Nov. 8, 1960 W. F. THORNBURGH 2,959,248

AIR CLEANING AND INDUCTION SYSTEM INLET MEANS

Filed July 7, 1959 2 Sheets-Sheet 1

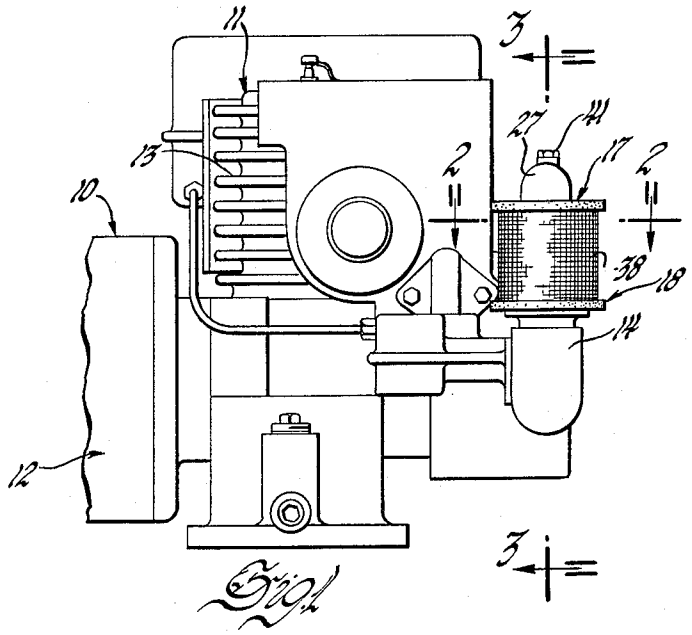


Fig. 1

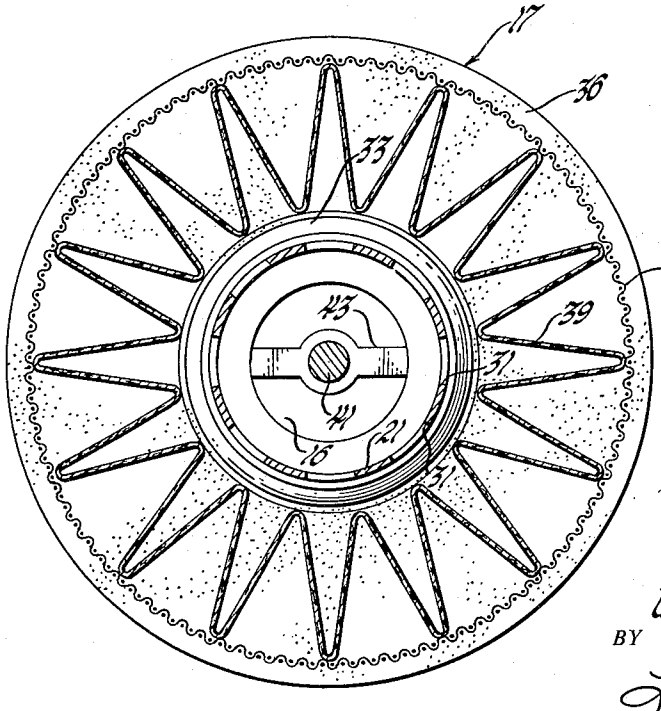


Fig. 2

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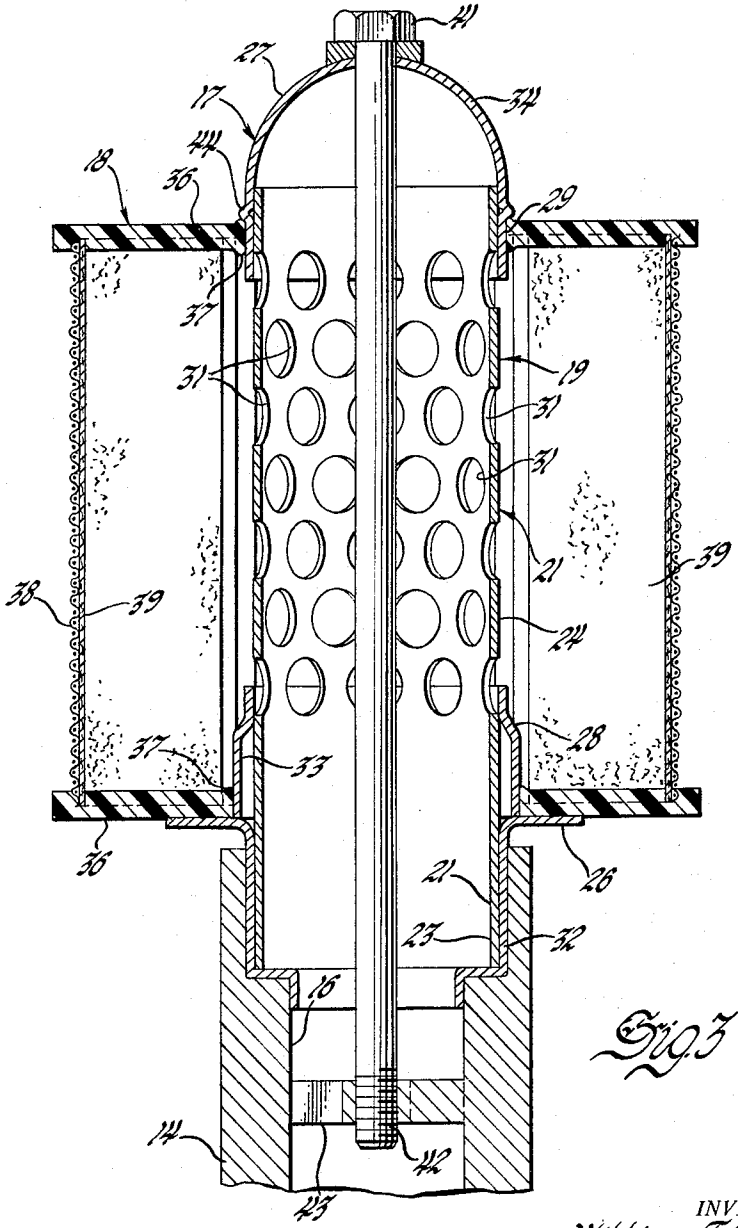


Fig. 3

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AIR CLEANING AND INDUCTION SYSTEM INLET MEANS

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2 Claims. (Cl. 183—73)

This invention relates to air cleaning means, particularly to air cleaning means for the induction system inlets for internal combustion engines and the like.

It is proposed to provide an air cleaner having an inner air conducting and flame quenching part and an outer air cleaning part, the latter being adapted to be projected over the inner part and secured and sealed thereon by the elastic inner edges of the end plates engaging the filter element for the outer air cleaning part.

Figure 1 is a fragmentary side elevational view of a motor generator unit having air cleaning and flame quenching means for the induction system of the internal combustion engine employed in the unit.

Figure 2 is a cross-sectional view through the cleaning and quenching means as the structure would appear in the plane of line 2—2 on Figure 1.

Figure 3 is a vertical sectional view through the cleaning and quenching means and the induction system inlet embodied in the structure disclosed by Figure 1. Figure 3 is taken substantially in the plane of line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 1 illustrates the motor generator or other unit **10** in which an internal combustion engine **11** is employed in driving a generator **12**. The engine **11** may have a cylinder **13** adapted to be supplied with air for operating the engine by an induction system **14** having an air inlet **16**. Air cleaning and flame quenching means **17** may be associated with the induction system **14** for supplying air to the inlet **16** and quenching any flame projected from the inlet **16** by a backfire within the engine. The air cleaning and flame quenching means may comprise an outer part or air cleaning means **18** and an inner part or flame quenching and supporting means **19**. The inner part embraces a sleeve **21** having inner and outer ends **23** and **24** respectively and between which a flange **26** projects outwardly. The sleeve **21** may have a closed outer end indicated at **27**. The sleeve **21** also may have an annular shoulder **28** adjacent the sleeve **21** and an annular shoulder **29** adjacent the closed end **27** and between which shoulders a plurality of perforations **31** may be provided for supplying air to the interior of the sleeve **21** and the inlet **16**. The sleeve **21** may be made of a material capable of rapidly absorbing heat so that the perforations **31** may quench any flame projected from the inlet **16** by a backfire within the engine. The sleeve **21** may be formed in any suitable manner as by employing a collar **32** at the inner end thereof which might include the flange **26** by employing a collar **33** outwardly of the flange **26** which includes the shoulder **28**, and by employing a separate closure member **34** including the shoulder **29** and forming the closed end **27**.

The cleaner **18** may embrace a pair of plastic or other suitable end plates **36** having elastic inner edges **37** around axially disposed openings in the end plates that are smaller than the shoulders **28** and **29** of the sleeve **21**. The end plates **36** have imbedded therein the opposite ends of an outer screen or support **38** and a pleated

paper or other suitable filter **39**. The cleaner **18** may be secured on the sleeve **21** by projecting the cleaner **18** over the closed end **27** of the sleeve **21** with the inner one of the end plates **36** engaging the flange **26** and the inner edges **37** of the end plates **36** being elastically deformed by the shoulders **28** and **29** to provide air seals for the end plates to resiliently secure the cleaner **18** upon the inner flame quenching and supporting part **19**.

The unit **17** may be secured to the induction system **14** of the engine **11** by a bolt **41** projecting through the closed end **27** and having a threaded end **42** engaging a threaded opening in a support **43** extending across the induction system inlet **16**. Removal of the bolt **41** will allow the entire unit **17** to be removed from the induction system inlet **16**. Removal of the bolt **41** also will permit removal of the end closure **34**, thereby releasing the compression of the inner edge of the outer end plate **36** upon the shoulder **29**. This expedient may be employed to facilitate removal of the cleaner **18** from the inner flame quenching and supporting part **19** without removing the inner flame quenching and support part **19** from the induction system inlet **16**.

A bead **44** may be formed on the closure means **34** to aid in securing the cleaner **18** upon the sleeve **21** and against the flange **26**. However, a backfire in the engine will not tend to blow the cleaner **18** from its inner support. It will be apparent that the force resulting from the backfire will expand from the sleeve **21** through the perforations **31** which are disposed radially with respect to the axis of the sleeve **21** and to the inner surface of the filter element **39**.

I claim:

1. An air cleaner for the air inlet for the induction system of an internal combustion engine or the like and comprising a flanged sleeve having an inner end on one side of said flange adapted to project into said air inlet and having an outer end on the other side of said flange adapted to project outwardly from said inlet, said sleeve having a closed end at said outer end of said sleeve and in spaced relation to said flange, spaced shoulders formed on said sleeve adjacent said flange and adjacent said closed end, a filter element having end plates with axially disposed openings therethrough, said end plates having elastic inner edges around said openings and said openings being smaller than said shoulders, said filter element being adapted to be projected around said outer end of said sleeve with the inner one of said end plates engaging said flange and with said inner edges of said end plates being expanded by said shoulders to provide seals for sealing said end plates with respect to said sleeve, and means securing said sleeve to said inlet, said sleeve within said filter and between said end plates being perforated to provide air flow passages between said filter and said air inlet and to provide flame quenching means between said air inlet and said filter, said sleeve being removable from said air inlet by removing said securing means.

2. An air cleaner for the air inlet for the induction system of an internal combustion engine or the like and comprising a flanged sleeve having an inner end on one side of said flange adapted to project into said air inlet and having an outer end on the other side of said flange adapted to project outwardly from said inlet, a shoulder formed on said sleeve adjacent said flange and on said outer end of said sleeve, a filter element having end plates with axially disposed openings extending therethrough, said end plates having elastic inner edges around said openings, said filter element being adapted to be projected on said outer end of said sleeve with the inner one of said end plates engaging said flange and with the inner edge of said inner end plate being expanded by

said shoulder to provide a seal for sealing said inner end plate with respect to said flange and said shoulder, an end closure adapted to be projected over the outer end of said sleeve and between said outer end and the outer one of said end plates and expanding the inner edge of said end plate to provide a seal between said outer end plate and the end of said closure overlapping said outer end of said sleeve, means formed on said closure and engaging said end plate and limiting the inner movement of said closure, and means securing said closure on said outer end of said sleeve and against said outer one of said plates and securing said inner end of said sleeve within said inlet, said sleeve within said filter and between said end plates being perforated to provide air flow passages between said filter and said air inlet and to provide flame quenching means between said air inlet and said filter, said filter being removable from said sleeve and said sleeve from said air inlet by removing said securing means and said closure and by removing said filter element from said sleeve and said shoulder and said flange and said sleeve from said air inlet.

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