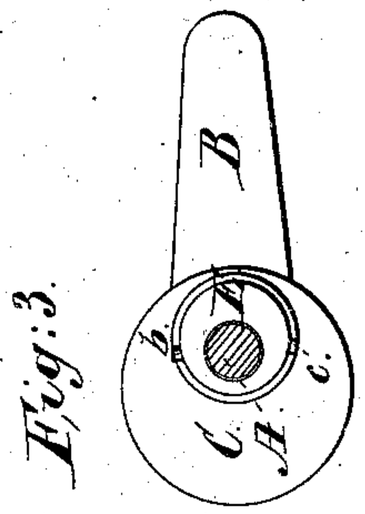
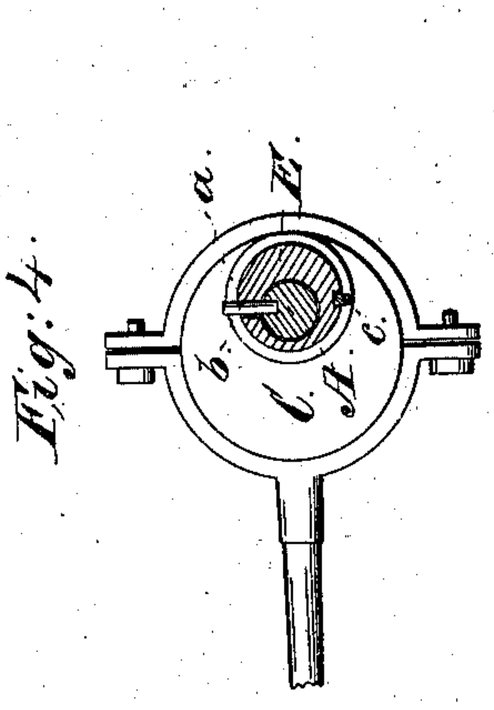
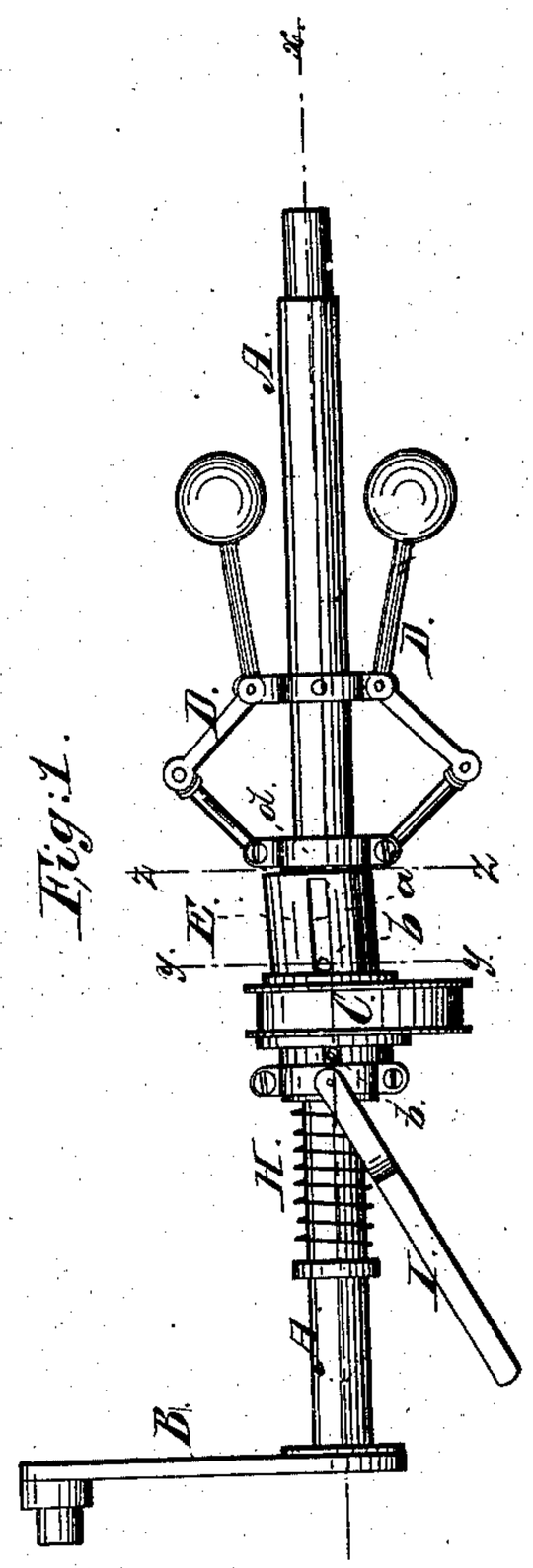
L. Eikenberry,

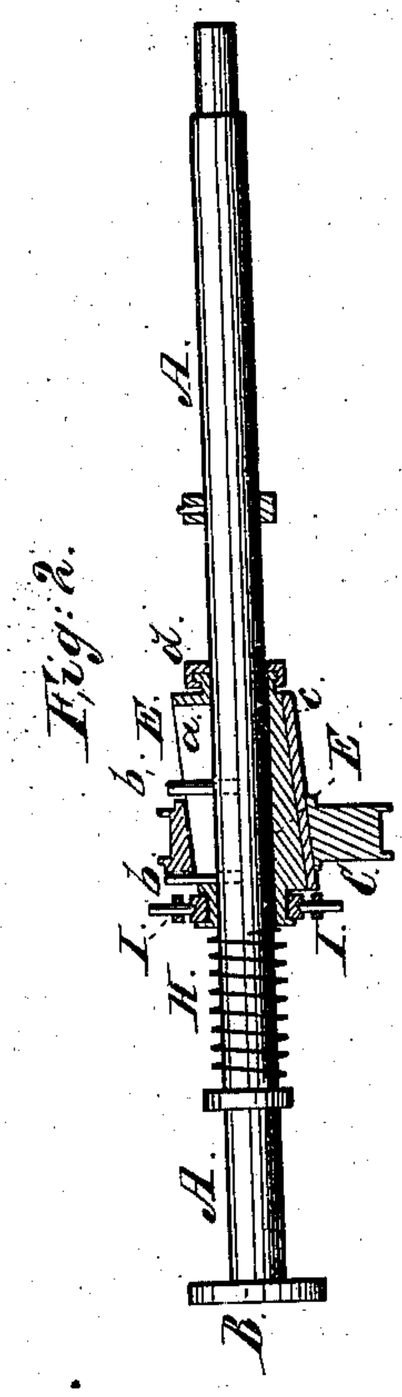
Governor.

No. 32,055. Patented Apr. 16, 1861.









Witnesses.

G. Y. Y. Deterich

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Inventor:

Lewis Eikenberry

UNITED STATES PATENT OFFICE.

LEWIS EIKENBERRY, OF PHILADELPHIA, PENNSYLVANIA.

VALVE ARRANGEMENT.

Specification of Letters Patent No. 32,055, dated April 16, 1861.

To all whom it may concern:

Be it known that I, LEWIS EIKENBERRY, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement for Governing Valves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, is a top view of the horizontal crank shaft of an engine with my improvements applied to it. Fig. 2, is a vertical central section of the same. Fig. 3, is a vertical transverse section in the line *z*, *z*, and Fig. 4, is a vertical transverse section in the line *y*, *y*.

Similar letters of reference, in each of the several figures indicate corresponding parts.

The nature of my invention consists 1st, in effecting a connection between the sliding diagonally set tubular shifter, crank shaft and the eccentric by means of an oblong slot cut through the tubular shifter, one or more guide pins projecting from the shaft through the slot and a feather or key attached to the tubular shifter and working in a groove formed in the eye of the eccentric.

It consists 2nd, in the combination of a ball governor and spring with a slotted and diagonally set tubular shifter, shaft and the guide pins, substantially in the manner hereinafter described.

To enable others, skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

A, represents the shaft of the engine; B, the crank; C, the eccentric; and D, a ball governor.

The shaft has a short tubular shifter E, fitted loosely on it; said tubular shifter being set on the shaft so as to have its sides run diagonally or obliquely to the shaft and having a slot *a*, cut through its circumference in order to allow one or more pins *b*, *b*, which project out from the circumference of the shaft, to pass through it. The pins *b*, *b*, serve to keep the eccentric from longitudinal movement on the shaft, also to control the position of the tubular shifter, and they likewise will serve to give a slight turn to the tubular shifter and eccentric when the slot runs diagonally to the shaft, as will be hereinafter described.

Over the tubular shifter E, the eccentric C, is fitted loosely and then secured against rotary but not longitudinal motion by means of a feather *c*, which forms part of the tubular shifter and enters a groove in the eye of the eccentric. The eccentric thus secured, cannot turn independently of the tubular shifter, and whenever the tubular shifter slides in the direction of the arrow, the center of the eccentric is brought nearer to the shaft by reason of the tubular shifter setting oblique on the shaft, and consequently the length of the stroke imparted to the valve is decreased.

In order to have the tubular shifter under control, I have arranged a ball governor D, and a spring H, on the shaft A, and connected one end of the tubular shifter to the spring and the other end to the sliding collar *d*, of the governor, thereby regulating the speed of the engine. And in order to have it under the control of the engine when the governor is not used, I have attached a swiveling hand lever I, to its opposite end.

If it is desirable to have the lead of the valve vary with the change in the length of the stroke of the valve, the slot in the tubular shifter should run parallel with the axis of the shaft, but if it is desired always to maintain the same lead, then the slot should run sufficiently oblique to the shaft to turn the eccentric and tubular shifter—as they slide—together on the shaft to such an extent as to compensate for the change or any part thereof which is caused in the lead by the adjustment of the stroke.

My arrangement is exceedingly simple, and it obviates much of the inconvenience which is experienced with that arrangement of variable eccentric which requires a guide way or framing to keep the eccentric in place during its adjustment.

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

1. Effecting a connection between the sliding diagonally set tubular shifter E crank shaft A, and the eccentric C, by means of

an oblong slot *a* cut through the tubular shifter, one or more guide pins *b*, *b*, projecting from the shaft through the slot, substantially as and for the purposes set forth.

2. The combination of a governor D, or a governor and spring with a diagonally set tubular shifter E constructed and operating as described, and a shaft, A, substantially as and for the purposes set forth.

LEWIS EIKENBERRY.

Witnesses:
GOODWIN Y. ATLEE,
G. F. G. DIETERICH.