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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN FEED AND GIG MECHANISMS FOR SAW-MILLS.

Specification forming part of Letters Patent No. **215,254**, dated May 13, 1879; application filed February 24, 1879.

To all whom it may concern:

Be it known that I, EDWARD H. STEARNS, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in the Feed and Gig Mechanism of Saw-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the construction of circular-saw mills; and consists in providing improved devices for giving flexibility to the feed and gig movement.

The devices heretofore used, I believe, consisted of flexible or cushioned journal-boxes for the rag-shaft, or of springs or cushions applied to the carriage, which operate longitudinally with the carriage. These devices are found to be inadequate in the best mills now made, as the work of feeding and gigging is done with such rapidity that the momentum of the carriage cannot be sufficiently overcome by them, and the friction-gears at each change of direction of the carriage slip upon each other, and become so hot as to burn and destroy the paper or other soft material used in the construction of the wheels.

The object of my invention is to provide means whereby sufficient flexibility shall be given to the feed and gig movements to overcome this slipping of the frictions, as well as to overcome the jarring and straining of the machinery when the reversing of movement of the carriage takes place. This I do by the use of coil or spiral springs, or their equivalent, and clutches upon the shafting of the feed and gig mechanism, whereby one part of the gearing may continue its movement to a certain extent in one direction after the sawyer has reversed the movement of the other parts.

This will fully appear hereinafter in the general description of my invention, as illustrated by the accompanying drawings, in which my invention is illustrated as follows:

Figure 1 is a top or plan view of a circular-saw mill, and Fig. 2 is a side view of the gearing of the same.

In these figures, A is the arbor. D is the main drive-shaft. C is the main drive-wheel, and C' is the pulley on the arbor. D' is a friction-pulley on the main drive-shaft. G' is

an intermediate friction-wheel, communicating motion from D' to R', which is the pulley which is on the rag-shaft R. C'' and C''' are belt-pulleys, by which motion is taken from the arbor to the feed friction-shaft F. F' is a friction-pulley on the shaft F, and communicates motion from it to the rag-shaft R. B is a swinging bar, on which one end of the rag-shaft is journaled, and by which it is put in communication with either the feed-friction F' or with the gig-friction G'. This bar B is operated by a rock-shaft and lever, L L'. S S' are the springs which I use for cushioning the feed and gig movement of the carriage.

These springs I show as applied on the rag-shaft R; but they may be applied elsewhere, as follows: One may be on the shaft F and one on the shaft G, or one may be on the shaft R and the other on the shaft G or F, according to which one is left on the shaft R. One of these springs, S', cushions the feed-movement, and the other, S, the gig-movement; hence, as before stated, they may be applied, respectively, on the shafts F and G, or on the rag-shaft, as shown. I prefer the application shown.

The manner of application is as follows: Near the middle of the rag-shaft R is a fixed collar or flange, U, with lugs to engage with the ends of the springs. On the pinion P and the pulley R' are also lugs, engaging with the other ends of the springs. The pinion and pulley are loose on the shaft R; but they abut against clutch-flanges, respectively, T and T'. These clutch-flanges are keyed to the shaft. The clutch is of such a construction that the pinion and pulley can each revolve loosely nearly a whole revolution, provided a force is applied to them sufficient to overcome the tension of the spring. These springs have sufficient tension to resist the power necessary to do the ordinary work of feeding and gigging; but when the extra strain resulting from a sudden reversal of motion occurs they yield to it. Consequently—for example, when the shaft R is suddenly changed from a gig-movement to a feed-movement—the pinion P may continue to revolve in a gigging direction until the spring S has taken up and overcome the gigging momentum of the carriage; and, again, when the pulley R' is suddenly changed

from a feed to a gig motion, the shaft and pinion may continue to revolve in a feeding direction, and let the spring S' overcome and take up the feeding momentum of the carriage.

It will be seen that in neither of these cases will there be any slipping of the friction-pulleys upon each other. Nearly a whole revolution of the pinion may take place in either case, and if it is a twelve-inch pinion, that would allow nearly three feet movement of the carriage in each case in which to check its momentum. This arrangement gives complete flexibility to the gig and feed movement, all shock to the machinery is overcome, and the heating of the friction-gears is obviated. I have found that the device is wholly adequate to the exigencies required by the present rapid-acting mills.

The springs S S' are kept in proper tension, in actual construction, by a ratchet or winding device on each side of the fixed flange U. This construction I have not shown, nor do I claim it, as it is of ordinary construction.

I do not claim, broadly, the cushioning of the gig and feed movement, nor the use or application of springs for that purpose; nor do I claim as new the placing of a coil-spring around a shaft for the purpose of giving flexibility to the movements of that shaft or its connected gearing, for such an arrangement is

old in many mechanical devices; but I believe that in the construction of the feed and gig gearing of a saw-mill the combination of a coil-spring with the rag-shaft, or with the shaft of the feed and gig pulleys, for the purpose of giving flexibility to the movements of that gearing, and hence to the carriage itself, is new. In carrying out or embodying this combination the details may be somewhat varied; hence I do not desire to be limited to the kind of spring shown, nor to the exact construction and arrangement described.

What I claim is as follows:

1. The combination, with the feed or gig mechanism of a saw-mill, of a spring so applied upon the shafting of the same as to give flexibility to the movement of the carriage, substantially as and for the purposes set forth.

2. The combination of the clutch-flange T, loose pinion P, spring S, and flange U, substantially as and for the purposes set forth.

3. The combination of the clutch-flange T', loose pulley R', spring S', and flange U, substantially as and for the purposes mentioned.

In testimony whereof I, the said EDWARD H. STEARNS, have hereunto set my hand.

EDWARD H. STEARNS.

Witnesses:

JNO. K. HALLOCK,
JACOB F. WALTHER.