J. A. Lynch,

Governor.

No. 112,159. Patented Feb. 28, 1871.

Fig. 4.

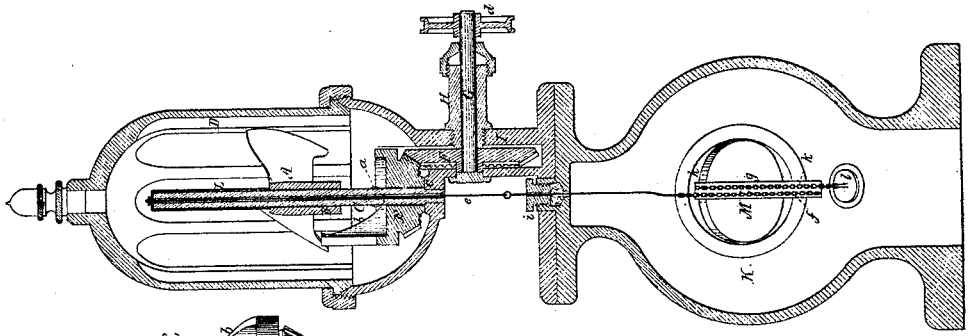


Fig. 6.

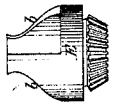


Fig. 3.

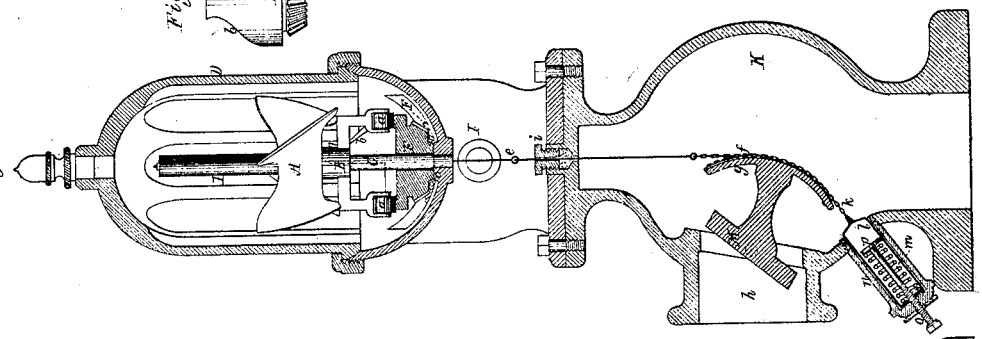


Fig. 2.

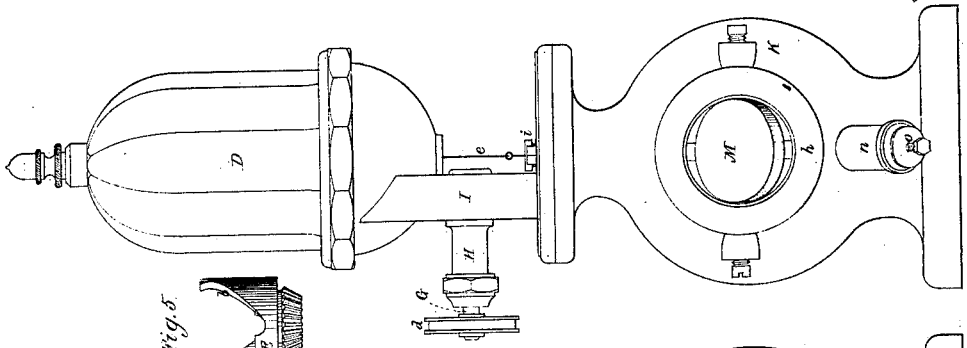


Fig. 5.

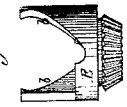
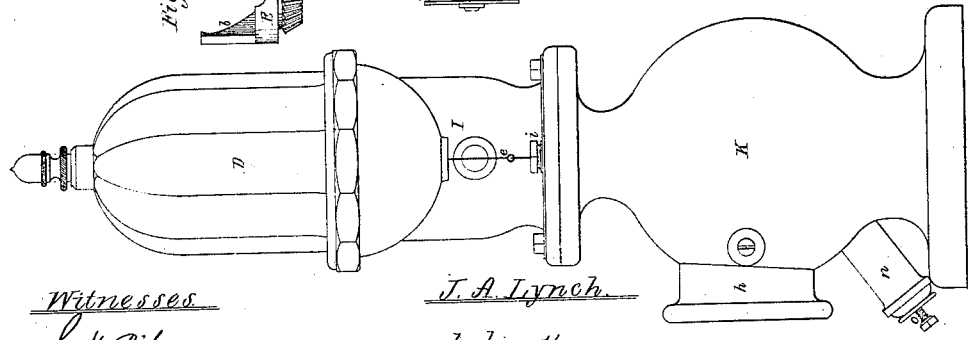


Fig. 1.



Witnesses.

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L. N. Miller

J. A. Lynch.

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R. H. Eddy

United States Patent Office.

JOHN AUGUSTUS LYNCH, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 112,159, dated February 28, 1871.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, JOHN AUGUSTUS LYNCH, of Boston, of the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Governors for Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figures 1 and 2 are side elevations, and

Figures 3 and 4 are vertical sections of one of my improved governors.

Figures 5 and 6 are side elevations of the helical lifter and rotator of the propeller.

This governor is of the kind where the throttle-valve or gate to be actuated by it is moved by a screw-propeller revolving within a liquid contained in a cistern or vessel.

In the drawing the screw-propeller is exhibited at A as fixed on a carrier, B, having two legs, each leg at its foot being provided with a wheel or friction-roller, *a*.

The said propeller and carrier turn freely on a stationary tubular spindle, C, erected within the closed receiver or oil-case D.

The propeller-carrier is supported on the helical lifter E, which also revolves freely on the spindle C, and is arranged within the case D and below the carrier, such helical lifter being a bevel-gear having two helical cams *b b* arranged on and projecting from it, and formed in manner as represented.

The lifter is supported on a bearing, *c*, of the case D, and engages with a driving bevel-gear, F, that is fixed on the inner end of a horizontal shaft, G, arranged and having a bearing in a tubular arm, H, projected from the hollow neck I, by which the propeller-case is connected with the outer case K.

A driving-wheel, *d*, to receive an endless band, is fixed on the outer end of the shaft G.

The neck I, closed at bottom, opens at its upper part directly into the case D, in order that the liquid or oil may surround the operative gears and keep them and their rubbing surfaces and shaft suitably lubricated.

Encompassing that part of the spindle which extends above the propeller is a sleeve, or thimble, or tube, L, which rests on the hub of the propeller and is closed at top.

From such top a small wire, *e*, extends down through the spindle and the bottom of the case D, and thence through the top of the valve-case or a stuffing-box thereon.

At its lower end the said wire *e* is fastened to one end of a chain, *f*, which is laid on and fixed to the periphery of a sectoral arm, *g*, that projects from a throttle-valve, M, pivoted within the induction-passage *h* of the valve-case, the eduction-passage of the valve-case being in any other convenient part of it.

The hollow neck I is arranged wholly on one side of the common vertical axis of the valve and propeller-cases in order that access may readily be obtained to the stuffing-box *i* at the top of the valve-case.

Another chain, *k*, fastened to the sectoral arm of the valve, extends down the periphery of such arm, and is fastened to the upper end of a cylindrical thimble, *l*, containing a helical spring, *m*, which rests on the hollow of the thimble.

The thimble is disposed concentrically within a tubular arm, *n*, projecting obliquely from the lower part of the valve-case, and being closed at its lower end, except in having a passage through the center thereof to receive a screw-rod, *o*, that screws into the lower end of the arm.

At its upper end the rod has a head, *p*, against which the top of the helical spring *m* bears. On revolving the rod the helical spring may be either contracted or extended, more or less, either to increase or diminish its power or tension, as occasion may require. The spring is to effect the opening of the valve, or its movement in a direction contrary to that in which it may be moved by the action of the propeller.

From the above it will be seen that, while the engine may be in operation, the band for actuating the driving-pulley of the governor will be in action, and such pulley will be kept in revolution, thereby causing the bevel-gear F to revolve and turn the helical lifter. This latter, by its action against the carrier of the propeller, will set such carrier in rotation so as to revolve the propeller.

As the propeller may tend to rise within the liquid, the carrier will be borne against the inclined planes or helical cams of the lifter; consequently the helical lifter, besides effecting rotary motion of the propeller, will perform another function, that is to say, it will aid in effecting the rise of the propeller.

The lifter, by thus favoring the rise or upward motion of the propeller, renders the governor much more sensitive, its sensitiveness being increased with the diminution of the pitch of the helical plane or planes of the lifter.

Inasmuch as it is very desirable to avoid friction as much as possible in the action of the parts of a governor of this kind, all such friction tending to diminish its sensitiveness, I have adopted the very fine wire *e* to operate the valve by tension rather than thrust.

In the said governor I claim—

1. The combination of the helical cam-lifter E with the propeller A and its case D, all being to operate substantially in manner as described.

2. The propeller-case neck I, made as an oil-reservoir to open into the body of the case D, and arranged with the driving-gear F, the valve-wire *e*, and the valve-case K, substantially in manner as described.

3. The combination of the spring *m*, provided with means for varying its tension, as described, with the valve M, the propeller A, its case D, and the helical cam-lifter E, all being arranged and combined substantially in manner and so as to operate as described.

J. AUGUSTUS LYNCH.

Witnesses:

R. H. EDDY,

J. R. SNOW.