Dec. 6, 1955 A. RICHTER-GLIER 2,725,834

CLINKER DISCHARGE DEVICE FOR COMBUSTION APPARATUS

Filed March 26, 1952

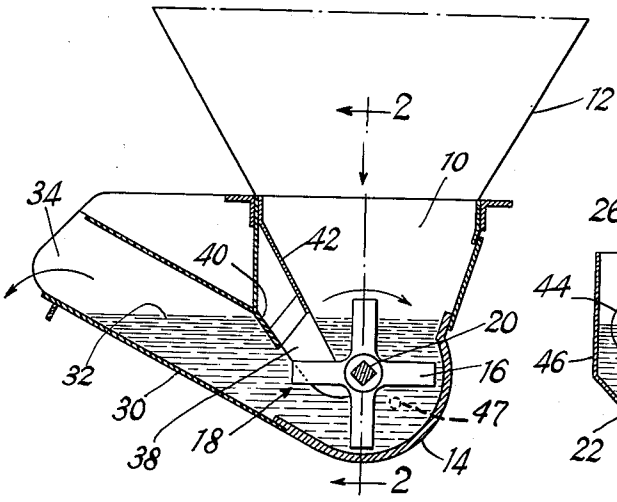


FIG. 1

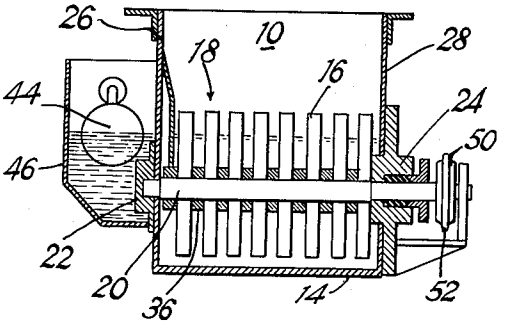


FIG. 2

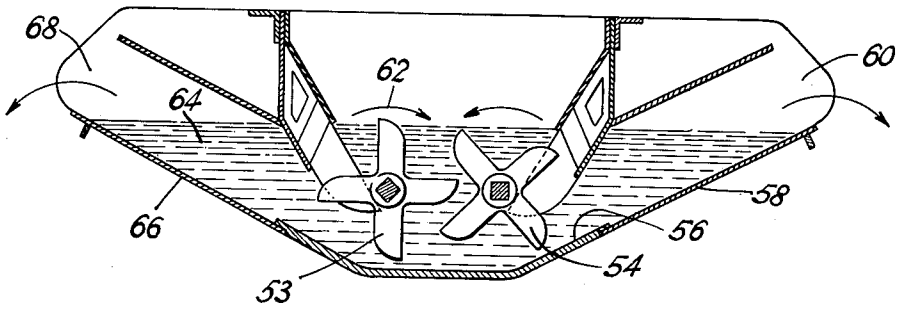


FIG. 3

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CLINKER DISCHARGE DEVICE FOR COMBUSTION APPARATUS

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1 Claim. (Cl. 110—171)

This invention relates to apparatus for the disposal of the solid incombustible matter such as ash or clinker formed by combustion apparatus.

In a more specific sense, the invention involves a combined clinker crusher and discharger receiving ash and clinkers from a furnace outlet and simultaneously crushing those materials and discharging the same to a disposal zone.

The invention also involves such a construction and arrangement of elements as to form, in a unitary structure, a clinker crusher at least partly operating through a submerging body of liquid and discharging the crushed material through the liquid to a disposal zone. In an embodiment of the invention, a power operated clinker crusher such as a crusher involving rotating star wheels operates partly under a body of water in a well construction which is associated with a hopper receiving clinker and ash from combustion apparatus and directing it to the crusher. The power operated crusher operates in such close association with a part of the surface of the well construction that the crushed material is forced or discharged through the water to a disposal outlet as the crusher operates.

The invention will be described with reference to the accompanying drawings in which—

Fig. 1 is a vertical section of an embodiment of the invention involving a single rotating clinker crusher and a single outlet for the crusher;

Fig. 2 is a vertical section at right angles to the plane of the Fig. 1 section, on the line 2—2 of Fig. 1, and

Fig. 3 is a vertical section of another embodiment of the invention involving a double clinker crusher construction with a plurality of outlets for crushed clinker.

The clinker crusher and discharger of Fig. 1 has a hopper **10** adapted to be disposed beneath the ash or clinker outlet of a furnace chamber **12**. The hopper has a curved bottom **14** preferably having a curvature of the order of the circular path of movement of the outer ends of the arms **16** of the star wheels **18** which are fixed upon a shaft **20** rotatably mounted in journal bearings **22** and **24** secured to the walls **26** and **28** of the construction.

The well construction of the illustrative apparatus has an inclined wall **30** extending upwardly from the curved bottom **14** of the hopper to provide a receptacle for a body of water or other coolant **32** and to provide for an outlet **34** for crushed slag.

The power operated slag crusher has its star wheels **18** held apart by spacers **36** so that the teeth **16** may operate between other similarly spaced teeth **38** fixed relative to the entire well construction as by being secured to the elements **40** and **42**.

Any desired level of the water within the well construction may be maintained by a float mechanism **44** operating within the auxiliary receptacle **46** which has an opening **47** near its bottom communicating with the hopper in which the clinker crusher operates.

The shaft **20** of the power operated clinker crusher is shown as having a driving pulley **50** which may be operated by a belt **52**.

The Fig. 3 embodiment is similar to the embodiment above described, but it has two power operated radially toothed crushers or rollers **53** and **54** rotating in opposite directions. The radial teeth of the crusher **54** operate in close relationship to a part **56** of the wall of the well construction to cause crushed clinker to be moved along the inclined wall **58** to the clinker outlet **60**, and the companion crusher is rotated in the reverse direction as indicated by the arrow **62**, and similarly feeds crushed clinker upwardly through the body of water **64** and along the inclined wall **66** to the opposite outlet **68**.

The entire apparatus may be referred to in other terms, as for instance, a clinker discharge device or clinker grinder. It may also be appropriately referred to as an ash grinding or removing apparatus. The body of this apparatus may also be referred to as a receptacle or a basin, having in mind particularly the fact that it maintains a body of liquid therein. This portion of the body may be also referred to as a sump. It may be also referred to as a housing which encloses a cylindrical clinker grinder and conveyor. Again, it might be appropriately referred to as involving the clinker funnel of a furnace.

The illustrative constructions combine a clinker grinder and discharger in such an arrangement that the head room requirements for the entire combustion construction with which the clinker crusher is associated are minimized, and the possibility of damage to the operative elements of the clinker crusher by overheating is also minimized.

Although the invention has been described with reference to the details of preferred embodiments, it is to be understood that the invention is not to be considered as limited to all of the details thereof. It is rather to be taken as of a scope commensurate with the scope of the subjoined claim.

I claim:

In a clinker crusher and discharger for combustion apparatus, a clinker receiving hopper for maintaining a body of liquid with predetermined liquid level in the hopper, said hopper having a clinker outlet at a level above the liquid level, a rotating clinker crusher and discharger disposed in the bottom of the hopper directly in the path of descending clinker and having a plurality of axially and radially spaced teeth movable through the body of liquid and along the bottom of the hopper toward said outlet, the hopper having an upwardly extending wall close to the oncoming teeth of the rotating crusher in the upper part of their orbit, and a set of spaced and fixed teeth secured to the hopper in alternation relative to the crusher teeth so that the teeth of the clinker crusher pass therebetween, the rotating clinker crusher being operative to move all clinker from the hopper.

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