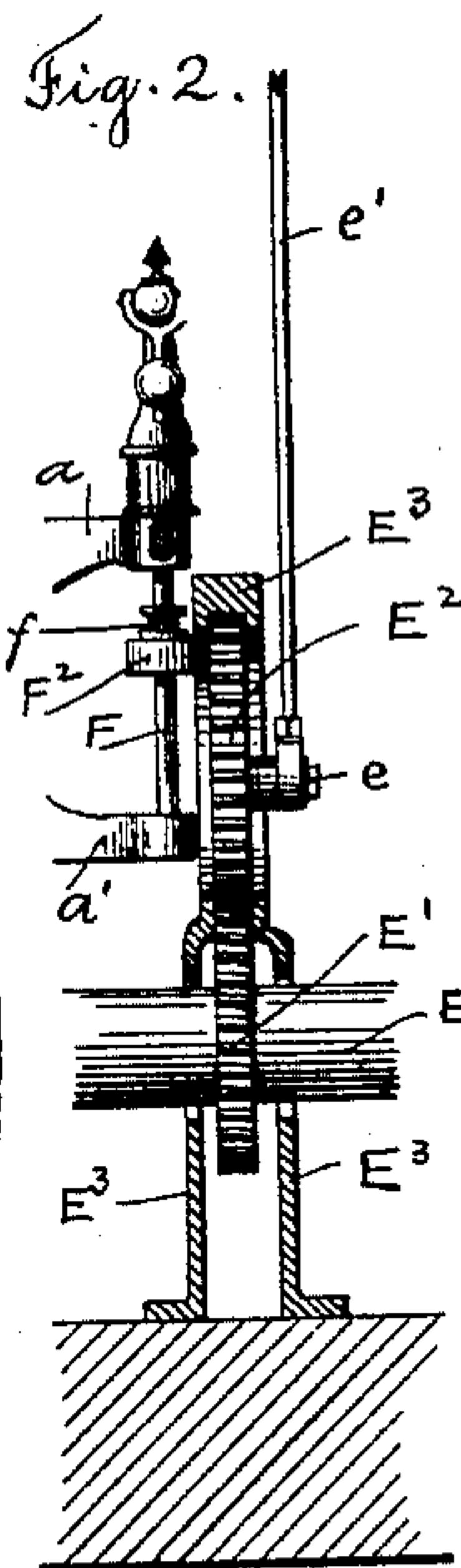
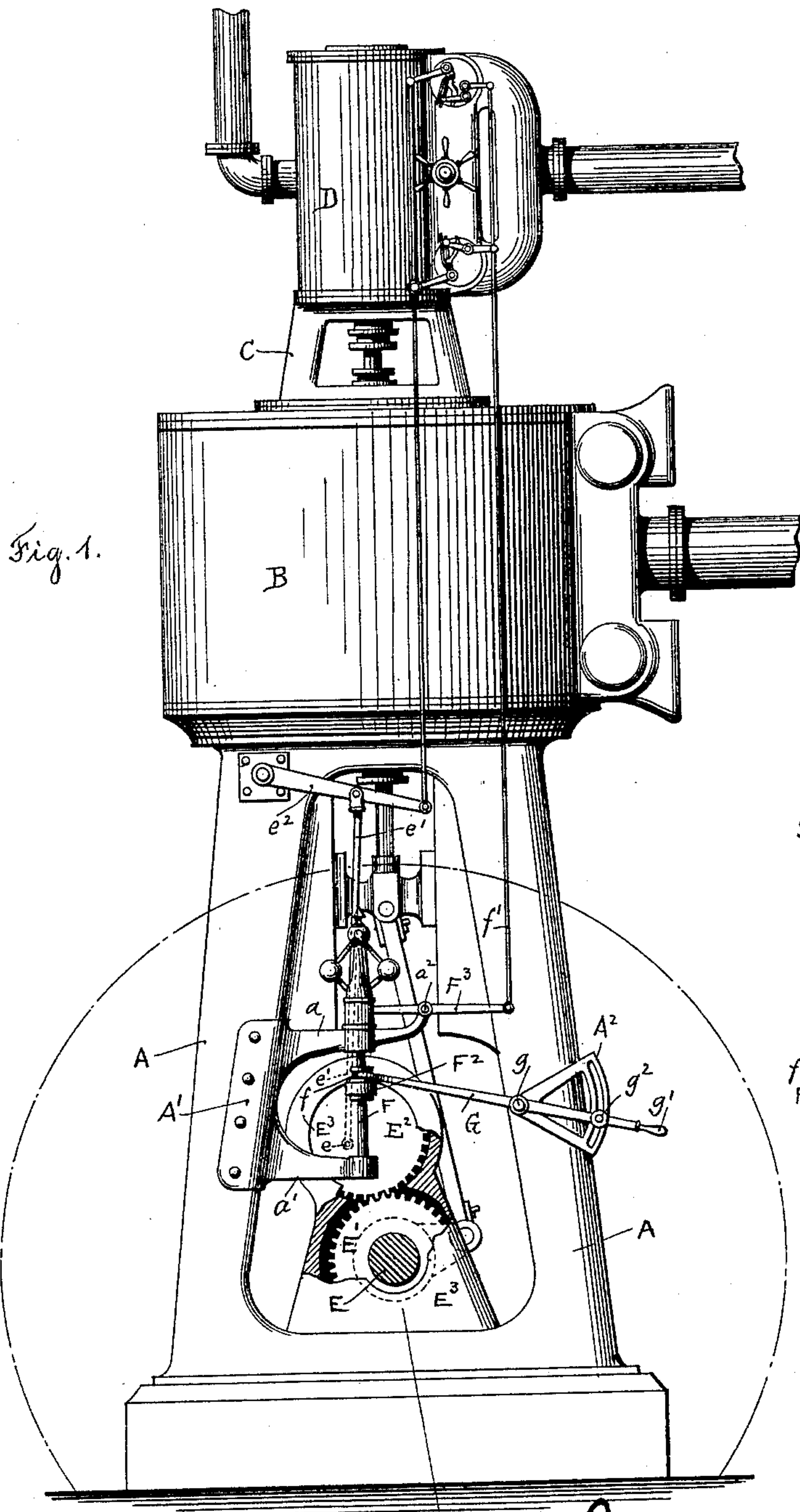


(No Model.)

J. WHEELLOCK.  
VALVE GEAR FOR ENGINES.

No. 467,868.

Patented Jan. 26, 1892.



Witnesses  
Chas. F. Schuchert  
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# UNITED STATES PATENT OFFICE.

JEROME WHEELOCK, OF WORCESTER, MASSACHUSETTS.

## VALVE-GEAR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 467,868, dated January 26, 1892.

Application filed October 26, 1891. Serial No. 409,770. (No model.)

*To all whom it may concern:*

Be it known that I, JEROME WHEELOCK, a citizen of the United States, and a resident of Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Mechanism for Operating the Valve-Gear and Governor of Steam-Engines, of which the following, in connection with the accompanying drawings, is a specification.

My invention consists in providing means whereby the valve-gear of an automatic cut-off engine is operated by an auxiliary crank-disk having a periphery-bearing, and so arranged that the valve-gear is operated by a pin on one side, while the governor-spindle is driven by the other side, and in such a manner that the speed of the governor may be varied at will and in such a way that under some conditions the governor may be operated at the maximum speed, while under others the same may be made stationary, in which case the engine would take steam for the entire length of the stroke.

In the accompanying drawings I have shown my improvement adapted to a blowing-engine, since in this class of machinery the purpose is to pump air and discharge it under pressure, and it has been found desirable in practice to devise means whereby the amount of such discharge in a given time may be regulated, according to the demands of consumption—as, for instance, in a blast furnace or cupola.

In my present invention steam is admitted the full opening of the ports; but it is cut off completely at a point which is determined by the governor, and I then rely upon its expansive force to complete the stroke.

Figure 1 represents a side view of a blowing-engine embodying my invention; and Fig. 2 is a vertical central section of the driving-disk and its bearing, taken on line  $x x$ , Fig. 1.

In the drawings, A is the engine-bed supporting the air-cylinder B, which is connected through the thimble-casting C with the steam-cylinder D.

E is the main shaft carrying a gear  $E^1$ , which meshes with another gear  $E^2$  of a diameter equal to that of the former and running in the housing  $E^3$ , which forms a periphery-bearing for it, so that a central spindle or

trunnions are dispensed with. Pivotal secured to the rear side of the gear  $E^2$ , as at  $e$ , is one end of the connecting-rod  $e'$ , the other end of which is attached to the rocker  $e^2$ , whereby motion is imparted to the valve-cranks of the steam-cylinder, thereby obviating the employment of the eccentric as generally in use.

Attached to the bed A is a bracket  $A'$ , which is provided with the arms  $a a'$ , serving as bearings for the upright spindle F, to which the governor-balls are secured. Keyed to said spindle F, and held in sliding contact thereon, is a pulley  $F^2$ , the outside of which is preferably covered with leather or other suitable material to come into frictional contact with the front side of the above-mentioned gear-disk  $E^2$ , so that as the main shaft E revolves the governor-spindle F is rotated at a speed which is controlled by the location of the pulley  $F^2$  relative to the center of the gear  $E^2$ . The upper portion of the hub of the pulley  $F^2$  is provided with an annular groove  $f$ , adapted to receive the bifurcated end of a lever G, which is pivoted at  $g$  to the bed A, and the other end of which has a handle  $g'$ , whereby the lever G can be rocked around its pivot for the purpose of adjusting the height of the pulley  $F^2$  relative to the center of the gear  $E^2$ . A thumb-screw  $g^2$  in the handle end of the lever G serves to clamp the latter in position against the segment  $A^2$ , which is rigidly secured to the bed of the engine.

It will now be readily understood that the nearer the pulley  $F^2$  is brought to the center of the disk  $E^2$  the slower the governor-spindle will be rotated relative to the speed of the main shaft E. The governor-balls operate on the rock-lever  $F^3$ , which is pivoted on the projection  $a^2$  of the arm  $a$  and is connected by the rod  $f'$  with the trip-cams of the steam cut-off valves.

By the use of the disk  $E^2$  I, am enabled to bring the pulley  $F^2$  to a position in line with the axis of the said disk, and if the latter is made of a uniform size with the driver  $E^1$  and supported in a housing, as shown and described, I am enabled to drive both the valve-gear of the engine and the governor from the same disk. It must, however, be understood that it is not absolutely essential to employ



one disk supported in a periphery-bearing, since two disks with a bearing between them can be substituted for the one illustrated; neither do I confine myself to the use of gear-teeth for driving the disk from the shaft, since any other well-known method can be used for the same purpose. Therefore

What I claim as my invention, and desire to secure by Letters Patent, is--

1. The combination of the governor and its driving-pulley held in sliding contact with a disk adapted to frictionally drive said pulley, said disk consisting of a gear-wheel in peripheral guide and independently from the main driving-shaft, substantially as and for the purpose set forth.

2. The combination, with the governor, its spindle, and driving-pulley held in sliding

contact with a disk, consisting of a gear-wheel in peripheral guide independent from the main driving-shaft, of means, substantially as described, for varying the position of said pulley on said spindle, as and for the purpose set forth.

3. The combination, with a spindle and driving-pulley held in sliding contact with a disk, consisting of a gear-wheel peripherally journaled independently of the main driving-shaft and adapted to frictionally drive said pulley, of a pin upon the opposite side of said disk for operating the valves, substantially as described.

JEROME WHEELOCK.

Witnesses:

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