

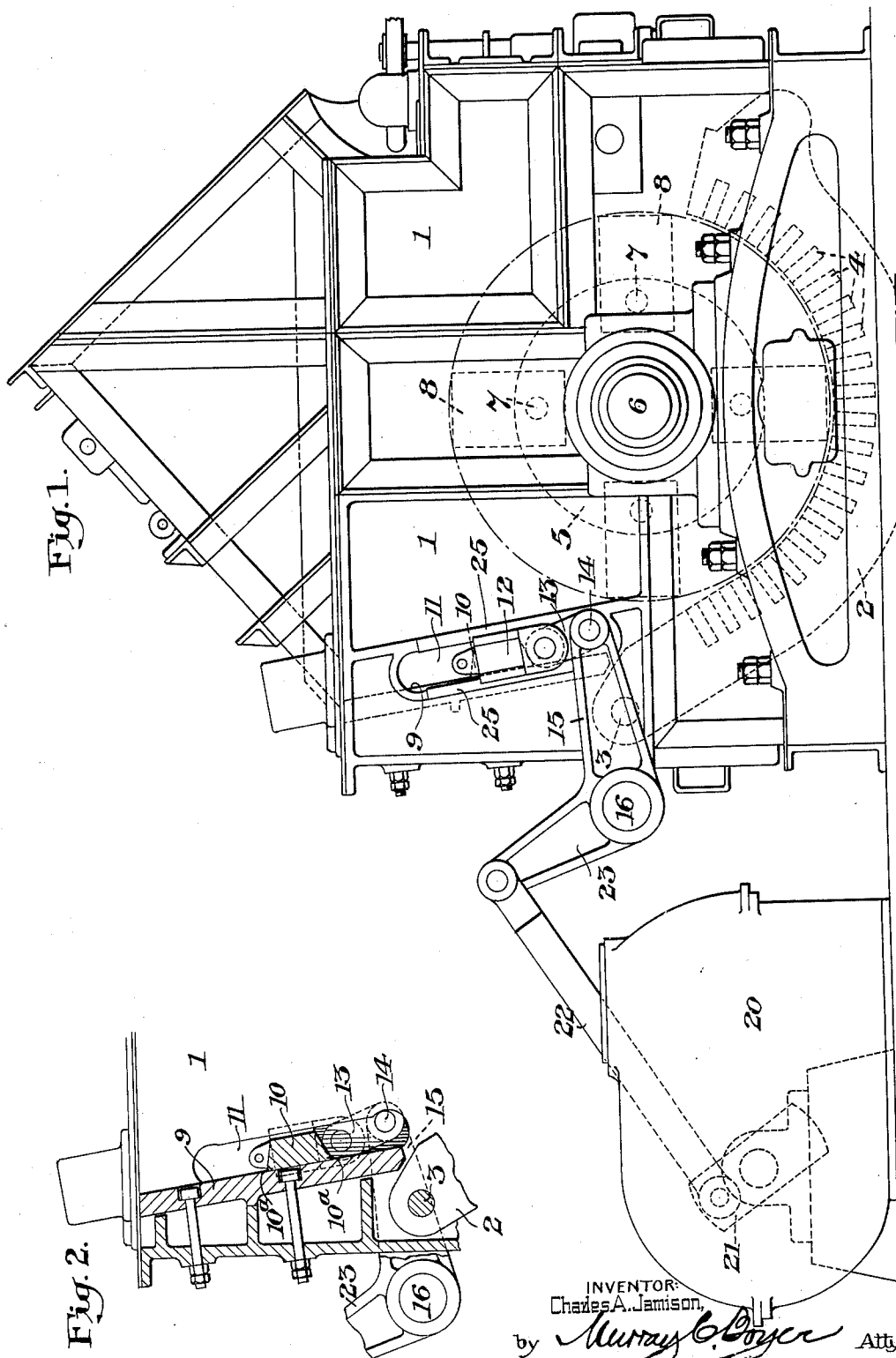
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CRUSHING MACHINERY

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UNITED STATES PATENT OFFICE

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CRUSHING MACHINERY

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This invention relates to crushing machinery of the type employing rotor structures carrying hammers which engage material delivered into their path and effect breakage or rupture thereof by hurling the same against a breaking surface (or surfaces) forming one wall or part of one wall of the crushing chamber.

In the crushing of raw material of various kinds, it is common to find material containing a high moisture content, and various materials which are to be crushed, are frequently stored under such weather conditions as to absorb additional moisture.

In the crushing of material in a wet or moist condition, a mass of highly viscid mud builds up on the breaking surface (or surfaces) and seriously impairs the capacity of the machine. The main object of this invention therefore is to provide means that will prevent this building up of a body of sticky or slimy material, mud, and/or the like, upon such breaking surface (or surfaces).

Another object of the invention is to provide a sliding member or scraping blade arranged to be reciprocated over the breaking surface against which the material is hurled by the rotating hammers.

And a still further object of my invention is to provide means for imparting proper reciprocative movement to the scraping blade.

These and other features of my invention are more fully described hereinafter; reference being had to the accompanying drawing, in which:

Figure 1 is a side elevation of a crushing structure with which may be employed the improved scraping mechanism within the scope of this invention, and

Fig. 2 is a sectional elevation of a portion of the breaking surface; showing the scraping blade in operative position with respect to the breaking surface.

In the present instance the improved scraping means and operating mechanism therefor have been applied to a crushing structure of usual type, employing a hammer-carrying rotor of usual character, arranged within a

crushing chamber whose lower portion is defined by a cage or screen pivotally mounted within the frame and carrying the usual bars or members with which the hammers of the rotor cooperate.

The frame of the crushing structure is indicated generally at 1, having a cage or screen comprising side frames 2, pivotally mounted at 3, and carrying the usual cross-bars 4. The rotor structure may be of usual type comprising a series of disks 5, mounted on a shaft 6; said disks supporting rods 7 from which hammers 8 are hung.

Carried by an end wall of the frame is a breaker plate 9 which may be of any usual type; in the present instance shown as inclined slightly from the vertical and disposed above the cage or screen. The material to be crushed is fed through the usual chute or hopper opening at the upper portion of the frame and is hurled against this breaker plate and partly broken by impact thereon; further breaking or reduction being effected by the hammers 8 cooperating with the cross-bars 4 of the cage or screen.

When material carrying a large moisture content is being reduced, considerable difficulty is had in keeping the breaking surface clean. In practice, a wall of mud builds up on such breaking surface, and such wall being so much less hard than the normal breaking surface, there is practically no breaking by impact, and unless removed, the breaker plate will become so clogged with this mud as to destroy the efficiency of the machine and in some instances completely stop its operation by clogging the hopper.

To overcome the difficulty occasioned by the wet or damp portion of the material building up on the breaking surface, I propose to employ a reciprocating scraping bar or blade 10, clearly illustrated in Figs. 1 and 2; which blade is reciprocated over the breaking surface. The ends of the blade or supports therefor extend through openings 11 formed in the side walls of the crusher frame. This blade may be provided with end brackets or supports 12, pivotally attached to links 13, which links are connected at 14 to bell-crank levers 15, pinned or otherwise con-

5 nected to a shaft 16 externally disposed and
 extending across the end of the machine.
 Upon rocking shaft 16, the scraper blade 10
 will be reciprocated across the breaking sur-
 10 face. Preferably this blade is provided with
 cutting edges 10^a, so that as it is moved back
 and forth it will actually cut away and re-
 move the mud tending to build up on such
 15 breaking surface. It will be understood, of
 course, that the reciprocative movement of
 the scraper blade is continuous while the ma-
 chine is in operation.

15 For the purpose of driving the rock shaft
 16, which is operatively connected to the
 scraping blade 10 and serves to effect move-
 ment of the latter, I provide a motor 20,
 whose shaft carries a crank arm 21, connected
 20 by link 22 to an arm 23, carried by rock shaft
 16, and such arm 23 may be an extension of
 one of the bell-crank levers. The connection
 between the several parts is such that proper
 adjustment may be made so as to vary the
 speed and/or the extent of the stroke of the
 25 scraper blade.

25 In the present arrangement, with the side
 walls of the frame making up the hammer
 structure slotted at 11 for the passage of the
 scraper blade, slide ways 25 may be provided
 30 for guiding the brackets 12.

30 While I have illustrated a crushing struc-
 ture having an inclined breaking surface, it
 will be understood that the angle of such
 breaking surface may be changed as may be
 35 desired and that crushing structures having
 breaking surfaces with other degrees of an-
 gularity may be equipped with the scraping
 blade operated by means disposed external-
 ly of the frame or casing of the machine.
 40 In like manner such blade may be operated
 in connection with a breaking surface verti-
 cally disposed.

I claim:

1. The combination, in crushing machin-
 45 ery of the rotary beater type, of a casing or
 frame having a breaking surface, a scrap-
 ing blade disposed within said casing and
 having end connecting portions; the walls
 of said casing being slotted adjacent to the
 50 breaking surface for the passage of said end
 connections, arms pivotally connected at one
 end to the casing and at the opposite end
 to said scraping blade, and means for moving
 said arms whereby said scraping blade may
 55 be reciprocated across the breaking surface.

2. The combination, in crushing machin-
 ery of the rotary beater type, of a casing
 or frame having slotted side walls, a rotor
 structure having hammers disposed within
 60 said casing, a breaking surface against which
 material undergoing crushing may be thrown
 by the action of the said hammers, a mov-
 able scraping blade disposed within said cas-
 ing and movable therein across said break-
 65 ing surface; said blade having end portions
 extending through the slotted sides of said

casing, and means disposed externally of the
 machine and operatively connected to said
 end portions for effecting movement of said
 scraper blade.

In witness whereof I have signed this spec-
 70 ification.

CHARLES A. JAMISON.

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