March 31, 1936. L. P. OWINGS 2,035,829

AUTOMATIC THROTTLE CONTROLLING MEANS FOR TRACTORS AND STATIONARY MOTORS

Filed July 21, 1934 2 Sheets-Sheet 1

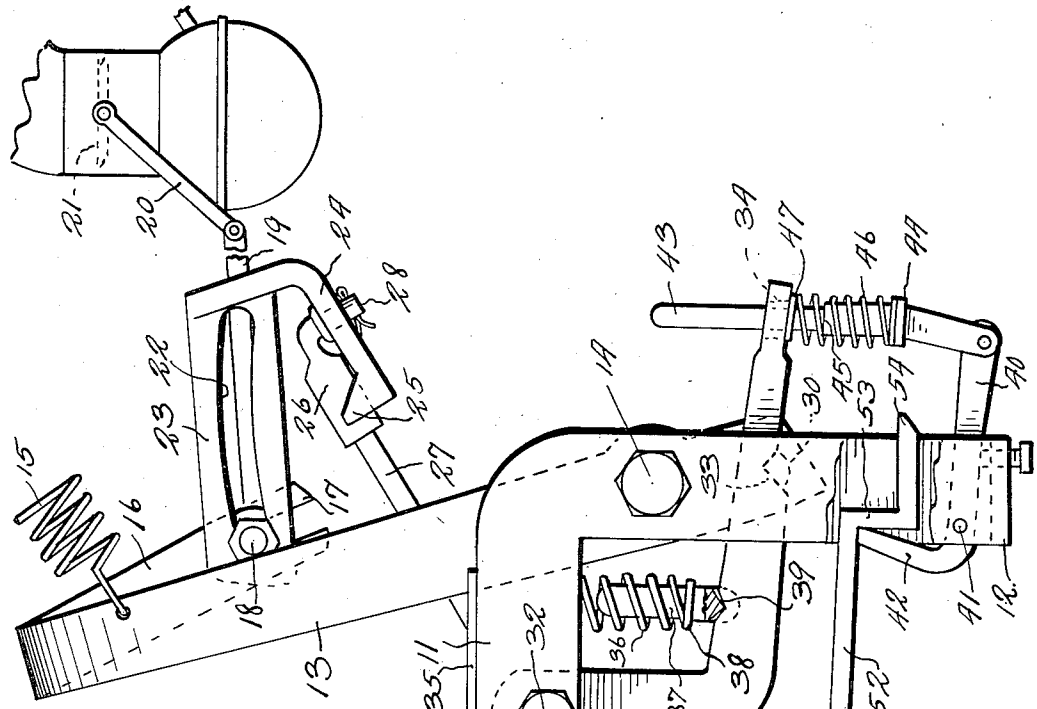


FIG. 1

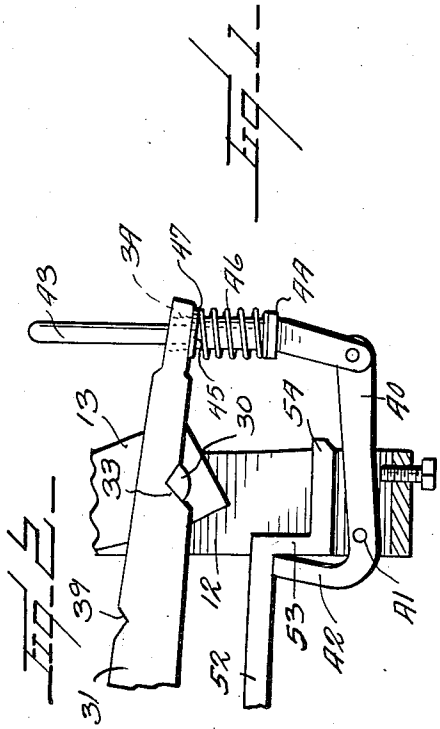


FIG. 2

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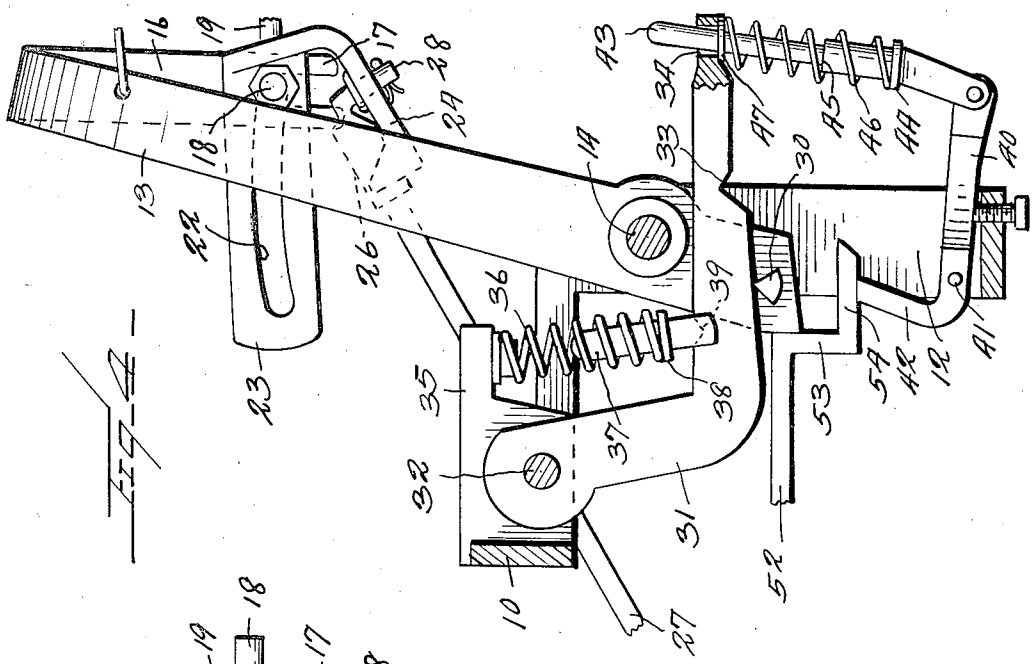


Fig. 2.

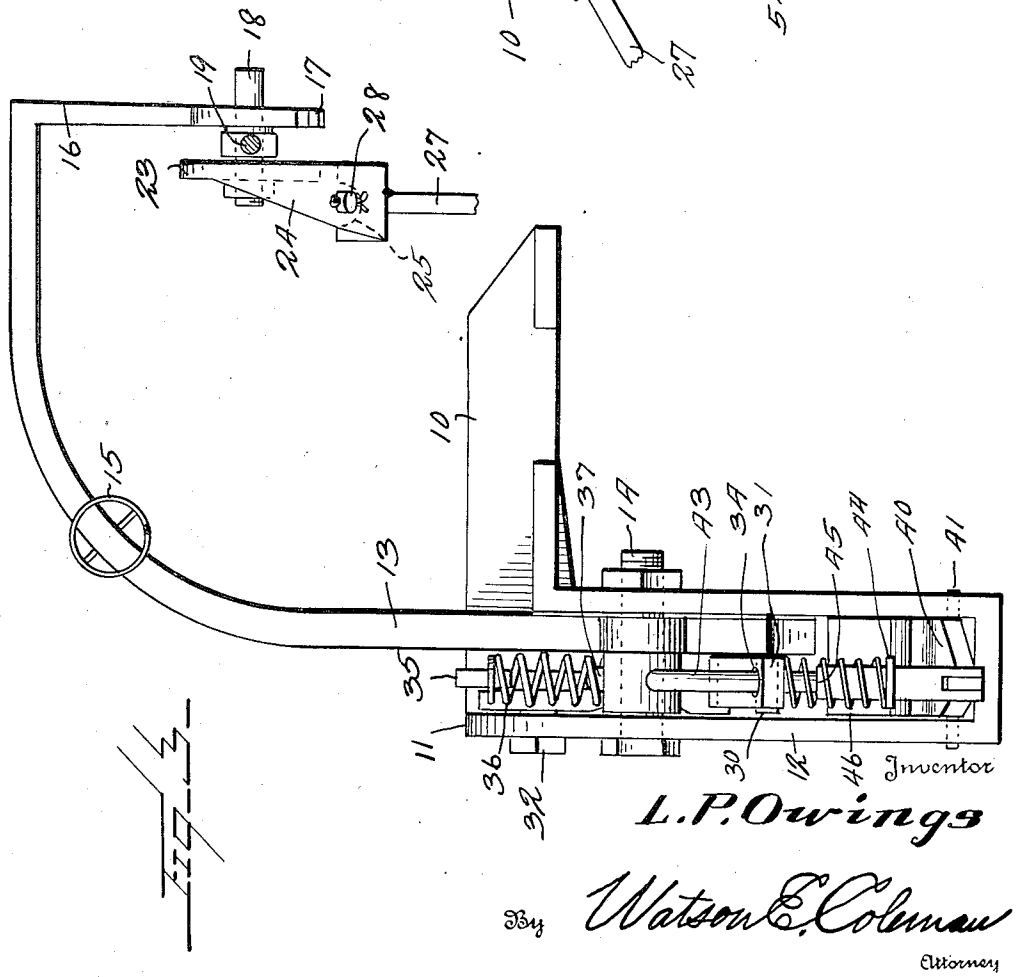


Fig. 3.

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Patented Mar. 31, 1936 2,035,829

# UNITED STATES PATENT OFFICE

2,035,829

## AUTOMATIC THROTTLE CONTROLLING MEANS FOR TRACTORS AND STATIONARY MOTORS

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REISSUED

Application July 21, 1934, Serial No. 736,426

10 Claims. (Cl. 192—.01)

This invention relates to throttle controlling means for tractors or other automotive vehicles, and the object is to provide an automatic motor controlling mechanism which will insure the closing of the throttle of the motor when the transmission clutch is thrown out or load taken off, and will automatically open the throttle before the clutch is completely in or just before load is applied so that the motor will handle a heavy load without stalling.

A further object of the invention is to provide, in more detail, a controlling mechanism in which a lever is provided operatively connected to the throttle valve and urged by a spring to a position with the throttle open, to provide manually controlled means for controlling the throttle, and to prove means latching the lever in a throttle-closing or "idling" position, and means operated automatically by the throwing in of the clutch to release said throttle controlling lever and permitting opening of the throttle by the lever just before the load is applied.

A further object is to provide a construction of this character so made that the throttle may be manually controlled or set in the usual manner and yet permit the throttle to be automatically controlled as above described.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a throttle controlling mechanism constructed in accordance with my invention.

Fig. 2 is a fragmentary elevation partly in section with the angular bracket removed.

Fig. 3 is a rear elevation of the structure shown in Fig. 1.

Fig. 4 is a side elevation looking from the same side as in Fig. 1, but showing the throttle controlling lever shifted to throttle opening position.

Referring to the drawings, 10 designates a bracket adapted to be bolted to the frame of the motor, this bracket being formed to provide a longitudinally extending leg 11 and a vertically extending leg 12 angularly related to the horizontal leg 11. Pivotally mounted upon the downwardly extending leg 12 is a lever 13 pivoted upon a bolt 14 or like element. This lever is operatively connected with the throttle and is urged in a forward direction by means of a spring 15. This lever as shown in Fig. 3, is curved laterally and is formed at the free end of the lever with a downwardly extending portion 16 which is forked, at 17, and embraces a pin 18, which in turn is connected to the rod 19 which is pivoted to the throttle valve arm 20, the throttle valve being designated 21. The pin 18 not only passes through the fork 17 but passes through the slot 22 of a link 23. This link at its forward end is reversely curved to provide the downwardly and rearwardly extending arm 24, the extremity of which is forked, at 25. Resting in this forked extremity 25 is the terminal end 26 of a throttle controlling rod 27. The terminal end 26 is downwardly bent to provide a pin 28 extending through an aperture in the arm 24 and held from detachment by means of a cotter pin or the like. The opposite end of the rod 27 is operatively connected to the usual throttle lever 29 commonly found on tractors. It is obvious that a throttle pedal may be used in place of the lever.

The lower end of the lever 13 is provided with a tooth 30. Co-acting with this tooth is an angular latch 31 pivoted at 32 to the forward end of the horizontal portion 11 of the bracket 10. This latch extends downward and then rearward and is provided with a notch 33 adapted to engage over the tooth 30.

The rear end of the latch 31 has a relatively large aperture 34. The bracket 10 has a rearwardly extending portion 35 which carries a stud for the compression spring 36 which extends down around a pin 37 and bears against a shoulder 38 on this pin, this pin being operatively supported upon the lever 31 in the notch 39. The spring 36 thus urges this latch lever 31 downwardly and into latched engagement with the tooth 30. This latch thus acts to hold the lever 13 in its rearward position with the throttle closed.

For the purpose of lifting this latch I provide a trip lever 40 pivoted at 41 upon the portion 12 of the bracket, this trip lever at its forward end being upwardly and inwardly extended as at 42. To the rear end of the lever 40 is pivoted a stem 43 which extends upwardly and forwardly and then straight upward, and which is provided with a flange or shoulder 44. The upper end of this stem passes through the aperture 34. The stem is formed with a shoulder 45 and surrounding the stem is a coiled expansion spring 46 which bears at its lower end against the shoulder 44 and at its upper end against a washer 47, which in turn bears against the extremity of the lever 31.

The clutch of the engine is operated by means of the usual clutch lever 48, and pivotally connected to the lower end of the clutch lever is the usual connecting rod 49 which has the connection 50 to the clutch proper (not shown). Also pivoted to the extremity of the connecting rod 49 by a pin 51, is a trip releasing rod 52 which extends forwardly and at its forward end is angularly bent downward, at 53, and then extended forward, at 54, this forward extension having a beveled nose. The downward extension 53 constitutes a hook which in the position of the parts as shown in full lines in Fig. 1, engages

over the hook 42 of the trip 40. With this construction as the lever 48 is thrown forward to throw in the vehicle transmission clutch, the rod 52 is retracted, the hook 53 engages against the face of the hook 42, and as the rod 52 moves rearward it pulls the trip lever 40 to the position shown in Fig. 2, thus thrusting upward on the spindle 43. This spindle moves upward until the shoulder 45 engages against the wall of the opening 34 and then lifts the latching lever 31 against the action of the spring 36. As the latching lever 31 is started upwardly, the hook 42 swings toward a rearwardly inclined position and the lower end of the extension 53 rides up on the inner face of this hook. As the tooth 30 is released, it rides under the lower edge of the latch 31 and the reaction of the spring 46 rapidly oscillates the trip 40 and snaps the hook 42 forwardly, thus imparting a kickup action to the rod 52, so that the upper end of the part 53 thereof is snapped into position in opposed relation with the rear edge of the lower end of the lever 13, as illustrated in Figure 4, where the rod 52 is held by the upper end of the hook 42 engaging beneath the portion 54 of the rod. As soon as the notch 33 has released the tooth 30, the spring 15 throws the lever 13 over to the full line position in Fig. 4, thus opening the throttle to its full extent or to the extent permitted by the adjustment of the throttle lever 29.

On the reverse movement of the clutch lever 48 the forward face of the part 53 on rod 52 strikes the lower end of the lever 13, pushing this lower end forward until the notch 33 drops down over the catch tooth 30, spring 36 forcing the latch 31 downward so as to catch and hold the lever 13 in its idling position. This, of course, acts to close the throttle as the load is taken from the motor, preventing the motor from racing which is, of course, injurious to the motor, and furthermore saving fuel, as the motor is always idling unless load is applied.

The hand lever 29 may be adjusted so that the spring 15 will open the throttle to secure the desired revolutions of the motor, this being possible due to the fact that the link 23 is free to slide backward or forward over the pin 18 to any desired extent, the end of the slot 22 acting as a limiting stop for the pin 18 when the throttle operating lever is shifted under the action of spring 15.

It will thus be seen that the automatic throttle mechanism idles the motor immediately after the load is removed and increases speed as clutch is engaged in time to take care of the load.

The particular automatic throttle controlling mechanism which I have shown, is designed for operation on the John Deere tractor, but it will operate on any motor with a snap clutch such as is used on most combine motors and other tractor motors. Obviously by using a different connection it may be applied to a pedal clutch as the principle of this automatic throttle controlling mechanism will work equally as well either on a snap or pedal clutch.

While I have illustrated the preferred form of mechanism which I intend to use, and which has been found utterly effective in practice, yet I do not wish to be limited to this as obviously many changes might be made in the details of construction and arrangement of parts without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle lever, a connection between the throttle lever and the throttle, a spring acting to urge the throttle lever in position to open the throttle, a spring projected latch holding the lever in throttle closing position, means for lifting said latch against the action of the spring, means connected to the clutch controlling lever for operating the last named means to lift the latch upon movement of the lever to let in the clutch to thus permit the throttle lever to open the throttle, and means acting upon the reverse movement of the clutch controlling means to shift the throttle lever to its initial position engaged by said latch.

2. In a throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle lever, an operative connection between the throttle lever and the throttle, including a longitudinally shiftable link connected directly to the throttle but having a sliding engagement with the throttle controlling lever, manually operable means for shifting said link to adjust the opening of the throttle, means resiliently urging the throttle lever to throttle opening position, a spring actuated latch holding the lever in throttle closing position, and means controlled by the movement of the clutch controlling means to let in the clutch acting to release the latch to permit the throttle lever to open the throttle and acting upon a movement of the clutch controlling means to throw out the clutch to return the throttle lever to its throttle closing position.

3. In a throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle lever operatively connected with the throttle and resiliently urged toward throttle opening position, the lever having a tooth, a pivoted latch having a notch receiving the said tooth and holding the throttle lever in throttle closing position, a spring urging the latch into latching position, a bell-crank lever having one arm operatively engaging the free end of the latch and the other arm bent to form a hook, a rod connected to the clutch controlling means and movable therewith, the rod having at its upper end a hook adapted to engage over the first named hook whereby upon longitudinal movement of the rod in one direction the bell crank lever will be operated to lift the latch from its engagement with the tooth, said rod having a portion adapted, upon reverse movement of the rod, to engage against said throttle operating lever and shift the lever to its initial latched position.

4. In throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle, a bracket mounted upon the engine, a throttle lever pivoted upon the bracket, an operative connection between the lever and the throttle, a spring urging the lever in a direction to open the throttle, the throttle lever having a tooth, an angular latch pivoted upon said bracket and having a horizontal arm provided with a notch with which said tooth is adapted to engage when the lever is thrown to a throttle closing position, a spring urging the latch downward, a latch releasing trip comprising a bell-crank lever having one arm extended upward and passing through the extremity of the latch and provided with a shoulder to engage the latch extremity, the other arm of the bell-crank lever having an upwardly extending hook, a longitudinally movable rod operatively connected to

the clutch controlling means and having a portion adapted to engage behind the hook of the bell-crank lever and ride up on the hook as the rod is pulled rearward upon a movement of the clutch controlling means to let in the clutch to thus release the latch and permit the throttle to open, said rod having a portion adapted to abut against the lower end of the throttle controlling lever upon a reverse movement of the rod due to a movement of the clutch controlling means to throw out the clutch, said movement of the rod acting to shift the throttle controlling lever to its initial latched position.

5. In throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle, a bracket mounted upon the engine, a lever pivoted upon the bracket, an operative connection between the lever and the throttle, a spring urging the lever in a direction to open the throttle, the throttle lever having a tooth, an angular latch pivoted upon said bracket and having a horizontal arm provided with a notch with which said tooth is adapted to engage when the lever is thrown to a throttle closing position, a spring urging the latch downward, a latch releasing trip comprising a bell-crank lever having one arm extended upward and passing through the extremity of the latch and provided with a shoulder to engage the latch extremity, the other arm of the bell-crank lever having an upwardly extending hook, a longitudinally movable rod operatively connected to the clutch controlling means and having a portion adapted to engage behind the hook of the bell-crank lever and ride up on the hook as the rod is pulled rearward upon a movement of the clutch controlling means to let in the clutch to thus release the latch and permit the throttle to open, said rod having a portion adapted to abut against the lower end of the throttle controlling lever upon a reverse movement of the rod due to a movement of the clutch controlling means to throw out the clutch, said movement of the rod acting to shift the throttle controlling lever to its initial latched position, the operative connection between the throttle controlling lever and the throttle including a longitudinally slotted link, a manually operable throttle controlling lever, an operative connection between the throttle controlling lever and said link whereby the latter may be shifted, and a pin engaged by the first named throttle controlling lever and operating in said slot, and a rod carrying said pin and connected directly to the arm of the throttle.

6. In throttle controlling mechanism for motor vehicles, manually operable clutch controlling means, a throttle, a throttle lever operatively connected to the throttle and resiliently urged to shift the throttle to an open position, a latch holding the lever in throttle closing position, the latch releasing element having a hook-shaped portion, a rod operatively connected to the clutch controlling means and shiftable therewith and having at its extremity a downwardly and then forwardly extending portion adapted to engage behind the hook and acting when the clutch controlling means is shifted to throw in the clutch to engage such hook-shaped portion and release the latch and ride up upon said hook-shaped portion to a position opposite the lower extremity of the clutch controlling lever, said rod when shifted in the opposite direction by a movement of the clutch controlling means to throw out the clutch engaging against the lower end of the throttle controlling lever and shifting it to throttle closing position in engagement with said latch.

7. In a mechanism of the character described, a manually operable vehicle transmission clutch-controlling means, a throttle, means urging the throttle to an open position, means for latching the throttle in a closed position, means automatically releasing the latching means as the clutch is let in to thereby permit the throttle to open, and means automatically returning the throttle to its closed position as the clutch-controlling means is shifted towards a position to throw the clutch out.

8. In a mechanism of the character described, a manually operable vehicle transmission clutch-controlling means, a throttle, means urging the throttle to an open position, means for latching the throttle in a closed position, means automatically releasing the latching means as the clutch is let in to thereby permit the throttle to open, means automatically returning the throttle to its closed position as the clutch-controlling means is shifted towards a position to throw the clutch out, and manually operable means adjustable to control the degree of opening movement of the throttle when the latch is released.

9. Means for automatically shifting the throttle of a tractor to open position upon the shifting of the transmission clutch of the tractor to a clutching position, including a manually operable clutch operating lever on the tractor, a throttle urged to an open position, means for latching the throttle in a closed position, means operated by and with the clutch operating lever automatically releasing the latching means upon a movement of the lever to let in the clutch to thereby permit the throttle to open just prior to the engagement of the clutch, said means automatically returning the throttle to its closed and latched position upon a movement of the lever to release the clutch.

10. In a mechanism of the character described, a manually operable transmission clutch-controlling lever, a throttle, a throttle controlling lever operatively connected to the throttle, a spring urging the lever in a direction to open the throttle, means for latching the throttle controlling lever in a position with the throttle closed, means for automatically releasing said latching means as the transmission clutch controlling lever is shifted to let in the clutch to thereby permit the throttle to open, and means engaging the throttle controlling lever and automatically returning the throttle controlling lever to its throttle closing position as the clutch-controlling means is shifted towards a position to throw the clutch out, and manually operable means for adjustably controlling the degree of opening movement of the throttle including a slotted member, a pin on the throttle controlling lever extending into the slot of said member, the slotted member being manually movable along the path of movement of the throttle controlling lever to thus adjustably limit the movement of the throttle controlling lever in a throttle opening direction.

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