Nov. 27, 1928.

1,693,479

H. A. EDGAR

AIR CLEANER

Filed May 15, 1926

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Fig. 1.

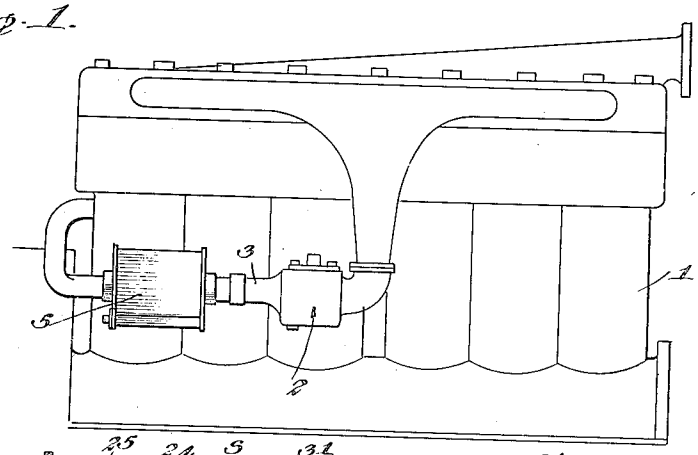


Fig. 2.

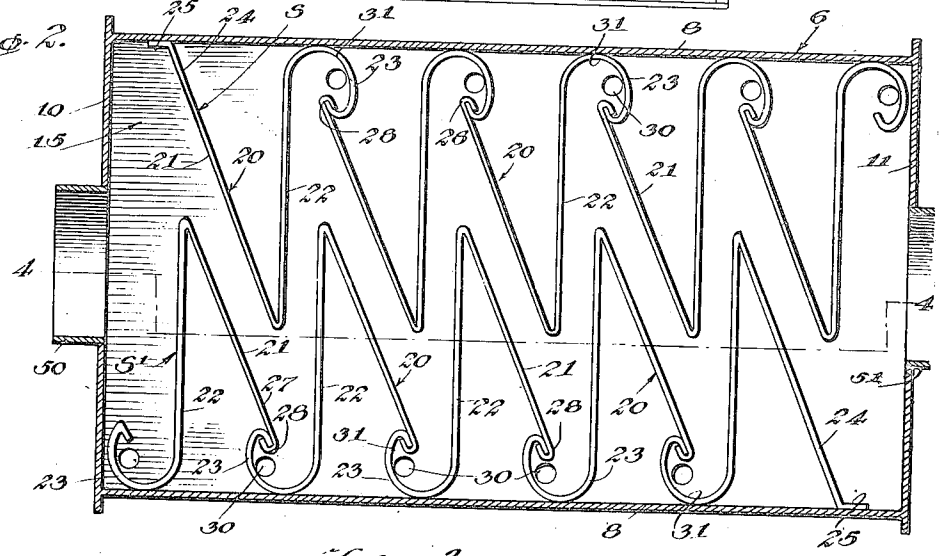
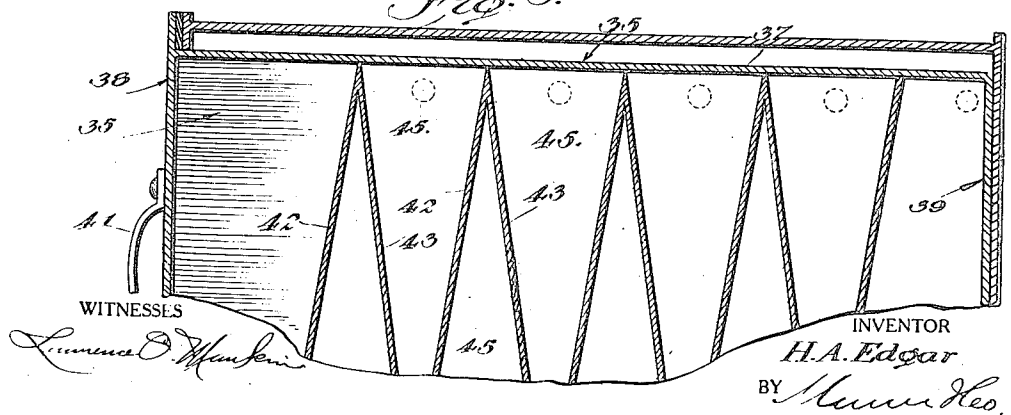


Fig. 3.



WITNESSES

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Fig. 4.

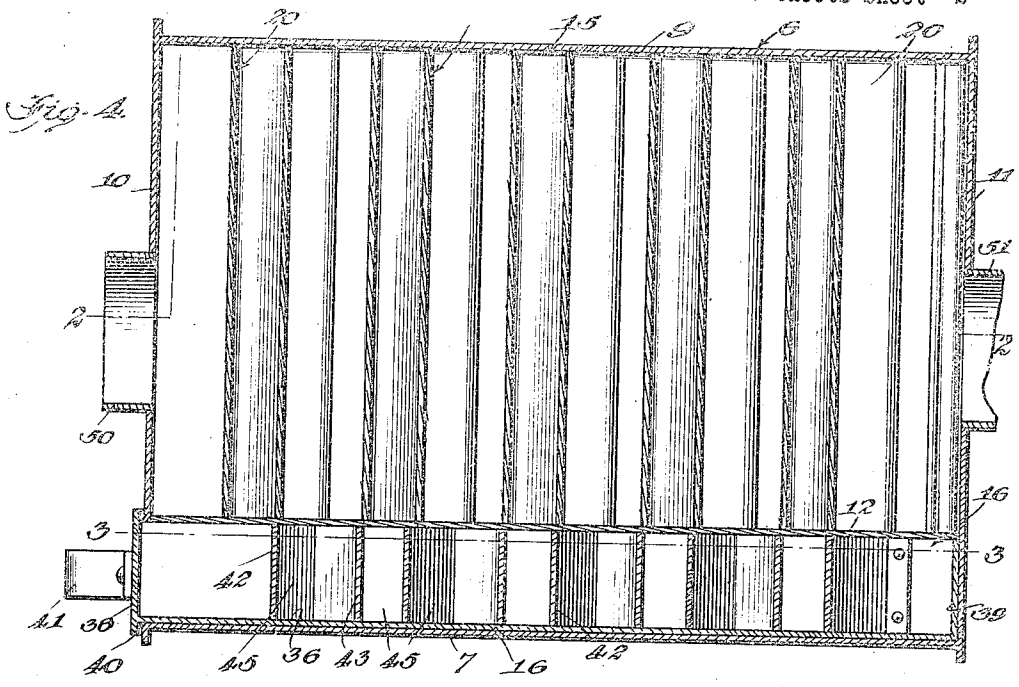


Fig. 5.

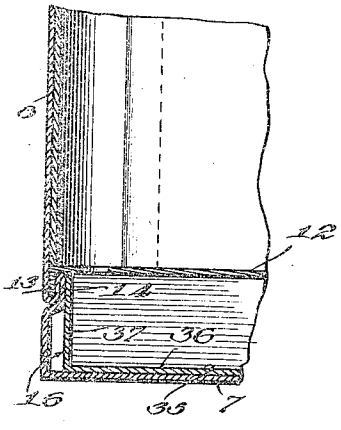


Fig. 6.

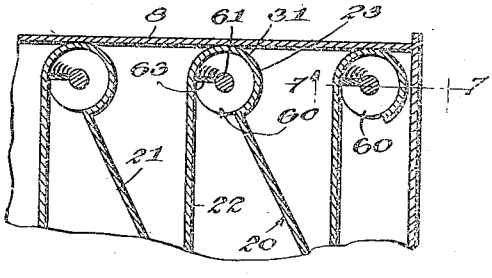
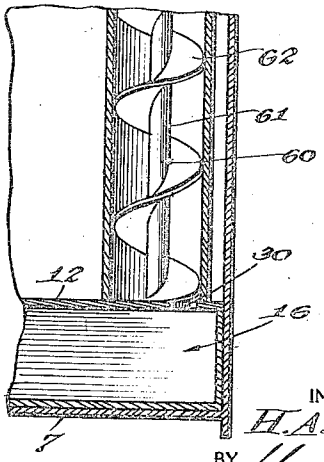


Fig. 7.



WITNESSES

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Filed May 15, 1926

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Fig. 8.

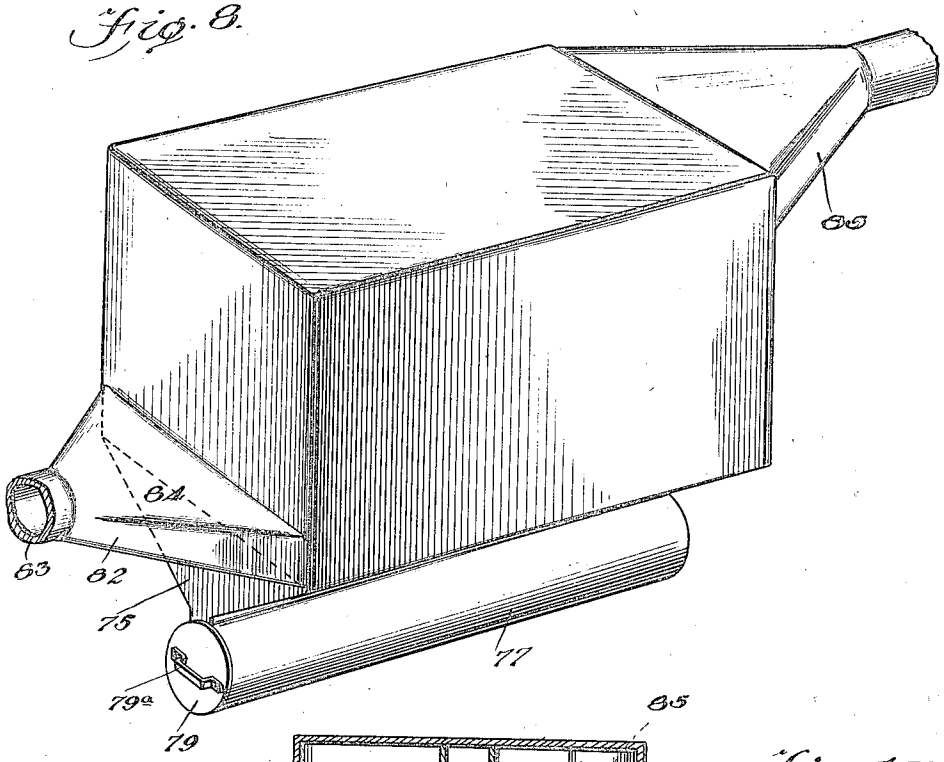


Fig. 9.

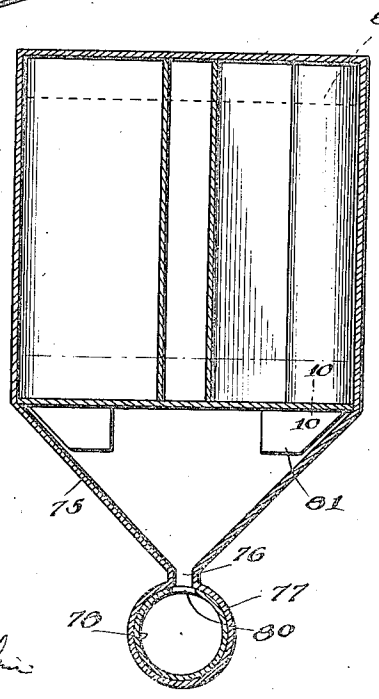
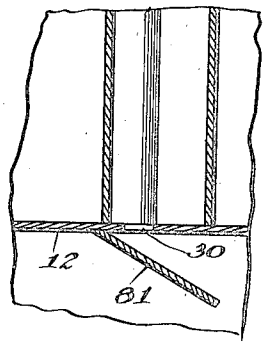


Fig. 10.



WITNESSES

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Patented Nov. 27, 1928. 1,693,479

UNITED STATES PATENT OFFICE.

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AIR CLEANER.

Application filed May 15, 1926. Serial No. 109,435.

This invention relates to an air cleaner especially designed and adapted for use in removing dust, dirt and any other foreign or solid matter from the air to be drawn into the carbureter of an internal combustion engine and commingled with the fuel for consumption in the cylinders of the engine.

The object of the invention is to provide a cleaner which has no moving parts requiring a source of power to operate and liable to get out of order but which nevertheless effectively precipitates and removes from the air all dirt, dust and like particles.

A still further object is to provide a cleaner which is of simple and durable construction, reliable and effective in operation and easy and comparatively inexpensive to manufacture.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:—

Figure 1 is a view in elevation showing how the cleaner is associated with an internal combustion engine,

Figure 2 is a view in horizontal section taken on the line 2—2 of Figure 4,

Figure 3 is a fragmentary view on the line 3—3 of Figure 4,

Figure 4 is a view in longitudinal vertical section taken on the line 4—4 of Figure 2.

Figure 5 is a fragmentary sectional view illustrating one mode of mounting the horizontal partition in the casing,

Figure 6 is a fragmentary view in horizontal section showing a slightly modified form of the invention, and

Figure 7 is a view thereof partly in elevation and partly in longitudinal vertical section,

Figure 8 is a perspective view showing another embodiment of the invention,

Figure 9 is a view in transverse vertical section further illustrating the embodiment shown in Figure 8, and

Figure 10 is a sectional view on the line 10—10 of Figure 9.

Referring to the drawings and more particularly to Fig. 1, the numeral 1 designates an internal combustion engine having a carbureter 2 provided with an air intake 3. An air cleaner embodying the present invention is designated generally at 5, and is connected up to the air intake 3 of the carbureter to clean and purify the air drawn thereinto.

The cleaner 5 comprises a casing, designated generally at 6, and made up of a bottom wall 7 and side walls 8, a top wall 9 and end walls 10 and 11. A horizontal partition 12 is provided in the casing and may be secured in position by having side flanges 13 firmly clamped against the side walls 8 by crimps 14 provided in the side wall. This partition divides the interior of the casing into a cleaning or separating compartment 15 and a dust and dirt compartment 16.

In the cleaning or separating compartment 15 opposed sets of baffles or vertical partitions are provided, one set of baffles being designated generally at S, and the other set of baffles, being designated generally at S'. Each set of baffles is made up of a plurality of substantially V-shaped baffle plates, designated generally at 20, each V-shaped baffle plate having an inclined portion 21 and a straight portion 22, the straight portions 22 extending straight across the compartment 16 and terminating in curled or curved portions 23. All of the inclined portions 21 except one are fastened to the curled portions 23 of adjacent baffles and the one inclined portion 21 that is not so fastened is extended, as at 24, and secured as at 25 to the casing. The baffles thus constructed are arranged in the casing, as shown in Figure 2 and extend from the top to the bottom of the compartment 15, and when so arranged define a zig-zag passage 27 which extends back and forth across the casing from one end thereof to the other. As shown the zig-zag passage 27 is of such character that the air must change its direction of movement in each run of the passage and at each point where the direction of the air is sharply changed the curved portions 23 of the baffles occur, and by virtue of their being united with the portions 21 as shown in the drawings, shoulders or projections 28 are provided which assist in the precipitation of the dust and dirt to the floor of the compartment 15. The floor of the compartment 15 which is constituted by the partition 12 is provided with a dust discharge opening 30 below each pocket 31 which each curled portion 23 of each baffle defines.

The dust that falls through the discharge openings 30 passes down into the compartment 16 and in order to facilitate the removal of this dust a drawer, designated generally

at 35, is provided and is slidably fitted in the compartment 16. The drawer 35 is made up of a bottom wall 36, side walls 37, and end walls 38 and 39, the end wall 38 being larger than the drawer opening and having gaskets 40 around its margins designed to engage the margins of the drawer opening to seal the joint between the end 38 of the drawer and the casing. A handle 41 is provided on the drawer to facilitate its manipulation. For the purpose of preventing the air from passing through the compartment 16 or through the drawer and in effect short circuiting the cleaner, the drawer is provided with a series of inclined partitions 42 and 43 which divides its interior into isolated spaces 45, there being one such space 45 for each discharge opening 30. Thus when the dust drops down into the drawer it is not adapted to be stirred up by the air passing through the cleaner. As shown in Figs. 2 and 4 the end wall 10 has an inlet opening 50 which communicates with the atmosphere or with any desirable source of air supply. The end wall 11 has a flanged outlet opening 51 which connects up with the air intake of the carbureter.

If desirable in each of the pockets 31 constituted by the curled portions 23 of the baffles, a deflector 60 may be positioned and as illustrated in Figs. 6 and 7, the deflector 60 may consist of spiral screws consisting of a central stem or axis 61, around which the spiral vane 62 extends. This deflector does not move but simply serves to aid the device in precipitating the dust or other foreign matter in the air. When the deflectors 60 are used the shoulders 28 are omitted.

The form of the invention shown in Fig. 8 is identical with that shown in Figs. 1 to 4 in so far as the construction and arrangement of baffles in the cleaning compartment of the casing is concerned but in this embodiment shown in Figs. 8, 9 and 10 the dust-receiving compartment is in the form of a hopper, as indicated at 75 and at its lower end the hopper 75 has a discharge slot 76 which opens into a cylinder 77. The cylinder 77 slidably receives a cylindrical drawer 78 having its ends closed, as at 79. The cylindrical body of the drawer 78 has a lengthwise slot 80 which registers with the discharge slot 76 to permit the dust to slide into the drawer. The outer end wall 79 carries a handle 79^a. In lieu of the partitions 42 and 43 an inclined baffle 81 is provided below each discharge opening 30, the baffle connecting with the horizontal partition 12 and leading from a point in front of each opening 30 downwardly and rearwardly with respect to the same.

A somewhat different arrangement of inlet and outlet forming pockets 31 is provided in that the inlet, which is designated at 82, is located at the bottom of the cleaning compartment and consists of a cylindrical connecting portion 83 and a flaring portion 84. The outlet, indicated at 85, is similarly constructed but couples with the top of the casing.

I claim:—

1. An air cleaner comprising a casing having an inlet at one end and an outlet at its opposite end, said casing having means therein defining a separating and cleaning compartment and a dust receiving compartment and a pair of sets of baffles, the baffles of each set being opposed, each set of baffles being made up of a plurality of substantially V-shaped baffle plates, one leg of each V-shaped baffle plate terminating in a curl connected with the adjacent leg of the adjacent baffle, and forming dust precipitating pockets, the V-shaped baffle plates of the other set being staggered and co-acting to define a zig-zag passageway through the cleaner, the means which divides the casing into the cleaning and dust-receiving compartments having discharge openings leading from the pockets into the dust receiving compartment.

2. An air cleaner comprising a casing having an inlet at one end and an outlet at its opposite end, said casing having means therein defining a separating and cleaning compartment and a dust receiving compartment and a pair of sets of oppositely disposed baffles, each set of baffles being made up of a plurality of substantially V-shaped baffle plates, one leg of each V-shaped baffle plate terminating in a curl connected with the adjacent leg of the adjacent baffle, the V-shaped baffle plates of the two sets being staggered and co-acting to define a zig-zag passageway through the cleaner, the curled portions of the baffles defining pockets, the means which divides the casing into cleaning and dust-receiving compartments having discharge openings leading from the pockets into the dust-receiving compartment, and means in the dust-receiving compartment for preventing the air from passing therethrough and for preventing agitation of the dust therein.

3. An air cleaner comprising a casing having an inlet at one end and an outlet at its opposite end, said casing having means therein defining a separating and cleaning compartment and a dust receiving compartment and a pair of sets of baffles, the baffles of each set being opposed, each set of baffles being made up of a plurality of substantially V-shaped baffle plates, one leg of each V-shaped baffle plate terminating in a curl connected with the adjacent leg of the adjacent baffle, the V-shaped baffle plates of the two sets co-acting to define a zig-zag passageway through the cleaner, the curled portions of the baffles defining pockets, the means which divides the casing into cleaning and dust-receiving compartments having discharge openings leading from the pockets into the dust-receiving compartment, and means in the dust-receiving compartment for preventing the air from

passing therethrough and for preventing agitation of the dust therein and consisting of a plurality of partitions separating the dust receiving compartment into a plurality of isolated and uncommunicating dust-receiving spaces.

4. An air cleaner comprising a casing having an inlet at one end and an outlet at its opposite end, said casing having means therein defining a separating and cleaning compartment and a dust-receiving compartment and a pair of sets of baffles, the baffles of each set being opposed, each set of baffles being made up of a plurality of substantially V-shaped baffle plates, one leg of each V-shaped baffle plate terminating in a curl connected with the adjacent leg of the adjacent baffle, the V-shaped baffle plates of the other sets co-acting to define a zig-zag passageway through the cleaner, the curled portions of the baffles defining pockets, the means which divides the casing into cleaning and dust-receiving compartments having discharge openings leading from the pockets into the dust-receiving compartment, and a drawer slidable in the dust-receiving compartment and having means for preventing the passage of air therethrough and for minimizing agitation of the dust.

5. An air cleaner comprising a casing having an inlet at one end and an outlet at its opposite end, said casing having means therein defining a separating and cleaning compartment and a dust-receiving compartment and a pair of sets of baffles, the baffles of each set being opposed, each set of baffles being made up of a plurality of substantially V-shaped baffle plates, one leg of each V-shaped baffle plate terminating in a curl connected with the adjacent leg of the adjacent baffle, the V-shaped baffle plates of the other sets co-acting to define a zig-zag passageway through the cleaner, the curled portions of the baffles defining pockets, the means which divides the casing into the cleaning and dust-receiving compartments having discharge openings leading from the pockets into the dust-receiving compartment, and a spiral deflector mounted in each pocket.

6. An air cleaner comprising a casing having a horizontal partition therein defining a cleaning compartment and a dust-receiving compartment, the casing having an inlet leading into the cleaning compartment and an outlet leading therefrom, a pair of sets of opposed baffle plates mounted in the cleaning compartment and extending from the floor thereof to the top of the casing, each set of baffle plates being made up of a plurality of substantially V-shaped baffle plates, one leg of each baffle plate terminating in a curled portion connected with the adjacent leg of the adjacent baffle plate, the V-shaped baffles of one set being staggered with respect to the V-shaped baffles of the other and overlying the same to define a zig-zag passageway through the cleaner, the curled portion of the baffles defining precipitating pockets, the partition having discharge openings therein below each pocket, and a drawer slidably fitted in the dust-receiving compartment and having partitions defining non-communicating spaces to receive the dust from the discharge openings.

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