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S. S. WHEELER.

BORING MILL.

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Fig. 1

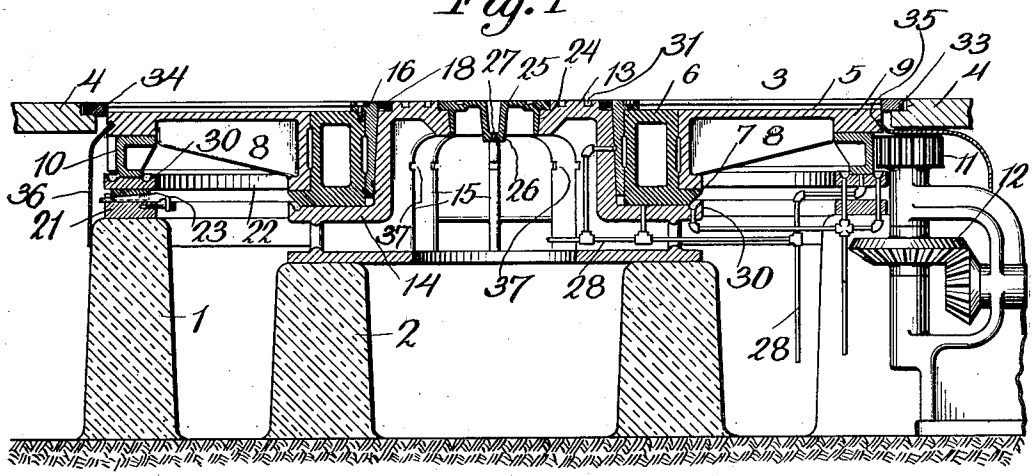
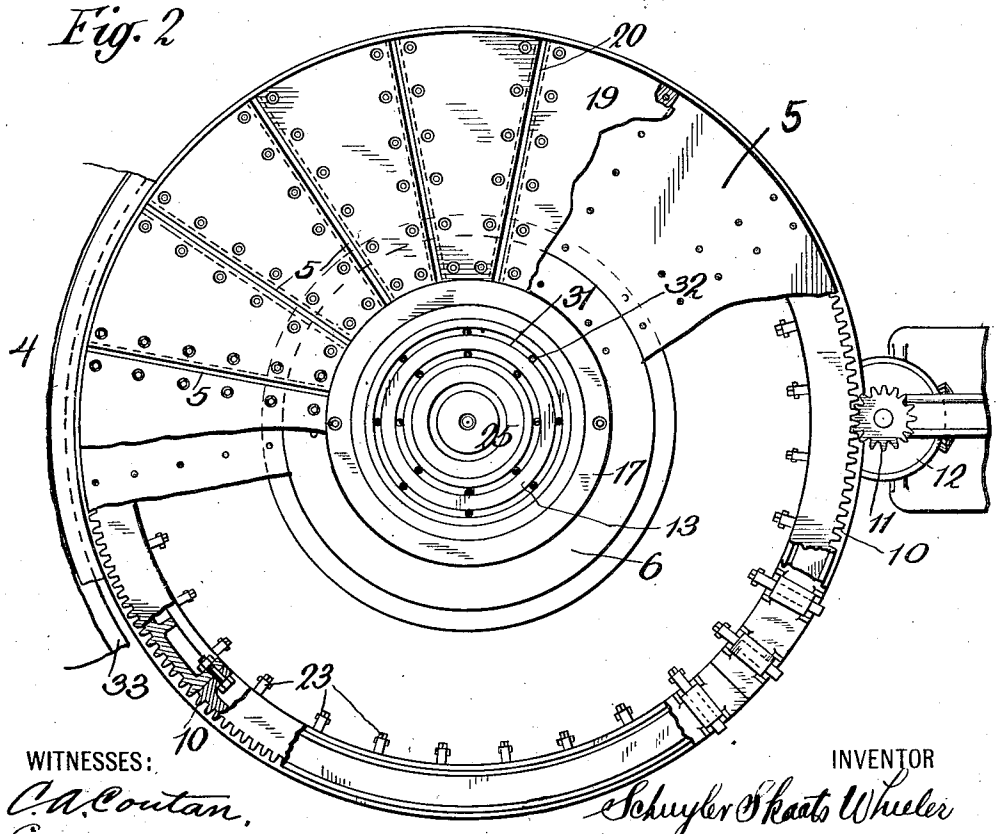


Fig. 2



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BORING-MILL.

No. 891,199. Specification of Letters Patent. Patented June 16, 1908.

Application filed March 25, 1907. Serial No. 364,527.

To all whom it may concern:

Be it known that I, SCHUYLER SKAATS WHEELER, a citizen of the United States of America, and resident of the town of Bernardsville, county of Somerset, State of New Jersey, have invented certain new and useful Improvements in Boring-Mills, of which the following is a specification.

My invention relates to boring mills and it is especially adapted for use in connection with what is known as the floor-plate system, in the finishing or machining of heavy work such as the rotors of large dynamos and the like.

In the floor-plate system the floor is made up of plates of iron accurately finished on their upper surfaces and rigidly held in position and provided with holes or slots so that machine tools such as drilling, milling and slotting machines etc. may be easily moved up to the work and securely held in accurate alinement while performing their work.

The object of my invention is to provide a boring mill of massive construction especially adapted to be used in connection with or as a part of a floor-plate system and which shall be simple and effective in its construction and operation.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

In the drawings accompanying and forming a part of this specification Figure 1 is a vertical central section through the axis of the mill. Fig. 2 is a plan of the mill, portions of the face-plate being broken away and shown in section.

Referring to the drawings, numerals 1 and 2 represent respectively the outer and inner annular walls or piers which support the boring mill; 3 represents a movable annular table or face-plate whose top, or working surface is flush with the surface of the floor-plates 4. The face-plate 3 is made up of an annular ring 5, heavily webbed on its under side, to which is secured in its central opening the hub 6 provided with a projecting flange 7 upon which the ring 5 rests. The ring 5 is strengthened by the radial webs 8 terminating at the outer periphery in the thickened rim 9. To the under side of the rim a segmental rack or gear 10 is rigidly bolted. With this gear wheel a pinion 11 meshes, the same being driven through suitable gears 12 from a horizontal shaft.

Securely mounted upon the inner pier 2 I provide a central stationary face-plate or king post 13 which presents a flat surface flush with the surface of the face-plate and an upwardly projecting centrally disposed body with an annular shoulder or seat 14 disposed about the lower part thereof. This king post is heavily built to take the weight of the annular face-plate on the seat 14 and is suitably reinforced by ribs 15. The body of the king post is slightly conical and tapers upwardly to a slightly reduced diameter. The annular face-plate rests upon the seat 14 in the manner illustrated and it is brought into accurate axial alinement, or centered, by means of a wedge sleeve or ring 16 which is forced down from above into the space between the king post and the annular face-plate; the said wedge sleeve being secured to the hub of the annular face-plate through a flange 17 overhanging the edge of the opening in the hub as shown. This wedge sleeve is adapted to be adjusted to take up the wear. The upper surface of the king post is plain or flat as shown and is formed with a groove at its edge which receives a packing ring 18 as indicated.

From the construction described it will now be understood that as the face-plate is rotated its weight will be taken by the seat 14 through it is held in axial alinement by the king post 13.

The face-plate is covered by anchor-plates 19 having separated undercut edges whereby radial **T** slots 20 are formed that are suitable for bolting down heavy machine parts upon the face-plate as will be readily understood. These anchor plates and the other parts of the face plate are all flush with the floor so that when not in use the face-plate virtually constitutes simply a part of the floor. I provide means for supporting the face-plate near its outer edge which operates to give the face-plate additional support when carrying an eccentric load or an overload. For this purpose I mount a series of foundation plates 21 with adjusting blocks on the outer pier 1, upon which rests the auxiliary bearing ring 22 which is adapted to be adjusted up to touch against the face of the ring 10 by suitable wedge-keys or gibs 23. It should be understood; however, that the bearing ring

22 normally does not take any part of the weight of the face-plate and load but is intended to hold the face-plate true in case it should tend to sag at its edge from an overload or eccentric load.

The king post 13 is formed with a central opening 24 which can be closed by a removable taper plug or cover 25. When the plug is removed a boring bar of a boring machine or the tool of a slotting machine may be introduced from below which can operate upon the interior of a machine part such as a cylinder or rotor bolted to the face-plate or to the king-post. The face-plate may be held fixed during this operation but if the machine part is a large one it may be fixed to the face-plate and as the face-plate revolves the exterior of the work may be finished by a tool mounted on the floor while the interior is finished by a tool carried on a boring bar introduced through the opening 24 as suggested. The plug is formed with a downwardly extending tubular neck 26 having threaded opening 27 in the lower end thereof.

The bearing surfaces are lubricated by oil introduced under pressure through a supply pipe system 28 and carried away by a return pipe system 29, the seat 14 and the bearing-ring 22 being provided with lips 30 as shown, to retain the oil.

In the upper face of the king post 13 I provide two or more annular slots 31 and the bottom of these slots are provided with threaded bolt holes 32 spaced equal distances apart as shown. These grooves are concentric with the axis of the boring mill and facilitate the seating of a tool-post on the king post, the tool-post having annular ribs on its bottom to fit in the grooves and being rigidly secured in position by bolts seating in the bolt holes 32.

On account of the concentric position of the slots 31 it is possible to remove the tool-post referred to and replace it in center without employing any other centering means. These slots are at a measured distance from the axis of the mill and facilitate laying off radial measurements for the work. Around the outer edge of the face-plate 3 a continuous rabbet groove 33 is formed in the stationary floor plate and in this groove is placed a packing ring 34 that is finished at its inner edge to the diameter of the face-plate. It is unnecessary for the outer edge of this ring to touch the side of the rabbet groove; it may simply make a rough fit as indicated. This ring like the packing ring 18 excludes chips and dirt from the working parts. The side-face or outer edge of the face-plate 3 is provided with a deep undercut or inclined groove 35 in which is guided the upper edge of an apron or shield 36, secured at its bottom edge to the stationary foundation parts; this apron is made of sheet metal and extends continuously around the machine, acting as a covering to protect the working parts beneath, as indicated in Fig. 1. On the interior of the king post 13 the ribs 15 are formed with notches 37 which are at the same level and at a measured distance below the face of the face-plate; their presence enables a boring bar set up in the center opening to be accurately alined vertically.

On account of its great size the face-plate 3 is most conveniently formed in sections bolted together. The use of the segmental anchor plates is also advantageous as they are readily handled and set in place. While I have described the face-plate as being flush with the floor, this arrangement is not essential.

Having thus described my invention what I claim is:

1. The combination with a stationary central face-plate of a movable annular face-plate surrounding said stationary face-plate and means for driving said annular face-plate.

2. A movable annular face-plate in combination with a fixed central face-plate having its working face in substantially the same plane as that of the movable annular face-plate and having an opening in its center, and means for driving said movable annular face-plate.

3. In a floor-plate boring mill the combination with a stationary circular face-plate having an annular seat below its exposed surface, of an annular rotatable face-plate adapted to rest upon said annular seat and having a central opening adapted to receive said stationary face-plate.

4. In a floor-plate boring mill the combination with a stationary circular face-plate having an annular seat below its exposed surface and a conical body between its exposed surface and said annular seat, of an annular rotatable face-plate adapted to rest upon said annular seat and an adjusting ring between said conical body portion and the central opening in said annular face-plate.

5. In a floor-plate boring mill the combination with a stationary circular face-plate having an annular seat below its exposed surface, of an annular rotatable face-plate adapted to rest upon said annular seat and having a central opening adapted to receive said stationary face-plate, and a movable guide ring disposed beneath said annular face-plate at a part removed from its central opening, and means for moving said guide ring into and out of contact with said annular face-plate.

6. The combination with a stationary circular face-plate of a movable annular face-plate concentric therewith, a groove formed in the surface of one of said face-plates adjacent to the joint between them, and a packing ring in said groove.

7. In a boring mill the combination with a central stationary face-plate having an upwardly projecting centrally disposed body and an annular seat disposed about the lower part thereof, of a rotatable annular face-plate mounted upon said stationary face-plate and comprising a central ring, an external ring secured to said central ring and radial segments with undercut edges secured to the upper surfaces of said inner and external rings.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

SCHUYLER SKAATS WHEELER.

Witnesses:

R. J. RANDOLPH, Jr.,

J. W. PALMER.