

G. MITCHELL.

Improvement in Ore-Crushers.

No. 133,111.

Patented Nov. 19, 1872.

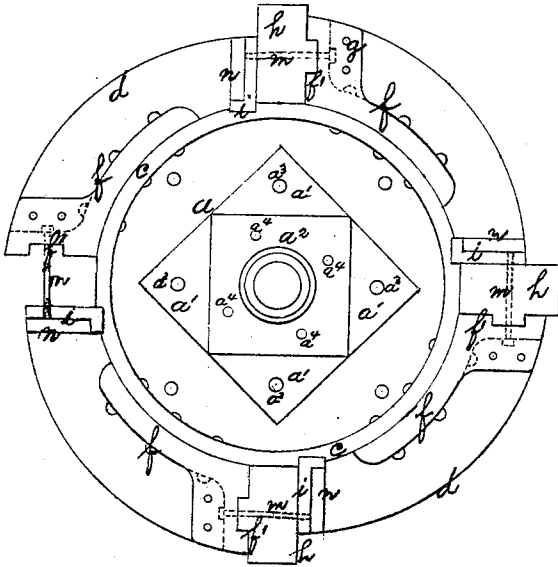


Fig. 1.

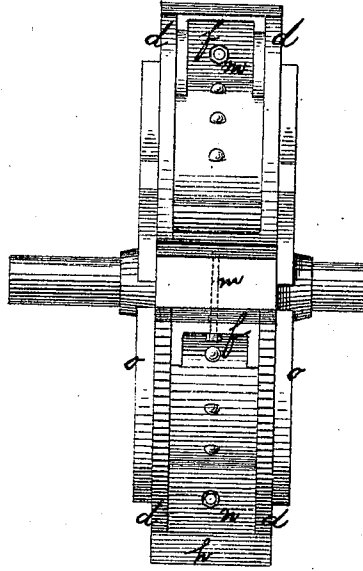


Fig. 3.

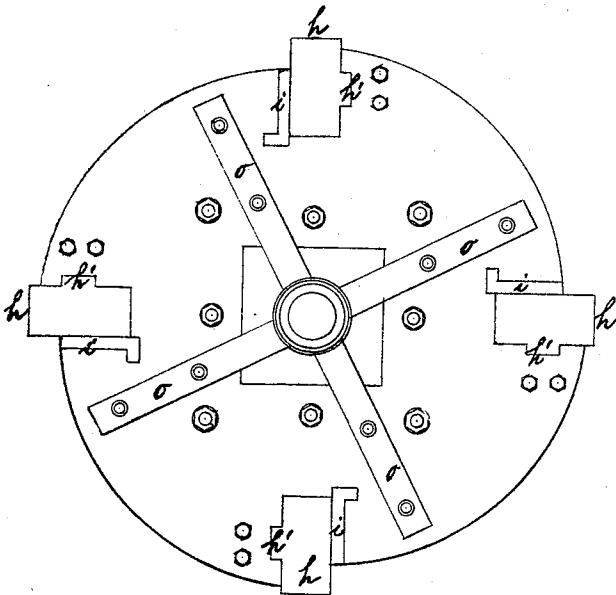


Fig. 2.

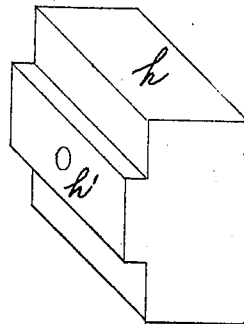


Fig. 4.

Witnesses
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GOVE MITCHELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN ORE-CRUSHERS.

Specification forming part of Letters Patent No. **133,111**, dated November 19, 1872; antedated November 13, 1872.

To all whom it may concern:

Be it known that I, GOVE MITCHELL, of Philadelphia, Pennsylvania, have invented certain Improvements in the Wheels of Mills for Grinding Quartz, Guano, Phosphates, and other hard substances, of which the following is a specification:

My improvements relate to the mill for which Letters Patent No. 106,271 were granted to me August 9, 1870.

In the drawing, Figure 1 is a side elevation of the wheel, one of the hammers and the rear side plate being removed; Fig. 2, a side elevation of the complete wheel, representing either side thereof, all the hammers being shown in their respective sockets; Fig. 3, a front or an edge elevation of the wheel, intended to show the flanged knees employed to give backing and support to the hammers; and Fig. 4, a perspective view of one of the hammers, which are all similar in form.

Wheels of the character above mentioned are intended to be run at a high rate of speed. They therefore require to be constructed so that their several parts can be compactly bound together.

My invention consists of the peculiar form and arrangement given to the several parts of the wheel, including the hammers, with the view of giving the wheel cohesive strength.

a, Fig. 1, is a square forging of iron or steel, which constitutes the hub of the wheel. The corners *a*¹ of the hub are recessed, forming a square projection, *a*², which corresponds in depth with the thickness of the side plates respectively. *a*³ are holes, through which are passed the bolts or rivets for securing the side plates to the hub *a*. *a*⁴ are recesses filled by pins which project from the under sides of the fanning-flanges *o*. *c* is a ring, of wrought-iron or steel, forged in one piece, each edge of which fits into a shallow recess of about one-eighth of an inch in depth, formed in the side plate, with which it is in contact.

The two side plates are marked *d*. They are similar in form. Each is removable. Each is provided with a central aperture corresponding in form and size with the square projection *a*², to which both side plates *d* are fitted. They are bound together by bolts or rivets, which pass from one side to the other

side of the wheel. Recesses are formed in the periphery of the side plates, as shown in Fig. 1, for the hammers and their keys.

I have now described the body or skeleton of the wheel, to which the hammers are attached as follows, to wit: *f* are flanged knees attached to the periphery of the ring *c* by bolts or rivets, and also by like means attached to the side plates *d*, as at *g*, Fig. 1. Each of the knees *f* contains a groove, *f*¹, in its front side, into which groove the tongue of one of the hammers fits. The knees *f* form backing, and, in connection with the side plates *d*, supports, for the hammers respectively. The hammers *h* are oblong, each being provided with a tongue, *h*¹, Figs. 2 and 4, which occupies the middle space of one of its sides. When the hammers are in their places their tongues *h*¹ fit into the corresponding grooves *f*¹ of the knees respectively. The hammers are not adjustable in the direction of the radiuses of the wheel, but they are reversible, so that when their striking (or projected) faces are worn down by use, the hammers can be reversed in their sockets by simply removing the bolts *m*. *i*, Figs. 1 and 2, are L-shaped keys, the shorter legs of which occupy recesses in the side plates, as shown in Fig. 2. The keys are first put into position and then the hammers are inserted. *m* are bolts which pass through the knees and the hammers and enter the keys, respectively, as shown in Fig. 1. *n* are removable face-plates, of steel or iron, fastened to the keys by bolts. These plates, in breadth, fit the space between the side plates *d*, thus preventing any lateral motion of the hammers. *o*, Figs. 2 and 3, are flanges bolted on the outsides of both the side plates *d*, for the purpose of creating a blast, so that the mill is enabled to clear itself, and the ground materials are kept from clogging the wheel by settling down about the shaft, between the wheel and its inclosing-case.

The wheel described may be inclosed in a case such as is described and shown in the specification and drawing of the Letters Patent above mentioned, the central apertures for the shaft being closed by stuffing-boxes around the shaft.

I claim—

1. The hub *a*, squared and recessed, in com-

bination with the ring *c* and recessed side plates *d*, all constructed and arranged as set forth, forming the skeleton of a wheel capable of withstanding injury from centrifugal force.

2. The reversible hammers *h* with their tongues *h'* and the L-shaped keys *i*, in combination with the plates *n*, to prevent lateral

motion of the hammers, and the flanged knees *f*, which form supports and backing for the hammers, when these several parts are arranged and constructed as set forth.

GOVE MITCHELL.

Witnesses:

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