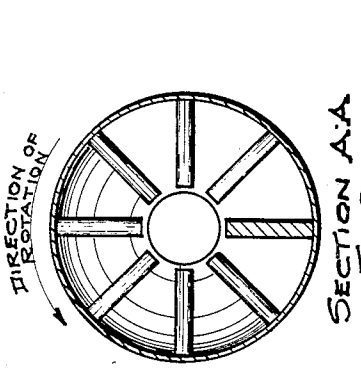
March 6, 1934. G. H. FRANTZ 1,949,933

SULPHUR BURNER

Filed March 25, 1932



SECTION A-A
FIG. 2

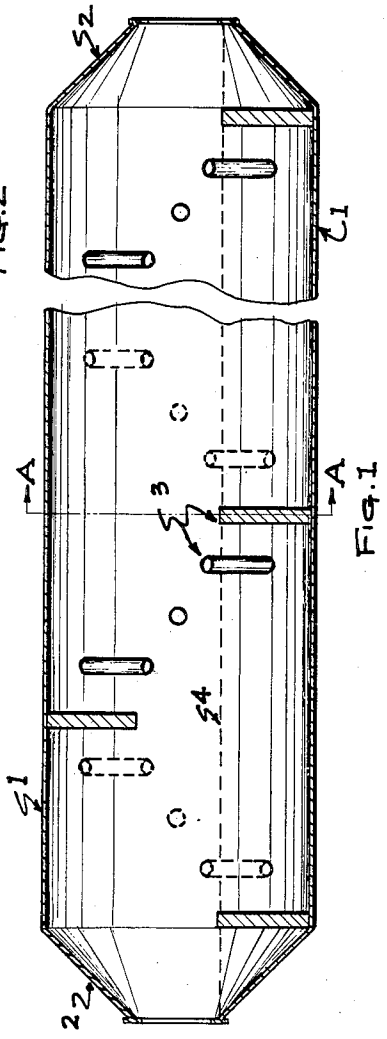


FIG. 1

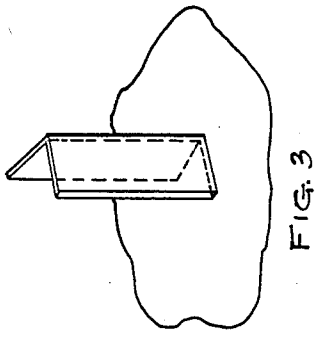


FIG. 3

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SULPHUR BURNER

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1 Claim. (Cl. 23—278)

The present invention relates to rotary sulphur burners in which the inner surface of the drum which contains the burning molten sulphur carries a series of individual projections, which will break up and cause to move forward any agglomerated masses which form in the bed of molten sulphur in the burner and thereby prevent the accumulation of large masses of impurities in the burner.

The small amounts of dirt usually contained in brimstone agglomerate in rotary sulphur burners, after they have been in operation for some time, into large plastic lumps which enclose considerable amounts of sulphur.

The formation of such lumps is greatly favored when the burner is operated at reduced capacity.

The agglomerates float on the bed of molten sulphur and often collect in the form of a plastic, snake-like mass which extends through the whole length of the burner and at times sticks up to 8 to 12 inches above the bed. Such snake not only reduces the surface of the burning sulphur bed, but it is always changing its position influencing thereby draft conditions in the burner. A sudden shift of such agglomerates in the burner is always accompanied with a radical change in the SO_2 content of the burner gases, whereby the efficiency of the sulphuric acid process is reduced.

These agglomerated masses are not discharged from the burner and they finally become so large during the course of a few months and their interference with the draft regulations and operations of the burner becomes such that the burner has to be shut down and cleaned out.

I have found that small agglomerates of sulphur and dirt as formed in rotary sulphur burners are broken up and the dirt discharged continuously when the inside of the burner drum carries a number of individual projections which reach far into the inside of the drum.

The attached Figure 1 shows a longitudinal section through a sulphur burner drum equipped with projections according to my invention.

Fig. 2 is a cross section through A—A of the burner of Fig. 1.

Fig. 3 represents a projection, or spike in one of the preferred forms.

A rotary sulphur burner consists generally of a cylindrical, substantially horizontal drum, 1 of Figs. 1 and 2, which is terminated at both ends by a truncated cone 2, Fig. 1. This drum rests on trunnions and is rotated by any desired means. Solid or liquid sulphur is introduced into the burner drum through one of the frustums, the burner gases leave through the other one.

The driving mechanisms of the burner, the attachments for the introduction of sulphur and the means for carrying the burner gases away from the rotating drum are only incidental to the performance of my invention and as they are well known in the arts, they are not represented in the drawing and need not be further described.

The surface of the bed of molten sulphur is shown at 4 in Figs. 1 and 2.

In the construction of a sulphur burner according to my invention, I fix to the inside of the burner drum a series of projections. Such projections are shown as 3, in Figs. 1 and 2.

These projections can be of any desired shape, polygonal as well as round spikes are entirely satisfactory, such spikes can be bolted or welded to the shell of the drum. Blade shaped projections can likewise be used successfully. I have also installed projections formed from angle iron, as shown in Fig. 3. The pieces of angle iron were welded to the inside of the shell with their nose pointing in the direction of rotation of the drum.

The size of these projections should be such that they produce, on rotation of the drum, a gentle agitation in the bed of molten sulphur and they should reach into the zone where large agglomerates of sulphur and dirt would be formed in the absence of such projections.

As a general proposition I can say that projections which extend about ⅛ of the diameter of the drum into the drum will already show a beneficial effect towards preventing the formation of large agglomerated masses. These projections can extend as far as desired into the drum, though it seems unnecessary to make them longer than the radius of the drum and I rather prefer to make these projections shorter than the radius of the drum.

The projections shown in Figs. 1 and 2 are about ⅓ of the diameter of the drum and were found to be very efficient in preventing the formation of large agglomerates.

An efficient prevention of the formation of large agglomerates is obtained when a series of spikes, for instance one for each foot of burner length, is placed at random throughout the burner drum. When placed in such fashion the spikes will not greatly effect the elimination of the dirt particles and these will either be entrained in the burner gases or, to a certain extent, accumulate at the discharge end of the drum towards which end there is a slow flow of sulphur.

I can improve the elimination of the dirt contained in the brimstone which, in burners equipped according to my invention floats as small particles in the molten sulphur, by using blade shaped projections and fix them in the drum in the path of a spiral developed in the direction of rotation of the burner. The floating dirt is gradually pushed towards the gas discharge end of the burner and discharged through the gas exit opening.

Figs. 1 and 2 show this arrangement of the

spikes in spiral form, with 3 revolutions for the full length of the drum and 8 spikes to each spiral.

I can also construct my sulphur burner with projections in both conical ends in addition to the projections in the cylindrical part. I obtain thereby a more rapid distribution of solid sulphur introduced and a more efficient discharge of the dirt which accumulates as a fine dust at the gas discharge end of the burner.

The projections attached to the inside of the burner drum have also other advantages besides preventing the lump formation. The spikes, during their course of travel, pick up sulphur gobs and as they pass into the combustion space this sulphur falls back in the form of drops which ignite, greatly increasing thereby the combustion surface.

The combination of the various effects of the spikes results in the elimination of shut downs due to accumulation of dirt in the burners; a more uniform gas is obtained, the number of draft adjustments required was, for instance, cut in half by installation of spikes in an ordinary rotary sulphur burner. I also found that after shut downs burners equipped with spikes according to my invention return to normal operation more quickly than ordinary burners.

Comparing burners equipped with individual projections according to my invention and burners equipped with one or more continuous spirals or agitator bands, I found that in the latter burners the agglomerates of sulphur and dirt are not broken up; on the contrary, as there is no abrupt emergence from or immersion of metallic parts in the liquid sulphur bath as is the case with spikes, which produces an irregular agitation in the liquid, the continuous progress of the band in the liquid produces a rolling movement in the viscous sulphur which favors the formation of large snake-like agglomerates.

I claim:

A burner of the rotary type for burning elemental sulphur in which the inside of the rotating drum, containing the burning molten sulphur, is equipped with a series of individual inwardly projecting spikes which have a length at least equal to one-eighth of the diameter of said shell.

GLEN H. FRANTZ.