H. J. PARCHMAN.

CONTROL FOR ENGINES.

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Fig. 1.

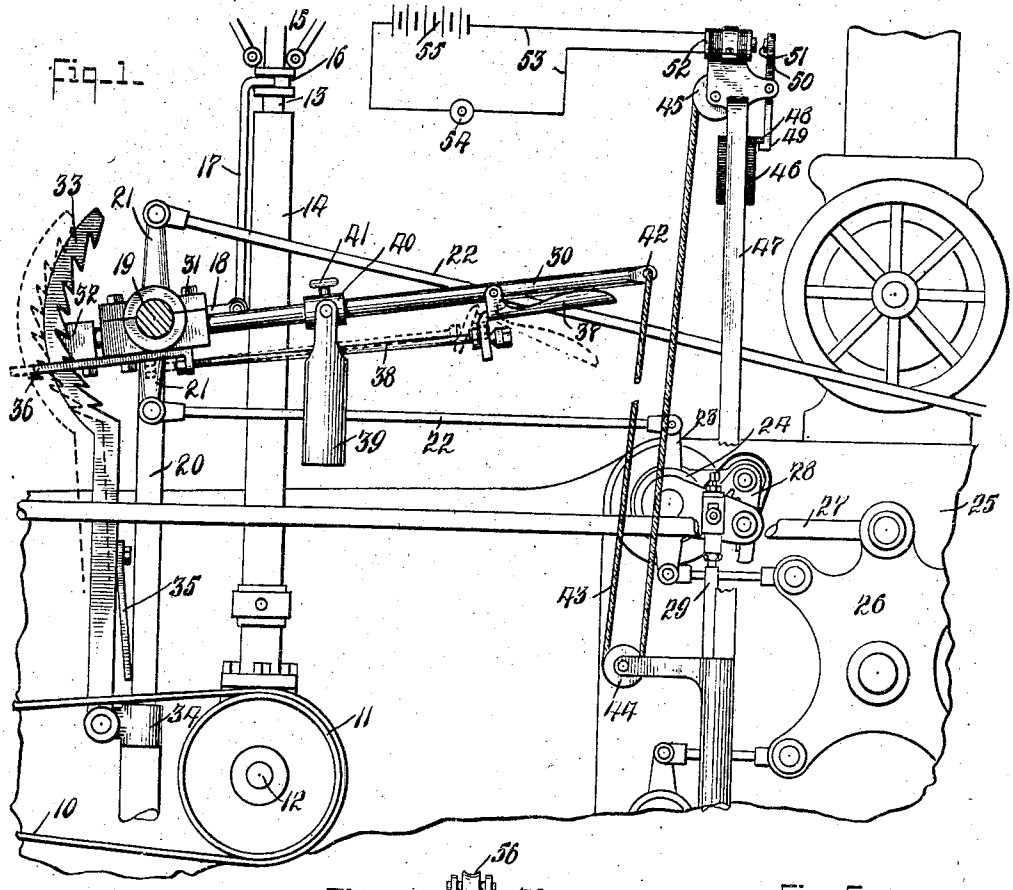

Fig. 4.

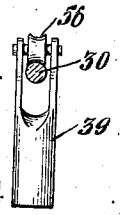

Fig. 5.

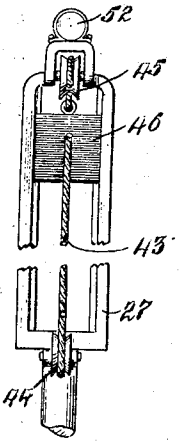

Fig. 2.

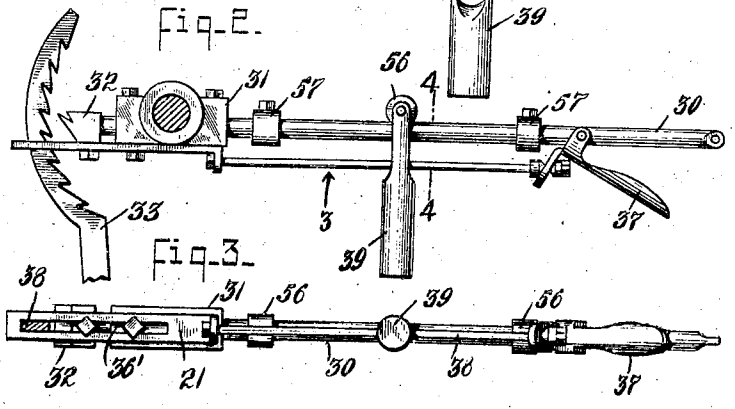

Fig. 3.

WITNESSES

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CONTROL FOR ENGINES.

1,055,217. Specification of Letters Patent. Patented Mar. 4, 1913.

Application filed September 5, 1912. Serial No. 718,650.

To all whom it may concern:

Be it known that I, HENRY J. PARCHMAN, a citizen of the United States, and a resident of Anacortes, in the county of Skagit and State of Washington, have invented a new and Improved Control for Engines, of which the following is a full, clear, and exact description.

The invention relates to controls for engines, and more particularly to a manually-controlled mechanism of this class, which comprises a member having means whereby the admission valve may be so adjusted as to vary the speed of the engine from the normal to a complete stop, without closing the throttle valve or adjusting the governor.

The object of the invention is to provide an inexpensive hand-controlled mechanism, simple in construction and reliable in its action, which can be used for different engines and which will not interfere with the existing controlling means of the engine.

A further object of the invention is to provide a hand-controlled mechanism so related to the governor mechanism that when the engine acquires normal speed, the hand controlling mechanism is automatically disengaged from the admission valves.

A still further object of the invention is to provide a control, by means of which any variation of speed below the normal, the normal being governor controlled, is obtained by controlling the cut-off of the admission valve leaving the throttle valve open.

Still another object is to provide a control where, in connection with a magnet, the engine may be stopped completely from any desired place, without closing the throttle valve of the engine. And still another object of the invention is to make the governor more sensitive when the engine runs normally.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of an embodiment of my invention as attached to a Corliss engine, some of the parts being broken away, this figure showing the control mechanism in operation in full, and the normal position of the ratchet bar dotted; Fig. 2 is a side view of my device with a rolling weight in place of a fixed one; Fig. 3 is a plan on Fig. 2, as indicated by the arrow 3; Fig. 4 is a cross section on the line 4—4 of Fig. 2; Fig. 5 is an enlarged side elevation of the electrical connection for the stopping of the engine by means of my control.

Before proceeding to a more detailed description of my invention, it must be clearly understood that while the drawing shows the invention in connection with a special type of Corliss engine, it may be attached to any type of Corliss or other engine. When the device is to be attached to a different type of engine, a modification of parts that may be required by the special conditions or by individual preference may be made without departing from the underlying spirit of the invention. It must also be remarked that while in the drawing the device is directly connected to the rocking shaft of the governor, so as to eliminate the extra connections with the admission valves, the same result will be obtained if an entirely separate construction is directly attached to the admission valves. In such a case a separate rocking shaft and valve connections will be provided.

By the normal speed of the engine is here understood the speed for a normal load for which the governor is adjusted, that is, any variation in load will make the engine change the speed, and consequently the governor will change the cut-off of the admission valve and bring the speed again to normal. In consequence, to obtain a speed below normal, with which the engine should run, it is necessary to adjust the governor for the new desired speed, or it is required to admit less steam to the admission valves, that is, close to a certain extent the throttle valve, thus reducing the amount of cut-off due to the change in speed, and in consequence, hunting of the governor will begin, therefore making it difficult to obtain the desired change in speed. When a change below normal is required for a short period of time only, or when the change may be for different speeds or alternately during the run, disregarding the load of the engine, the adjustment of the governor becomes out of the question, as it will too often require a change, and it is therefore not practicable.

To obviate the hunting for speed below the normal by the closing of the throttle valve, or by the adjustment of the governor while the load may fluctuate, as is often required in practice, I introduce my device.

Referring more particularly to the drawings, 10 is the belt from the main shaft driving the pulley 11, rigidly connected to the shaft 12. The rotation of the shaft 12 is transmitted to the vertical governor shaft 13, supported in a vertical column 14, in any well known way, the rotation of the vertical shaft 13 being transmitted to the governor 15 and thus actuating the collar 16 during the fluctuation of speed of the engine on the vertical shaft 13. The vertical displacement of the collar 16 forces the rod 17 connected to the collar, correspondingly to rise, or descend, and in consequence the end of the crank 18, connected to the lower end of the rod 17, is also raised or lowered. The crank 17 is fixed to the rocking shaft 19 and rocks the shaft in its bearing placed on a support 20 in its displacement by the rod 17. Rigidly attached to the rocking shaft 19 are two vertically-projecting arms 21 above and below the center of the shaft 19. The vertical arms 21 are at their extremities connected by means of rods 22 to crank arms 23 on the admission valves 24 on the steam cylinder 25. The steam cylinder 25 is provided with the customary Corliss engine parts, rocking plate 26 and connecting rod 27 connecting the said rod and plate with the eccentric on the main shaft. The admission valve 24 is provided with knock-off cams 28, as used in all of the Corliss type engines, and an attachment 29 to the dash pot, the functions of all the parts being well known in the art.

So far the parts described are well known in the art, are common in most of the Corliss type engines, and through the medium of which the normal speed of the engine is controlled.

Rigidly attached to the rocking shaft 19 by means of a bearing piece 31 is a lever 30, provided at one end with a toothed member 32, made to engage a ratchet bar 33, pivotally attached to a collar 34, mounted on the column 20, the ratchet part of the ratchet bar 33 forming an arc, having its center in the axis of the rocking shaft 19, so that when the lever 30 is turned, the toothed member 32 will engage any tooth of the ratchet bar. A spring 35, attached to the ratchet bar 33, bears against the column 20 and normally disengages the ratchet bar 33 from the toothed member 32 of the lever 30.

Slidably attached under the bearing piece 31 of the lever 30, by means of bolts, is a slidable member 36, having a slot 36′ engaging the ratchet bar 33 and through which the ratchet bar 33 projects. The lever 30 at the end opposite the toothed member 32 is provided with a handle 37, and a rod 38 connects said handle to the slidable member 36. By the action of the handle 37 the ratchet bar 33 may be engaged with the toothed member 32, provided on said lever 30, as can be easily seen from the drawings in Fig. 1. The lever 30 is also provided near its middle, between the fulcrum point and the handle 37, with a weight 39, pivotally attached to a slidable member 40 also provided with a set screw 41, by means of which the weight 39 may be placed in any desired position between the fulcrum and the handle 37. By so doing the sensitiveness of the governor may be adjusted. At the end of the lever 30, near the handle 37 is also provided an eye 42, engaging a rope 43, guided by pulleys 44 and 45, and carrying at its free end a guide weight 46. The weight 46 is guided in a support 47, said support supporting also pulleys 44 and 45. The weight 46 at its upper end has a leap 48, hooked on a similar leap 49, provided at the lower end of a centrally pivoted member 50, and supported by the support or standard 47. The member 50 at the upper end is provided with a button 51 facing a magnet 52, also supported on the standard 47. A wire system 53, provided with a push button 54, connects the magnet with a battery 55, so that by means of the button 54, placed in any desired place, the weight 46 may be unhooked from the member 50, and as normally the ratchet bar 33 is disengaged from the lever 30, the weight, in its falling motion, will carry the lever 30 downward, the rocking shaft 19 will turn, and the upper and lower projecting arms 20, 21, by means of the rod 22, will prevent the admission valve from opening, and in consequence no steam will be admitted to the cylinder, and the engine will stop, with the throttle valve open. The throttle valve may be closed as soon as the lever has closed the admission ports, or after, and as no steam is passing to the cylinder, no throttling or wire drawing will take place during the closing of the throttle valve.

In the modified form of my device, the lever 30 has a weight 39, provided with a roller 56 and collars 57, for limiting the travel of said weight on the lever 30 between the fulcrum point and the handle 37. The reason for this is that while the engine is running normally under the control of the governor, the ratchet bar 33 is disengaged from the member 32 of the lever 30, and the fluctuation in speed makes the lever 30 rotate with the rocking shaft 19, under the action of the governor governing the cut off of the steam to the admission valve. As the speed decreases, due to an increase in load, the governor will diminish the cut off, and a certain lapse of time is required before the governor can bring the engine to the same speed, and to obviate this and increase the sensitiveness of the governor, the weight 34 is placed on the roller 56 on the lever 30. As it will be seen, under the action of the

governor when the speed diminishes, the lever 30 will have its end with the rod coming down. In consequence, the weight 39, mounted on the roller 56, will roll in a direction toward said end (see Fig. 2), so as to help diminish the cut off. The reverse will take place when the speed is increased, as can easily be seen.

In starting the engine with my device, the throttle valve is opened until the engine begins to move, there generally being no load or very little when the engine is being started. Set the lever 30 as shown in Fig. 1, by first pulling downward on the end of the lever 30 where the rope is attached, and then by forcing the end 37 from the dotted position to the position indicated in full lines. Attention is here called to the form of tooth in the ratchet bar 33 and to the member 32, so that to be disengaged the opposite end of the lever 30 must be raised as the spring 35 again forces the ratchet away from the member 32. By setting the lever 30, as indicated in Fig. 1, the engine is at half of its normal cut off, the throttle valve is wide open and the engine having little or no load will quickly pick up its speed. When the speed approaches normal the action of the governor, through the medium of the rocking shaft 19, will force the end of the lever 30 provided with the rope up, and thus the opposite end provided with the toothed member, down, and consequently allow the spring 35 to disengage the ratchet bar 33 from the toothed member 32. As the engine reaches the normal speed, the engine may be loaded to its normal capacity, as the governor is then governing the action of the engine.

It must be emphasized again that with my device only speeds below the normal for which the governor is adjusted may be obtained, or a complete stop, without touching the throttle valve. With the weight placed on the lever, as shown in the drawing and described, the sensitiveness of the governor may be altered, to obtain a certain latitude within which the variation of speed will take place, and again, when the engine is running under the control of my device, the variation in load is such that normal speed cannot be reached so as to throw out the ratchet, as above described, and alter the cut off of the admission valve.

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

1. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft, and means associated with said member, whereby the said member, rocking shaft and connecting means may be maintained in any desired position and thereby alter the cut-off of the admission valve for speed below the normal.

2. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft, a ratchet bar normally disengaged from said member, and means on said member and associated with said ratchet bar, whereby said ratchet bar is made to engage the said member for the purpose above described.

3. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft, and a rolling load on said member having means to limit the motion of said load on said member.

4. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft, and a suspended weight connected to said member, a frame guiding said weight, said suspended weight having a projection; a lever pivoted on said frame having a projection engaging the said projection of said weight, and is electrically controlled from any desired place, and whereby said weight can be set in motion so as to operate said member and consequently said rocking shaft and means connecting it to the admission valves so as to stop the engine.

5. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft having engaging means at one end, a ratchet bar adapted to engage the said end of said member with its ratchet part, said ratchet bar being pivotally mounted and having a resilient member keeping said ratchet part normally away from said engaging end of said member, and means associated with said member and ratchet bar for engaging said ratchet bar with said engaging end of said member.

6. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission

valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a member attached to said rocking shaft having engaging means at one end, a ratchet bar pivotally mounted and adapted to engage said engaging means on said member, and a resilient member associated with said ratchet bar so that when the engaging end of said member engages the ratchet bar the said resilient member will only disengage said ratchet bar from said engaging end after said member attached to said rocking shaft will be displaced through a certain angle for the purpose as above described.

7. In an engine having a governor in combination, a rocking shaft, means connecting said rocking shaft to the admission valves of the engine whereby the cut-off of the admission valves is controlled by the governor when the engine is running normally, a lever of the first class attached to said rocking shaft having a toothed member at one extremity of said lever, and a weight adjustably mounted on the opposite end, a ratchet bar pivotally mounted having the ratchet part in an arc of a critch, the radius of which is the distance from the fulcrum of the lever to the toothed member at its extremity, a resilient member connected with said ratchet bar for normally keeping said ratchet part of said ratchet bar away from said toothed extremity of said lever, and means associated with said ratchet bar and said lever for engagement of said ratchet bar and said toothed extremity of said lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY J. PARCHMAN.

Witnesses:
GEO. B. SMITH,
GEORGIA B. SMITH.