E. K. CONOVER.

THROTTLE AND SPARK CONTROL FOR AUTOMOBILES.

APPLICATION FILED AUG. 30, 1907.

1,131,600.

Patented Mar. 9, 1915.

4 SHEETS—SHEET 1.

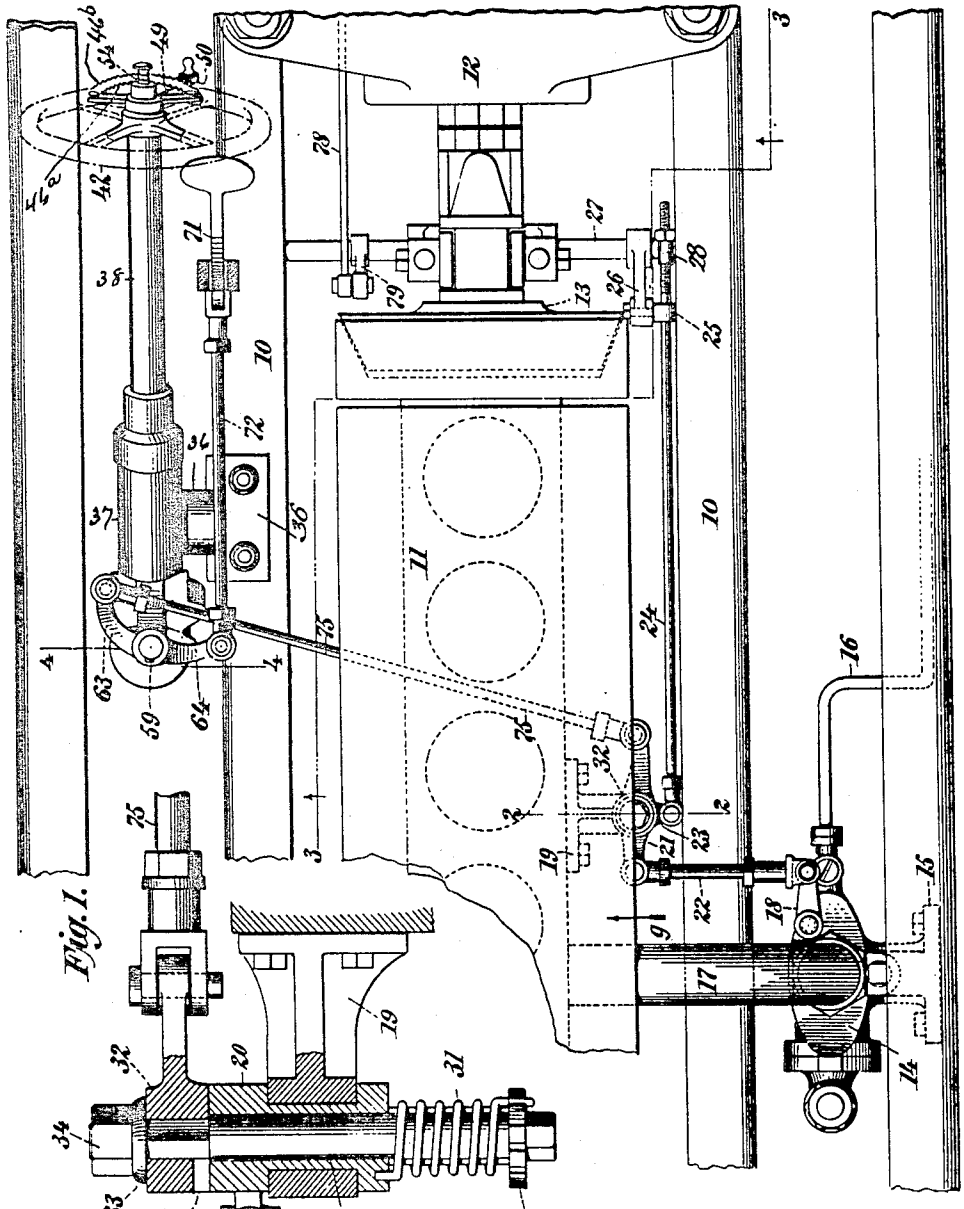


Fig. 1.

Fig. 2.

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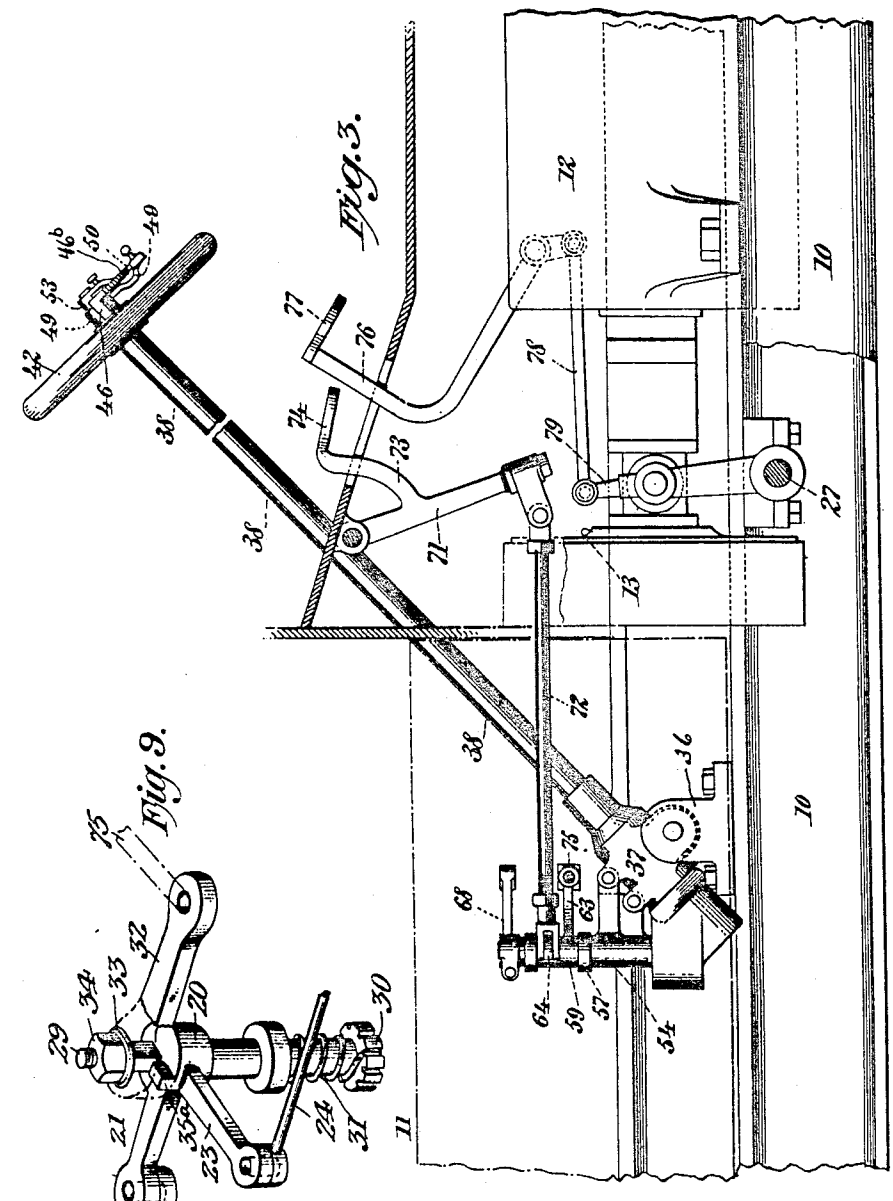
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4 SHEETS—SHEET 2.



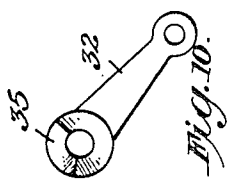


Fig. 10.

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4 SHEETS—SHEET 3.

Fig. 4.

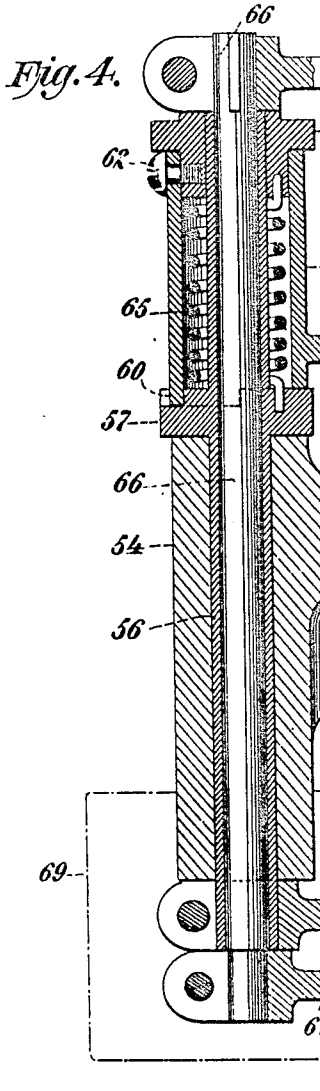


Fig. 6.

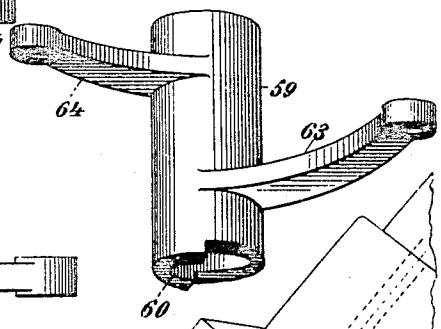


Fig. 7.

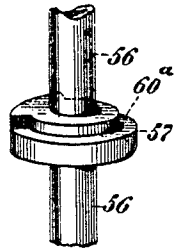
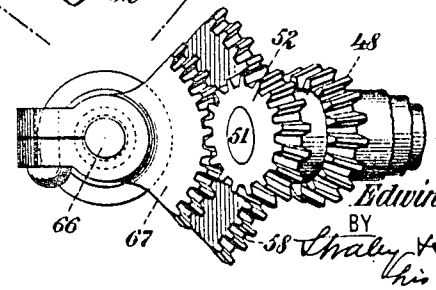


Fig. 5.



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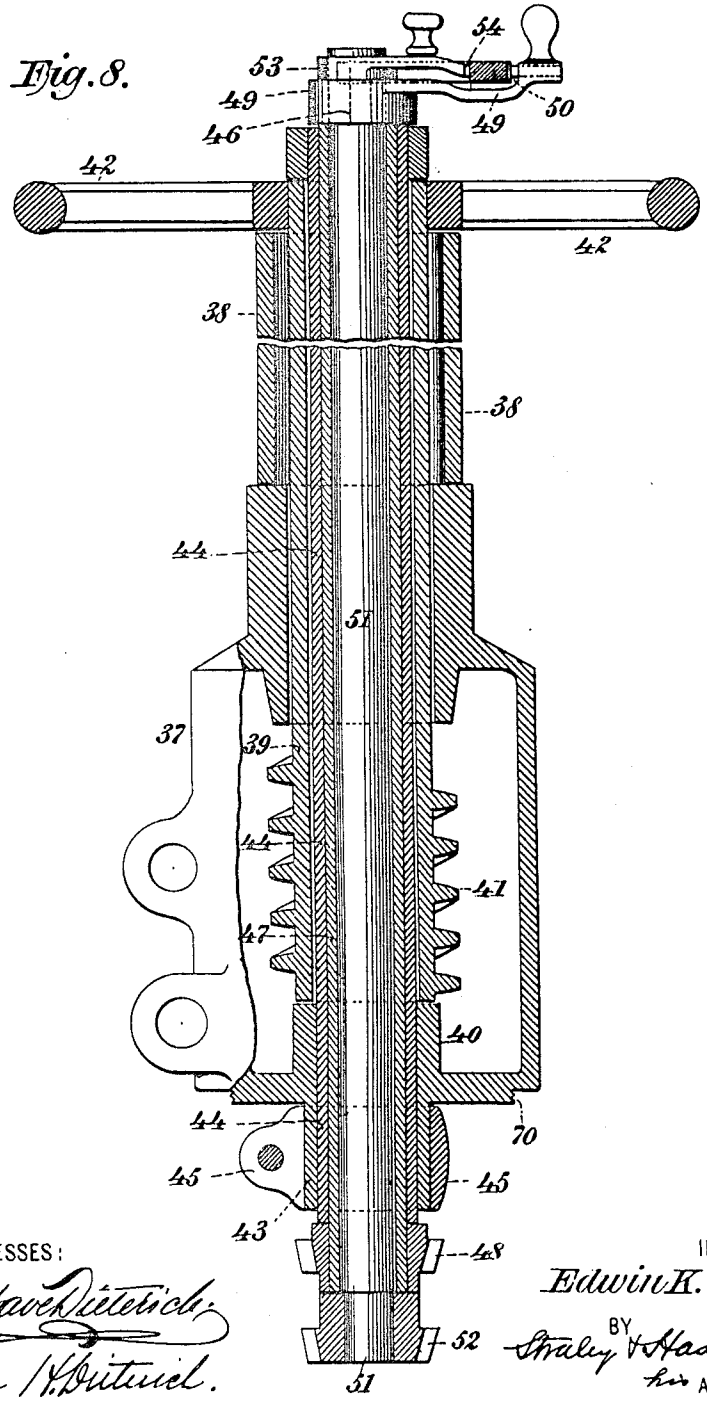
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4 SHEETS—SHEET 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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THROTTLE AND SPARK CONTROL FOR AUTOMOBILES.

1,131,600. Specification of Letters Patent. **Patented Mar. 9, 1915.**

Application filed August 30, 1907. Serial No. 390,793.

To all whom it may concern:

Be it known that I, EDWIN K. CONOVER, a citizen of the United States, residing at Paterson, Passaic county, in the State of New Jersey, have invented certain new and useful Improvements in Throttle and Spark Controls for Automobiles, of which the following is a full, clear, and exact specification.

My invention relates to improvements in motor vehicles, and the same has for its object more particularly to provide a simple, efficient and reliable means for temporarily accelerating the speed of the motor in order to obtain sudden bursts of great speed when such become suddenly necessary or desirable.

Further, said invention has for its object to provide means operating partly in conjunction with the main throttle control under normal conditions, but which may be actuated independently of, and without affecting the operation of said main throttle control when such sudden bursts of speed are to be attained.

Further, said invention has for its object to provide an auxiliary throttle control which may be readily and conveniently thrown into or out of operation without in any way disturbing or changing the adjustment of the main control.

To the attainment of the aforesaid objects and ends my invention consists in the novel details of construction, and in the combination, connection and arrangement of parts hereinafter more fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification, wherein like numerals of reference indicate like parts, Figure 1 is a plan or top view, partly broken away, showing a portion of a motor vehicle frame, the engine, transmission case, and a carbureter provided with a main throttle control and an additional or auxiliary throttle control constructed according to and embodying my said invention; Fig. 2 is an enlarged detail vertical section taken on the line 2—2 of Fig. 1, showing one of the joints; Fig. 3 is a side view, partly in section, taken on the line 3—3 of Fig. 1, looking in the direction of the arrows *a*, *a*. Fig. 4 is an enlarged detail side view, partly in section, taken on the line 4—4 of Fig. 1, showing the lower end of the steering post, and the parts connected thereto; Fig. 5 is an inverted plan view of the lower end of the steering post and parts; Figs. 6 and 7 are enlarged detail perspective views showing one of the tubular shafts, and a cylindrical section arranged to work thereon; Fig. 8 is an enlarged detail central section showing the construction and arrangement of the steering post and related parts; Fig. 9 is a detail perspective view partly broken away showing the construction and arrangement of the controlling device, and Fig. 10 is a plan or top view showing the arrangement and construction of the levers 23 and 32, and their coöperating parts forming a part of the controlling device.

In said drawings 10 designates the vehicle frame, 11 the motor mounted thereon in the usual manner, 12 the transmission gear case, 13 the clutch mechanism arranged intermediate the transmission gear and the motor, and 14 denotes a carbureter of any well known general construction which is secured to the frame 10 by means of a bracket 15 bolted to one of the side members of the frame.

16 denotes a gasolene pipe having one end secured to and communicating with a gasolene supply receptacle, and its other end secured to the inlet portion of the carbureter 14, and 17 denotes a gas or mixture pipe leading from the carbureter 14 to the inlet port of the engine or the manifold connecting the inlet portions of the several cylinders of the engine 11.

18 denotes a lever for operating the throttle or valve controlling the passage of the explosive mixture from the carbureter 14 through the delivery pipe 17 to the engine.

19 denotes a bracket secured to one side of the bed of the engine 11 in which bracket is revolubly disposed a controlling device comprising a sleeve 20 having a forwardly projecting arm 21 connected at its end by a link 22 with the end of the throttle lever 18 of the carbureter, and 23 denotes a short arm arranged upon said sleeve 20 at right angles to the arm 21. The end of said short arm 23 is pivotally secured to the forward end of a rod 24 forming part of the main adjusting mechanism, which rod has its rear end supported in the swiveling bearing 25 mounted in the end of an arm 26 fixed upon a transverse clutch shaft 27 supported upon the frame of the vehicle adjacent to the rear end of the engine 11, and 28 denotes a stop

adjustably secured upon the rear end of said rod 24.

Within the sleeve 20 is disposed a revoluble shaft 29 (hereinafter called "third" shaft) having a head 30 at its lower end between which and the bottom of the sleeve is arranged a spring 31 having one end secured to the underside of said sleeve 20, and its other end secured to the head 30 on said shaft. The upper end of the shaft 29 is squared to receive one end of an arm 32 which is secured in position upon said shaft by a washer 33 and nut 34. The arm 32 is provided at its inner end adjacent to the upper end of the sleeve 20 with a segmental recess 35 which recess is adapted to contact at its ends with a segmental projection 35^a provided upon the upper end of the sleeve 20 which projects into said recess 35, so that either the sleeve 20 or the shaft may be partially rotated without disturbing the other, and only rotate conjointly for the remainder of their possible movements when the projection 35^a on said sleeve 20 engages with the ends of the segmental recess 35 of the arm 32.

Upon the right-hand inner longitudinal frame member 10 is secured a bracket 36 in which is mounted a tubular socket-member 37 and 38 denotes a tubular post or housing having its lower end rigidly secured to said socket-member 37.

39 denotes a hollow steering rod disposed within the tubular post or housing 38 and has its lower end supported upon a bearing 40 provided in the base of the socket member 37, and upon the outer side of said hollow steering rod 39 at its lower end is secured a worm gear 41 which meshes with a suitable toothed sector forming part of the usual steering mechanism, all of which is here omitted for the sake of clearness.

42 denotes a steering wheel fixed upon the upper end of the steering rod 39 directly above the upper end of the hollow inclosing post 38.

43 denotes a short split sleeve made integral with the socket-member 37 and projecting from the lower end thereof and within said split sleeve 43 is disposed the lower end of a tube 44 which is rigidly secured in position therein by a clamping collar 45. Said tube 44 extends upwardly within the hollow steering rod 39 and terminates just above the steering wheel 42, and 46 denotes a segment fixed upon the upper end of said tube 44, having its inner and outer edges provided with teeth or notches 46^a 46^b.

Within the segment-supporting tube 44 is disposed a tubular throttle shaft 47 having its lower end projecting below the lower end of the segment tube 44 and provided at said projecting end with a bevel gear 48, and at its upper end with a gas control lever 49, provided with a detent 50 adapted for engagement with the teeth 46^b upon the outer edge of the segment 46.

51 denotes a solid main or spark shaft disposed within the tubular throttle shaft 47 and projecting beyond the same at its upper and lower ends. To the lower end of said shaft 51 is fixed a bevel gear 52, and to its upper end a spark control lever 53 provided with a detent 54^a adapted to engage the teeth 46^a upon the inner edge of the segment 46.

54 denotes a bearing having a lateral projection 55 by means of which said bearing is secured to the socket-member 37 and rigidly supported in a vertical position thereon. Within said bearing is mounted a tubular shaft 56 having a collar 57 thereon for supporting said shaft in said bearing. 58 denotes a toothed segment fixed to the lower end of said tubular shaft 56 which meshes with the bevel gear 48 on the tubular throttle shaft 47, and 59 denotes a cylindrical section which is disposed upon the upper end of the tubular shaft 56 and has a segmental projection 60 at its lower end fitting into a segmental slot or recess 60^a in the upper side of the collar 57 in order that either said cylindrical section 59 or the shaft 56 therein may be partially rotated without disturbing the other, and then rotate jointly for the remainder of their possible rotation. Into the upper end of said cylindrical section 59 is fitted a head 61 which is secured thereto by a screw 62, and provided with a central opening to receive the upper end of the tubular shaft 56. 63 and 64 denote laterally projecting arms made integral with said cylindrical section 59 and projecting therefrom at substantially right angles to each other, and 65 denotes a coil spring disposed about the portion of the tubular shaft 56 within the cylindrical section 59 and has one end secured to the collar 57 on said shaft, and its other end to the head 61 on said cylindrical section.

66 denotes a solid second shaft disposed loosely within the hollow shaft 56, and provided at its lower end with a toothed segmental rack 67 in mesh with the bevel gear 52 on the lower end of the spark control shaft 51, and at its upper end with an arm 68 which is suitably secured thereto, and adapted for connection with a suitable sparking device.

69 denotes a housing secured at one end to a threaded hub 70 projecting from the underside of the socket-member 37, and within said housing are disposed the bevel gears 48, 52 and the segmental racks 58, 67 and their connected and adjoining parts.

The accelerating or secondary adjusting mechanism for temporarily opening the carbureter beyond the point ordinarily obtainable by means of the main adjusting

mechanism comprises a lever 71, which is pivotally secured at its upper end in the floor of the vehicle, and at its lower end to the rear end of a rod 72 which is pivotally secured at its forward end to an arm 64 on the cylindrical section 59, and 73 denotes an offset on the lever 71 provided at its end with a foot plate 74.

75 denotes a rod extending transversely across the frame 10 and having one end pivotally connected to the end of the arm 63 on the cylindrical section 59, and its other end pivotally connected to the end of the arm 32 fixed upon the upper end of the shaft 29 mounted in the bracket 19.

The main adjusting mechanism comprises a lever 76, pivotally mounted intermediate its ends upon a shaft supported in the vehicle frame having its upper end bent and provided with a foot plate 77, and its lower end pivotally connected to the rear end of a rod 78 which is pivotally connected at its forward end to an arm 79 fixed on the clutch shaft 27, to which is also fixed the arm 26 having connected thereto one end of the link 24 whose other end is connected to the arm member 23 of the controlling device, as hereinabove described, by means of which lever the connection between the driving shaft of the engine and the transmission gear may be broken, and at the same time the valve of the carbureter 14 closed.

The operation of the apparatus is as follows: The ordinary regulation of the sparking device is effected partially by rotating the spark lever 53 on the steering post which rotates the shaft 51, bevel gear 52, segment 67, shaft 66 and lever 68 which moves a rod (not shown) connected at one end to said lever 68, and at its other end to any suitable sparking device, not shown. The ordinary regulation of the throttle valve is effected by means of the throttle lever 49 on the tubular shaft 47 which rotates said tubular shaft 47, bevel gear 48, segment 58, tubular shaft 56 and the cylindrical section 59, and by means of the arm 63 on said tubular section 59 and transverse rod 75 connected at one end to said arm 63, and at its other end to the lever 32, lever 21 and rod 22, actuates the lever 18 to adjust the throttle valve of the carbureter 14 to the desired point, and as soon as the pressure upon the foot plate 77 of the clutch lever 76 is removed, and the clutch 13 engages its corresponding member on the driving shaft of the engine 11 the arm 26 on the clutch shaft 27 and rod 24 connected thereto will be permitted to move forward under the action of the spring 31 on the shaft 29 and at the same time said spring 31 will cause the arm 21 to be moved to the right in the direction of the arrow *g* drawing with it the link 22, and lever 18 and thereby opening the valve of the carbureter 14 controlling the supply of gas to the engine. As soon as pressure is again applied to the clutch lever 76 the shaft 27, and arm 26 will be partially rotated, the clutch 13 disengaged from its corresponding member on the driving shaft of the engine 11, and at the same time the arm 26 will engage the stop 28 on the rod 24 connected at its forward end to the arm 23 and thereby rotate the arm 21 and force the link 22 and lever 18 toward the left in the opposite direction of the arrow *g* and close the gas supply valve of the carbureter. Assuming the vehicle to be in operation, and as illustrated at Fig. 1, with the gas valve of the carbureter opened sufficiently to supply the required amount of gas to the engine, and it becomes necessary or desirable to suddenly accelerate the speed of the vehicle for a short period of time, and without disturbing the normal adjustment of the parts, it merely becomes necessary for the operator to depress the accelerator pedal 71 thereby forcing forward the rod 72 and rotating the cylindrical section 59 surrounding the hollow shaft 56 in the bearing 54 by means of the arm 64. As the said cylindrical section 59 is rotated the arm 63 thereon will move the rod 75 and arm 32 farther to the left (Figs. 1 and 2) and the arm 21, link 22 and throttle lever 18 of the carbureter 14 farther to the right and thereby further open the carbureter valve, which will thereupon remain open until the pressure upon the lever 71 is removed whereupon the carbureter valve will again assume its previous or normal adjustment due to the action of the spring 65 in the cylindrical section 59 of the tubular shaft 56.

It will be observed that in the operation of the regular adjustment of the throttle valve of the carbureter 14 which is effected through the lever 49, shaft 47, bevel gear 48 segment 58, tubular shaft 56 and the cylindrical section 59 and its connected parts, the said tubular shaft 56 and cylindrical section 59 move as one, and that the same is true of the shaft 29 and the arms 21 and 23 thereon, but that, when the auxiliary control is brought into operation for accelerating the speed the connection between the tubular shaft 56 and cylindrical section 59 is broken, and the latter caused to rotate without disturbing the position of said tubular shaft 56, and its operating parts, thus permitting the carbureter valve to be operated through the rod 75, arms 32, 21, link 22 and arm 18 as in the regular control above described. The connection between the parts thus broken will, however, be instantly restored by the spring 65 as soon as the pressure on the lever 71 is removed, and the normal adjustment of all the parts again restored.

When the clutch 13 is released from its engagement, for example, when the speed is to be reduced for stopping the vehicle, or shutting off the power when going down

hill, and in order to prevent racing of the engine, as the clutch shaft 27 is rotated toward the right (Fig. 3) through the action of the pedal 77, lever 76, link 78 and arm 79, the arm 26 fixed on said clutch shaft 27 will move therewith and the swivel bearing 25 on the arm 26 will move into engagement with the stop 28 and draw the rod 24 to the rear thereof actuating the bell-crank levers 23 and 21, and cause the link 22 to rotate the arm 18 and close the throttle valve of the carbureter, this operation of the rod 24 and its connected parts being effected without disturbing the position of the arm 32, rod 75 and its connected operating parts.

Having thus described my said invention, what I claim and desire to secure by Letters Patent is:

1. In an apparatus of the character described, the combination with a controlling device comprising a plurality of coöperating levers, a main shaft, an operating lever thereon, a second shaft connected to, and revoluble with said main shaft, a bell-crank lever mounted upon said shaft and adapted for independent movement thereon, a main adjusting mechanism comprising a clutch lever, a transverse shaft, a pair of arms fixed thereon, a link connecting one of said arms with said clutch lever, and a link connecting the other of said arms with one of the arm members of the coöperating levers of said controlling device, a secondary adjusting mechanism comprising a foot lever, a link connecting said foot lever with one member of said bell-crank lever, and a link connecting the other member of said bell-crank lever with the other arm member of said controlling device for actuating said controlling device without disturbing the adjusted position of said primary adjusting mechanism, substantially as specified.

2. In an apparatus of the character described, the combination with a controlling device and an operating lever therefor, of a main shaft, a second shaft connected to and revoluble therewith, a bell-crank lever mounted upon said second shaft and adapted for independent movement thereon, a foot lever, a link connecting the same with one member of said bell crank lever for shifting a part of said controlling device lever beyond its normal adjusted position without disturbing the adjustment of the remaining parts, a third shaft, an arm fixed thereon, a rod connecting said arm with the other member of the bell-crank lever on said second shaft, a bell-crank lever mounted upon said third shaft, a link connecting one member of said last named bell-crank lever with the operating lever of said controlling device, means for restoring said controlling device and its operating lever to their normal adjustment, a transverse shaft having a pair of arms fixed thereon, a link connecting one of said arms with the remaining member of said last named bell-crank lever, a second foot lever, and a link connecting said foot lever with the remaining arm on said transverse shaft, for shifting said controlling device lever to its normal adjustment, substantially as specified.

3. In an apparatus of the character described, the combination with a controlling device and an operating lever therefor, of a main shaft, means for securing said shaft to its adjusted position, a gear on said shaft, a second shaft supported adjacent to said main shaft having a toothed sector thereon in mesh with the bevel gear on said main shaft, a tubular section arranged upon said second shaft and adapted for partial rotation thereon, means for rotating said second shaft and tubular section together, arms projecting from said tubular section, a foot lever, a link connecting said foot lever with one of the arms on said tubular section, a third shaft, a bell-crank lever mounted to rotate on said third shaft, a link connecting one of the arms of said bell-crank lever with the lever of said controlling device, a clutch shaft, an arm fixed thereon, a rod connecting the other arm of said bell-crank lever with the arm fixed on said clutch shaft, an arm fixed on said third shaft, and a link connecting said arm with the remaining arm on the tubular section arranged upon said second shaft, substantially as specified.

4. In an apparatus of the character described, the combination with a controlling device and an operating lever therefor, of a main shaft, means for securing said shaft to its adjusted position, a gear fixed on said main shaft, a second shaft supported adjacent to said main shaft having a toothed sector fixed thereon in mesh with the gear on said main shaft, a collar on said second shaft having a segmental recess therein a cylindrical section arranged upon said collar and surrounding said second shaft and provided with arms extending therefrom at right angles to each other, and a segmental projection extending into the segmental recess in said collar, a spring disposed about said second shaft having one end secured to the collar thereon and its other end secured to said cylindrical section, a foot lever, a link connecting said foot lever with one of the arms on said cylindrical section, a third shaft, a bell-crank lever mounted to rotate thereon, and provided with a segmental projection, a coil spring disposed about said third shaft having one end secured thereto, and its other end secured to the bell-crank lever thereon, an arm mounted upon said third shaft having a segmental recess therein adapted to receive the segmental projection on said bell crank lever, a link connecting said arm with the other arm of the cylindrical section of said second

shaft, a link connecting one member of the bell-crank lever on said third shaft with the lever of said controlling device, a clutch shaft, an arm secured thereon, and a rod having one end secured to the other member of the bell-crank lever on said third shaft, and its other end secured to the arm fixed on said clutch shaft, substantially as specified.

5. In an apparatus of the character described, a throttle and spark control comprising a socket-member, a tubular housing projecting therefrom, a tube secured in said socket-member and extending through said housing, a segmental plate secured to the upper end of said tube, a tubular throttle shaft arranged within said tube having a gear fixed at its lower end, and a lever at its upper end, means for locking said lever to said segmental plate, a solid spark shaft disposed within said tubular throttle shaft, a gear fixed at the lower end of said solid shaft, a lever fixed at the upper end of said shaft, means for locking said lever to said segmental plate, a hollow steering shaft surrounding said tubular throttle shaft, a hand wheel secured to the upper end of said steering shaft, means arranged upon the lower end of said steering shaft within said socket-member adapted for connection with the steering mechanism of a vehicle, a bearing arranged outside of said socket-member and secured thereto, a hollow shaft mounted therein having a bell-crank lever at its upper end adapted for connection with a controlling device, and the operating lever therefor, a segmental gear secured to the lower end of said hollow shaft in mesh with the gear at the lower end of said tubular throttle shaft, a solid shaft disposed within said hollow shaft having an arm secured to its upper end adapted for connection with a sparking device, and a segmental gear at its lower end in mesh with the gear at the lower end of the solid spark shaft aforesaid, substantially as specified.

6. In an apparatus of the character described, a throttle and a spark control comprising a socket-member, a tubular housing projecting therefrom, a tube disposed within said tubular housing and socket-member, and secured at its lower end to said socket-member, a segmental plate secured at its upper end to said tube, a tubular throttle shaft arranged within said tube having a bevel gear fixed at its lower end, and a lever at its upper end adapted to engage said segmental plate, a spark shaft disposed within said tubular throttle shaft, a bevel gear fixed at the lower end of said spark shaft, a lever fixed at the upper end of said shaft adapted also to engage said segmental plate, a hollow steering shaft surrounding said throttle shaft, a hand-wheel fixed to the upper end of said steering shaft, a member arranged upon the lower end of said steering shaft within said socket-member adapted for connection with the steering mechanism of a vehicle, a bearing arranged outside of said socket-member and secured thereto, a hollow shaft mounted therein having a segmental gear at its lower end in mesh with the bevel gear on the throttle shaft, a collar on said hollow shaft having a recess therein, a bell-crank lever arranged upon said hollow shaft having a projection extending into the recess in the collar on said hollow shaft, a spring having one end secured to said hollow shaft and its other end to said bell-crank lever, a shaft disposed within said hollow shaft having a segmental gear at its lower end in mesh with the bevel gear on said spark shaft, and an arm fixed at its upper end adapted for connection with a sparking device, substantially as specified.

Signed at the city of New York, in the county and State of New York, this twenty-seventh day of August, nineteen hundred and seven.

EDWIN K. CONOVER.

Witnesses:
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FRANK S. MOORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."