

(No Model.)

A. S. ROSS.  
BEATER FOR PULVERIZING MACHINES.

No. 453,417.

Patented June 2, 1891.

Fig. 1.

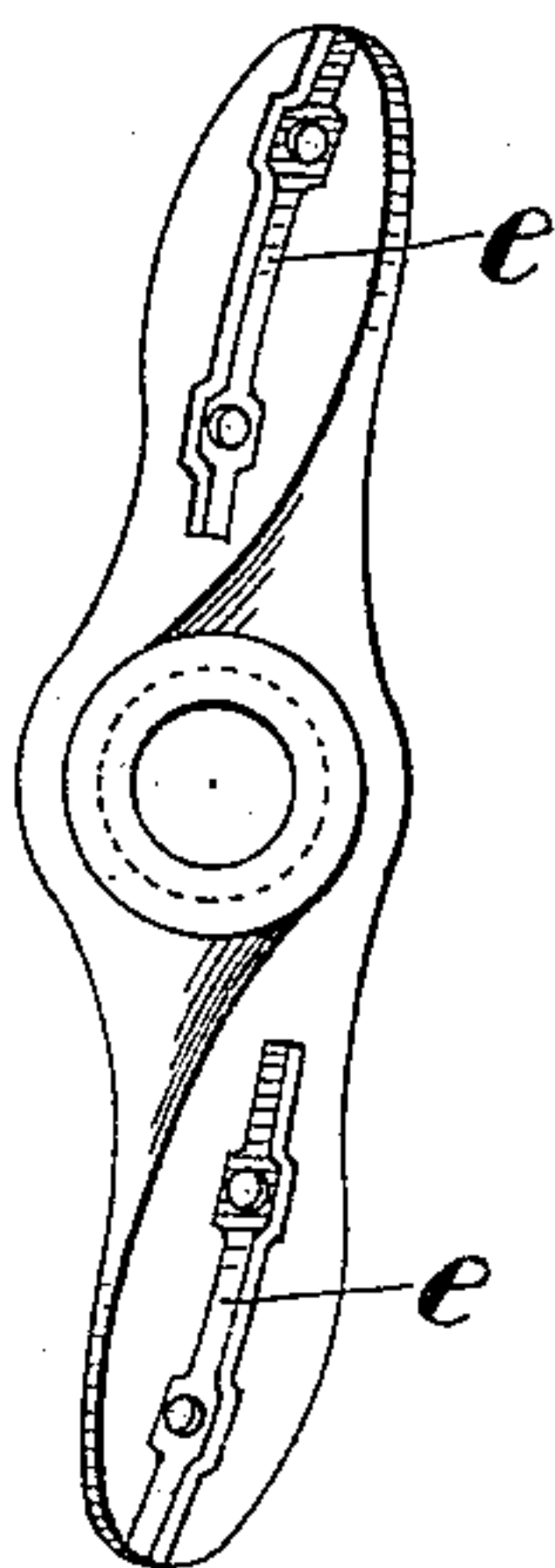


Fig. 2.

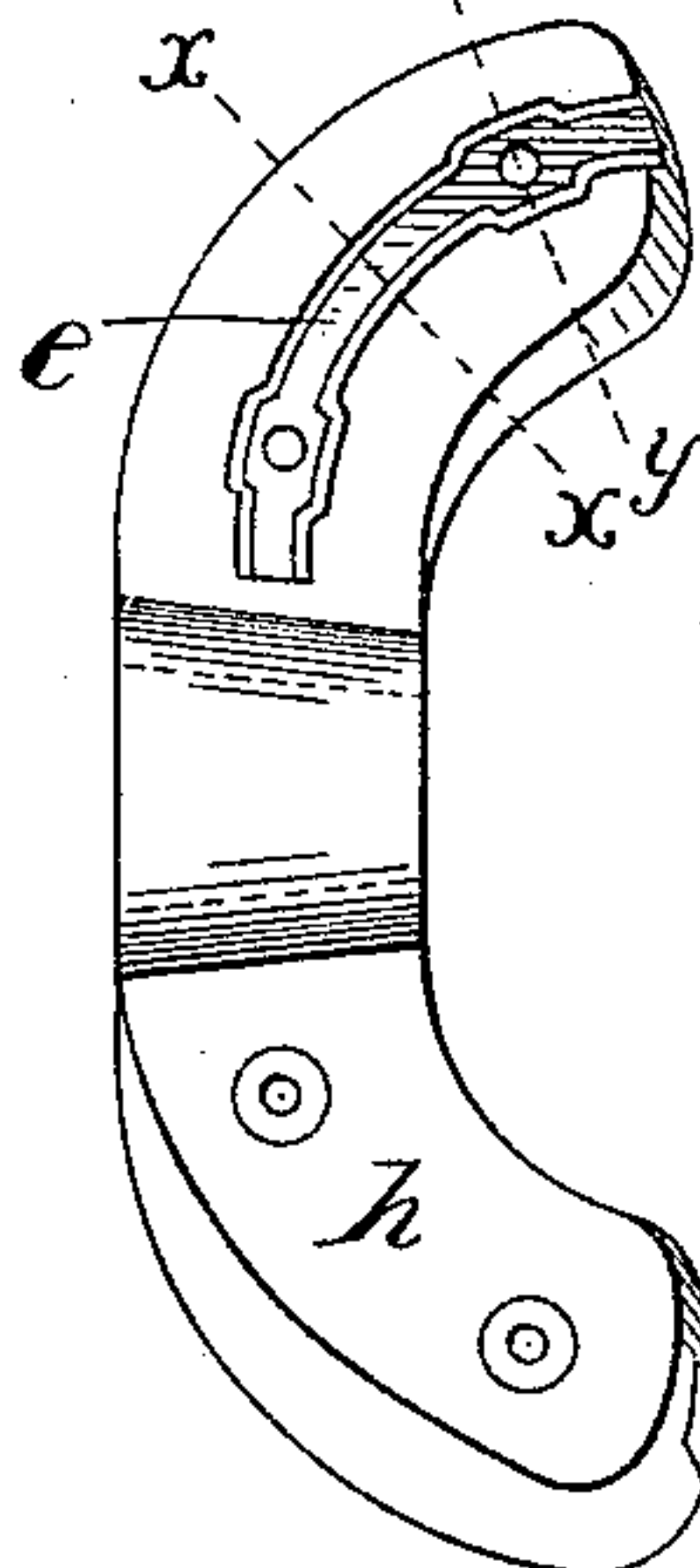


Fig. 3.

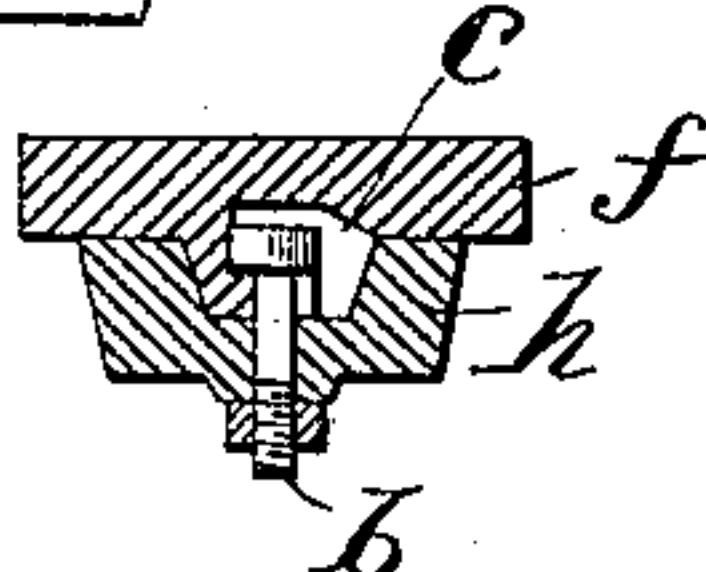


Fig. 4.



Fig. 5.



Fig. 11.



Fig. 6.



Fig. 7.

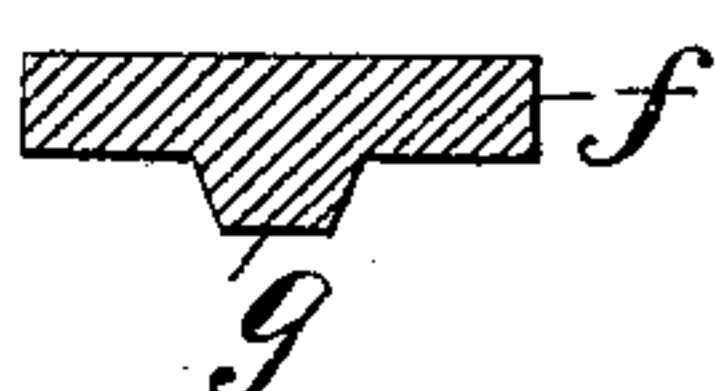


Fig. 8.



Fig. 9.

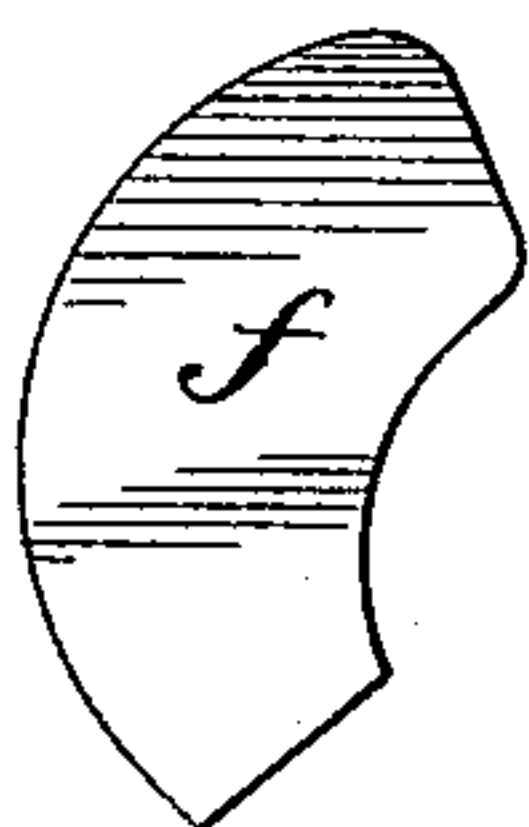
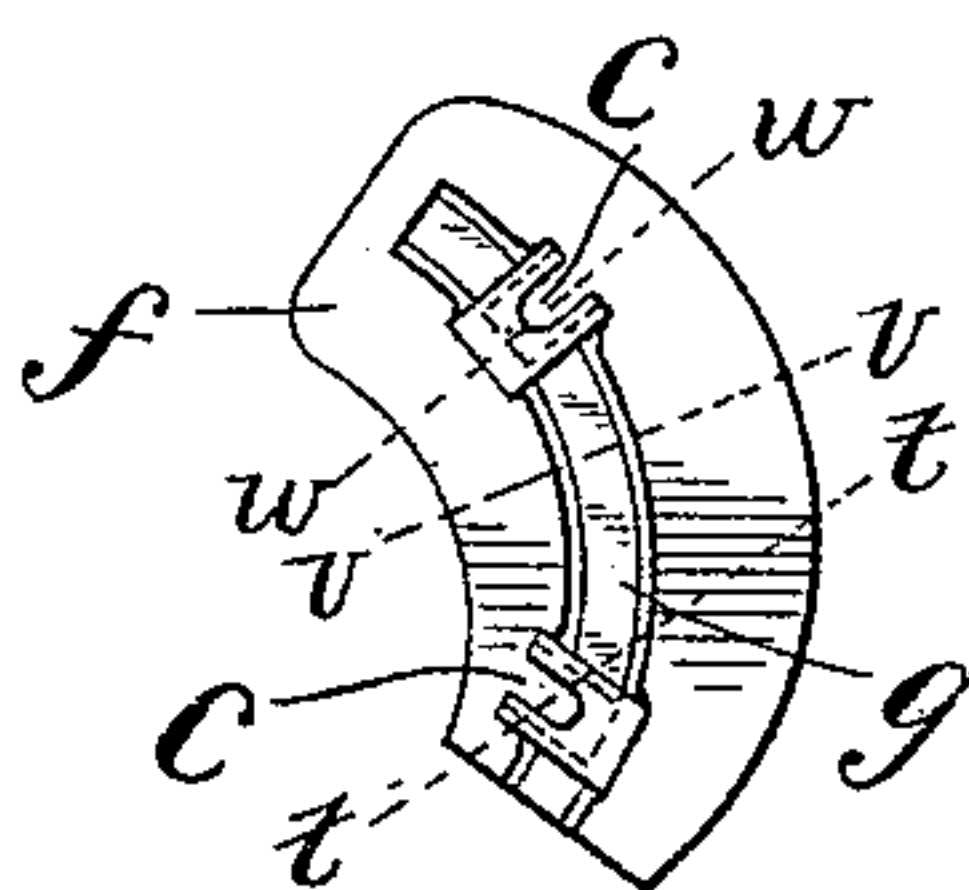


Fig. 10.



Witnesses:—

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Augustus Stoughton Ross

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# UNITED STATES PATENT OFFICE.

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## BEATER FOR PULVERIZING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 453,417, dated June 2, 1891.

Application filed December 3, 1890. Serial No. 373,415. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUSTUS STOUGHTON ROSS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Beaters for Pulverizing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists of the improved form of beater for use in pulverizing-machines, hereinafter to be more fully described and claimed.

In the drawings, Figure 1 is a face view of the hub and beater-arms. Fig. 2 is a side view of the same. Fig. 3 is a cross-section on the line *y y*, showing face-plate in place. Fig. 4 is a similar view without the face-plate. Fig. 5 is a cross-section on line *x x*. Fig. 6 is a cross-section on line *w w* of Fig. 10. Fig. 7 is a cross-section on line *v v*, and Fig. 8 on line *t t*, of same figure. Fig. 9 shows the front of the face-plate. Fig. 10 shows the back of the same. Fig. 11 is a detail of the bolt.

Considerable difficulty has been encountered in the construction of beaters for pulverizing-machines, such as the "Cyclone Pulverizer," in which said beaters revolve at a high rate of speed and are subjected to severe attrition. In order to enable the face-plates of the beater to stand the attrition of the refractory material which is fed into the machine for pulverization, it is necessary to chill them. For this reason and for certain structural advantages the face-plates are made separate from the hub. To securely fasten these chilled plates to the beater-arms has been a problem. If the bolts pass through the face-plate, their heads are rapidly worn away and the plate is liable to break and fly off, injuring the machine and workmen. To avoid these difficulties I have designed the construction illustrated, in which—

*h* is a hub having two or more arms. To each of these arms a chilled face-plate *f* is bolted. One or more recesses *C* are formed in the back of the face-plate. These recesses have overhanging edges, as shown in Figs. 3,

6, and 8. When the head of a bolt is inserted in one of these recesses and the body of the bolt passed through a perforation in the hub, as shown in Fig. 3, and a nut screwed onto the threaded end of the bolt, the face-plate is held securely against the hub.

To more certainly prevent the breakage of the face-plates and to guard against their being torn from the hub if broken, I form a longitudinal rib *g* on the back of the face-plate and form a depression *e* in the arms of the hub to receive said rib. The recesses *C* may then be formed in enlargements of this rib, as shown, Fig. 10, thereby avoiding any weakening effect which they might otherwise have on the face-plate.

The method of operation of my invention is evident. The head of a bolt is introduced into each of the recesses *C*. The bolts are then passed through the openings in the hub. The rib *g* is thereby drawn down into the recess *e*, which it should fit closely. Nuts are then screwed onto the ends of the bolts, and the face-plates are thereby securely clamped to the hub.

Its advantages are that the face-plate of hardest chilled metal is firmly held to and supported by the hub, presenting a smooth chilled surface to the material to be pulverized. The rib greatly strengthens the plate, and if the latter is broken by shock tends to prevent the pieces from being turned around and twisted off. By putting the recesses *c* in a rib they do not penetrate too deeply into the body of the plate and weaken the same. By having one recess *c* open on one side of the rib and the other on the other side the possibility, when the bolts work loose, of their heads working out of the recesses is diminished and practically prevented.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. The combination of the beater face-plate chilled on one side and provided with a rib on the other side, in which rib are one or more recesses with overhanging edges, bolts whose heads fit into said recesses and under the overhanging edges thereof, a beater-arm which

has a longitudinal depression into which said rib fits, and perforations through which the bolts may pass, substantially as described.

2. The combination of the chilled beater  
5 face-plate, which is provided with a longitudinal rib which has two or more recesses, one or more opening on one side of the rib and one or more opening on the other, bolts whose heads fit into said recesses, and a beater-arm

which has a longitudinal depression into which 10 said rib fits, and holes through which said bolts may pass, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS STOUGHTON ROSS.

Witnesses:

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H. L. LUQUES.