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J. P. REMINGTON
AIR FILTERING DEVICE

1,735,694

Filed Jan. 6, 1925

FIG. I.

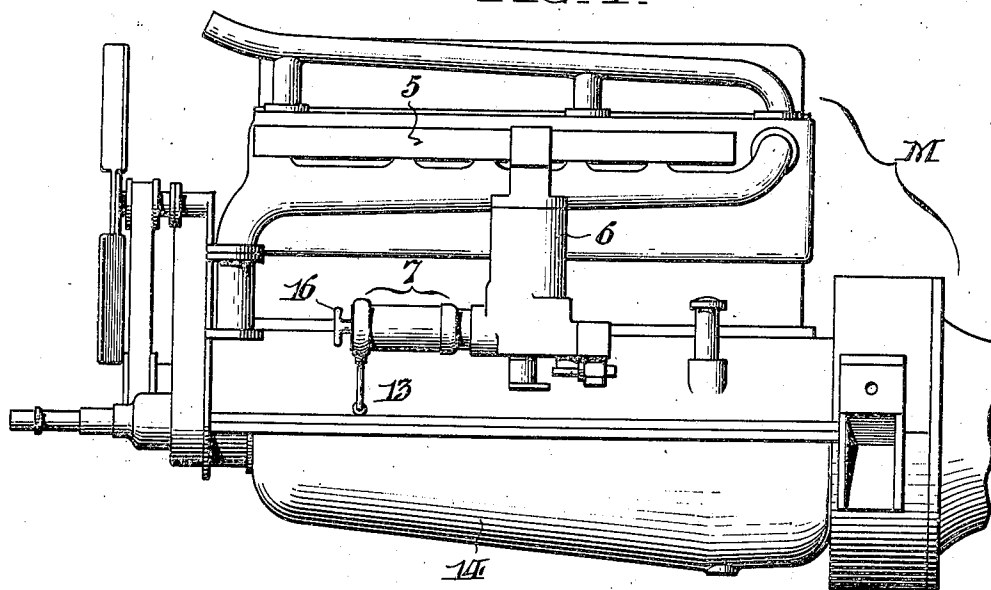


FIG. II.

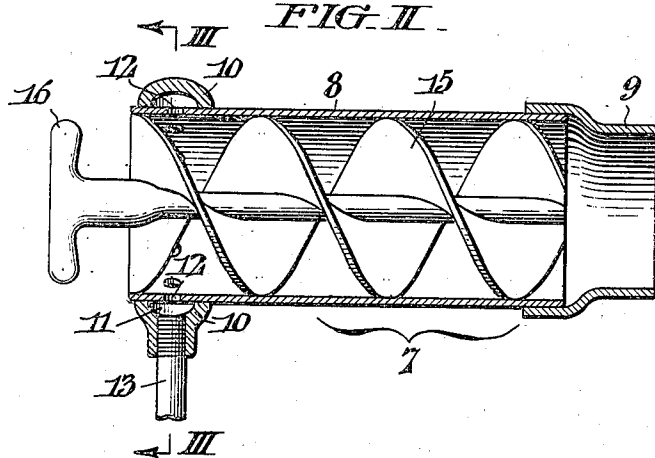
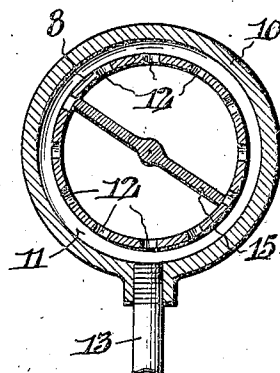


FIG. III.



WITNESSES

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AIR-FILTERING DEVICE

Application filed January 6, 1925. Serial No. 832.

This invention while relating generally to air filtering media is concerned more particularly with a novel method and means useful in association with the carbureter of an internal combustion engine to cleanse the air stream entering said carbureter of dust particles and other impurities conducive of inefficient engine operation.

Air filters heretofore designed for the purpose referred to have been found objectionable in that they impose a restraint upon the free flow of air to the carbureter thereby interfering with proper operation, especially at high speeds, and thus requiring readjustments to be made in said carbureter to compensate for such induced lag in the air flow.

The primary object of my invention is to overcome the difficulties above noted by ensuring a free flow of air without appreciable decrease in volume even when the engine is running at very high maximum speeds.

Another object of this invention is the provision of an air cleaner of the type referred to characterized by the fact that the vapors normally formed or collecting in the crank case—certain portions of which tend to dilute the oil therein—are promptly withdrawn, cleaned and passed through the carburetor to effect valve lubrication with incident rust prevention.

A further object is to provide an air cleaner of the typified character functional as a "breather" which, by virtue of its assembly location, effectively prevents fouling of the exterior parts of the engine and dash with oil that accumulates road dust and dirt.

With the foregoing and other objects in view this invention consists of an air cleaner which is compact in size and readily attachable to any standard form of carburetor ordinarily employed, and which furthermore affords a comparatively long smooth-walled anti-frictional flow-passage which is non-resistant to free-flow of air while affording an extensive surface whereon an oleaginous film—such as oil vapor drawn from the crank case of an internal combustion engine under suction—is constantly maintained to serve as a medium for intercepting the impalpable

and other particles of solid matter suspended in the passing air.

With reference to the drawings, Fig. I is a side elevation of a typical internal combustion engine having associated therewith an air filtering device conveniently embodying my invention.

Fig. II is a longitudinal sectional view of the air filtering device on a larger scale than that of the preceding illustration; and

Fig. III is a cross section taken as indicated by the arrows III—III in Fig. II.

Directing attention first to Fig. 1 of these illustrations, 5 indicates the fuel intake manifold of a motor M, and 6 the carbureter, in advance of which my novel air filtering device, comprehensively indicated at 7, is placed as shown. Or, the air cleaner 7 may be oriented in any other desirable position either in front of, or behind, the carbureter 6.

From Fig. II it will be observed that the air cleaner device 7 comprises a tubular shell 8 which is fitted at the rear end with an adapter 9 for direct connection to the air inlet of the carbureter 6, and that said device is surrounded at the forward end by a hollow fitting 10 affording an annular cavity 11 which communicates with the interior of the shell 8 through a series of ports 12 in the wall of the latter. The fitting 10 is connected by a tube or pipe 13 with the crank case 14 of the motor M at a point above the oil level normally maintained therein, so that oil vapor is constantly drawn into the tubular shell 8 through the ports 12 under the suction of the motor M. The ports 12 are of relatively small size so that no appreciable suction or reduced atmospheric pressure is imparted to the crank case interior.

Located within the shell 8 is an insert member conveniently—although not essentially—in the form of a spiral 15 that defines a circuitous course for the air flowing into the carbureter 6, which affords conjointly with said shell, an extensive surface over which the oil vapor, diffused incidental to entry through the ports 12, distributes itself, and it serves to intercept any particles of solid matter suspended in the passing air. The spiral insert member 15 engages the interior of the

shell 8 with a snug friction fit so as to be normally held against rotation or accidental displacement, but capable of being withdrawn when required, from time to time, for cleaning. For convenience in removing, the spiral 15 is fitted with a hand grasp 16 that is preferably formed integral therewith as illustrated.

Although the air is obliged to traverse a circuitous course through the device 7 in being filtered before entry into the carbureter 6, no abrupt directional changes such as would interfere with its free flow—and the proper operation of the carbureter 6—are involved. The spiral 15 therefore provides a comparatively long smooth-walled anti-frictional flow passage in a very small compact space, in addition to an extensive surface for distribution of the trapping medium as already explained.

From the foregoing it will be apparent that I have devised a novel and efficient air cleaner which embodies all the features enumerated as expedient, while it is deemed desirable to particularize certain important advantages discerned as a result of intensive experiments. Primarily among these advantages is the effectiveness of my air filter device 7 in reducing the amount of gasoline and water vapor collecting in the engine crank case 14 which—as is well known—acts as a diluent of the crank case oil. Another important advantage attained is that the oil vapor being drawn in with the carbureted air—and not wholly deposited upon the impact faces of the tubular shell 8 and spiral 15—affords an excellent lubricator and rust preventative for certain parts of the motor M difficult to otherwise supply with an anti-friction medium, such as the valve stems. Again, by closing up the customary “breather pipe” and using the filter device 7 therefor, I eliminate the diffusion of oil vapor about the engine dash and adjacent parts which ordinarily accumulate road dust to an extent that renders such surfaces extremely filthy and objectionable.

Finally it will be apparent that the carbureter 6 is assured of a maximum air flow regardless of the speed of the motor M, while the filter device 7 of my invention may be installed without requiring compensative adjustments of said carbureter; as was the case with adjuncts heretofore designed to function for a similar purpose.

Having thus described my invention, I claim:

1. An air filtering device for connection to the air inlet of an internal combustion engine comprising a smooth-walled conduit having its outer end apertured at circumferential intervals, means affording an annular cavity exteriorly around the apertures and adapted to conduct crank case vapor thereinto, and a removable spiral insert frictionally fitting

within the aforesaid conduit to define an extensive filtering surface.

2. An air filtering device for connection to the air inlet of an internal combustion engine carbureter comprising a smooth-walled conduit having its outer end apertured at circumferential intervals, a hollow fitting surrounding said conduit and affording an annular cavity surrounding the apertures, means for conducting crank case vapor directly thereinto, and a removable spiral insert frictionally fitting the aforesaid conduit to define an extensive filtering surface.

3. An air filtering device for connection to the air inlet of an internal combustion engine carbureter comprising a smooth-walled conduit having an adapter at its inner end and alignedly spaced apertures circumferentially about its outer end, a hollow fitting affording an annular cavity exteriorly surrounding the apertures and adapted to conduct crank case vapor directly thereinto, and a removable spiral insert frictionally fitting the aforesaid conduit to define an extensive filtering surface to collect some of the crank case vapor.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 31st day of December, 1924.

JOSEPH PERCY REMINGTON.