No. 859,118. PATENTED JULY 2, 1907.

F. SCHIEFFLER.

GRINDING MACHINE.

APPLICATION FILED MAY 14, 1906.

Fig. 2

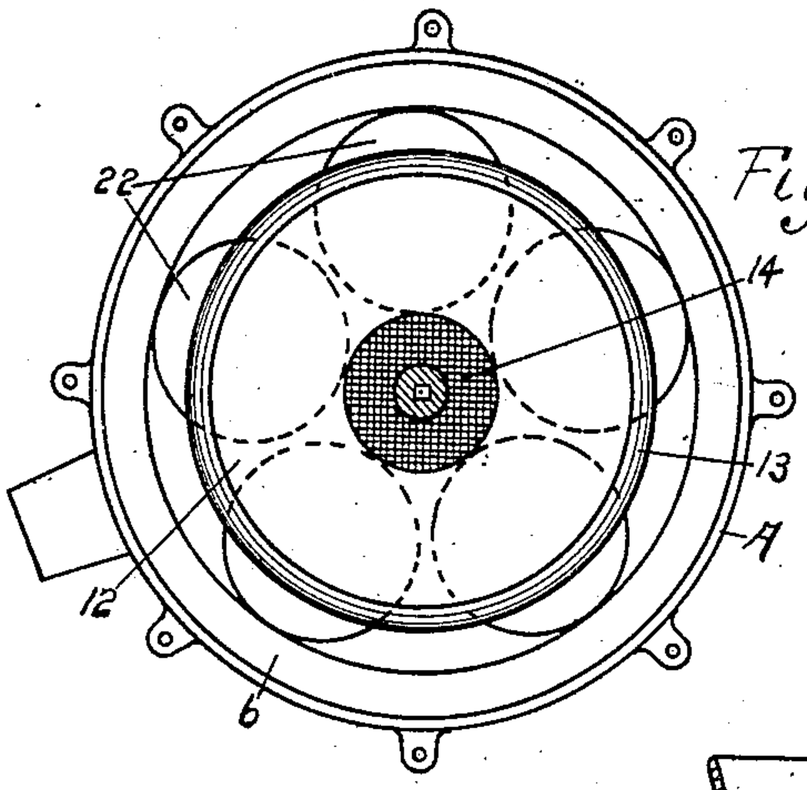


Fig. 3

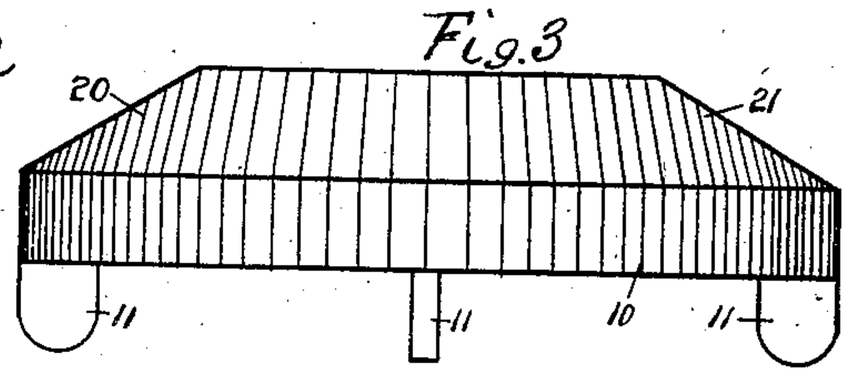
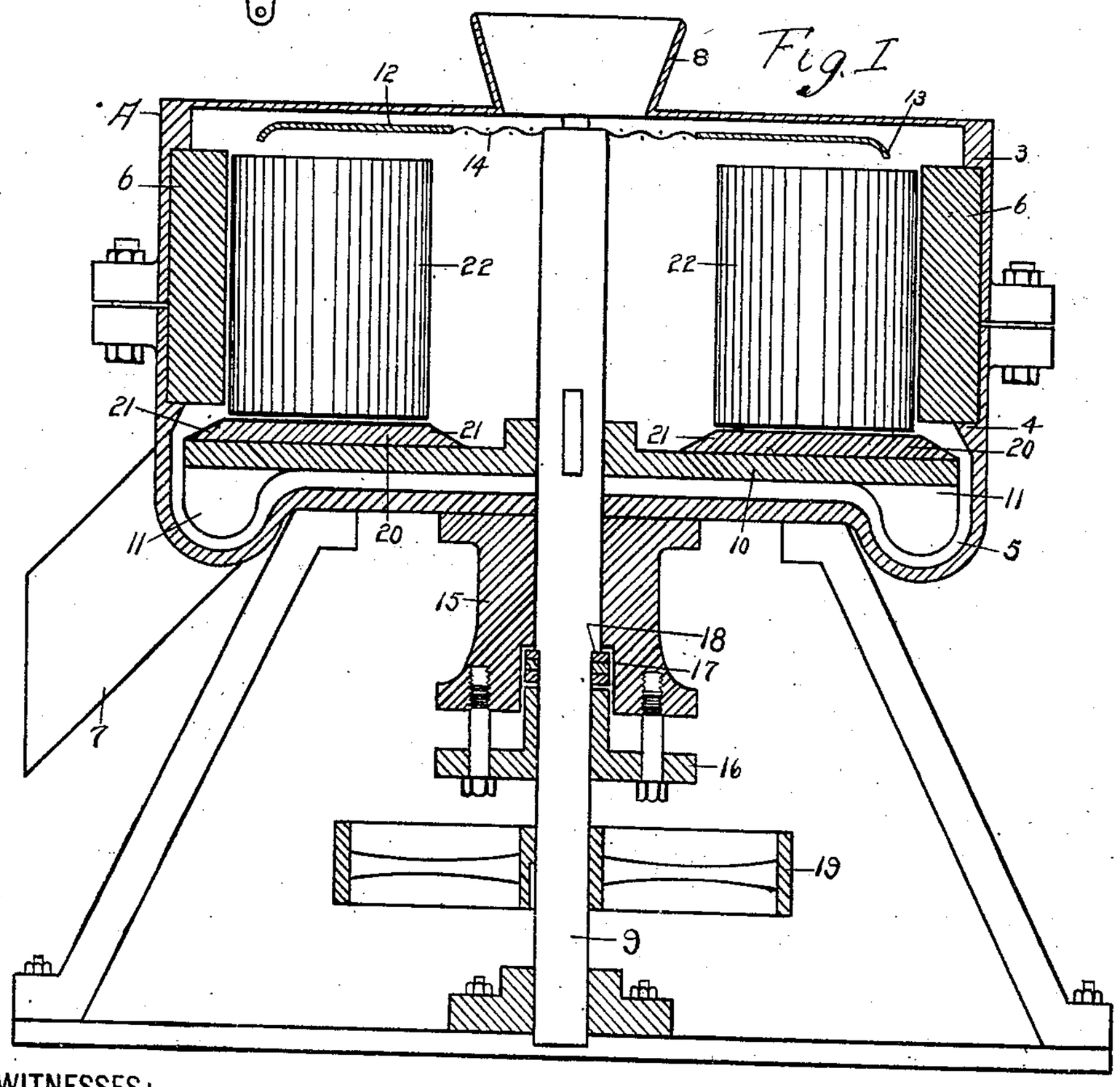


Fig. I



WITNESSES:

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FREDRICK SCHIEFFLER, OF ALPENA, MICHIGAN.

GRINDING-MACHINE.

No. 859,118. Specification of Letters Patent. Patented July 2, 1907.

Application filed May 14, 1906. Serial No. 316,780.

To all whom it may concern:

Be it known that I, FREDRICK SCHIEFFLER, a citizen of the United States, residing at Alpena, in the county of Alpena and State of Michigan, have invented certain new and useful Improvements in Grinding-Machines; 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.

My invention relates to grinding machines and more particularly to that class of grinding machines designed to crush or granulate hard substances as ores, coal, stone, cement, or clay and similar substances although its use is by no means confined to these materials.

One object of my invention is to utilize centrifugal force in grinding the material fed to the machine.

Another object of my invention is the provision of means for distributing the material to the grinding mechanism.

A further object of my invention is the provision of means for conveying the ground material to a discharge spout and a still further object is the provision of novel mechanism for grinding material fed to the machine.

To these and other ends, therefore, my invention consists in certain novel features and combinations of parts together with their equivalents, such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, wherein is illustrated one embodiment of which my invention is capable, Figure 1 is a vertical cross section through the machine, parts being in full lines, Fig. 2 is a top plan view, the casing being omitted and Fig. 3 is a detail side view of a portion of the rotary table.

Supported upon a suitable bed plate and legs is a casing A, composed of upper and lower sections which sections are removably secured together at their meeting edges in any convenient manner, the casing being approximately cylindrical.

Each section of the casing is provided internally with an annular shoulder 3, 4, shoulder 4 in the lower section preferably being beveled or undercut as shown to permit the ground material to pass into the annular, preferably semicircular, channel 5 formed at the juncture of the side and bottom of the lower section of the casing.

Between the shoulders 3, and 4 is supported and located a ring or tire 6 preferably of hardened steel, the inner periphery of which is wider than and extends beyond the shoulders into the compartment formed by the casing, the tire being nearly of the same height as the casing and being held in position by the engagement of the shoulders with its upper and lower edges, the shoulders securely clamping the edges by reason of the removable fastening connecting the upper and lower sections of the casing.

A spout or discharge 7 leads from the annular channel and though I have shown but one such discharge a larger number may be provided.

Centrally of the top of the upper section or cover is located a hopper 8 through which the material to be ground is introduced into the hopper.

Projecting up through the bottom of the casing and preferably centrally thereof is a shaft 9 to which is keyed a horizontally located circular table 10 at a point just above the bottom of the casing the table lying parallel with the bottom of the casing and extending conveniently to a point over the annular channel and beneath the overhanging shoulder 4 and tire 6. Depending from the table at its outer edge are the series of wings 11, 11, which lie in the annular channel and push the ground material around to the discharge 7. The upper end of the shaft 9 extends to a point just beneath the hopper 8 and has secured thereto a distributing plate 12, preferably circular or disk-shaped, the periphery of the plate being slightly battered as at 13 and lying in proximity to the inner periphery of the tire or ring 6. This plate at a point directly beneath the hopper is reticulated as shown at 14 for a purpose hereinafter described. The shaft 9 is supported in a thrust bearing in the bed plate and passes through a stuffing box 15 carried by the lower section of the casing, a gland 16 being adjustably connected to the stuffing box and supporting a series of packing rings 17 engaging a shoulder 18 on the shaft whereby the position of the table relative to the tire may be adjusted to widen or narrow the opening between the tire and table whereby the material under treatment is ground coarse or fine as desired. A pulley 19 on the shaft driven in any suitable manner imparts rotation to the shaft and its connected parts.

The upper face of the table is preferably provided with a metallic annulus 20, the edges of which are oppositely beveled as shown at 21, 21, the bevel on the outer periphery of the annulus conveniently conforming to and being parallel with the bevel on the shoulder 4 opposite which the annulus lies and it is the distance between this annulus and the shoulder 4 and tire 6 which determines the size to which the material shall be ground, such distance being adjustable by means of the gland referred to. Located upon this beveled annulus are a plurality of upright rolls 22, 22, which are cylindrical in shape and rest loosely on one end on the annulus 21, the rolls being of approximately the same height as the width of the tire, the distributing plate overhanging the rolls as shown.

Having thus fully described the construction of one embodiment of my invention, its operation is as follows:—Power is imparted to the shaft to rotate the latter together with the table and the distributing plate. As soon as the shaft has attained a sufficient speed of

rotation, the rolls which loosely rest upon the annulus, are moved outward by centrifugal force until the peripheries of the rolls engage the inner periphery of the tire 6 against which they are closely pressed. The table, is of course, positively rotated and the heavy rolls, (preferably of steel) are carried around with the table and are constantly pressed against the tire. Owing to the fact that the rolls are not secured to the table, however, they will lag behind and will rotate as they are revolved by reason of their frictional engagement with the tire. This movement of the rolls is even more marked when the material to be ground is fed thereinto. The material is introduced into the casing through the hopper and falls upon the rotating distributing plate which casts the coarse material in a circular spray to a point between the rolls and the inner periphery of the tire, the material working down between the rolls and tire and being ground in its passage and finally drops onto the annulus 20 from which it passes between the outer beveled edge of the annulus and the beveled edge of the shoulder 4 into the channel 5, the material being given a final granulation when passing between the opposed beveled surfaces. The finer material sifts through the screen 14 and falls onto the table inside the annulus 20 onto which it is forced by centrifugal action, its passage onto the annulus being facilitated by the inner bevel 21 and as it passes across the annulus toward the periphery of the table it is ground beneath the rotating bases of the rolls and finally escapes from the edge of the table into the channel 5, in the same manner as does the material passing between the rolls and the tire. The channel is kept free and the material caused to discharge through the spout 7 by the wings 11 depending from the table into the channel, the wings rotating with the table and sweeping the ground material before them to the discharge opening.

From the foregoing it will be seen that I have devised a most efficient grinding mechanism capable of operating on both coarse and fine material simultaneously the machine being capable of use with any material which it is desirable to grind. It is also evident that changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact construction herein set forth.

Having thus fully disclosed my invention what I claim as new is:—

1. An attrition mechanism comprising a stationary circular grinding surface, a plurality of loosely mounted rotatable members revolved in contact with the grinding surface, a rotatable distributing member adapted to receive and discharge the material to be ground, and a screen carried by and forming a portion of the distributing member.

2. An attrition mechanism comprising a stationary circular grinding surface, a rotatable table inclosed within the stationary circular grinding surface, a grinding surface on and movable with the table, grinding members loosely resting on the table-supported grinding surface, the peripheries of the members caused to engage the stationary circular grinding surface by centrifugal action, and a means for simultaneously feeding material to points between the grinding members and the stationary circular grinding surface and to points within the orbit of movement of the grinding members.

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

FREDRICK SCHIEFFLER.

Witnesses:
LAWRENCE SCHIEFFLER,
FRED W. HAGEN.