No. 665,552. Patented Jan. 8, 1901.

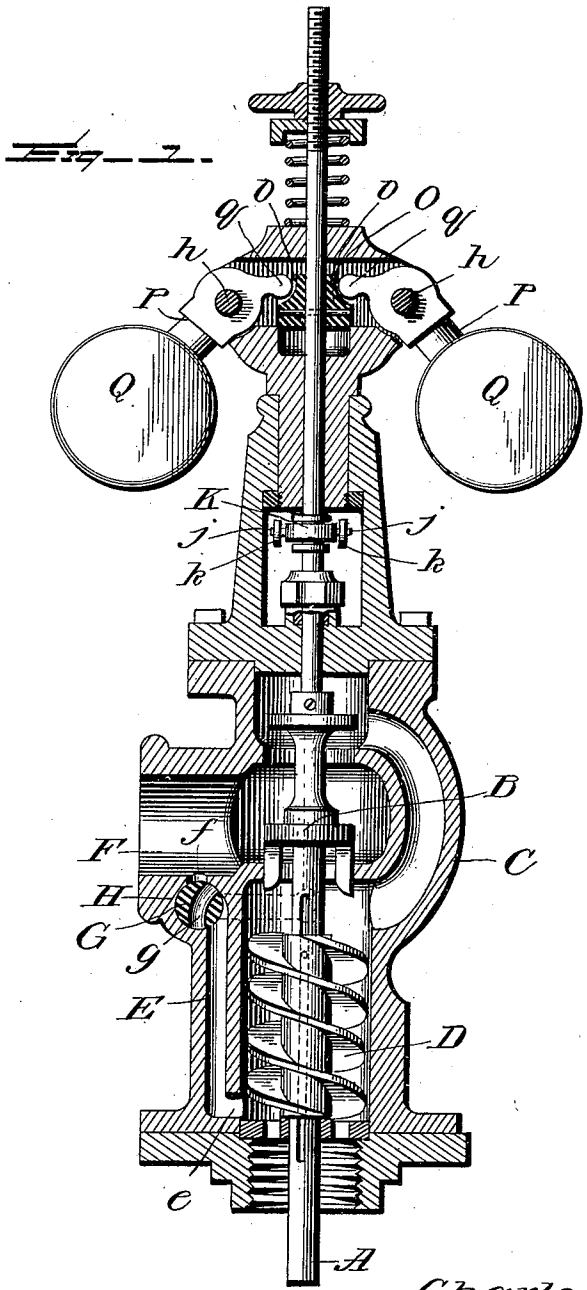
C. F. SLEIGH.

SPEED GOVERNOR.

(Application filed July 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

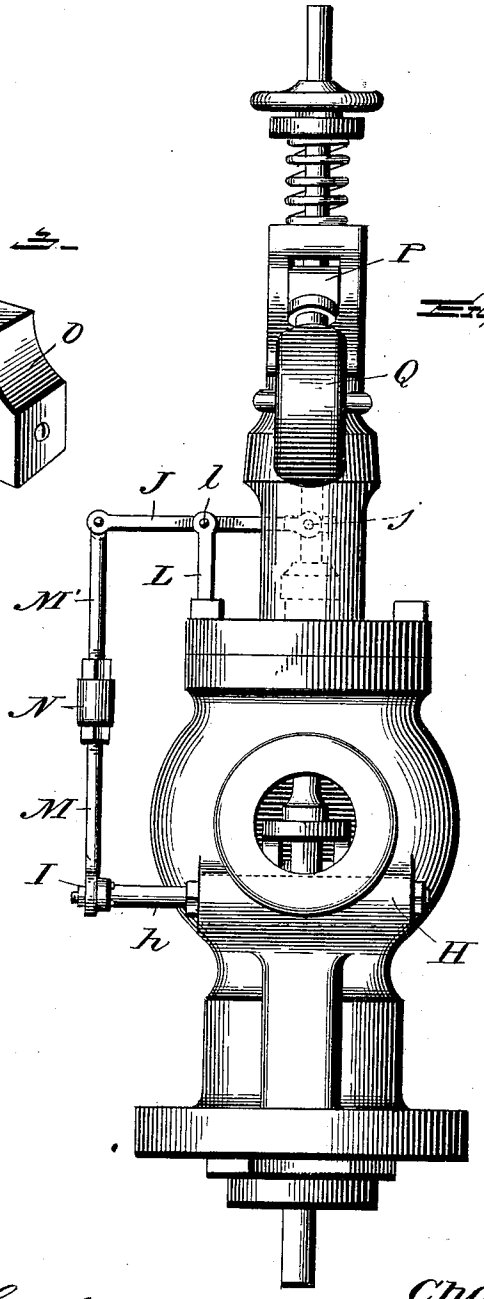


Fig. 3.

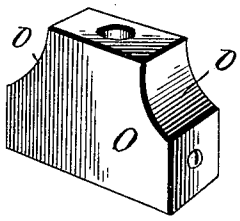
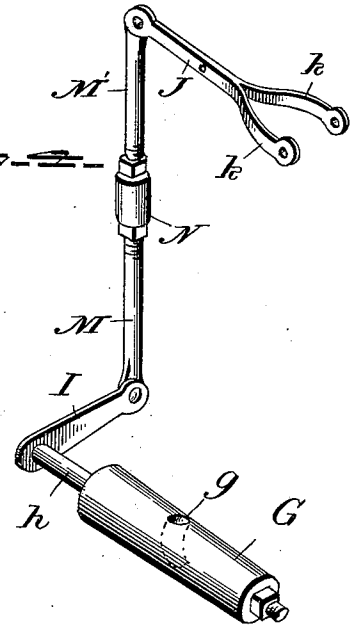


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES F. SLEIGH, OF CAIRO, WEST VIRGINIA.

SPEED-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 665,552, dated January 8, 1901.

Application filed July 13, 1900. Serial No. 23,504. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SLEIGH, a citizen of the United States, residing at Cairo, in the county of Ritchie and State of West Virginia, have invented certain new and useful Improvements in Speed-Governors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in speed-governors, and more particularly to a speed-regulator so constructed and arranged as to provide an automatic speeder by which the speed of the engine can be regulated without stoppage of the engine and by means of which the speed of the governor can also be changed so as to reduce the wear to a minimum.

The present invention pertains more particularly to that form of speed-governor in which a propeller is affixed to the governor-shaft between the valve and the engine, such as is shown, described, and claimed in my Patent No. 654,332, dated July 24, 1900. It comprehends in its broadest sense a by-pass whereby the steam is allowed to pass around the propeller without acting thereupon, and the valve controlling this by-pass is so connected with the governor as to be actuated thereby, so that the valve is closed or opened proportionately to the speed. The outward or upward movement of the governor-balls causes the main governor-rod to lower, closing the main governor-valve proportionately and at the same time moving the lever of the speeder or by-pass valve to open it proportionately, so that an amount of the steam is allowed to flow past the propeller, and thus weaken the latter. I also provide a sliding block in the governor-top, which block is secured to the governor-rod and is entirely independent of the balls of the governor or the arms that carry the same, so that the governor is free to be closed without the action of the balls. The short arms of the arms or levers which carry the balls are so disposed as to have engagement with the said block to actuate the same when the balls are thrown outward or upward.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention in its preferred form is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a substantially central vertical section through a speed-governor embodying my present invention. Fig. 2 is a view in elevation at right angles to Fig. 1. Fig. 3 is a perspective of the sliding block removed. Fig. 4 is a perspective view, on an enlarged scale, of the by-pass valve and its operating mechanism.

Like letters of reference indicate like parts throughout the several views in which they appear.

Referring now to the details of the drawings by letter, A designates the governor-rod, B the valve, and C the casing. D is a propeller of any suitable form disposed between the said valve and the engine, and through the hub of this propeller passes the governor-rod in such a manner that while the propeller revolves with the rod the latter may slide freely through the said propeller. All this is substantially the same as is set forth in my application above referred to and is not claimed herein.

The novelty in the present instance resides in the mechanism for regulating the speed of the governor, and consists, broadly, in the provision of the by-pass E, (shown clearly in Fig. 1,) which affords communication between the steam-inlet F and the space beneath the propeller by way of the lateral passage *e* at the lower end of said by-pass, as shown in Fig. 1. It will thus be seen that when the valve G is turned so that its port *g* is coincident with the port *f* and the by-pass the steam will pass through such port *f*, by-pass E, and lateral port *e* to the space below the propeller without exerting its force thereupon, and in accordance with the greater or less opening of the said valve G the propeller will be more or less weakened. This valve G is rotatably mounted in its casing H, formed on the side of the valve-casing C, and its rod or stem *h* has attached to its projecting end an arm I, which is connected with one end of the lever J, the other end of which is pivotally

connected, as at *j*, with the governor-rod, as seen best in Fig. 2. This lever is pivotally mounted between its ends, as at *l*, on the vertical support L, rising from the top of the casing C, and its inner end is bifurcated, as seen best in Fig. 4, its two arms *k* being attached to a collar K on the said governor-rod, as seen in Fig. 1. The rod which connects the lever J with the arm I is in two parts M and M′, joined together by a right and left hand threaded nut N, so that by turning of the nut the rod can be shortened or lengthened, as the speed of the engine may require.

O is a block secured to the governor-rod and having its upper face provided upon opposite sides with the concave portions *o*, as seen clearly in Figs. 1 and 3. Any suitable means may be employed for fastening this block to the rod. In this instance I have chosen to show a rod passed through the block and through the rod; but it is evident that this is but one of the many ways that may be devised.

P represents the governor-arms. They are pivoted, as at *p*, and carry the balls Q. The inner ends of the short portions of these arms are disconnected from the sliding block, as seen best in Fig. 1, so that the block may move independently of the governor arms or balls; but the rounded projections *q* of these arms rest in the concavities *o* of the block, so that when the arms are raised and the balls thrown outward the block, and consequently the rod and the valve B, will be moved downward, as will be readily understood.

The operation will be readily understood. When in use, the steam acting upon the propeller causes the governor-rod to revolve, and the arms and balls are thrown outward and upward according to the speed attained. The revolution of the rod and balls causes the valve B to close proportionately to the speed. As the valve B is moved downward the valve G is turned by reason of the connections above described with the governor-rod and the steam allowed to flow through the by-pass, and as this much power is taken from the propeller the speed of the governor is necessarily diminished, and as it assumes normality the valve B rises to allow more steam to pass to the propeller, and simultaneously with this movement the valve G is proportionately closed. It will thus be seen that as the opening of the by-pass valve weakens the propeller and that as the propeller is the primary cause of the opening of the by-pass valve they will have to meet and equalize in regulation.

It will be noted that I have produced a simple, novel, and cheap form of regulator for speed-governors; but while the embodiment of the invention herein illustrated and described is thought at this time to be preferable I do not wish to limit myself to the structural details, as I reserve the right to effect such changes, modifications, or variations of both construction and arrangement as may be suggested by further experiment, in so far as such changes, modifications, and variations may be comprehended within the scope of the protection prayed. For example, in some instances I prefer to key or otherwise secure the propeller to the governor-rod and dispense with the bridge-piece on which the propeller rests, so that the said propeller may slide up and down in its casing as the rod and valve rise and fall, as this arrangement makes the governor more sensitive in starting and there will be less friction and wear, and, besides, when the steam is turned on to the engine quickly the pressure of the steam on the propeller pulls the valve down proportionately, causing the engine to start slowly and giving the governor more time to regulate the engine. I wish it distinctly understood, however, that the following claims are intended to cover my improved regulating mechanism whether the propeller be fast on the governor-rod and move up and down therewith or is loosely fitted thereon, so that the rod may move therethrough.

What I claim as new is—

1. The combination with a speed-governor embodying a propeller, of a by-pass and means for regulating the speed of the governor by escape of steam therethrough and means for regulating the amount of such escape, as set forth.

2. The combination with a speed-governor embodying a propeller on the governor-shaft between the valve and engine, of a by-pass and means for regulating the flow of steam to act upon said propeller for regulating the speed of such propeller and governor shaft or rod, as set forth.

3. The combination with a speed-governor embodying a propeller on the governor-rod, of a by-pass and by-pass valve for conducting a regulated amount of steam around said propeller as and for the purpose specified.

4. The combination with a speed-governor embodying a propeller on the governor-rod between the valve and engine, of a by-pass and valve for conducting a regulated amount of steam around said propeller, as set forth.

5. The combination with a speed-governor embodying a propeller on the governor-rod between the valve and engine, of a by-pass for allowing the escape of steam around the propeller, and means for automatically controlling such by-pass, as set forth.

6. The combination with a speed-governor embodying a propeller on the governor-rod between the valve and engine, of a by-pass, a valve controlling the same, and connections between said valve and the governor-rod, as set forth.

7. The combination with a speed-governor embodying a propeller on the governor-rod, of a by-pass, a valve controlling the same, and means connecting the by-pass valve and governor-rod whereby the actuation of the by-

pass valve is automatically controlled by the movement of the main governor-valve, as set forth.

8. The combination of a governor-rod, its valve and a propeller on said rod, of a by-pass and means for automatically regulating the amount of steam which shall act upon and thus controlling the speed of said propeller, as set forth.

9. The combination of a governor embodying a propeller on the governor-rod, its rod, a by-pass and means connected with the governor-valve for regulating the flow of steam through said by-pass for automatically controlling the flow of steam through such by-pass, as set forth.

10. The combination with a speed-governor embodying a propeller on the governor-rod between the valve and engine, of a by-pass for conducting steam around the propeller, and a valve for controlling such by-pass, and connections between said valve and the main governor-valve and acting in unison therewith whereby the by-pass valve is automatically opened as the main governor-valve closes, as set forth.

11. The combination with the governor-rod, its valve and propeller, of a by-pass, a valve controlling the same, and an adjustable connection between such by-pass valve and the governor-rod, as and for the purpose specified.

12. The combination with the governor-rod, its valve and propeller disposed between the valve and engine, of a by-pass, a valve controlling the same, a lever pivotally mounted and pivotally connected with the governor-rod, and an adjustable rod connecting an arm on the by-pass valve with the said lever, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. SLEIGH.

Witnesses:
S. L. SMITH,
E. A. YOUNG.