

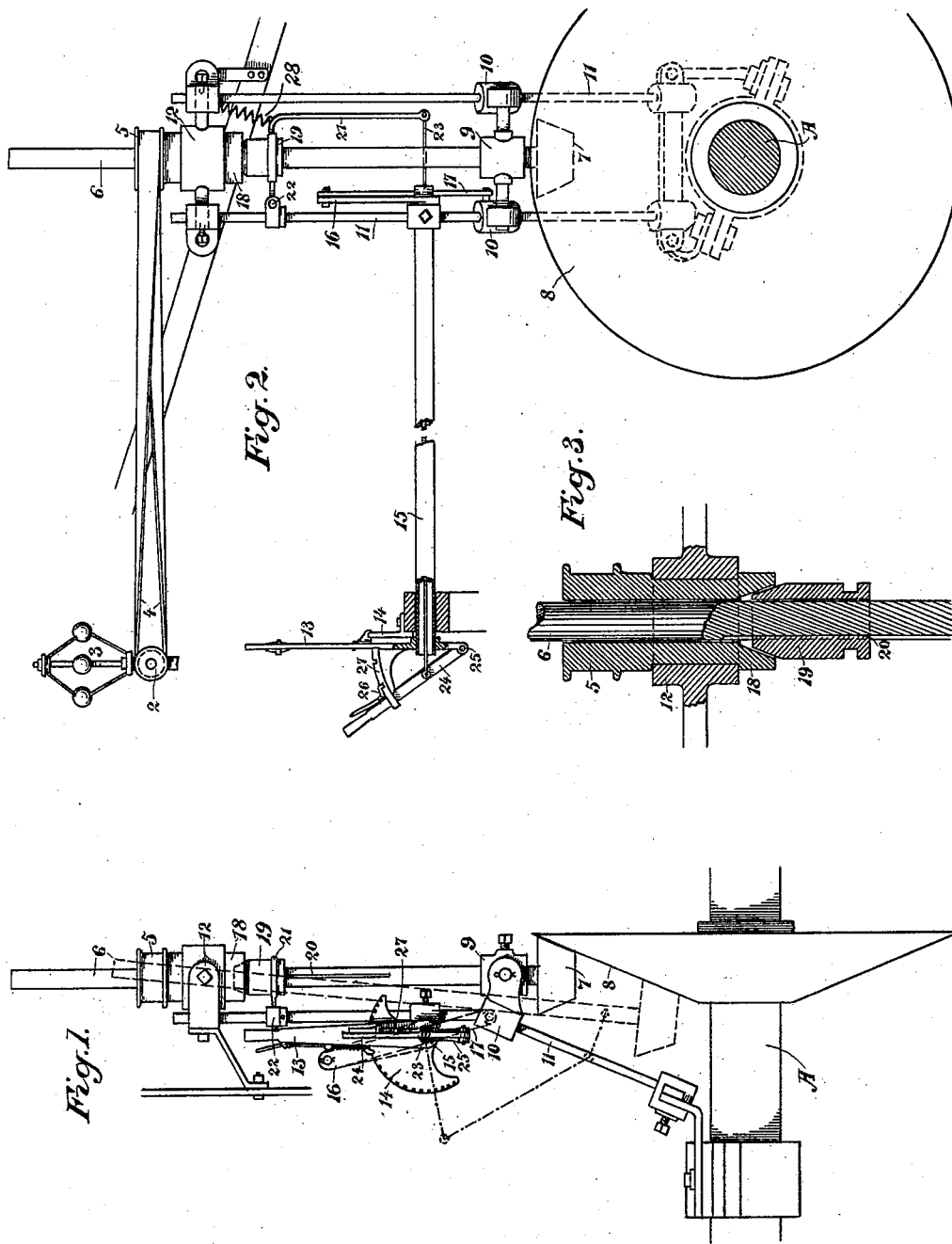
No. 649,167.

Patented May 8, 1900.

C. A. HUFFMASTER.  
ENGINE SPEED REGULATOR.

(Application filed Dec. 15, 1899.)

(No Model.)



Witnesses,

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# UNITED STATES PATENT OFFICE.

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## ENGINE SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 649,167, dated May 8, 1900.

Application filed December 15, 1899. Serial No. 740,468. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. HUFFMASTER, a citizen of the United States, residing at San Leandro, county of Alameda, State of California, have invented an Improvement in Engine Speed-Regulators; and I hereby declare the following to be a full, clear, and exact description of the same.

The object of my invention is to provide a means for varying the speed of an engine or other machine with relation to that of the governor by which it is normally controlled, so that without changing the speed of the governor that of the engine may be varied within certain limits.

My invention consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

Figure 1 is a side elevation of the regulator. Fig. 2 is a front view of the same. Fig. 3 is a vertical section through the swivel and clutch connections.

In the use of engines where the work to be done requires a somewhat-regular speed it is customary to employ a governor which controls the speed of the engine within certain limits, thus insuring a certain regularity of motion independent of the load, which may be a constantly-varying one, or the work which the engine has to do. It is, however, desirable in some cases to vary the speed of the engine, and as a governor is set to operate and control the engine when running at a certain rate of speed my invention is designed to so vary the conditions and connections between the governor and the engine that the speed of the engine may be changed without altering the speed of the governor. An illustration of conditions under which such changes are necessary is well shown in the case of traction-engines which are designed to haul harvesters and the like. The governor upon such an engine is ordinarily used to allow the engine to travel at such a rate of speed that the sickle mechanism will cut grain under the ordinary condition in which it is found in the field; but in some cases the grain is very much lighter or very much heavier, and in such a case it is necessary to change the speed of the engine in order to either allow it to run faster in light grain, and thus keep the threshing-cylinder properly supplied, or

to run slower when heavy grain has to be cut, so as not to clog the threshing and cleaning part of the machine, which may be driven by an independent engine running at a regular rate of speed. Similar conditions frequently arise in the running of stationary and like engines; and it is the object of my present invention to enable the speed of the engine to be varied independent of its governor. Various devices may be employed for this purpose, which will readily suggest themselves to any mechanic. I have here illustrated one form in which my invention may be applied and which I have found very satisfactory.

As here illustrated, A is the engine or other shaft to which power is applied and through which it is transmitted.

2 is a pulley through which power is applied to drive the governor 3 by means of a belt 4, driven from the pulley 5 upon the spindle 6. This spindle is in connection with the shaft A or some equivalent part of the driven machinery, so that the speed of the engine or other machine is transmitted through the above-named connections to the governor. The governors are so adjusted that running at a certain rate of speed—as, for instance, four hundred revolutions a minute—they will act upon the source of power and keep it regulated, so that the engine or other machine will run at a certain regular rate of speed. Any appreciable increase in this speed will cause the governor to run faster and will correspondingly shut off the source of power, while a reduction in the speed of the machine will cause the governor to run slower, and this will open the governor-valve or otherwise increase the source of power, so as to again bring the engine up to its normal speed.

As before stated, under certain conditions it is desirable to change the speed of the engine without interfering with that of the governor. As here illustrated, I have shown the spindle 6 having a frictional or other equivalent pulley or pinion 7 fixed to it, and this pulley is driven by a correspondingly-faced pulley 8, which receives its motion directly from the shaft A or by equivalent connection. The pulley 7 is movable to or from the center of the driver 8, and this movement will vary the speed of the pulley 8 and the shaft A in order to maintain a certain speed

of the governor. Thus when the pulley 7 is moved toward the center of the pulley 8 the latter will have to run at a higher rate of speed in order to keep up the speed of the governor, and all the mechanism driven by or in unison with the shaft A will be correspondingly run at a higher rate of speed. If the pulley 7 be moved toward the periphery of the pulley 8, a slower rate of speed of the shaft A will maintain the regular speed of the governor. I have here shown the pulleys as being beveled similarly to bevel-gears, as this produces the best rolling contact between the two without twisting friction. In order to operate this mechanism as here constructed, it is necessary to move the spindle 6 up or down and to cause its lower end to move in a line parallel with the contact-face of the pulley 8. To effect this the lower end of the spindle 6 is journaled in a box 9, and this box is pivotally connected with a slide 10, which is movable upon a properly-supported guide-bar 11, this bar being so fixed as to stand parallel with the face 8. Thus when the slide 10 has moved down the guides 11 it carries with it the shaft 6 and the pulley 7, and the latter, traveling along the face 8, will be moved nearer to the shaft A; but the opposite movement carries the pinion 7 away from the center of the shaft A. The upper end of the shaft 6 passes through a swiveled journal-box 12, which allows it to conform to the inclined position which the shaft will take when moved toward the center of the shaft A. In order to move these parts, I have shown a hand-lever 13 and a rack-and-pawl mechanism, as at 14, by which the lever 13 can be held at any desired point. This lever is connected with a tubular shaft 15, and when the lever is moved over the rack in one direction or the other the shaft 15 will be turned. This shaft has fixed upon it a crank-arm 16, and this crank-arm is connected by links 17 with the sliding box 10, so that the rotation of the shaft 15 will move the box 10 along the guide 11, and it can be thus set at any point of adjustment.

It is often desirable under certain conditions to disengage the governor entirely from the engine to allow the engine to run independently. This is effected by means of the clutch-coupling, one member 18 of which is turnable within the swivel-box 12, and this member carries the belt-pulley 5, from which the governor is driven. The other member 19 of the coupling is slidable upon a feather 20 on the spindle 6 and is rotated by this connection with the spindle. When the two members of the clutch-coupling are in engagement, power is transmitted from 19 to 18, and thus drives the governor-pulley. When the two are disengaged, the engine continues to run, but the governor stops and has no influence upon the speed of the engine or other machine.

The member 19 of the coupling is here shown as having an annular groove or channel around it, with which a clutch-lever 21 en-

gages. This may be variously constructed. As here shown, this lever is bent at right angles, has one end fulcrumed, as shown at 22, and the other end is connected with a rod or wire 23, which passes through the tubular shaft 15, and its opposite end is connected with a lever 24, which is fulcrumed to an extension 25, carried by the lever 13, so that whatever position will be occupied by this lever 13 and the tubular shaft 15 the lever 24 will be turned with them and occupy the same angle with relation thereto. This lever 24 has a pawl mechanism 26, and this is adapted to engage with a rack-bar 27, so that when the lever 24 is moved in one direction the clutch member 19 will be disengaged from 18 and leave the engine or other machine free to run without connection with the governor. When moved in the other direction, the members 18 and 19 of the clutch will be engaged, and the governor will then run in unison with the machine.

I have here shown a spring 28, which normally acts to hold the clutch members 18 and 19 in engagement. When the lever 24 is moved to disengage them, it compresses or extends the spring 28, and when it is released the spring will act to again engage the coupling members.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An engine or like mechanism, a governor by which the source of power to the engine is controlled and means for operating the governor, including a driver and contact-pulleys or rotatable members between the governor and the driver, and means whereby one of said pulleys or members is moved toward or from the center of the driver and also permitted to move laterally whereby the speed of the driver may be changed independent of that of the governor.

2. The combination with an engine or like mechanism and a governor by which its speed is controlled, of beveled-face pulleys between the governor and engine, means for moving one pulley toward or from the center of its companion, and means permitting one of the pulleys to yield laterally during its adjustment over the face of the other pulley.

3. In a variable-speed device, an engine or like machine through which power is applied, a governor, means by which said governor is driven by connection with the machine, frictional-contact pulleys, one driven directly by the machine and the other connected with the spindle from which the governor is driven, a swiveled bearing about which the spindle may swing laterally, and means for moving the driven pulley toward or from the center of the driver whereby the constant speed of the governor allows a variable speed of the driver.

4. An engine or like machine, a pulley driven thereby, a governor, a spindle from which power is transmitted to drive the governor, a pulley carried by said spindle and

driven by frictional contact with the driver-pulley, journal-boxes in which the spindle is turnable one of said boxes swiveled to allow the spindle to swing laterally, guides upon which the other box is movable parallel with the face of the driver-pulley whereby the driven pulley may be moved toward or from the axis of the driver and its frictional contact therewith maintained.

- 5  
10  
15  
20
5. An engine or like machine, a beveled frictional wheel, driven thereby, a governor, a spindle, belt-pulleys and belt by which power is transmitted therefrom to drive the governor, a frictional beveled wheel carried by said spindle and contacting with the face of the driver, boxes within which the spindle is turnable, one of said boxes having a swiveled connection with a slide, guides parallel with the face of the driver, upon which guides the slide is movable, and a lever and connection whereby the slide may be moved and the pinion upon the spindle moved to or from the center of the driver.

6. An engine or like machine, a governor,

a spindle with pulleys and belt through which power is transmitted therefrom to the governor, a bevel-wheel fixed to the spindle, a correspondingly-shaped driven bevel-wheel carried by the engine, a swivel-box in which the lower end of the driver is journaled, a slide with which it is connected and mechanism by which it is movable upon guides parallel with the face of the driver, a swivel-box through which the upper end of the shaft passes, one member of a clutch turnable in said box and carrying the pulley through which power is transmitted to the governor, a second clutch member slidable upon a feather on the spindle, and mechanism by which it is moved into engagement with its fellow member or disengaged therefrom.

In witness whereof I have hereunto set my hand.

CHARLES A. HUFFMASTER.

Witnesses:

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CHAS. BALDWIN.