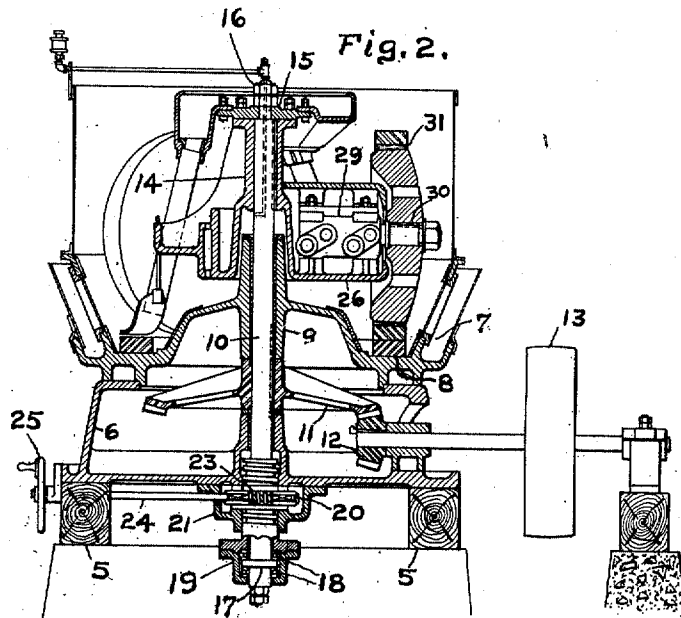
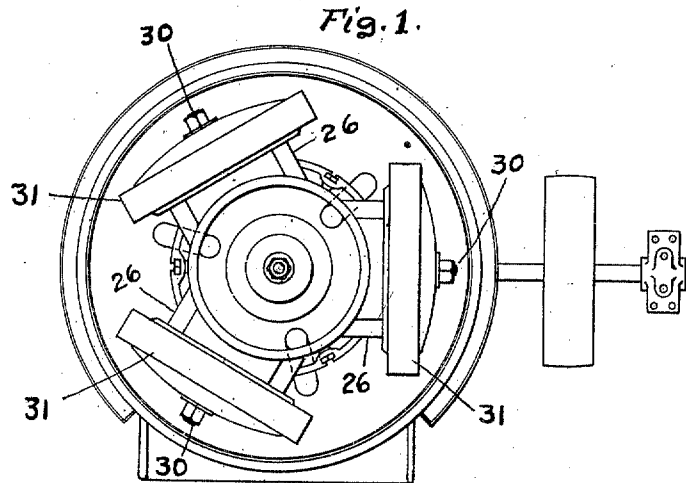


P. E. VAN SAUN.
CHILIAN MILL.
APPLICATION FILED JUNE 15, 1910.

985,305.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.



Witnesses:

Geo. L. Tolson,
Benj. M. Stahl,

Inventor

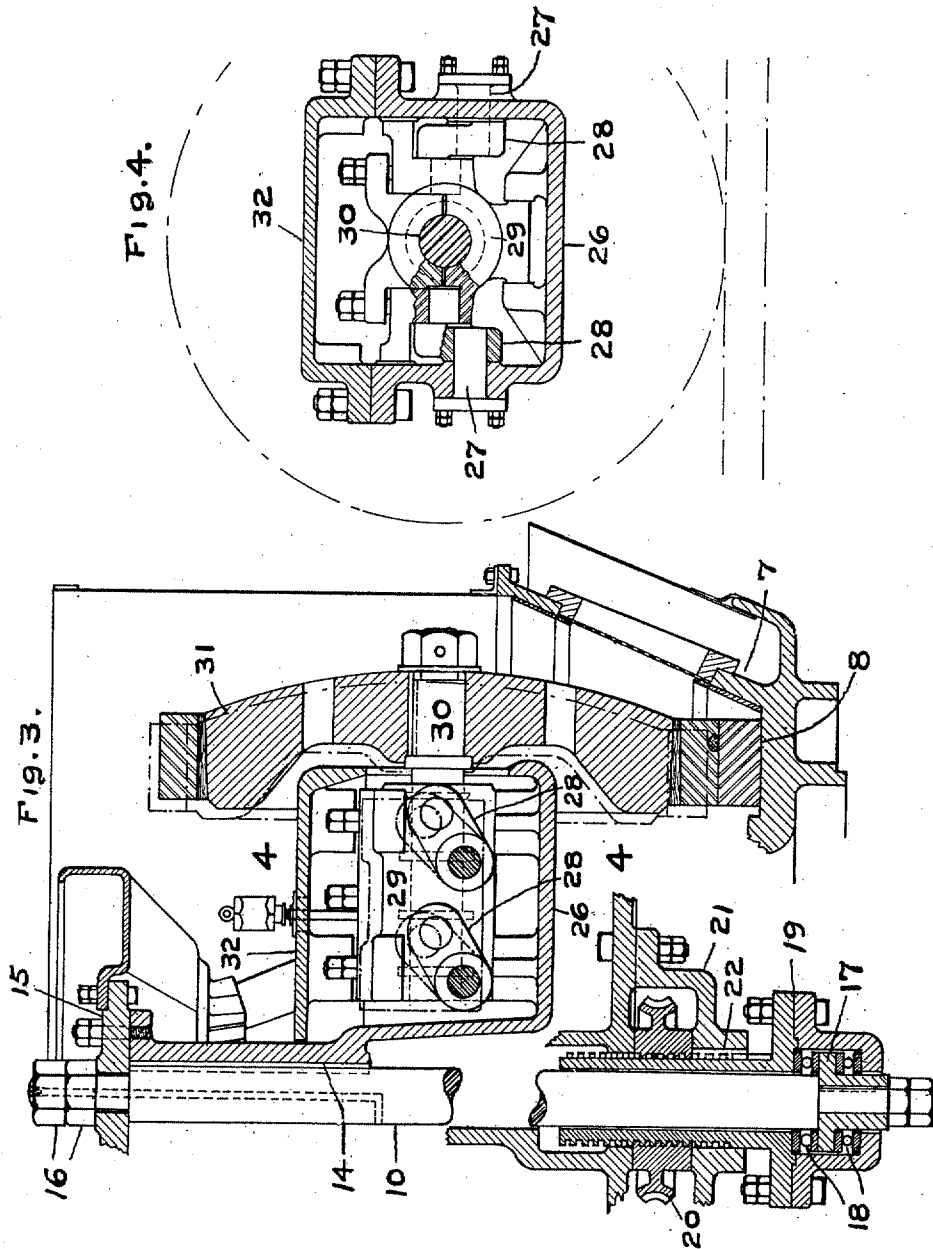
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By *Spencer Middleton Donaldson* Attorney

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Edw. L. Tolson.
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UNITED STATES PATENT OFFICE.

PETER EDWIN VAN SAUN, OF NEW YORK, N. Y., ASSIGNOR TO MILL AND SMELTER ENGINEERING COMPANY, OF NEW YORK, N. Y., A COPARTNERSHIP.

CHILIAN MILL.

985,305.

Specification of Letters Patent.

Patented Feb. 28, 1911.

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To all whom it may concern:

Be it known that I, PETER EDWIN VAN SAUN, citizen of the United States, residing at New York, N. Y., have invented certain new and useful Improvements in Chilian Mills, of which the following is a specification.

My present invention relates to improvements in crushing mills or chasing mills, and has among its objects to provide a mill of increased economy of manufacture, efficiency and durability.

I have particularly aimed to provide a simple manner of mounting the rolls and so that while free to move upwardly and return, their displacement will be such that the axis of the rolls will be kept in all positions in planes which are parallel, the movement of the axis in such displacement being such as to continuously lie in a plane either parallel to or coinciding with the axis of revolution of the rolls. I have also aimed to provide a construction which, when a roll has been raised unduly by a piece or lump of coarse material, will cause the roll to exert additional crushing force or effect.

My invention includes the novel features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

A mill in accordance with my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the mill, Fig. 2 is a vertical sectional elevation through the axis of the mill, Fig. 3 is an enlarged sectional view through a portion only; Fig. 4 is a section on line 4—4 of Fig. 3.

The numerals 5, 5, designate timbers or sills which are representative of any suitable supporting means upon which is mounted the base 6 of the mill which is hollow to contain the driving gears. The pan or mortar for receiving the ore to be crushed is indicated at 7, and contains the usual circular die ring or track 8. The central portion of the pan is provided with an elongated bearing sleeve or member 9, within which is rotatably located a vertical driving shaft 10, receiving motion through gears 11 and 12 from driving pulley 13 or the like in the ordinary or any desired manner. Gear 11 is fitted with a feather key engaging a spline in shaft 10 for driving the latter, but

permitting vertical movement of the shaft through the gear. The driving head 14 is keyed to shaft 10 and additionally held from vertical movement on the shaft by being shouldered against a bolted washer plate 15 and nuts 16 engaging a reduced portion of shaft 10, although it may be secured to the shaft by any other suitable means.

When not in operation, the weight of the driving head and its pertaining parts is carried by shaft 10 as hereinafter described, but when in operation its weight may be overcome by the upward force exerted, due to the centrifugal action of the rollers. Therefore to cause shaft 10 to be able to resist either an upward or downward force I use the following arrangement of parts: At the lower end of shaft 10 is secured a thrust collar 17 by which either upward or downward motion is resisted by ball or other suitable bearings 18. These bearings are contained in a case 19 with upwardly extending sleeve which is threaded externally to engage similar threads in worm wheel 20. Bracket 21 which is secured to base 6 and also the center portion of the base are bored to allow sleeve 19 to freely slide vertically therein. Sleeve 19 is splined, and engages a feather key 22 secured in bracket 21 so that rotation of the sleeve is prevented. It is therefore evident that by rotating worm wheel 20 the upward or downward motion of sleeve 19 and accordingly shaft 10 may be effected either with the machine in operation or not, and by so doing the vertical position of driving head 14 may be regulated. A worm 23 fixed to shaft 24 fitted with hand wheel 25 outside of the base of the machine furnishes convenient means for accomplishing this regulation.

The driving head carries a plurality of receiving boxes 26 preferably three in number, to the side walls of which are pivotally connected by bearing pins 27 the pairs of links 28, the opposite ends of these links being pivotally connected with the sides of the journal boxes 29 in which the roll shafts 30 are journaled, these roll shafts carrying at their outer ends the ordinary rolls 31. It will thus be seen that the journal box of each roll shaft is so connected with the driving head that the roll is capable of a free, upward and downward movement, and that the weight of the roll rests upon the material to be crushed. At the same time when the

roll rises by reason of any lumps or large pieces resting upon the ring, the roll shaft or axis does not tilt but rises bodily by reason of its journal being connected to the driving head by the two pairs of links, so that whether the roll rises by reason of obstructions or lowers abnormally, by reason of wearing away of its steel tire or the track ring, its axis is always maintained in a horizontal position, and the surface of its tire always parallel to that of the track ring in the mortar. It will also be noticed that the means before described for regulating the vertical position of the driving head is such that the normal action of the links may be maintained within their proper operating limits.

It will be noticed that the links are so arranged that they incline upwardly and outwardly from the point of connection with the driving head. The result of this is that a portion of the centrifugal force resulting from the revolving rollers is added to the downward pressure due to their weight and thus utilized in crushing. The amount of this added force increases as the angle of the links from the horizontal becomes greater. The useful result of this action is that when a roll is lifted by reason of a large lump or piece of material on the track ring as indicated for instance by dot and dash lines in Fig. 3, the links assume an increased angular position and cause a greater proportion of the centrifugal force to augment the weight of the roll, thereby exerting a greater crushing effect upon the large lumps or pieces. The journal boxes 20 are preferably provided with covers 32 to protect the contained parts.

Having thus described my invention what I claim is:

1. In combination a pan or mortar, a driving head, crushing rolls having suitable shafts or axles, with their axes located in vertical planes passing through the axis of

the driving head, and connecting means interposed between said head and shafts or axles, and permitting vertical movement of said shafts or axles with relation to the head while causing them to be revolved bodily with the driving head, said means being constructed and adapted to hold said shafts or axles with their axes in vertical alinement with the axis of the driving head during the rise and fall of the shafts or axles and also to hold them at all times parallel with the face of the die ring, substantially as described.

2. In combination with a pan or mortar, a drive head, rolls having suitable supporting shafts or axles, and a driving connection between the drive head and said roll shafts or axles comprising a plurality of pairs of links arranged in planes parallel to the axis of the respective roll shaft, substantially as described.

3. In a combination a pan or mortar, a drive head, a shaft or axle box, a plurality of pairs of links pivoted respectively to the said box and the drive head, a roll shaft journaled in said box, and a roll carried by said shaft or axle and coacting with the pan, said pairs of links lying in planes parallel to the axis of the roll shaft, substantially as described.

4. In combination a pan or mortar, a drive head, a journal box or bearing, a pair of links on each side of said journal box or bearing connecting the same to the drive head, said links inclining upwardly and outwardly, a roll shaft journaled in the bearings, and a roll carried by said shaft, substantially as described.

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

PETER EDWIN VAN SAUN.

Witnesses:

FRANK W. HOPKINS.

REINHARDT PETERSON.