(No Model.)

E. S. & H. H. BLAKE.

Ore Crusher.

No. 230,524. Patented July 27, 1880.

Fig. 1.

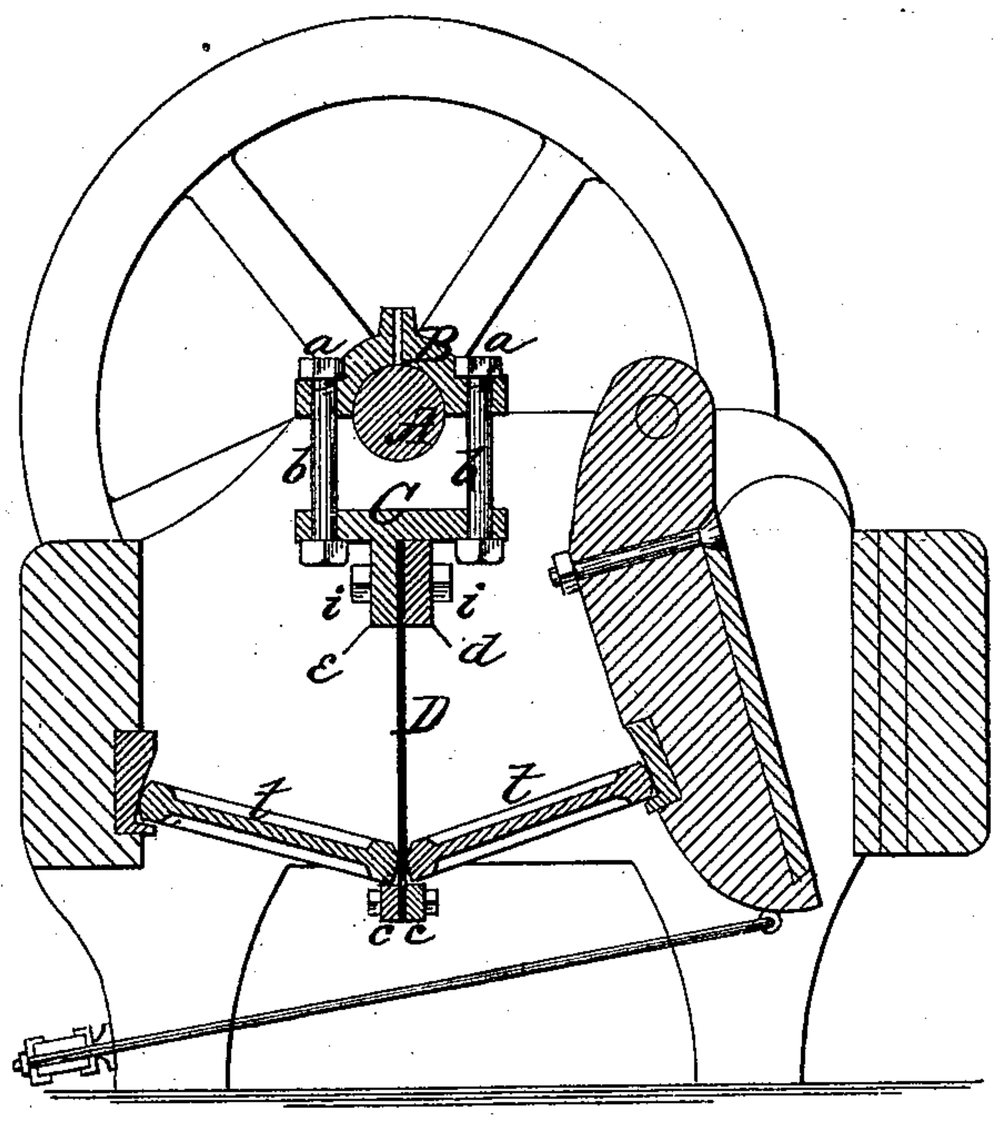
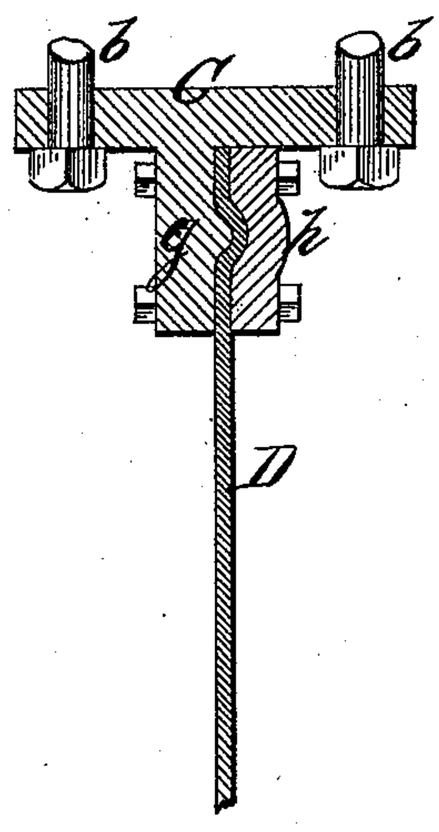


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD S. BLAKE AND HENRY H. BLAKE, OF PITTSBURG, PENNSYLVANIA

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 230,524, dated July 27, 1880.

Application filed April 19, 1880. (No model.)

To all whom it may concern:

Be it known that we, EDWARD S. BLAKE and HENRY H. BLAKE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Ore-Crushers, whereof the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a crusher, showing our improvements. Fig. 2 is a detail section, showing a modification.

This invention relates to improvements in that class of ore-crushers in which the jaw is vibrated by the action of toggles operated by a pitman receiving reciprocatory motion from an eccentric on a revolving shaft.

The invention consists in constructing the toggles with their adjacent ends convex and interposing between them a sheet steel or iron pitman properly connected to the eccentric, substantially as hereinafter described and claimed.

The present improvement relates solely to the construction of the pitman and the operation by it of the toggles.

As we have described in a pending application, the eccentric-shaft A has a box, B, on the flanges of which are supported, by means of nuts *a*, the bolts *b*, which, in turn, support a plate, C, to which the pitman proper is connected.

As before, the toggles *t* have their adjacent ends convex; but instead of being in direct contact they bear against the interposed pitman D, which consists of a thin sheet or plate of iron or steel, having at its lower end suitable ribs or other projections *c*, to prevent the toggles from falling down in case of a sudden jar or jolt.

The pitman is attached to the plate C by the clamping-bar *d*, between which and the flange *e* of plate C the pitman is clamped by bolts and nuts *i*, as shown; or it may be attached, as shown in Fig. 2, by the ribbed and grooved clamps *g h*, which, when drawn together, cause the pitman D to buckle, as shown in the drawings, thereby preventing it from slipping.

The plain sides of the pitman prevent friction on the toggle ends and allow the toggles to operate very smoothly.

The pitman, being of thin sheet or plate, is elastic, and thus allows the lateral movement of the box B and its attached bolts *b* and plate C without producing an irregular motion of the toggles *t*, since the pitman can bend freely. If it break it can be readily replaced at a very slight expense; but it will be heavy enough to stand most strains, the "break-down" being at the bolts *b*, as in our former application.

We do not herein claim the construction of the break-down part, as that forms part of the subject-matter of the application before referred to.

By the term "break-down" we mean that part of the crusher which is intended to give way when the machine is subjected to a strain which would cause a break.

The break-down part is comparatively inexpensive and readily inserted, as can be easily seen, thus avoiding the expense of replacing the more costly parts, which would, in the absence of such a break-down, yield to the excessive strain.

What we do claim is—

1. In a toggle-action ore-crusher, the combination of the eccentric-shaft A, plain convex-ended toggles *t t*, and interposed pitman D, of sheet or plate metal, substantially as described.

2. In an ore-crusher, the combination of plate C, suitably connected to the eccentric-shaft, clamps *e* and *d*, plate or sheet D, and toggles *t*, having their adjacent ends convex, substantially as described.

In witness whereof we have hereto set our hands.

EDWARD S. BLAKE.
HENRY H. BLAKE.

Witnesses:
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