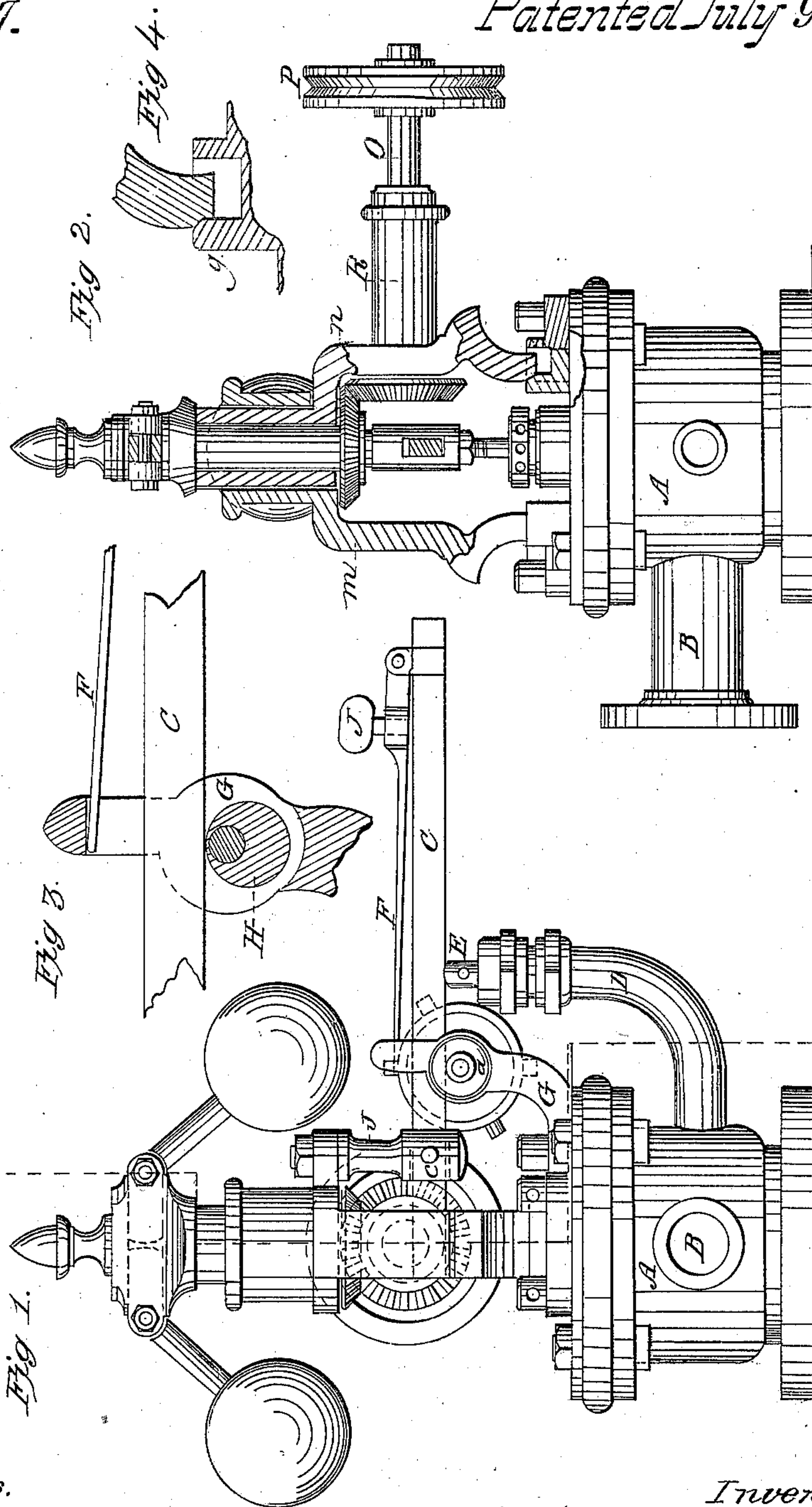


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N^o 66,617.

Patented July 9, 1867.



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Letters Patent No. 66,617, dated July 9, 1867.

IMPROVEMENT IN GOVERNORS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that we, F. J. NUTZ and PHILIP ESTES, of Leavenworth, in the county of Leavenworth, and State of Kansas, have invented a new and useful Improvement in Governors; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This improvement relates to that class of governors which are designed to regulate and control the speed of steam engines, water-wheels, &c., by centrifugal motion, and our improvement is intended to be applied to governors of that kind, although its action upon the steam-valve may be made independent of such governors. While the common centrifugal or ball-governor is intended to regulate the motion of the engine, our arrangement is intended to regulate such governors or to assist them in performing the proper functions of governors or regulators of motion. It is well enough known that when the pressure of the steam in the boiler increases the motion of the engine must increase, (and consequently the centrifugal motion of the balls,) in order to close the valve, and so when the pressure diminishes the speed must also diminish to open the valve. This of course occasions an unsteady motion in the machinery driven, which is extremely objectionable. Our object is to overcome this difficulty, and also to provide for closing the valve instantaneously in case the belt or band which drives the governor should break or run off its pulley. And the invention consists in providing a lever which is operated upon directly by the pressure of the steam upon a piston, and in the provision made for graduating the pressure, and also in the devices for closing the valve entirely when it is desired, and in stopping the engine in case of accident, as will be hereinafter more fully described.

Figure 1 represents an elevation of the governor with our improvements attached.

Figure 2 is also an elevation of the apparatus partly in section as through the line *x x* of fig. 1.

Figure 3 represents a section of the lever with a view of the eccentric and a portion of the spring.

Figure 4 shows the foot of one of the governor stands with its recess or the stop motion arrangement.

Similar letters of reference indicate like parts.

A is the valve-chest; B is the steam pipe; C is the lever; D is a steam pipe which has a piston and piston-rod, which works in its upper end; E is the piston-rod; F is a spring which is attached to and operates on the lever C; G is a stand which is attached to the steam-chest. The upper portion of this stand is slotted and the lever C passes through the slot, and the spring F bears against the upper end. The slot also contains the eccentric H. This eccentric is hung on a shaft which passes through it and through the stand at *a*. The outer end of the shaft has a hand-wheel on it with short studs projecting from its periphery. The shaft is rotated and the eccentric operated by this wheel when it is desired to raise the lever by the eccentric, and close the valve. J' is a hanger which is attached to the governor-stand. The lower portion of it is slotted and the lever C passes through it, and the fulcrum of the lever is at *c* in the slot. The end of the lever passes through the stem of the governor-valve, and rises and falls with the stem. The piston and rod work steam-tight in the end of the steam pipe D, there being a stuffing-box for the piston-rod, arranged in the usual manner. When the steam increases in pressure the piston-rod E is forced against the lever, and assists in closing the valve without any increase in the speed of the engine, and when the pressure is diminished the piston decreases in its pressure on the lever and allows the valve to open without any decrease in the motion of the engine. The spring F is intended to bear upon the lever and to partly counteract the pressure of the steam on the lever C. J is a thumb-screw, by which the tension of the spring is increased or diminished. The speed of the engine may be altered at any time by this spring operating upon the lever. The eccentric H may be used as a throttle by turning it half round, thereby raising the lever and closing the valve. The drawing, (fig. 2,) has more particular reference to our stop motion, which it is intended should operate when the governor-belt breaks or runs off the pulley and stops the engine. The governor-stand is constructed in two separate parts *m* and *n*. *n* has the gearing-wheels and governor attached. *m* is simply a stand attached to the steam-chest, and intended for the support of *n* and the governor-spindle. The part *n*, with the gearing and governor attached, is so arranged that its foot can drop into a recess, and thereby instantly close the valve. The foot of *n* stands in a shallow recess *g*, but in the recess there is an inclined offset. When the belt of the governor is on the pulley, the strain of the belt keeps the foot of *n* on the higher or inclined part of the recess, in which situation the gear-wheels

engage and the governor-balls revolve. Should the governor-belt break or run off, the strain on *n* is removed and the foot slips down off the inclined shoulder or offset to the bottom of the recess, thereby closing the valve and stopping the engine immediately. It will be noticed and understood that when the stand drops the governor drops also with its spindle and valve-stem. The recess with the incline offset or shoulder is represented in fig. 4. O is the shaft upon which the pulley which drives the governor is placed. P is the pulley. The driving-gear wheel is on the other end of this shaft. The shaft O is supported by a sleeve bearing R, which is attached to and projects from the stand *n*.

What we claim as new, and desire to secure by Letters Patent, is—

1. The governor-valve operated upon by the pressure of the steam pressing upon the piston and rod E and lever C, producing an effect substantially as described for the purpose specified.
2. We claim the spring F with its regulating thumb-screw J, arranged substantially as and for the purposes set forth.
3. We claim the arrangement of the eccentric H, whereby the governor-valve can be entirely closed and the steam throttled, substantially as described.
4. We claim the stop-motion, substantially as shown in fig. 2, whereby the steam is shut off and the engine stopped by the breaking or running off of the governor belt, substantially as set forth.

F. J. NUTZ,
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Witnesses:

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W. A. CADE.