

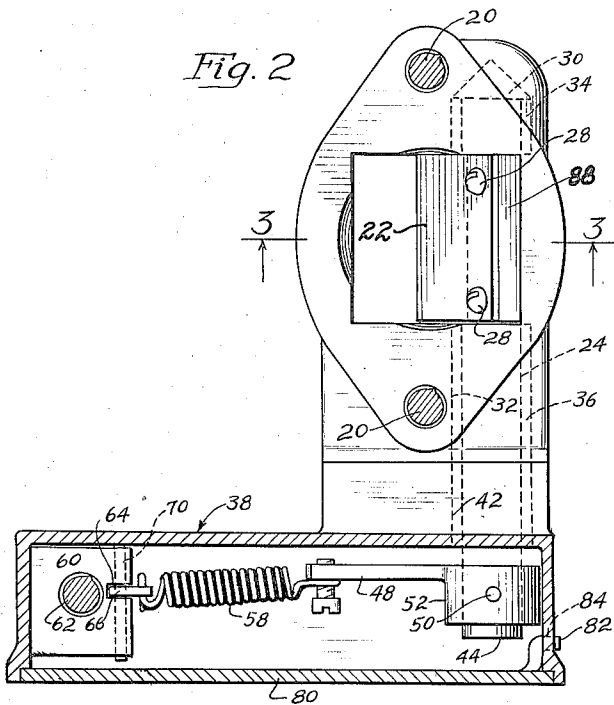
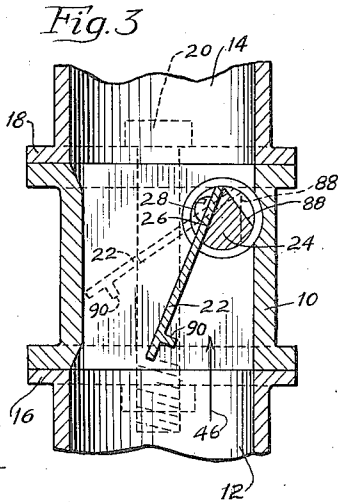
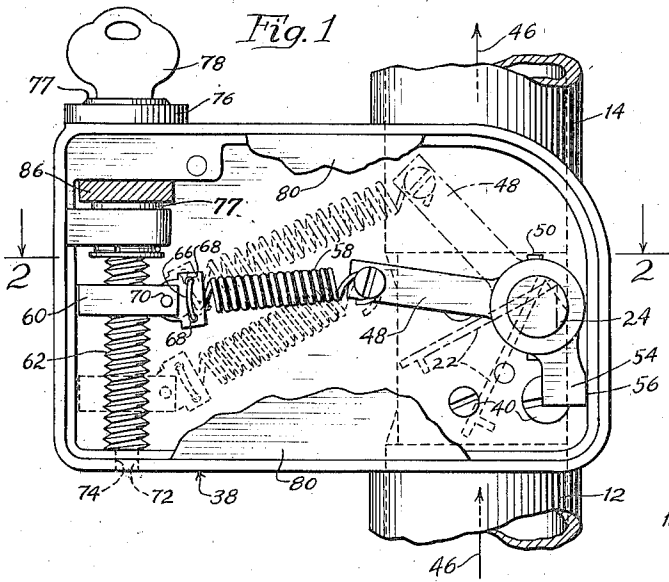
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E. R. KLEMM, JR

GOVERNOR

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Inventor:
Emil R. Klemm Jr.

By Freeman and Sweet
Attys.

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GOVERNOR

Emil R. Klemm, Jr., Chicago, Ill.

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6 Claims. (Cl. 137-152)

My invention relates to internal combustion engines and includes among its objects and advantages an improvement and simplification in control means for such engines operating by throttling the intake gases.

In the accompanying drawing:

Fig. 1 is a view showing an unbalanced throttle valve and its associated structure;

Fig. 2 is a sectional view taken along the line 2-2 of Fig. 1; and

Fig. 3 is a sectional view taken along the line 3-3 of Fig. 2.

In the embodiment selected to illustrate the invention I make use of a valve housing 10 positioned between members 12 and 14 which provide an intake conduit between the carbureter and the internal combustion engine with which the carbureter is associated. The members 12 and 14 are ordinarily provided with flanges 16 and 18 which are secured together. The housing is rigidly secured to the flanges 16 and 18 by means of bolts 20.

A flap valve 22 mounted upon a shaft 24 is positioned within the housing 10. A portion of the shaft is cut away as at 26 for providing a surface to which the valve may be rigidly secured by means of screws 28. The housing is provided with openings 30 and 32 for receiving bushings 34 and 36 respectively. The shaft 24 is rotatably mounted in the bushings.

A companion housing 38 is connected with the housing 10. The two housings are connected together by means of screws or bolts 40, see Fig. 1. The companion housing 38 is provided with an opening 42 which aligns with the opening 32 for receiving the bushing 36. One end of the shaft 24 extends into the companion housing as indicated at 44 in Fig. 2.

The arm 48 is rigidly secured on the end of the shaft 24 by the pin 50 passing through the boss 52 and moves within the companion housing 38. A heel 54, see Fig. 1, is formed integrally with the enlarged portion 52 and is arranged to bear against one side of the casing 38 as indicated at 56 to limit the opening movement of the valve to the final position shown in full lines in Fig. 3.

The end of the arm 48 is connected with a spring 58 which in turn is connected with a block 60 having a threaded opening for receiving a screw 62. The block 60 is slotted as at 64 for receiving a link 66 which has openings 68 for receiving the end coil of the spring 58. The link 66 is loosely mounted upon a pin 70 which is carried by the block 60.

One end of the screw 62 is provided with a re-

duced portion 72 which is rotatably mounted within an opening 74 in one side of the housing 38. The opposite end of the screw is connected with a lock mechanism passing through the boss 76 and including the barrel, or female portion, 77 which may be turned through the medium of the male portion, or key 78. The block 60 may be shifted to various positions upon the screw 62 for changing the tension and relative position of the spring 58. The tension of the spring increases as the block 60 is moved away from the lock mechanism.

In referring to Fig. 1 it will be noted that the end of the spring 58 connected with the block 60 is always below a line representing the longitudinal axis of the arm 48 whereby the heel 54 is caused to bear against the casing 38 as indicated at 56 to the extent that fluttering of the flap valve 22 is prevented. A plate 80 seals the companion housing 38 against tampering.

One end of the plate 80 is provided with a lug 82 arranged to be passed through an opening 84 in the companion casing 38. The opposite end of the plate has a lug 86 having an opening there-through for receiving the lock mechanism 76. The edge of the casing 38 is grooved for receiving the edge of the plate as shown in Fig. 2. The plate 80 is assembled with the companion casing by inserting the lug 82 in the opening 84 and pressing the plate into the groove in the edge of the casing. The lock mechanism is then inserted and secured to the casing. Thus it will be seen that the plate is firmly secured in position when the lock mechanism is passed through the lug 86.

One side of the shaft 24 is cut away at 88, see Fig. 3. The shaft is mounted in close proximity to one side of the housing 10. When the flap valve 22 is moved from its full line position to the dotted line position, the face 88 is parallel to the wall of the housing which provides an opening between the shaft and the wall, acting as a vacuum release. When the flap valve is open the convex side of the shaft is positioned substantially in contact with the wall to close the opening and prevent gases from passing the valve except past the free end of the flap valve 22. The flap valve may be provided with a rib 90 which functions as a baffle for increasing the influence of the gases upon the flap valve.

The flap valve 22 is normally open as shown in Fig. 3. The direction of flow of the gases through the housing 10 is indicated by an arrow 46. The flap valve is arranged at an angle with respect to the longitudinal axis of the housing 10 and the members 12 and 14, so that the incoming gases tend to close the valve.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge readily adapt the same for use under various conditions of service.

I claim:

1. The combination with an intake conduit for internal combustion engines, of a flap valve positioned within the conduit, a movable shaft passing through the conduit and having said flap valve connected thereto, a rigid arm connected with said shaft and having a heel contacting with a portion of the conduit for preventing movement of the shaft beyond a predetermined limit in one direction, a helical spring connected with said arm for resisting the closing movement of the flap valve, the resisting force of said counterbalancing means increasing at a slower rate than the increasing turning effort of the suction responsive member as the latter moves to closed position, whereby when open the suction responsive member will move completely closed at a predetermined engine speed and when closed the valve will move completely open at a slightly slower engine speed, said helical spring being positioned at an angle with respect to the longitudinal axis of said arm, and screw means connected with said helical spring for varying the tension of the latter.

2. The combination with an intake conduit for internal combustion engines, of a flap valve positioned within the conduit, a movable shaft passing through the conduit and having said flap valve connected thereto, a rigid arm connected with said shaft and having a heel contacting with a portion of the conduit for preventing movement of the shaft beyond a predetermined limit in one direction, a helical spring connected with said arm for resisting the closing movement of the flap valve, the resisting force of said counterbalancing means increasing at a slower rate than the increasing turning effort of the suction responsive member as the latter moves to closed position, whereby when open the suction responsive member will move completely closed at a predetermined engine speed and when closed the valve will move completely open at a slightly slower engine speed, said helical spring being positioned at an angle with respect to the longitudinal axis of said arm, screw means connected with said helical spring for varying the tension of the latter, and key operated lock means for turning said screw.

3. The combination with an intake conduit for internal combustion engines, of a pivoted flap valve controlling the passage of gas through said conduit, an arm rigidly connected with said flap

valve to rotate about the same axis, a block remote from said axis and beyond the end of said arm in the same general direction, a tension spring pivotally connected to said block and to the proximate end of said arm, the length of said tension spring being approximately the same as the length of said arm, and means for adjusting said block substantially perpendicular to a line from said block to said axis.

4. The combination with an intake conduit for internal combustion engines, of a pivoted flap valve controlling the passage of gas through said conduit, an arm rigidly connected with said flap valve to rotate about the same axis, a block remote from said axis and beyond the end of said arm in the same general direction, and a tension spring pivotally connected to said block and to the proximate end of said arm, said spring and arm lying almost in alignment with each other when the valve is open, and moving to an angle of at least thirty degrees with each other when the valve is closed.

5. The combination with an intake conduit for internal combustion engines, of a pivoted flap valve controlling the passage of gas through said conduit, an arm rigidly connected with said flap valve to rotate about the same axis, a block remote from said axis and beyond the end of said arm in the same general direction, and a tension spring pivotally connected to said block and to the proximate end of said arm, the length of said tension spring being approximately the same as the length of said arm, said spring and arm lying almost in alignment with each other when the valve is open, and moving to an angle of at least thirty degrees with each other when the valve is closed.

6. The combination with an intake conduit for internal combustion engines, of a pivoted flap valve controlling the passage of gas through said conduit, an arm rigidly connected with said flap valve to rotate about the same axis, a block remote from said axis and beyond the end of said arm in the same general direction, and a tension spring pivotally connected to said block and to the proximate end of said arm, the length of said tension spring being approximately the same as the length of said arm, said spring being close wound with initial tension, said spring and arm lying almost in alignment with each other when the valve is open, and moving to an angle of at least thirty degrees with each other when the valve is closed.

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