

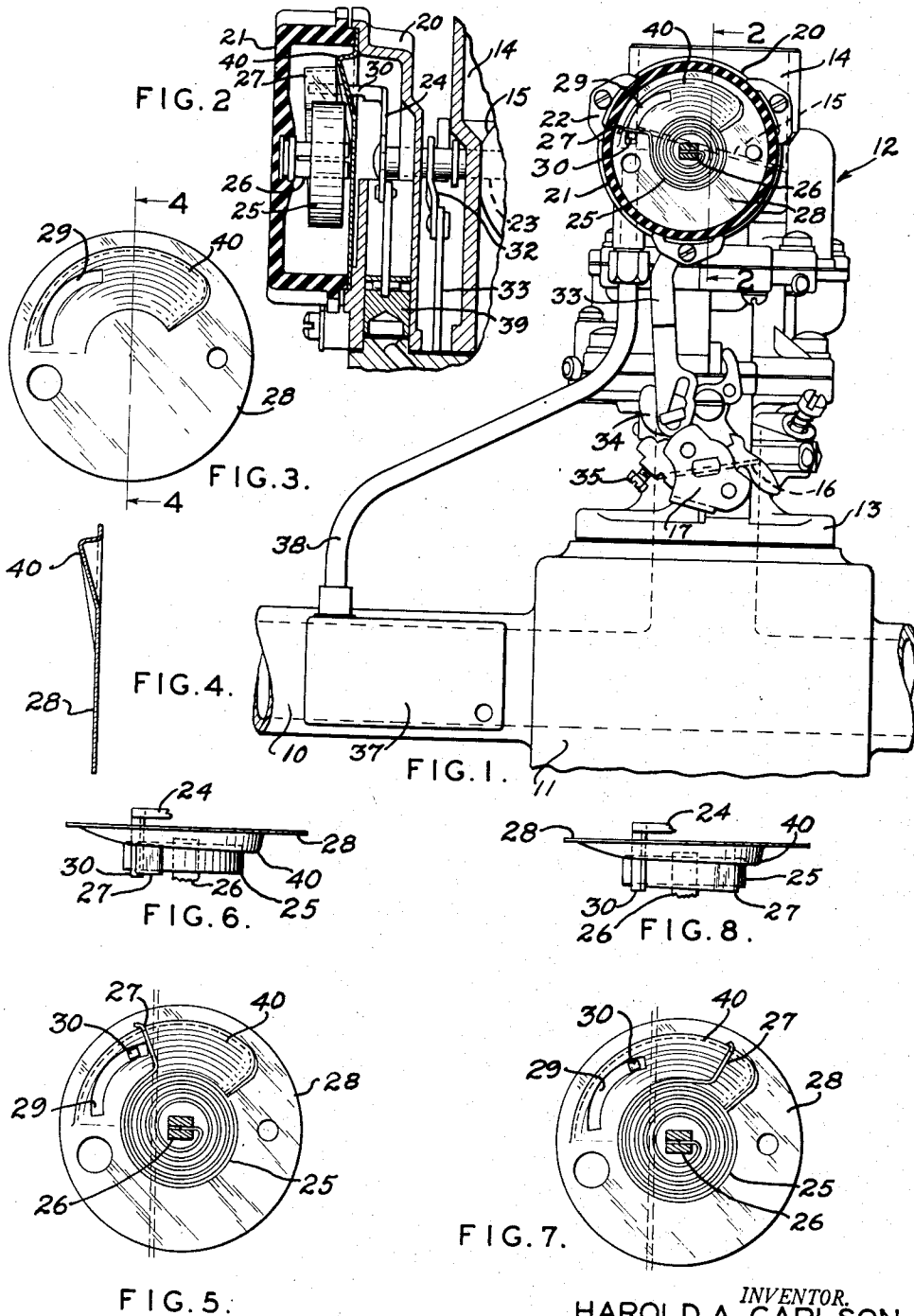
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STABILIZER FOR OVERRUNNING THERMOSTATIC CONTROLS

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STABILIZER FOR OVERRUNNING THERMOSTATIC CONTROLS

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This invention relates to thermostatic control units of the overrunning or one-way type and consists particularly in novel means for stabilizing such units during the overrun portions of their actions when they are separated from the members they control.

An example of the above type of thermostat occurs in a well known automatic choke control for automotive carburetors. Such control, as illustrated, for instance, in Coffey Patent No. 2,085,351, embodies a bimetal thermostatic coil having a shiftable, outer extremity with a one-way operative connection to an arm movable with the choke valve, so that when the thermostat flexes, as the temperature drops, this arm and the choke valve are yieldingly urged toward closed position. However, when the thermostat flexes in the opposite direction, under the influence of rising temperatures, the outer operating extremity thereof tends to move away from the choke valve arm, permitting opening of the choke valve under the influence of direct action of suction thereon. Ultimately, the thermostat extremity separates from the choke valve arm so that the thermostat will not be unduly strained at high temperatures. During the period when the thermostat extremity is separated from the choke valve arm and unsupported, an unpleasant tapping or hum may be produced due to vibration of the extremity against an adjacent part.

The main object of the present invention is to provide means for stabilizing the outer extremity of the thermostat coil so as to avoid this unpleasant vibration sound.

This object and other more detailed objects hereafter appearing are attained by the structure illustrated in the accompanying drawing in which

Fig. 1 is a side view, partially sectioned, showing a portion of an internal combustion engine manifold with a carburetor mounted thereon.

Fig. 2 is an enlarged, partial section taken approximately on line 2—2 of Fig. 1.

Fig. 3 is a side view of the thermostat housing partition removed.

Fig. 4 is a section on line 4—4 of Fig. 3.

Fig. 5 is a side view of the thermostat and partition, the choke valve being shown in full open position.

Fig. 6 is an edge view of the parts in Fig. 5.

Fig. 7 is a view similar to Fig. 5, but showing the thermostat in its overrun position.

Fig. 8 is an edge view of the parts in Fig. 7.

Figure 1 shows a portion 10 of the intake mani-

fold of an automotive internal combustion engine which extends into a hot spot 11 upon which is mounted a downdraft carburetor 12 by means of a flange 13 at the lower end thereof. At the upper end of the carburetor is an air inlet horn 14 within which is an unbalanced, butterfly choke valve 15 for controlling the admission of air to the carburetor and, accordingly, the richness of the fuel mixture supplied to the engine thereby. At the lower end of the carburetor is a butterfly type throttle valve 16 having an arm 17 rigid therewith for attachment to the usual accelerator controls conveniently located for operation by the driver.

Mounted on air horn 14 is a cup-like housing 20 having a cover 21 of insulating material adjustably secured thereto by means of wing clips 22. Choke shaft 23, upon which choke valve disk 15 is mounted, projects into this housing and carries an arm 24 rigid therewith inside the housing. A bimetal thermostat coil 25 is centrally secured to a pintle 26 projecting inwardly from the housing cover and has a free outer extremity formed with a hook 27. Traversing the housing is a baffle disk 28 having an arcuate slot 29 through which projects a finger 30 on choke shaft arm 24. This finger is in position to be engaged by extremity 27 on the thermostat coil, during counterclockwise movement of the hook (Fig. 1), to urge the choke valve closed. Such movement of hook 27 is produced by a lowering of the temperature within the housing which, in effect, causes the thermostatic coil to unwind. Upon raising of the temperature, the thermostat coil is caused to further wind upon itself, whereupon hook 27 shifts in a clockwise direction permitting the unbalanced choke valve to open by its own weight and by the influence of air drawn in through the carburetor by operation of the engine.

Figure 5 shows the choke valve in its fully open position, and with thermostatic hook 27 just separated therefrom. In Figure 7, the thermostat is further heated so that hook 27 has moved a considerable distance beyond finger 30. This overrun is customary and desirable so that the thermostat will not be placed under undue strain upon increases of temperature above that at which the choke should be fully open.

A second arm 32 on the choke valve shaft between the air horn and housing 20 is connected by a link 33 to a cam 34 pivotally mounted on the carburetor body adjacent the throttle valve. Operating arm 17 on the throttle valve carries an abutment screw 35 for engaging the

cam to vary the limit of closing movement of the throttle valve. Cam 34 is moved, when the choke valve is closed, to a position to limit the closing of the throttle valve to a fast idle position and, when the choke valve is fully open, permits closing of the throttle valve to its normal idling position.

A stove 37 is mounted on a portion of the manifold for supplying hot air to a tube 38 which extends to the interior of housing 20. Hot air is drawn from the stove through the housing and past the thermostat by engine suction which is transmitted to the interior of the housing past suction piston 39. This piston, as explained in the above mentioned Patent No. 2,085,351, responds to suction in the engine intake posterior to the throttle, to bias the choke toward open position. The stove and hot air connection tend to make the thermostat closely responsive to the actual engine temperature, so that the position of the choke valve and, consequently, the richness of the mixture is likewise responsive to engine temperature.

In order to prevent the free extremity of the thermostatic coil from vibrating against baffle disk 28 when the engine is in operation, which may produce an unpleasant hum or buzzing sound, the baffle disk is provided with a restricted, outlet portion 40 of general arcuate contour and inclined circumferentially to the plane of the disk, as indicated in Figs. 6 and 8, and also inclined radially, as indicated in Fig. 4. This outlet ramp is positioned in the path of hook 27 on the thermostat coil so that just as the hook leaves finger 30 (Fig. 5) it comes into engagement with the ramp and, thereafter, during its continued overrun, the hook is distorted somewhat, as indicated in Fig. 8. The ramp, thus, applies a stabilizing stress to the hook and, of course, eliminates rapid striking of the disk baffle thereby and resulting buzzing or humming sound.

A further advantage is that the transference of heat to the thermostat from the metal of the carburetor is facilitated so that the cooling thereof is delayed after the engine stops.

The exact shape and disposition of the stabilizing structure 40 and its manner of mounting, may be varied as expedient and so as to properly cooperate with the particular type of overrunning control. The invention is especially advantageous when used in connection with the automatic choke control thermostat of a carburetor, as illustrated, but may be applied to other types of controls having a similar manner of functioning.

The exclusive use of all modifications as come within the scope of the appended claims is contemplated.

We claim:

1. A thermostatic control comprising a mov-

able thermostatic element, a device operable by said element and having a one-way operative connection therewith whereby said element, in one position thereof, may operate said device and, in another position thereof is separated from said device, and a ramp member located in the path of the latter part of the movement of said element for frictional engagement thereby to stress and stabilize said element.

2. A thermostatic control comprising a coiled thermostatic spring having an outer extremity rotatable under temperature changes, a device operable by said coil and having a one-way operating connection with said outer extremity thereof, said extremity being rotatable beyond said device after the limit of movement of said device, and a ramp member located in the path of movement of said extremity after separation from said device for frictional engagement by said extremity to stress and stabilize the same.

3. A thermostatic control unit comprising a bimetal thermostatic coil having a rotatable, laterally resilient outer extremity, a device with which said coil cooperates and positioned to be engaged by said extremity during a portion of its movement in one direction and to separate from said device during a portion of its movement in the opposite direction, and an inclined member disposed to be engaged by said extremity after separation from said device for distorting and stabilizing the same.

4. A thermostatic control unit comprising a thermostatic coil spring having a free, movable outer extremity, a device having a one-way operative connection with said extremity for movement thereby during a part of the movement of said extremity, said extremity separating from said device during another part of the movement thereof, and a disk mounted adjacent and parallel to said spring and having a ramp forming part projecting into the path of said extremity for frictional engagement thereby, upon separation from said device, to apply stabilizing stress to said extremity.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,612,114	Hall	Dec. 28, 1926
1,731,822	Mau	Oct. 15, 1929
1,811,442	Snelling	June 23, 1931
2,162,296	Chappell	June 13, 1939
2,481,259	Taylor	Sept. 6, 1949
2,503,259	Hall	Apr. 11, 1950
2,564,112	Kittler	Aug. 14, 1951