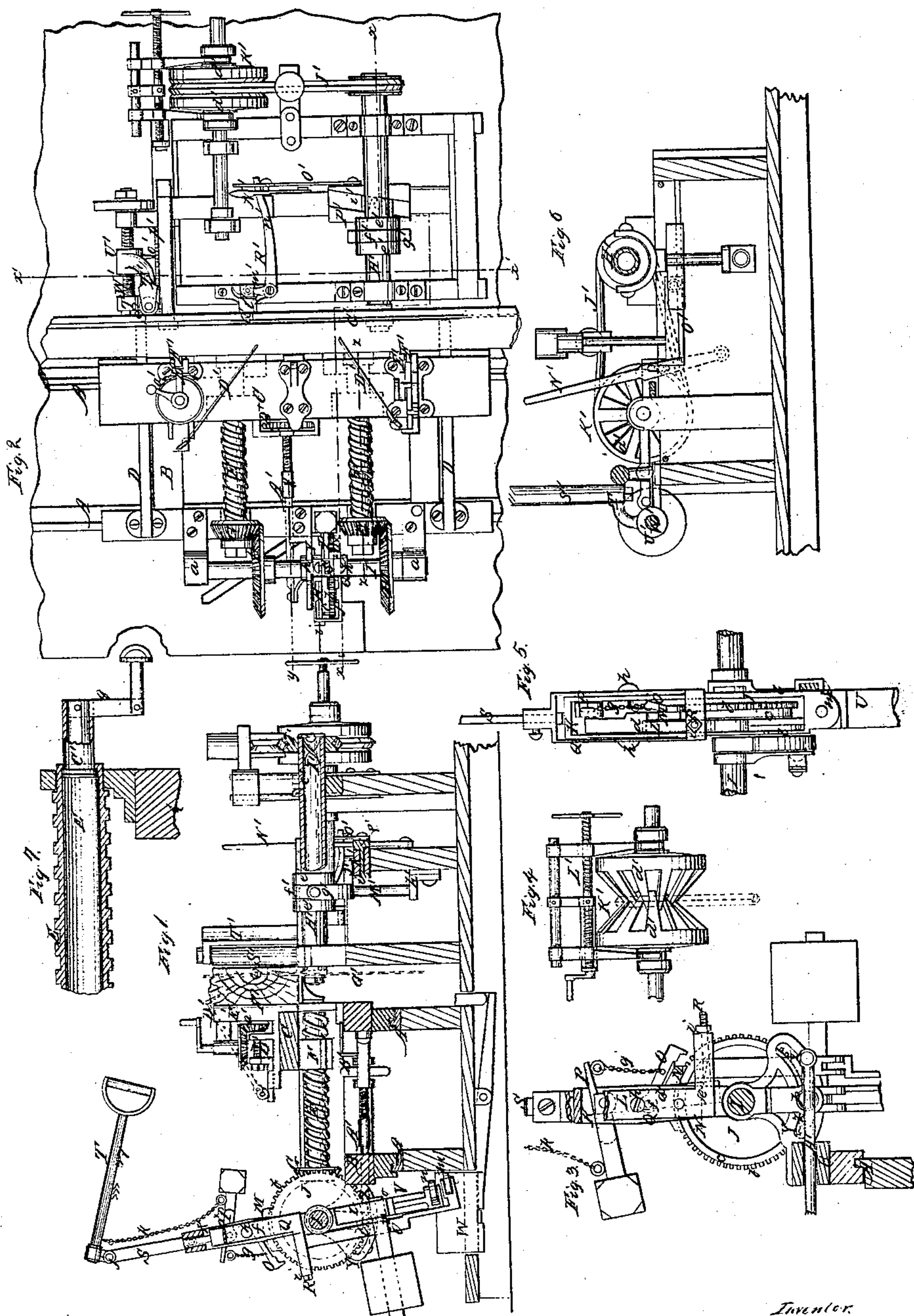


T. H. Russell.

Saw Mill.

N^o 106,729.

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Witnesses.
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Letters Patent No. 106,729, dated August 23, 1870; antedated August 17, 1870.

IMPROVEMENT IN CIRCULAR-SAW MILLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, **TITUS H. RUSSELL**, of Northfield, in the county of Washington, and State of Vermont, have invented a new and useful Improvement in Circular-saw Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a transverse vertical section of my invention taken in the line *x x* of fig. 2.

Figure 2 is a plan or top view of the same.

Figure 3 is a transverse vertical section of a portion of the same taken in the line *y y*, fig. 2.

Figure 4, a detached plane or top view of an expanding pulley pertaining to the same.

Figure 5, a front view of fig. 3.

Figure 6, a longitudinal vertical section of a portion of the same taken in the line *x' x'* of fig. 2.

Figure 7, a vertical section of a portion of the same, taken in the line *z z*, fig. 2.

Similar letters of reference indicate like parts.

This invention relates to a new and improved sawing-machine of that class in which a circular saw is employed.

It consists in a novel construction of the machine, as hereinafter fully shown and described, whereby several important advantages are obtained, to wit:

First, in the setting of the log to saw.

Second, in the moving of the setting-bar back from the saw.

Third, the adjusting of the knees, so that a proper bearing of the log against them may always be obtained.

Fourth, the preventing of the beating of the saw-mandrel.

Fifth, in an improved belt-slipping mechanism, arranged in connection with the saw-arbor and saw-guide, whereby the saw and guide are drawn from the log at the end of each cut, and simultaneously with the raising of the friction-pulley from the driving-belt.

Sixth, in an improved arrangement or application of a guide or gauge-roller, for determining the thickness of the stuff being sawed, said guide or gauge-roller being used chiefly in sawing thick stuff.

In the accompanying drawing—

A A represent two parallel ways or guides, on which a carriage, **B**, is fitted and works, and

C is a setting-bar, which is fitted and works on blocks **D D**, secured transversely on the carriage.

The log is secured or dogged to this setting-bar,

and the latter is moved on the blocks **D D** by means of screws, **E E**, which work in nuts **F**, secured to the under side of the setting-bar, as shown clearly in fig. 1.

On the outer ends of the screws **E E** there are secured bevel-pinions **G G**, which gear into bevel-wheels **H H** on a shaft, **I**, which has its bearings, *a a*, attached to the carriage **B**, and on said shaft **I**, at about its center, there is keyed a wheel, **J**, the periphery of which is toothed, as shown at *b*, said wheel having a concentric flange, *c*, projecting from one side of it, as shown in figs. 2 and 3.

On the shaft **I** there is placed, loosely, a bar, **K**, which is forked, or made with two sides, so as to straddle the wheel **J**, as shown clearly in fig. 5, and within the bar **K**, to the inner surface of one of the sides thereof, there is secured, by a pivot-bolt, *d*, a bar, **L**, which rests upon a jaw, **M**, the latter bearing on the upper surface of the flange *c*, a projection, *d'*, on said bar fitting in a notch in the upper surface of the jaw **M**, and keeping the latter in place. (See dotted lines in fig. 3.)

A similar jaw, **N**, bears against the under side of the flange *c*, and this jaw **N** is retained in place by resting on a projection, *e*, on bar **L**, (also seen by dotted lines in fig. 3.)

To the inner surface of the opposite side of the bar **K** there is secured, by a pivot-bolt, *f*, a pawl, **O**, which is connected, by a chain, *g*, with a loaded arm, **P**, the latter being fitted on a pivot at the upper end of the bar **L**.

This loaded arm **P** has a tendency to keep the pawl **O** elevated and free from the teeth, *b*, of the wheel **J**, as will be fully understood by referring to fig. 3.

Q is a forked bar, which straddles the bar **K**, and is connected to it by pivot-bolts *h h*.

The lower part of the bar **Q** extends outward at right angles with the upper part, and has a screw-rod, **R**, passing through it, with a nut, *i*, on its outer end, the inner end of said screw-rod being fitted in the bar **L**.

A single bar, **S**, is secured to the upper end of the bar **Q**, and a handle, **T**, is attached to the upper end of bar **S** by a joint, *j*, the handle **T** being connected by a chain, *k*, with the loaded arm **P**, (see more particularly fig. 1.)

The bar **Q** is provided with two pendent arms, *l l*, to the lower ends of one of which there is secured, by a joint, *m*, a bar, **U**, having a roller, *m'*, at its lower end, and a bar, **V**, having a similar roller, *u*, at its lower end, is attached, by a joint, *o*, to the lower end of the other arm *l*.

The joints *m o* admit of the bars **U V** moving in one direction only, as indicated by the arrow in fig. 5.

W is a block, fitted in the flooring of the building or in the base of the machine, and having an oblique position.

This block is arranged in such a manner that it may be moved down level with the flooring, or raised upward above it, the latter position being given it when it is designed to have the machine self-setting.

X is a segment slot, made in a plate, Y, which is attached to the carriage B, and through which the shaft I passes, loosely, the slot X being concentric with the shaft I.

A line, p projects, laterally, from the plate Y, and extends into the slot X.

Z is a stop, which is also fitted in slot X, and this stop is connected to a rod, A', on which a nut, B', is fitted, (see fig. 1.) By turning this nut the stop Z may be moved or adjusted in the slot X.

This adjustable stop is for the purpose of regulating the movement of the bar K, and determining the length of the feed movement of the setting-bar C.

At the termination of each cut of the saw, and after the log has been giggered back, the operator pulls the handle T in the direction indicated by the arrow 1, (see fig. 1,) and the jaws M N grasp or clutch the flange c, and turn the wheel J, and, consequently, the shaft I, which, through the medium of the wheels and pinions H G, turns the screws E E, and, consequently, moves the setting-bar C.

In order to move the setting-bar C back, when a new log is to be dogged to it, the operator raises the outer end of the handle T, so that a projection, a', on the loaded arm will press against the bar Q, above its pivot-bolts h h; and the lower end of the bar S, in consequence of being connected to Q by the rod R, will be shoved toward the setting-bar C, and the jaws M N rendered inoperative, so that they will not turn the shaft I, and the loaded end of the arm P, being raised by the upward movement of the handle T, the pawl O is allowed to engage with the teeth b of wheel J, and, consequently, when the handle T is shoved back in the direction indicated by arrow 2, the shaft I will be turned and the setting-bar C moved back.

In lieu of this arrangement, however, for effecting this purpose, the screws E may be turned by a direct application of power, either through the medium of a crank or key. I prefer the former, and I have one of the screws E made tubular, see fig. 7, and have a tubular slide rod, C', fitted therein, the outer end of C' being provided with a jointed crank, q, which, when the rod C' is drawn out from the screw, may be adjusted in proper working position, and, when not required for use, may be adjusted in a straight line and with the rod C', shown within the screw E, the crank being shoved within the rod C'.

In order to render the device self-setting, all that is required is simply to raise the oblique block W, so that the rollers m n of the bars U V may come in contact with it under the movement of the carriage B.

The log to be sawed (shown in red) is secured to the knees of the setting-bar C by means of the usual clogs D'.

These knees, designated by E', are each provided with an adjustable bar F', which may be moved further in or out from the knees, by gearing a' and a screw, b', (see figs. 1 and 2,) or by other suitable means.

The object of these adjustable bars is to always obtain a proper bearing of the log against all of the knees, and, with a crooked log, this result could not otherwise be obtained.

G' represents the circular saw, which is placed upon a mandrel, H', the latter being hollow, and having a spiral fan, I', in one end of it.

The mandrel is also perforated at points within its bearings, as shown at c', fig. 1.

Oil being poured within the mandrel, the centrif-

gal force generated by the rotation of the same will cause the oil to escape through the perforations c', and keep the bearings perfectly lubricated.

The fan I' will also cause a current of air to pass through the mandrel, which will keep the latter perfectly cool.

The mandrel H' is driven by a belt, J, from an expanding pulley, K', composed of the sliding parts d' d', which are adjusted by a right-and-left screw-rod, L'.

By this means the speed of the saw may be regulated while the machine is running without any difficulty whatever.

This expanding pulley, however, is applicable to other machinery than sawing-machines, and as it will be the subject of a separate application, it is not necessary to describe it further in connection with the present invention.

The mandrel H' has two hubs or bosses, c' c', upon it, between which there is a collar, f', the latter being loose on the mandrel, and having a pendent-rod, M', attached by a pivot yoke, g', the lower end of the rod M' being stepped loosely in a plate, k'.

N' is a lever, which is connected by a bar, O', with a sliding plate, P', having an oblique groove, i', made in its upper surface, and the pendent-rod M' is provided with lateral arm j', which has a block, k', attached, said block being fitted in the oblique groove i'.

By moving this lever N', it will be seen that a lateral movement will be given the pendent-rod M', and the mandrel H', moved longitudinally, so that at the end of a cut the saw may be drawn from the log, and the latter giggered back with the carriage, without touching the saw.

Q' is a saw-guide, which is fitted in a bearing, l, and is allowed to slide freely therein.

This guide is attached to the outer end of the shut arm m' of a bent lever R', the other and longer arm, n', of said lever being connected to the bar O'.

By this arrangement the guide Q' will be drawn from the saw simultaneously with the drawing of the saw from the log, and I design to have the idle pulley on the driving-belt connected with the lever N' in such a manner that, when the saw and its guide are thus moved, the idle pulley will be raised, so as to slacken the belt, and render the saw inoperative during the giggering back movement of the carriage and lock.

S' is a gauge-roller, which is fitted in an upright frame, T, the lower end of which has a nut, U', that is fitted on a screw-shaft, W'.

This nut has an index, o', projecting from it, which extends over a graduated plate, p', on the frame of the machine.

The log, in being sawed, bears against this gauge-roller, and in adjusting the frame T' by turning the shaft W', the roller S' may be set for sawing timber of greater or lesser thickness, as desired.

In sawing thick timber, the roller S' is all that is used for a gauge.

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

1. The combination of the bars Q K L and jaws M N, with the flanged wheel J, screws E, and gearing G H, substantially as described for the purpose specified.

2. The arrangement of the jointed bars U V, carrying the rollers m' n, with reference to the feeding mechanism and the oblique bar W, for rendering the device self-setting, as herein shown and described.

3. The combination of the handle T, loaded arm P, and pawl O, with the bars Q K, and the teeth b of the wheel J, all arranged and operating substantially as described for the purpose specified.

4. The adjustable crank q, constructed as described,

fitted or applied to the screws E, substantially in the manner as and for the purpose set forth.

5. The hollow mandrel H', perforated at its bearings, and receiving in its end opposite the saw, the spiral fan I', as herein described, for the purpose specified.

6. The combination of the collar f', pendent-rod M', block k', sliding plate P', having the oblique groove i', bar O', and lever N', for the purpose of giving the saw-mandrel H' a longitudinal adjustment, substantially as herein described, for the purpose specified.

7. The adjustable gauge-roller S', having its frame T arranged to swing upon the screw-shaft W' by the nut U', said nut being provided with the index O', working over the graduated plate p', upon the frame of the machine, as herein described for the purpose specified.

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Witnesses:

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