No. 712,531. Patented Nov. 4, 1902.

# A. M. HEWLETT.

## RATTLING MILL.

(Application filed Aug. 30, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

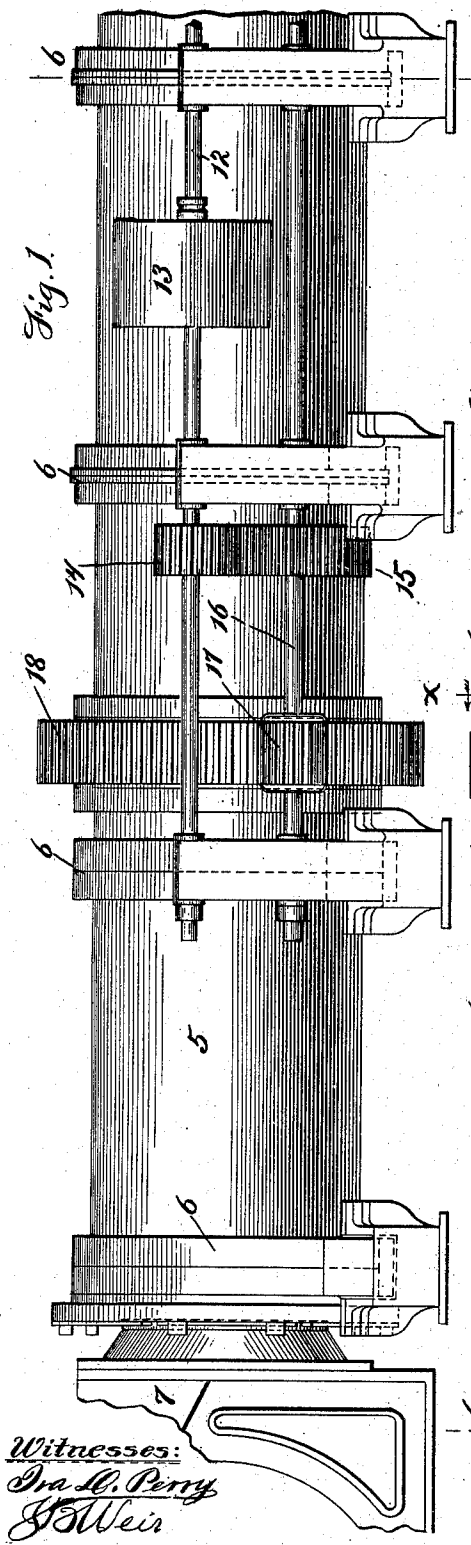
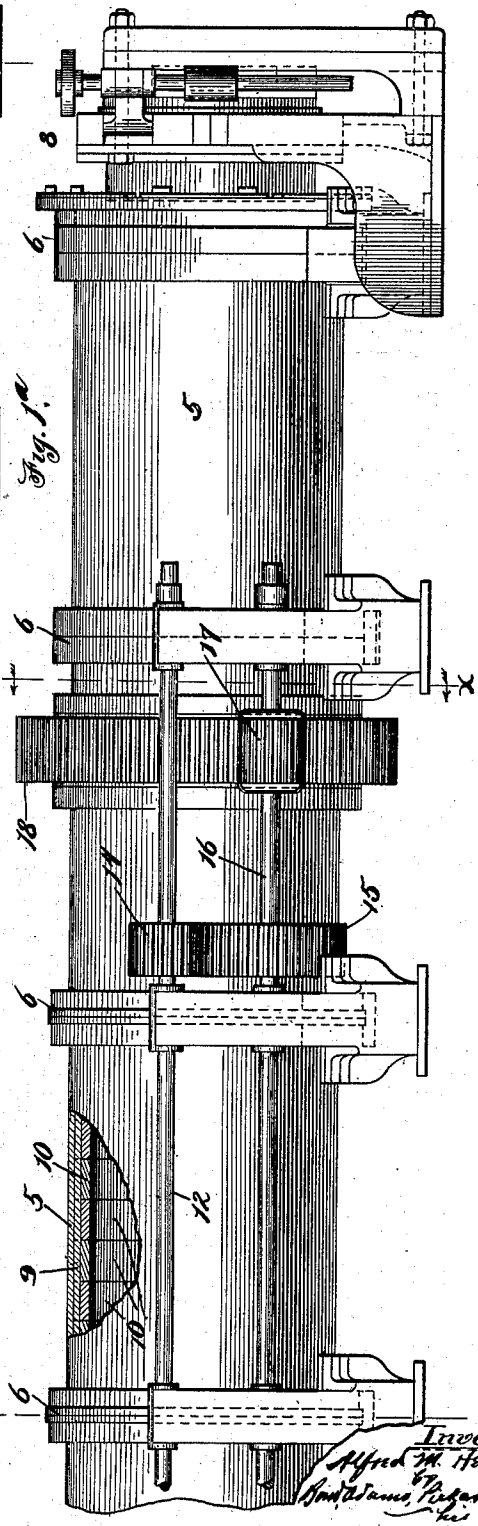



Fig. 1a.




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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

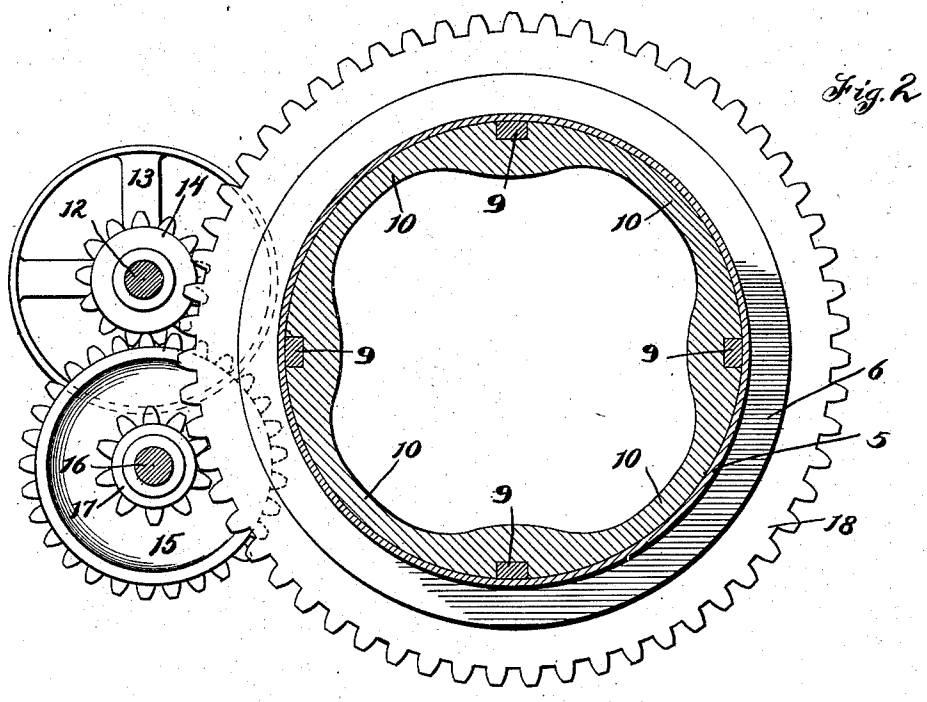



Fig. 3.

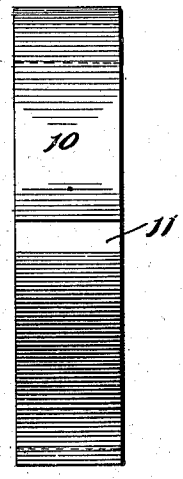
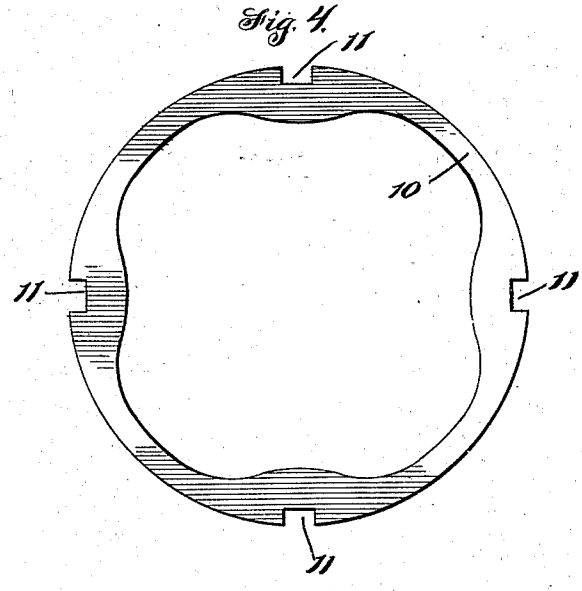



Fig. 4.




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# UNITED STATES PATENT OFFICE.

ALFRED M. HEWLETT, OF KEWANEE, ILLINOIS.

## RATTLING-MILL.

SPECIFICATION forming part of Letters Patent No. 712,531, dated November 4, 1902.

Application filed August 30, 1901. Serial No. 73,833. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED M. HEWLETT, a citizen of the United States, residing at Kewanee, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Rattling-Mills, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in rattling-mills for cleaning castings.

Continuous rattling mills or traps as ordinarily constructed have been found to be very unsatisfactory and expensive on account of their liability to breakage by reason of the faulty formation of their linings. It is necessary to make the wearing or inside parts of such mills of hard iron, as soft or gray iron wears so rapidly as to render such parts when made of it expensive and unsatisfactory. As generally constructed the linings or wearing parts of such rattling-mills have been made in the form of long pieces placed longitudinally of the cylinder or barrel, and as such pieces have had to be made of hard iron, as above explained, in order to withstand the wear they would break so frequently and sections drop out of place and expose the shell that continuous rattle-mills have become unpopular and have been practically abandoned and in place thereof a large number of small short rattling-machines are now generally used. A continuous mill, however, if it can be properly constructed to withstand the shocks to which its linings are continuously subjected, is much to be preferred to a number of short ones, as on account of its great length it can be loaded and emptied continuously and automatically, as by the time the castings have reached the discharge end they will have become thoroughly cleaned, while the smaller machines have to be stopped for both loading and emptying.

To overcome the objections to the use of continuous rattling-mills growing out of the faulty construction of the linings, as above noted, is the object of my invention, and I accomplish this by means of the new and improved construction of lining and manner of attaching the same shown in the drawings and hereinafter particularly described.

That which I regard as new will be set forth in the claims.

In the accompanying drawings, Figures 1 and 1ª, taken together, constitute a side elevation of the machine, Fig. 1 being a view of the left-hand part of the machine, and Fig. 1ª a view of the other part, a portion of the cylindrical shell in Fig. 1ª being broken away to illustrate the construction and arrangement of the lining. Two figures are employed to furnish a side view of the complete machine on account of the great length of the machine. Fig. 2 is a cross-section at line $x\ x$ of Fig. 1ª. Fig. 3 is a plan view of one of the lining-rings, and Fig. 4 is a side view of the same.

Referring to said drawings, 5 indicates the cylindrical outside shell of the mill, which is made up in sections of boiler-plate, each preferably above five feet in width and each section being riveted at its ends to heavy rings 6, by means of which the several sections are firmly bolted together, the said rings resting on suitable bearings or supports, in which they turn as the machine is operated.

7 indicates a suitable hopper at the forward end of the machine and communicating with the interior thereof in such manner as not to interfere with the free turning of the shell, through which hopper castings can be fed. At the opposite end the machine can be provided with mechanism 8, as shown, or other suitable devices for adjusting the size of the discharge-opening, and thereby regulating the time that the castings are to be rattled.

9 indicates bars extending longitudinally of the machine from end to end on the interior thereof and suitably secured to the shell. Four of these bars are shown; but I do not limit myself to such number, although in practice I have found that number satisfactory.

10 indicates a number of rings of a diameter to adapt them to slide within the shell 5, each of these rings being provided on its periphery, as shown, with four notches 11 of a size and shape to adapt them to fit over the longitudinal bars 9, and in the form of construction shown the inner face of the ring opposite each notch 11 is swelled or thickened, so that the ring is reinforced at those points, and consequently is as strong and thick opposite the notches as at any other point. These rings are each made of hard iron and can be made of various widths; but I have found from practical use that about six inches is a satisfactory width to make them. The rings, as shown, are each formed

with substantially straight side faces or edges at right angles to the wearing-face of the ring, the side face of one ring abutting closely against the corresponding side faces or edges of the adjacent rings, which construction is of decided advantage in mills designed for the rough and heavy work herein described, for the reason that rings so constructed are much less liable to breakage than if such side faces or edges were beveled or otherwise formed to fit against other correspondingly-shaped rings, because if such side faces were beveled or formed otherwise than substantially straight or flat such engaging sides or edges must fit with great accuracy, for otherwise such rings near their edges would be much weaker than at other points and be apt to chip or break off under the severe pounding to which they are subjected by the action of the heavy castings. To provide accuracy of fit of beveled edges, so that the rings would be as strong near and at their edges as at other points, would be quite expensive and not practicable for machines of this character.

The shell 5 is filled from end to end with these lining-rings, which being made of hard iron and rigidly held in place by the longitudinal bars 9 will withstand a great amount of wear before breaking. When, however, they do break, they will ordinarily remain in place and not interfere with the proper tumbling of the castings being operated upon nor allow the shell to become exposed and subjected to the action of the moving castings. If at any time a ring should become broken in two or more places, so as to allow it to drop out of place and expose the shell, all that is necessary to be done is to take out such broken ring and close up the space that it occupied by shoving forward all the rings at one side of such space and then putting in another ring at the end, thus allowing any such repair to be made at small expense and with but little loss of time.

It is evident that by my invention the lining, composed of a large number of separate rings guided into place and held by the bars, will furnish a strong and durable wearing-surface for the castings to roll upon and that such lining, while easily and quickly slipped into place, cannot be moved or disturbed in its relation to the shell during the operation of the machine and at all times completely protects the entire interior surface of such shell from end to end. By my invention I am enabled to construct a mill of this character of great length and have, indeed, put mills into practical use that were from thirty to forty-five feet long, obtaining from their use the advantages hereinbefore referred to over the series of small short mills that are in general use.

The mill can be turned by any suitable mechanism, that shown being that which I have employed for the purpose and which I will now briefly describe.

12 indicates a shaft journaled in suitable supports at one side of the shell 5, to which is fastened a driving-pulley 13.

14 indicates two pinions on the shaft 12 at opposite sides of the pulley 13, each of which meshes with a gear 15, fast on another shaft 16.

17 indicates two pinions on the shaft 16 near opposite ends thereof, each of which pinions 17 meshes with a gear-ring 18, secured around the shell 5.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a rotatable shell, a support therefor, and means for rotating said shell, of a lining for the shell formed of a series of rings placed side by side and having side faces or edges formed at substantially right angles with the wearing-faces of the rings, substantially as specified.

2. The combination with a rotatable shell, a support therefor, and means for rotating said shell, of a lining for said shell formed of a series of rings placed side by side and having side faces or edges formed substantially at right angles with the wearing-faces of the rings, and means for removably securing said rings in place, substantially as specified.

3. The combination with a rotatable shell, a support therefor, and means for rotating said shell, of a lining for said shell formed of a series of rings placed side by side, and means on the inner face of the shell adapted to removably secure said rings in place, substantially as specified.

4. The combination with a shell, a lining for the same formed of a series of rings having their abutting edges substantially radial with the axis of the shell, and means carried on the inner face of the shell for engaging said rings and removably holding them in place, substantially as described.

5. The combination with a shell, of a lining for the same formed of a series of rings each having in its periphery a notch, and a projecting strip on the inner face of the shell adapted to be engaged by the notches of the rings, substantially as specified.

6. The combination with a shell, of a lining for the same composed of a series of rings, each having a notch in its periphery and a swell or reinforcing thickness on its inner face opposite said notch, and a projecting strip in the inner face of the shell adapted to be engaged by the notches of the rings, substantially as specified.

7. A lining-ring provided on its periphery with a notch, substantially as specified.

8. A lining-ring provided on its periphery with a notch and on its inner face opposite said notch a swell or reinforcing thickness, substantially as specified.

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