(Model.)

J. A. BARNES.

PIG IRON BREAKER.

No. 306,124. Patented Oct. 7, 1884.

Fig. 1.

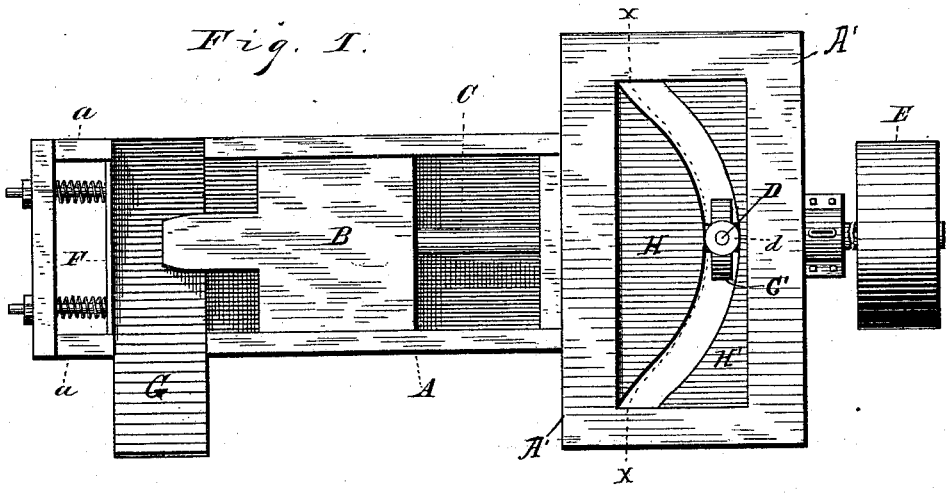


Fig. 2.

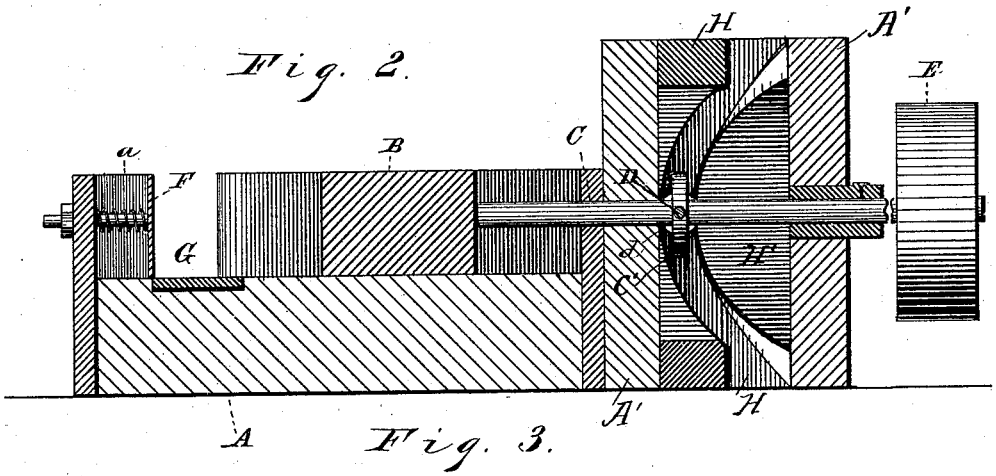
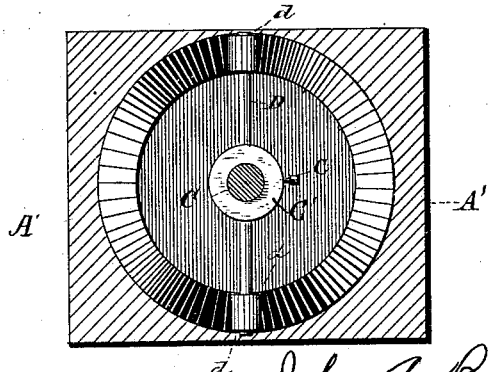


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN A. BARNES, OF AKRON, OHIO.

PIG-IRON BREAKER.

SPECIFICATION forming part of Letters Patent No. 306,124, dated October 7, 1884.

Application filed April 2, 1883. (Model.)

To all whom it may concern

Be it known that I, JOHN A. BARNES, of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Pig-Iron Breakers; 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 pertains to make and use the same.

My invention relates to improvements in a device for breaking pig-iron; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view. Fig. 2 is a longitudinal vertical sectional view. Fig. 3 is a transverse section on the line of *x x*, Fig. 1.

A represents the bed or frame of the machine; B, the butting-slide or cross-head operating in ways in the usual manner, and driven by the shaft C, the end of which is journaled in the said cross-head. Both the end of the shaft and the cross-head are made to withstand the thrust of the one against the other in operating the machine.

To the shaft C is attached a collar, C′, held in place by a set-screw, *c*. The collar C′ carries two oppositely-disposed cross-arms, D, extending radially from the shaft C and carrying each at its outer end a roller, *d*.

H H′ designate two cam-faced plates set in the rectangular portion A′ of the frame A, and formed each with a central circular aperture through which passes the shaft C. Each plate H H′ is further formed with a central circular cavity on the side of said plate adjacent the opposite plate, and this cavity is surrounded by a circular double-inclined face. When the two plates H H′ are placed in proper position, the two projecting portions of the inclined face of one plate coincide with the two depressed portions of the inclined face of the other plate, and thus a tortuous path or cam-groove is formed in which the rollers *d* of the arms D work. The outer end of the shaft C projects through the front side of the frame portion A′, and upon this projecting end of the shaft is mounted a band wheel or pulley, E, the distance between the wheel and frame A′ being sufficient to avoid any contact between the frame and wheel, as the shaft C reciprocates longitudinally in consequence of the action of the cam-groove upon the cross-arms D. Thus the shaft C is given an endwise reciprocating motion, in addition to its rotary motion, and it will be seen that this end motion, forward and back, will occur twice during each revolution of the shaft.

The frame is provided with the projections or abutments *a*, against which the pigs of iron are pressed by the butting of the slide B against the side of the pig. In the recess between the abutments is the plate F, that has springs behind it that hold it out flush with the face of the abutments; but any considerable pressure brought to bear on the face of this plate will press it back into the recess, compressing the springs thereby. When the pressure is removed the plate will, by means of the elasticity of the said springs, be forced forward to its former position in line with the face of the abutments.

The operation of the device is as follows: When, by means of the reciprocating motion heretofore described, the butting-slide or cross-head is drawn back, a pig of iron is placed in the way G, so that the pig will rest against the two abutments. The way G extends transversely of the frame A, contiguous to the plate F, and is inclined downward from its feed end to its discharge end, so as to facilitate the passage of the pigs. By the forward stroke of the cross-head it will butt against the pig midway between its supports against the abutments, breaking it. The plate F, while yielding so much as is necessary to accommodate the breaking of the pig, will, as soon as the pressure of the cross-head is withdrawn, be returned to its normal position. The return of the plate F to its first position will force back into the way G the fragments of the broken pig, leaving a straight surface over this side of the said way, and by this straight surface greatly facilitating the passing of pig-iron through this way to be broken. Of course the way G should be made wide enough to admit the larger sizes of pigs, while the stroke of the machine should be great enough to break the smaller sizes when they are against the abutments aforesaid.

I do not claim in this application any particular mechanism for imparting rotary mo-

tion to the shaft C, as it is evident that numerous devices can be devised to accomplish this end.

What I claim is—

1. In a machine for breaking pig-iron, the combination, with the abutments *a*, of the plate F and springs situated behind the plate, for the purpose set forth.

2. In a machine for breaking pig-iron, the combination of the abutments *a* and the plate F, the springs situated behind the plate, and the butting-slide B, substantially as and for the purpose set forth.

3. In a machine for breaking pig-iron, the combination, with the cam-faced plates so arranged as to form a tortuous or cam groove, of the revolving shaft provided with cross-arms, and rollers journaled to said arms and moving in the cam-groove, whereby the shaft is reciprocated, substantially as set forth.

4. In a machine for breaking pig-iron, the combination, with cam-faced plates arranged as described, of the cross-arms D, having the rollers *d*, the shaft C, butting-slide B, the abutment *a*, plate F, and springs situated behind said plate, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 13th day of March, 1883.

JOHN A. BARNES.

Witnesses:
C. MEHAASS,
J. E. LACKEY.