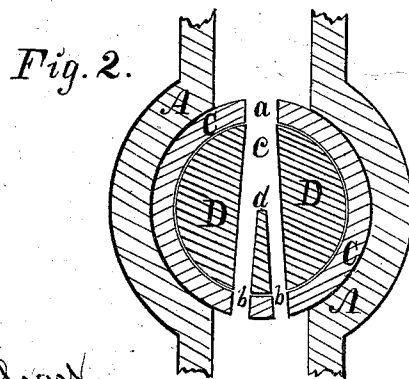
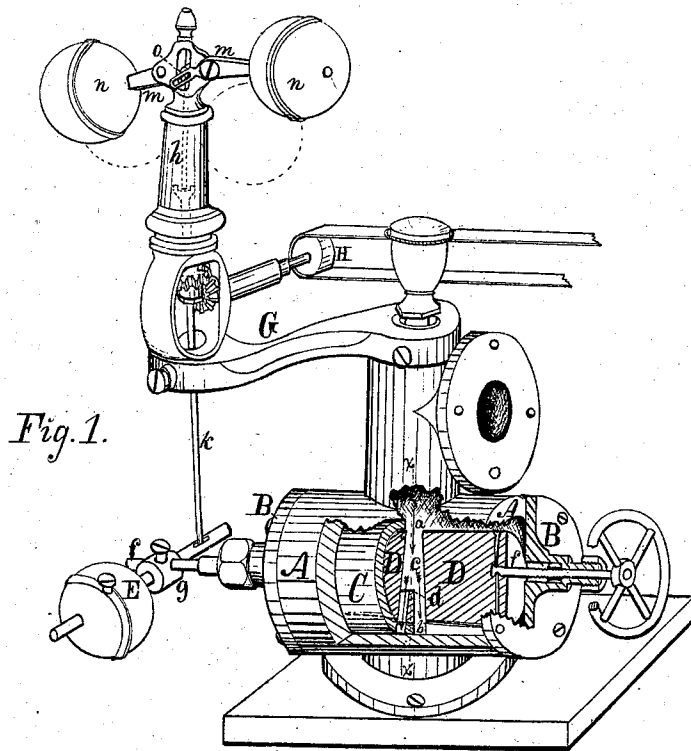


M. A. DALBEY.
Steam-Governors.

No. 149,579.

Patented April 14, 1874.



Witnesses.
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UNITED STATES PATENT OFFICE.

MILO A. DALBEY, OF OSKALOOSA, IOWA.

IMPROVEMENT IN STEAM-GOVERNORS.

Specification forming part of Letters Patent No. **149,579**, dated April 14, 1874; application filed August 15, 1873.

To all whom it may concern:

Be it known that I, MILO A. DALBEY, of Oskaloosa, in the county of Mahaska and State of Iowa, have invented a Steam-Governor, of which the following is a specification:

The object of my invention is to simplify and improve the construction and operation of steam-governors. It consists in an adjustable and tapering valve and a movable valve-seat, so arranged and combined with a governor that it will perform the functions of a governor and also of a cut-off; in a movable arm to combine and adjust the governor-frame with the valve-chamber, and the relative and varying positions of the boiler and engine; and in the use of a ball to operate the cut-off and regulate the speed without changing the size of the belt-pulley, all as hereinafter fully set forth.

Figure 1 of my drawing is a miniature perspective view, illustrating the construction and operation of my invention. Fig. 2 is an enlarged sectional view through the plane *xx*, showing more fully the form of the ports in the valve and valve-seat.

A A is the valve-chamber, of tubular form, with right-angle extensions above and below to form connections with the boiler and engine. My drawing represents this chamber supported on an improvised base-block. B B are movable ends, that serve to close the chamber, and also as stuffing-boxes for passing the valve-stems. C is the movable valve-seat, fitted into a corresponding bore in the chamber A. It may be of regular diameter its entire length on its outside surface, or it may be tapering. Its bore, which receives the valve, is tapering. It has a longitudinal slot, *a*, in its upper side, to connect with the hollow of the top extension of the chamber, which is the steam entry, and two parallel slots, *b b*, on its under side, to connect with the passage leading to the engine. The size and form of this movable seat, and also its slots or ports, may vary to correspond with valves of different size and construction. By means of this movable seat the valve and seat can be taken out and repaired when necessary, and duplicates inserted without moving any other portion of the governor, and without breaking or disconnecting pipes and joints, as heretofore often required. A change and repairs may there-

fore be effected with very little interruption in the running of machinery, and consequently delays may be prevented, and time and labor saved thereby. D is the valve, tapering in form, to fit the tapering bore of the valve-seat. It has a longitudinal slot, *c*, through its center, which slot is divided on the under side by the partition *d*, to form two parallel slots or ports, corresponding with the two slots *b b* in the seat C. In the position shown all the ports register and allow a free passage of the steam. When the valve is turned by means of the stem extending from its rear end, the ports may be closed or partly closed and the volume and pressure of the passing steam regulated. *f f* are the valve-stems, passing outward through the end covers B B. On the right or front end of the valve the stem is attached thereto in any suitable manner that will allow the stem to turn while the valve remains stationary. A male screw-thread on the stem operates in a corresponding female screw attached in any suitable way inside of the bore in the center of the end piece or cover B. A hand-wheel on the outside end of the stem affords a means of turning the stem and screwing it in and out, and thereby moving the valve back and forth in the valve-seat. By this means the tapering form of the valve is made available to compensate for wear. When the valve becomes too loose in the seat it is readily tightened by simply turning the wheel on the end of the stem, and thereby pushing the valve farther in. By this same means the valve can be pressed in tight and locked, and held stationary, with the ports entirely closed or opened to any degree desired. On the left or rear end of the valve the stem is rigidly attached thereto, and passes outward through the rear end piece B, and also through the collar or swell of a shaft that crosses the stem at right angles. *g* is that shaft, and forms a connecting-link between the valve and the governor. It is locked to the stem *f* by means of a set-screw passing through the swell of the shaft. This shaft *g* may also be made available as an index-finger to point to a scale that will indicate the position of the ports and the amount of steam passing. When it stands horizontal and level, the ports are entirely open. When it stands at an angle the degree of

angle will tell the degree to which the ports are closed. E is a movable ball sliding on the shaft *g*, and held at any point desired by means of a set-screw. When the shaft *g* is disconnected from the governor-stem the ball or weight E will, by force of gravity, turn the valve-stem and valve, and close the ports. In case of the governor-belt slipping off or breaking, the ball E will act in the same manner, and cause the valve to perform the functions of a cut-off. G is a movable arm fitted to the top of the upward extension on the chamber A, and held there with a set-screw. An oil-cup is connected at the same point, and rises above the arm G. The governor-frame is journaled to the opposite end of the arm G, in such a manner that it can be turned to extend and hold the shaft bearing the belt-pulley H in any direction desired. My governor is thereby adapted to be placed on any side of the engine, and in any position desired, by simply turning the governor-frame which carries the shaft bearing the belt-pulley H, and then locking it rigidly to the arm G by means of a set-screw. When it is reversed from one side to the other, the shaft *g*, carrying the weight E, must also be reversed, in order that a connection may be maintained between the valve-stem *f* and the governor-stem *h*. *k* is a movable rod or pin, used to connect the governor-stem with the valve-stem through the medium of the shaft *g*. It passes through an opening provided in the base of the governor-frame, and also through the end of the arm G, which supports the frame. It has a head, which prevents its dropping from the hollow of the spindle, and in the top of its head is a cavity, which admits the lower end of the governor-stem *h*, and allows it play therein. A loose joint is thus formed between the stem *h* and pin *k*, which allows the pin *k* to move out of a perpendicular position, and thereby adapt itself to the varying angles of the shaft *g*, upon which it rests. An indentation or cavity in the shaft *g* retains the pin *k*, when the governor is adjusted for use. It can be readily disconnected whenever desired by simply lifting the pin out of the cavity in the shaft *g*. When the governor-stem *h* and valve-stem *f* are thus disconnected, the weight E will turn the valve and close the ports *b b*, and thereby perform the functions of a cut-off. *m m* are

the governor-arms, carrying the balls *n n*. The arms are pivoted on the front and back, and on opposite sides of the governor-head. This arrangement prevents the necessity of forming openings to receive the arms, simplifies the construction, and saves labor in making the governor. *o* is a T-shaped head on the stem *h*, connected with the upper ends of the arms *m m*, by passing outward through the slots in the arms. A vertical opening in the governor-head allows the T-shaped head of the stem to move up and down during the operation of the arms *m* and balls *n*. A common bevel-gearing connects the governor-spindle with the shaft bearing the pulley H.

In the operation of my governor the centrifugal force of the balls *m m* is communicated to the shaft *g* through the stem *h* and pin *k*. This force is partly balanced by the ball E, and by adjusting the ball on the shaft *g* its resistance to the pressure or force of the balls *m* is readily increased or decreased. By moving the ball outward, and thereby increasing the leverage, it exerts an increased upward force on the pin *k* to resist the centrifugal force that elevates the balls *m m* and presses down the pin *k*, and vice versa. By this means the speed of the governor and engine may be regulated without changing the size of the belt-pulley H. The various parts of my complete governor may vary in size to produce governors of various sizes and capacities.

I claim—

1. The adjustable arm G, when combined with the chamber A, as a means of supporting, carrying, and adjusting the governor-frame and belt-wheel H, substantially as described, and for the purposes specified.

2. The combination of the ball E, shaft *g*, valve-stem *f*, pin *k*, and stem *h*, as described, and for the purposes specified.

3. The valve-chamber A, movable end covers B B, movable valve seat C, tapering and adjustable valve D, stems *f f*, shaft *g*, carrying the ball E, stem *h*, movable arms *m m*, carrying balls *n n*, and arm G, when combined and co-operating in a steam-governor, substantially as described, and for the purposes specified.

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Witnesses:

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