

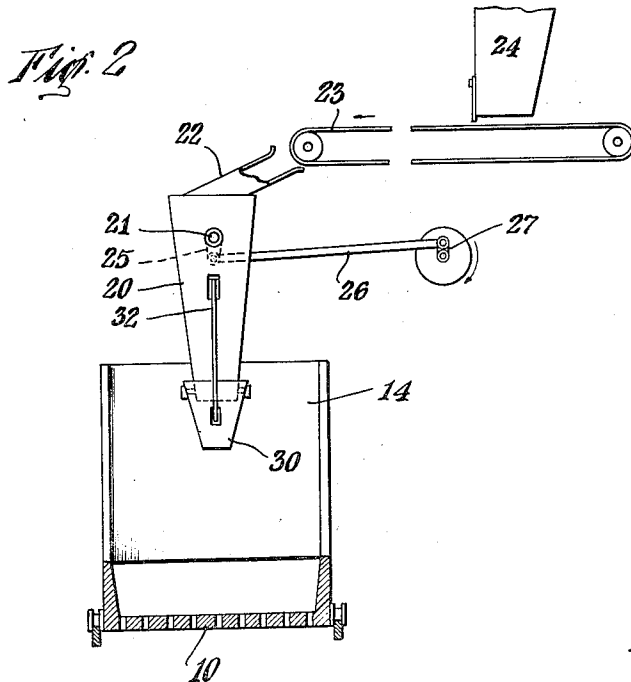
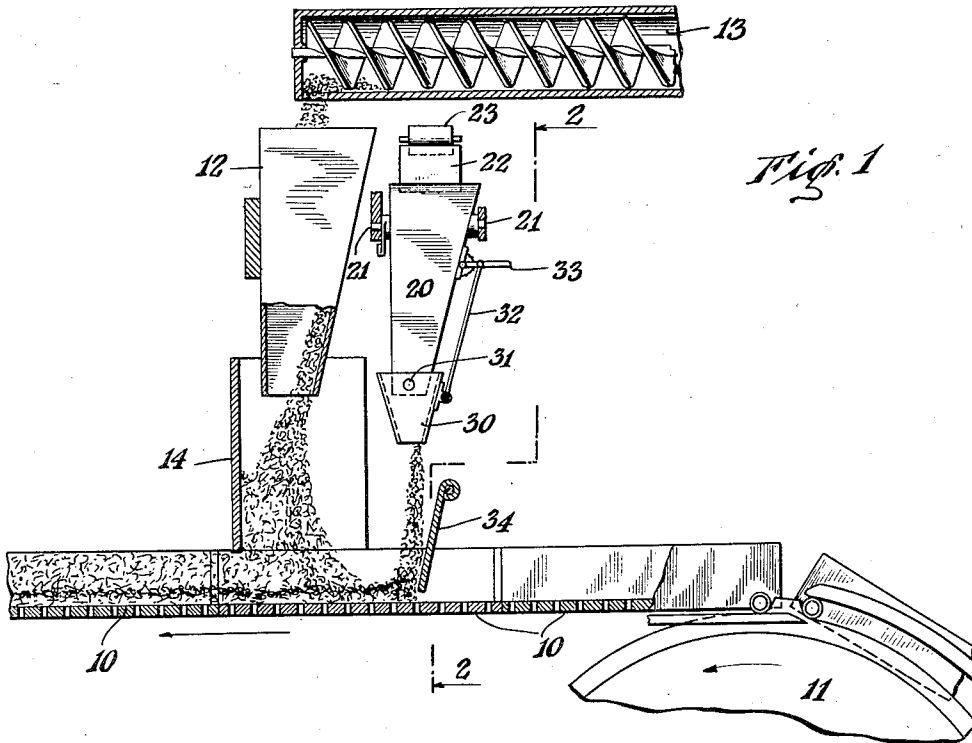
Sept. 12, 1933.

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1,926,044

METHOD OF SINTERING

Original Filed Jan. 24, 1930



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## UNITED STATES PATENT OFFICE

1,926,044

## METHOD OF SINTERING

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Original application January 24, 1930, Serial No. 422,998. Divided and this application August 23, 1932. Serial No. 630,029

4 Claims. (Cl. 75—28)

This invention relates to sintering and particularly concerns a method for removing or eliminating volatile metals in a sintering operation. The invention is especially applicable to the removal of cadmium and lead in the sintering of zinc ores.

This application is a division of my prior application, Serial No. 422,998, filed January 24, 1930.

It has been found that in a sintering operation the volatile metals tend to condense in the lower portion of the bed as they come in contact therewith and that the removal of these metals from the bed requires a higher temperature or a longer sintering period for the lower portion of the bed than for the upper portion thereof. The present invention provides for so controlling the temperature and duration of the sintering in the various portions of the bed as to substantially eliminate the volatile metals from the various parts thereof. This is accomplished by adding a quantity of fuel or raw ore at a predetermined portion of the bed, as for example, near the bottom thereof, so that a greater heat may be developed when the zone of combustion reaches this part of the bed during the sintering operation. For accomplishing this, an auxiliary feeder is employed which is so arranged that the position in the bed to which the fuel is applied may be varied and controlled at will.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which

Fig. 1 is a side elevation of a portion of the sintering machine partly in section showing the arrangement of the feeders; and

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Like reference characters denote like parts in the several figures of the drawing.

In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring to the drawing more in detail, the invention is shown as applied to a sintering ma-

chine comprising a plurality of pallets 10 which are driven by wheel 11 and are mounted upon a suitable track not shown by which they are passed through the various portions of the machine. For feeding a charge to the pallets there is provided a chute 12 which receives material from a pugmill 13 in which the charge is thoroughly mixed and applies the same to the pallets as they are passed thereunder. Baffle 14 is provided for limiting the amount of charge applied to the pallets and causing the charge to be deposited in a thin even layer. The various parts of a sintering machine and the charging apparatus are well known in the art and are accordingly not described herein in detail, it being understood that the term "sintering machine" refers to a machine of the Dwight-Lloyd type.

For adding fuel or ore to the lower portion of the bed, there is provided an auxiliary feeder 20 which is mounted on trunnions 21. Feeder 20 communicates with chute 22 which receives material from traveling belt 23. Hopper 24 is mounted adjacent belt 23 and serves to apply the fuel or ore thereto.

For imparting an oscillatory motion to the feeder whereby the charge may be distributed evenly across the entire width of the pallets, there is provided a crank 25 which is connected by connecting rod 26 to rotating crank 27. Crank 27 may be operated in any convenient manner and causes a reciprocating movement of connecting rod 26 which in turn causes feeder 20 to pivot about trunnions 21.

For controlling the vertical distribution of the fuel in the pallets a nozzle 30 is pivoted, as by pivots 31, adjacent the end of feeder 20. Rod 32 is pivotally connected to said nozzle and is operated by lever 33 which is mounted on feeder 20. It is to be noted that the pivotal position of nozzle 30 is determined by the position of lever 33 and that the point of application of the charge is varied accordingly. An adjustable baffle 34 is provided for further controlling the distribution of the charge and preventing the same from becoming segregated.

In the operation of the above described device for the sintering of zinc ores, an auxiliary feeder is used to apply a definite amount of coal, coke, raw sulphide ore or other suitable fuel to any desired portion of the sinter bed. The amount of fuel is accordingly increased at the desired point, especially near the bottom of the bed, and insures a substantial removal of the volatile metals therefrom. As the zone of

combustion travels downwardly through the bed, the volatile metals are first condensed in the colder portions of the bed. As the zone of combustion reaches the lower portion, the extra heat produced by the added fuel causes these condensed metals to volatilize and to be substantially completely removed from the bed.

The reducing conditions produced by using an excess of carbon in the charge favor the elimination of cadmium, although the amount of zinc volatilized is comparatively small, seldom exceeding 1% of that charged into the machine.

It is to be noted that the position of the added fuel may be closely regulated by tilting nozzle 30 to apply the fuel at a prescribed point along the slope of the main charge. The corresponding regulation of baffle 34 prevents the fuel from rolling down this slope to an undesired extent.

Although certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the several steps of the process and in its operation and in the form and details of the apparatus illustrated may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. The method of sintering zinciferous material which comprises depositing a rearwardly sloping charge of such material upon the bed of a sintering machine, applying an auxiliary

charge of fuel to the slope of the main charge at a point where said auxiliary charge becomes incorporated in the lower portion of said main charge and sintering the charge thus formed.

2. The improvement in sintering zinciferous material to eliminate lead and/or cadmium therefrom which comprises incorporating additional fuel in the lower portion of a layer of said zinciferous material and treating same in a sintering machine of the Dwight-Lloyd type whereby quantities of lead and/or cadmium which condense in the lower portion of the layer in the first stages of the sintering process are volatilized as the sintering process progresses.

3. The process of sintering ores for the elimination of volatile metallic impurities which comprises feeding a main charge of such ore to the bed of a sintering machine in a manner adapted to effect a slope at the end of the charge most remote from the zone of combustion, supplying additional fuel along the slope of such charge and incorporating said additional fuel in the lower portion of the charge before the charge enters the sintering zone.

4. The method of incorporating additional fuel in ore suitable for sintering which comprises establishing a layer of ore having a rearward slope upon the bed of a sintering machine, applying fuel along said slope and levelling off said layer of ore whereby said fuel is incorporated in the lower portion thereof.

BRUCE WINFRED GONSER.

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