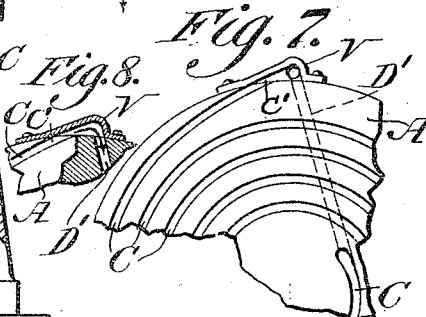
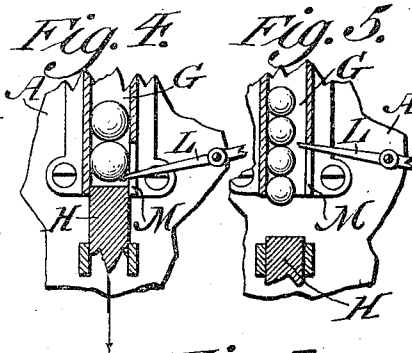
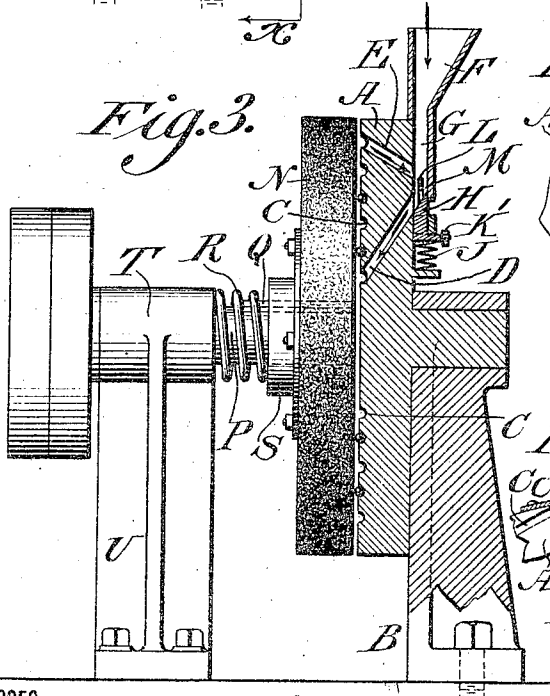
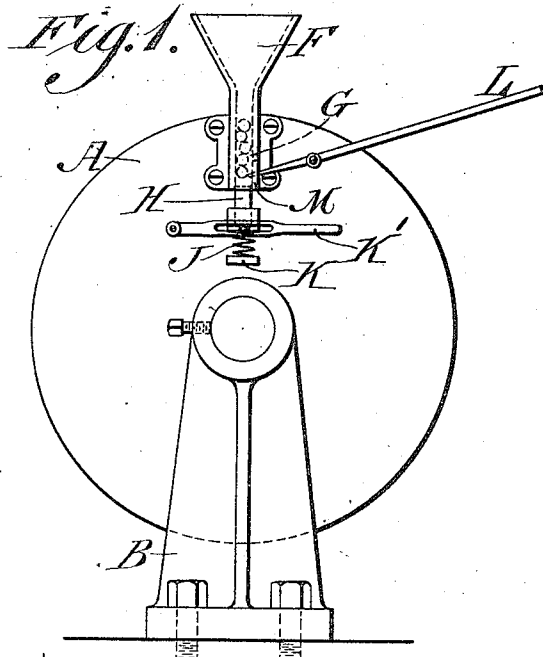


981,310.



WITNESSES
L. Downille,
H. F. Dickrich

Fig. 6.

BY A C' A C' A C'

Albert Ringland
Inventor
Friederich Hairbault
Attorneys

UNITED STATES PATENT OFFICE.

ALBERT RINGLAND, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO STANDARD
ROLLER BEARING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION
OF NEW JERSEY.

MACHINE FOR GRINDING AND POLISHING METALLIC BALLS.

981,310.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed June 16, 1910. Serial No. 567,131.

To all whom it may concern:

Be it known that I, ALBERT RINGLAND, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Machine for Grinding and Polishing Metallic Balls, of which the following is a specification.

My invention consists of a machine for grinding and polishing metallic balls, embodying a bed having a spiral groove or recess to receive the balls, and a runner adapted to be pressed against said balls so as to cause the latter to traverse said recess and thereby be ground and polished, and means for returning the balls if unfinished to the bed to be furthermore subjected to grinding and polishing operations.

It consists also of a tell-tale for automatically indicating that the balls are properly finished.

It consists further of means for discharging the finished balls.

For the purpose of explaining the invention, the accompanying drawings illustrate a satisfactory reduction of the same to practice, but the important instrumentalities thereof may be varied, and so it is to be understood that the invention is not limited to the specific arrangement and organization shown and described.

Figure 1 represents a side elevation of a machine for grinding and polishing metallic balls embodying my invention. Fig. 2 represents a view of the inner face of the bed of the machine. Fig. 3 represents a partial side elevation and partial section on line $x-x$, Fig. 2. Figs. 4 and 5 represent sections of detached portions on an enlarged scale, Fig. 4 showing the tell-tale when the balls are in unfinished condition, and Fig. 5 showing the same when the balls are in reduced and finished condition. Fig. 6 represents a section of beds of the machine, having different shaped grooves or recesses therein. Fig. 7 represents a modification of the spiral groove or recess. Fig. 8 represents a vertical section of the parts shown in the upper portion of Fig. 7.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings:—A designates a bed of the form of a plate or disk, which is supported on the standard B, and has on its inner face the spiral groove or recess C which has an inlet or supply channel D, and outlet or discharge channel E, said channels passing transversely through the bed and terminating near each other on the outer side of said bed.

F designates a supply hopper or funnel whose outlet is of the form of a chute G, the same occupying the side of the bed and having its inner wall cut away so as to be in communication with the outer terminals of channels E, D. The bottom of the chute G is open, but is adapted to be closed by the movable block H, which is held in normal position by the action of the upwardly-pressing spring J, the latter having a support K on the side of the bed A. Connected with the block H, is the lever K' which is mounted in the bed A and adapted to lower said block and so uncover the bottom of the chute G, as will be hereinafter more fully explained.

It will be noticed that the channel E is inclined downwardly and that the channel D is inclined upwardly, both in the direction from the inner to the outer side of the bed, and that the upper face of the block H is sloping so as to accord with the channel D with which, in a measure, it forms a continuation in the normal condition of said block.

L designates a lever, the inner end of which projects through a slot in the side of the chute G into the interior thereof, so as to be in the path of the balls in said chute and to be depressed by the same, as plainly shown in Fig. 4. The outer limb of said lever is lengthened whereby it overbalances the inner limb thereof, so as to elevate the latter when relieved of the balls, as plainly shown in Fig. 5.

N designates a runner of grinding and polishing material, it having its working face against the recessed face of the bed A, said runner being connected with the arbor or shaft P by the feather Q, so that while the runner receives rotary motion from said arbor, it may move slidably therein in a di-

rection toward the bed A, it being subjected in such motion by the action of the spring R, which is interposed between the hubs of the runner and the bearing T of the arbor P; said bearing being on the standard U, said arbor receiving rotary motion in any suitable manner.

The operation is as follows:—The hopper is supplied with balls, which descend through the chute G and pass the end of the lever L so as to reach the channel D, by which they are directed into the groove or recess C, said end of the lever lowering into the slot M, the runner N yielding laterally on its arbor to allow the balls to enter said recess. Power is applied to said arbor and consequently to the runner, whereby the latter is rotated and it bears against the balls carrying them through the spiral recess and subjecting them to the grinding and polishing action of the runner N under the pressure of the spring P. When the balls traverse said recess, they enter the channel E and so are reconveyed to the chute G. If their diameter is not sufficiently reduced, they drop on the adjacent end of the lever L and lower and trip the same and then strike the block H, from whence they roll into the channel D and so are reconveyed to the recess C so as to be subjected to a further grinding and polishing action. As a ball passes the end of the lever, the latter is released and rises so as to engage the next descending ball and then be actuated by the latter, thus causing the lever to vibrate, acting as a tell-tale or indicator to the operator that the balls are not in condition to be removed. Should, however, the balls be reduced to the required diameter, the end of the lever is no longer in the path of the same, when said end rises in the slot M, as in Fig. 5, and the lever ceases to vibrate, thus indicating to the operator the finish of the balls. The lever K' is now operated, so as to lower the block H, when the balls no longer contact with the same, the bottom of the chute G then being uncovered or opened, and thus the balls may drop from the chute and be gathered or be directed elsewhere to a place of deposit in any suitable manner.

In Fig. 6, I show spiral grooves or recesses C', C² and C³ of different contours from the semi-cylindrical groove or recess in Fig. 1, without, however, producing different results.

In Fig. 7, I show the spiral groove or recess C continued as at C' to the periphery of the bed and its terminal opens into a cap V which is secured to said periphery. From said cap, there extends the channel D' which is formed in said bed and adapted to communicate with the groove or recess C' so as to return the balls to the latter, as in the previous case.

In practice, the bed may be formed of steel and the runner of emery or stone, but to said materials I do not limit myself.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a machine of the character stated, a bed having therein a spiral-shaped recess, a supply channel leading thereto, and a discharge outlet leading therefrom and ball-engaging means at the junction of said channel and outlet.

2. In a machine of the character stated, a bed having a recess to receive an article to be polished, a runner opposite thereto, and movably mounted means at the junction of the inlet and discharge from said recess for automatically redirecting said article to the inlet of said recess after leaving the outlet thereof.

3. In a machine of the character stated, a bed having a spirally-shaped recess therein, an inlet channel leading to said recess, and an outlet channel leading from said recess, one of said channels leading from said recess near the periphery and the other leading from said recess near the center of the bed and a supplying vessel adapted to form a communication for said channels.

4. In a machine of the character stated, a bed having a spirally-shaped recess therein, an inlet channel leading to said recess, and an outlet channel leading from said recess, one of said channels leading from said recess near the periphery and the other leading from said recess near the center of the bed, a supplying vessel adapted to form a communication for said channels, and a movable supporting member on said vessel adjacent to the outlet channel.

5. In a machine of the character stated, a bed having on its working face a groove, and through its body a supply channel and an outlet channel, a supplying vessel adapted to form a communication for said channels, and a movable member operative at the base of said vessel adjacent the junction of said outlet and supply channels, and the terminal of said outlet channel adapted to close and uncover said channel.

6. In a grinding and polishing machine of the character stated, a bed and a runner adapted to grind and polish an article admitted between the same, means for returning said article from the outlet of said bed to the inlet thereof, and a tell-tale in said means of the finished work.

7. In a grinding and polishing machine of the character stated, a bed and a runner therefor, a supplying vessel for said bed, and a tell-tale on said device composed of a lever having a limb within the same in the path of the article traversing said device.

8. In a grinding and polishing machine

of the character stated, a bed and a runner therefor, a supplying vessel for said bed, a tell-tale of the finished work having a limb adapted to enter said vessel in the path
5 of the article traversing the same, a member adapted to close the outlet of said vessel, means for holding said member in closed position and means for operating said member to open said vessel.

ALBERT RINGLAND.

Witnesses:

C. D. McVAY,

M. E. RINKENBACH.