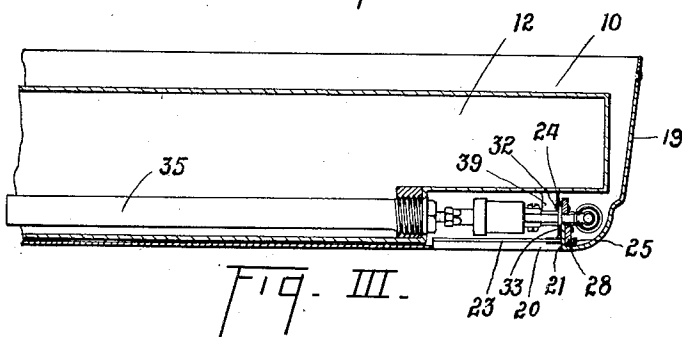
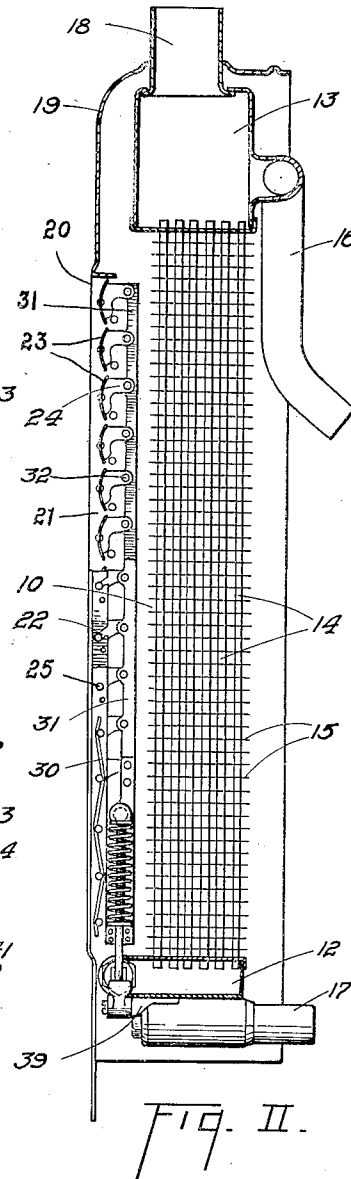
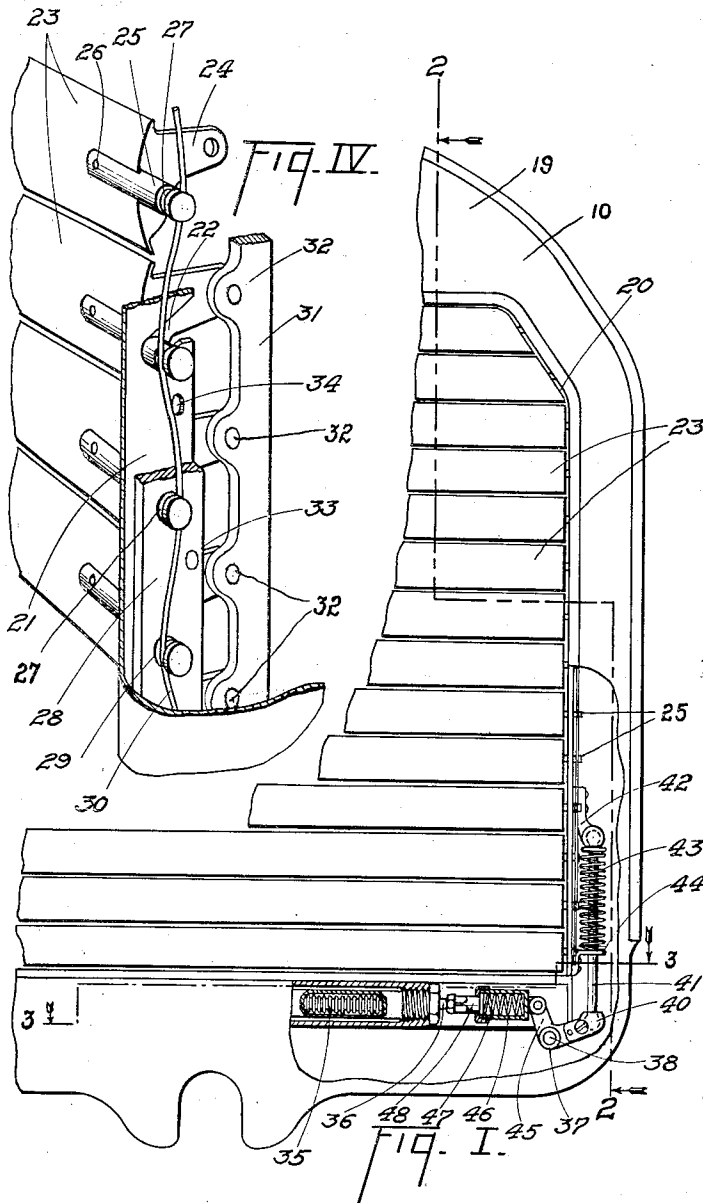


L. K. SNELL.
AIR FLOW CONTROLLING MECHANISM FOR INTERNAL COMBUSTION ENGINE RADIATORS.
APPLICATION FILED OCT. 1, 1917.

1,393,917.

Patented Oct. 18, 1921.



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AIR-FLOW-CONTROLLING MECHANISM FOR INTERNAL-COMBUSTION-ENGINE RADIATORS.

1,393,917

Specification of Letters Patent.

Patented Oct. 18, 1921.

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To all whom it may concern:

Be it known that I, LYLE K. SNELL, a citizen of the United States, and resident of Detroit, Wayne county, State of Michigan, have invented certain new and useful Improvements in Air-Flow-Controlling Mechanism for Internal-Combustion-Engine Radiators, of which the following is a specification.

10 This invention relates to improved radiator constructions for hydrocarbon motors.

One of the objects of this invention is to devise a radiator for hydrocarbon motors which shall be of neat and compact appearance.

15 Another object of this invention is to devise a radiator for hydrocarbon motors which shall possess a maximum degree of efficiency.

20 Another object of this invention is to devise a radiator for hydrocarbon motors which will operate to maintain the liquid passing therethrough at a substantially constant temperature.

25 Another object of this invention is to devise a radiator for hydrocarbon motors which can be readily assembled during process of manufacture.

30 Another object of this invention is to devise a radiator for hydrocarbon motors which shall have an arrangement of shutters operating in a noiseless manner and without rattle.

35 Another object of this invention is to devise a radiator for hydrocarbon motors which shall operate to prevent freezing of liquid contained therein, in winter weather.

40 These and other objects, will more clearly appear from the following description taken in connection with the accompanying drawings which form a part of this specification and in which:

45 Figure 1 is a front elevation view of a portion of a radiator, with parts broken away and in section to more clearly show the invention.

Fig. 2 is a vertical sectional view substantially on the line 2—2 in Fig. 1.

50 Fig. 3 is a plan sectional view substantially on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged perspective detail view showing a portion of the casing and the

manner of pivotally supporting the shutters therein.

Referring to the drawings, 10 is a radiator 55 comprising the bottom tank 12 and the upper tank 13, connected by the tubes 14, said tubes having the radiating plates 15 arranged therearound as customary in radiator construction. The radiator is also provided 60 with the water inlet pipe 16 and the water outlet pipe 17 and the filler pipe 18 as customary in radiator construction.

A casing 19 is arranged over the radiator and inclosing the same on all sides and partially covering the front, leaving the opening 20 opposite the tubes 14 of the radiator, the sides of the radiator casing about the opening 20 having the inwardly turned flanges 21 suitably notched from the inner 70 edge as at 22, the notches having a downward incline toward the base to more readily receive shutters 23 as hereinafter explained.

The shutters 23 at each end thereof have inwardly turned arms 24 and the trunnions 75 25 secured thereto as by rivets 26, and circumferentially grooved as at 27 adjacent the ends thereof.

In order to facilitate assembly, the necessary number of shutters to cover the opening 20 of the radiator casing have the arms 80 24 thereof interconnected as by rods 31 pivotally secured to each shutter arm as by the screws 32. These shutters are mounted in the side bars 28 with their trunnions 25 85 extending through the orifices 29 in said side bars and a spring retaining wire 30 is woven upon opposite sides of the projecting trunnion ends and is seated in the grooves 27, thus preventing the shutters from rattling 90 and holding the several shutters in their assembled position relative to the side bars 28 with sufficient security to enable the side bars and shutters to be placed bodily in position in the front opening 20; the trunnions 25 95 being guided into the slots 22 of the inwardly turned side flanges 21 so that the side bar 28 and spring wire 30 come on the inside of the flanges. The side bars are then secured in position as by screws 33 inserted 100 through suitable orifices 34 in the side flanges 21 and into correspondingly threaded orifices in the side bar. It will thus be noted that the shutters as assembled, form a unit

capable of being readily placed in position in the radiator casing, and removed from the casing for repair or replacement at any time desired by taking out the screws 33.

5 The shutters 23 are arranged to be opened or closed in accordance with the temperature conditions of the liquid passing through the radiator, and for this purpose a thermostat 35 is arranged in the lower tank 12 and
10 extends substantially the entire distance across the front of the radiator, said thermostat being of the corrugated bellows type which is well understood in the art and having a rod 36 extending from one end thereof
15 and which is forced outwardly as the temperature about the thermostat rises.

The thermostat is operatively connected to the shutters as by a bell crank lever 37 pivotally supported at 38 from a bracket 39
20 secured to the bottom tank of the radiator. One arm 40 of said bell crank lever is connected by the rod 41 with the bracket 42 secured to one of the rods 31. The connections at each end of the rod 41 are preferably
25 in the form of ball and socket connections, and a spiral spring 43 is arranged about the rod 41 between the top thereof and a bracket 44 extending from the radiator casing whereby the spring will normally hold the rods
30 31 in a raised position to close the shutters. The arm 45 of the bell crank lever 37 is pivotally connected to one end of a small cylinder 46 having a spiral spring 47 arranged therein, and a plunger 48 is connected with the end of the rod 36 of the
35 thermostat whereby any excess movement on the part of the thermostat rod will be compensated for by the compression of the spring 46.

40 The thermostat extending across the bottom tank of the radiator is most dependable in winter weather to prevent liquid from freezing in the radiator as it will normally remain contracted with the rod 36 in its extreme inner position and the shutters closed
45 until the liquid entering the radiator at the top and passing downwardly therethrough has all become heated to a temperature above that of the bottom tank of the radiator. Thus when the thermostat is operated to open
50 the shutters, it is always assured that the entire radiator is filled with heated liquid, and this is a most important factor in the operation of a device of this kind wherein
55 the shutters are automatically operated, and if the shutter operating means were to open the shutters with only the liquid in the top of the radiator hot, and the liquid in the bottom of the radiator still quite cold, it is
60 obvious that a blast of extreme cold winter air upon the lower tubes and part of the radiator would likely freeze the liquid instantly.

The thermostat action may be adjusted by
65 regulating the position of the plunger end 48

on the thermostat rod 36, that is, the more the plunger 48 is screwed onto the rod 36, to shorten the connection to the bell crank lever, the greater the temperature that will be required to operate the shutters.

70 While I have described and will specifically claim what I deem to be preferred embodiments of my invention, it will be obvious to those skilled in the art that various modifications and changes may be made without
75 departing from the spirit and scope thereof.

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

1. In a device of the class described, in 80 combination, a frame, a plurality of shutters arranged in said frame and a single spring means acting upon all of said shutters to prevent rattling thereof.

2. In a device of the class described, in 85 combination, a frame, a plurality of shutters pivotally arranged in said frame and a single spring acting upon all of the pivotal supports of said shutters for retaining the pivotal supports of said shutters in contact
90 with said frame.

3. In a device of the class described, in combination, a frame, a plurality of shutters pivotally arranged in said frame and a single device for preventing vibration of
95 said shutters in said frame.

4. In a device of the class described, in combination, a frame, a plurality of shutters having trunnions extending through said frame and pivotally supporting said shutters
100 and a single resilient anti-rattling element engaging with said trunnions.

5. In a device of the class described, in combination, a frame, a plurality of shutters having trunnions supported in said frame
105 and a spring wire interwoven about said trunnions and resiliently engaging all of them.

6. In a device of the class described, in combination, a pair of side bars, a plurality
110 of shutters having trunnion ends extending through suitable orifices in said side bars and having circumferential grooves adjacent the extremities and spring wires woven past alternate sides of said trunnions and bearing in
115 said grooves on the outer sides of said side bars.

7. In a device of the class described, in combination, a casing having inturned side flanges diagonally slotted, side bars secured
120 to said flanges and having orifices there-through in register with said slots, shutters having end trunnions circumferentially grooved and extending through said slots and said orifices and spring wires woven about
125 said trunnions on alternate sides thereof and resting in said grooves.

8. In a device of the class described, a casing having an opening provided therein; two side bars spaced apart from one another; a 130

plurality of shutters each of which is provided with a trunnion at each of its ends, and which trunnions extend through holes provided for them in said side bars; means for 5 securing said side bars in place within the opening aforesaid in said casing; and a single spring wire in engagement with all of the trunnions at one end of said shutters, to thereby prevent said trunnions from rattling 10 in the holes through which they extend.

9. In a device of the class described, a casing provided with an opening, and with

inwardly extending side walls adjacent said opening; two side bars spaced apart from one another; a plurality of shutters each of 15 which is provided with a trunnion at each of its ends; means for securing said side bars in place adjacent said opening; and notches provided in the side walls of said opening and within which said trunnions lie when the 20 parts are assembled.

In testimony whereof I affix my signature.

LYLE K. SNELL.