

CLASS 181, ACOUSTICS**SECTION I - CLASS DEFINITION**

This class includes devices and corresponding methods for mechanically transmitting, for amplifying and for ascertaining the direction of sound and for mechanically muffling or filtering sound, and not elsewhere provided for.

SECTION II - REFERENCES TO OTHER CLASSES**SEE OR SEARCH CLASS:**

- 73, Measuring and Testing, subclasses 572+ and especially 645+ for the determination of qualities, characteristics or conditions by the utilization of acoustical energy and which is not specifically provided for elsewhere.
- 84, Music, appropriate subclasses for musical instruments.
- 109, Safes, Bank Protection, or a Related Device, subclass 21.5 for partitions having a sound transmitting passage constructed to prevent passage of projectiles.
- 116, Signals and Indicators, appropriate subclasses, for mechanical signaling devices utilizing sound.
- 178, Telegraphy, appropriate subclasses, for acoustic instruments limited to that art.
- 333, Wave Transmission Lines and Networks, subclasses 141+ for electrical delay networks wherein the electrical waves may be converted to sound waves, such sound waves being delayed and reconverted to electrical waves, and subclasses 186+ for wave filters of the electromechanical transducer type, wherein electrical waves may be converted to sound waves, such sound waves being filtered and reconverted to electrical waves.
- 352, Optics: Motion Pictures, subclasses 1+ for "taking" motion picture apparatus.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, for electrical signaling devices utilizing sound or compressional waves.
- 369, Dynamic Information Storage or Retrieval, for an information storage or retrieval device having particular acoustical structure.
- 379, Telephonic Communications, appropriate subclasses, for acoustic instruments limited to that art.

- 381, Electrical Audio Signal Processing Systems and Devices, appropriate subclasses for one-way electrical transmission of audio signals.
- 434, Education and Demonstration, particularly subclass 300, on teaching acoustic principles.
- 446, Amusement Devices: Toys, subclass 175 for a toy having sound responsive switch or control.
- 472, Amusement Devices, particularly subclass 64 for an amusement device causing an illusion by sound imitation or effect.
- 505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature (T_c 30 K) superconducting devices, and particularly subclass 203 for electroacoustic transducers.

SUBCLASSES**.5 MISCELLANEOUS:**

This subclass is indented under the class definition. Inventions falling within the definition of this class, and not otherwise provided for.

- (1) Note. Acoustic levitation devices are found here.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 570+ for an acoustic levitation apparatus combined with a motion sensing device or a motion controlling device and not elsewhere classified.

18 Systems:

This subclass is indented under subclass .5. Construction of speaking-tubes with their associated parts; also "speaking-tube exchanges", also, any patents on speaking-tubes not classified elsewhere.

19 Alarms and indicators:

This subclass is indented under subclass .5. Alarms or indicators of a speaking-tube.

20 Combined mouth and ear pieces:

This subclass is indented under subclass .5. Mouthpieces and connected earpieces.

- 21 Mouthpieces:**
This subclass is indented under subclass .5. Structure of the mouthpieces of speaking-tubes and the combination therewith of accessory parts, as alarms, indicators, etc.
- 22 Tubes:**
This subclass is indented under subclass .5. The construction of the tubes, per se.
- 30 AUDITORIUM:**
This subclass is indented under the class definition. Devices for improving the acoustic properties of halls or other places.
- 101 GEOPHYSICAL OR SUBSURFACE EXPLORATION:**
This subclass is indented under the class definition. Subject matter relating to systems for mechanically transmitting or receiving acoustical waves for the purpose of identifying geologic or subsurface structure.
- (1) Note. Subsurface is defined as including anything, whether composition, article, structure or formation which lies below the upper natural surface of the earth.
- (2) Note. Acoustical waves are considered to include seismic waves for the purposes of this section.
- (3) Note. In scope, this subclass is analogous to Class 367 Communications Electrical: Acoustic Wave Systems and Devices subclasses 25+ and 853.1+ wherein electrical communication, in part or in whole, is involved.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
124, for depth sounding related to sound echo compressional wave systems.
- SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 323+ for geophysical surface or subsurface exploration in situ generally.
340, Communications: Electrical, subclass 853.8 for a wellbore telemetering system.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 14+ for seismic prospecting using electrical acoustic wave systems.
- 102 Well logging:**
This subclass is indented under subclass 101. Subject matter wherein said geologic or subsurface structure includes a shaft or deep boring in the earth.
- SEE OR SEARCH CLASS:
33, Geometrical Instruments, subclasses 302 and 304+ for bore-hole direction indicators.
73, Measuring and Testing, subclasses 152.01+ for instruments, for bore-hole studies.
166, Wells, subclasses 64, 66 and 113 for well apparatus including measuring and testing means, subclasses 250.01+ for well processes including measuring and testing, and subclass 264 for processes comprising merely sampling a well fluid and appropriate subclasses (especially subclasses 142+ and the subclasses there noted) for the corresponding apparatus.
175, Boring or Penetrating the Earth, subclasses 40+ for a process or means of measuring or testing combined with an earth boring process or apparatus.
250, Radiant Energy, subclasses 256+ for ray energy detection or measurement (including detection or measurement of radioactive materials) applied to bore-hole and drilling study.
324, Electricity: Measuring and Testing, subclasses 323+ for electrical testing of bore holes.
340, Communications: Electrical, subclasses 853.1+ for telemetering in wells.
367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 25+ for seismic well logging using acoustic wave responsive electrical means.

103 Programmed or timer-controlled:

This subclass is indented under subclass 102. Subject matter including means operative upon initiation to transmit or receive acoustical waves through a given cycle of operations.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

107, for similar subject matter not limited to a well bore.

104 Directional source or detector:

This subclass is indented under subclass 102. Subject matter including means for sending, or receiving acoustical waves which is characterized by some quality that varies according to the relative bearing of the means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

125, for sound locating means not limited to bore holes.

105 Bore hole or casing condition:

This subclass is indented under subclass 102. Subject matter for investigating physical conditions of well bores and casings, such as obstructions, bore surfaces, etc.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 152.01+ for a determination of a physical characteristic of a borehole by making a measurement which is not purely electrical or purely magnetic and subclass 152.57 for a determination of a physical characteristic of a casing or a cementing by making a measurement which is neither purely magnetic.

106 Seismic wave generation:

This subclass is indented under subclass 102. Subject matter including means for generating acoustical waves mechanically in the shaft.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

108+, for seismic wave generation not limited to a well bore in combination with a receiver.

133+, for seismic wave generation not limited to a well bore.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 152.01+ for a determination of a physical characteristic of a borehole by making a measurement which is not purely electrical or purely magnetic and subclass 152.57 for a determination of a physical characteristic of a casing or a cementing by making a measurement which is neither purely electrical nor purely magnetic.

107 Programmed or timer-controlled:

This subclass is indented under subclass 101. Subject matter including means operative upon initiation to transmit or receive acoustical waves through a given cycle of operations.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

103, for this subject matter in a well bore environment.

108 Seismic source and detector:

This subclass is indented under subclass 101. Subject matter including means for transmitting and receiving seismic waves.

109 Aerial:

This subclass is indented under subclass 108. Subject matter wherein the means for transmitting or receiving seismic waves is elevated above the surface of the earth.

110 Underwater:

This subclass is indented under subclass 108. Subject matter wherein the means for transmitting or receiving seismic waves is in wave coupling relationship with a body of water.

111 Plural sources:

This subclass is indented under subclass 108. Subject matter wherein the means for transmitting seismic waves includes more than one source.

112 Plural detectors:

This subclass is indented under subclass 108. Subject matter wherein the means for receiving seismic waves includes more than one seismic wave detector.

- 113 Seismic wave generation:**
This subclass is indented under subclass 101. Subject matter wherein the system includes means for producing seismic waves.
- SEE OR SEARCH CLASS:
116, Signals and Indicators, appropriate subclasses, for mechanical signalling devices utilizing sound.
- 114 Vehicle-mounted:**
This subclass is indented under subclass 113. Subject matter including means for supporting the seismic wave producing means on a land vehicle.
- (1) Note. Included in this subclass are combinations of a land vehicle adapted to transport a seismic wave source to a desired location, a seismic wave source, and means to position the source in contact with the earth.
- 115 Bubble suppression or control:**
This subclass is indented under subclass 113. Subject matter including means to minimize adverse effects arising from the production of bubbles by the means for producing seismic waves in a fluid medium.
- (1) Note. Some seismic sources produce seismic pulses by producing gaseous bubbles which may produce undesired or adverse secondary impulses. This subclass is drawn to means to mechanically control or compensate for such secondary bubble impulses.
- 116 Explosive:**
This subclass is indented under subclass 113. Subject matter wherein the means for producing seismic waves includes means for utilizing the violent expansion of hot gases resulting from the sudden combustion of a material.
- 117 Gas:**
This subclass is indented under subclass 116. Subject matter wherein the material is a gas.
- 118 Underwater:**
This subclass is indented under subclass 117. Subject matter wherein the seismic waves are produced and coupled to a body of water.
- 119 Fluid means:**
This subclass is indented under subclass 113. Subject matter wherein the seismic waves are generated by utilizing a fluid under pressure.
- 120 Underwater:**
This subclass is indented under subclass 119. Subject matter wherein the seismic waves are produced and coupled to a body of water.
- 121 Moving weight:**
This subclass is indented under subclass 113. Subject matter wherein the seismic waves are generated by utilizing the kinetic energy of a moving inertial mass.
- 122 Seismic wave detection:**
This subclass is indented under subclass 101. Subject matter wherein the system includes means for mechanically receiving the acoustic waves.
- SEE OR SEARCH CLASS:
367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 140+ for electrical geophysical vibration transducers.
- 123 ECHO SYSTEM:**
This subclass is indented under the class definition. Subject matter having means for sending out a sound wave and receiving said wave after a reflection being utilized to add some information to the original wave.
- (1) Note. Except for mechanical altitude or depth detectors in subclass 124 below, this subclass does not provide for mechanical systems relating to identifying geologic or subsurface structure which is provided for by subclass 101 above.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
101+, for systems for identifying geologic or subsurface structure (see (1) Note above).

- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 620+ and 627+ for means for testing a body utilizing a wave reflected from a surface of a body.
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), appropriate subclass for reflected or otherwise returned radio wave systems.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 87+ for electrical acoustic wave echo systems.
- 124 Altitude or depth detection:**
This subclass is indented under subclass 123. Subject matter for determining the vertical distance of a body above the surface of the earth or the vertical distance down from a surface.
- 125 SOUND LOCATION:**
This subclass is indented under the class definition. Subject matter for ascertaining the direction from which a sound proceeds.
- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclass 170.16 for means for measuring cloud height, and subclass 290 for means for measuring liquid level.
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for reflected radiant energy wave systems and subclasses 350+ for radio wave systems.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, subclass 87 for electrical echo altimeters, subclass 99 for electrical underwater sound direction indication.
- 126 ANATOMIC OR PROSTHETIC RELATION:**
This subclass is indented under the class definition. Subject matter including an acoustical device wherein at least a portion is in contact with a living being during use.
- (1) Note. This and indented subclasses provided for subcombination devices particularly adapted for use in or with the acoustical device.
- SEE OR SEARCH CLASS:
600, Surgery, subclass 558 for diagnostics of ear or hearing.
- 601, Surgery: Kinesitherapy, subclass 47 for kinesitherapy.
- 127 Dentiphone:**
This subclass is indented under subclass 126. Subject matter wherein the acoustical device is held or positioned in the mouth, generally by the teeth.
- 128 Ear and mouth:**
This subclass is indented under subclass 126. Subject matter having an earpiece and mouthpiece operatively connected together.
- 129 Ear:**
This subclass is indented under subclass 126. Subject matter for aiding hearing or preventing unwanted noises from entering the auditory canal.
- SEE OR SEARCH CLASS:
128, Surgery, subclasses 846+ for body protectors and restraining devices.
- 130 Auditory canal insert:**
This subclass is indented under subclass 129. Subject matter wherein there is a device that is operatively inserted in the auditory canal.
- 131 Stethoscope:**
This subclass is indented under subclass 130. Subject matter having a sensing element which is to be used in contact with a source of sound and a sound conducting element guiding the sound to an ear contacting element.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
135, for subcombination of stethoscope.
- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 585, 591 and 649+, where the stethoscope is part of a testing device which tests articles or mechanisms by sensing the vibrations produced therein.

- 381, Electrical Audio Signal Processing Systems and Devices, subclass 67 for a stethoscope comprising a vibration-electric transducer which senses vibrations of the body by virtue of physical contact between the transducer and the body, there being no acoustical transmission through the air, and in accordance with said vibrations controls an electric current which is applied to a hearing or listening device.
- 132 With diaphragm:**
This subclass is indented under subclass 130. Subject matter including a flexible element which form part of a sound sensing device.
- 133 Deflector type:**
This subclass is indented under subclass 130. Subject matter wherein there is a device to deflect sound waves into the auditory canal.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
136, for a device to deflect sound wave to an ear where there is no element inserted into the auditory canal.
- 134 Eardrum:**
This subclass is indented under subclass 130. Subject matter wherein the device inserted in the auditory canal is an artificial ear drum.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
135, for ear insert only.
137, for receiver only.
- 135 Ear insert:**
This subclass is indented under subclass 130. Subject matter having the device inserted into the auditory canal only.
- 136 Deflector type:**
This subclass is indented under subclass 129. Subject matter wherein there is a device to deflect sound waves into the auditory canal.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
133, for a deflector and means to be inserted into the auditory canal.
- 137 Receiver:**
This subclass is indented under subclass 129. Subject matter having a sensing element only.
- 138 MECHANICAL TELEPHONE:**
This subclass is indented under the class definition. Subject matter wherein sound is transmitted by the vibrations of molecules set up by mechanical means in a wire, string or flexible member strung taut.
- SEE OR SEARCH CLASS:
379, Telephonic Communications, appropriate subclasses for transmission of sound by means of electrical devices.
381, Electrical Audio Signal Processing Systems and Devices, appropriate subclasses for one-way electrical transmission of audio signals.
446, Amusement Devices: Toys, subclasses 141+ for a toy telephone which is not capable for transmitting sound.
- 139 WAVE GENERATION AND DETECTION:**
This subclass is indented under the class definition. Subject matter for producing and receiving sonic compressional waves.
- 140 WITH VESSEL:**
This subclass is indented under the class definition. Subject matter for producing or receiving sonic compressional waves and a marine device.
- (1) Note. This subclass includes any container for use in a water environment.
- 141 COMBINED:**
This subclass is indented under the class definition. Subject matter to which has been added a subcombination or assembly which is recognized as the subject matter of some other class.
- 142 WAVE GENERATION:**
This subclass is indented under the class definition. Subject matter for producing a sonic compressional wave.
- (1) Note. A diaphragm or a diaphragm and means to move it will be placed as an original in subclasses below.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 143, for sound means and means to move the sound means.
 144, for plural diaphragms.
 148, for a diaphragm and enclosure.
 157, for a diaphragm.
- 143 MOVING SOUND PRODUCER OR DEFLECTOR:**
 This subclass is indented under the class definition. Subject matter for continuously moving a sound source (e.g., loudspeaker) or for continuously moving a sound reflector located in the sound path.
- (1) Note. The continuous motion is generally designed to produce a tremulant effect.
- 144 PLURAL DIAPHRAGM SOUND SOURCES:**
 This subclass is indented under the class definition. Subject matter including at least two separate means that can be vibrated by sound waves or produce sound waves.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 148, for a single diaphragm and an enclosure with plural sound emitting portions.
 163, for plural dependent diaphragms.
- SEE OR SEARCH CLASS:
 381, Electrical Audio Signal Processing Systems and Devices, subclasses
 150+ for instruments designed to transform variable electrical current or potential into sound in combination with means to intensify the sound by mechanical means. Note especially subclasses 337+ for such combinations having sound resonators as the intensifying means. Also subclasses 193 and 202+ for diaphragm and support means with electrical means to move the diaphragm.
- 145 Plural chambers:**
 This subclass is indented under subclass 144. Subject matter wherein the vibrated means are mounted in more than one enclosure or compartment.
- (1) Note. Each enclosure or compartment may contain plural speakers.
- 146 With sound-absorbing means:**
 This subclass is indented under subclass 144. Subject matter including sound absorbent material associated therewith for preventing undesirable effects.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 126, for sound absorbing means and an enclosure.
- 147 Three diaphragms:**
 This subclass is indented under subclass 144. Subject matter including at least three vibrated means per unit.
- 148 DIAPHRAGM AND ENCLOSURE:**
 This subclass is indented under the class definition. Subject matter having means that can be vibrated by sound waves or produce sound waves and means to support and means to at least partially contain the vibrated means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 199, for a speaker enclosure, per se.
- SEE OR SEARCH CLASS:
 381, Electrical Audio Systems Processing Systems and Devices, subclasses
 150+ for instruments designed to transform variable electrical current or potential into sound in combination with means to intensify the sound by mechanical means. Note especially subclasses 337+ for such combinations having sound resonators as the intensifying means. Also subclass 193 and 202+ for diaphragm and support plus electrical means to move the diaphragm.

- 149 Moisture proof:**
This subclass is indented under subclass 148. Subject matter wherein the means to enclose the diaphragm is waterproof or rain resistant.
- 150 Recessed (e.g., wall-mounted, etc.):**
This subclass is indented under subclass 149. Subject matter wherein the means to support the diaphragm is provided with means to facilitate mounting within or behind a surface wall or an exposed surface.
- 151 With sound-absorbing means:**
This subclass is indented under subclass 148. Subject matter including sound absorbent material within the means to enclose the diaphragm for preventing undesirable effects.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
146, for plural diaphragms and sound absorbing means.
199, for an enclosure with sound absorbing means.
- 152 With horn:**
This subclass is indented under subclass 148. Subject matter including a tube of varying sectional area associated with the diaphragm for intensifying the sound waves produced therefrom.
- 153 Rounded enclosure (e.g., curved, etc.):**
This subclass is indented under subclass 148. Subject matter wherein the means to enclose the diaphragm has at least one surface that is circular or curved.
- 154 Inclined diaphragm:**
This subclass is indented under subclass 148. Subject matter wherein the means to support the diaphragm is mounted at an angle to both the horizontal and vertical axes of one side of the enclosure means.
- 155 Reflector baffle:**
This subclass is indented under subclass 148. Subject matter wherein the vibrated means is substantially enclosed and a portion of a radiation wave from in front of the vibrated means is deflected or modified.
- (1) Note. The enclosure has only openings for sound to be emitted. An enclosure which has no top, back, or etc., will be found above.
- 156 Reflex baffle:**
This subclass is indented under subclass 148. Subject matter wherein the vibrated means is substantially enclosed and a portion of a radiation wave from the rear of the vibrated means is propagated forward after a shift or modification of the wave.
- (1) Note. The enclosure has only openings for sound to be emitted. An enclosure which has no top, back or, etc., will be found above.
- (2) Note. A grille of cloth or other material that sound passes through is not considered a reflector for this subclass.
- 157 DIAPHRAGM:**
This subclass is indented under the class definition. Subject matter including a vibratable partition which is designed to produce sound waves when driven.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
144+, for plural, independent diaphragms.
148+, for diaphragms included with an enclosure.
- SEE OR SEARCH CLASS:
381, Electrical Audio Signal Processing Systems and Devices, subclass 398 for diaphragm and electrical means to move the diaphragm.
- 158 Microphone type:**
This subclass is indented under subclass 157. Subject matter wherein the diaphragm is designed specifically for use in a microphone.
- 159 With horn:**
This subclass is indented under subclass 157. Subject matter including a sound intensifying horn acoustically coupled to the diaphragm.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
177+, for sound intensifying horns, per se.

160 With resonant chamber:

This subclass is indented under subclass 157. Subject matter including a compartment which is acoustically coupled to the diaphragm.

- (1) Note. The compartment will affect the quality, tone or loudness of the sound produced by the diaphragm.

161 With direct mechanical connection to drive unit:

This subclass is indented under subclass 157. Subject matter including a mechanical means which directly connects the diaphragm to a driver unit.

162 Stylus bar:

This subclass is indented under subclass 161. Subject matter wherein the driver unit is a needle or holder furnished with an abrasive-resistant tip.

- (1) Note. This is primarily a collection of old style phonograph pick-up heads which include a thin metallic diaphragm directly actuated by a stylus bar.

SEE OR SEARCH CLASS:

369, Dynamic Information Storage or Retrieval, subclasses 157, 158, and 160+ for this subject matter forming a portion of a phonograph sound box.

163 Plural dependent diaphragms:

This subclass is indented under subclass 157. Subject matter wherein two or more diaphragms are driven by the same mechanism, or arranged so that the sound waves produced by one cause the other to vibrate.

- (1) Note. Each of the diaphragms must have at least a portion of its surface facing the surface of the other.
- (2) Note. The diaphragms are usually aligned on a common axis, and may be surrounded by walls to form an airtight compartment.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

144+, for plural diaphragm sound sources which are independent from one another.

165, for a single diaphragm having more than one sound producing section.

164 Sectional diaphragm:

This subclass is indented under subclass 157. Subject matter wherein the diaphragm has areas of different material, shape or thickness which are united to form a vibratable partition.

- (1) Note. Only one independent driver unit may drive the diaphragm. When the different sections are driven independently of one another, they are considered plural, independent diaphragms and classified in subclasses 144+.

- (2) Note. The different sections may have different natural periods of vibration and thus produce sound waves within different frequency ranges.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

163, for plural, dependent diaphragms.

165 Concentric annular section:

This subclass is indented under subclass 164. Subject matter wherein the diaphragm has a central section which is attached to and surrounded by at least one concentric, annular portion.

- (1) Note. The outer, ring-like section is usually designed to vibrate within a lower frequency range than the center section, and often supports the center section.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

144+, for diaphragms having sections which are independently driven, and therefore considered plural diaphragm sound sources.

163, for annular diaphragms which face another diaphragm and are driven by sound waves produced by it.

- 166 With damping means:**
This subclass is indented under subclass 157. Subject matter including means to suppress or limit diaphragm vibrations.
- (1) Note. The damping means must be in addition to diaphragm structure, for example an air chamber, a travel limiter, or a special coating on the diaphragm.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
174, for diaphragms having portions of different thickness which might dampen vibrations.
- 167 Critically defined material or coating:**
This subclass is indented under subclass 157. Subject matter wherein the diaphragm is constructed of specific material or the diaphragm is covered or saturated, at least in part, with extraneous material.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
166, for diaphragm coatings specifically designed to dampen vibrations.
- 168 Metallic material:**
This subclass is indented under subclass 167. Subject matter wherein the material of which the diaphragm is made is metal.
- 169 Fibrous material:**
This subclass is indented under subclass 167. Subject matter wherein the material of which the diaphragm is made consists of or includes fibers.
- 170 Laminated type:**
This subclass is indented under subclass 167. Subject matter comprising plural layers or surfaces, adhered or cohered to each other.
- 171 Mounting or suspension means:**
This subclass is indented under subclass 157. Subject matter wherein means are provided to hold the diaphragm in a given, neutral position.
- (1) Note. The mounting or suspension means may serve to shape or tension the diaphragm, or may be designed to permit the diaphragm to vibrate freely.
- 172 Elastic suspension means:**
This subclass is indented under subclass 171. Subject matter wherein the means to hold the diaphragm is sufficiently flexible to permit the diaphragm to vibrate freely.
- 173 Particular shape:**
This subclass is indented under subclass 157. Subject matter characterized by the form or configuration of the diaphragm.
- 174 Variable thickness:**
This subclass is indented under subclass 173. Subject matter wherein the thickness of the vibratable partition constituting the diaphragm varies across its surface.
- 175 SOUND-MODIFYING MEANS:**
This subclass is indented under the class definition. Subject matter for (1) deviation of the direction of an acoustical wave, (2) blocking of an acoustical wave, or (3) the modification of the character or property of an acoustical wave.
- 176 Lens:**
This subclass is indented under subclass 175. Subject matter wherein a structure is placed in front of an acoustic wave device having an aperture which inserts a phase delay over the cross section of the aperture so as to effect a convergence or divergence of acoustic waves from the acoustic wave device.
- 177 Intensifying horn:**
This subclass is indented under subclass 175. Subject matter comprising a hollow member open at opposite ends and having a progressively increasing cross sectional area from one end to the other. Sound is introduced at the smaller open end and emerges increased in loudness at the larger open end.
- (1) Note. A device which both increases the loudness of the sound and modifies the quality or tone of the sound is properly classified here.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
129, for a sound intensifying horn which is designed to have contact with the human body.

- 152, for a horn and sound diaphragm in an enclosure.
- 159, for a horn and a sound producing diaphragm.
- 178 Collapsible:**
This subclass is indented under subclass 177. Subject matter wherein the horn includes means to effect a reduction in size from an operative condition to an inoperative condition, e.g., telescopes or folds.
- 179 With particular mounting structure:**
This subclass is indented under subclass 177. Subject matter including means for connecting the sound intensifying horn to a support.
- (1) Note. The connecting means must be emphasized, and not merely incidental.
- (2) Note. Structure which connects one portion of a horn to another portion of a horn is not considered mounting structure.
- 180 Material:**
This subclass is indented under subclass 177. Subject matter wherein the horn is constructed of a specific material or materials.
- 181 With vibratory filaments:**
This subclass is indented under subclass 177. Subject matter including thin wires which are attached to the sound intensifying horn.
- (1) Note. The thin wires affect the quality or tone of the sound through vibration.
- 182 With resonant chamber:**
This subclass is indented under subclass 177. Subject matter including a compartment exterior to the basic horn shape, but in communication with the horn via a sound passage or a vibrating portion of the horn wall.
- (1) Note. The compartment does not necessarily intensify the sound but does affect the quality or tone of the sound coming from or passing through the horn.
- 183 Double wall:**
This subclass is indented under subclass 182. Subject matter wherein the resonant chamber lies between at least part of a side of the horn
- and a second structure substantially parallel to that part of the horn.
- 184 Having apertures in walls:**
This subclass is indented under subclass 177. Subject matter wherein the horn has sides which are provided with openings.
- (1) Note. The openings may take any shape and be covered by sound transmitting material.
- (2) Note. The presence of the openings is designed to affect the quality or tone of the sound coming from or passing through the intensifying horn.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
182+, for horns having apertured walls which communicate with resonant chambers.
- 185 With sound-path restriction:**
This subclass is indented under subclass 177. Subject matter including structure within the horn which constitutes an obstruction to the sound waves.
- (1) Note. The restriction can be an object placed within the horn or a pinch in the horn walls which generally affects the quality or tone of the sound in addition to decreasing the loudness by partially blocking the expected sound path.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
187+, for structure which merely divides the horn into plural intensifying portions.
191, for external sound deflectors.
196+, for similar structure located within a sound conveying tube.
- 186 Adjustable:**
This subclass is indented under subclass 185. Subject matter wherein the structure can be altered or moved within the horn.
- (1) Note. Such adjustment generally affects the loudness of the sound.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
197, for similar structure within a sound conducting tube.
- 187 Plural intensifying portions:**
This subclass is indented under subclass 177. Subject matter wherein the sound intensifying horn comprises more than one section having an increasing cross-sectional area in the direction of travel of the sound.
- (1) Note. The sections may range in type from divisions within one horn to independent horns bundled together.
- 188 Similar portions:**
This subclass is indented under subclass 187. Subject matter wherein the plural intensifying portions have substantially the same shape or are mirror images of one another.
- 189 Multisection housing:**
This subclass is indented under subclass 177. Subject matter wherein the structure forming the sound intensifying horn comprises two or more units attached together. Each unit must include part of a given sound path.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
187, for intensifying sections providing plural sound paths.
- 190 Separable:**
This subclass is indented under subclass 189. Subject matter wherein means are provided which permit the units to be detached from each other.
- 191 With external sound deflector:**
This subclass is indented under subclass 177. Subject matter including means for changing the direction of the sound after it has left the horn.
- 192 Particular shape of the horn:**
This subclass is indented under subclass 177. Subject matter characterized by the form or configuration of a wall of the horn.
- 193 Spiral sound path:**
This subclass is indented under subclass 192. Subject matter wherein the wall of the horn is arranged to provide a spiral sound path.
- 194 Doubly folded sound path:**
This subclass is indented under subclass 192. Subject matter wherein the wall of the horn is arranged to provide a sound path which changes direction by substantially 180 degrees at least twice.
- (1) Note. Such arrangements are also called “reflex type” or “internally reversed”.
- 195 Wide angle annular outlet:**
This subclass is indented under subclass 192. Subject matter wherein the horn has a mouth from which sound emanates and has at least a quarter circle silhouette when viewed from one of its sides.
- 196 Within tubular means:**
This subclass is indented under subclass 175. Subject matter wherein a mechanical restriction or valve is located within a sound conducting tubular member.
- (1) Note. The structure generally affects the loudness of the sound and/or its quality or tone.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
185+, for similar structure within a sound intensifying horn.
- 197 Adjustable:**
This subclass is indented under subclass 196. Subject matter wherein the sound modifying structure can be altered or moved within the tubular member.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
186, for similar structure within a sound intensifying horn.
- 198 Housing or enclosure (e.g., sound confining and absorbing):**
This subclass is indented under subclass 175. Subject matter comprising means to at least partially contain an acoustical device.

- 199 Speaker type:**
This subclass is indented under subclass 198. Subject matter wherein the enclosure is for a loudspeaker.
- 200 Machine type enclosure:**
This subclass is indented under subclass 198. Subject matter wherein the enclosure is specially designed to confine an acoustic wave emitting device, which device does not form an element of this class type or is not claimed in combination with the subject matter of another class.
- (1) Note. Subject matter of this class type in combination with or forming an element of an art device is with the appropriate art.
- (2) Note. See the Index to Classification: "Anti-Noise", "Deadeners" and "Mufflers".
- SEE OR SEARCH CLASS:
352, Optics: Motion Pictures, subclass 35 for mounts and housings for motion picture apparatus with acoustical damping of the sound originating in the motion picture apparatus.
- 201 Office type devices (e.g., typewriters, teleprinters, etc.):**
This subclass is indented under subclass 200. Subject matter wherein the enclosure is for machines normally used and found in a business type office.
- 202 Electrical type devices (e.g., transformers, motors, etc.):**
This subclass is indented under subclass 200. Subject matter wherein the enclosure is for electrical apparatus.
- 203 Reaction engine test chamber:**
This subclass is indented under subclass 200. Subject matter wherein a reaction-type engine is completely enclosed while undergoing a testing operation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
217, and 218, for similar devices, but which do not enclose the acoustical device.
- SEE OR SEARCH CLASS:
60, Power Plants, subclasses 200.1+ for reaction engines of this subclass type, per se.
- 204 Internal-combustion engine:**
This subclass is indented under subclass 200. Subject matter wherein the type of machine enclosure is for internal-combustion engines, e.g., automobiles, tractors, lawnmowers, etc.
- SEE OR SEARCH CLASS:
123, Internal-Combustion Engines, for engines of this subclass type, per se, and in combination with subject matter similar to that of this class (181), note especially subclass 198.
- 205 Partial enclosure or shroud:**
This subclass is indented under subclass 200. Subject matter wherein only certain parts of a machine are enclosed, or the enclosure partially covers the device.
- 206 By wave interference:**
This subclass is indented under subclass 175. Subject matter wherein the means for modifying the sound includes modulating the sound by interacting or introducing an additional higher or lower frequency to the sound source, the resulting sound being at a different frequency.
- SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclasses 165+ for electrical wave filters, and particularly subclasses 186+ for electric wave filters of the electromechanical transducer type, and subclass 81 for electrical attenuators.
- 207 Mechanical vibration attenuator:**
This subclass is indented under subclass 175. Subject matter comprising sound deadening material physically or mechanically attached or installed on the acoustical device, or an ele-

ment thereof to prevent vibratory noise usual to the operation of the device.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 514.12+ for fluid or fluent material dampening of an inertial member in an acceleration measuring apparatus and subclass 514.14 for vibration dampening in an inertial-type acceleration measuring apparatus.
- 105, Railway Rolling Stock, subclass 452 for sound deadeners limited thereto.
- 248, Supports, particularly the subclasses pertaining to resilient or vibration dampening supports for those which dampen sound.
- 295, Railway Wheels and Axles, subclass 7 for railway wheels having sound deadeners.

208 Damping of flexural structure:

This subclass is indented under subclass 207. Subject matter wherein the sound deadening material is applied to vibratile structure or other bending surfaces to dampen the sound.

209 Relatively moving parts:

This subclass is indented under subclass 207. Subject matter wherein the device has at least two parts moving with respect to one another.

210 Sound absorbing fence or screen (e.g., jet engine or vehicle noise):

This subclass is indented under subclass 175. Subject matter comprising physical barriers which absorb, direct, and/or block sound waves from acoustical devices.

- (1) Note. Subject matter of this subclass type includes, for example, sound absorbing fences erected along runways at airports and along highways.

SEE OR SEARCH CLASS:

- 244, Aeronautics and Astronautics, subclass 114 for blast deflector fences arranged adjacent to runways.

211 Combined:

This subclass is indented under subclass 175. Subject matter not provided for above comprising some acoustical device or other device having a function other than sound modifying or

sound muffling combined with or in addition to sound modifying or sound muffling means.

- (1) Note. Subject matter claimed in combination with or forming an element of an "Art Device" are with the appropriate art.

212 Muffler, fluid conducting type:

This subclass is indented under subclass 175. Subject matter for conducting or guiding moving liquids or gases, and acting on such moving liquids or gases to attenuate acoustic waves therein, i.e., "mufflers".

- (1) Note. Such devices in combination with or forming an element of an art device are with the appropriate art.
- (2) Note. See the Index to Classification: "Anti-Noise", "Deadeners" and "Mufflers".

SEE OR SEARCH CLASS:

- 60, Power Plants, subclasses 272+ and 685+ for combinations of engines or motors with means for treating the exhaust fluids.
- 137, Fluid Handling, appropriate subclasses for fluid handling devices not otherwise provided for.
- 138, Pipes and Tubular Conduits, appropriate subclasses, particularly subclasses 26+ and 37+ for related structure.

213 Reaction engine type:

This subclass is indented under subclass 212. Subject matter comprising fluid conducting device which muffles or dampens noise emanating from a reaction type engine.

- (1) Note. In the subject matter of this subclass type, the engine is usually shrouded and the muffling means are generally along the shroud.
- (2) Note. For recited combinations of reaction engines and muffling means, see the reference to Class 60, Power Plants, in the Search Note below.

- SEE OR SEARCH CLASS:
60, Power Plants, for reaction engines, per se, and subclasses 272+ and 685+ for combinations of engines or motors with means for treating the exhaust fluids.
- 214 Upstream (e.g., intake silencer):**
This subclass is indented under subclass 213. Subject matter wherein the attenuating device is at the air intake side of the engine shroud.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
229, for internal-combustion engines having attenuating devices for the carburetor air intake.
- 215 With adjustable outlet nozzle:**
This subclass is indented under subclass 213. Subject matter wherein the shroud is comprised of adjustable tail end sections and the position of the shroud end sections determine the degree of attenuation.
- 216 Longitudinally adjustable section:**
This subclass is indented under subclass 215. Subject matter wherein the tail end sections are adjustable longitudinally of the shroud in the downstream direction.
- 217 Removable silencer unit (e.g., mobile):**
This subclass is indented under subclass 213. Subject matter wherein the fluid conducting device can be attached to and detached from the exhaust end of the jet engine exhaust nozzle.
- (1) Note. Subject matter of this subclass type, because of its size, is usually mounted on wheels or other means for mobility.
- 218 Ground installation silencer:**
This subclass is indented under subclass 213. Subject matter wherein the fluid conducting device is a fixed structure with an opening to receive the tail end of a jet engine exhaust nozzle.
- (1) Note. The jet engine is usually brought to the site of the structure. The structure may also be provided with multiple receiving stations.
- 219 With adjustable internal baffles:**
This subclass is indented under subclass 213. Subject matter wherein the jet engine shroud comprises a series of repositionable barriers spaced along the internal surface of the shroud.
- 220 With disparate fluid mingling:**
This subclass is indented under subclass 213. Subject matter in which a fluid is introduced into and mingled with the moving fluids to assist in muffling, as by dilution or condensing the moving fluids.
- (1) Note. Chemical treatments of exhaust gases are not in this class. See Class 23, for chemical treatment.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
259+, for mufflers having fluids mixed with the exhaust for muffling the sound.
- SEE OR SEARCH CLASS:
60, Power Plants, subclasses 272+ and 685+ for combinations of engines with means for treating exhaust.
- 221 Liquid:**
This subclass is indented under subclass 200. Subject matter in which the added fluid is a liquid, usually water.
- 222 With sound absorbing material:**
This subclass is indented under subclass 213. Subject matter comprising sound absorbing material positioned in the shroud to be contacted by the exhaust gases, as by surrounding or being positioned adjacent to and communicating with the exhaust gases.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
248, 252 and 256+, for similar sound absorbing devices with sound absorbing material.
- 223 Silencer for firearms:**
This subclass is indented under subclass 212. Subject matter comprising silencer muffler which attenuates explosive sounds generated by small firearms and which have a straight-

through passage for the projectile and silencing chambers for the explosive exhaust.

SEE OR SEARCH CLASS:

89, Ordnance, subclasses 31 and 42.01 and indented subclasses for recoil checks, flames arrestors, etc., which inherently muffle.

224 Sound absorbing ventilating duct or curb (e.g., A/C, heat, air flow type):

This subclass is indented under subclass 212. Subject matter comprising ducts or conduits for the movement of streams of air therethrough.

- (1) Note. The ducts of this subclass type are usually lined with sound absorbing material or other sound absorbing structure for attenuating the sound waves of moving air.

SEE OR SEARCH CLASS:

454, Ventilation, subclass 262 for an air mixing building inlet airway having specific noise prohibiting structure; cross-reference art collection 906 for ventilating means, in general, including specific noise prohibiting structure; and subclasses 329, 338, and 341+ for inlet or outlet air pumps which forcefully admit or exhaust air from the stationary structure of a building.

225 With fan to assist fluid flow:

This subclass is indented under subclass 212. Subject matter wherein there is provided rotating fan means to assist in the movement of fluid through the sound modifying means.

- (1) Note. The fan of this subclass type may be operated by the force of the moving fluid or may be operated by some other mechanical means.

226 With adjustable fluid flow:

This subclass is indented under subclass 212. Subject matter wherein there is provided some means for varying the fluid flow while attenuating and diffusing the sounds normally produced by moving fluids.

227 Pipe-muffler (e.g., tail pipe type):

This subclass is indented under subclass 212. Subject matter wherein the fluid conducting device is comprised of a conduit with sound attenuating chambers along the length thereof.

- (1) Note. Subject matter of this subclass type is generally referred to as a tail pipe, and is usually connected to a muffler which is not claimed as part of the system.

228 With exhaust pipe:

This subclass is indented under subclass 212. Subject matter comprising an attenuating fluid conducting device in combination with an additional pipe (i.e., exhaust pipe) connected to the exhaust outlet of the attenuating device.

229 Carburetor, burner, or compressor intake silencer:

This subclass is indented under subclass 212. Subject matter wherein the fluid conducting attenuating device is mounted on a carburetor (air intake) of an internal-combustion engine.

- (1) Note. Subject matter of this subclass type includes, for example, devices designed for attenuating air intake noise for gasoline engines, compressors, and burners.
- (2) Note. For structure claimed in combination with the silencer and which goes beyond the scope of this class, such as specific motor structure, or specific art device, search the appropriate art classes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

214, for air intake silencers for jet or reaction engines.

230 Pneumatic type motor (e.g., air hammer, etc.):

This subclass is indented under subclass 212. Subject matter wherein the fluid conducting attenuating device is mounted on the exhaust end of a compressed air or vacuum actuated motor (i.e., air hammer, tool, etc.).

- (1) Note. Structure claimed in combination with the silencer and which goes beyond the scope of the class is classified with the art device. For example, the combination of an impact tool plus a muffler for the tool is classified with the impact tool.
- SEE OR SEARCH CLASS:
173, Tool Driving or Impacting, appropriate subclasses for pneumatic tools, and specifically Digest 2 for sound muffling.
415, Rotary Kinetic Fluid Motors or Pumps, subclass 119 for sound or vibratory wave absorbing or preventing means.
- 231 With solid particle separator (e.g., spark arrestor, vacuum cleaner, etc.):**
This subclass is indented under subclass 212. Subject matter wherein there is provided additional means which at the same time remove from the moving fluids (exhaust) all entrained dirt particles, sparks, and the like.
- SEE OR SEARCH CLASS:
96, Gas Separation: Apparatus, subclasses 380+ for gas separation apparatus having sound damping means.
- 232 Separate distinct units serially connected:**
This subclass is indented under subclass 212. Subject matter provided with a plurality of sound attenuating devices, each either of duplicate or different design and connected one after the other in the down-stream direction.
- 233 Liquid motion silencer:**
This subclass is indented under subclass 212. Subject matter wherein the fluid conducting attenuating device suppresses the transmission of sound waves or similar vibrations (fluid impulses) along pipes and conduits carrying fluids.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
227, for pipe mufflers for handling exhaust gases.
- SEE OR SEARCH CLASS:
138, Pipes and Tubular Conduits, appropriate subclasses, particularly subclasses 26+ and 37+ for related structure.
- 234 Water-closet type:**
This subclass is indented under subclass 233. Subject matter in which the fluid conductor is part of a fluid supply leading to or part of a water closet.
- SEE OR SEARCH CLASS:
4, Baths, Closets, Sinks, and Spittoons, appropriate subclasses for water closets, per se.
- 235 Underwater discharge:**
This subclass is indented under subclass 212. Subject matter wherein the fluid is ejected under water.
- 236 With muffler cut-out:**
This subclass is indented under subclass 212. Subject matter comprising a valve device which can be utilized for diverting the moving fluid away from the fluid conducting attenuating device which performs the muffling operation.
- 237 With pressure relief safety valve:**
This subclass is indented under subclass 212. Subject matter wherein there is provided a valve responsive to relieve excess pressure to the atmosphere.
- SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 455+ for valves responsive to change in line condition.
- 238 Multiple distinct inlets and/or outlets:**
This subclass is indented under subclass 212. Subject matter wherein the moving fluid is introduced in the muffler via at least two inlets or expelled through at least two outlets.
- 239 Outlets:**
This subclass is indented under subclass 238. Subject matter comprising a plurality of fluid outlets or discharge ports.

- 240 Manifold type:**
This subclass is indented under subclass 212. Subject matter for collecting and conducting the fluids from single or multiple cylinders into a single exhaust pipe.
- 241 Adjustable muffler (i.e., internal or external parts):**
This subclass is indented under subclass 212. Subject matter wherein two or more of the internal parts of external casing sections can be repositioned relative to each other to change the size of the muffler.
- 242 Mouthpieces (e.g., telephone, microphone, etc.):**
This subclass is indented under subclass 212. Subject matter comprising devices constructed to be spoken into.
- (1) Note. Only such parts of the device necessary to establish the environment are included in this subclass. For devices such as microphones, telephones, etc., per se, search the appropriate art.
- SEE OR SEARCH CLASS:
379, Telephonic Communications, subclasses 437+ for such devices in combination with telephones.
- 243 With repair, replacement, or quick disassembly:**
This subclass is indented under subclass 212. Subject matter having means to facilitate the repair of damaged parts or elements of the muffling device.
- (1) Note. Subject matter of this subclass type includes, for example, muffling devices which can be disassembled with minimum mechanical manipulations.
- 244 Corrosion prevention:**
This subclass is indented under subclass 212. Subject matter comprising means for preventing chemical erosion of the material of which the device is made.
- 245 Internally coated parts:**
This subclass is indented under subclass 244. Subject matter wherein at least some of the fluid contacting surfaces of the conducting devices are coated so as to prevent corrosion.
- 246 Nonmetallic:**
This subclass is indented under subclass 244. Subject matter wherein the fluid conducting device is constructed of organic materials.
- 247 Straight-through passage:**
This subclass is indented under subclass 212. Subject matter wherein the fluid is conducted through a fluid conducting device having a linear, unobstructed passage at least the same size from the inlet to the outlet.
- 248 Continuous conduit:**
This subclass is indented under subclass 247. Subject matter wherein the passage is comprised of a continuous uninterrupted conduit from its inlet to the outlet.
- (1) Note. Subject matter of this subclass type may have sound absorbing material.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
222, 252 and 256, for similar sound absorbing devices with sound absorbing material.
- 249 With expansion chamber:**
This subclass is indented under subclass 248. Subject matter having enlarged chambers intermediate the length of the through passage.
- 250 And side branch:**
This subclass is indented under subclass 249. Subject matter having cushion, acoustic filter, or resonator chambers in communication with the through passage.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
266, 273 and 276, for similar devices with side branch chamber.

251 And multipassage:

This subclass is indented under subclass 249. Subject matter having a plurality of through passages between which the moving fluid is divided.

252 With sound absorbing material:

This subclass is indented under subclass 247. Subject matter having acoustic wave attenuating material positioned within the fluid conducting device to be contacted by the exhaust fluid as by surrounding the through passage or being positioned adjacent to and communicating with the exhaust fluids.

SEE OR SEARCH THIS CLASS, SUBCLASS:

222, 248 and 256, for similar sound absorbing devices having sound absorbing material.

253 With muffler bypass:

This subclass is indented under subclass 247. Subject matter having one or more passages, which performs a muffling function, which bypass the whole or part of the through passage.

(1) Note. Subject matter of this subclass type includes, for example, devices in which the bypassed fluid is returned out of phase with the fluid in the through passage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

236, in which the fluids are diverted from the muffler and are not muffled.

268, for devices which have a plurality of through passages connected in parallel.

254 Valve controlled:

This subclass is indented under subclass 253. Subject matter having means to vary the rate of fluid flow in either the through or the bypass passage.

255 Expansion chamber:

This subclass is indented under subclass 247. Subject matter having enlarged chambers intermediate the length of the through passage.

256 With Sound absorbing material:

This subclass is indented under subclass 212. Subject matter having acoustic wave attenuating material positioned to be contacted by the moving fluid, as by surrounding or being positioned adjacent to and communicating with the fluid passage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

222, for jet engine muffler devices having sound absorbing material.

247, for straight-through continuous passage mufflers having sound absorbing material.

252, for through passage mufflers with sound absorbing material.

257 And multipassage:

This subclass is indented under subclass 256. Subject matter having a plurality of passages between which the moving fluid is divided.

258 Pervious material interposed in flow path:

This subclass is indented under subclass 256. Subject matter wherein the sound absorbing material is directly in the flow path of the moving fluid, and the fluid must pass through the material to its exit.

259 With disparate fluid mingling:

This subclass is indented under subclass 212. Subject matter in which a fluid is introduced into and mingled with the moving fluids to assist in muffling, as by diluting and condensing the moving fluids.

SEE OR SEARCH THIS CLASS, SUBCLASS:

220+, for similar devices in jet engines.

260 Liquid:

This subclass is indented under subclass 259. Subject matter in which the added fluid is a liquid, usually water.

261 Sprayed:

This subclass is indented under subclass 260. Subject matter in which the liquid is injected into the main stream of exhaust by some diffusing means.

- 262 Induced by suction:**
This subclass is indented under subclass 259. Subject matter wherein the device is provided with openings for admitting the fluid through said opening as a result of a vacuum created by the moving exhaust fluids.
- 263 Motion induced:**
This subclass is indented under subclass 262. Subject matter wherein the motion of the device on which the muffler is installed creates a vacuum by scooping a fluid as the device moves.
- 264 With baffle or baffle structure:**
This subclass is indented under subclass 212. Subject matter in which barriers or partitions cause the fluids to travel in a tortuous path.
- 265 Retroverted:**
This subclass is indented under subclass 264. Subject matter having a plurality of serially connected fluid passages substantially parallel to the inlet, the direction of flow of the fluid being reversed as it travels through each successive passage.
- 266 And side branch chamber:**
This subclass is indented under subclass 265. Subject matter having cushion, acoustic filter, or resonator chambers in communication with the fluid passage.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
250, and 273, for similar devices with side branch chambers.
- 267 Coaxial foraminous walls:**
This subclass is indented under subclass 264. Subject matter in which are provided a plurality of coaxial cylindrical chambers having fluid pervious walls through which the fluid flows in a radial direction into the atmosphere.
- 268 Multipassage:**
This subclass is indented under subclass 264. Subject matter having a plurality of passages between which the moving fluid is divided.
- 269 Expansion chamber type:**
This subclass is indented under subclass 264. Subject matter having an enlarged chamber intermediate the length of the fluid passage.
- 270 With alternating partial baffles along the length of casing:**
This subclass is indented under subclass 269. Subject matter wherein there is a plurality of partial barriers alternately spaced along the length of the muffler casing.
- 271 With adjustable or flexible wall:**
This subclass is indented under subclass 269. Subject matter wherein at least one of the partitions defining the chamber is repositionable with respect to another.
- 272 Plural chambers:**
This subclass is indented under subclass 269. Subject matter having more than one expansion chamber.
- 273 And side branch chamber:**
This subclass is indented under subclass 269. Subject matter having cushion, acoustic filter, or resonator chambers in communication with the fluid passages.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
250, 266 and 276, for similar devices with side branch chambers.
- 274 With centrifugal flow:**
This subclass is indented under subclass 269. Subject matter in which the inlet to the expansion chamber and the baffles are in such direction as to impel the fluid into a circular flow.
- 275 And multipassage:**
This subclass is indented under subclass 269. Subject matter having a plurality of passages between which the moving fluid is divided.
- 276 Side branch:**
This subclass is indented under subclass 264. Subject matter having cushion, acoustic filter, or resonator chambers in communication with the fluid passages.

277 Movable baffle:

This subclass is indented under subclass 264. Subject matter having baffles constantly in motion, and driven either under the force of the moving fluid or by some external means.

- (1) Note. Subject matter of this subclass type includes, for example, baffles which form rotating vanes.

278 Biased:

This subclass is indented under subclass 277. Subject matter having means tending to force the moving baffle toward a position to restrict flow of fluid.

279 Spiral:

This subclass is indented under subclass 264. Subject matter in which the baffles are arranged to guide the moving fluid through an axially or radially expanding, circular path.

280 Helical:

This subclass is indented under subclass 279. Subject matter in which the circular path is axially expanding.

281 Perpendicular and/or oblique:

This subclass is indented under subclass 264. Subject matter having baffles angularly disposed relative to the axis of the flow passage, i.e., not parallel to the axis.

282 Casings:

This subclass is indented under subclass 264. Subject matter comprising the jacket or housing structure of the fluid handling device wherein the jacket or housing structure is more than nominally recited.

SEE OR SEARCH CLASS:

- 165, Heat Exchange, subclasses 52, 154, or 157 for casings with a surrounding jacket to form a space for circulating cooling fluids.

283 Air or liquid cooled:

This subclass is indented under subclass 282. Subject matter having a chamber or other structure for providing a cooling fluid to lower the temperature of the moving exhaust fluids.

284 Sound absorbing panels:

This subclass is indented under subclass 175. Subject matter comprising planar-type structure for attenuating acoustic waves.

SEE OR SEARCH CLASS:

- 52, Static Structures (e.g., Buildings), subclasses 144+ for a combination of units having an exposed surface configuration having an acoustical function, or a unit with a feature for such a combination.
- 428, Stock Material or Miscellaneous Articles, for a product or stock material.

285 Load bearing block type structure:

This subclass is indented under subclass 284. Subject matter comprising sound attenuating structural elements or units, e.g., blocks, sufficiently strong or rigid to support a load.

SEE OR SEARCH CLASS:

- 52, Static Structures (e.g., Buildings), subclasses 144+ for a combination of units having an exposed surface configuration having an acoustical function, or a unit with a feature for such a combination.

286 Specific acoustical properties or dimensions:

This subclass is indented under subclass 284. Subject matter whose composition, size or shape is related to a particular type of acoustic wave attenuation, e.g., insertion loss, transmission loss, or specific acoustic structure (Helmholtz resonator, 1/4 wavelength chamber depth).

287 Movable/foldable panels:

This subclass is indented under subclass 284. Subject matter specifically designed to be flexible, hinged, or portable.

- (1) Note. Subject matter of this subclass type includes, for example, curtain or drape-like products.

SEE OR SEARCH CLASS:

- 49, Movable or Removable Closures, appropriate subclass for such devices.
- 160, Flexible or Portable Closure, Partition, or Panel, appropriate subclass for such devices.

288 Cellular:

This subclass is indented under subclass 284. Subject matter comprising either discrete elements (e.g., tubular constituents) or components which form, or cooperate to form, cavities the longitudinal axis of which are at an angle to the plane of the major face of the product.

- (1) Note. Multilayer products having one layer formed as a honeycomb-like or cellular layer are found in this class, subclasses 290+.

289 Light permeable:

This subclass is indented under subclass 284. Subject matter which is translucent or transparent to visible radiation.

290 Multilayer panel or wall structure:

This subclass is indented under subclass 284. Subject matter comprising more than one layer of sound attenuating material.

291 With membrane outer layer:

This subclass is indented under subclass 290. Subject matter having a front or rear facing formed as a coating, foil, or film.

292 With perforated or porous face and honeycomb-like core:

This subclass is indented under subclass 290. Subject matter having at least one porous or perforated layer and at least one honeycomb-like layer.

- (1) Note. Typically, such products are used as reaction engine duct liners.

293 With channels or cavities in surface layer:

This subclass is indented under subclass 284. Subject matter wherein the outer face is formed with channels or cavities.

294 Materials:

This subclass is indented under subclass 284. Subject matter characterized by the particular sound absorbing material used to form the product.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, for such compositions which have sound deadening properties.
252, Compositions, subclass 62 for heat or sound insulating compositions.
428, Stock Material or Miscellaneous Articles, subclasses 411.1+ for laminate characterized by compositions of laminas.

295 Space absorber:

This subclass is indented under subclass 175. Subject matter comprising structures of sound absorbing material for absorbing acoustic energy in rooms or similar chambers within which the structure is enclosed.

- (1) Note. Subject matter of this subclass type, for example, is usually formed as a hollow box and suspended from a wall or ceiling or used in anechoic chambers.

296 Methods:

This subclass is indented under subclass 175. Subject matter comprising methods of attenuating sound.

- (1) Note. Methods of this subclass type may attenuate the entire sound or selected frequencies thereof.
(2) Note. Patents claiming both a method of attenuating sound and a product or apparatus for attenuating sound are placed above in the appropriate subclass and cross-referenced here.
(3) Note. Methods of making a sound attenuating product or apparatus are found in the various manufacturing classes involved.

CROSS-REFERENCE ART COLLECTIONS

The following subclasses are collections of published disclosures pertaining to various specified aspects of the acoustic art which aspects do not form appropriate bases for subclasses in the foregoing classification (i.e., subclasses superior hereto in the schedule), wherein original copies of patents are placed on the basis of proximate function of the apparatus. These subclasses assist a search based on remote function of the apparatus

and may be of further assistance to the searcher, either as a starting point in further related fields of search inside or outside the class. Thus, there is here provided a second access for retrieval of a limited number of types of disclosure.

- (1) Note. Disclosures are placed in these subclasses for their value as references and as leads to appropriate main or secondary fields of search, without regard to their original classification of their claimed subject matter.
- (2) Note. The disclosures found in the following subclasses are examples, only of the indicated subject matter, and in no instance do they represent the entire extent of the prior art.
- (3) Note. Original copies of patents are not placed in the following subclasses.

400

Elements or material for transforming sound wave energy from high to low pressure and vice versa.

- (1) Note. Included herein are means to transmit sound waves from one medium to another medium with minimum reflection, deviation or absorption wherein the means acts as a mechanical impedance matching means. The impedance matching may be a function of the material or may be due to the shape or configuration of an element such as a horn shape.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175+, for material or elements for attenuating sound waves.

401

This subclass is indented under subclass 400. Elements or material wherein one of the media is the earth.

402

This subclass is indented under subclass 400. Elements or material wherein one of the media is a liquid.

403 REFRIGERATOR COMPRESSOR MUFFLER:

Disclosures of sound attenuating mufflers for refrigerator compressors.

SEE OR SEARCH CLASS:

417, Pumps, subclass 312 for pumps with mufflers acting on the pumped fluid.

404 HOBBY CRAFT ENGINE MUFFLER:

Disclosures of toy engines or hobby craft-type engines with sound attenuating mufflers.

END