No. 609,218. Patented Aug. 16, 1898.

R. H. WHITE.

MACHINE FOR GRINDING BALLS.

(Application filed June 14, 1897.)

(No Model.)

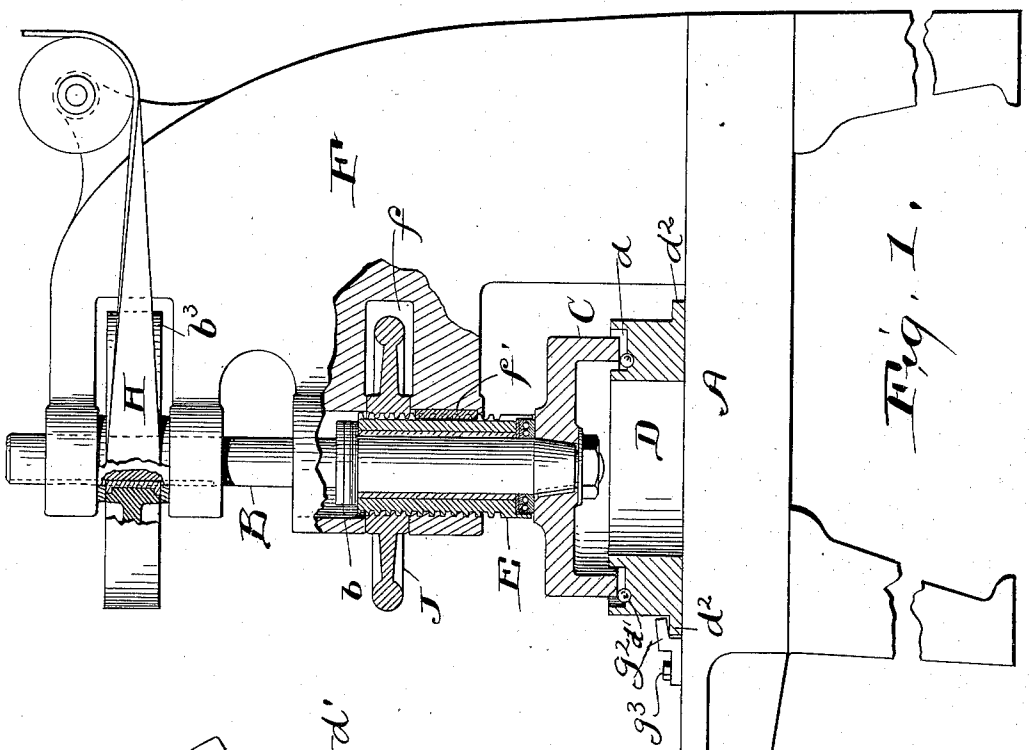


Fig. 1.

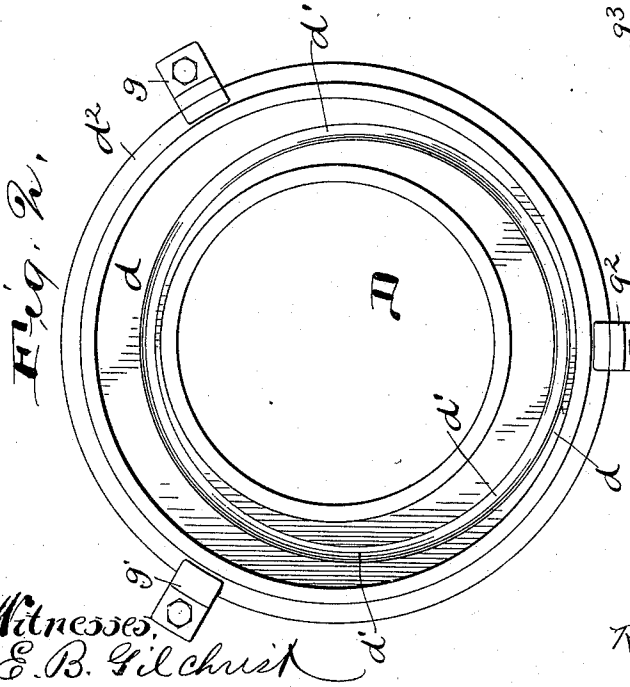


Fig. 2.

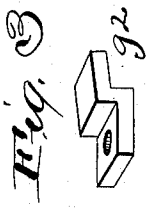


Fig. 3.

Witnesses,
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Inventor.
Rollin H. White,
By his attorneys,
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROLLIN H. WHITE, OF CLEVELAND, OHIO.

MACHINE FOR GRINDING BALLS.

SPECIFICATION forming part of Letters Patent No. 609,218, dated August 16, 1898.

Application filed June 14, 1897. Serial No. 640,614. (No model.)

To all whom it may concern:

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Grinding Balls; 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 certain improvements in ball-grinding machines; and its main object is to provide an efficient machine wherein the balls may be finally ground to the proper size and perfect form and smoothly polished in a mixture of oil and emery or like substance.

The invention consists in certain novel features and combinations of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of a machine embodying my invention. Fig. 2 is a plan view of the plate D, and Fig. 3 is perspective view of one of the clamp-stops.

Referring to the parts by letters, A represents the table or bed of the machine, and F represents the bracket-standard, in which is journaled a vertical shaft B.

C represents a tubular cylindrical grinder, which may be made of cast-iron, which is secured to the lower end of shaft B. This shaft ought to be vertically movable a short distance, and any suitable means for so moving it may be provided. The means shown in the drawings consist of the following parts: The shaft is embraced by a sleeve E, which is externally threaded. A hand-wheel J, which fits in a horizontal slot in the bracket f, screws onto this sleeve. The sleeve is prevented from revolving by a tongue f', which enters a vertical groove in the sleeve. This sleeve fits between a collar b on shaft B and the top of the grinder. Preferably antifriction-balls are interposed between the top of sleeve E and the collar b and between the bottom of the sleeve and the grinder C. Obviously the turning of hand-wheel J raises or lowers sleeve E, and the movement up or down of this sleeve produces a like movement of the shaft B.

D represents a plate which rests upon the table A below the grinder. In its top surface is an annular channel d, and in the bottom of this channel is an annular ball-groove d'. In vertical radial section this groove d' is seen to be particylindrical, less than semicylindrical.

The plate D is preferably slidable from beneath the grinders, so that the balls may be inserted and removed from the groove d'. In such case stops and clamps are provided for fixing the position of the plate beneath the grinder and for holding it. Two stops g g' may be permanently fixed to the table, and a flange d^2 on the lower edge of the plate D will engage with them. The clamp g^2 may be secured to the table by a bolt g^3, which permits its easy removal. These stops and clamps are so placed that when the plate D is in engagement with them the ball-groove d', which is preferably circular, is eccentric to the grinder. In the best construction this groove d' is also eccentric to the channel d, which channel in such case is concentric with the grinder.

In the operation of the machine the groove d' is filled with balls, and the plate D is then pushed to and secured in the proper position beneath the grinder. The grinder is then lowered until it bears with the proper pressure upon the balls. The channel d is filled with a mixture of oil and emery. The grinder is rotated in contact with the balls, which are thereby turned in all directions as they are moved around in groove d'.

One advantage in having the channel d concentric with the grinder is that the grinder can project into the said channel, whereby the balls will be entirely buried in the oil and emery. The machine will be operative, however, if the channel d and the groove d' are concentric, provided the plate D is placed in such position that the groove d' is eccentric to the grinder.

The shaft B may be driven by any suitable means—as, for example, by the belt H, which engages with a pulley b^3, which is connected with the shaft by a tongue and groove which will permit the shaft to slide through it.

Having described my invention, I claim—

1. In a machine for grinding balls, in combination, a grinder rotatable upon a vertical axis and having a plane grinding-face, a hori-

zontal plate below said grinder having in its upper face a recess adapted to contain a mixture of oil and emery or like substance and having in the bottom of said recess a ball-groove which, when the parts are in operative position, is not concentric to the grinder, substantially as and for the purpose specified.

2. In a machine for grinding balls, in combination, a rotatable tubular grinder, a plate, below said grinder, having in its top surface a circular channel concentric with said grinder, and having in the bottom of said channel a ball-groove which is eccentric to said grinder and channel, substantially as and for the purpose specified.

3. In a machine for grinding balls, in combination, a grinder rotatable upon a vertical axis, a table below said grinder, a plate slidable upon said table, which plate has in its upper surface an annular channel, and in the bottom of said channel an annular groove which is eccentric to the grinder, and guide-stops on the table for determining the position of the plate relative to the grinder substantially as and for the purpose specified.

4. In a machine for grinding balls, in combination, a rotatable tubular grinder, a table below the grinder, a plate slidable upon said table, stops and a clamp for fixing the position of the plate relative to the grinder, said plate having, in its top surface, a circular channel adapted to receive the lower grinding edge of the grinder, and in the bottom of said channel a ball-groove which is eccentric to said channel, and means for moving the grinder vertically to permit the withdrawal of the plate from beneath the grinder, substantially as and for the purpose specified.

5. In a machine for grinding balls, a horizontal plate having, in its top surface, a circular channel, and in the bottom of said channel a circular ball-groove eccentric to said channel, substantially as and for the purpose specified.

6. In a machine for grinding balls, in combination, a grinder rotatable upon a vertical axis and having a flat grinding-surface, a substantially horizontal bed below said grinder, a plate movable upon said bed and having in its top a recess adapted to contain a mixture of oil and emery or like substance, and having in the bottom of said recess an endless ball-groove which, when the parts are in operative relation, is not a circle concentric with the axis of the grinder, substantially as and for the purpose specified.

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

ROLLIN H. WHITE.

Witnesses:

E. L. THURSTON,

ALBERT H. BATES.