

R. R. BEAR.
CLINKER COOLER.
APPLICATION FILED JAN. 13, 1912.

1,034,861.

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Fig. 1,

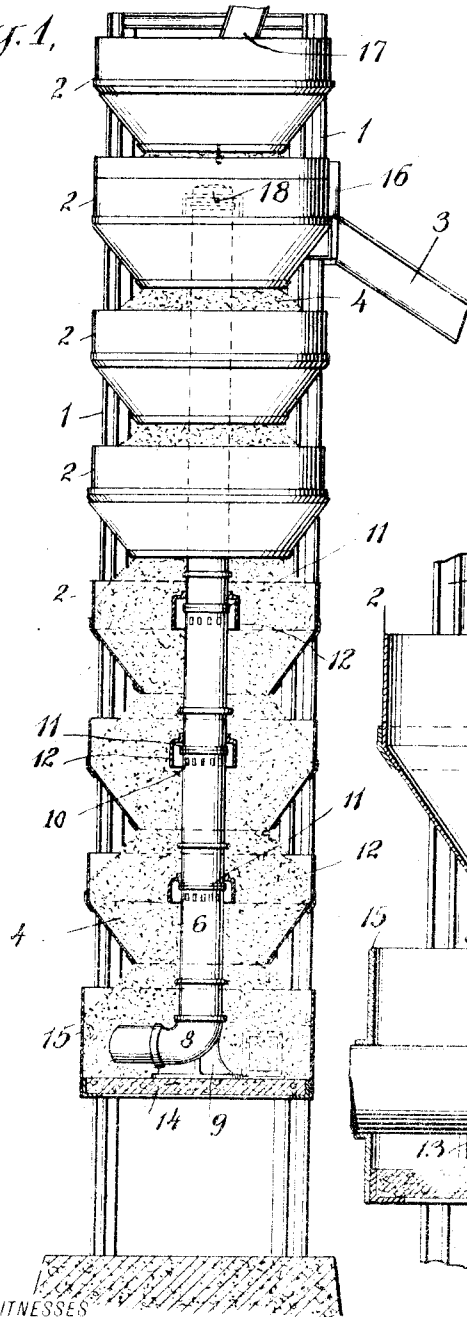


Fig. 2,

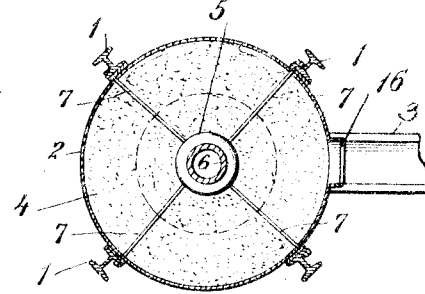
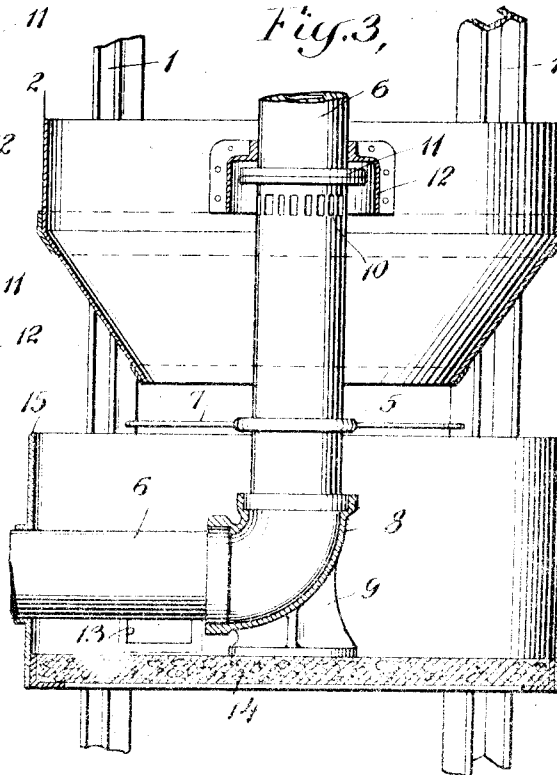


Fig. 3,



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CLINKER-COOLER.

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To all whom it may concern:

Be it known that I, RAYMOND R. BEAR, a citizen of the United States, and resident of Allentown, county of Lehigh, and State of Pennsylvania, have made a certain new and useful Invention Relating to Clinker-Coolers, of which the following is a specification, taken in connection with the accompanying drawings, which form part of the same.

This invention relates especially to coolers for the Portland cement clinker or other granular material, the cooler comprising a number of superimposed hoppers supported on a skeleton frame work so as to allow the free circulation of air around them and also preferably having an air circulation through the material feeding gradually down through these hoppers.

In the accompanying drawings showing in a somewhat diagrammatic way an illustrative embodiment of this invention, Figure 1 is an elevation partly in section. Fig. 2 is a horizontal section through one of the hoppers; and Fig. 3 is an enlarged vertical section showing the base and adjacent parts.

As shown somewhat diagrammatically in Fig. 1, the cooler may comprise any desired number of hoppers or receivers preferably arranged substantially vertically one above another, and each of these hoppers 2 may be conveniently formed with a cylindrical body and an attached hopped bottom which may be substantially conical. The hoppers may be conveniently mounted by attaching each of them to a suitable skeleton frame work, such as a series of columns or I-beams 1 arranged around the hoppers and secured thereto in any desired way, the hoppers being preferably so spaced that the clinker or other material discharged from the hopped bottoms is all received in the hopper below, since the upper edge of each of the lower hoppers is above the angle of repose of the material fed thereto. A suitable base 15 of cylindrical or other form may be arranged below the series of hoppers to receive the material 4 therefrom and this base may if desired be provided with a suitable floor or lining 14 of reinforced concrete or the like and also with one or more discharge doors 13 having suitable adjusting slides or the like to control the discharge of material therethrough. For some purposes it is desirable to arrange an overflow or emergency discharge chute, such as 3, in connection with one of the upper hoppers of the cooler

so that when desired the control slide 16 may be opened and the material discharged to the extent desired through this discharge chute without allowing the material to pass 60 entirely through the cooler.

It is desirable in some cases to provide a suitable internal air cooling arrangement which may be in the form of a suitable air-blast pipe 6 arranged substantially centrally through the series of hoppers and provided with air holes such as 10 at intervals along the pipe so as to discharge air through the surrounding material and promote the cooling of the central portions of the descending column of granular material in the hoppers. This blast pipe may be conveniently mounted on a special bracket 9 formed integral with or otherwise attached to the elbow 8 and the pipe may be supported at the proper intervals by braces 7 extending out to the columns 1 and connected to suitable guides 5 embracing the pipe as indicated in Figs. 2 and 3. It is desirable to have suitable hoods such as 12 arranged adjacent the air holes 10 in the blast pipe so as to prevent access of the material to these holes and thus insure the free discharge of air therefrom at all times. These depending hoods 12 may be secured in position in any desired way, as for instance by tightly bolting the sectional hoods upon the blast pipe, if desired adjacent the pipe flanges 11 joining the various sections of this pipe which may extend up through the series of hoppers and have its upper end provided with a suitable closing cap 18 shown in dotted lines in Fig. 1.

The hot granular material, such for instance as cement clinker delivered from the rotary kilns in which it is burned, may be fed to the cooler through a suitable chute such as 17 delivering it into the upper hopper 2 of the cooler. The material under normal conditions forms the conical piles in the various hoppers and is fed down through the cooler gradually as determined by the amount which is withdrawn from the discharge doors 13 in the base which is preferably located at sufficient height so as to allow a suitable conveyer of any description to run beneath the cooler and receive the material directly from the discharge doors. The columns form a skeleton supporting frame work for the hoppers and base of the cooler and allow the free circulation of air around these parts so as to

cool the same and also come into direct contact with the inclined upper surfaces of the heaps of material in each hopper so as to exert an important cooling influence thereon as different parts of the material are exposed in this way as it feeds slowly down through the cooler. A further cooling action may be secured by the cold air discharged into the material from the blast pipe 6 having its lower portion extending through the base, connected with the fan and delivering air at a pressure of a few ounces sufficient to force its way through the material in the cooler.

Having described this invention in connection with illustrative embodiments, forms, proportions and arrangements of parts, to the details of which disclosure the invention is not of course to be limited, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

1. In coolers for cement clinker or other granular material, a series of receiving hoppers having substantially cylindrical sides and conical hopped bottoms, a skeleton supporting frame work composed of a series of vertical columns secured to said hoppers and supporting them in a substantially vertical series and spacing them apart so as to prevent the material overflowing the lower hoppers as it gradually feeds down therethrough while allowing free access of air to said hoppers and the upper surface of the material therein, a base provided with a discharge door and mounted in said frame work below said hoppers, a blast pipe mounted substantially centrally within said hoppers and provided with sets of air holes and with depending hoods mounted on the

joints in said blast pipe and cooperating with said air holes to prevent clogging thereof as cooling currents from said blast pipe are forced through the surrounding material within said hoppers.

2. In coolers for cement clinker or other granular material, a series of receiving hoppers having substantially cylindrical sides and conical hopped bottoms, a skeleton supporting frame secured to said hoppers spacing them apart so as to prevent the material overflowing the lower hoppers as it gradually feeds down therethrough while allowing free access of air to said hoppers and the upper surface of the material therein, a base provided with a discharge door and mounted in said frame work below said hoppers, a blast pipe mounted substantially centrally within said hoppers and provided with sets of air holes through which cooling currents from said blast pipe are forced through the surrounding material within said hoppers.

3. In coolers for cement clinker or other granular material, a series of receiving hoppers having substantially hopped bottoms, a skeleton supporting frame work secured to said hoppers spacing them apart allowing free access of air to said hoppers and the upper surface of the material therein, a blast pipe mounted within said hoppers and provided with sets of air holes through which cooling currents from said blast pipe are forced through the surrounding material within said hoppers.

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