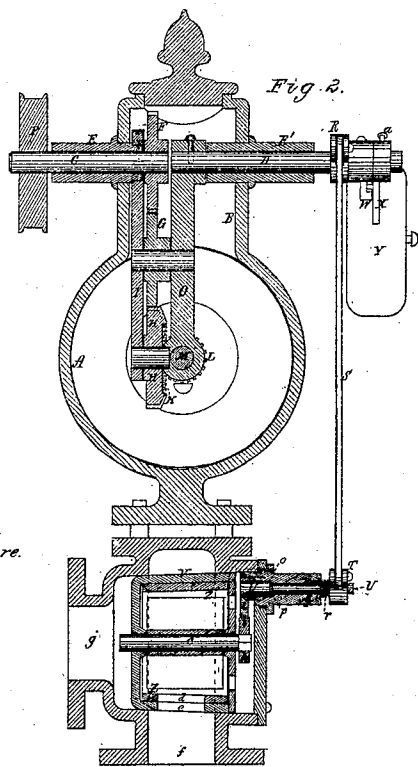
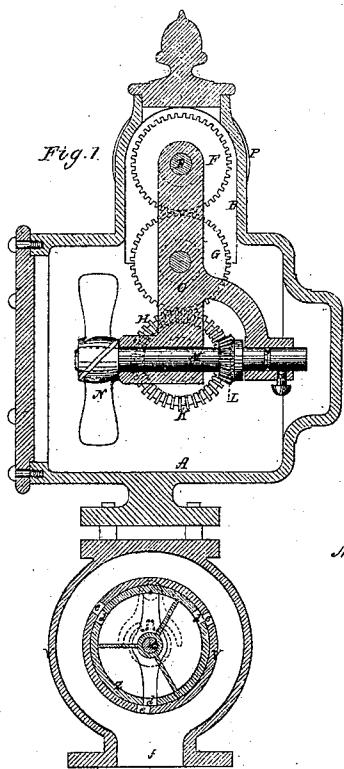


R. K. Huntton,
Steam Governor.

No. 109013.

Patented Nov. 8. 1870.



Auxiliary Figure.

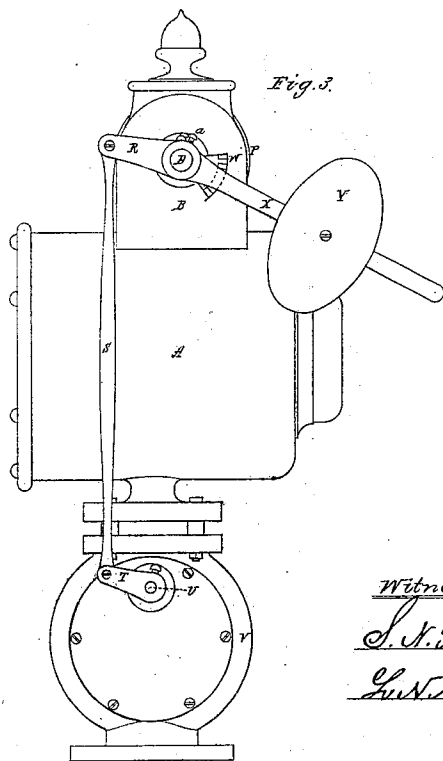
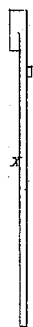


Fig. 4.



Witnesses.

S. S. Piper
Geo. W. Allen

R. K. Huntton.

by his attorney.

N. H. Ledy

UNITED STATES PATENT OFFICE.

REUBEN K. HUNTOON, OF WAKEFIELD, ASSIGNOR TO J. AUGUSTUS LYNCH,
OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 109,013, dated November 8, 1870.

To all whom it may concern:

Be it known that I, REUBEN K. HUNTOON, of Wakefield, in the county of Middlesex and State of Massachusetts, have invented an Improved Governor for Steam-Engines; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a longitudinal section, Fig. 2 a transverse section, and Fig. 3 is a side elevation, of it.

In such drawings, A denotes a hollow drum or cylinder, provided with a hollow head or extension, B, within and across which, and so as to extend from it in manner as shown, are two shafts, C D, which are supported in tubular bearings E E'. On that part of the shaft C which is within the head B is fixed a spur-gear, F, comprising part of a train of such gears, F G H, the two gears G and H being supported on pivots or journals projected from an arm, I, which is pivoted to the bearing E. On the inner side of the gear H is a bevel-gear, K, that engages with a bevel-pinion, L, fixed on the shaft M of a screw-propeller, N, having four or any other suitable number of blades or wings. The propeller-shaft M is supported within bearings in or applied to the arm I, or to another arm, O, connected therewith, and extending down from the shaft D, and fixed thereto. A driving wheel or pulley, P, is fastened on the shaft C. Furthermore, a short arm, R, is projected from the shaft D, and, by means of a rod, S, jointed to it, is connected with a crank-arm, T, fixed on a rocker-shaft, U, such shaft being arranged in the upper part of a valve-case, V, which is disposed underneath the case A, in manner as shown. A sectoral gear, W, is also fixed on the shaft D, and serves to aid in effecting the adjustment of an arm, X, which extends from and turns on the shaft, and is held thereto by a set-screw, a. A small stud or tooth, b, is projected from the side of the arm X, to enter between the tooth of the sectoral gear, such tooth being shown in Fig. 4, which is a top view of the arm X. The purpose of the tooth and the sectoral gear is to enable the arm X to be adjusted to a proper position to counteract the tendency of the steam to close the valve when it may be nearly closed.

The valve shown at Z is arranged within

the case V, the spindle *c* of such valve being wholly within the case. The valve-ports are shown at *d d d*, and the case-ports at *e e e*, the induction-passage being seen at *f*, and the ejection at *g*.

On the valve-spindle is a wheel, *h*, provided with a tooth, *i*, to operate or engage with two teeth, *k k*, arranged in a bifurcated arm, *l*, whose prongs project from the teeth and about the wheel *h*, in manner as represented. This arm *l* is extended downward within the valve-case and from the shaft U, and, when the said shaft is turned, the teeth of the arm and wheel operate to revolve or turn the valve within its case, the prongs of the arm serving as stops to limit the extent of motion of the valve. This they do by either of them bringing up against the periphery of the wheel *h*. The object of the prong-stops is to prevent the valve from being moved beyond a certain arc, so that, when the connecting-rod S may be separated from the arm T, the valve may not revolve so far as to render it difficult to bring it back for its ports to come into their proper relations with those of the case.

The shaft U, for operating the arm *l*, is formed with a shoulder, *o*, to rest against a similar seat or shoulder, *p*, arranged in the shaft-bearing *q*, in manner as shown. A helical spring, *r*, disposed between the arm T and the outer end of the bearing *q*, and encompasses the shaft, serves, when there is condensed water in the valve or its case, to draw the shoulder *o* closely up to the seat *p*, so as to prevent such water from leaking through the shaft-bearing, or being blown through such by the steam when it may next enter the valve or the case. The shoulder *o* and the seat *p* serve, by the pressure of the steam endwise on the shaft, to make a close joint about the shaft, and thus render packing unnecessary. The shafts U and C are so disconnected in one sense and connected in another as to admit of either being moved endwise, independently of the other, in order that the steam in the case, by its operation or pressure on the two shafts, will tend not only to press the valve closely upon its seat, (the valve and seat being slightly conical,) but to press the shoulder *o* of the shaft U up to the case-shoulder *p*, thereby insuring close joints.

The operation of the governor may be thus

described: The case A is to be filled or partially filled with a fluid—such as oil or water, for instance—in order that the propeller while being revolved may turn or wallow in such fluid. An endless belt from a pulley fixed on the engine-shaft is to run around the wheel P, so as to communicate rotary motion to such wheel, whereby, by means of the train of gears, the propeller will be put in revolution within the mass of fluid in its case. The propeller, while revolving, will cause the pendulous arms O and I to swing back together against the gravitating action of the weight Y on the arm X, whereby the valve will be moved more or less, so as to open the ports, it being moved in a reverse direction by the weight.

In the above-described governor it will be seen that the propeller and the mechanism for revolving it are applied to a pendulous arm or arms, I O, thereby enabling the propeller, while in revolution, to swing within the vessel A, and by so doing cause a slight rocking or recoiling motion to be imparted to the shaft D, whereby the valve will be turned more or less.

By the use of the pendulous arm or arms, the friction of the operation of the parts is greatly reduced in comparison to what results from the mechanism as represented in the

United States Patents Nos. 71,015, 82,322, and 89,581, granted on inventions made by me, the governor being rendered much more sensitive in consequence of such.

I therefore claim in the steam-engine governor—

1. The combination of the pendulous arm or arms I O with the propeller, and the mechanism for revolving it, and that for actuating the valve, the whole being substantially as explained.

2. The combination of the furcated or pronged arm *l* and the teeth *k k i* with the wheel *h* and the shaft U of the valve and its operative mechanism.

3. The conical valve and the auxiliary shaft U, as combined with the valve-case and with shoulders *o p*, arranged as described, and by means or mechanism by which the valve-shaft will derive rotary motion from the shaft U, and the two shafts be independent of each other, so as to be capable of being moved in opposite directions by the pressure of the steam, as set forth.

R. K. HUNTOON.

Witnesses:

R. H. EDDY,
J. R. SNOW.