O. Leonard,

Steam-Engine Valve-Gear.

No. 14,486. Patented Mar. 18, 1856.

Fig: 3.

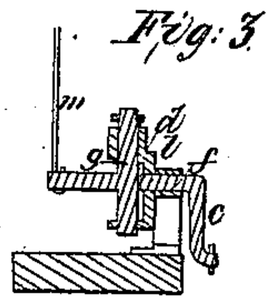


Fig: 1.

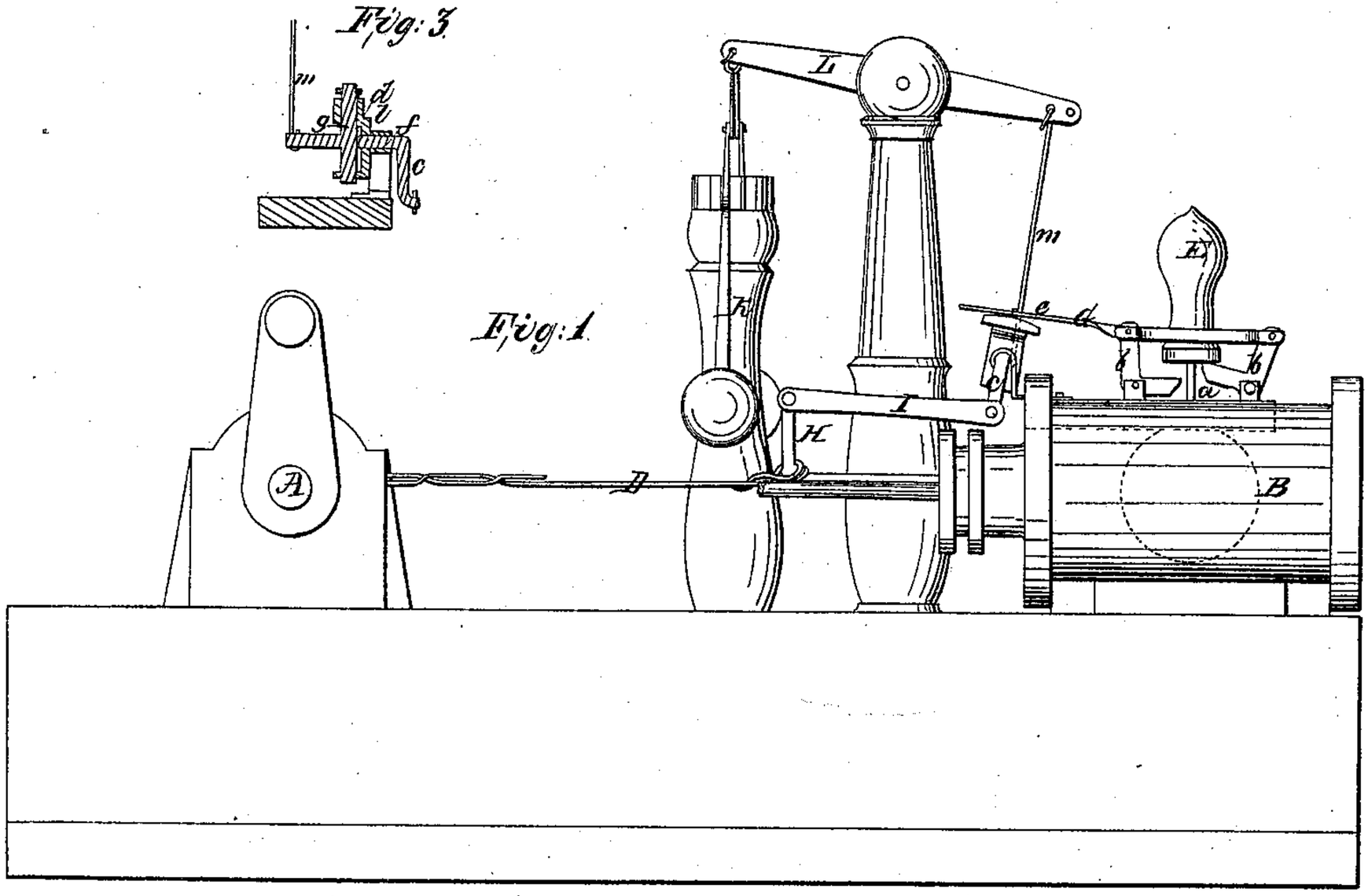
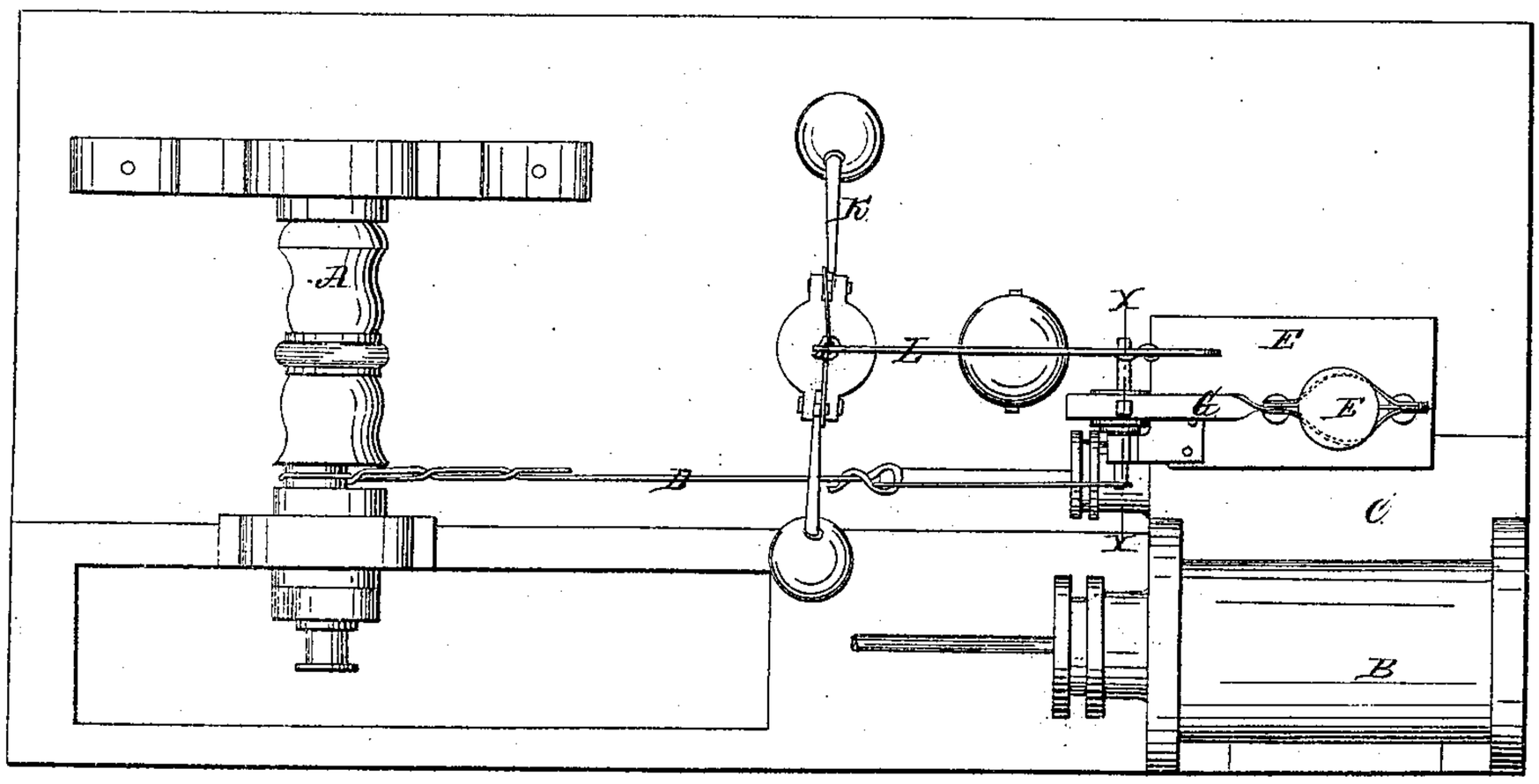


Fig: 2.


K
A
X
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B

UNITED STATES PATENT OFFICE.

ORVILLE LEONARD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO O. LEONARD AND GEO. H. REYNOLDS.

CUT-OFF GEAR FOR STEAM-ENGINES.

Specification of Letters Patent No. 14,486, dated March 18, 1856.

To all whom it may concern:

Be it known that I, ORVILLE LEONARD, of Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Method of Regulating Steam-Valves by Means of the Governor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a side elevation. Fig. 2, a plan. Fig. 3, a section upon the line X, X, of Fig. 2.

Various methods have been devised for the purpose of regulating the amount of steam admitted to the cylinder; to the varying amount of work upon the engine by means of the governor balls, most of these methods are complicated, and can only be applied to engines built expressly for the purpose, while the original cost of those which are most effective is such that they cannot with economy be applied to engines of small size.

The object of my present invention is to produce a cut off which may be applied to any ordinary engine with but small original expense and that shall not be liable to get out of order or require expensive repairs.

To enable others skilled in the art to understand my invention I will proceed to describe the manner in which I have carried it out.

In the accompanying drawings A is the main shaft; B, the cylinder; C, the steam box; D, the eccentric rod which operates the slide valves within the steam box C.

E, is a weight upon the top of the valve stem *a*, of a balance puppet valve placed at the point where the steam pipe enters the steam box C; this valve is raised at the moment the piston is about to start from either end of the cylinder, an amount varying with the work at the time upon the engine, and regulated by means of the ordinary governor in the following manner: F, is an auxiliary steam box or enlargement of the end of the steam pipe, into which the steam is admitted, and from which it passes through the puppet valve into the box C.

b, are bent levers pivoted upon the top of the box F, and so arranged that as they are rocked or vibrated they shall raise the weight E, and the valve attached to it—the upper ends of the levers *b*, are pivoted to a bar G, which is vibrated longitudinally for the purpose of raising the valve by the following device.

An arm H, rises from the eccentric rod D, and is connected by means of the link I, with a crank *c*, upon the rocker *d*, which is allowed to vibrate around the point *f*, as the valve rod D moves. Through the center of the rocker passes up the post *g*, which is so connected with the governor K, by means of the lever L, and rod *m*, that as the governor balls fall, the end of the post is caused to project up through the rocker, and as the balls rise the post is drawn down beneath the curved surface *e*, of the rocker, the position of this post being at all times regulated by that of the governor balls. The bar G, lies immediately over the rocker *d*, and has a slot through it in such a position that the post *g*, which projects above the surface of the rocker shall lock with the bar and raise the valve. If now the governor balls fall, as in the case where additional work is thrown upon the engine, the post is projected above the surface of the rocker, and taking a rank hold upon the bar G, raises the valve and retains it open until by the vibration of the rocker, the post is withdrawn from the slot, when the valve is instantly closed by its weight E. If the velocity of the engine increase, the motion of the governor balls causes the post *g*, to project a less distance above the surface of the rocker, causing the valve to fall sooner and admit less steam, and if the governor balls rise still higher, the post is withdrawn beneath the surface of the rocker and the valve is not raised. The amount of steam admitted to the steam box is thus regulated every half stroke by the governor, and the speed of the engine remains unchanged however varying the work upon the engine may be.

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

To the rocker *d*, the toe *g* and the bar G, constructed and arranged as described and operating substantially as herein set forth.

ORVILLE LEONARD.

Witnesses:

SAM. COOPER,

THOS. R. ROACH.