

(No Model.)

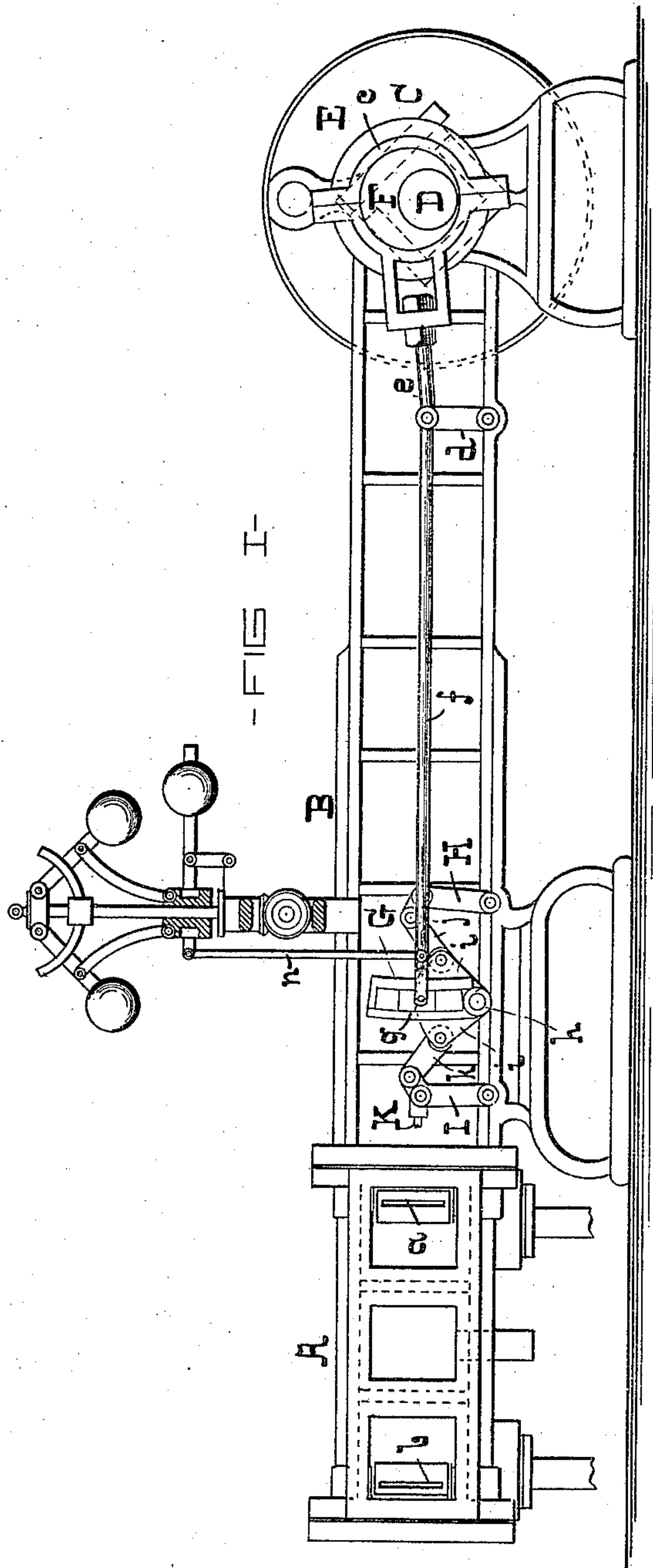
2 Sheets—Sheet 1.

G. T. PILLINGS.

VALVE GEAR.

No. 331,003.

Patented Nov. 24, 1885.



-WITNESSES-

Dan L. Fisher
Chas. W. Arnold

-INVENTOR-

George T. Pillings,
by E. H. W. Howard,
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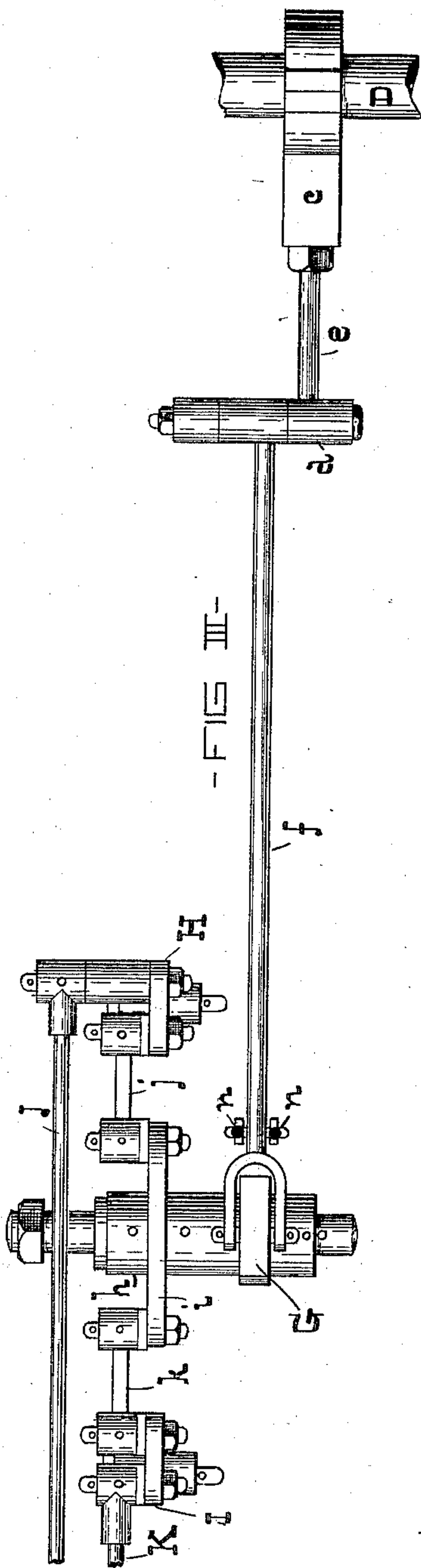
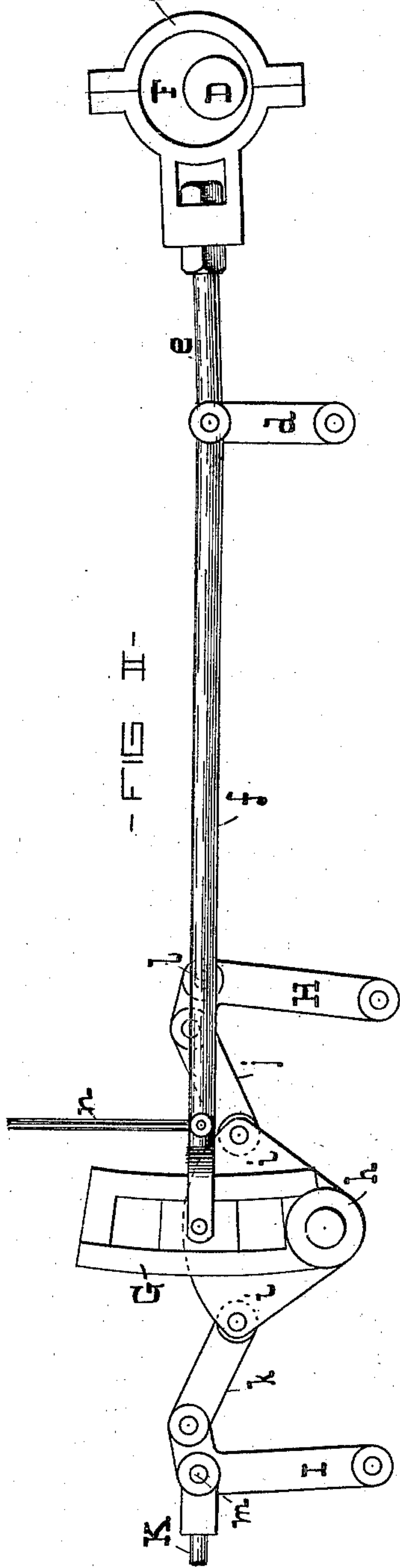
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UNITED STATES PATENT OFFICE.

GEORGE T. PILLINGS, OF BALTIMORE, MARYLAND.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 331,003, dated November 24, 1885.

Application filed July 24, 1885. Serial No. 172,539. (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 certain improvements in Letters Patent No. 273,567, granted to me on the 6th day of March, 1883, for valve-gear for engines, to which reference should be had.

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

Figure I is an exterior side view of certain portions of a horizontal reciprocating engine embodying my improvements. Figs. II and III are enlarged views of the valve-gearing.

A is the steam-cylinder, secured to a frame, B, carrying the shaft-bearing box C.

D is the main shaft, and E the crank-wheel keyed thereon.

The cylinder is of the four-ported description, and the steam and exhaust ports are each provided with an independent valve.

In Fig. I the steam-valve chests are shown without covers, so as to disclose the steam-ports, which are denoted by *a* and *b*.

F is an eccentric keyed to the main shaft D, and *c* is the eccentric-strap. This eccentric-strap is connected to a rocker, *d*, by means of a rod, *e*, which in turn is attached, through the medium of the rod *f*, to the adjustable block *g* of the link G. The link G is pivoted at its lower end to the engine-frame. The hub *h* of the link G has a plate, *i*, and this plate is attached to arms H and I by means of rods *j* and *k*. The steam-valve stems J and K are attached to the arms H and I by means of pins *l* and *m*. (See particularly Figs. II and III.)

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

The governor proper is of ordinary construction, and requires no description herein.

The mechanism for actuating the exhaust-valves is not shown in the drawings.

The various parts of the valve-gear are represented in the drawings in such relative positions as they would occupy when the engine is doing ordinary duty. If an increased load is put on the engine, a slight reduction in speed of the shaft 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 thus lowered in the link G, and as its motion is at all times uniform its application to a point nearer to the pivotal point or fulcrum of the link G causes the valve-stems to receive an increased movement. An increased stroke of the steam-valves causes the steam to follow the piston further in its stroke, and its speed is consequently increased, which increase continues until checked by the distention of the governor-balls.

Referring particularly to Fig. II, it will be seen that the arrangement of the various parts of the valve-gear therein shown is such as would exist with both steam-ports covered with their valves. Supposing the block G to be now moved in the direction indicated by the arrow in full lines, very little movement would at first be imparted to the valve-stem J in view of the angular position of the rod *j*; but as this rod is straightened the motion of the valve-stem is increased, which increase continues until the rod is straightened and the maximum speed attained. At this time the operation as regards the valve-stem K is reversed. In the return of the eccentric-rod, or its movement as indicated by the arrow in dotted lines, the motion of the stem J is at first rapid; but as the rod *k* falls below a straight line the rapidity of movement of the stem decreases until it stops with the steam-valve over its port.

From the foregoing description it will be understood that with my invention steam is admitted to the steam-ports very slowly at the beginning of the stroke, and the speed increases as the piston advances, which has the effect of obviating the jar occasioned by a too rapid introduction of steam to the cylinder at the beginning of the stroke.

I claim as my invention—

In a steam-engine, the steam eccentric-rod connected to a sliding block within a pivoted vibratory link and to some adjustable portion
5 of the governor, a plate adapted to have a movement in common with the said link, a pair of vibratory arms connected to the valve-

stems, and pivoted links or rods to connect the said plate with the said pivoted arms, all combined substantially as specified.

GEORGE T. PILLINGS.

Witnesses:

DANL. FISHER,

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