new and useful Improvements in Valve-Gears, of which the following is a specification, reference being had therein to the accompanying drawing.

This improvement relates to that class of valve gear designed to be reversible and to be automatically regulated by the governor, and the object of the invention is to provide a device that will automatically control the motion of the valve, combined with a reversing arrangement which can be easily and cheaply applied, and which will be free from the complication of the link motion and other devices in common use, whereby the cost of the engine is not only lessened, but it is rendered more durable and less likely to get out of order.

The invention consists in the peculiar construction, arrangement and combinations of parts by which these ends are obtained, as hereinafter more particularly described and then definitely claimed.

The accompanying drawing is an elevation of my gear showing it in one position in full lines and in the other position in dotted lines.

Referring now to the details of the drawing by figures—1 represents the shaft, on which is mounted the eccentric 2, carrying the eccentric strap 3 and rod 4, which latter is pivoted to the lever 5, which is also pivotally connected at 6 to another lever 7 and a rod 8, the former being pivoted at the other end to a bracket 9, attached to some fixed part of the engine, and the rod 8 is pivotally connected to a slide 10, working in the slotted lever 11, pivoted on the frame of the governor, or any suitable part of the engine. The slide 10 is also pivotally connected to one end of a rod 12, whose other end is pivoted to a reversing lever 13. The lever 11 is provided with an arm 14, which extends under and is connected to the governor rod 15, which is arranged to be operated in the usual way by the arms 16 of the governor balls 17, so as to rise and fall with them, in a manner well understood, as the speed of the engine increases or decreases.

At 18 is shown the valve rod pivoted to the rod 4 and its other end should be connected to the valve (not shown).

The operation is as follows: As the speed of the engine rises beyond the normal rate, the balls 17 fly out, thus depressing the rod 15 which changes the position of the lever 11 to one near horizontal, which, through the rods and levers 5 and 7, gives the eccentric rod 4 a different line of travel, and thus changes the motion of the valve rod 18 causing it to give less steam to the engine. By moving the lever 13, the rod 12 moves the slide 10 to the opposite end of the slotted lever 11 causing the point of connection 6 of the rods 5, 7 and 8 to move upward as indicated in dotted lines and the valve then moves reversely.

I may in some cases use a crank and piston in place of the eccentric 2, strap 3 and rod 4, and should consider these devices as equivalent for each other in most positions.

What I claim as new is:

1. The combination with levers 5 and 7, of a rod 8 pivotally connected with both levers arranged to be operated by the movement of a governor, and a bar 4 having a reciprocating and vibrating motion connected to said lever 5, and a valve rod connected with said bar 4, substantially as described.

2. The combination with the levers 5 and 7, of a rod 8, connected with both and operated by a governor, and a bar 4 connected with an eccentric strap 3 mounted upon a revolving eccentric 2, and a valve rod connected with said bar, substantially as described.

3. The combination with levers 5 and 7, of a rod 8 pivotally connected at one end with both, a lever 11 connected to the opposite end, having an arm 14 connected to a rod 15 operated by the governor, a reciprocating vibrating rod 4 connected to the lever 5, and a valve rod connected to said rod 4, substantially as described.

4. The combination with the levers 5 and 7, of a rod 8, pivotally connected at one end with both, a slide 10 connected to its opposite end, a slotted lever 11 in which said slide moves having an arm 14 connected to the governor rod 15, means for moving said slide from

one end of the lever 11 to the other, a reciprocating vibrating rod 4, connected to the lever 5 and a valve rod connected to said rod 4, substantially as described.

- 5 5. The combination with the revolving eccentric 2, strap 3, rod 4, levers 5 and 7 and rod 8, of the slotted lever 11 having slide 10 working therein, and an arm 14, the rod 15 connected to the arm 14 and operated by the gov-

ernor, the rod 12, and the lever 13, all substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 4th day of May, 1892.

FRANCIS M. WALKER.

Witnesses:

WILFRED C. SMITH,
CHAS. W. SEWARD.