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Reuben K. Huntoon's Impt. in Steam Engine Governors.

Witnesses.
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R. K. Huntoon
by his attorney.
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Fig. 4.

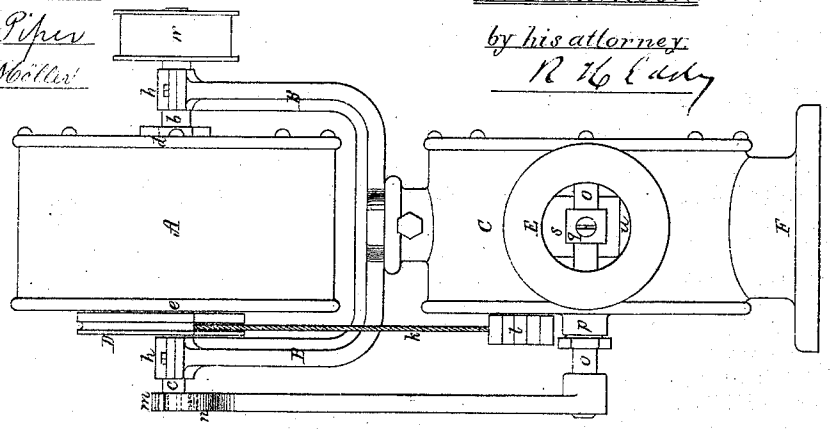


Fig. 3.

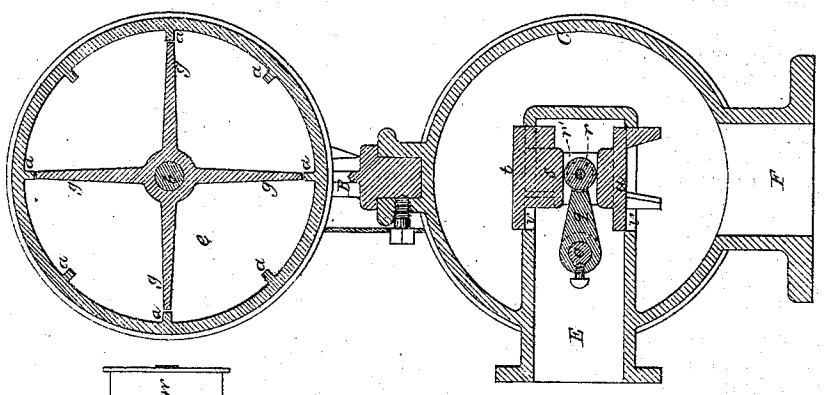


Fig. 2.

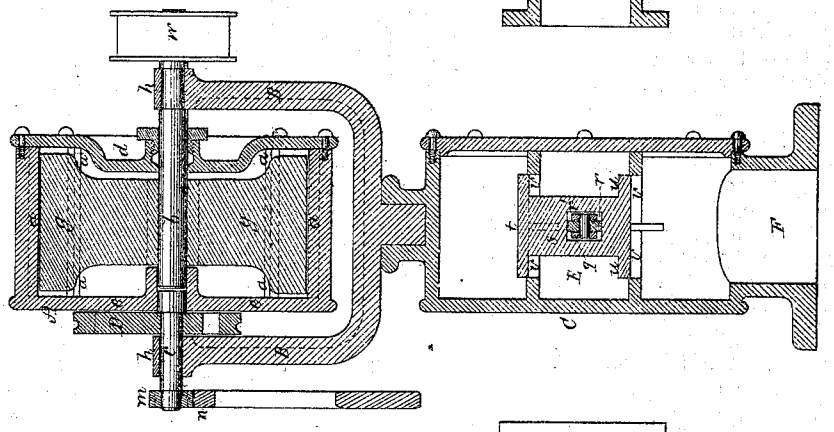
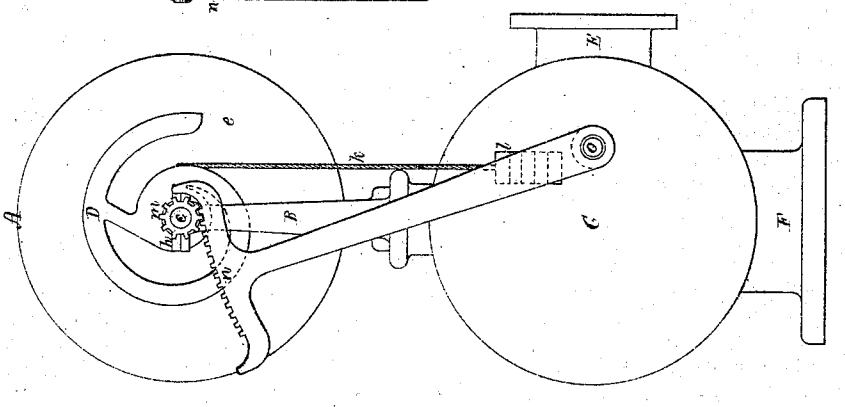


Fig. 1.



UNITED STATES PATENT OFFICE.

REUBEN K. HUNTOON, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 116,596, dated July 4, 1871.

To all whom it may concern:

Be it known that I, REUBEN K. HUNTOON, of Boston, of the county of Suffolk and State of Massachusetts, have made an invention of certain new and useful Improvements in Governors for Steam-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 is a front elevation, Fig. 2 a vertical and longitudinal section, Fig. 3 a transverse section, and Fig. 4 a side view of one of my improved governors.

In such drawing, A denotes a cylindrical drum, provided on its inner periphery with a series of flanges or ribs, *a a*, arranged at or about at equal distances apart. This drum is mounted on, and so as to turn on, a shaft, *b*, there being another shaft, *c*, to which the drum is fixed or fastened. The said shaft *b* extends into the drum from one head, *d*, thereof, the shaft *c* being extended from the other head, *e*, of the drum, as shown. To the shaft *b*, and within the drum, a series of paddles or flat wings, *g g*, is fastened, each of such paddles or wings being made to radiate from the shaft in manner as shown in Fig. 3. The two shafts are supported in bearings *h h* in a standard, B, erected on a valve-case, C, all being as shown. On the shaft *c* there is fixed a volute scroll or fusee, having a chain or rope, *k*, fastened at one end to its periphery, and extended partially around such, and to a weight or series, *l*, of weights applied to the lower end or part of such chain or line. A small gear-wheel or pinion, *m*, fixed on the shaft *c*, engages with a toothed sector, *n*, fixed on a shaft, *o*, that enters one head of the valve-case C through a stuffing-box, *p*, and passes into the induct E. An arm, *q*, carrying a friction-wheel, *r*, projects from that part of the shaft O which is within the induct E of the valve-case, and enters a slot or passage, *r'*, made in the shank *s*, that connects two valves, *t u*. The said valves are arranged in manner as shown, with ports or openings *v v* made in the opposite sides of the tubular induct E, projects within the case C, the said induct being closed at its inner end. An educt, F, leads out of the lower part of the case C. If we suppose a driving-belt from a pulley or drum on a shaft of a steam-engine to run upon a pulley or wheel, *w*, fixed on the shaft *b*, the series of paddles or floats *g* will be put in revolution within the case A. Such case is to be filled or supplied with water, or a fluid which, by the action of the paddles or floats, will be put in revolution and thrown against the flanges or ribs *a* of the case A, thereby causing the said case to revolve in the same direction. As a consequence, the pinion *m* will be revolved so as to put the toothed sector *n* in movement so as to turn the shaft *o*, and thereby effect a movement of the valves, or what may be termed the double-balanced valve of the induct E of the valve-case C. The rotary movement of the case A will be resisted by the weight suspended from the scroll or fusee D, which, as it revolves, will increase the leverage of the weight on the shaft of the case. An arm projecting from the shaft C, and provided with an adjustable weight, is not so effective as the scroll or fusee with its line and weight, for with the former the effect of the weight is diminished as the arm moves out of a horizontal position; but with the fusee or scroll the effect or resistance of the weight constantly increases as its rope is wound up by the scroll or fusee. Thus it will be seen that with the scroll or fusee there is an element in action not incident to the arm and weight, as ordinarily used, such element, and the functions performed by it, being specially useful or advantageous with the governor and other mechanism, as described. By having the valves operated by the arm *q* applied to their connection *s*, there will be no pressure on the valves, such as would result were their stem extended through a stuffing-box and out of the case C. Consequently, the compound valve becomes a balanced valve, easily put in operation by the governor. Applying the fusee or scroll, with its extended weight, directly to the shaft *c* is far preferable to applying it or an arm, and adjustable weight thereon, to the shaft *o*, for in the latter case the weight has to be very materially increased to produce the necessary result, as it has to operate through the sectoral lever and its pinion, and, consequently, has all the leverage of such to overcome in order to move the case A.

My invention, though based on a rotary case, corrugated or having ribs on its inner periphery, and a rotary series of paddles arranged within such case filled with a liquid, is not to be considered as confined to such with the driving-power devices from the engine applied to the case to revolve it, and thereby cause it, through the liq-

uid, to revolve the series of paddles applied to a shaft separate from that of the case, and connected with a valve so as to put such in operation, as such an arrangement of parts is by no means so advantageous, and does not operate as mine does, in which the motive power is applied directly to the shaft of the paddle-wheel to put such wheel in revolution within the liquid, and thereby cause such liquid to revolve, and revolve the case so as to cause it to actuate the valve-operating mechanism applied to it. It will easily be seen that when the case is revolved by the prime motor the centrifugal force generated in the water or liquid put in revolution will cause such water or liquid to be thrown away from the paddle-wheel, so as to exert little or no action upon it. In practice, I have found this result to follow, the consequence being a very inefficient governor; but when the motive-power mechanism is applied directly to the paddle-wheel shaft and the valve mechanism to the rotary-case shaft the centrifugal force generated in the fluid by the paddle-wheel, while in revolution, will cause the fluid to be thrown directly against the case and at right angles to its ribs, the whole body of fluid within the paddle-wheel being thus thrown out from its axis and cause to spend its centrifugal force against the case and its ribs. With my arrangement a very small governor will do the work of a very much greater one wherein the case is made to revolve the fluid, thereby causing the centrifugal force of the fluid put in revolution to operate with little or no practical advantage to revolve the wheel; therefore,

I claim as my invention the following, viz.:

1. The improved governor, composed of the rotary ribbed case A, as described, and the wheel or series of paddles *g* applied to separate shafts *b c*, with the driving-power drum or pulley or actuating device *w* fixed to the shaft *b* of the wheel, and with the valve-operating machinery applied to that *c* of the case, whereby the wheel, while in revolution in a fluid when in the case, will be caused to put the case in revolution and thereby operate the valve mechanism connected therewith, all being substantially as described and represented.

2. The combination of the scroll or fusee D and weight *l*, suspended therefrom, as set forth, with the engine-governor, as described, the valve-case C, valve or valves thereof, and the operative mechanism of the latter, all being substantially as specified.

3. The arm *q* and shaft *o*, as arranged and combined with the valve-stem *s*, the case C, and the induct E thereof, substantially as explained.

REUBEN K. HUNTOON.

Witnesses:

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S. N. PIPER.