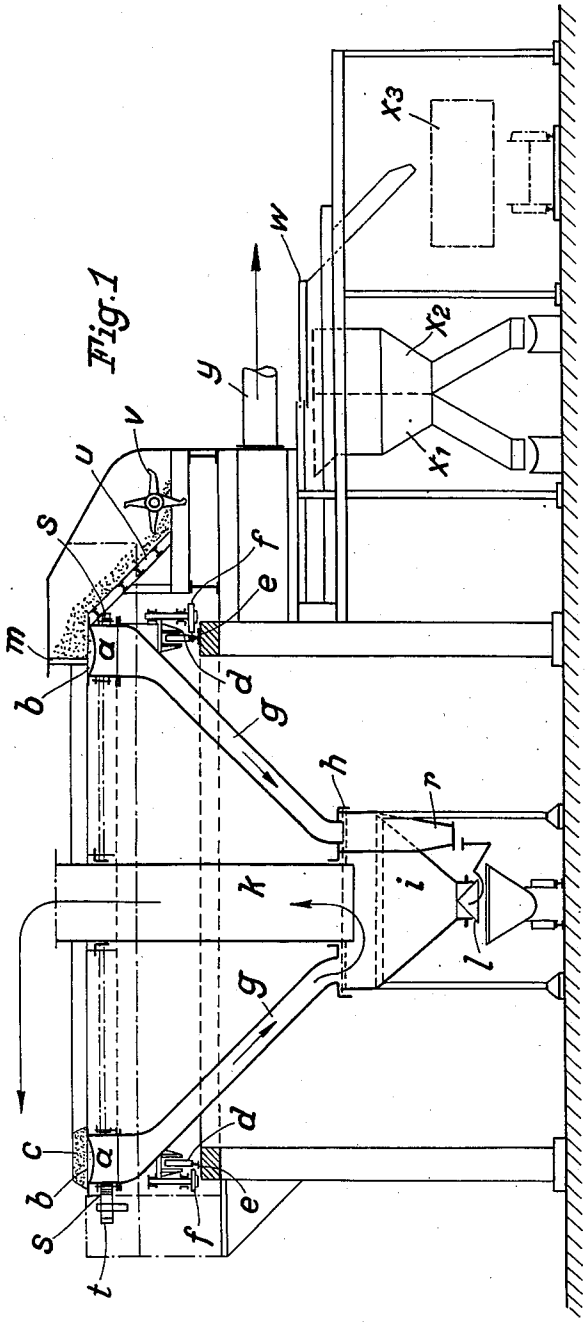
May 12, 1942. K. R. GÖHRE 2,283,053

SINTERING DEVICE

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Fig. 1



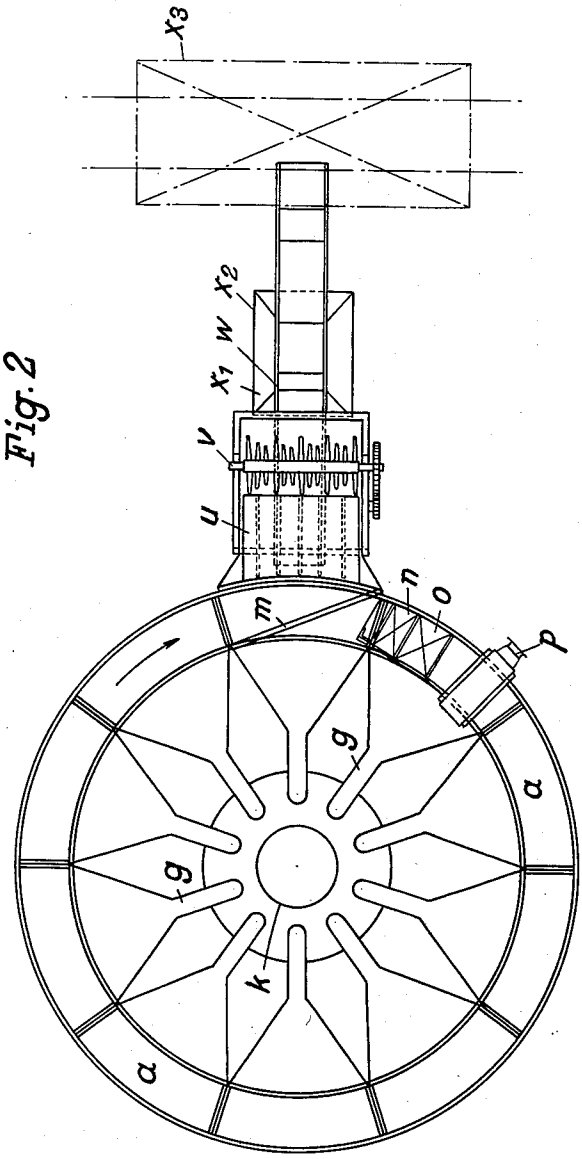
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SINTERING DEVICE

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Fig. 2



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Fig. 3

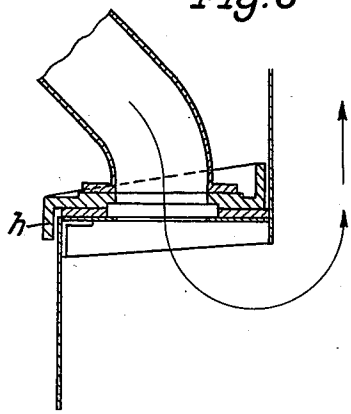


Fig. 4

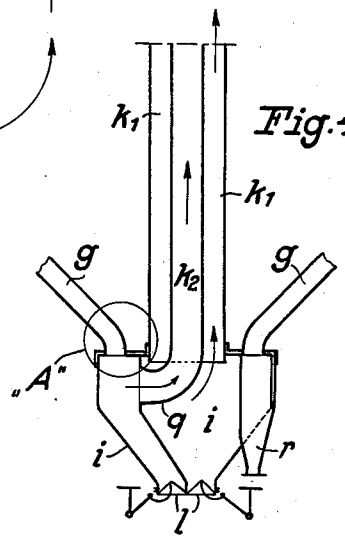
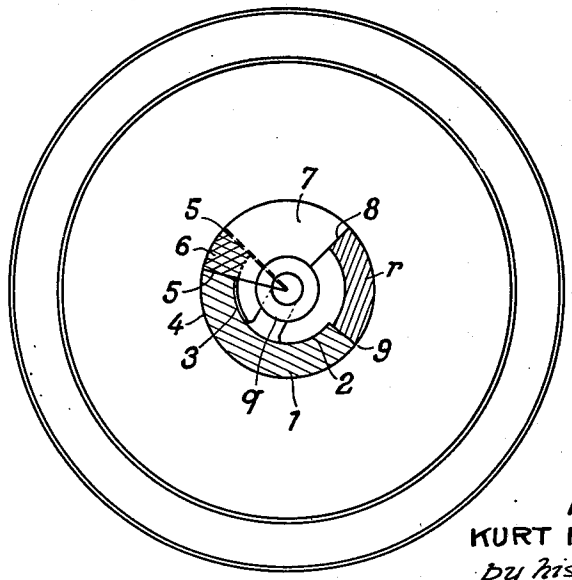


Fig. 5



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UNITED STATES PATENT OFFICE

2,283,053

SINTERING DEVICE

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Application November 26, 1940, Serial No. 367,291
In Germany October 20, 1939

3 Claims. (Cl. 266—21)

For the roasting and sintering of ores and similar materials there are frequently used ring-shaped blower grates which turn about a horizontal axis. In connection with devices of this type, the charge is removed from the grate by means of strippers or the like, without the grate being tipped as is necessary in the case of upright sintering plants or sintering ladles. During the charging of the material to be placed on the grate and of the mixture to be sintered, a certain quantity of fine substance will drop down through the grate. In the case of the ring-shaped blower roasters, this fine substance as well as the material which drops through the grate when the charge is removed from the latter is collected in suction chambers disposed below the grate, while the gases are carried off from the various suction chambers through horizontal flues to a central control head. The latter connects and disconnects the various flues and the blower at intervals. It is necessary to remove the fine substance from time to time through side ports. The volume of the substance accumulating in the said suction chambers is rather great, particularly in connection with the high output encountered in the sintering of iron and copper ores, so that the chambers need frequent cleaning. The removal of the dust from the chambers was hitherto possible only by stopping the operation of the plant. This practice, particularly when dust accumulates in considerable quantities, causes frequent interruptions in the work and production stoppage. Another drawback of this prior expedient is that unnecessary power losses arise as a result of the acute changes of direction of the gas stream in the suction lines, particularly when working with great quantities of air and high vacuum.

It is an object of this invention to eliminate these defects, and to provide that the gas flues from the suction chambers run at such an incline down to the control head that the gases will carry the material which has dropped through the grate, into a dust separator provided in the control head.

Another object is to provide the dust separator with means for passing the gases from the flues during an angle of their rotation after they have passed the furnace, to one gas discharge conduit, and to pass the gases from said flues during another angle of their rotation to another gas discharge conduit.

A further object is to provide control means in said dust separator for disconnecting the flues during an angle of their rotation from the draft or suction imposed upon the flues during another angle of their rotation.

Other objects and features of novelty will be apparent from the following description and the accompanying drawings, in which there is shown a device in accordance with this invention, by way of example.

In the drawings—

Fig. 1 illustrates the preferred embodiment of sintering device diagrammatically and in vertical section;

Fig. 2 is a plan view of the same;

Fig. 3 is an enlarged view of the portion of Fig. 4 within the circle A;

Fig. 4 is similar to the central portion of Fig. 1, showing a modified form of control head; and

Fig. 5 is a plan of Fig. 4, partly in section.

The sintering device, according to the preferred embodiment of the present invention, comprises a suction chamber *a* and a grate *b*. Upon the grate there rests in the manner shown in Fig. 1, the charge *c* consisting for example, of a bottom layer covering the grate and a top layer of the material to be treated. The grate is driven by means of a gear rim *s* and a pinion *t* in the manner known per se. The flue gases are carried to the dust separator and control device *i* by means of the flue *g* which slants downward. The said annular roasting or sintering device *b* rests on casters *d* which run over a rail *e*. Several rollers *f* distributed over the circumference of the grate serve for the lateral guiding of the device.

The stationary dust separator and control device *i* is provided on top with a cover *h*, which rotates with the conduit *g*, the suction chambers *a* and the roasting grate *b* as a unit. This cover is sealed for example in the manner shown in Fig. 3, against the housing of the container *i*, and if need be also against the waste gas conduit *k*, particularly if the latter leads upward from the said container *i*. Of course, the flues *g* may also lead in a different manner into the container *i* for example from the side and possibly so that the said flues terminate in a rotary ring provided on the cylindrical portion of the said container *i* for instance near the top edge thereof. The outlets of the said flues *g* are disposed in the said cover *h* and the container *i* is provided with discharge openings *l*, either at the bottom or on the sides.

The container *i* is also provided with a separate section or compartment for that portion of the flues *g*, which is temporarily not connected with the blower. This portion *r* is preferably

equipped with a separate discharge for the material dropping through the grate. The discharge devices, particularly in that portion of the container *i* which is under suction draft, are suitably constructed like locks to prevent air from entering the container *i* during the discharge of dust or the like.

Above the blower grate *b* there are disposed the furnace *p*, the charger *o*, and if desired an additional charging device for the roasting grate covering *n*. The blown-off material is removed from the ring-shaped grate *b*, which rotates in the direction of the arrow shown in Fig. 2, by means of the stripper *m*. The suction chambers *a* are preferably subdivided in the customary manner, for example as shown in Fig. 2.

The material which is thrown off by the stripper *m* is conveyed by means of the ejector grate *u*, and crackers or breaking cylinders *v* to a rocking trough or the like *w*, which may at the same time be equipped as a sifting device. By means of this device, the material may then be separated, for example, into three grain sizes: material which is to be used again; roasting grate covering; and ready sinter; for which there are provided bins or conveyor devices *x1*, *x2*, *x3*. The dust created during the ejection and breaking of the material and during the sifting may be drawn off by means of devices *y*, of a type known per se. Also the control system *i* which connects and disconnects the flues *g* and the blower and the gas discharge from the said control device *i* may be constructed and arranged in a manner known per se.

Figs. 4 and 5 show by way of example and diagrammatically, an embodiment of the invention by means of which gas currents of different composition, for example gas currents having different sulfur dioxide contents, can be discharged apart from one another. This device may for instance be used in connection with the blow roasting of sulfurous material to lead off rich and useful gases through the conduit *k2* of the gas discharge *k*, while lean and useless gases are led off through the conduit *ki*.

To this end the container *i* is sub-divided as is shown in Figs. 4 and 5. The suction chambers of the section *r* above which are the devices used for the removal of the treated material, for the cleaning of the grate and for the charging of the material, are generally disconnected from the blower. When the suction chambers reach that area or section, the solid substances which drop down through the suction chambers and the flues *g* collect in the portion *r* of the container *i*.

In the course of their rotation, the suction chambers then pass through under the ignition furnace. Soon after the ignition there are created gases with high sulfur dioxide contents of approximately 2–8% and the evolution of these rich gases will last for ⅓ to ⅔ of the total roasting time. During that portion of the revolution, the suction conduits connect with section *l* of the container *i*, the said section being bounded by the walls **2**, **3**, **4**, **5** and **9**, and connecting by means of the passage *q* with the discharge conduit *k2*. The wall **5** is preferably movable and pivoted so that it can turn about the center axis of the container *i* so that the length of the rich gas section is adjustable. It may be extended by the entire length or by only a part of the regulating area **6**. Of course, aside from the wall **5** there are provided other sealing means which assure the connection with the wall **3**. The various walls in the container *i* are preferably provided with top cover plates to achieve a better separation of the gases.

Toward the end of the roasting or calcination of sulfidic ores and the like the sulfur dioxide concentration of the gases drops considerably so that these gases can no longer be used. For that quantity of gas there is provided in Fig. 5 the separate discharge through the lean gas area **7**, with which the conduits *g* correspond after their outlets have slid over the wall **5** of the rich gas area and until they have passed the wall **8** of the dead area *r*. The compartment **7** of the container *i* connects with the gas discharge *ki*.

It is to be understood that the invention is not limited to the use for suction drafts sintering plants and that it possesses the afore-described advantages also when the gases are not drawn through the charge but are forced through by pressure.

I claim:

1. Sintering device comprising an annular grate, suction chambers below said grate, a dust separator below said chambers, downwardly inclined flues from said chambers to said separator, means for rotating said grate, chambers and flues as a unit, and means in said separator for controlling the disposition of the discharge from said flues, said flues being connected to the bottom of said suction chambers and with the flues having a size to correspond to the size of the cross section of the suction chamber.

2. Sintering device comprising an annular grate, suction chambers below said grate, a dust separator below said chambers, downwardly inclined flues connected to the bottom of said chambers and having a size to correspond to the size of the cross section of said suction chambers and extending to said separator, means for rotating said grate chambers and flues as a unit, a gas outlet conduit from said separator, a separate compartment in said separator, and means for connecting certain of said flues with said outlet and the remainder thereof with said compartment.

3. Sintering device comprising an annular grate, a furnace above said grate, suction chambers below said grate, a dust separator below said chambers, flues from said chambers to said separator, means for rotating said grate, chambers and flues as a unit, said separator having separate gas conduits, means for connecting said flues during successive angles of rotation past said furnace respectively with said conduits, and means for adjusting the angles of rotation for which the flues are connected with said conduit, said flues being connected to the bottom of said suction chambers and downwardly inclined to said separator and having a size to correspond to the size of the cross section of the suction chamber.

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