(No Model.) 2 Sheets—Sheet 1.

S. C. McLANAHAN & W. F. KIRK.

ORE WASHER.

No. 419,790. Patented Jan. 21, 1890.

Fig. 1.

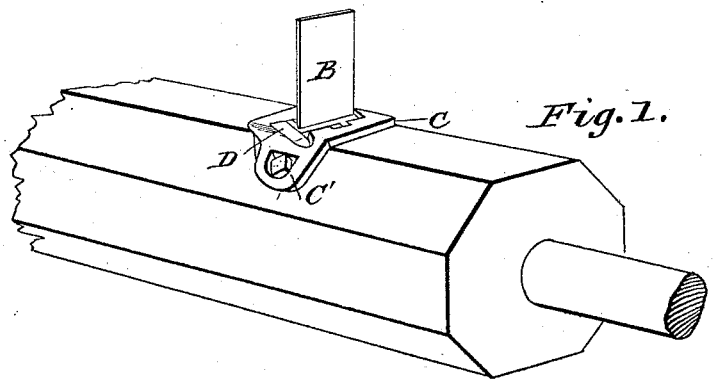


Fig. 2.

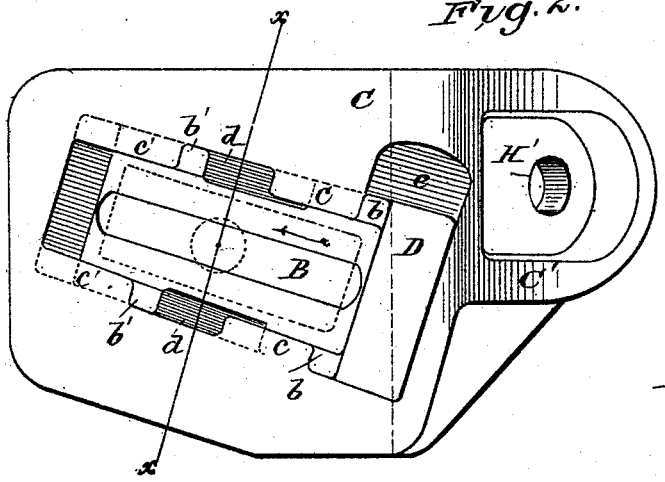


Fig. 3.

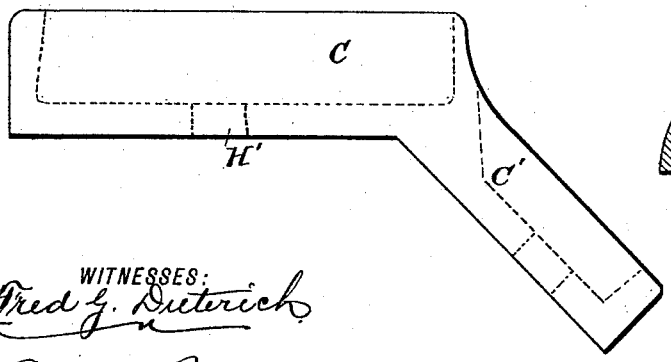
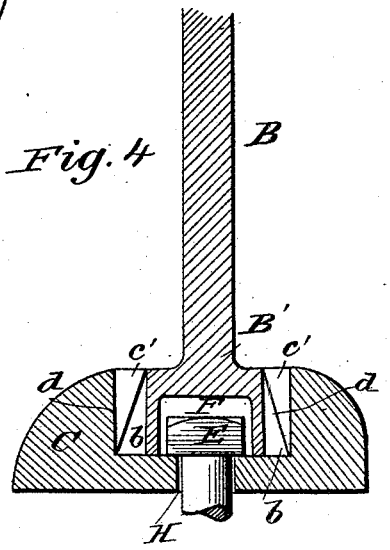


Fig. 4



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(No Model.) 2 Sheets—Sheet 2.

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ORE WASHER.

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Fig. 5.

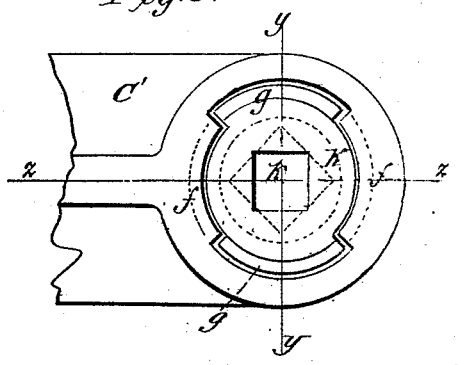


Fig. 6.

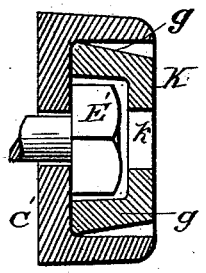


Fig. 7.

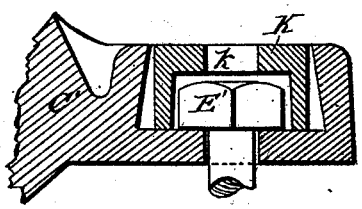


Fig. 8.

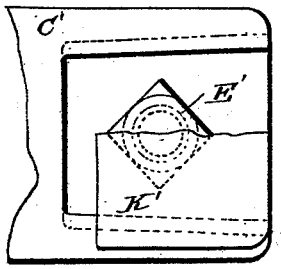


Fig. 9.

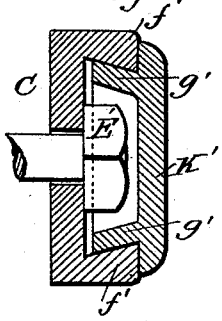
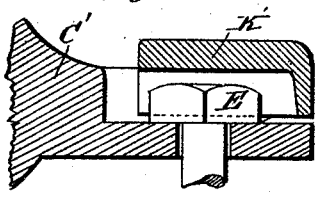


Fig. 10.



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UNITED STATES PATENT OFFICE.

SAMUEL CALVIN McLANAHAN AND WILLIAM F. KIRK, OF HOLLIDAYSBURG, PENNSYLVANIA.

ORE-WASHER.

SPECIFICATION forming part of Letters Patent No. 419,790, dated January 21, 1890.

Application filed August 19, 1889. Serial No. 321,318. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL CALVIN McLANAHAN and WILLIAM F. KIRK, of Hollidaysburg, in the county of Blair and State of Pennsylvania, have invented a new and useful Improvement in Ore-Washers, of which the following is a specification.

Our invention relates to ore-washers of that form in which a revolving shaft or cylinder is provided with detachable radial blades for agitating and washing the ore. Our invention relates more particularly to the blades and their means of connection to the shaft or cylinder; and it consists in the peculiar construction and arrangement of the blade and a base-plate for detachably connecting it to the cylinder or shaft, and also in the means for protecting the heads of the bolts which secure the base-plate to the cylinder or shaft, as hereinafter fully described.

Figure 1 is a perspective view showing the position of one of the radial blades and its base-plate on the cylinder or polygonal shaft. Fig. 2 is an enlarged plan view of the blade and its base-plate. Fig. 3 is an edge view of the base-plate. Fig. 4 is a cross-section through line *x x* of Fig. 2. Fig. 5 is a plan view of the means for protecting one of the bolt-heads. Fig. 6 is a section of the same through line *y y*, and Fig. 7 a section of the same through *z z*. Fig. 8 is a broken plan view of a modification of the device shown in Fig. 5, and Figs. 9 and 10 are respectively a transverse and longitudinal section of the device shown in Fig. 8.

A is a polygonal shaft or cylinder, to which is bolted any number of base-plates C C′, with detachable blades B. These base-plates have one portion C adapted to lie flat against one face of the polygon (see Figs. 1 and 3) and the other portion C′ at an obtuse angle to lap over and fit upon the adjoining face of the polygon. This causes the base-plates to straddle and shoulder upon the angles of the polygon and makes a much stronger connection than where a flat surface in a single plane is employed. The portion C of the base-plate is chambered out to receive the foot B′ (see Fig. 4) of the radial blade. The edges of the chamber or recess are formed with four overhanging lugs *c c c′ c′*, with an open space *d d* between them and a wide open space *e* at the end of the chamber. The foot B′ of the blade is formed with four lugs *b b b′ b′*, which are adapted to slide under the lugs *c c c′ c′* and be retained thereby to hold the blade to the plate.

D is a wooden block, which is driven in the enlarged end *e* of the chamber to hold the foot of the blade to its place. The bearing-faces of the lugs *b c b′ c′* are made tapered, so that when the foot of blade B is slipped in the direction of the arrow it binds like a wedge. In adjusting the blade to its place the foot B′ is dropped into the recess of the plate C, the lugs *b b* passing down the opening at the end of the recess, and the lugs *b′ b′* passing down the openings *d d*. The foot of the blade is then slid in the direction of the arrow until the lugs *b b* pass under lugs *c c* and *b′ b′* pass under lugs *c′ c′* and tighten by reason of their wedge-shaped bearings. The wedge-block D is then inserted in the enlarged chamber *e* and driven across the end of the foot of the blade to prevent the latter from coming out.

The underneath part of the foot B′ is chambered at F, so as to fit over and form a housing for the head E of the bolt that passes through the hole H of the base-plate to connect the same to the polygonal shaft or cylinder. The object of this is to protect the heads of the bolts from wear by contact with the ore.

Ordinarily the bolts that secure the base-plate are exposed, and the constant grinding action of the ore soon wears them, so that a wrench will take no hold upon the same, and the plates are with difficulty removed. When housed and protected by the feet of the blades, this difficulty is avoided.

In providing for the bolt-heads that secure the sections C′ of the base-plate, this may be unprovided with a protective cap, as shown in Fig. 2; but we prefer to construct it as in Figs. 5, 6, and 7, in which the base-plate is provided with overhanging lugs *f f*, and a rotary adjustable protective cap K is provided, which has lugs *g g*, adapted to lock under the lugs *f*. This cap is chambered on its under side to receive the bolt-heads, and has also a square

hole *k* to receive a tool for turning it into the locked or unlocked position. Figs. 8, 9, and 10 show a modification of this construction, in which we use a rectilinearly-sliding cap instead of a rotary adjustable one. In this case K′ is the rectilinearly-sliding cap, which has a dovetail edge *g′ g′*, that slides under the overhanging edges *f′ f′* of the base-plate. In Fig. 8 half of this cap K′ is cut away, in order to show the recess and bolt of the subjacent plate.

We are aware that the blades of an ore-washer have been made detachable from their base-plate by a tapered dovetail connection, and do not claim this broadly.

Having thus described our invention, what we claim as new is—

1. The combination, in an ore-washer, of the revolving shaft or cylinder, a recessed base-plate carrying stirring arms or blades, bolts for securing the same to the shaft or cylinder, and protective caps or housings for the heads of the bolts, substantially as shown and described.

2. The combination, in an ore-washer, of a base-plate having a recess or chamber for receiving the detachable blade, and a bolt-hole through the plate within said chamber for connecting the plate to the revolving shaft, and a detachable stirring-blade having a chambered foot adapted to be seated in the recessed plate, and also to form a housing or cap for the bolt-head, substantially as described.

3. The combination, with the base-plate having a recess or chamber with overhanging lugs *c c c′ c′*, with spaces *d* between them, of a stirrer-blade having lugs *b b b′ b′*, with tapered faces adapted to lock under lugs *c c′*, as described.

4. The combination, with base-plate having a chamber enlarged at *e*, and provided with overhanging lugs *c c′*, with spaces *d* between them, of a stirrer-blade having lugs *b b′*, and a wedge-block D, fitting in the chamber *e* at the end of the blade-foot, as described.

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