

(No Model.)

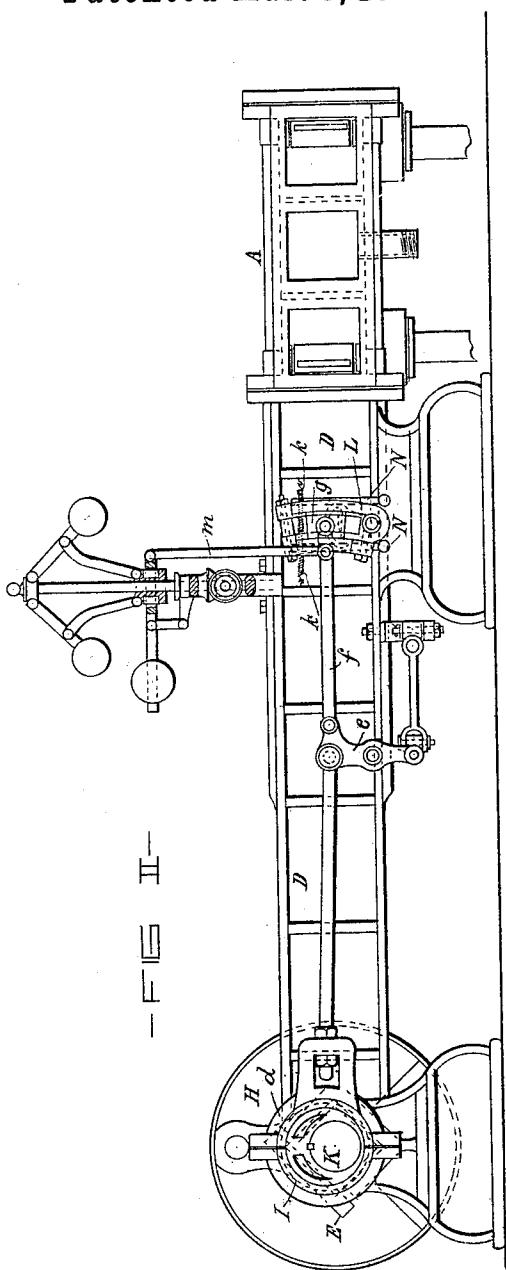
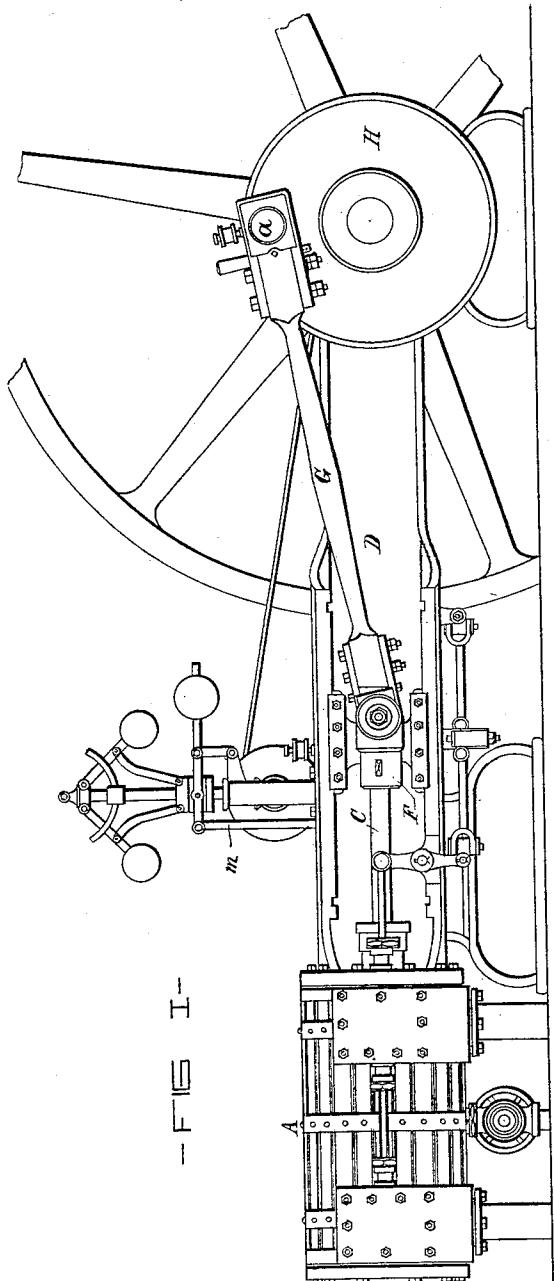
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G. T. PILLINGS.

VALVE GEAR FOR STEAM ENGINES.

No. 273,597.

Patented Mar. 6, 1883.



— WITNESSES —

 Dad Fisher  
Erwin H. Howard

— INVENTOR —

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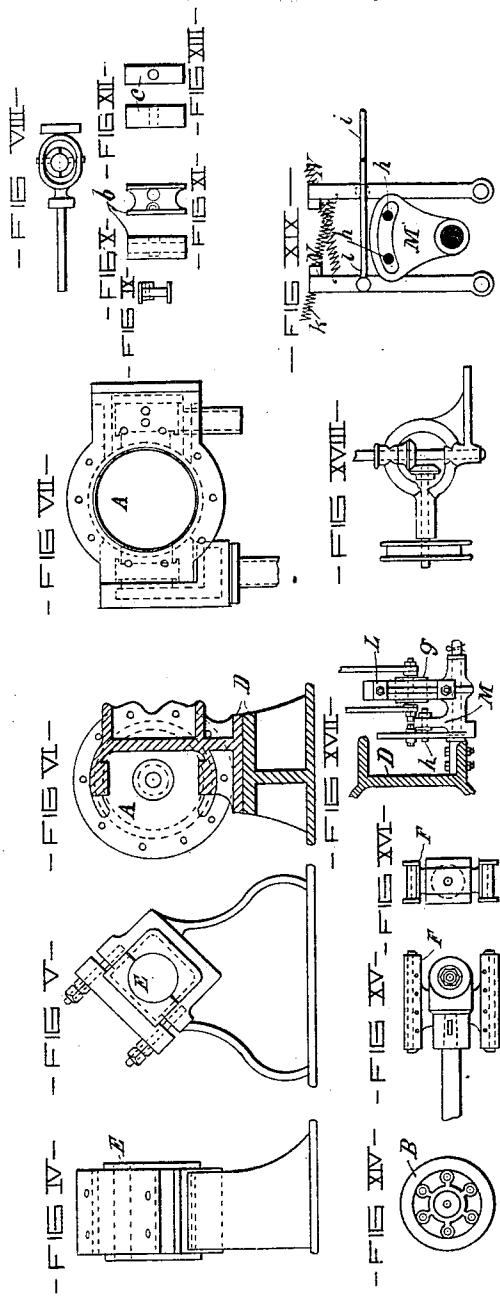
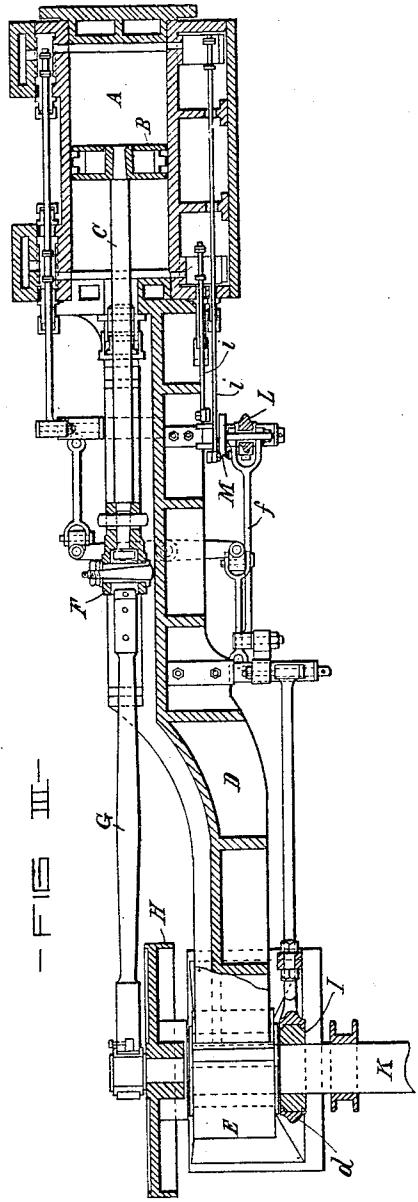
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# UNITED STATES PATENT OFFICE.

GEORGE T. PILLINGS, OF BALTIMORE, MARYLAND.

## VALVE-GEAR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 273,597, dated March 6, 1883.

Application filed December 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. PILLINGS, of the city of Baltimore and State of Maryland, have invented certain Improvements in Valve-Gear for Steam-Engines, of which the following is a specification.

This invention relates to means for controlling the steam cutting-off point or regulating the distance traveled by the cylinder-piston before expansion of steam within the cylinder takes place from the engine-governor; and it consists, briefly stated, in connecting some portion of the governor mechanism which is alterable in position by an increase or decrease in velocity of the governor-balls to a block in a pivoted link, which is applied to the steam-valve stem through the agency of suitable devices, as hereinafter fully described.

In the further description of my said invention which follows, reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure I is a front view of a direct-acting high-pressure steam-engine embodying my invention, and Fig. II a rear view of the same. Fig. III is a sectional plan of the improved engine; and Figs. IV to XX, inclusive, are details of the engine on an enlarged scale.

Similar letters of reference indicate similar parts in all the views.

A is the cylinder, B the steam-piston, and C the piston-rod, of the engine. The cylinder is secured to a suitable frame, D, carrying the shaft-bearing box E. The piston-rod has the usual cross-head, F, and connecting-rod G, which latter device forms the means of communication between the said cross-head and the crank-pin *a* of the crank-wheel H. The cylinder is of the four-ported description—that is to say, the steam and exhaust ports are each provided with an independent valve.

The steam-valves, which are represented by *b*, and the exhaust-valves by *c*, consist of flat plates, as shown in Figs. X, XI, XII, and XIII.

I is an eccentric keyed to the main shaft K, and *d* the eccentric-strap. This eccentric-strap is connected to a rocker, *e*, which in turn is attached by means of a rod, *f*, to the adjustable block *g* of the link L. The link L is pivoted at its lowerend to the engine-frame. M is an arm, which, in the present case, forms

a part of the link L, and consequently has a movement in common with that device. The arm M is slotted and provided with two pins, *h*, which are adjustable in its slot. (See Fig. XIX.) It is not necessary to the proper working of the link and slotted arm that they should be made in a single piece, as their operation would be the same if they were keyed to a shaft.

N N are pivoted bars, to which the steam-valve stems *i i* are connected, (see Fig. XIX,) and these bars are provided with springs *k*, which effect the closing of the said valves. The adjustable pins *h* are situated between the bars N N, and in the movement of the eccentric and its attendant mechanism effect the alternate opening of the two steam-valves. The pins *h* are made movable for the purpose of allowing the proper adjustment of the steam-valves.

By referring to Fig. II it will be seen that the rod *f*, at a point near to the block *g*, is connected by a link, *m*, to a vertically-moving part of the engine-governor, the height of which depends upon the rapidity of motion of the governor-balls.

The governor proper is of ordinary construction and requires no description herein, as it forms no part of my invention.

The exhaust-valves are actuated from the eccentric I through the medium of a system of rods and other devices, as shown in the drawings; but my invention does not extend to the exhaust-valve mechanism; consequently it is not specifically described.

As the link-block *g* is connected to the governor, it will be understood that any variation in the speed of the engine changes the position of the said block in its link and lengthens or shortens the stroke of the steam-valves and changes their steam cutting-off point.

Supposing the engine to be running and an increased load is placed thereon, a slight diminution in speed takes place, and the vertically-moving part of the governor, in view of the reduced centrifugal force of the balls, is consequently depressed. The sliding block *g* is therefore lowered in its link, and as its longitudinal motion is constant, and is then applied nearer to the fulcrum of the bars N N, their motion, and that of the steam-valves, is

increased. An increased stroke of the steam-valves causes the steam to follow further, which accelerates the speed of the piston until it is checked by the extension of the governor-balls, as will be readily understood.

5 In some cases I prefer to operate the exhaust-valves through the agency of a second eccentric; but in this invention such change need not be considered.

10 I claim as my invention—

1. In a steam-engine, the steam eccentric rod connected to a sliding block within a pivoted vibratory link, and to some adjustable portion of the governor, an arm adapted to have a move-

15 ment in common with the said link, a pin or pins projecting from the said arm, and a pair of pivoted bars provided with devices to connect them with the stems of the steam-valves, whereby, in the vibratory movement of the arm

20 and pins, the said bars are alternately actuated, substantially as and for the purpose specified.

2. In a steam-engine, the steam eccentric rod connected to a sliding block within a pivoted vibratory link, and to some adjustable portion of the governor, an arm adapted to have a 25 movement in common with the said link, a pair of projecting pins secured adjustably within a slot in the said arm, a pair of pivoted bars provided with devices to connect them with the stems of the steam-valves, whereby, in the vibratory movement of the arm and pins, the said bars are alternately actuated in one direction, and spring mechanism to effect the motion of the said bars in an opposite direction, substantially as and for the purpose specified. 30

GEORGE T. PILLINGS.

Witnesses:

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JOHN WILLIAMS.