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H. L. JOHNSTON.

DRIVING MECHANISM.

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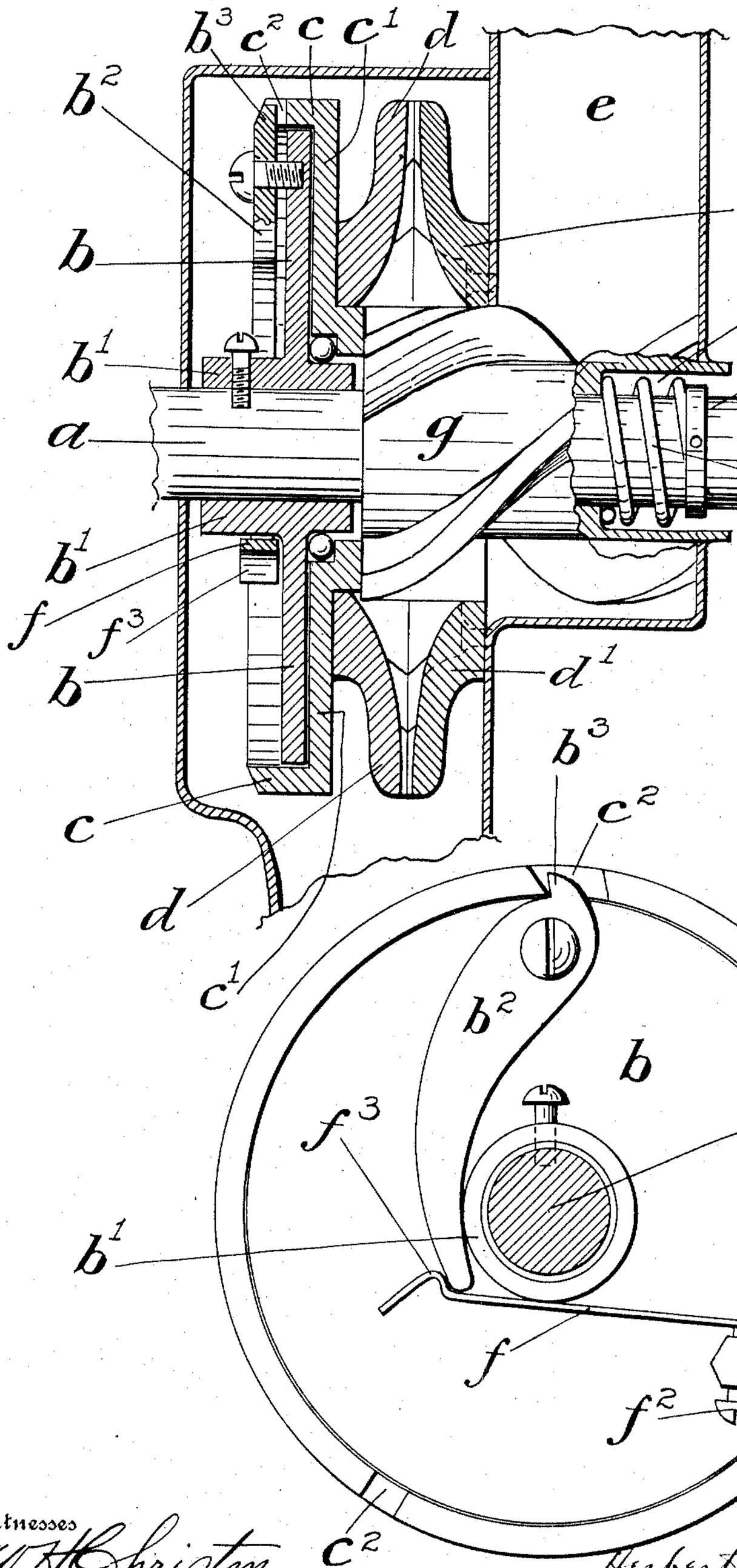

Fig. 1.

Fig. 2.

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DRIVING MECHANISM.

No. 864,786. Specification of Letters Patent. Patented Sept. 3, 1907.

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To all whom it may concern:

Be it known that I, HERBERT L. JOHNSTON, a citizen of the United States, residing at Troy, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Driving Mechanism, of which the following is a specification.

My invention relates to driving mechanism, and is especially adapted to grinding mills but is capable of use for other machines where a detachable driving connection is desirable.

The object of the invention is to provide simple means by which in the event of foreign substances entering into a grinding mill, or in case other obstacles which would be disastrous to the mechanism should be met with, the driving mechanism can be automatically detached and allow the parts of the machine to rotate freely while the operating part remains at rest so as to prevent damage by breakage or otherwise to the machinery.

In the accompanying drawings, Figure 1 represents a sectional view of the grinding mill to which my invention is shown attached. Fig. 2 is an end elevation of a portion of the same showing the automatic detachable driving mechanism.

Like parts are represented by similar letters of reference in the several views.

In the drawings, a represents the driving shaft which may be attached to a motor or any other form of prime mover. To this shaft there is secured a disk, b, which is preferably provided with a suitable hub, b^1, which fits over the shaft, a, and which is attached securely to said shaft. This disk, b, is preferably fitted in an annular flange, c, formed on the outer periphery of a plate, c^1, which plate is provided with a central opening sufficiently large to fit loosely over the extended hub, b^1, of the disk, b. The disk, b, and the plate, c^1, are each provided with a ball-race, and there are preferably placed between these respective parts a series of balls to form a ball-bearing. Any other bearing, however, which will permit one of the parts to move freely within the other will be sufficient.

To the plate, c^1, is attached a running bur or grinding plate, d, of the grinding mill, the opposite or stationary plate or bur, d^1, being secured to the casing in any suitable manner. To provide for driving this running bur, d, the detachable driving connection is provided between the disk, b, secured to the shaft and the plate, c^1, which is secured to the running bur, and this I preferably accomplish as follows: The annular flange, c, of the plate, c^1, is provided with one or more notches, c^2, and there is pivoted to the disk, b, a latch, b^2, having a projecting nose, b^3, which is adapted to project into the notch, c^2, of the flange, and engage with one side of said notch as a shoulder. The extended arm or tail of this latch, b^2, is engaged by a spring catch, f, which is also secured to the disk, b, as shown at f^1, and is preferably provided with an adjustable fulcrum, f^2, by means of which the tension of the spring can be changed. This spring catch is formed at the outer end with a hook, f^3, the sides of which are preferably slightly beveled, the end of the latch, b^2, being also rounded or beveled so that an unusual pressure on the latch, b^3, will cause the same to be forced out of engagement with the hook, f^3, and move outwardly against the flange, c, so as to disengage the nose, b^3, from the driving shoulder and permit the parts to be disengaged so that the disk, b, may continue to rotate with the shaft, while the plate, c^1, and grinding bur remain at rest. The parts may readily be attached together by simply moving the latch to a position opposite the notch and forcing the end of the latch into engagement with the hook-shaped end of the spring, f^3. The latch, b^2, acts as a locking device for the driving and driven members, and the catch, f, a frictional device for normally holding the locking device in operative position.

There is preferably located on the shaft a conveyer, g, which is adapted to move the material from the outer part of the casing, e, into the space between the grinding burs. This conveyer, g, is also preferably mounted loosely on the shaft and is driven by friction between the inner end of the conveyer and the plate, c^1, the outer end of the conveyer being preferably counterbored as shown at g^1. There is placed within this counterbore a spring, g^2, one end of which rests against a collar or shoulder, a^1, on the shaft, a, and the other end of said spring rests against the inner portion or bottom of the counterbore, g^1. This spring, therefore, furnishes the means of establishing a frictional connection between the inner end of the conveyer, g, and the plate, c^1. This frictional connection is sufficient to drive the conveyer under all ordinary conditions. In case any foreign substance, however, should become lodged in the conveyer such as would tend to break or damage the same, the conveyer will be allowed to stop while the disk and burs continue to revolve, simply by reason of the frictional connection between these parts. In case any foreign substance should be carried into the bur then the driving connection will be completely broken and the plate, the bur and the conveyer will all be allowed to remain stationary while the shaft and disk alone revolve freely, there being but little friction between the disk, b, and plate, c^1, by reason of the anti-friction bearing between these parts.

It will be seen that the construction herein described is extremely simple and quite effective.

Having thus described my invention, I claim:

1. In a driving connection for a grinding mill or similar mechanism, a driving shaft, a disk connected to said shaft,

a pivoted locking device on said disk, an engaging device between said locking device and the part to be driven, and a frictional engaging device located near one end of the locking device, substantially as specified.

2. In a detachable driving connection, a plate having an annular flange, a disk fitting into said flange, an anti-friction bearing between said parts, a shoulder on one part and a hinged latch adapted to engage said shoulder on the other part, and a yielding catch to hold said latch in its driving position, the connection between said latch and catch being such as to be disengaged by an unusual pressure on said latch, substantially as specified.

3. In a driving connection, a plate having an annular flange, a disk fitted into said flange, anti-friction bearing between the parts, a latch having a driving nose adapted to engage a shoulder on said flange, a spring having an adjustable connection to engage the end of said latch, and a detachable connection between said spring and latch, substantially as and for the purpose specified.

4. In a driving connection for a grinding mill or similar mechanism, a driving shaft, a disk connected to said shaft, a pivoted locking device on said disk, an engaging device between said locking device and the part to be driven, and a spring-pressed frictional engaging device located near one end of the locking device, substantially as specified.

5. The combination with a driving shaft, a disk mounted thereon, a latch and spring-catch on said disk, a plate having an annular flange, an anti-friction bearing between the parts, a shoulder on said flange adapted to be engaged by said latch, and a running bur attached to said plate, a stationary bur opposed to said running bur, and a conveyer having frictional engagement with said plate, and a spring opposed to said conveyer to maintain the frictional connection between said conveyer and plate, substantially as specified.

In testimony whereof, I have hereunto set my hand this 2nd day of April, 1907.

HERBERT L. JOHNSTON.

Witnesses:
E. J. STACKHOUSE,
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