

Dec. 11, 1928.

W. K. LIGGETT

1,694,423

CRUSHING MACHINE

Filed June 8, 1923

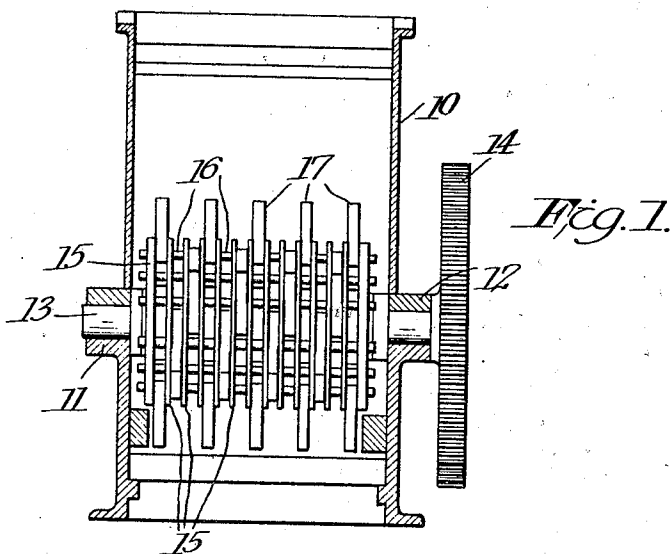


Fig. 2.

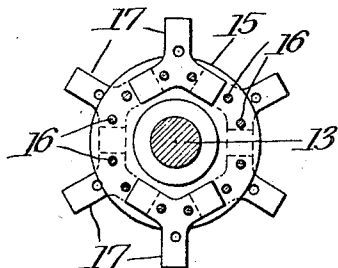


Fig. 4.

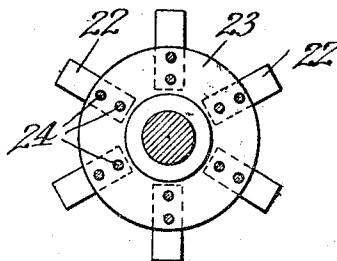
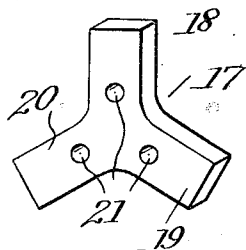


Fig. 3.



Inventor.

William K. Liggett.

By *Cushman Bryant & Darby*

Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM K. LIGGETT, OF COLUMBUS, OHIO, ASSIGNOR TO THE JEFFREY MANUFACTURING COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

CRUSHING MACHINE.

Application filed June 8, 1923. Serial No. 644,168.

The present invention relates to a crushing or like machine of that class which consists in general of a casing and a rotor mounted in the casing adapted through cooperation with the casing walls to reduce material fed thereto.

The rotor of such machines consists in general of a rotor body or frame to which are secured hammers or tooth elements which are adapted to directly engage and reduce the material to be treated. The machine with which the present invention is concerned is of the type wherein the hammers or tooth members are secured in fixed position to the rotary body.

The present invention, as hereinafter claimed, has particular reference to the form of hammers or tooth members themselves, and means for mounting them on a particular form of rotary frame.

The novel features to be hereinafter set forth are not dependent on any particular form of casing, and consequently, in the accompanying drawings:

Figure 1 is a section through a casing of any suitable form showing the rotor mounted therein and in side elevation.

Figure 2 is a cross sectional view of the rotor shown in Figure 1.

Figure 3 is a perspective of the hammer or tooth member illustrated in Figures 1 and 2, and

Figure 4 is a cross sectional view of a rotor comprising a modified form of rotary frame and a modified form of tooth member.

Referring to Figure 1, 10 indicates the casing of the machine, which, as above stated, may be of any desired form so far as the present invention is concerned. The casing is provided with bearings 11 and 12, in which is journaled a shaft 13, on which the rotor is mounted. As here shown, shaft 13 is provided at one end with a gear wheel 14 adapted to be engaged by an appropriately disposed drive gear not shown.

The rotary frame is formed of a series of disks 15 fixed in spaced relation upon shaft 13. These disks are provided with aligned apertures remote from their axes, through which are passed axially extending rods 16, and tooth members 17 are mounted upon these rods between the various disks.

Members 17 are preferably formed with a plurality (three (3) being shown) of equally

spaced radiating arms 18, 19 and 20, each of which is provided with an aperture 21, adapted to receive one of the supporting rods 16. The proportions of the parts are such that when in operative position the apertures of two of the arms will be engaged by the supporting rods 16, thereby holding the third arm rigidly in radial position to form a material engaging tooth. These tooth members 17 are preferably omitted from certain of the spaces between the disks 15, this resulting in a tooth arrangement adapted to reduce to a minimum the tendency to slippage between the surface of the rotor and the material to be crushed.

The crushing elements 17 are, it will be seen, of substantially trefoil shape, and their arms are, as here disclosed, symmetrically disposed so that elements 17 may be turned, after the forward edge of one arm has become dulled in service, to supply sharp teeth for the rotor until each side of each arm in turn has been used.

According to Figure 4 the tooth members are shown as being in the form of straight bars 22, and the disks 23, which are preferably plane surfaced as in Figures 1 and 2, are provided with series of radially spaced apertures adapted to receive rods 24, which pass through appropriately spaced apertures in the ends of members 22.

In each instance it will be seen that the tooth member is engaged by a plurality of rods between a pair of adjacent disks so that it is held in absolutely fixed relation while still permitting ready removal for alteration of position or replacement.

It will be obvious that various modifications of the devices of the invention will be possible without departure from the spirit of the invention, and accordingly it is to be understood that I do not limit myself except as determined in the following claims.

What I claim is:

1. In a machine of the class described, a rotary support, radially disposed crushing elements spaced axially from one another and removably mounted on said support, and a plurality of circumferentially disposed fastening means to rigidly secure each of said crushing elements to said support.

2. In a machine of the class described, a rotary support, radially disposed crushing elements having a plurality of arms remov-

ably mounted on said support, and a plurality of fastening means engaging at least two arms of said crushing elements to rigidly secure them to said support.

5 3. In a machine of the class described, a rotary support, radially disposed crushing elements having three symmetrically placed radially disposed arms removably mounted on said support, and a plurality of fastening
10 means for two of the radiating arms to rigidly secure said crushing elements to said support.

4. In a machine of the class described, a rotary support formed of a plurality of
15 spaced apart disk like members, a plurality of radially extending circumferentially disposed crushing elements removably mounted between said disks, and a plurality of fastening means to secure each of said crushing ele-
20 ments in constant rigid position.

5. In a machine of the class described, a rotary support formed of a plurality of spaced apart disks, crushing elements having a plurality of radiating arms removably
25 mounted between said disks with one of said arms extending radially from said support, and a plurality of circumferentially spaced fastening means to secure the other arms of said crushing elements rigidly to said disks.

30 6. In a machine of the class described, a rotary support formed of a plurality of spaced apart disk like members, a plurality of circumferentially disposed crushing elements having three symmetrically disposed
35 arms removably mounted between said disks with one of the arms extending radially from said disks, and a plurality of circumferentially spaced fastening means for each crushing element extending through the other

arms thereof and said disks to secure the 40 crushing elements rigidly in place.

7. In a machine of the class described, the combination of a plurality of spaced apart disks, a plurality of substantially trefoil
45 shaped crushing elements removably mounted between said disks with two of their arms housed within the periphery of said disks and the third arm extending radially there-
50 from, and a plurality of circumferentially spaced tie rods traversing apertures in said disks and the housed arms of said crushing elements to secure them rigidly in place.

8. A crushing element for crushing machines of substantially trefoil shape, each
55 arm of said element having an aperture symmetrically placed with respect to the apertures in the other arms to provide means for securing said crushing element to a suitable support, the aperture in two of said
60 arms being utilizable to secure the third arm in working position.

9. In a machine of the class described, a rotary support formed of a plurality of spaced apart disc-like members, a plurality
65 of radially projecting circumferentially disposed crushing elements mounted between said disc-like members, the portion of each crushing element between said disc-like members being provided with a plurality of perforations, and rod-like members extending
70 through said disc-like members and through at least two perforations of each of said crushing elements to secure said crushing elements in constant rigid radial position.

In testimony whereof I have hereunto set 75 my hand.

WILLIAM K. LIGGETT.