F. P. MIES AND F. W. JARVIS.

ENGINE INTAKE ATTACHMENT.

APPLICATION FILED FEB. 9, 1920.

1,380,824. **Patented June 7. 1921.**

Fig. 1.

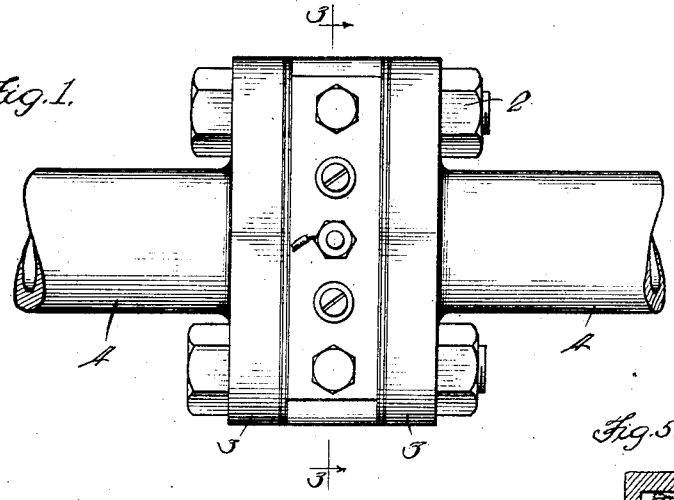


Fig. 2.

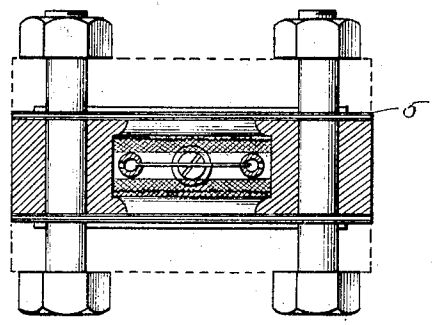


Fig. 5.

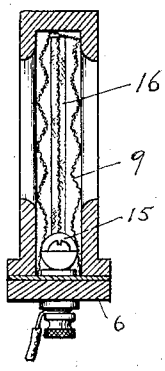


Fig. 3.

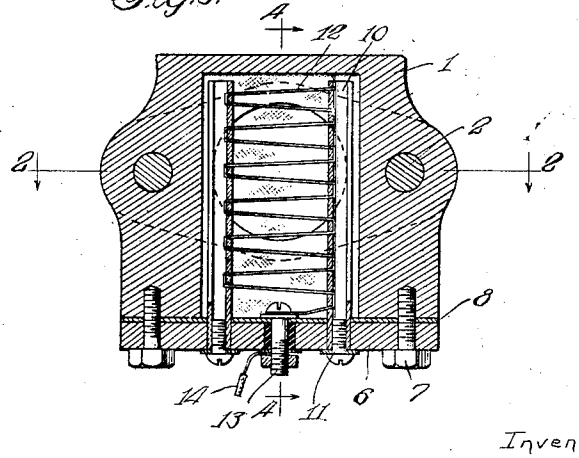
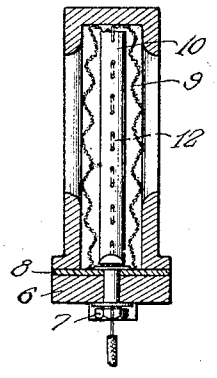


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ENGINE INTAKE ATTACHMENT.

1,380,824. Specification of Letters Patent. **Patented June 7, 1921.**

Application filed February 9, 1920. Serial No. 357,123.

To all whom it may concern:

Be it known that we, FRANK P. MIES and FRANKLIN W. JARVIS, both citizens of the United States, and both residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Engine Intake Attachments; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to internal combustion engines, and in its general aspects aims to provide an attachment for the intake duct of such an engine, which will simultaneously serve the following four purposes, namely, the screening of non-gaseous particles from the intake, the entrapping of such particles where the same can readily be removed, the more intimate intermixing of the intake gases, and the heating of these gases.

Viewed in its more particular aspects, our invention aims to provide an attachment of the class described which will effectively interpose at least one screen in the path of the intake and which will intercept non-gaseous particles in the intake gases, so as to prevent these from clogging the engine valves or otherwise interfering with the operation of the engine; to arrange the screening so that it will present a plurality of surface portions disposed oblique to the path of the intake, thereby deflecting various parts of the gaseous mixture in different directions and consequently aiding in their intermixing; to provide an auxiliary mixing chamber having foraminous walls on each side, which walls will coöperate in straining any non-gaseous particles from the intake; to provide a simple mounting for such a screening and mixing attachment, and to arrange this mounting so that it can readily be detached for removing the matter separated out of the intake by screening, and for permitting a cleaning of the screening; to provide simple, inexpensive and effective means for supporting such screening in effective position; to provide heating means disposed within the said auxiliary mixing chamber, and desirably to provide single means cooperating in supporting the screening and the heating means. Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which—

Figure 1 is a bottom view of a horizontal intake duct, of the type used with automobile engines, showing the attachment of my invention as interposed between the flanged ends of two pipes forming a portion of this duct.

Fig. 2 is a horizontal section through the attachment proper, taken along the correspondingly numbered line of Fig. 3.

Fig. 3 is a vertical section taken centrally through Fig. 1.

Fig. 4 is a central section taken at right angles to that of Fig. 3.

Fig. 5 is a section similar to Fig. 4, showing an embodiment of our invention in which the heater is disposed entirely below the inlet and outlet of the casing.

In the embodiment of Figs. 1 to 4, the attachment of our invention includes a body 1 clamped by bolts 2 between the flanges 3 on a pair of duct portions 4, the joints between these flanges and the body 1 being packed by compressible gaskets 5. This body 1 has a central chamber open at the bottom and also opening through bores in its sides into the bores of the two duct portions 4. This bottom opening is closed by a cover 6 secured to the body 1 by screws 7 and packed gas-tight by a gasket 8. Disposed within this vertical pocket are a pair of screen elements spaced longitudinally of the intake and desirably consisting of a single piece of wire mesh 9 which has first been corrugated or fluted and which has then been doubled upon itself to afford two screens connected by an upper back portion. Each of these two screen elements desirably is normally of a length slightly in excess of the path of the pocket of the body 1, so that when the screening is slipped into position, the cover 6 will jam the screening against the top of the pocket formation and therefore will cause the screening to bulge out somewhat. This bulging even if very marked in extent, as shown for example in Fig. 4, widens the mixing chamber between the two screen portions which are consecutively disposed in the path of the intake gases, and also clamps the screening in position so that it will not shake or rattle in the pocket.

To hold the screening still more effectively in position we desirably also mount on the cover 6 a pair of risers or posts, such as the tubes 10 of the drawings, which risers are disposed between the two consecutive screen portions and therefore will keep these screen portions continuously spaced in spite of any strains due to the pressure of the intake gases. These risers 10 are secured to the cover 6 by any suitable means, such as screws 11 threaded into corresponding bores in the lower ends of these risers, these screws being of such size as to expand the adjacent annular portions of the risers into firm and gas-tight engagement with corresponding bores in the cover plate 6.

Furthermore, we desirably make the risers 10 of insulating material, so that they may serve also as supports for a high resistance wire 12 which, when connected to a battery, will radiate heat and therefore will warm the intake gases, so as to facilitate the starting the effective operation of the engine. For this purpose, we may employ tubes of insulating material for these perforations in these tubes after the manner of Figs. 3 and 4. Then we may connect the lower end of the wire 12 to a suitably insulated bolt 13 which serves as a binding screw for a wire 14 leading to one terminal of the battery, and we may intertwine the upper end of the wire 12 with the upper portion of the screening, so as to ground this terminal of the wire through the screening and the body of our appliance to the engine parts and thereby to the grounded terminal of the battery.

With the appliance constructed as above described, the screen portion first encountering the intake will catch the greater part of the dust, soot and other non-gaseous particles sucked in with the intake, and these particles will be entrapped between the screening and the adjacent wall of the body 1 of our appliance. Likewise, any particles which might pass through the first wall of the screening will be strained out by the other wall and will be entrapped in the space between the two screen walls. Consequently, by occasionally detaching the removable part of the appliance, we can readily shake out these particles, and also can readily clean the screening if this should be necessary.

With the wire mesh arranged as above described, this screening has almost all of its surface portions disposed oblique to the general direction of the intake, and consequently will deflect and redirect different parts of the intake while the latter is passing through each of the screen walls. The space between the two screen walls therefore forms an auxiliary mixing chamber, and the resulting intermixing of the intake is made still more thorough by the deflection action of the oblique surface portions of the second screen wall. Consequently, we are able to obtain a thoroughness of intermixing which in practice has shown a decided saving in the amount of fuel required for a given car mileage. This mixing may also be augmented through the deflecting of portions of the intake gases by the resistance wire 12, although the latter primarily serves the purpose of warming the intake in cold weather, so as to enable our attachment to improve the combination of the intake gases both as to the thoroughness of their intermixing and as to the suitability of their temperature for efficient explosion.

However, it will be obvious that when the battery is operatively disconnected from the wire 12, the other portions of my appliance will all still serve their intended purposes as means for purifying and intermixing the intake gases, hence we do not wish to be limited to the use of heating means in connection with the means employed for spacing the two walls of the screening. Neither do we wish to be limited to other details of the construction and arrangement here disclosed, it being obvious that various changes, modifications, additions and omissions may be made in the described appliance without departing from the spirit and scope of the invention as recited in the appended claims. For example, Fig. 5 shows an embodiment in which the heater is in the form of a standard tubular heating unit 15 (of the type in which a high resistance wire is embedded in enamel), supported close to the cover 6 and between the diverging lower ends of the screen 9, and in which an intermediary screen 16 is disposed between the screen sides 9 above the heating unit to increase screening and mixing effect.

We claim as our invention:

1. An engine intake attachment comprising a casing clamped between two consecutive portions of the normal intake duct of the engine, the said casing having a chamber larger in cross-section transversely of the said duct than the major portion of the latter and having an opening transverse of the said duct, intake screening means disposed within the said chamber transverse of the said duct and adapted to be inserted and withdrawn through the said opening without detaching the casing from the adjacent duct portions, and movable means normally closing the said opening.

2. An engine intake attachment comprising a casing forming part of the intake passage and having a chamber extending below the said passage and opening downwardly, a detachable closure for the said opening, and an intake screen disposed within the chamber transverse of the said passage and normally retained in place by the said closure.

3. An engine intake attachment compris-

ing a casing forming part of the intake passage and having a chamber extending below the said passage and opening downwardly, a detachable closure for the said opening, and an electric heating element carried by the closure and disposed in the path of the intake gases.

4. An attachment for a horizontal engine intake duct, comprising a casing clamped between two consecutive portions of the said duct and having a chamber connecting the said duct portions, the said chamber also having a downward opening; a detachable closure for the said opening, and a plurality of screen elements carried by the closure and disposed transversely of the intake.

5. An attachment for a horizontal engine intake duct, comprising a casing clamped between two consecutive portions of the said duct and having a chamber connecting the said duct portions, the said chamber also having a downward opening; a detachable closure for the said opening, and intake heating and screening elements both mounted on the closure and adapted to be withdrawn from their normal positions when the closure is detached.

6. An engine intake attachment, comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, riser means fast upon the cap, and a pair of screen elements disposed in the said chamber and spaced by the riser means.

7. An engine intake attachment, comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, riser means fast upon the cap, a pair of screen elements disposed in the said chamber and spaced by the riser means, and an electric heating element fast upon the riser means.

8. An engine intake attachment comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, a pair of relatively spaced risers fast upon the cap and disposed within the said chamber, and a pair of screen elements between which the risers are disposed.

9. An engine intake attachment comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, a pair of relatively spaced risers fast upon the cap and disposed within the said chamber, and a pair of screen elements between which the risers are disposed, the said screen elements being integrally connected with each other by a screen element extending over the tops of the risers.

10. An engine intake attachment comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, a pair of relatively spaced risers fast upon the cap and disposed within the said chamber, a pair of screen elements between which the risers are disposed, and an electric heating element carried jointly by the risers.

11. An engine intake attachment comprising a body having a downwardly open chamber forming part of the intake duct, a cap normally closing the downward opening of the said chamber, a pair of relatively spaced risers fast upon the cap and disposed within the said chamber, a pair of screen elements between which the risers are disposed, and an electric heating element carried jointly by the risers and having one terminal thereof grounded to the body of the appliance through the screen element.

12. An engine intake attachment comprising a casing affording part of the intake passage and having a chamber extending below the said passage and opening downwardly, a detachable closure for the said opening, an intake-heating member fast upon the closure, and a screening member disposed in the said chamber and comprising a plurality of screen elements substantially housing the said heating member.

Signed at Chicago, February 7th, 1920.

FRANK P. MIES.
FRANKLIN W. JARVIS.