

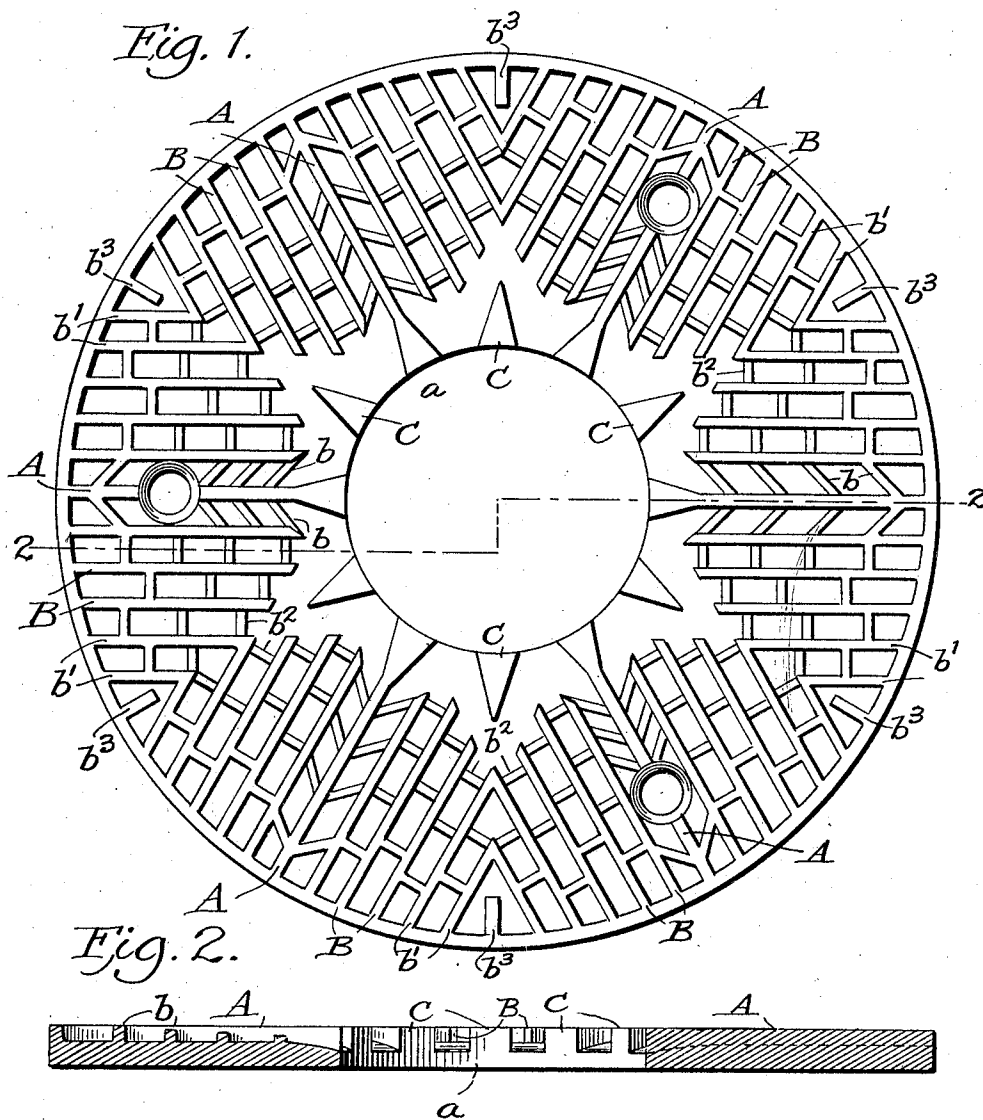
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ATTRITION MILL PLATE

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UNITED STATES PATENT OFFICE.

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ATTRITION-MILL PLATE.

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To all whom it may concern:

Be it known that I, SIMON SNYDER, 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 Attrition-Mill Plates; 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 grinding plates for attrition mills, and has for its object to provide a grinding plate with ribs or projections which extend over the whole grinding surface and are arranged so as to provide as many as possible shearing or cutting edges, and adapt said surface to prevent the product or material which is to be ground from working to the outer edge faster than it is being ground.

A further object is to provide a grinding plate having a maximum capacity and capable of doing its work more efficiently and speedily than grinding plates as heretofore ordinarily constructed and without liability to heat and injure the grain as it passes between the grinding surfaces.

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 plan view of an attrition mill plate embodying my invention; and

Fig. 2 is a transverse section of the same, said section being taken on the line 2—2 of Fig. 1.

Referring to said drawings, in which the same reference characters are used to denote corresponding parts in different views, the letters A, A, denote radial ribs or projections which are suitably spaced around a central opening *a* in the grinding plate or disk and extend from said opening to the circumference of the plate, in the plane of the axis or center of the plate and preferably slightly enlarged or wedge-shaped or tapering outwardly at their inner ends. The letters B, B, denote shorter ribs or projections arranged in series on each side of said ribs A, A, and parallel therewith. Said ribs B gradually decrease in length

successively toward the periphery of the plate as they recede from the ribs A to a point about midway between each pair of ribs A, at which point the inner ends of two intermediate ribs meet and are joined together, being arranged in V-shaped form; a V-shaped space being provided between the inner ends of the short ribs and said central opening, and in said V-shaped space there is a wedge-shaped rib or projection C, which extends outwardly from the margin of said opening and has its pointed end arranged substantially in the plane of or in alinement with the meeting ends of said intermediate ribs. The shorter ribs B, on opposite sides of the longer ribs A, are connected by a plurality of checking ribs or baffles *b*, *b*, which preferably extend substantially at right angles thereto, while the longer ribs A are each connected on opposite sides thereof with an adjacent shorter rib at an acute angle to the longer rib. Within the V-shaped space between the aforesaid intermediate ribs of the two series of short ribs, which are joined together at their inner ends, similarly arranged short ribs *b*¹, *b*¹ may be formed and connected to the adjacent longer ribs by transverse ribs or baffles *b*² and within the V-shaped space between the short ribs *b*¹, a short rib or projection *b*³ extends inwardly from the periphery of the plate. A grinding surface is thus provided over the entire working face of the plate, with unobstructed channels or depressions between the wedge-shaped projections around the central opening or eye of the grinder and the inner ends of the shorter ribs, so as to facilitate the entrance of grain between the plates and into the receiving ends of a multiplicity of channels or depressions which are provided between a multiplicity of parallel ribs, the depressions between which open into the spaces on opposite sides of the series of outwardly pointed preferably tapering or wedge-shaped ribs.

The passage of the material along the depressions, grooves or channels between the parallel ribs is retarded by the transverse ribs or baffles in such manner as to effectually overturn and spread the crushed grain over the whole grinding surface of the plate, so that none of the grains will be allowed to escape until effectually and completely reduced to the desired degree of fineness,

by the cutting and shearing edges of the radial ribs over which and between and along which the crushed and broken grain must pass. The checking ribs or baffles serve not only to retard the outward progress of the material that is being ground, but aid in the grinding; and preferably the height of the baffles increases successively from the innermost to the outermost baffle, which is flush with the surface of the radial ribs while the innermost and intermediate baffles are slightly below said surface, gradually increasing in height toward the periphery of the plate, so as to retard the outward progress of the material between the radial ribs more and more toward the periphery of the plate. The angular arrangement of the checking ribs or baffles is such that when in operation they will have a shearing action, and at no time will the ribs of the opposite or stationary plate, which may be identical with the rotary plate, travel directly across the ribs of the other plate, but in a shearing direction across the other ribs. It will also be observed that the ribs of the plate are so arranged that it will have the same action when running either right or left hand, so that it is not necessary to make a different plate to suit the direction in which the mill is driven.

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

1. An attrition mill plate having a grinding surface consisting of a series of radial ribs or projections which extend outwardly from a central opening therein to its outer circumference, and shorter ribs on opposite sides of the longer ribs which gradually decrease in length in opposite directions to an intermediate point, at which point the inner ends of two of the shorter ribs meet, the latter ribs being arranged in V-shaped form, a wedge-shaped rib or projection located in the space between the inner ends of the two series of shorter ribs and the margin of said opening, and checking ribs or baffles connecting adjacent ribs on each side of the longer ribs throughout the series.

2. An attrition mill plate having a grinding surface consisting of a series of radial ribs or projections which extend outwardly from a central opening therein to its outer circumference, and a series of shorter ribs on each side of each of the longer ribs which gradually decrease in length toward the periphery of the plate, two intermediate ribs meeting at their inner ends and arranged in V-shaped form, a V-shaped space being provided between the inner ends of the shorter ribs and said opening, and a wedge-shaped rib or projection in said space extending outwardly from the margin of said opening and having its pointed end ar-

ranged substantially in the plane of the meeting ends of said intermediate ribs; the shorter ribs on opposite sides of the longer ribs being connected by checking ribs or baffles which extend substantially at right angles thereto and the longer ribs connected with an adjacent shorter rib on each side thereof by checking ribs or baffles which extend at an acute angle to the longer rib.

3. An attrition mill plate having a grinding surface consisting of a series of radial ribs or projections which extend outwardly from a central opening therein to its outer circumference, and a series of shorter ribs on each side of each of the longer ribs which gradually decrease in length toward the periphery of the plate, two intermediate ribs meeting at their inner ends and arranged in V-shaped form, a V-shaped space being provided between the inner ends of the shorter ribs and said opening, and a wedge-shaped rib or projection in said space extending outwardly from the margin of said opening in the plane of the axis of the plate and having its pointed end arranged substantially in the plane of the meeting ends of said intermediate ribs; the shorter ribs on opposite sides of the longer ribs being connected by checking ribs or baffles which extend substantially at right angles thereto and the longer ribs connected with an adjacent shorter rib on each side thereof by checking ribs or baffles which extend at an acute angle to the longer rib.

4. An attrition mill plate having a grinding surface comprising a series of radial ribs or projections spaced apart around a central opening in said plate and extending therefrom to the outer circumference of the plate substantially in the plane of its axis, and a series of shorter ribs or projections on each side of each of the longer ribs which gradually decrease in length successively toward the periphery of the plate, the intermediate short ribs of the two series being joined together at their inner ends and arranged in V-shaped form, a V-shaped space being provided between said opening and the inner ends of the two series of short ribs, and a wedge-shaped rib or projection in said space extending outwardly from the margin of said opening and having its pointed end arranged substantially in the plane of the meeting ends of the two united intermediate ribs, checking ribs or baffles connecting the shorter ribs substantially at right angles thereto, and checking ribs or baffles connecting each of the longer ribs with an adjacent shorter rib on each side thereof at an acute angle to the longer rib.

5. An attrition mill plate having a grinding surface comprising a series of radial ribs or projections spaced apart around a central opening in said plate and extending therefrom to the outer circumference of the

plate substantially in the plane of its axis, and a series of shorter ribs or projections on each side of each of the longer ribs which gradually decrease in length successively toward the periphery of the plate, the intermediate short ribs of the two series being joined together at their inner ends and arranged in V-shaped form, a V-shaped space being provided between said opening and the inner ends of the two series of short ribs, and a wedge-shaped rib or projection in said space extending outwardly from the margin of said opening and having its pointed end arranged substantially in the plane of the meeting ends of the two united intermediate ribs, short ribs arranged within the space between and parallel with said united intermediate ribs, checking ribs or baffles connecting the several shorter ribs substantially at right angles thereto, and checking ribs or baffles connecting each of the longer ribs with an adjacent shorter rib on each side thereof at an acute angle to the longer rib.

6. A grinding plate having a central opening and a surrounding series of radial ribs or projections with shearing edges spaced apart and extending from said opening to the outer circumference of the plate, and between each pair of longer ribs two series of shorter ribs with shearing edges, one series extending substantially parallel with each of the longer ribs along lines which intersect the other series and gradually decreasing in length toward the periphery of the plate, the shortest ribs of the two series be-

ing joined together at their inner ends, a substantially V-shaped space being provided between said opening and the inner ends of the two series of ribs and the receiving ends of the grooves or depressions between adjacent ribs opening into said space, baffles connecting adjacent ribs of each series, and a rib projecting from the margin of said opening into said space about midway thereof.

7. A grinding plate having a central opening and a surrounding series of radial ribs with outwardly tapering end portions adjacent said opening, said ribs extending to the outer circumference of the plate, series of shorter ribs between each pair of longer ribs, one series extending substantially parallel with each of the longer ribs along lines which intersect the other series and gradually increasing in length toward the periphery of the plate, so that a substantially V-shaped space is provided between said opening and the inner ends of the two series of ribs, in which space there is a rib projecting outwardly from the margin of said opening, and baffles connecting adjacent ribs of each series; said baffles gradually increasing in height from the innermost to the outermost baffle.

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

SIMON SNYDER.

Witnesses:

W. W. NOWOTNY,
A. J. GRAMMER.