

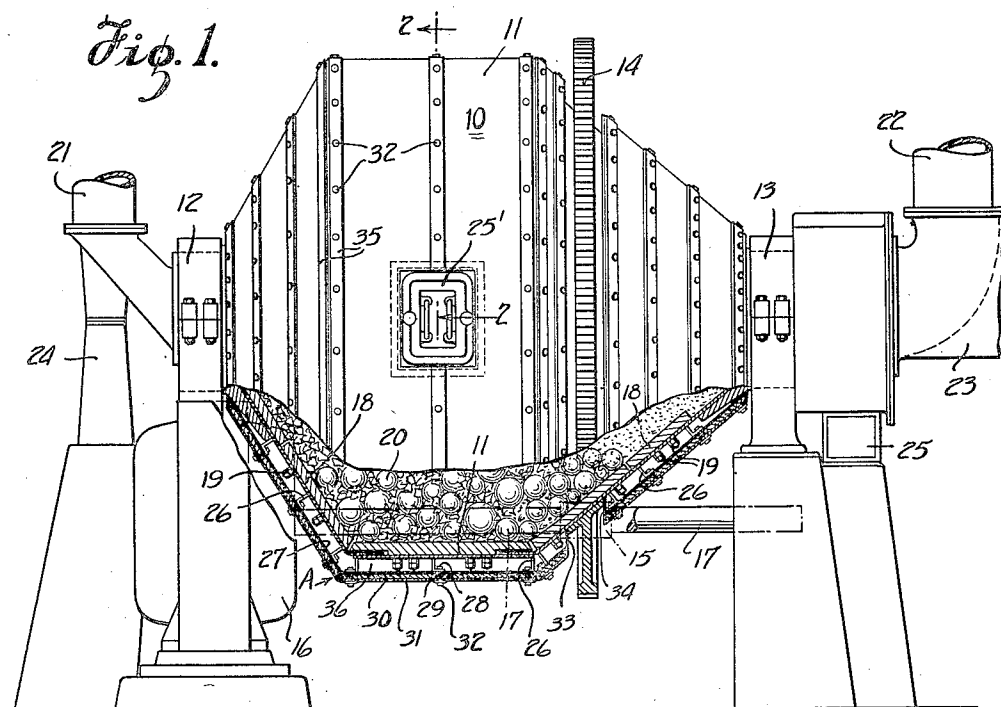
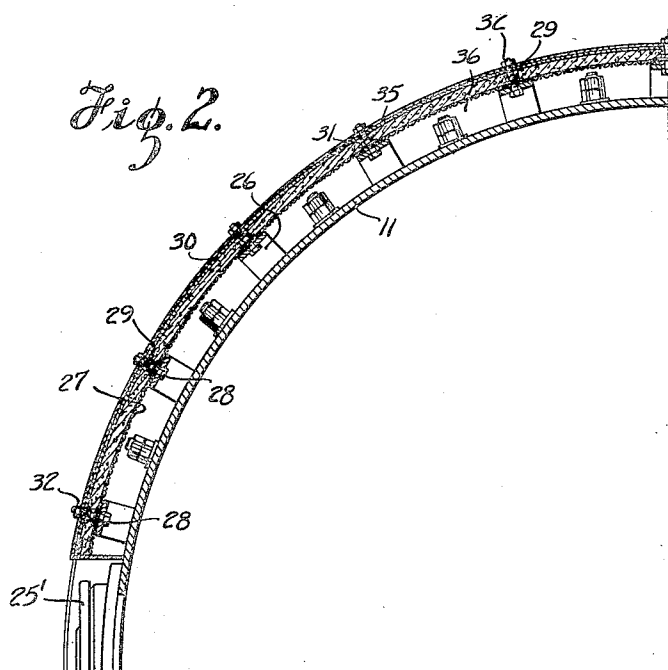
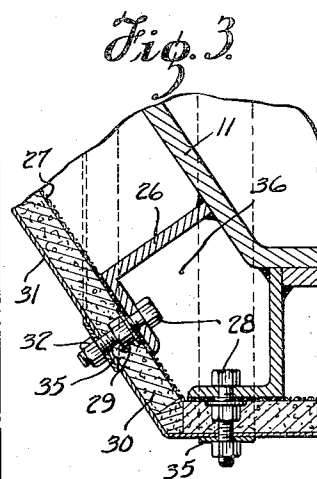
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PULVERIZING APPARATUS AND THE LIKE

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PULVERIZING APPARATUS AND THE LIKE

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My invention relates to pulverizing apparatus and like devices which have a tendency to be noisy in operation and the object of the invention is to provide means for deadening noise in such apparatus which is effective for the purpose and yet does not interfere with the operation or the accessibility of the apparatus.

The nature of the invention will become apparent from the following description considered in connection with the accompanying drawing forming a part thereof showing a preferred form of the invention.

In the drawing:

Fig. 1 is an elevational view, partly in section, of a ball mill pulverizer embodying the invention,

Fig. 2 is an enlarged transverse cross-sectional view of a portion of the mill taken substantially on line 2—2 of Fig. 1, and

Fig. 3 is an enlarged view of that portion of the mill casing indicated "A" in Fig. 1.

Referring to the drawing, reference character 10 denotes generally a rotary mill of the loose ball type for pulverizing coal. The mill comprises a drum or shell 11 having a substantially cylindrical central portion and tapering or conically shaped ends. The shell is supported for rotation in bearings 12 and 13 and is driven by means of a gear 14 suitably secured to the shell 11. Gear 14 meshes with and is driven by a pinion 15 which in turn is driven by an electric motor 16 through a shaft 17. The shell 11 of the mill is lined internally with a lining 18 of suitable material which is secured to the shell by bolts and nuts indicated 19 or by other securing means. A number of steel crushing or grinding balls 20 of varying size which are adapted to pulverize the coal introduced thereinto are contained within the shell 11.

Unpulverized coal is introduced into the shell 11 through a conduit 21 and is pulverized by the steel balls 20 when the shell 11 is rotated. Preheated air is introduced into the shell 11 through a conduit 22 and the combustible mixture of pulverized coal and air is withdrawn from the shell 11 through a conduit 23 and is delivered to a combustion chamber. Conduit 21 is provided with a

support 24 and conduits 22 and 23 are maintained in position by a suitable support 25. The shell 11 of the mill is provided with a manhole opening which is closed by a cover 25' removably secured to the shell.

It will be readily understood that during operation of the mill the steel grinding balls 20, as a result of their intermittent contact with each other and with the shell of the mill, will produce considerable noise. This noise is effectually deadened or neutralized by means of a sound deadening casing attached to shell 11. In general, this casing consists of a layer or covering of suitable sound absorbing or deadening material which is maintained in spaced relation to the mill shell so as to provide a relatively narrow dead air space adjacent to the shell and between the sound absorbing material and the shell, and a suitable retaining casing over the sound absorbing material to retain it in position on the shell.

To the end of spacing the sound absorbing material from the mill shell so as to provide for the dead air space referred to, a plurality of angle clips 26 are secured to the shell 11 at intervals over substantially the entire shell. These angle clips are preferably secured to the shell 11 by welding one end of a leg of each to the shell so that the welded leg of each angle clip will be disposed substantially radially of the shell and the other leg of each clip will be disposed substantially parallel to the portion of the shell to which it is secured. As shown, a sheet of heavy wire mesh 27 encloses the shell 11 except at the extreme ends of the shell and in the zone of gear 14 and is maintained in spaced relation to the shell by the angle clips 26. The wire mesh 27 is secured to the clips 26 by bolts 28 and nuts 29. Over the wire mesh 27 is placed a layer, comprising one or more sheets, of sound absorbing or deadening material 30, such as asbestos composition, rock wool or sponge felt. The sound absorbing material 30 is covered and retained in position on the shell 11 by a casing 31 of sheet steel or other suitable material secured to the angle clips 26 by bolts 28 and nuts 32. Casing 31 is bounded on each side of gear 14 by annular bands 33 and 34 welded

to the shell 11 or the gear 14 and to the casing 31. The ends of casing 31 adjacent the bearings 12 and 13 are preferably welded to the shell 11. Steel bands 35 which are secured to the casing 31 by the nuts 32 serve to reinforce the casing.

The wire mesh 27 serves to support the layer of sound absorbing material 30 in spaced relation to the mill shell 11 so as to provide a dead air space or gap 36 between the shell 11 and the sponge felt 30 and at the same time permits access of the noise waves to substantially the whole inner surface of the fibrous material 30. The use of a wire mesh for this purpose affords certain practical advantages, such as lightness and economy of installation because of the fact that the mesh may be readily bolted to the mill shell without the drilling of bolt holes therein. It is understood, however, that sheet steel or other suitable perforated material may be used if desired in place of the wire mesh.

The layer of dead air and the layer of sound absorbing material effectually cooperate to absorb, neutralize or deaden the noise produced in the mill shell and thus to provide a substantially sound proof casing for the mill. Both the irregularity of surface of the wire mesh and the irregularity of the surface of the fibrous material act to deflect the sound waves at different and intersecting angles to break up the waves and deaden the sound. Variations may be made in the structure within the scope of the invention. For example, the layer of sound absorbing material may comprise one or more sheets of the same kind of material or may comprise sheets of different kinds of material.

What I claim is:

1. Pulverizing apparatus or the like comprising a rotatable shell and a casing secured to and spaced from said shell, said casing comprising a layer of fibrous material having an irregular surface opposite and spaced from the outer surface of the shell.

2. Pulverizing apparatus or the like comprising a rotatable shell and a casing secured to and spaced from the shell, said casing comprising a sheet of perforated material opposite the outer surface of the shell and a layer of sound deadening material supported by said perforated material.

3. Pulverizing apparatus or the like comprising a rotatable shell and a casing secured to and spaced from said shell, said casing comprising a sheet of wire mesh opposite the outer surface of the shell and a layer of sound deadening material supported by said wire mesh.

4. Pulverizing apparatus or the like comprising a rotatable shell and a casing secured to and spaced from the shell, said casing comprising a sheet of perforated material opposite the outer surface of the shell, a layer of sound deadening material over said perforated material and a cover for the sound deadening material.

5. Pulverizing apparatus or the like comprising a rotatable shell, a driving gear secured to the shell intermediate the ends thereof, a casing secured to and spaced from the shell comprising a layer of sound deadening material and a cover for said material, said casing being terminated at each side of said gear, the ends of said cover at each side of the gear being secured to said shell.

6. Pulverizing apparatus or the like comprising a rotatable shell, a driving gear secured to the shell intermediate the ends thereof, a casing secured to and spaced from the shell comprising a layer of sound deadening material and a cover for said material, the ends of said cover being secured to the ends of the shell, said casing being terminated at each side of said gear and having the cover of the casing extending into contact with the shell at each side of the gear and secured to the shell.

7. Pulverizing apparatus or the like comprising a rotatable shell, a plurality of spacing elements secured to the outer surface of the shell, a sound deadening casing secured to said spaced elements, said casing comprising a sheet of wire mesh, a layer of sound deadening material over the wire mesh and a cover over the sound deadening material.

8. Pulverizing apparatus or the like comprising a rotatable shell, a driving gear secured to the shell intermediate the ends thereof, a plurality of spacing elements secured to the outer surface of the shell, a sound deadening casing secured to said spacing elements, said casing comprising a sheet of wire mesh, a layer of sound deadening material over the wire mesh and a cover over the sound deadening material, the ends of said cover being secured to the ends of the shell, said sound deadening casing being terminated at each side of said gear and having the cover of the casing extending into contact with the shell at each side of the gear and secured to the shell.

In testimony whereof I have affixed my signature.

CHARLES HUNTER CORBISHLEY.