June 10, 1941. J. D. LAIRD 2,244,996

AUTOMATIC RELEASE FOR FEED GRINDERS

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Fig. 1.

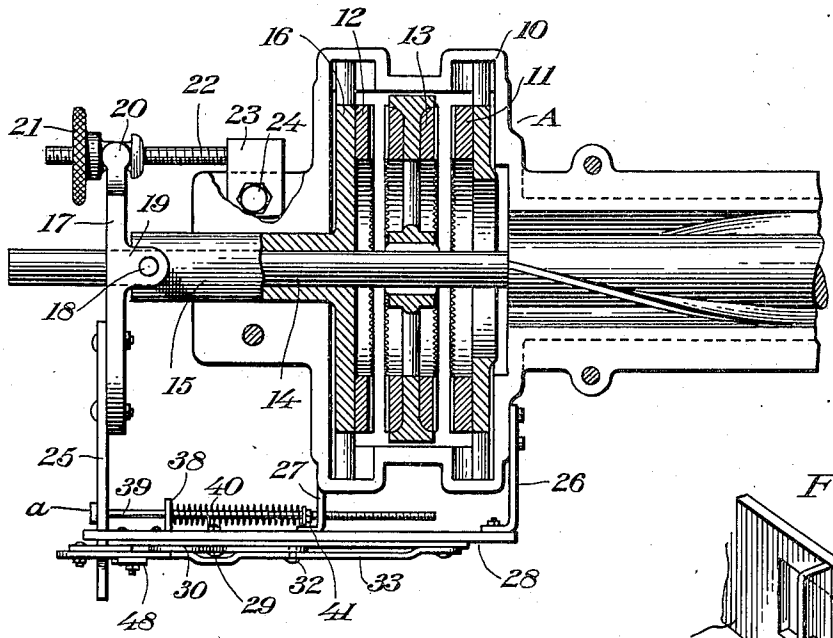


Fig. 6.

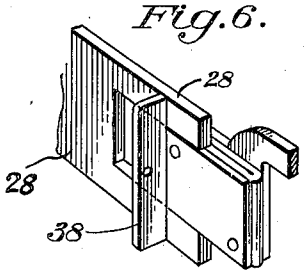
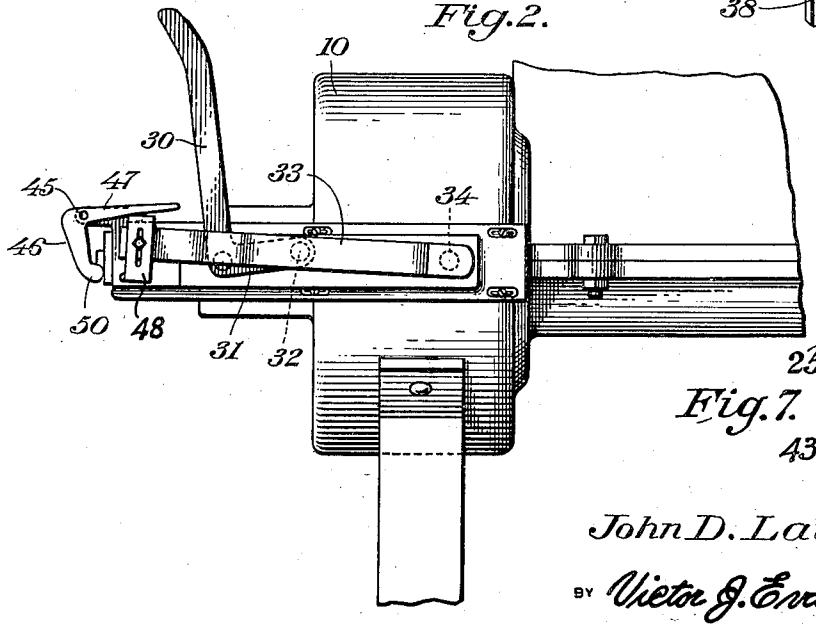


Fig. 2.



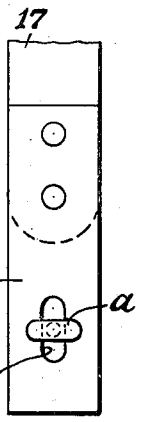


Fig. 7.

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Fig. 3.

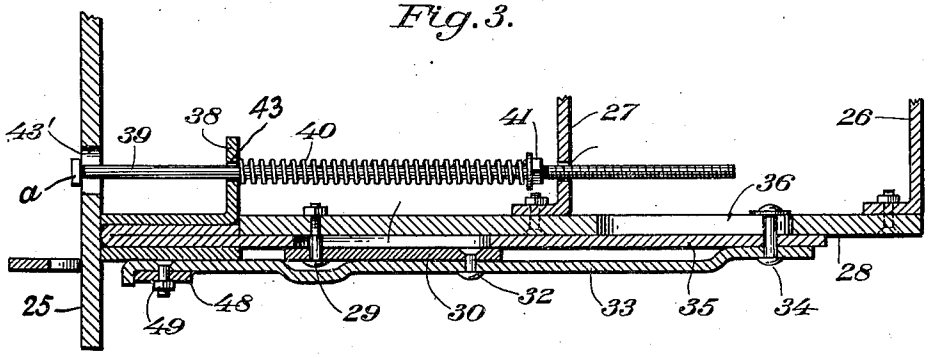


Fig. 4.

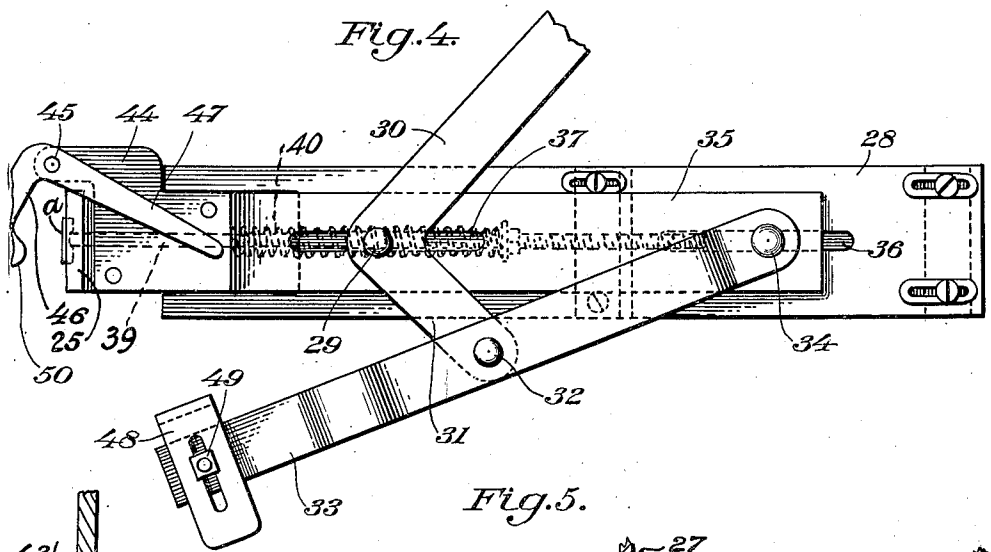
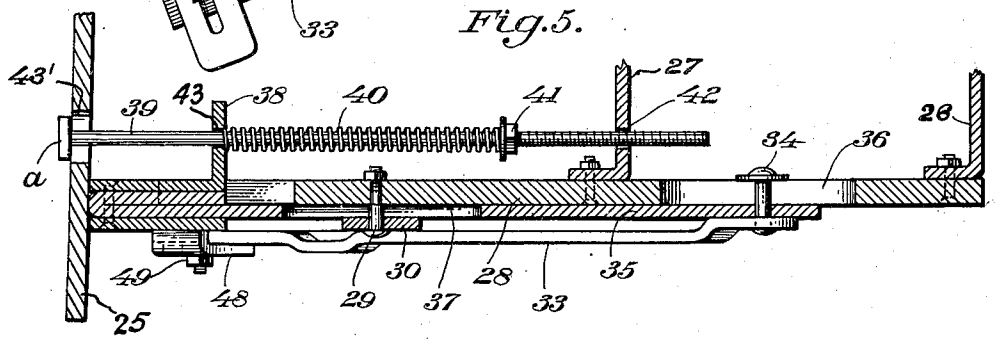


Fig. 5.



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AUTOMATIC RELEASE FOR FEED GRINDERS

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Application October 24, 1939, Serial No. 301,022

4 Claims. (Cl. 83—8)

The invention relates to a feed mill attachment and more especially to an automatic release for feed grinders.

The primary object of the invention is the provision of a release device of this character, wherein the same when used in connection with a feed mill will automatically effect the release of the grinding elements when the same become overloaded or subjected to foreign particles and in this way avoiding the choking of the machine or possibility of damage to the grinders.

Another object of the invention is the provision of a device of this character, wherein the closest possible protection to the feed mill is assured, particularly when foreign particles such as small bolts, nuts, etc., enter the mill in that the device becomes active for releasing the grinders of such mill.

A further object of the invention is the provision of a device of this character, wherein the construction thereof enables automatic operation in the use of the feed mill for the release of its grinders, while in the setting of the device the grinders are under tension and held in proper working relation to each other for the successful grinding operation, the parts of the release device being so constructed that they are interchangeable in assembling whereby the device may be operated from either side of the mill.

A still further object of the invention is the provision of a device of this character, which is simple in its construction, requiring the least effort to operate, thoroughly reliable and efficient in operation, readily and easily mounted in association with the said feed mill for automatic release operation and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a fragmentary plan view partly in in section of a feed mill showing the device constructed in accordance with the invention applied thereto.

Figure 2 is a fragmentary side elevation.

Figure 3 is a fragmentary transverse sectional view through the device, the same being in set position.

Figure 4 is a side elevation of the device released.

Figure 5 is a view similar to Figure 3 with the device in a released position.

Figure 6 is a perspective view of adjuncts of the device.

Figure 7 is a fragmentary front elevation showing in detail the releasable fastening of the carrier rod to an extension.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally a portion of a feed mill having, as usual, a casing 10 for the crushing and grinding devices, which casing is of substantially cylindrical form and is enlarged at that portion which contains the grinding rings and wheel, the details of the feed mill illustrated in the drawings being exhibited in Letters Patent No. 380,180, issued March 27, 1888.

Within the casing 10 are two grinding rings 11 and 12, respectively, the ring 11 being fixed while the ring 12 is adjustable. Associated with the rings 11 and 12 is a rotatable grinding wheel 13, being located between said grinding ring and is mounted on a shaft 14. The shaft mounting the member 13 has free longitudinal movement between the limits of the rings 11 and 12, respectively. The adjustable ring 12 is attached directly to the end of a sleeve 15 in any suitable manner and this sleeve surrounds the shaft 14 and has formed therewith a substantially disk-shaped head 16 with which the said ring 12 is attached. The sleeve 15 is susceptible of adjustment and this is effected in a manner presently described.

The adjustment of the sleeve 15 is had by a rest 17 extending transversely across the end of the sleeve and pivoted to the latter by screw bolts, one being indicated at 18, passed through a lug 19 on said lever 17. This lever 17 has a forked end 20 straddling the neck of the pinion headed nut 21 on the screw bolt 22, which has contact at 23, bolted at 24 to the casing 10.

The lever 17 at the end remote from the fork 20 carries an extension 25 adapted to be latched in a manner presently described.

Fixed to the casing 10 at one side thereof are the brackets 26 and 27, respectively, these having bolted thereto a stationary guide bar 28 having fixed therein a pivot 29 for a rocking bell crank lever 30, which at the short arm 31 thereof is pivoted at 32 to a release arm 33, the latter being pivoted at 34 to a slide bar 35, the pivot 34 being slidably fitted in a slot 36 provided in the guide bar 28 while the pivot 29 in this bar 28

projects through a slot 37 provided in the slide bar 35. Thus the slide bar 35 is susceptible of movement relative to the bar 28 and the arm 33 is arcuately swung by the lever 30 and also the bar 35 is indirectly shiftable by said lever 30.

The slide bar 35 has fitted therewith a bracket forming an abutment ear 38 for a coiled tensioning spring 40 about a carrier rod 39, the spring 40 being tensioned by a nut 41 with which it contacts and this nut is threaded on the rod 39 which plays through clearances 42 and 43, respectively, the clearance 42 being in the bracket 27 while the clearance 43 is in the abutment ear 38. The extension 29 has formed therein an elongated slot 43' while the rod 39 at its outermost end has an elongated cross head *a*, which is adapted for passage through the slot 43' and susceptible after such passage of being turned at substantially right angles to the length of the slot for the separable latching of the rod 39 to this extension 25.

On the slide 35 is a hanger 44 to which is pivoted at 45 a tripping latch 46, its arm 47 being in the path of an adjustable rest piece 48 on the arm 33, being adjustable at 49, and this latch 46 at the nose 50 thereof has contact with the extension 25 when the arm 33 is in the position as shown in Figure 2 of the drawings, being a manually set position. When heavy duty is imposed upon the grinding devices within the casing 10, the head 16 on the sleeve 15 becomes subjected to pressure causing the sleeve 15 to be moved in a direction for the rocking of the lever 17 and thus the extension 25 of the lever 17 acts upon the nose 50 of the latch 46 thus operating it so that the arm 47 of this latch plays upon the piece 48 on the arm 33 and the lever 30 will become automatically tripped or released from the position shown in Figure 2 of the drawings to that shown in Figure 4 of the drawings and in this way relieving the latched condition of the grinder ring 12 so that it can spread and thus free the larger material from grinding action and thereby avoiding the choking of the feed mill. When the latch 50 is moved to unlatching position, as shown in Figure 4 of the drawings, the slide 35 remains forced against the extension 25 on the lever 17, the spring 40 being for the purpose of keeping the slide 35 in contact with the said extension 25. This position is held at all times until the instant of release by the latch 50 or even after a release has been effected. The ring 12 is moved away from its companion grinding medium on the wheel 13 within the casing 10 and in this way the choking of the feed mill will be avoided, allowing the heavier material to be discharged from the mill without grinding action imposed thereon and also avoids foreign particles or matter making entrance between the grinders with possibility of damage to the said feed mill. The arrangement of the pivots 29, 32 and 34 is such that when the linkage is in the position as shown in Figure 2 of the drawings the pivot 32 is above a line between the pivots 29 and 34 so that the linkage will be locked. Now in releasing action the adjustable rest piece 48 is so adjusted that the arm 47 moves the pivot 32 on the lever 33 to a position on the opposite side of or below a line between the pivots 29 and 34 and thus unlocking the linkage. The rest piece 48, when the linkage is locked, acts upon the arm 47 of the latch 46 so that its nose 50 presses against the extension 25 with the arm 47 of the latch contacting with the said rest piece 48 for the purposes hereinbefore set forth.

What is claimed is:

1. In a grinding mill of the kind described, the combination of rotatable and non-rotatable grinders, the non-rotatable grinders being disposed at opposite sides of the rotatable grinders and one being movable toward and away from the said rotatable grinder, a sleeve extended outwardly from said movable non-rotatable grinder, a rest pivoted to the sleeve and extended transversely thereof, means acting upon the said rest to vary the crosswise position thereof with respect to the said sleeve, an extension on said rest, a stationary guide bar next to said extension, a slide fitted on said guide bar and having a tripping latch for releasable engagement with the said extension, means yieldably acting upon the slide and the extension for holding the same together, and means manually set and carried by the slide for operating the latch to engage and latch the extension.

2. In a grinding mill of the kind described, the combination of rotatable and non-rotatable grinders, the non-rotatable grinders being disposed at opposite sides of the rotatable grinder and one being movable toward and away from the said rotatable grinder, a sleeve extended outwardly from said movable non-rotatable grinder, a rest pivoted to the sleeve and extended transversely thereof, means acting upon the said rest to vary the crosswise position thereof with respect to the said sleeve, an extension on said rest, a stationary guide bar next to said extension, a slide fitted on said guide bar and having a tripping latch for releasable engagement with the said extension, means yieldably acting upon the slide and the extension for holding the same together, means manually set and carried by the slide for operating the latch to engage and latch the extension, and means cooperating with the last-named means to manually move the same to the set position.

3. In a grinding mill of the kind described, the combination of rotatable and non-rotatable grinders, the non-rotatable grinders being disposed at opposite sides of the rotatable grinder and one being movable toward and away from the said rotatable grinder, a sleeve extended outwardly from said movable non-rotatable grinders, a rest pivoted to the sleeve and extended transversely thereof, means acting upon the said rest to vary the crosswise position thereof with respect to the said sleeve, an extension on said rest, a stationary guide bar next to said extension, a slide fitted on said guide bar and having a tripping latch for releasable engagement with the said extension, means yieldably acting upon the slide and the extension for holding the same together, means manually set and carried by the slide for operating the latch to engage and latch the extension, means cooperating with the last-named means to manually move the same to the set position, means for adjustment of the first-named means, and means for sliding the sleeve supporting the non-rotatable grinder and limiting the movements thereof toward and away from the rotatable grinder.

4. In a grinding mill of the kind described, the combination of rotatable and non-rotatable grinders, the non-rotatable grinders being disposed at opposite sides of the rotatable grinder and one being movable toward and away from the said rotatable grinder, a sleeve extended outwardly from said movable non-rotatable grinder, a rest pivoted to the sleeve and extended transversely thereof, means acting upon the said

rest to vary the crosswise position thereof with respect to the said sleeve, an extension on said rest, a stationary guide bar next to said extension, a slide fitted on said guide bar and having a tripping latch for releasable engagement with the said extension, means yieldably acting upon the slide and the extension for holding the same together, means manually set and carried by the slide for operating the latch to engage and latch the extension, means cooperating with the last-named means to manually move the same to the set position, means for adjustment of the first-named means, means for sliding the sleeve supporting the non-rotatable grinder and limiting the movements thereof toward and away from the rotatable grinder, and a stationary contact for the first-named means and contacting the extension for moving the non-rotating sliding grinder away from the rotary grinder.

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