Aug. 16, 1949. W. W. MILLER 2,479,392

AUTOMATIC CHOKE CONTROL

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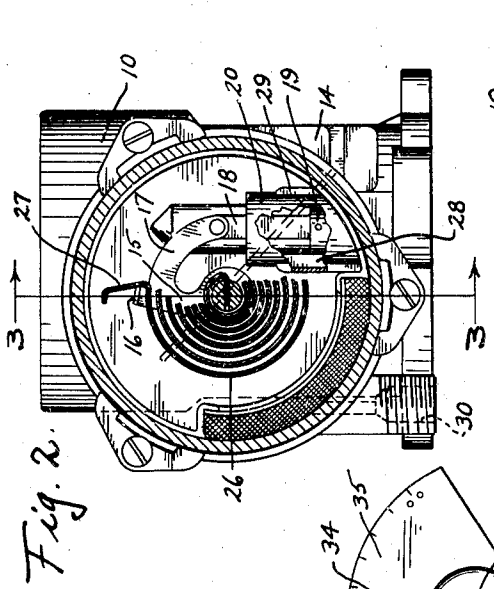


Fig. 2.

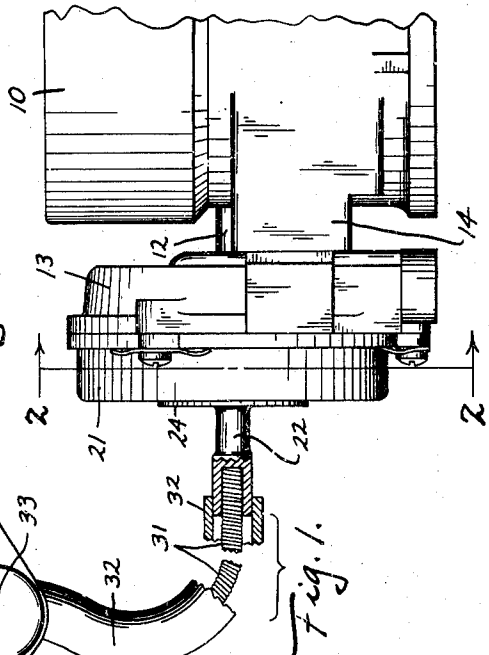
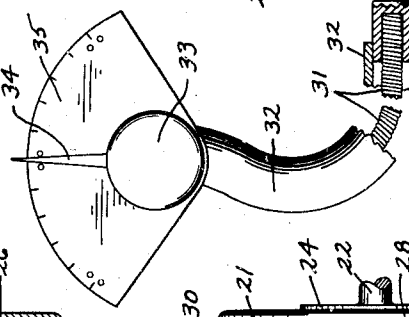


Fig. 1.



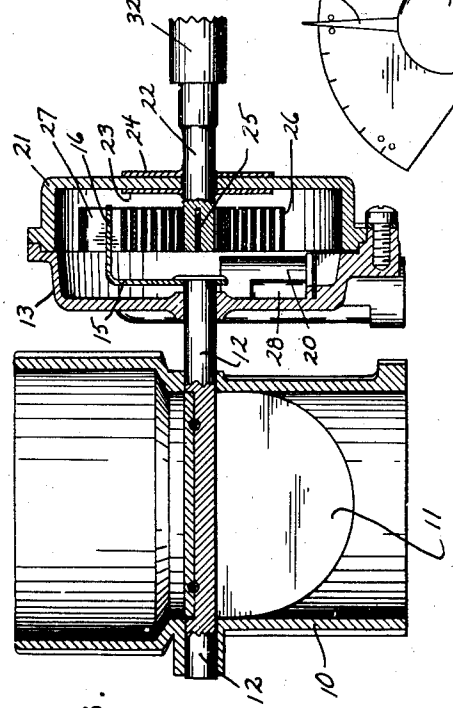


Fig. 3.

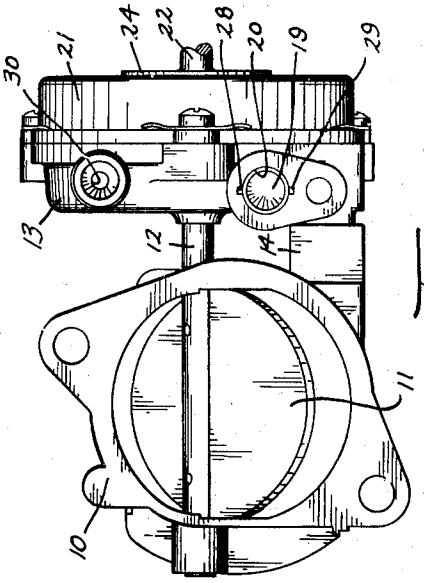


Fig. 4.

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AUTOMATIC CHOKE CONTROL

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1 Claim. (Cl. 236—101)

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This invention relates to remote manual control of automatic chokes in engine fuel induction systems. In many instances, the well-known automatic choke mechanism, particularly in extremely cold weather, will "over choke" to produce a flooded condition causing extreme difficulty in getting the engine started. My invention is intended to be applied to the well-known automatic choke mechanism now being commercially applied immediately ahead of the carburetor on engines employed in automobiles and the like, and it is the primary object of my invention to provide at some conveniently accessible place such as upon the instrument panel of the automobile an adjustable lever or knob, preferably with an indicating device, whereby the knob may be adjusted in accordance with weather temperature conditions to permit the choke mechanism to operate in accordance with the weather temperature and thus avoid the tendency to flood particularly in extremely cold weather. The invention of course may be employed for adjusting the choke mechanism to meet prevailing temperatures of different climates without further manipulation when conditions so warrant, although it is believed that the device constituting the invention should be made readily available as above indicated to prevent change in adjustment from season to season to secure a much better starting performance.

A further primary object of the invention is to provide a device that may be readily and quickly applied to existing choke mechanisms with a minimum amount of change and of labor in installation. A further primary object of the invention is to provide a device of the nature described which will permit "hand choking" of the engine when desired independently of the choking mechanism itself, particularly at milder temperatures.

These and many other objects and advantages of the invention will become apparent to those versed in the art in the following description of the one particular form of the invention as now best known to me, as illustrated in the accompanying drawing, in which,

Fig. 1 is a view in side elevation and partial section of a structure embodying the invention;

Fig. 2, a view in vertical section on a line 2—2 in Fig. 1;

Fig. 3, a vertical section on a line 3—3 in Fig. 2; and,

Fig. 4, a top plan view.

Like characters of reference indicate like parts throughout the several views in the drawing.

The choke mechanism herein shown and described is one of the commercially used types mounted directly over a down-draft carburetor, between it and the air cleaner. The part of the choke mounted between these two units (not shown) consists essentially of a thimble 10 within which is mounted a butterfly valve 11 on a shaft 12 carried transversely across through the thimble 10 to one side of the center thereof to have the valve 11 normally biased by the influence of gravity toward an open position, a partially open position being indicated in Figs. 3 and 4 in the drawing. This shaft 12 extends beyond the outside of the thimble 10 and terminates by a short length within a cupped head 13 mounted at one side of the thimble 10 by means of the bracket 14.

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Fixed on the outer end of the shaft 12 within the head 13 is an arm 15 from which extends a horizontally disposed finger 16 outwardly from the head 13. A finger 17 extends circumferentially about the shaft 12 in spaced relation therefrom as an integral part of the arm 15. The outer free end of the finger 17 is pivotly connected to a link 18 in turn pivoted to a plunger 19 freely slidable within the vertically disposed cylinder 20. The lower end of the cylinder 20 is connected with the intake of the engine, preferably through the carburetor, all in the usual and well-known manner. Thus the travel of the plunger 19 is downward, as viewed in Fig. 2, when the engine is operating and producing the vacuum in the carburetor, thereby pulling the butterfly 11 to its open position.

A cupped cover 21 is provided to enclose the head 13. A shaft 22 is carried axially through the cap 21 to be revoluble in relation thereto. In the form herein shown, the shaft 22 is supported by the cap by means of inner and outer washers 23 and 24 respectively slidingly engaging corresponding faces of the cap 21, these washers 23 and 24 being fixed to the shaft 22.

The shaft 22 extends into the cap 21 a sufficient distance to permit the inner end 25 of the helically coiled thermostat element 26 to be fixed thereto such as having the end carried through a slot in the end of the shaft 22. The outer end of the element 26 is carried outwardly substantially radially of the coil by an end portion 27 to be in the path of the finger 16 whereby unwinding of the element 26, Fig. 2, will shift the finger 16 in a counter-clockwise direction to produce corresponding rotation of the shaft 12. Accordingly sufficient unwinding of the element 26 will cause the valve 11 to be carried to the closed position.

The element 26 in the form described tends to unwind when cold and to contract when hot.

Once the invention is in operation, producing a vacuum tending to pull down the plunger 19, a partial vacuum will be produced in the cavity between the head 13 and the cap 21 by reason of the bypass slots 28 and 29 carried down along the cylinder 20 past the plunger 19 all in the usual manner. This partial vacuum within that cavity will tend to pull in air through the entrance opening 30 which is normally connected to a portion of the engine subjected to heat immediately the engine is set into operation.

The shaft 22 has connected therewith, Fig. 1, an extension shaft 31 herein shown as being a flexible shaft to permit its being carried to any suitable position to one side of the shaft 22 without having to employ universal joints or cranks and the like. The shaft 31 is preferably enclosed within a housing 32 and is carried to some point where an adjusting knob 33 fixed to the end of the shaft 31 may be rocked to cause corresponding rotation of the shaft 22. Preferably a needle 34 is fixed to the knob 33 to travel over an indicating segment 35 to indicate different positions of adjustment of the shaft 22, and correspondingly different positions of the thermostat element end 27. That is, by turning the knob 33, the thermostat element 26 is bodily shifted circumferentially within the cap 21 to variably position its end 27. Variably positioning this end 27 of course determines when that end will strike the finger 16 at a predetermined low temperature and thus cause the valve 11 to close and thereby induce the carburetor to supply an enriched fuel mixture to the engine. It is this variable positioning feature that constitutes the gist of the invention whereby the degree of valve 11 time of closure is determined. The element 26 itself serves as a resilient spring member against which the finger 16 may yieldingly travel a limited distance under the vacuum application at the plunger 19 tending to pull the finger 16 against the thermostat element end 27. Of course if the end 27 has been shifted too far in a counter-clockwise direction by reason of the lowering of the temperature, then a greater degree of resistance is set up to travel of the finger 16 to permit the valve 11 to reach a sufficiently open position so as to prevent "over-flooding" of the engine.

While I have herein shown and described my

invention in the one form as now best known to me, it is obvious that structural changes may be employed particularly in the type of thermostatic element employed, its mounting, and the interconnection between it and the adjusting means, all without departing from the spirit of the invention, and I therefore do not desire to be limited to that precise form beyond the limitations which may be imposed by the following claim.

I claim:

A remote choke valve control comprising the combination with a choke valve shaft, a vacuum cylinder, a rigid arm fixed directly to said shaft, a plunger in the cylinder connected to said arm for rotating the shaft upon production of vacuum in said cylinder; of a housing fixed in respect to said shaft; a helically coiled spring member about said shaft within said housing; a spring mounting post extending axially of said shaft, freely through said housing to extend therefrom; the inner end of said spring member being fixed to said post; a finger on said arm engaging the outer free end of said spring member whereby said spring member is tended to be wound upon said production of vacuum; said spring member being thermal-responsive to unwind and wind about said post upon varying degrees of heat applied thereto; a flexible shaft fixed axially of and to said post to extend to a remote control position; a member at said position fixed on the flexible shaft as means for rotating it; a washer fixed to said post on the inside and outside respectively of said housing to hold said post against longitudinal travel upon rotation thereof.

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