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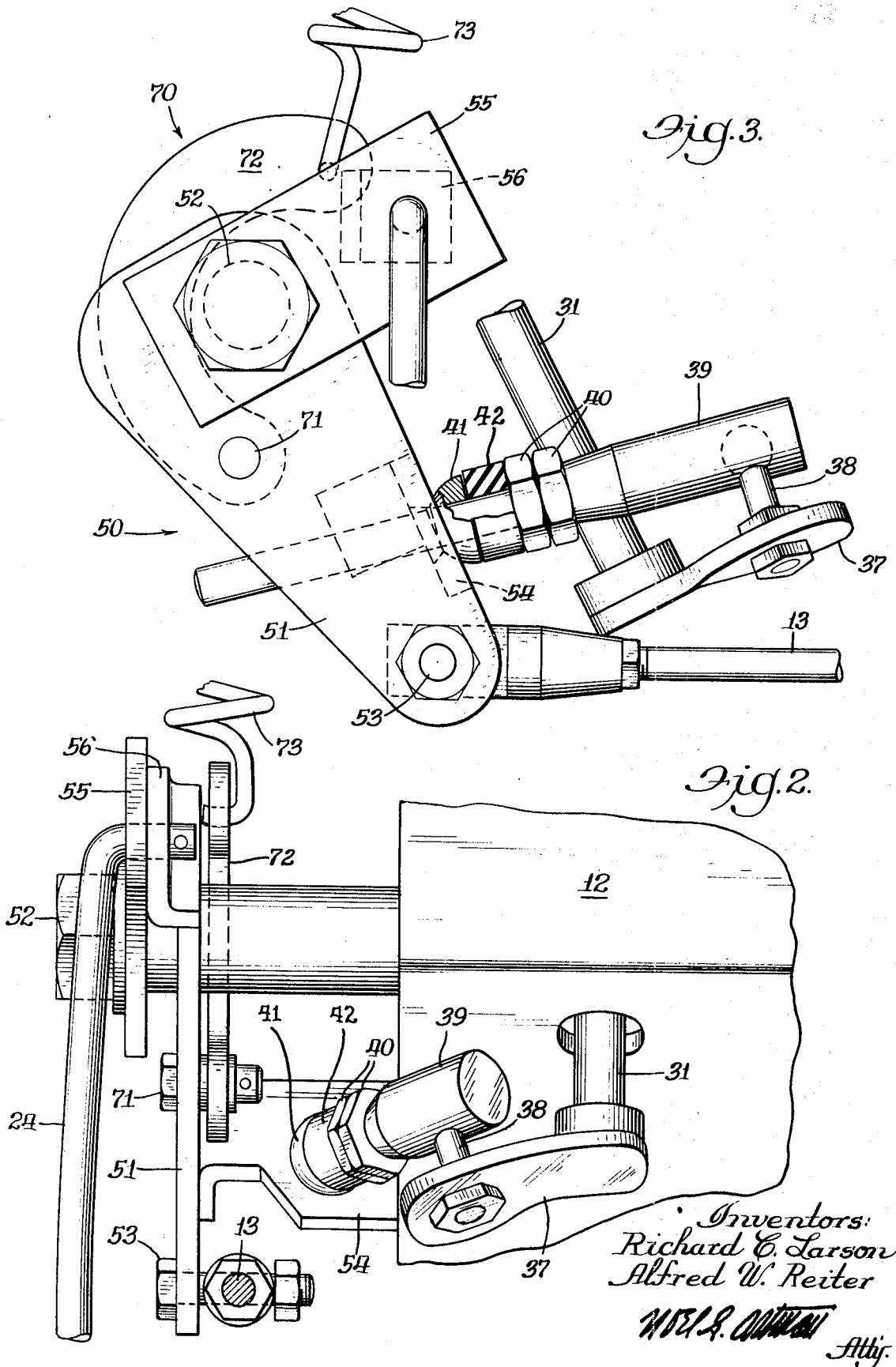
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FOOT ACCELERATOR ATTACHMENT FOR FARM AND INDUSTRIAL TRACTOR

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## FOOT ACCELERATOR ATTACHMENT FOR FARM AND INDUSTRIAL TRACTOR

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### ABSTRACT OF THE DISCLOSURE

A control mechanism for an internal combustion engine having an adjustable speed regulator in which a primary control means operates through a lever assembly to establish a primary speed for said engine, and a secondary control means is additionally provided to operate through said lever assembly for intermittently overriding the primary control means.

### BACKGROUND OF THE INVENTION

This invention relates to a dual control mechanism for speed adjustable combustion engines in which a primary speed is desirable whereby sufficient power is developed to operate certain auxiliary equipment, and higher speeds are intermittently desirable such that the engine may supply additional power for intermittent and heavier loads.

It is well known that most speed regulators for internal combustion engines, particularly those employed with farm and industrial tractors, have a speed regulator device often in the form of a mechanical governor which is biased to a position such that the engine will normally run at a slow r.p.m. or idle condition. Further control mechanisms provided for such speed regulators are normally positively operated, and when force is removed, the speed regulating device will return to the low r.p.m. condition. In operating farm and industrial tractors, it has been suggested to provide a hand-operated lever to increase this low r.p.m. or idle condition to a faster r.p.m. such that the engine has sufficient power to drive auxiliary equipment. Further in conjunction with this hand-operated lever, a foot control device has also been employed whereby intermittent higher speeds may be obtained by applying force on the foot pedal to develop power for intermittent loads. Thus in a tractor equipped with a front end loader, the hand lever control assembly has been employed to set the r.p.m. of the engine at a sufficient speed to hydraulically operate the loader and when the operator of the vehicle desires to move the vehicle, a foot pedal is provided whereby additional power may be obtained for this additional requirement. However these earlier dual control systems have been somewhat ineffective in maintaining the primary speed since the foot-operated pedal is released the momentum of the speed regulating device in returning to an idle condition often destroys or moves the setting of the primary control or hand lever. Too it would appear that many of these devices are either ineffective, too expensive or complicated for accomplishing the purposes intended.

### SUMMARY OF THE INVENTION

As disclosed in the preferred embodiment, this invention employs a lever assembly pivotally supported by the frame of the vehicle which is connected with the speed adjustable control member of the engine through a control rod. A primary control means having a one-way connection with said lever assembly is proposed to establish a minimum speed of the engine, and a second control

means is also connected with the lever assembly for overriding the primary control while counterweights and shock absorbing elements are additionally provided to the system to preclude the tendency of the speed control device of the engine to return to a speed below that of the primary control setting.

Thus it is an object of this invention to provide an effective dual control mechanism for a speed adjustable combustion engine. Further it is an object of this invention to provide a dual control mechanism which is quite inexpensive and simple to install.

### DESCRIPTION OF THE DRAWINGS

The manner in which these and other objects of the invention is attained will be made clear by consideration of the following specification and claims when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view in elevation of the entire mechanism;

FIG. 2 is a sectional view of the lever assembly means taken in the direction of arrows 2—2 of FIG. 1; and

FIG. 3 is an enlarged fragmentary side elevational view of the lever assembly.

### DETAIL DESCRIPTION

As disclosed in the preferred embodiment, the dual control mechanism is intended to be employed with a tractor or other vehicle 10 of which a frame 12 including a dash board 11 is disclosed. Forward of the frame 12 would be an internal combustion engine the speed of which would be controlled by a control rod 13 operating through a governor or other speed adjustable mechanism (not shown). As is well known in the art, the speed adjusting mechanisms are normally biased such that the r.p.m. of the engine is very low, and until the control rod 13 is moved rearwardly, the speed of the engine is set at a minimum to avoid fuel and power losses. Thus a strong forward acting force normally operates on the governor control rod 13 and if after being drawn to the rear by an accelerator which is later released, the governor control rod will be urged forward with a great deal of force.

In accordance with the instant invention a lever assembly 50 is pivotally supported at 52 by a portion of the frame 12, this lever assembly being capable of clockwise and counterclockwise movement. Through a pivotal connection 53, this lever assembly is attached to the control rod 13 so as to control its lateral position.

Movement of this lever assembly is then effected through either a primary control means 30 or a second or overriding control means 20. Referring first to the primary control means 30, such essentially comprises a handle 32 constrained for rotation with a control rod 31, and operative to rotate a control arm 37 which upon rotation will provide longitudinal movement through a swivel joint 38 to a push rod 39 which has a semi-spherical member 41 engaging the lever assembly 50. Thus rotation of the handle 32 in a clockwise position as viewed from above will move the push rod to the rear establishing a primary setting for the speed adjustable device of the combustion engine.

Additionally it should be observed that as the control rod 31 passes through the dashboard 11, friction pads 34, 34 are disposed upon either side of this dashboard, with washers 33, 33 being outwardly placed against said friction pads 34, 34. These pads 34, 34 are then frictionally compressed against the dashboard by a compression mechanism comprising a spring 35 disposed between a lower collar 36 and the lower washer 33. An upper collar 36' retains the upper washer 33 in position. Both the upper collar 36' and the lower collar 36 are attached to the control rod 33 by cross pins 42, 42 such that a com-

pressive force will be applied to each friction member 34, 34.

In regard to this primary control means 30, it should be noted that the push rod itself comprises merely an elongated rod having two lock nuts 40, 40 threadedly secured thereon for positioning a resilient shock absorber 42 against the member 41. The push rod 39 then continues past an L-shape abutment member 54 on the lever assembly 50. This interaction between the push rod 39 and the lever assembly 50 may be observed in FIG. 2, with the abutment 54 being disclosed by dotted lines in FIG. 3.

The secondary or overriding control means 20 comprises a foot pedal 21 pivotally connected to the support frame at 22. A connecting rod 24 then operates between the lever assembly 50 and the foot pedal 21 with a counterweight 23 being attached to the foot pedal so as to urge same in a downwardly position. As disclosed in the preferred embodiment, the connecting rod 24 is attached to the lever assembly via a second lever plate 55 which as shown in FIG. 2 is laterally displaced from the primary lever plate 51. An L-shape abutment 56 then provides a one-way connection between the second lever plate 55, and the main lever plate 51. Thus it should be observed that downward movement on the foot pedal 21 will cause clockwise rotation of the main lever assembly 50 and the control rod 13 will be displaced rearwardly such that the r.p.m. of the engine may be increased.

A recommended feature in the form of an overcenter mechanism 70 may additionally be incorporated into the dual control mechanism. Thus a spring 73 anchored by an abutment 74 on the dashboard will operate through an arcuate arm 72 upon the lever plate 51 at pivot point 71, the point of attachment of the arm 72 with the lever plate 51. As will be explained later, this overcenter mechanism improves the desirable characteristics of the instant invention when either a very slow idle or a very fast idle of the engine is desired.

It should be appreciated that applicants herein have set forth only a single preferred embodiment but various obvious modifications of the system may easily be made. For example the connecting rod 24 need not be directly attached to the lever plate 51 while the overcenter mechanism is merely desirable, such also being true of the friction pads 33, 33. For a better understanding of applicants' contribution, reference will now be had to the functional characteristics of the system.

### MODE OF OPERATION

Assume now that the operator of the vehicle has auxiliary equipment such as a front end loader which is driven by an auxiliary hydraulic power supply. In order to insure a continuous and sufficient horsepower availability to the hydraulic equipment, the operator of the vehicle may merely set control handle 32 to permit this r.p.m. from the engine. Thus rotation of the handle will cause the governor control rod 13 to be withdrawn to the rear by action of the push rod 39 operating about pivot point 52. As long as the control handle is not being re-adjusted, the minimum speed of the engine will be that determined by the preselected setting of the handle 32. Assume now that in addition to operating the front end loader or other equipment driven hydraulically, the operator of the vehicle also desires to rapidly move the vehicle to a loading or dumping point. Without disturbing the minimum r.p.m. setting of the primary control handle 32, the operator may depress the foot pedal and connecting rod 24 acting through lever plate 55 and abutment 56 will cause the main lever plate 51 to be rotated about pivot point 52, thus pulling the governor control rod 13 to the rear while the member 41 of push rod 39 remains stationary. When the operator desires to decelerate the vehicle he merely releases his pressure from the pedal 21, and the main lever plate 51 will return to the position determined by the position of the member 41

due to the engagement therewith of the L-shaped abutment 54. However the governor control rod as exists in many of the current vehicles, is urged forwardly with a great deal of speed and force and but for the inertia of the counterweight 23 of the applicants' instant invention and their resilient member 42 such force would affect the setting of the primary control means 30.

Further it should be appreciated that if the control rod 13 has a primary setting at a very low r.p.m. or at a very fast r.p.m., additional torque load to the main lever plate 51 may be provided through the overcenter mechanism 70. Thus if a low r.p.m. setting is desired by the primary control means 30, the resilient member 73 acting through pivot point 71 and arm 72 will urge the lever plate in a counterclockwise direction so as to main the control rod in a forward position and lever plate 51 against its abutment 41. Such may be necessitated if the resilient force in the governor device diminishes as the low idle condition is resumed. Similarly if a high r.p.m. setting is desired additional torque load may be provided by this overcenter mechanism since the line of force will be acting through a line on the opposite side of pivot 52. Such may be most desirable since the force required to displace control rod 13 to a high or fast setting may increase characteristics of the governor.

Thus among others the several objects of the aforesaid invention are achieved in that an effective way to achieve a primary and an overriding control mechanism for an adjustable speed regulator for an internal combustion engine are herein achieved. As previously pointed out many modifications such as those relating to the specific form of the lever assembly 50 as well as rearrangements may be resorted to without departing from the spirit of the invention as defined by the following claims.

We claim:

1. A control mechanism for a combustion engine having an adjustable speed regulator comprising:

- (a) a frame,
- (b) lever assembly means pivotally supported by said frame and connected to said regulator for controlling the speed of said engine,
- (c) primary control means attached to said frame and operably connected to said lever assembly means by a resilient one-way connection for establishing a primary speed for said engine,
- (d) overriding control means having a counter-weight attached thereto, said overriding control means being supported by said frame and operatively connected to said lever assembly means for controlling the speed of the engine at speeds in excess of the primary speed.

2. An apparatus as defined in claim 1 in which a biased overcenter means is interconnected between said frame and said lever assembly means for adding additional torque load to the lever assembly means when said lever assembly means is at minimum or maximum position.

3. An apparatus as defined in claim 1 in which a one-way connection is provided between said lever assembly means and said overriding control means.

4. A dual control mechanism for a governor regulated combustion engine comprising:

- (a) a support frame,
- (b) lever assembly means pivotally supported on said frame and connected with a governor control rod for controlling the movement thereof,
- (c) a primary control means supported by said frame and interconnected with said lever assembly through a one-way connection having a shock absorbing element for establishing a primary position of said governor control rod,
- (d) second control means supported by said frame and interconnected with said lever assembly means for overriding the primary control position of said governor control rod.

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5. An apparatus as defined in claim 4 in which said second control means includes a counterweight.

6. An apparatus as defined in claim 5 in which said lever assembly means includes overcenter means resiliently connected between said frame and said lever assembly means for acting on said lever assembly means when said control rod is positioned for a very slow or a very fast idle of said combustion engine.

7. An apparatus as defined in claim 6. in which said hand-control means is provided with a resilient one-way connection for engaging said lever assembly means and controlling the movement thereof in one direction.

8. A control mechanism for a combustion engine having an adjustable speed regulator comprising:

(a) a frame,

(b) a lever assembly means supported on said frame and connected with a governor control rod controlling movement of said governor control rod, said lever assembly including an overcenter means interconnected between said frame and said lever assembly means adding torque load to the lever assembly

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bly for a very fast or very slow idle for said combustion engine,

(c) hand control means supported by said frame and operatively connected with said lever assembly means for establishing a primary speed of said combustion engine,

(d) foot operated control means, supported by said frame and interconnected with said lever assembly means for overriding the primary control position of said governor control rod.

9. An apparatus as defined in claim 8, in which friction means are interconnected between said frame and said hand control means for absorbing vibrational forces.

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