

J. E. BLAKE.
CRUSHING MACHINE.

APPLICATION FILED JUNE 21, 1909.

944,999.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

FIG. 2.

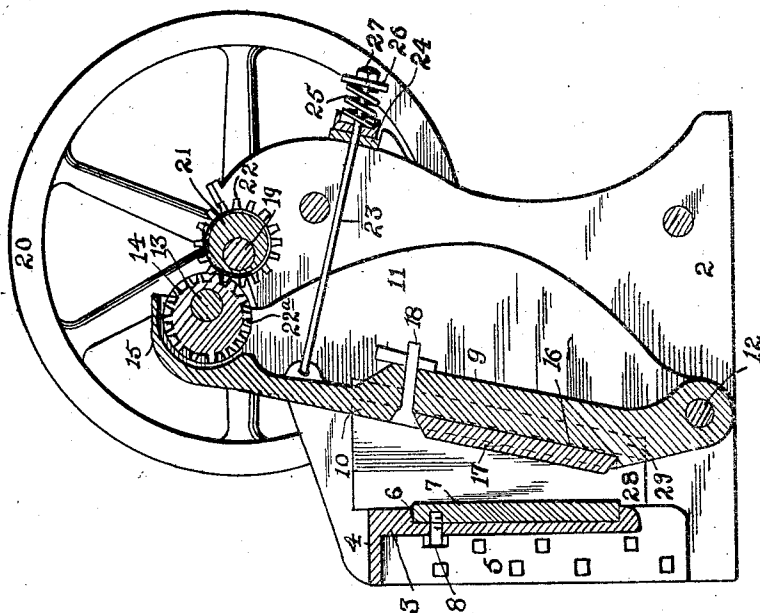
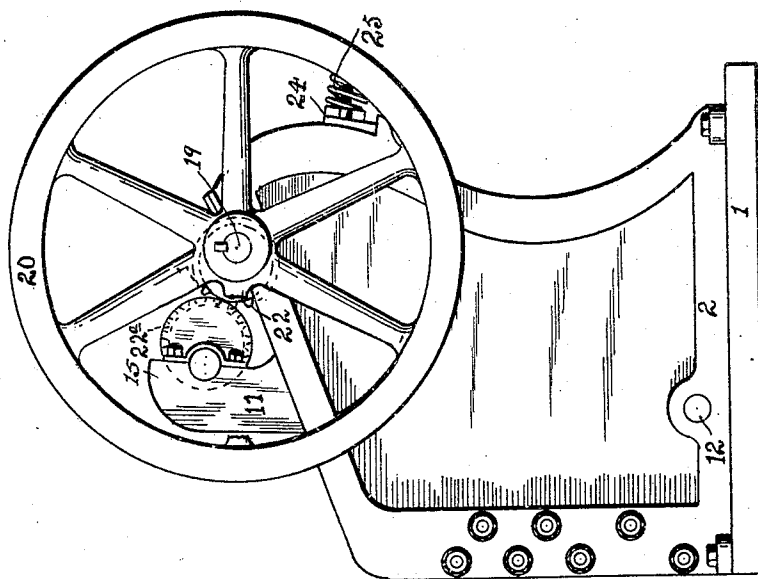


FIG. 1.



WITNESSES:

Robt. F. Phillips
J. H. Harrison

INVENTOR

John E. Blake,
BY *Edward A. Lawrence,*
HIS ATTORNEY

J. E. BLAKE.
CRUSHING MACHINE.
APPLICATION FILED JUNE 21, 1909.

944,999.

Patented Dec. 28, 1909.
2 SHEETS—SHEET 2.

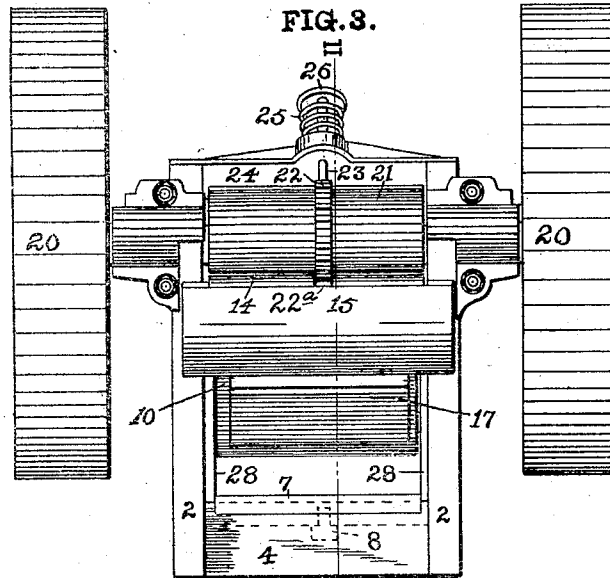


FIG. 4.

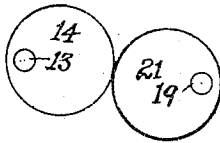
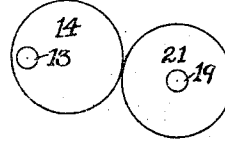


FIG. 5.



WITNESSES:

Robt. J. Dilworth
J. H. Harrison

INVENTOR

John E. Blake,
BY *Edward A. Lawrence,*
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN E. BLAKE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO BLAKE CRUSHER AND PULVERIZER COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CRUSHING-MACHINE.

944,999.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed June 21, 1909. Serial No. 503,268.

To all whom it may concern:

Be it known that I, JOHN E. BLAKE, a citizen of the United States, and residing in the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Crushing-Machines, of which the following is a specification.

My invention consists in a new and improved machine for crushing or reducing stone or other material. Other novel arrangements and construction of parts will appear from the following description.

In the accompanying drawings, Figure 1 is a side elevation of the machine, Fig. 2 is a vertical section along the line II—II in Fig. 3; Fig. 3 is a plan view of the machine, and Figs. 4 and 5 are diagrammatic views of roller constructions.

The following is a detailed description of the drawings.

1 is the bed plate on which are mounted the side plates 2—2, and 3 is the fixed jaw having a rearwardly extending top flange 4 and two rearwardly extending side flanges 5—5 which are bolted to the side plates 2—2 as shown. In the operative face of jaw 3 is a recess or seat 6 in which is seated the removable jaw plate 7 which serves to protect the fixed jaw from wear. Said plate 7 is secured in place by any convenient means, such as bolt 8 passing through jaw 3 and engaging a threaded hole in the rear of plate 7.

9 is the swinging jaw having an operative face 10 opposed to fixed jaw 3 and two rearwardly extending side flanges or plates 11—11. The base of swinging jaw 9 extends rearwardly and is mounted on a shaft 12 whose ends are journaled in side plates 2—2. This construction results in a downward feed to the material between the two jaws and prevents clogging.

13 is a cross shaft mounted in the upper portion of jaw 9 and having its ends journaled in the side plates 11—11.

14 is a roller mounted on said shaft. The upper portion of face 10 of jaw 9 is preferably extended upwardly and rearwardly to form a protecting hood 15 for said roller.

16 is a seat in the face 10 of jaw 9, provided with an inwardly inclined bottom, in which is seated the jaw plate 17 which pro-

TECTS the jaw 9 from wear. Said jaw plate is held in place by any convenient means, such as wedge bolt 18.

19 is the main shaft of the machine journaled in boxes mounted on the side plates 2—2 and provided at its ends with fly-wheels 20—20, one of which may be used as a band wheel for the application of power to the machine.

21 is a roller rigidly mounted on shaft 19 and in peripheral contact with roller 14.

In Figs. 1, 2, 3 and 4 I have shown both the rollers 14 and 21 as eccentrically mounted on their shafts, while in Fig. 5 I have shown the roller 14 only as eccentrically mounted. It will be understood that I may mount roller 14 axially on its shaft while roller 21 may be eccentrically mounted, if desired.

22 represent an annular series of cog teeth on the periphery of one of the rollers, 14 or 21, shown in the drawings in connection with roller 21, which teeth mesh with a corresponding annular series of depressions in the other roller, so that a positive transference of power is effected. Said depressions are marked 22^a.

It is evident that the rotation of the main shaft 19 will rotate roller 21 which will in turn rotate roller 14 which, owing to the eccentricity of one or both of the rollers will result in swinging the jaw 9 alternately toward and away from the fixed jaw 3, thus crushing the material between said jaws.

Where relatively soft material is to be reduced, a larger arc of swing may be permitted to the jaw 9 but where more refractory material is to be treated, a shorter arc of movement for said jaw is desirable. It is evident that by the installation of the proper rollers, any desired arc of movement or rapidity of motion may be obtained.

23 is a tension rod, pivoted at its inner end to the back of jaw 9 and passing through a hole in strut 24 bearing against the rear of side plates 2—2. 25 is a spring bearing against the outer face of said strut and coiled about the rod 23. 26 is a washer bearing against the outer end of said spring and adjustable on said rod by means of nut 27 which engages the threaded end of said rod. By adjusting said nut 27 it is evident that the tension on rod 23 may be adjusted,

and that said rod tends to draw said jaw 9 away from jaw 3 and hold it in its retracted position, thus insuring frictional contact between the rollers under all circumstances.

5 28—28 are a pair of cheek plates, one of the same fitting against each of the side plates 2—2 to protect the same from wear. The forward edges of said cheek plates bear against the fixed jaw 3, while their rear
10 edges rest against a rib 29, shown in dotted lines in Fig. 2, provided on the inner face of each of said side plates 2—2.

The operation of my device is as follows. The proper rollers to obtain the desired motion of jaw 9 are installed and the machine
15 is started, material being fed between the jaws 3 and 9. As the material is reduced it passes down between said jaws, the peculiar construction of the swinging jaw, wherein
20 its pivot point is below and in the rear of the operative face resulting in a downward feeding motion which greatly assists the reduction of the material and its passage from the machine. The rollers 14 and 21, being
25 in peripheral contact at all times, give a bearing for the swinging jaw for its full width, thus effectually maintaining the jaw in proper alinement and preventing its being forced from its proper arc of movement
30 by the uneven distribution of material between the jaws or the presence in the mate-

rial of more refractory substances. Efficient operation is thus insured.

Although, for the sake of clearness, I have minutely described the construction shown 35 in the drawings, I do not wish to limit myself thereby, but claim broadly:—

1. In a crushing machine, a fixed jaw, a swinging jaw, a pair of contacting rollers one of which is eccentrically mounted, one of 40 said rollers being mounted on said swinging jaw and the other roller being mounted on a power driven shaft mounted in said machine, and intermeshing means between said rollers, whereby said swinging jaw is oper- 45 ated.

2. In a crushing machine, a fixed jaw, a swinging jaw, a pair of contacting rollers one of which is eccentrically mounted, one of said rollers being mounted on said swing- 50 ing jaw and the other roller being mounted on a power driven shaft mounted in said machine, intermeshing means between said rollers, and means for maintaining said rollers in peripheral engagement, whereby 55 said swinging jaw is operated.

Signed at Pittsburg, Pa., this 17th day of June, 1909.

JOHN E. BLAKE.

Witnesses:

E. A. LAWRENCE,
J. H. HAMSON.