COWED PIVOTED HAMMER.


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To all whom it may concern:

Be it known that I, Milton F. Williams, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Cowed Pivot Hammers, of which the following is a specification.

This invention relates to certain new and useful improvements in cowed pivot hammers, the peculiarities of which will be hereinafter fully described and claimed.

The main object of my invention is the provision of a cowed pivot hammer, preferably of the stirrup kind, having a cutting edge combined with a curved deflecting surface adapted to throw the material being reduced forward and outward again into the path of the hammer, so that the large particles are again subject to reduction because between the cage and the said cutting edge, while the finer particles pass out through the cage; secondly, to provide an adjustable cutting edge in connection with said deflecting surface; thirdly to provide an adjustable reversible plate, adapted to form a cutting edge and deflecting surface in either position; and fourthly, to provide an adjustable cutter-bars in the cover adapted to cooperate with said cowed pivot hammer.

In the accompanying drawing on which like reference letter indicate corresponding parts, Fig. 1 represents a vertical sectional elevation across the rotor shaft of a machine exemplifying my invention,—the section being taken just inside the side housing of the machine; Fig. 2, an enlarged detail view of my cowed pivot hammer in the stirrup form of cross bar head and spaced shanks; Fig. 3, a cross section on the line 2—2 of Fig. 2; Fig. 4, a similar detail view of my adjustable cutter bar in the cover; and Fig. 5, an end view of the same.

The letter A designates a rotor shaft mounted in a casing B having a hopper C with regulating slide D, and breaker plate E. The shaft A is provided with discs F having rods G on which are pivotally mounted shanks H of pivot hammers by means of holes at their inner ends,—said rods being eccentric and parallel to the shaft A. The outer ends of the shanks are connected by a cross bar head I which is concavely curved at the front with regard to the direction of rotation of the hammers as indicated by the hammer circle Fig. 1, and with the outer edge of said head located substantially in the radial plane R through the pivotal axis X of the hammers and center of the shaft A, and the inner edge located nearer the pivotal axis and forward of said plane R so that the said head is inclined with the concave towards the front. The shanks H are spaced apart substantially the width of the casing B and on the head is adjustably mounted a similarly curved plate J, preferably curved cylindrically and somewhat more than a half circle, having its lateral edges K K' beveled or otherwise sharpened. One edge, K for instance Fig. 8, is located substantially in radial plane R when in operation and furthest from the operative cutting edge. The other edge, K' for instance, is located in front of the radial plane R and is bent so much further outward radially than a portion of the connecting intermediate surface of said plate that is nearer to the pivotal axis than the forward edge K', that this forward projecting edge gives an outward flip to the larger particles of the material being reduced after being deflected upward and inward and outward again over the forward edge K', and against the cage L concentric with the rotor shaft, as indicated in Fig. 1. The finer particles pass out through said openings in the cage. The larger particles are again subject to reduction by the cutting edge K in connection with the cage till they are fine enough to pass through the cage.

The forward side edge K' extends so much further outward radially from the pivot axis than the intermediate portion of the deep cove between the lateral edges, that the forward edge give a decided flip outward to the material deflected from the cutting edge around the cover plate to the said forward edge K'. This forward edge likewise serves to guard the deep cove between the lateral edges, from the surplus material not passing under the forward edge to be acted on the cutting edge K as described. The surplus material therefore passes over the cross bar head to be engaged by the following hammer and either driven around in the deep cove as indicated by the arrows in Fig. 1, or again passing inward over the cross bar head to a following hammer or hammers.

The plate J is preferably reversible so that either the edge K or K' may be located sub-
stantially in the radial plane \( R \), and the other edge become the forward edge over which is deflected the coarser particles before mentioned. Any suitable fastening means may be used to connect the said plate adjustably to the head \( I \), such as bolts \( M \) passing through holes in the center line of the plate and through transverse slots \( O \) in the said head, and having nuts \( P \) on their outer ends to hold the plate in any adjusted position or reversed position on said head. On account of the curved shape of the plate, the outer cutting edge when adjusted laterally as indicated by dashed lines in Fig. 3, will project slightly in front of the plane \( R \), and a further radial distance from the pivotal axis of the hammer and therefore closer to the inner surface of the cage, when adjusted laterally outward as indicated in Fig. 3. Under the reaction of the coarser particles of the material being deflected, the outer cutting edge will normally recede so that it lies substantially in the radial plane \( R \) when operating, and further backward movement will cause it to recede from the cage. A close adjustment of the operative edge with regard to the cage is thus obtainable.

As indicated in Fig. 1, this coved form of hammer is adapted to pick up and carry forward portions of the material being reduced, and I provide in the casing cover \( B' \) a series of cutter bars \( Q \) mounted on radial faces of projections \( S \) projecting inward from the cover \( B' \). These cutter bars are beveled on their lateral edges and have holes in which are mounted the hook ends of hook bolts \( T \) that pass to the outside of the cover and are provided with nuts by which the cutter bars are adjusted against filler strips \( U \) so that the inner edge of each bar is close to the hammer circle, and the bar may be reversed to bring the other edge into operative position. As the material is carried by, and thrown outward against these cutter bars by the cove hammers, a further reduction occurs.

I claim:

1. A rotary pivoted hammer comprising shanks spaced apart and provided with holes at their inner ends for pivotal mounting, and a cross bar head connecting the outer ends of said shanks and concavely curved towards the front, and a similarly curved plate adjustably mounted on said concave head and having an operative lateral edge located substantially in the radial plane through the shanks and the pivotal axis, and means to adjust said plate laterally on said head and vary the distance of the operative edge from the pivotal axis and also from said radial plane.

2. A rotary pivoted hammer comprising a pair of spaced shanks having holes in their inner ends for pivotal mounting, and a cross bar head connecting the inner ends of said shanks and concavely curved towards the front and having transverse slots, a similarly curved adjustable plate having a beveled lateral edge mounted on said head and having bolt holes matching said slots, bolts passing through said holes and slots to the rear of said head, and nuts on said bolts, substantially as shown and described.

3. In a machine of the character described the combination with a casing, cutter bars radially adjustable in said casing, and means for adjusting said bars radially, of cutters co-acting with said cutter bars and consisting of rotary pivoted hammers having heads provided with surfaces curved concavely forward into coves adapted to pick up the material being reduced and carry it upward and further reduce it on said cutter bars.

In testimony whereof I have affixed my signature.

MILTON F. WILLIAMS.