Dec. 3, 1935. S. OLDBERG 2,022,899

SILENCER

Filed Oct. 8, 1934

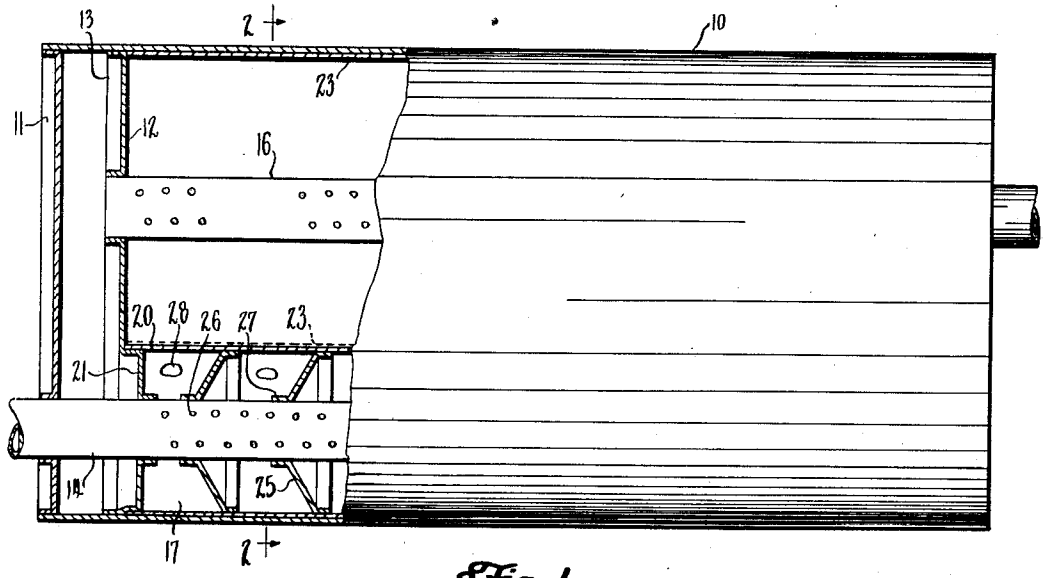


Fig. 1

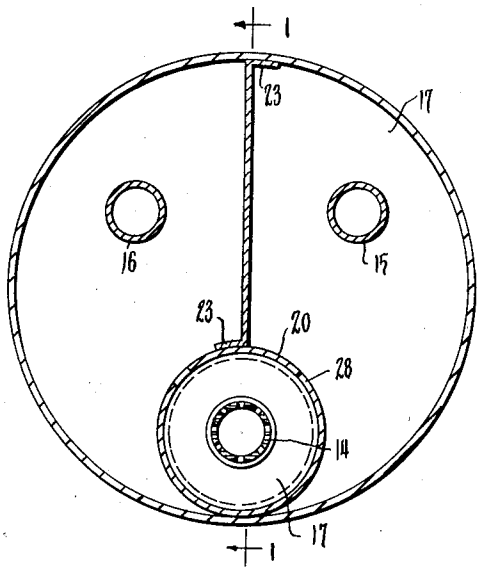


Fig. 2

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SILENCER

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1 Claim. (Cl. 137—160)

This application discloses a silencer of the triple-pass type having an outer casing partitioned by a novel partitioning structure to provide three longitudinally juxtaposed silencer units, each of which has an inner through-flow tube and a space surrounding the tube.

The silencer of this application is characterized by its novel partitioning structure and by its being extremely sturdy of construction, while economical of manufacture, and differs from heretofore known triple-pass silencers of the type under consideration in certain details of construction and in the arrangement of the silencer units.

The details of construction and the features of the silencer disclosed herein will best be understood upon reference to the appended drawing, whose

Fig. 1 is a longitudinal elevational section; and whose

Fig. 2 is a tranverse section as if on line 2—2 of Fig. 1.

The silencer here shown includes an imperforate outer casing 10 of substantially circular cross-section provided with end headers 11 and intermediate headers 12 providing end expansion chambers 13. Disposed within the silencer, in parallel juxtaposition and in transversely spaced relation, and in accordance with past practice, are three through-flow tubes 14, 15, 16, providing a retroverted passage in the silencer from the inlet end of the inlet tube 14 to the outlet end of the outlet tube 16 and through the tube 15 that communicates the expansion chambers 13. These tubes are supported in flanged openings of the headers in a conventional and well-known fashion.

For isolating the spaces 17 around the various tubes from one another and thus to form relatively isolated, longitudinally arranged compartments for silencer units of the resonance type, there is provided within the outer casing 10 a partition arrangement which differs from partition arrangements heretofore known. The partition arrangement here shown includes a substantially circular shell 20, connecting the intermediate headers, and surrounding the inlet tube 14 and disposed within and in tangential engagement with the casing 10, the ends of the shell being supported on circular steps 21 formed in the intermediate headers. Connecting the shell 20 and the casing 10 and also connecting the intermediate neaders, and disposed within the casing substantially on a plane which is the conjoint diametrical plane of the casing 10 and the shell 20 is a plate 22 having flanged edges 23, whereby it may be welded to the casing and the shell. The plate 22 and the shell 20 provide means for dividing the casing into three relatively isolated, longitudinally arranged spaces, each of which surrounds a through-flow tube.

It will be observed that the space between inlet tube 14 and shell 20 is provided with a plurality of substantially circular transverse diaphragms 25 which transversely partition the shell 20 and provide therein a multiplicity of chambers.

It will also be observed that the through-flow tubes are provided with a multiplicity of perforations 26, and that these are shown as arranged in spaced groups; in the case of the tube 14, within the shell 20, the tube is perforated substantially uniformly and continuously throughout its length, but at spaced points along the tube the perforations are blocked and closed by the collars 27 of the diaphragms 25, so as to be rendered ineffectual; therefore, even tube 14 may be considered as having its perforations arranged in spaced groups.

It will also be observed that the shell 20 is provided with a plurality of openings 28 whereby the interior of the shell 20 may be placed in communication with each of the spaces around the tubes 14.

The silencer here shown possesses many advantages over silencers heretofore known, and some of these will now be enumerated. For one thing, the silencer here shown, though extremely economical of manufacture, is well braced internally by virtue of the cooperation of the shell 20 and the plate 21; and that this arrangement of internal bracing means, though highly efficient because the shell 20, being substantially circular, is a brace of maximum strength, and because the shell 20 is disposed around the inlet one of the tubes 14, which is the highest pressure part of the silencer, where maximum bracing is most desirable, is also a most economically manufactured arrangement.

Furthermore, by virtue of the fact that the shell 20 is circular or substantially circular, the diaphragms 25 are also economical of manufacture, being circular, and that this would not be the case if the shell 20 were of triangular or other irregular form.

Further, since shell 20 is substantially circular, the steps 24 of the intermediate headers are also substantially circular, and this provides an efficient and easily made and assembled seat for the shell 20, and that this would not be the case if the shell 20 were made up of a plurality

of flat or substantially flat plates, it being observed that it is easier to provide circular steps in the intermediate headers than steps of irregular formation.

While the shell 20 is shown exactly circular, it is well understood that for many purposes this shell may be slightly non-circular if desired, although the exactly circular form is prefered in order to attain certain of the functional and manufacturing advantages expressed in the foregoing.

Now having described the silencer disclosed in the appended drawing, reference is had to the following claim for a determination of the scope of the monopoly.

What I claim is:

In a retroverted flow silencer, a circular casing having circular end headers and circular intermediate headers spaced therefrom to provide end expansion chambers, and a partition arrangement between the intermediate headers dividing the portion of the casing between the intermediate headers into three longitudinally extending juxtaposed compartments and comprising a circular shell independent of and disposed within and tangentially engaging the casing, and having openings communicating its interior with one of the two compartments on opposite sides of a longitudinally extending plate connecting the shell and casing, and disposed on the conjoint diametrical plane of the shell and casing, the shell and the plate connecting the intermediate headers, each compartment having a longitudinally extending substantially foraminous circular through-flow tube therein spaced from the longitudinal walls thereof and connecting the intermediate headers, and transverse circular diaphragms within the shell compartment and through which passes the tube therein, the ends of the compartments being closed by the intermediate headers, and circular formations on the intermediate headers seating the ends of the shell and the ends of the tubes, two of said tubes having parts extending through said end chambers to communicate the interior of the silencer with the outside thereof.

SIDNEY OLDBERG.