

E. E. HABERMAN
HAMMERS FOR HAMMER MILLS

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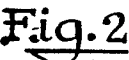


Fig. 4

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2 Sheets-Sheet 2

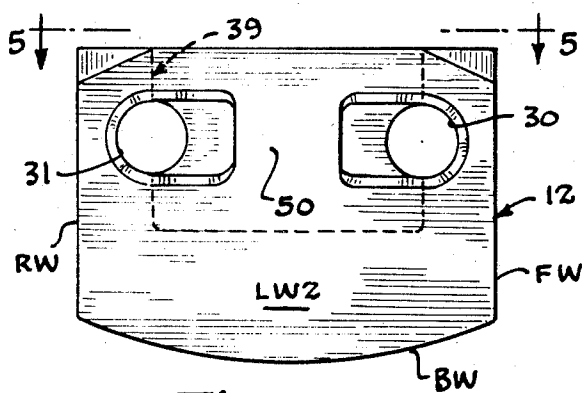
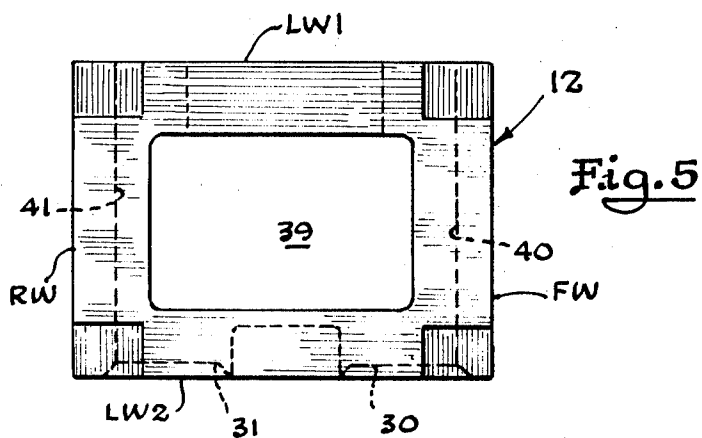


Fig. 6

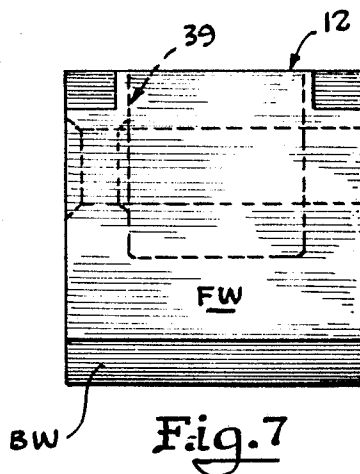


Fig. 7

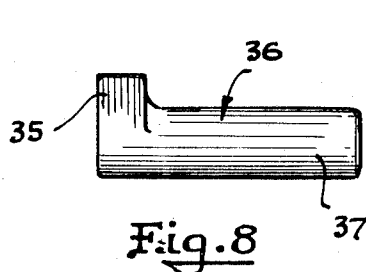


Fig. 8

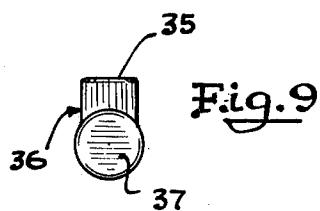


Fig. 9

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1

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HAMMERS FOR HAMMER MILLS

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3 Claims

ABSTRACT OF THE DISCLOSURE

A two-part mill hammer including a shank and a separable head either part having a cavity into which the other part fits joined by a pin detachably residing in opposed seats within the shank and head, thereby joining the head and shank, and held in place by a detachable retainer having a bent portion overlying the head of the pin.

This invention relates to a two-part mill hammer, including a shank and a head detachably secured thereto.

The wearing part of a mill hammer is the head which performs the work of attrition within the mill. It has heretofore been proposed to construct such a hammer of two parts so that the head may be detached from the shank either to replace a completely worn head with a new one or to turn a partially worn head to present a new leading face for performing the work of attrition within the mill.

The object of the present invention is to detachably join the head to the shank in such a way that detachment may be easily accomplished while using relatively few rugged and unsophisticated parts, and to so construct the head that this aim may be readily realized.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principle thereof and what is now considered to be the best mode contemplated for applying this principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention.

In the drawings:

FIG. 1 is a perspective view of a hammer assembly in accordance with the present invention;

FIG. 2 is a perspective view of all parts of the hammer in exploded form;

FIG. 3 is a sectional view of the hammer head having the pins and retainer seated therein;

FIG. 4 is a front elevational view of the head as shown in FIG. 3;

FIG. 5 is a top plan view of the hammer head per se substantially on the line 5—5 of FIG. 6;

FIG. 6 is a front elevation of the hammer head;

FIG. 7 is an end elevation of the hammer head; and

FIGS. 8 and 9 are side and end views of the pin, respectively.

Referring to FIG. 1, the hammer 10 of the present invention includes a shank 11 and a separate head 12 detachably secured thereto. As shown in FIG. 2, the shank 11 at one end includes a generally circular knuckle 14 having an aperture 15 extending therethrough. The aperture 15 enables the hammer assembly to be suspended on a supporting shaft within the hammer mill (not shown) in a manner well known in the art.

The shank 11 includes a depending tip 20 adapted to seat in a recess within the hammer head as hereinafter described, and the opposite sides of the tip 20, adjacent the free end thereof, are formed with semi-circular pin

receiving seats 21 and 22 which are on axes parallel to one another.

The head of the hammer 12 is the part that performs the work and is generally rectangular in appearance including a front side wall FW, FIG. 3, a rear side wall RW and a pair of lateral side walls LW1 and LW2. In use, when the head is secured to the hammer tip, the forward wall FW will be the leading wall which performs the crushing or other attrition operation within the mill. As will be described in detail hereinafter, the head is detachably secured to the shank enabling the head to be detached and turned 180° so that the rear wall RW thereof will become the working portion or surface. By the same token, when the head is worn beyond a usable or effective state, the entire head may be detached and replaced by a new one.

In accordance with the present invention, one of the side walls as LW2 is formed with a pair of pin receiving openings 30 and 31, FIGS. 2 and 5, of such size as to accommodate the laterally bent head 35 of a pin 36 having an elongated shank 37. Two such pins are used and are of identical shape as will be apparent in FIG. 3. Each pin 36 is of a length somewhat shorter than the spacing between the lateral side walls LW1 and LW2 so as to be protectively confined within the hammer head as will be apparent from the drawings.

Thus, the openings 30 and 31 extend from the lateral side wall LW2 entirely through this side wall to be in communication with an enlarged rectangular recess 39, FIGS. 2 and 5, formed in the top of the hammer head. This recess is bounded by the interior surfaces of the side walls above described, and at the bottom the recess 39 is bounded by the interior surface of the bottom wall BW of the hammer head. The recess is of such size as to accommodate the tip 20 of the hammer shank 11 as will be apparent in FIGS. 1 and 4.

The interior surfaces of the hammer head side walls FW and RW, which are respectively adjacent the openings 30 and 31, are formed with semi-circular recesses or pin seats 40 and 41, and these seats open into and communicate with the recess 39 which receives the tip of the hammer shank. When the shank is properly positioned, the pin seats 21 and 22 in the shank tip will be directly opposite and in complementary relation to the pin seats 40 and 41 as shown in FIG. 4 so that the pins 36 when properly positioned will reside in the complementary pin receiving seats presented by the interior of the hammer head and the exterior of the hammer shank.

To retain the pins in place as hereinafter described, resort is had to a retainer or key 45, FIG. 2, in the form of a U-shaped clip having a pair of legs 46 and 47 and an interconnecting bight or strap 48.

In assembling the parts, the retainer or key 45, FIG. 2, is first moved into the recess 39 as shown by the dotted line path PA in FIG. 2, and then is moved forwardly so that the legs 46 and 47 thereof project through the pin-receiving openings 30 and 31. The strap 48 embraces and is anchored by the rear surface of the lug 50, FIG. 3, which separates the openings 30 and 31 in the hammer head.

The hammer tip is then set in the recess 39 so that the pin receiving openings 21 and 22 thereof are disposed opposite the corresponding pin receiving openings 40 and 41 within the hammer head recess. The pair of pins 36, FIG. 3, are then set in position by first advancing the shank or shaft portions 37 thereof into the openings 30 and 31, and inward movement thereof is continued until the heads 35 thereof, oppositely disposed as shown in FIG. 3, are seated within the openings 30 and 31. This will bring the heads of the pins into contact with the wall of the hammer tip which is behind wall LW2, although it should be noted that the hammer shank is not shown in

3

FIG. 3. In this manner, the pins are effective to accomplish a mechanical connection between the hammer shank and the hammer head. Thereafter, the projecting ends of the key 45 are bent over at 46A and 47A, FIG. 3, to afford wings extending in a plane parallel to the bight or strap 48 of the key 45. Such bending thereby interposes retention elements 46A and 47A which are effective to prevent displacement of the pins 36 in the direction of the openings 30 and 31. Displacement of the pins in the opposite direction, that is, in the direction of the opposite side wall LW1, is prevented by the heads of the pins bearing against the solid surfaces of the hammer tip which are inward of and adjacent the pin receiving openings 21 and 22 therein.

When it is desired to detach the hammer head for either purpose mentioned above, it is merely necessary to bend the wings 46A and 47A to their original position shown by dotted line in FIG. 3. The pins may then be easily slipped from retaining position, and the head separated from the shank.

It will be seen from the foregoing that the pins 36 of the present invention afford a relatively simple but nevertheless rugged and effective means of separably attaching the head to the hammer shank, the pins being retained in place by a one-piece key of simple form having deformable elements thereof effective to retain both pins in place at the same time.

Hence, while I have illustrated and described a preferred embodiment of my invention it is to be understood that this is capable of variation and modification.

I claim:

1. In a two part hammer, for a hammer mill, having a shank and a replaceable head detachably mounted on the tip of the shank; said head including side walls and a bottom wall and having a recess in the top thereof bounded by internal surfaces of the side and bottom walls of said head, the tip of the shank being disposed in said recess, a pin-receiving opening in one of the side walls of the head in communication with said recess, a pin seat formed in the internal surface of the hammer head wall adjacent the wall having said opening, the tip of the shank having a pin seat opposite the first-named seat, each of said pin seats being in communication with said recess, a pin detachably entered in said opening with portions thereof disposed in each of said seats to thereby detachably join the head of the hammer to the hammer shank within said recess, and

4

retainer means held in position by the assembly of the shank and head to retain the pin in place, said pin having a head seated in said pin-receiving opening and which bears at one side against the hammer shank within said recess, and said retainer means having a bent portion overlying the opposite side of the head of the pin.

2. A hammer according to claim 1 wherein there are two such retainer pins, one located on each side of the tip of the hammer shank within said recess, and wherein the retainer means includes two such bent portions, one for the head of each pin.

3. A two part hammer for a hammer mill comprising, a shank member and a replaceable head member detachably mounted one on the other, one of said members having a recess for receiving a portion of the other member, said recess being bounded by internal surfaces of walls of said one member having the recess, a pin-receiving opening in one of said walls, a pin seat formed in the other of said members in an internal surface thereof and in alignment with said pin-receiving opening, a pin received in said pin-receiving opening and having a portion disposed in said pin seat detachably locking the head and shank together, said pin including a head, and retaining means held in place by the assembly of said members to retain the pin in locking position, said retaining means including a strap portion positioned between said recess and the side wall of the member having the pin-receiving opening and having a wing portion extending outwardly through the pin-receiving opening, and the outer end of said wing portion being bent over the pin head.

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