April 27, 1937. F. R. BARRATT 2,078,829

MEANS FOR SUPPORTING AND DRIVING TUBULAR GRINDING MILLS

Filed March 22, 1934 3 Sheets-Sheet 1

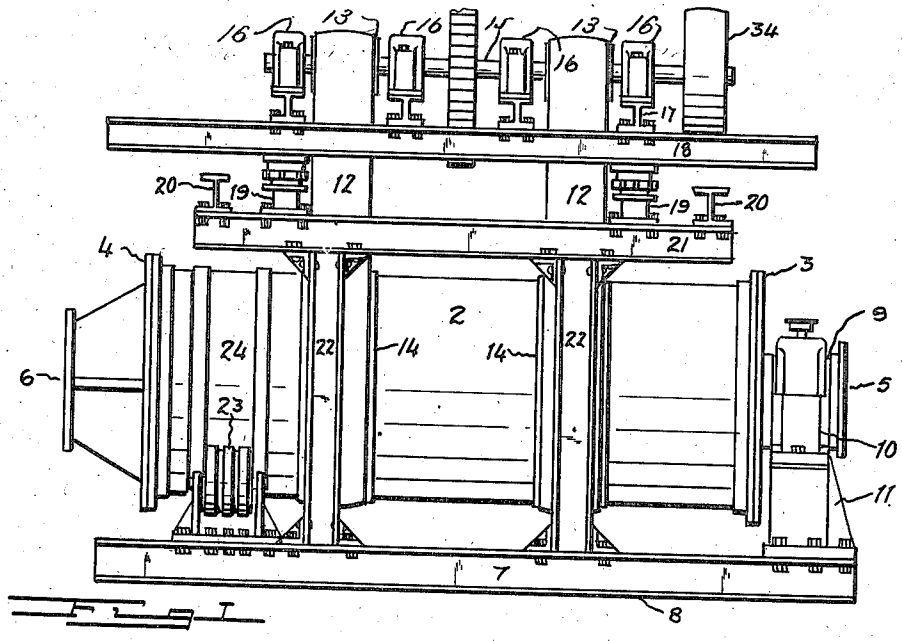


Fig. I

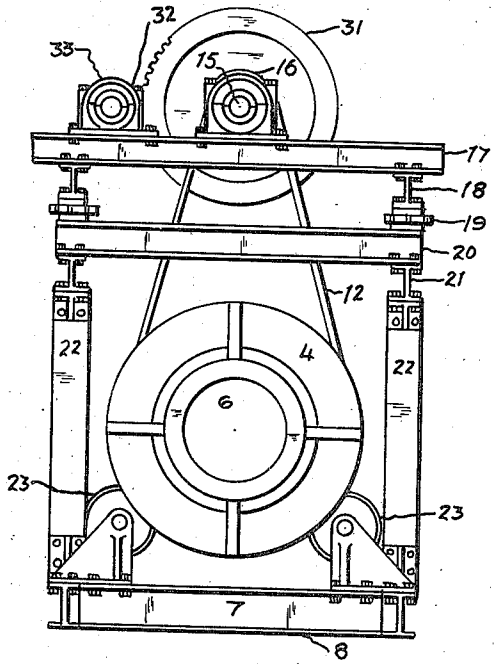


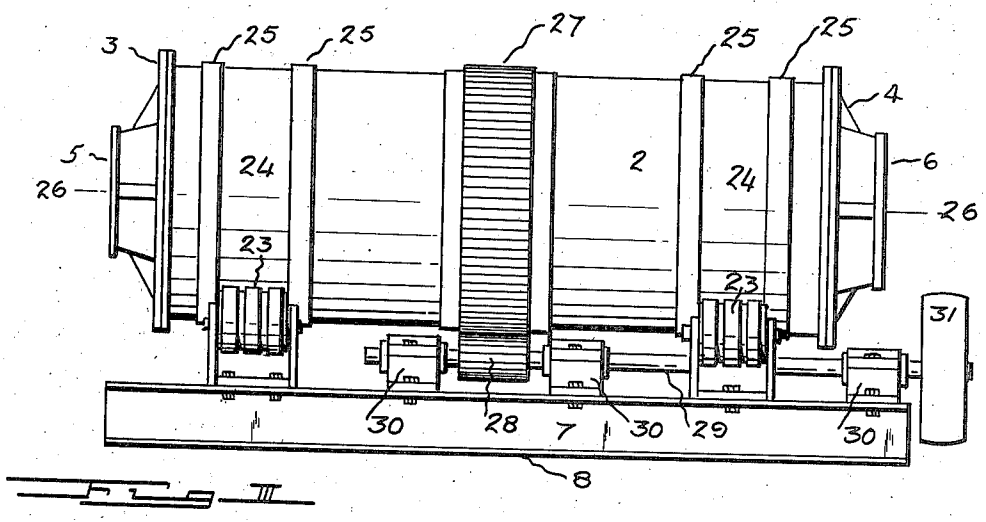
Fig. II

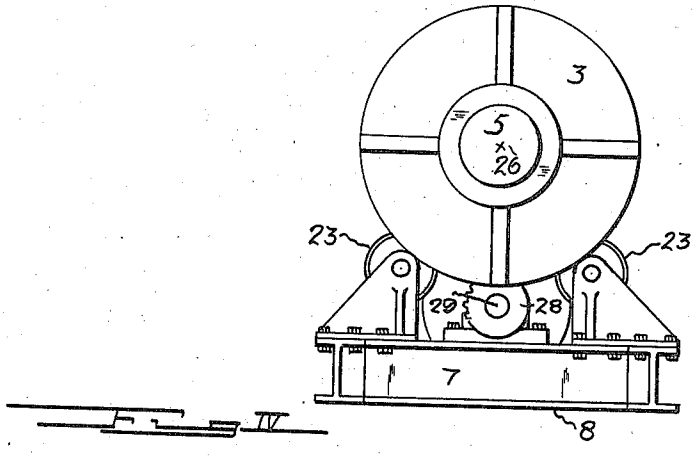
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MEANS FOR SUPPORTING AND DRIVING TUBULAR GRINDING MILLS

Filed March 22, 1934 3 Sheets-Sheet 2



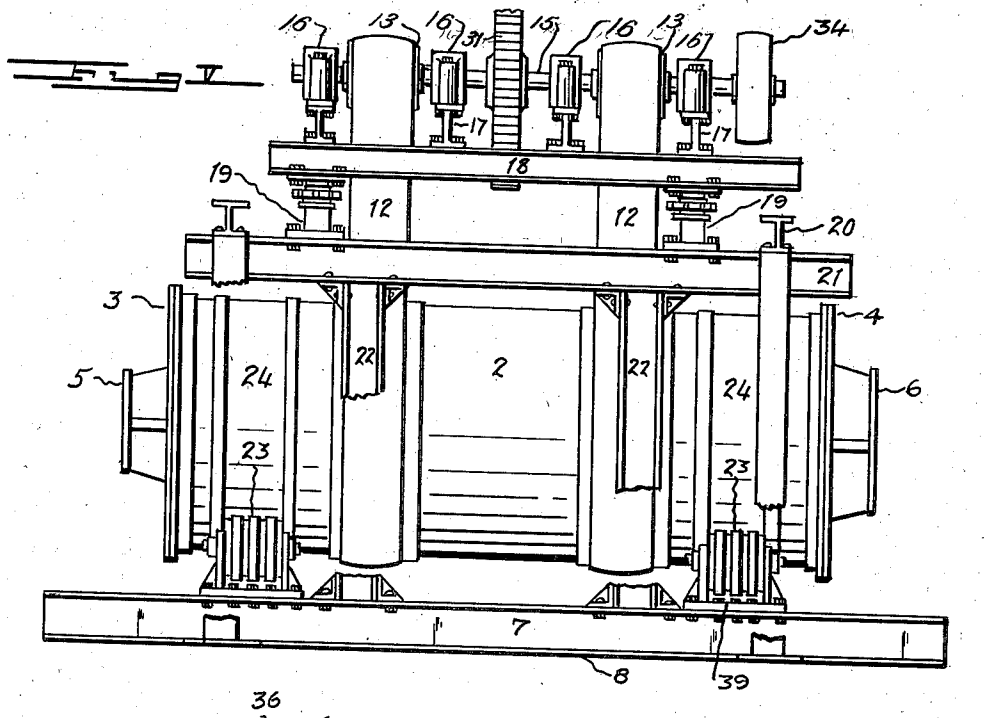


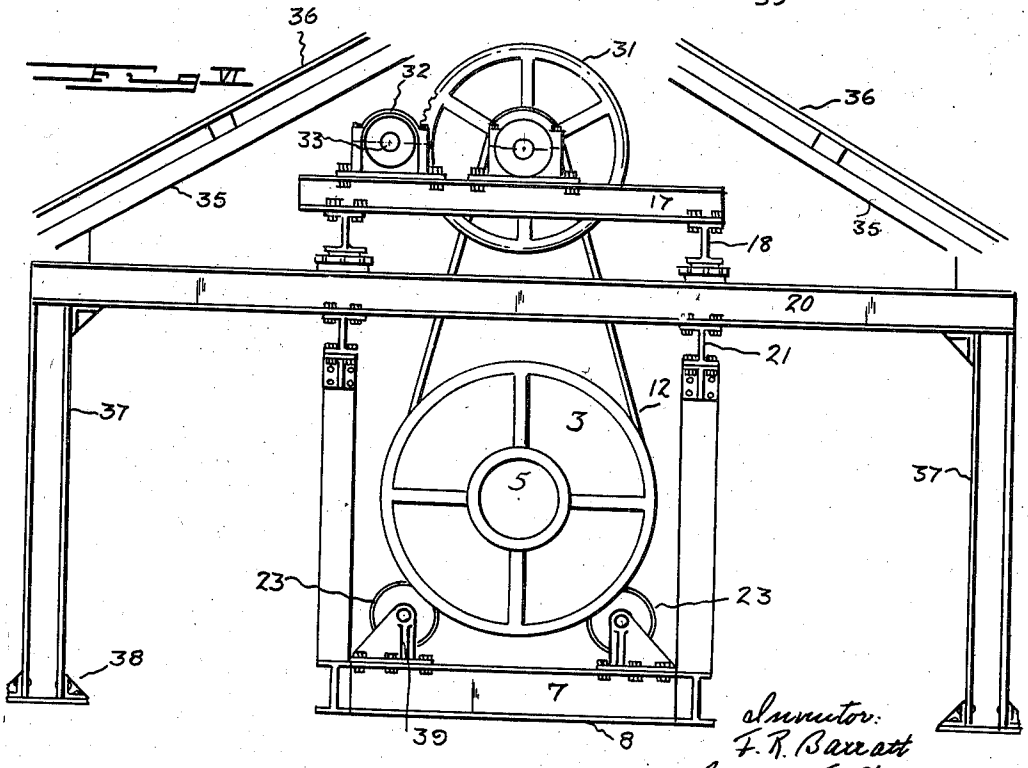
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MEANS FOR SUPPORTING AND DRIVING TUBULAR GRINDING MILLS

Filed March 22, 1934 3 Sheets-Sheet 3





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UNITED STATES PATENT OFFICE

2,078,829

MEANS FOR SUPPORTING AND DRIVING TUBULAR GRINDING MILLS

Frederick Reeves Barratt, Krugersdorp, Transvaal, Union of South Africa

Application March 22, 1934, Serial No. 716,868
In Union of South Africa November 11, 1933

1 Claim. (Cl. 83—9)

This invention relates to means for supporting and driving tubular grinding mills. This application shows and describes various features which are claimed in a companion application Serial No. 716,867, filed of even date herewith.

According to the invention there is provided a chassis upon which are erected the means for rotatably supporting the mill drum and the means for rotating it. The operative mill structure thus constitutes a single unit which can be supplied complete to the user and requires little or no foundation to be provided. It is moreover portable as compared with the usual rotary grinding mill, which is supported by means of its trunnions upon concrete pillars and the driving gear of which is secured upon separate foundations.

The invention is illustrated in the accompanying drawings in which:

Figures I and II are respectively a side and end elevation of one form of the invention.

Figures III and IV are similar views of another form.

Figures V and VI are similar views of a third form.

In all of the figures the grinding mill proper comprises a barrel 2, ends 3, 4 and orifices 5 and 6 in the ends for receiving material to be ground and for discharging the ground material. The chassis 7 consists of a framework of structural steel having a plane under surface 8, which permits it to be stood solidly on level ground.

In Figures I and II the means for rotatably supporting the mill comprises at one end of the mill a hollow trunnion 9 formed on the end cover 3. Said trunnion is carried in a bearing 10 supported on a pillar 11 which in turn is erected on the chassis 7. The bearing 10 is of the known kind which permits small deviation of the axis of the mill from its normal position. The rotary supporting means further comprises the belts 12 hung from pulleys 13 and engaging treads 14 on the barrel 2 of the mill. The pulleys 13 are fast on a shaft 15 mounted in bearings 16 which rest on a frame 17, 18. Said frame is supported and adapted for vertical adjustment by means of screw jacks 19 resting on framework 20, 21 mounted on posts 22 erected on the chassis 7.

The end of the mill opposite the trunnion 9 is further supported in a roller cradle comprising two rollers 23 positioned to engage the underside of a roller path 24 formed on the barrel and thereby prevent the barrel from swinging laterally. Said rollers may, if desired, be caused to take a portion of the weight of the barrel by suitably adjusting the jacks 19 so that only part of the weight is taken by the belts 12.

In the form shown in Figures III and IV the barrel is supported wholly by means of a roller cradle which in this case comprises at least four rollers 23. In order to control the mill against lengthwise displacement the roller paths 24 on the barrel are provided with end flanges 25 or equivalent flanges are formed on the rollers. It is evident that the roller cradle so supports the barrel that it is freely rotatable about its axis 26.

Figures V and VI show the barrel supported jointly by belts 12 as in Figures I and II and by a four-roller cradle 23 as in Figures III and IV.

Various means for rotating the drum may be employed. Figures III and IV show the barrel, fitted with a spur ring 27. The latter meshes with a pinion 28 fixed on a countershaft 29. Said shaft is mounted in bearings 30 carried on the chassis 7 and is fitted with a pulley 31 by means of which it is driven from any convenient source of power.

Figures I, II, V and VI show the drum driven by the suspending belts 12. For this purpose the shaft 15 is provided with any suitable means for rotating it, such as the spur gear 31 engaged by the pinion 32. The latter is mounted on a countershaft 33 which is itself driven by means of a belt on the pulley 34.

The frame 20, 21 which carries the jacks 19 and is supported on the posts 22, provides a convenient means for supporting a roof which protects the mill and the mill operator. The cross members 20 of said frame are for this purpose extended far enough to carry roof frame members 35 sloped towards one another at a proper angle to clear the gear 31, 32 and adjacent parts. Said members 35 support the roofings 36. To steady the structure the ends of the members 20 are provided with downwardly extended legs 37 provided with feet 38 which can simply rest on the ground or can be secured to a foundation if desired.

The cross members 20 are extended well beyond the frame proper, and said members 20, 21 constitute gantries or elevated supports for tackle used for handling heavy parts of the apparatus such as the mill ends 34. The posts 22 on at least one side of the mill are bolted to the chassis 7 and the frame 20, 21, and the roller brackets 39 at one side of the mill are similarly bolted to the chassis, so that said posts and brackets may be taken down without difficulty to enable the mill barrel to be removed when required for repair or the like, and replaced.

I claim:

A wet grinding tube mill suitable for comminuting ores, comprising a rotatable barrel, a chassis constructed as a flat frame composed of several structural steel members having their under surfaces level with one another so as to form a plane under surface for the chassis and thereby providing a foundation for the mill structure, metal posts erected on the chassis, a framework supported by said posts, auxiliary means for supporting said framework, a shaft on the framework, means for driving the shaft, pulleys on the shaft, flexible members hung from the pulleys and suspending the barrel, and roller cradle members mounted on the chassis for contacting with the barrel, some of said posts at one side of the barrel being removably secured to the chassis and the framework, and the roller cradle elements on the same side being removably secured to the chassis, so that upon displacement of said removable elements the barrel may be removed and replaced laterally while the auxiliary frame supporting means functions in place of the removed posts.

FREDERICK REEVES BARRATT.