Dec. 11, 1923.

1,477,502

F. R. KILLICK

EAR CORN CRUSHER

Filed July 10, 1923

2 Sheets-Sheet 1

Fig. 1.

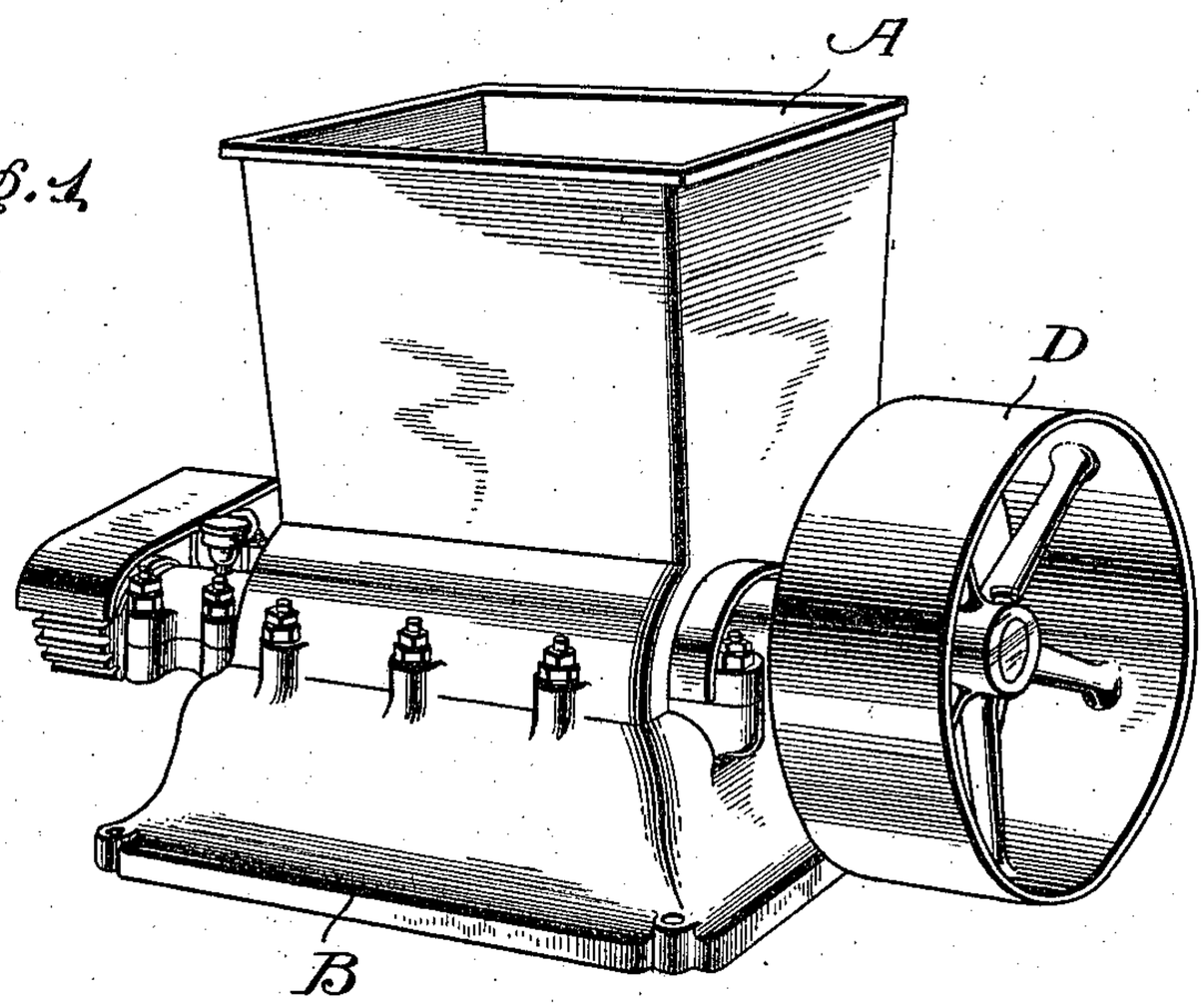
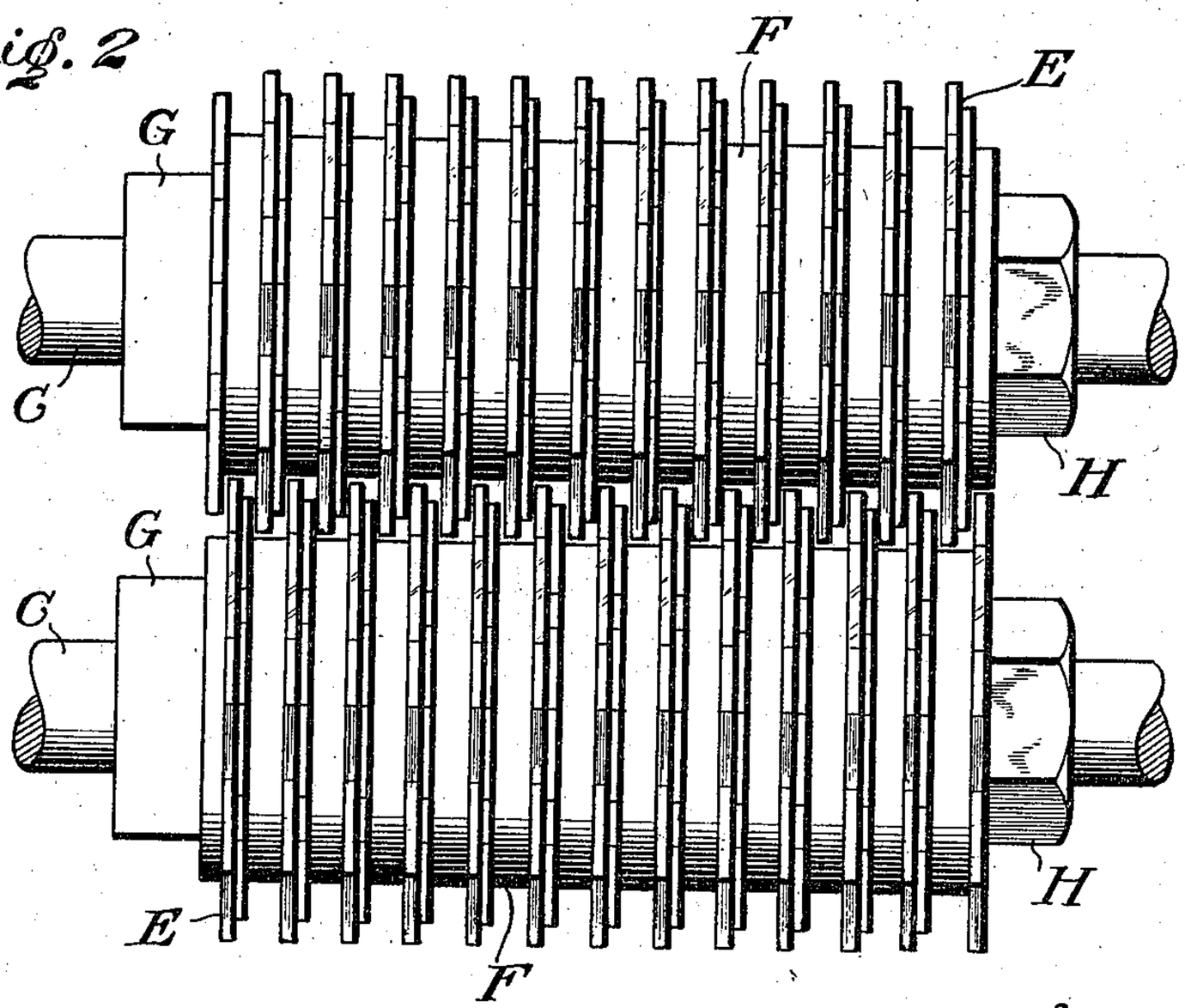



Fig. 2.




Inventor

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His Attorney

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Fig. 3

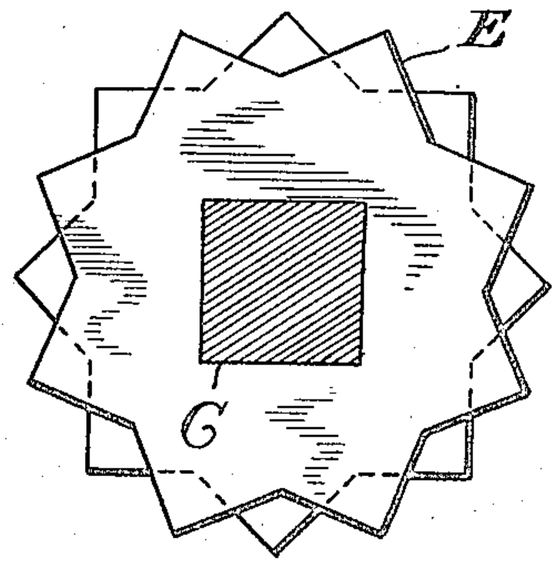



Fig. 4

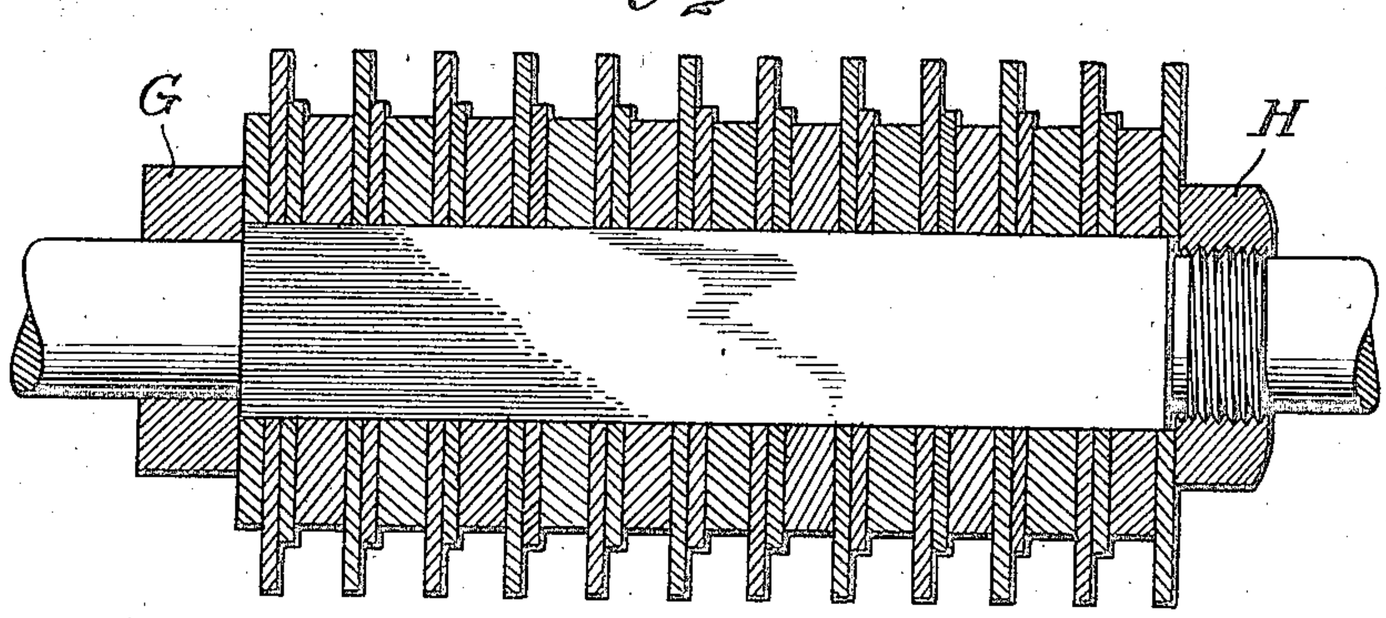
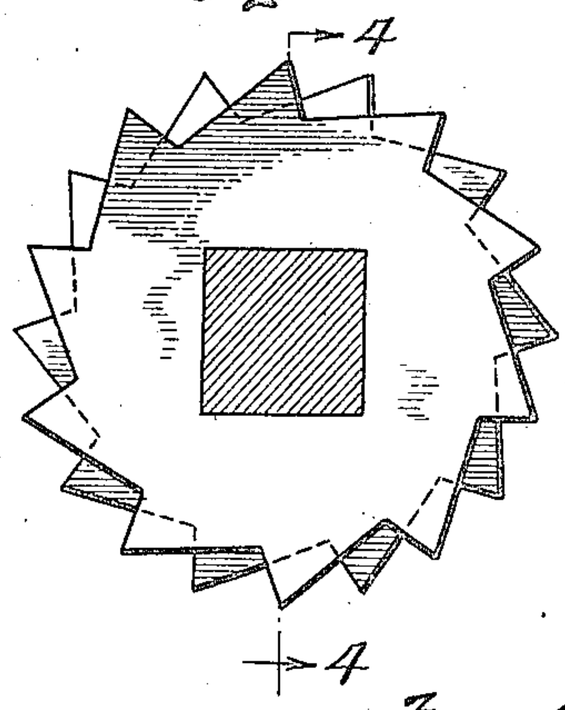



Fig. 5

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Patented Dec. 11, 1923. 1,477,502

# UNITED STATES PATENT OFFICE.

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## EAR-CORN CRUSHER.

Application filed July 10, 1923. Serial No. 650,656.

*To all whom it may concern:*

Be it known that I, FRANK R. KILLICK, a citizen of the United States, residing at Muncy, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Ear-Corn Crushers; 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 appertains to make and use the same.

This invention relates to crushing machines, and more particularly to machines for crushing ear corn so as to reduce the same to a sufficient degree of fineness for further reduction by an attrition mill or other grinding device.

The objects of the invention are to provide a strong and durable, simple and efficient crushing machine, specially designed and adapted to effect a reduction of ear corn to the required degree of fineness for further reduction by an attrition mill or other grinding device more evenly and effectually than is accomplished by crushing machines as heretofore constructed, the parts thereof being adapted to be easily assembled and readily taken apart for repairing or re-placing a broken or worn part.

The invention will first be hereinafter more particularly described, with reference to the accompanying drawings, which are to be taken as a part of this specification, and then pointed out in the claims at the end of the description.

In said drawings, Fig. 1 is a perspective view of a crusher embodying my invention;

Fig. 2 is a detached plan view of the crushing disks mounted on parallel shafts, the ends of which are broken away;

Fig. 3 is a transverse section of one of the shafts showing one set of disks thereon in assembled relation;

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 5, the shaft being shown in elevation; and

Fig. 5 is a transverse section of one of the shafts showing a set of disks thereon of a modified form in assembled relation.

Referring to said drawings, in which the same reference characters are used to denote corresponding parts in different views, the letter A denotes a feed hopper mounted upon a supporting base B, on which are secured shaft bearings of ordinary construction for a pair of shafts C, C, arranged in parallel relation, one of said shafts having a band wheel or pulley D thereon for applying power thereto. On said shafts are mounted peripherally toothed disks E, in sets of two or more disks, alternating with spacing washers F which are made somewhat wider than the width of a set of disks, so that the points of the teeth on one shaft or roll may overlap the points of the teeth on the other shaft or roll along the line between roll centers or the median line of the shaft. Holes or openings are formed through the centers of the disks, of square or angular form, for securing them upon a correspondingly shaped portion of the shaft, so that the disks will rotate with the shaft; the holes through the centers of the disks being so arranged relatively to the teeth that by assembling two or more disks side by side the points of the teeth of one disk will extend upon radial lines between the points of the teeth of another disk of the same set. Preferably the points of the teeth of one disk in each set extend about midway between adjacent teeth of another disk, of the same set, or in other words, points of the teeth of one disk coincide with radial lines through the center of the valley or hollow between two adjacent teeth of the other disk of the same set; the result being practically the same as would be obtained with a single disk having twice the number of teeth, one half of the teeth being arranged on one side and alternating with the teeth of the other half on the other side of a line passing between the two disks. By placing the disks in sets in the manner stated it is possible to obtain either fine or coarse grinding results with the same parts, the differences in results being attained in the method of assembly.

As shown in Figs. 1 to 4, the disk is in the form of a square having one pointed tooth on each straight edge thereof.

In Fig. 5 is shown a modification in which the disks are formed with saw-tooth-like teeth of such construction that when two disks are placed side by side on the shaft the teeth of one disk will extend radially substantially midway between the teeth of the other disk of the set forming a substantially saw-tooth-like peripheral portion with the teeth of one disk extending beyond and overlapping the teeth of the other disk in

the direction of rotation to a point beyond the greatest depth of the depression or valley between adjacent teeth.

It will be observed that the disks shown in Figs. 1 to 4 are not of circular form, strictly speaking, while in Fig. 5 they are substantially circular, and it will be understood that the form and arrangement of parts may be varied without departing from the spirit and scope of my invention.

The shafts carrying the grinding or crushing disks may be of any desired length for holding a greater or less number of disks, or sets of disks and alternating washers, as described, and preferably that portion of the shaft on which the disks and washers are mounted is square in cross-section, as shown in Figs. 3 and 5, but may be of any suitable angular form; the holes through the disks and washers being correspondingly shaped to adapt the disks and washers to rotate with the shaft. The assembled disks and washers may be held upon the shaft in assembled relation by means of a fixed nut or collar G at one end of the angular portion, and a nut H screwed on the shaft at the other end of said angular portion, as shown in Fig. 4 of the drawings.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent of the United States is:

1. An ear corn crusher comprising a feed hopper mounted on a supporting base, parallel shafts mounted in bearings on said base, and peripherally toothed disks fixed on and revoluble with said shafts, said disks being arranged in sets spaced apart on the shaft and each set consisting of a plurality of disks with the points of the teeth of one disk extending radially between the points of the teeth of another disk of the same set; the sets of teeth on one shaft projecting between sets of teeth on the other shaft.

2. A crusher for ear corn or the like comprising a supporting base, a feed hopper mounted on said base, and parallel shafts each having mounted thereon in sets peripherally toothed disks alternating with spacing washers, each of said sets consisting of a plurality of disks having the points of the teeth of one disk extending radially between the points of the teeth of another disk of the same set, and the sets on one shaft projecting between sets on the other shaft.

3. A crusher for ear corn or the like comprising a supporting base, a feed hopper mounted on said base, and parallel shafts each having mounted thereon in sets peripherally toothed disks alternating with spacing washers, each of said sets consisting of a plurality of disks having the points of the teeth of one disk extending radially between the points of the teeth of another disk of the same set, and the sets on one shaft projecting between sets on the other shaft, said washers being somewhat wider than the width of a set of disks, so that the points of the teeth on one shaft may overlap the teeth on the other shaft along the median line of the shaft, substantially as and for the purpose described.

4. An ear corn crusher comprising a supporting base, a feed hopper on said base and revolubly mounted parallel shafts carrying suitably spaced sets of peripherally toothed disks, each set consisting of a plurality of disks having the points of the teeth of one disk extending radially between the points of the teeth of another disk of the same set, and the sets on one shaft extending into the spaces between sets of teeth on the other shaft.

5. A crusher for ear corn or the like comprising a supporting base having mounted thereon a feed hopper and parallel revoluble shafts each carrying sets of peripherally toothed disks alternating with spacing washers, each set consisting of a plurality of disks having the points of the teeth of one disk extending radially between the points of the teeth of another disk of the same set and the washers being wider than the width of a set of disks, so that the points of the teeth on one shaft may overlap the teeth of the other shaft along the median line or centers of the two shafts, substantially as and for the purpose described.

6. In a crusher of the character described, a shaft carrying sets of crushing elements each consisting of a plurality of peripherally toothed disks arranged side by side with the points of the teeth of one disk extending between the points of the teeth of another disk of the same set, and forming practically a single disk having one-half of its teeth arranged on one side and the other half on the other side of a line passing centrally between the two disks parallel therewith.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK R. KILLICK.

Witnesses:
C. C. PFLEEGOR,
E. C. WOODWARD.