Jan. 6, 1925. 1,521,746

E. H. BELDEN

REGULATING MEANS FOR INTERNAL COMBUSTION ENGINES

Filed Sept. 14, 1920 2 Sheets-Sheet 1

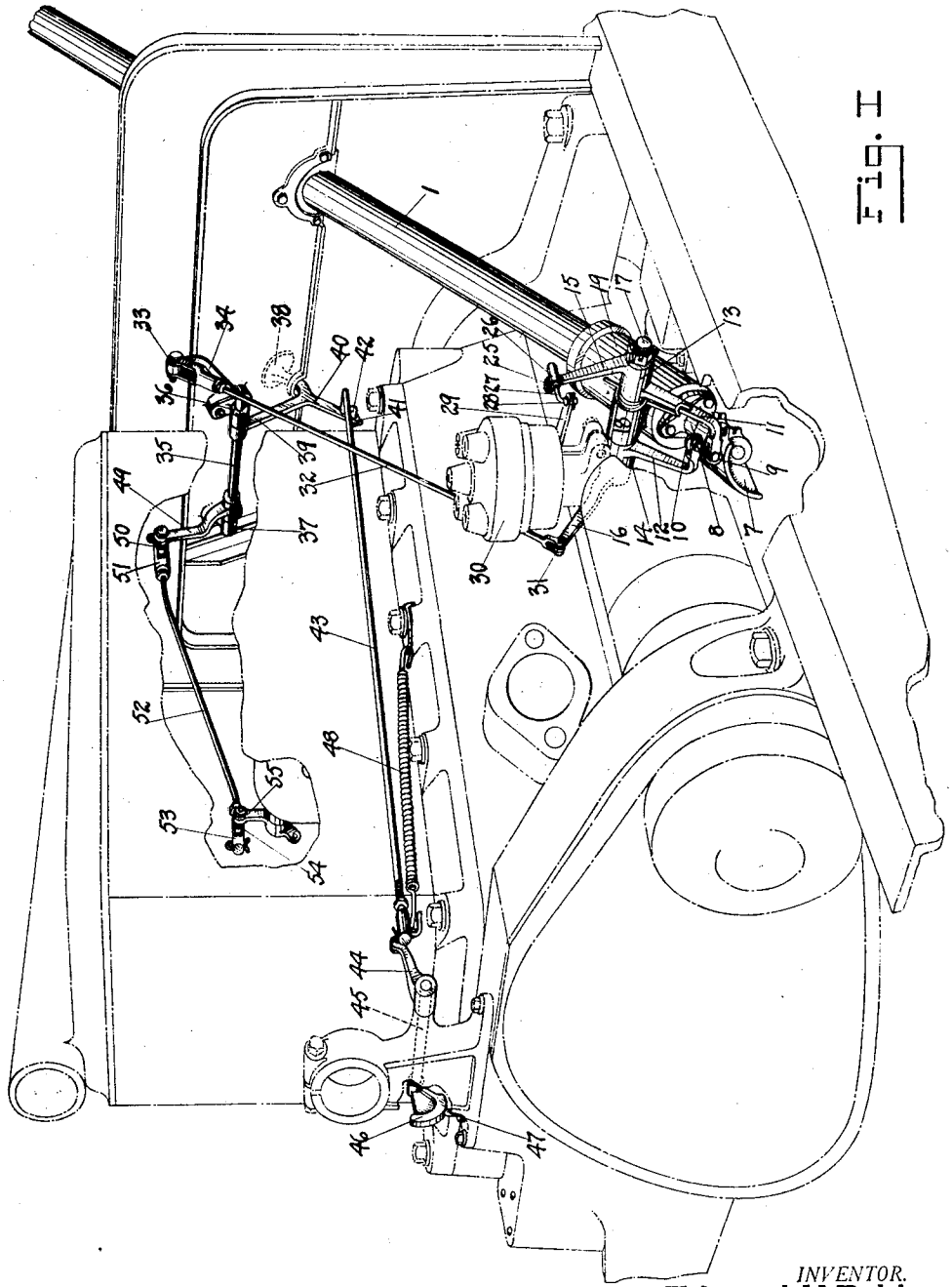


Fig. 1

INVENTOR.
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BY Chester W. Bradetton
Harry W. Lindsey
ATTORNEYS.

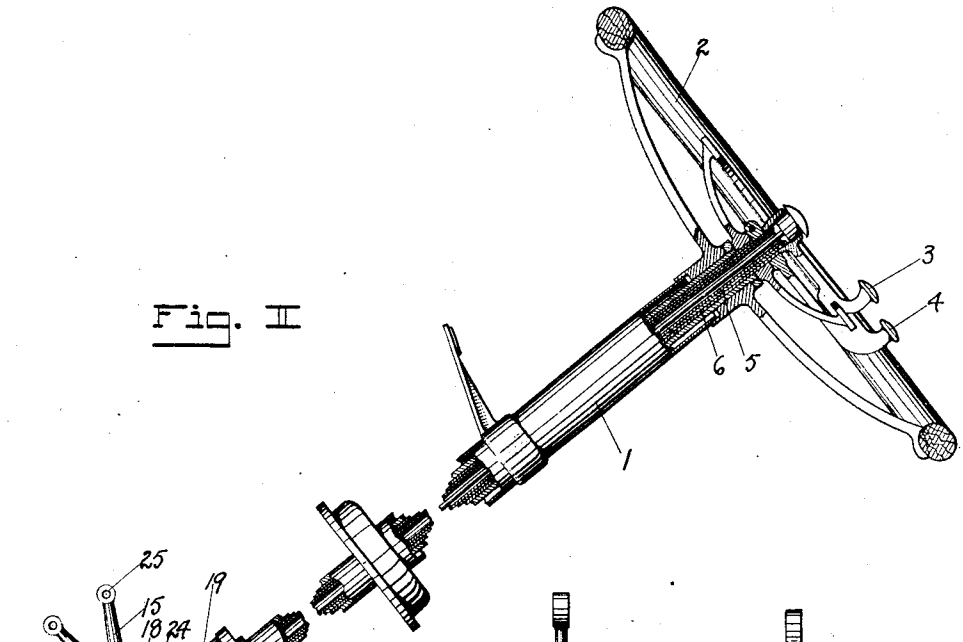
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Fig. II



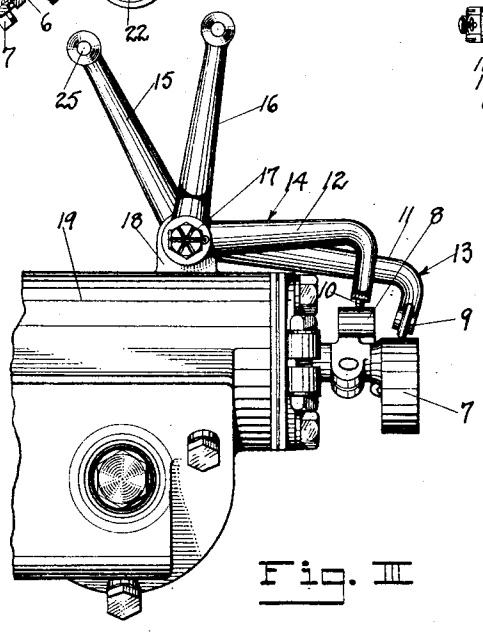


Fig. III

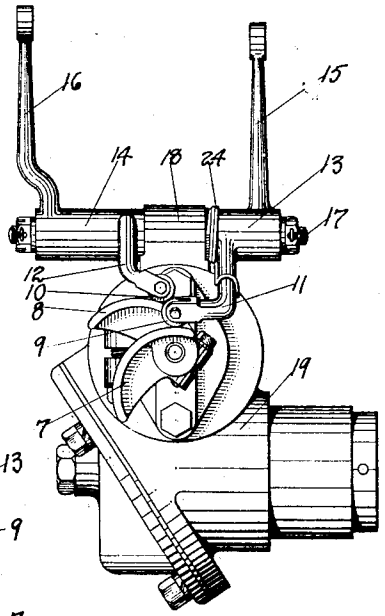


Fig. IV

INVENTOR.
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Patented Jan. 6, 1925. 1,521,746

UNITED STATES PATENT OFFICE.

EDWARD H. BELDEN, OF TOLEDO, OHIO, ASSIGNOR TO THE WILLYS-OVERLAND COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

REGULATING MEANS FOR INTERNAL-COMBUSTION ENGINES.

Application filed September 14, 1920. Serial No. 410,277.

To all whom it may concern:

Be it known that I, EDWARD H. BELDEN, a citizen of the United States, residing at Toledo, county of Lucas, State of Ohio, have invented certain new and useful Improvements in Regulating Means for Internal-Combustion Engines, of which I declare the following to be a full, clear, and exact description.

My invention relates to improvements in speed regulators and is particularly directed to a construction for operating the throttle, for adjusting the spark and controlling the forced feed lubricating system.

One object of the invention is to provide a new and improved means thru which the spark is controlled.

Another object of the invention is to provide a new and improved means for operating the throttle.

Another object of the invention is to provide an improved mechanism by which the throttle is operated and the feed lubricating system is controlled simultaneously.

Another object is the provision of a novel connection between the steering wheel lever and the throttle operating mechanism which will permit further operation of that mechanism toward the open throttle position independently by means of a foot accelerator.

Another object of the invention is to provide a unitary structure through which the spark or throttle may be controlled.

In still another object of the invention provision is made for a unitary structure which permits of the operation of the throttle and the forced feed lubricating system control by the accelerator pedal without disturbing the throttle lever on the steering wheel.

Further objects of the invention relate to economies of manufacture and details of construction as will hereinafter appear from the description to follow:

The objects of the invention are accomplished in one instance by the devices and means described in the following specification, but it is evident that the same may be varied without departing from the scope of the invention as pointed out in the appended claims. A structure constituting one embodiment of the invention which may be the preferred is illustrated in the accompanying drawings forming a part of the specifications, in which:

Figure I is a perspective view of the speed regulator mechanism as applied to an internal combustion engine.

Figure II is a side elevation of the steering post partly in section showing the operating rods for the cams.

Figure III is a fragmentary rear view showing the bell crank levers in engagement with the operating cams.

Figure IV is a fragmentary end view of the same construction shown in Figure III.

In reducing my invention to practice I provide a hollow steering post 1 having a steering wheel 2 mounted on one end and provided with the usual operating levers 3 and 4 for the hollow rods 5 and 6 located within the post 1 to control the spark and throttle. Mounted on the lower ends of these rods are cams 7 and 8 which engage rollers 9 and 10 on the lower free arms 11 and 12 of bell crank levers 13 and 14, respectively. The upper arms 15 and 16 of the levers are in staggered relation to the lower arms 11 and 12.

The bell-crank levers are pivoted on a spindle 17 which is fixed in position on a bracket 18. A split sleeve 19 mounted on the lower end of the steering post by means of flanges 20 and 21 and bolts 22 and 23 is made integral with the bracket 18.

The lever 13 is resiliently held in a predetermined position by a spring 24. The upper arm 15 of the lever 13 is perforated at 25 and provided with a pintle 26 pivoted in the perforation. The pintle carries a rod 27 fixed at one end to the pintle, the other end being bent and pivoted at 28 to the operating lever 29 of the timer distributor 30.

The upper arm 16 of the lever 14 is connected at 31 to a reciprocating rod 32 which is likewise adjustably connected at 33 with a crank 34 of the rock shaft 35. The rock shaft 35 loosely mounted in brackets 36 and 37 is operated by means of the accelerator pedal 38 which is in the form of a bell-crank lever having an arm 39 fixed to the rock shaft and another arm 40 hav-

ing a pivotal connection at 41 with the crank arm 42 of the rod 43. The other end of the rod 43 is adjustably connected to a crank 44 of a loosely mounted shaft 45 operating a cam 46 which engages the stem 47 of a valve that controls a by-pass in the forced feed lubricating system to relieve pressure in that system. A resilient means 48 returns the pedal 38 and the bell-crank lever 14 to their normal positions.

An arm 49 firmly mounted on said shaft 35 is pivotally connected at 50 with an adjustable element 51 on one end of a reciprocating rod 52. The other end 53 of this rod is pivoted on a pin 54 carried by a lever 55 which operates the throttle of the carburetor.

The operation of my device is as follows:

When the spark lever 3 is operated the hollow rod 5 causes the cam 7 to engage with the roller 9 forcing the arm 11 upwardly and through the arm 15, the timer distributor 29 will adjust the timing of the spark.

When the throttle lever 4 is operated the hollow rod 6 causes the cam 8 to engage with the roller 10 forcing the arm 12 upwardly. The other arm 16 of the lever is operated reciprocating the rod 32, moving the lever 34 downwardly and revolving the shaft 35. The arm 49 on the shaft 35 and the arm 55 through the connecting rod 52 are rocked, opening more or less the throttle valve.

When the throttle is adjusted in this manner the arm 40 of the accelerator pedal 38 is rocked reciprocating the rod 43 and revolving the shaft 45 through the arm 44. The cam 46 engages the stem 47 of a valve in the by-pass of the forced feed lubricating system, closing said valve more or less thus creating a pressure in the system. The valve and by-pass are not illustrated specifically because their details form no part of the present invention. The spring 48 tends to return the parts to normal position.

When the accelerator pedal 38 is depressed the shaft 35 is revolved and the crank arm 34 rocks the arm 16 of the lever 14 through the medium of the rod 32 and raises the lower arm 12 and its roller 10 out of engaging position with the cam 8. While the lever 14 is in this position an operation of the throttle lever on the steering wheel may have no effect on the throttle valve. The lower arm 40 of the depressed pedal 38 has been moved forwardly and through its connection with the shaft 45 causes the cam 46 to depress the stem 47, closing the valve in the by-pass of the forced feed lubricating system. The upper arm 39 of the compressed pedal 38 has revolved the shaft 35 rocking the arm 49 rearwardly and through its connection with the lever 35 has opened more or less the throttle valve.

It will now be apparent from the description that depressing the accelerator pedal will not disturb any previous position at which the throttle lever on the steering wheel may have been set before the accelerator pedal was depressed and the operator of the car after having released the pedal, may manually adjust the throttle from its former position by the lever on the steering wheel. The throttle valve is returned to the position set by the throttle lever on the steering wheel by means of the spring 48.

While I have shown and described my invention in more or less detail as being embodied in certain precise forms, I do not desire or intend it to be limited thereto, as on the contrary, my invention contemplates broadly all proper changes as well as the omission of the material elements and the substitution of equivalents as circumstances may suggest.

What I claim as new and desire to secure by Letters Patent is:

1. A regulator for internal combustion engines comprising in combination, spark and throttle control levers, a steering post having operating rods for the spark and throttle levers passing therethrough, operating cams on said rods, a bracket on said post, a pair of bell crank levers pivotally mounted on said bracket, one arm of each of said levers engaging one of said cams, and means operatively connected to the other arms of said levers for controlling the spark adjuster and the throttle.

2. A regulator for internal combustion engines comprising in combination, spark and throttle control levers, a steering post having operating rods for the spark and throttle levers passing therethrough, operating cams on said rods, a bracket on said post having a pair of trunnions, a pair of bell crank levers pivotally mounted respectively on said trunnions, one arm of each of said levers resting against one of said cams, and means operatively connected to the other arms of said levers for controlling the spark adjuster and the throttle.

3. A regulator for internal combustion engines comprising in combination, spark and throttle control levers, a steering post having operating rods for the spark and throttle levers passing therethrough, operating cams on said rods, a split bracket secured to the end of said post provided with a spindle, a bell crank lever mounted on each end of said spindle, one end of each of said levers being provided with a roller each adapted to engage one of said cams, means connecting one of said levers to the spark shifting mechanism, and means connecting the other lever with the throttle

4. A regulator for internal combustion engines, comprising in combination spark and throttle control levers, a steering post hav-

ing operation rods for the spark and throttle levers passing therethrough, operating cams on said rods, a bracket on the post provided with a spindle, bell-crank levers pivoted on said spindle, the lower arms of said levers carrying rollers which engage with the said cams, and means connecting the upper arms of said levers to the spark adjuster and the throttle.

5. A regulator for internal combustion engines, comprising in combination spark and throttle control levers, a steering post having operating rods for the spark and throttle levers passing therethrough, operating cams on said rods, a bracket on the post provided with a spindle, bell-crank levers pivoted on said spindle, the lower arms of said levers being engaged by said cams, the upper arm of one lever having means connecting it with the spark adjuster, and the free end of the upper arm of the other lever being connected with means for operating the throttle.

6. A regulator for internal combustion engines, comprising in combination spark and throttle control levers, a steering post having operating rods for the spark and throttle levers passing therethrough, operating cams on said rods, a bracket on the post provided with a spindle, bell-crank levers pivoted on said spindle, the lower arms of said levers being engaged by said cams, and resilient means for returning said arms to normal position.

7. In a regulator, a unitary structure, comprising in combination a split sleeve provided with a bracket, a pintle fixed on said bracket and bell-crank levers having staggered arms, pivoted on said pintle.

8. In a regulator, a unitary structure, comprising in combination a split sleeve provided with a bracket, a pintle fixed on said bracket and bell-crank levers having staggered arms pivoted on said pintle, one of said levers having resilient means to hold the said levers in a predetermined position.

9. In a regulator, a unitary structure comprising in combination, a split sleeve provided with a bracket, a pintle fixed on said bracket, bell-crank levers having upper and lower arms, the said arms of each lever being in staggered relation, and operating cams engaging the lower arms of said levers.

10. In a regulator for an internal combustion engine, a throttle lever, a shaft operatively connected thereto, an arm on said shaft connected to the engine throttle, a lever secured to said shaft carrying an accelerator pedal, and means connected to said lever for controlling the lubrication of said engine.

11. In a regulator for an internal combustion engine, a throttle lever, a rock shaft, means operatively connecting said throttle lever with said rock shaft, a connection between said rock shaft and the throttle of the engine, a lever secured at one end to said rock shaft, a lubrication controlling device, a connection between said device and the opposite end of said lever, and an accelerator pedal projecting from said lever at an intermediate point.

12. In an internal combustion engine, a steering column, an operating rod therein, a cam on the lower end of said rod, a pivotal member at the lower end of the column extending transversely thereof, an angular lever pivoted intermediate its ends upon said pivotal member and having one end operatively engaging the cam, and a throttle controlling device adapted to be actuated by said lever.

13. In an internal combustion engine, a steering column, an operating rod therein, a cam on the lower end of said rod, a pivotal member at the lower end of the column extending transversely thereof, a lever pivoted intermediate its ends upon said pivotal member and having one end operatively engaging the cam, and a spark regulating device operatively connected with said lever.

14. In an internal combustion engine, a steering column, an operating rod therein, a cam on the lower end of said rod, a bracket on the lower end of the column, a pivotal member carried by said bracket, an angular lever pivoted intermediate its ends upon said pivotal member and having one end operatively engaging said cam, throttle and oil pressure regulating devices for the engine, and means actuated by said lever for operating said devices.

15. In a speed regulator for internal combustion engines, a throttle lever, an accelerator pedal, a cam operated by the throttle lever, a throttle controlling rock shaft rigidly connected with and operated by the accelerator pedal, a lever operatively connected with the rock shaft and mounted to rock about a fixed pivot, said lever being adapted for operation by said cam, a rod directly connected with said pedal, and means operated by said rod for controlling the lubrication of the engine.

16. In a speed regulator for internal combustion engines, a throttle lever, an accelerator pedal, a cam operated by the throttle lever, a rock shaft rigidly connected with and adapted to be operated by the accelerator pedal, and a lever operatively connected with said rock shaft, said lever being mounted to rock about a fixed pivot and adapted to be actuated by said cam and to be disengaged therefrom when said rock shaft is operated by the accelerator pedal.

17. In an internal combustion engine, a steering column, an operating rod therein, a cam on the lower end of said rod, a support, a lever pivoted intermediate its ends upon said support and having one end operatively engaging the cam, a rock-shaft, an arm fixed

thereon, a connection between said lever and said arm, and a throttle controlling device adapted to be actuated by said rock-shaft.

18. In an internal combustion engine, a steering column, an operating rod therein, a cam on the lower end of said rod, a pivotal member at the bottom of the column extending transversely thereof, a bell-crank lever pivoted upon said member and having one end operatively engaging the cam, a timer-distributor, and an operating arm thereon connected with the other end of said lever.

In testimony whereof, I affix my signature.

EDWARD H. BELDEN.