J. L. HILLER.

ROTARY BEATER FOR SWING HAMMER CRUSHERS.

APPLICATION FILED JULY 23, 1919.

1,434,540. **Patented Nov. 7, 1922.**

2 SHEETS—SHEET 1.

FIG. 1

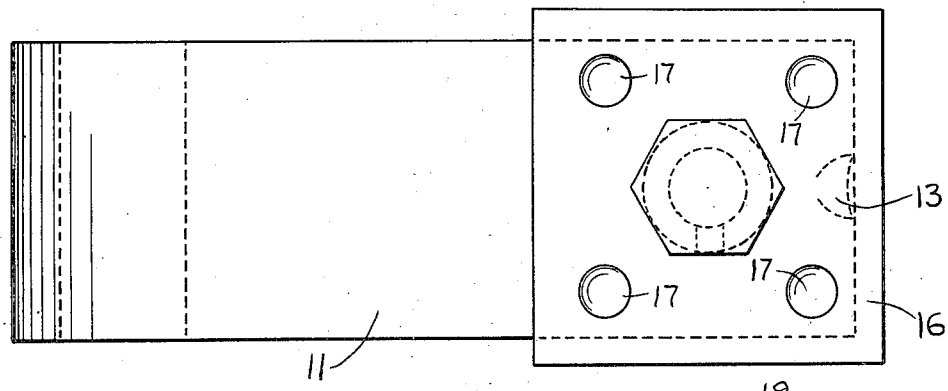


FIG. 2

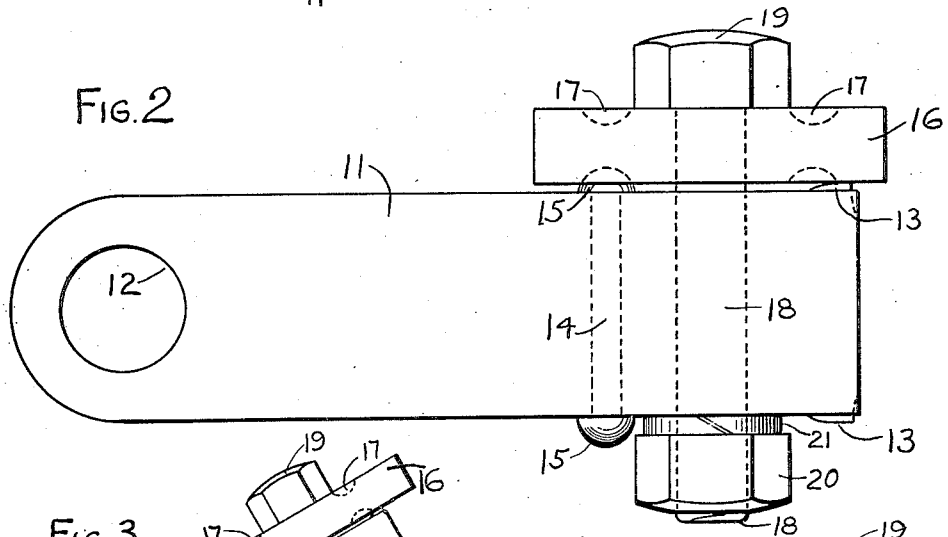


FIG. 3

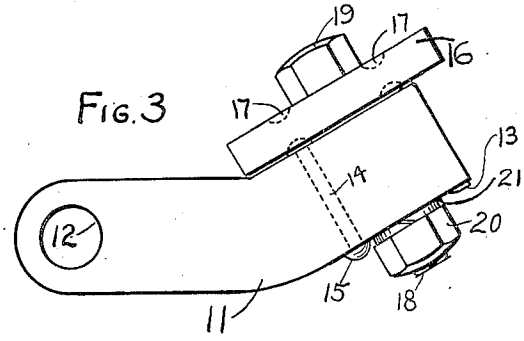
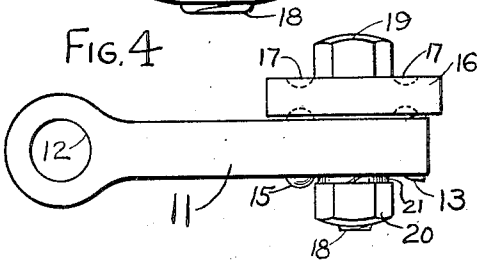


FIG. 4



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2 SHEETS—SHEET 2.

FIG. 5

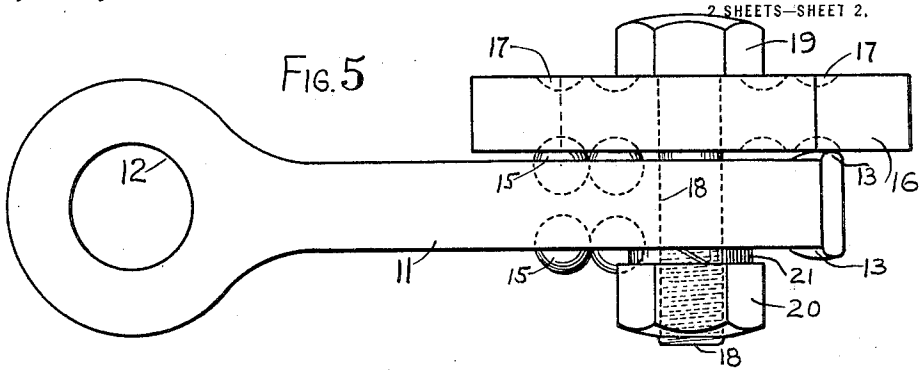


FIG. 6

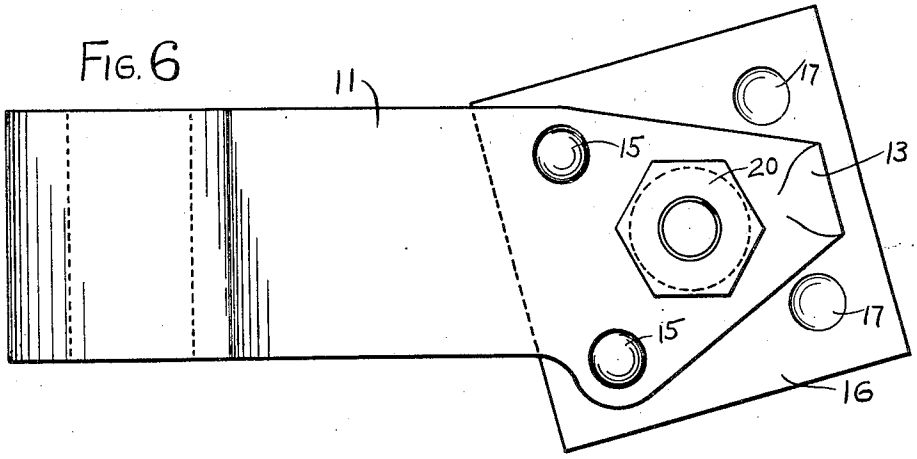


FIG. 7

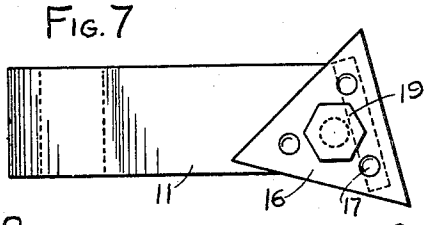


FIG. 9

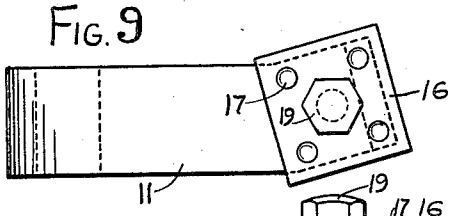


FIG. 8

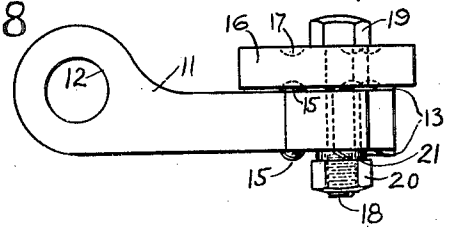
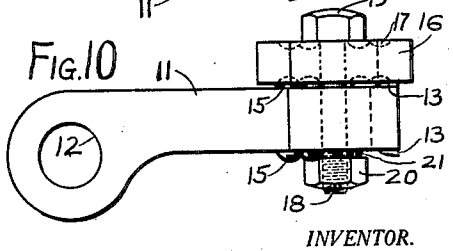


FIG. 10



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UNITED STATES PATENT OFFICE.

JOSEPH L. HILLER, OF MATTAPOISETT, MASSACHUSETTS.

ROTARY BEATER FOR SWING-HAMMER CRUSHERS.

Application filed July 23, 1919. Serial No. 312,747.

To all whom it may concern:

Be it known that I, JOSEPH L. HILLER, a citizen of the United States, residing at Mattapoisett, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Rotary Beaters for Swing-Hammer Crushers, of which the following is a specification.

This invention relates to method for the manufacture and use of rotary beaters belonging to that branch of the art in which Patent No. 1,197,026 was granted on Sept. 5, 1916, to me and being adapted for use in the class of machines described therein, in machines of the rotary beater type as do not possess adequate adjustments to compensate for the wear of the beaters, and in any machine of the rotary beater type which is desired to operate in balance.

The object of the invention is to secure greater accuracy of rotor balance in a practical cheap way, to prolong the life of the wearing unit, to lessen the discard of material and to reduce the cost of the wearing parts and so reduce the upkeep of the apparatus employing the invention.

In the rotary beater type of crushing machine, by far the greatest cost is for beater renewals. The method disclosed in Patent No. 1,197,026 hereinbefore referred to, is such as to effectuate large savings compared with the prior art, but has no less than four disadvantages as compared with the present invention.

First, from observations, covering the manufacture and use of many thousands of single piece beaters, I find it is impractical to count on a less variation than about one half pound in weight between the lightest and heaviest beaters of a set, and this variation makes it desirable to weigh each batter, every time it is changed and then, by skillful manipulation, to arrange them in balance upon the rotor. Second, considerable time is required to demount and reverse beaters after wear. Third, to remove from the crusher, re-machine the working ends and replace is an expensive operation and at best there are but two wearing edges. Fourth, there is a considerable loss of material in the discard after the last use of the beater.

My method of overcoming these deficiencies and of accomplishing the objects of my invention is, first to provide beater shanks which are of a permanent nature and in the manufacture of which it is, therefore, reasonable to bestow such care as will produce uniform members which will be in balance when assembled or requiring to be arranged in balance only once, if roughly manufactured. Second, to provide relatively small, securely held, easily adjustable, detachable and renewable sledge blocks, each provided with a greatly increased number of working edges, and of such form and size that accuracy and cheapness of manufacture is facilitated.

The drawings illustrate the outstanding features of the arrangements of the elements entering into my invention. The square plates shown in Figs. 1, 2, 3, 4, 5, 6, 9 and 10 and marked 16 is a preferred form of sledge block. The triangular plate shown in Figs. 7 and 8, and also marked 16, is also very economical of material. Both are surpassingly efficient.

Clamping and position locking means are provided which in the square sledge blocks provide for four edges being utilized before the sledge block is reversed side for side to present four fresh edges and in the triangular sledge blocks each side presents three available edges.

These sledge blocks may provide through an eccentric drilling for varying the reach of the beaters.

Referring to the drawings in detail, it will be observed that in Figs. 1 and 2 the invention consists of the shank 11 provided with means for mounting in the crusher or pulverizer as it would be pivoted if a bar passed through the hole 12. The shank 11 is provided with a hole for the clamping bolt 18 with two rivets 14 having heads 15 which heads together with the upset portion 13 of the shank provide a three point bearing for the sledge block 16. The projecting heads 15 by entering indentations 17 lock or key the sledge block 16 and prevent its misplacement. The bolt 18 having a head 19 and nut 20 is provided with a lock washer 21 and of course, may be provided with other or additional locking means. It will be noted that the shank 11 is reversible since the rivets 14 have heads 15 on both sides and since the upset portion 13 is identical on both sides.

Fig. 3 illustrates the same square sledge blocks mounted upon an equally sturdy shank 11 which is similar in all respects to that shown in Fig. 2 except that it is forged so that the angle of the face of the sledge

block is approximately radial with respect to the center of the hole 12, whereas in Fig. 2 the face of the sledge block present quite a different angle.

Fig. 4 represents a lighter type of beater shank and gives an angle to the face of the sledge block which is a compromise between that shown in Fig. 2 and Fig. 3. Fig. 4 also shows that shank 11 is reversible.

Figs. 5 and 6 show a beater shank 11 adapted for holding the sledge blocks 16 at an angle as for some uses it may be desirable. The clamping and locking means together with the reversible feature is essentially the same as has been described, but employs hardened balls staked in the shanks for locking the sledge blocks.

Figs. 7 and 8 illustrate a still different form of beater shank 11, both as regards its control of the angle of the face of the sledge block and in providing the upset portion 13 continuous along the full extent of the width of the shank and in line with the greatest work upon the sledge block. In the use of the triangular sledge block, the mechanics of a line and point bearing as is provided along the upset edge 13 and in conjunction with the single point 15 is quite satisfactory.

Figs. 9 and 10 show a shank similar to that illustrated in Figs. 7 and 8, but adapted for receiving a square sledge block and provides the continuous line support on the back and near the edge which forms the major portion of the crushing surface.

The sledge blocks 16 are relatively light. The indentations 17 may be readily forged in the sledge blocks, thus producing a relatively cheap renewable wearing portion for rotary beaters.

What I claim is:

1. A rotary beater hammer consisting of a shank member having an opening in each of its opposite ends extending at an angle to each other and provided at one end on one of its faces with projections surrounding the opening at said end, a head member with an opening therethrough and indentations surrounding said opening, and means for clamping or binding said head to said shank, said indentations being adapted to receive said projections.

2. A rotary beater hammer consisting of shank and head member and clamping means, said shank member having an opening near one end with surrounding projections, said head member having an opening with surrounding indentations adapted to receive said projections and said clamping member including a bolt adapted to pass through the said shank and head openings and on which said head can be adjusted so as to be located relative to said shank.

In testimony whereof I have affixed my signature in the presence of two witnesses.

JOSEPH L. HILLER.

Witnesses:

EDWARD B. HILLER,

FLORENCE L. HILLER.