Smith & Chase,

Head Block.

No. 113,217. Patented Mar. 28. 1871.

Fig. 1.

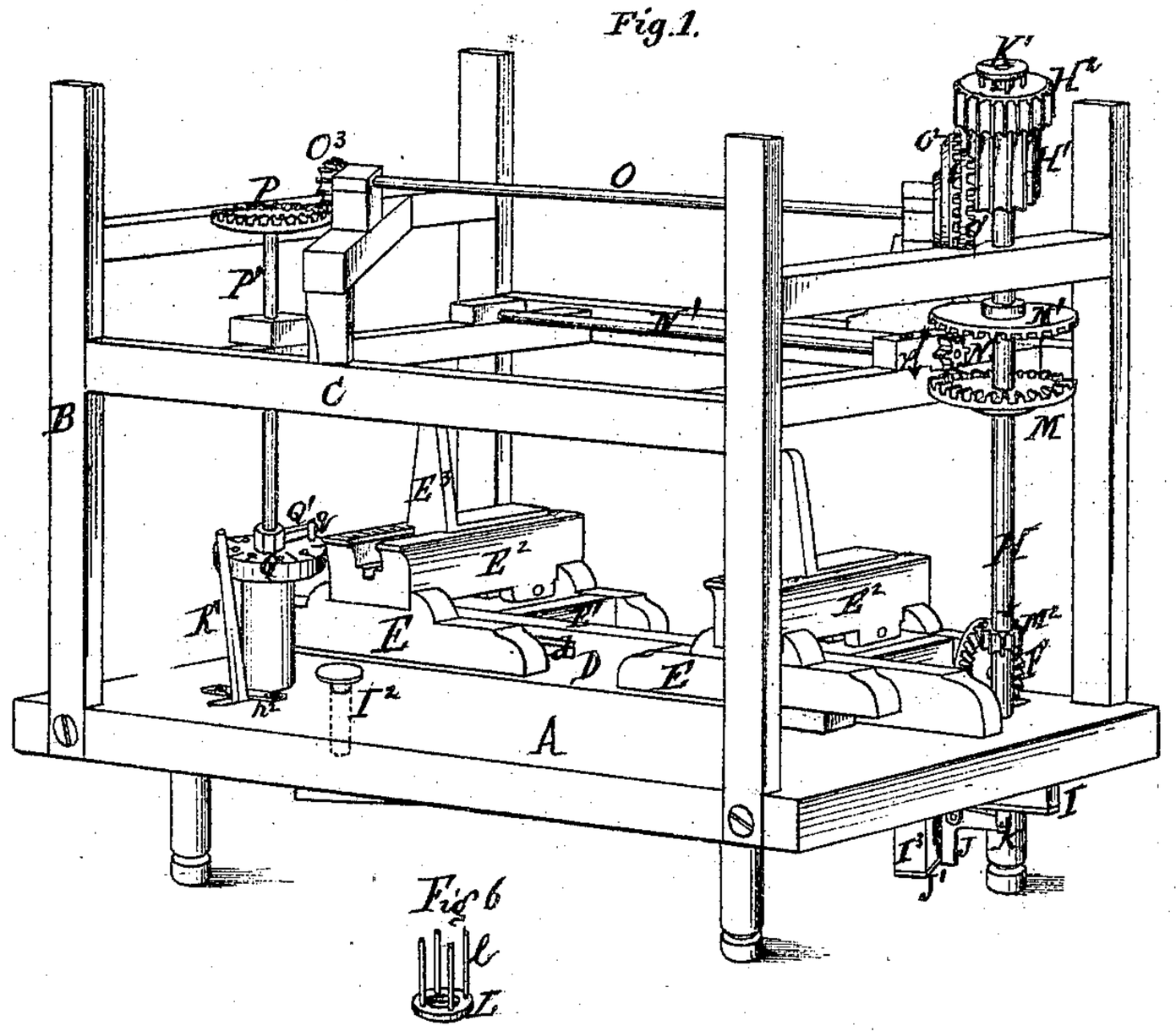

Fig 6

Fig. 2.

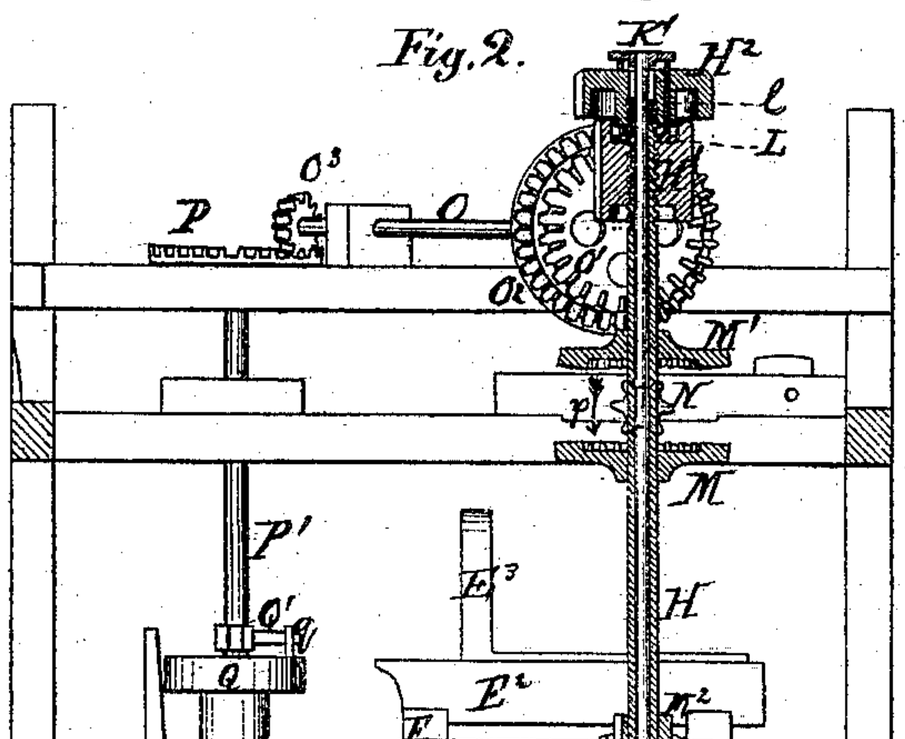

Fig. 3

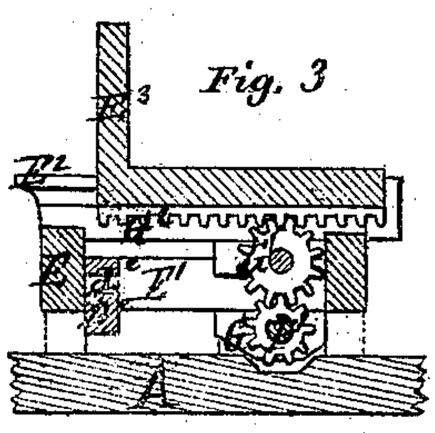

Fig. 4

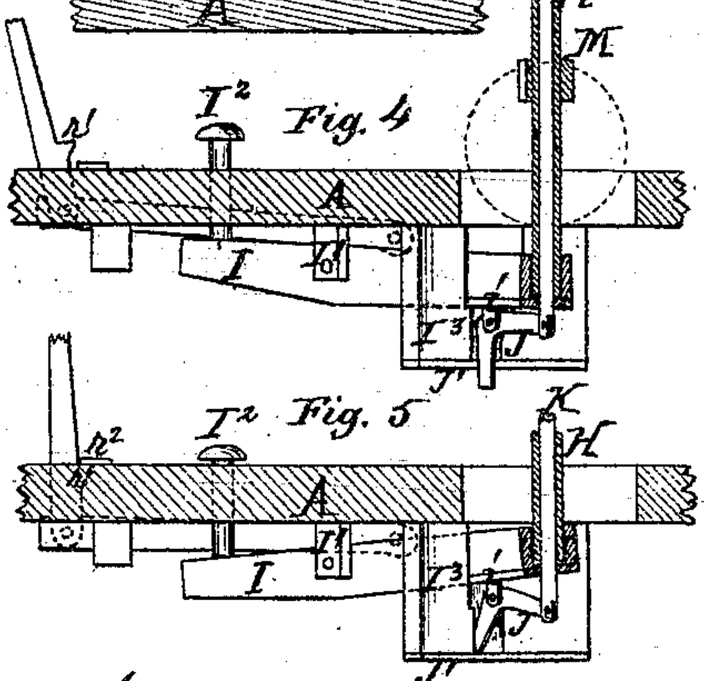

Fig. 5

Witnesses.
N. B. Smith
H. H. Doubleday

W. Dean Smith
Andrew J. Chase
by A. M. Smith
Atty

United States Patent Office.

W. DEAN SMITH AND ANDREW J. CHASE, OF UNION, NEW YORK,*

Letters Patent No. 113,217, dated March 28, 1871.

IMPROVEMENT IN 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 we, W. DEAN SMITH and ANDREW J. CHASE, both of Union, county of Broome and State of New York, have invented certain new and useful Improvements in Saw-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective view of the improved devices;

Figure 2, an end elevation, partly in section; and

Figures 3, 4, 5, and 6 are detached views, showing some of the parts in different positions.

The first part of the invention relates to that class of saw-mills in which the knees which feed the log or log-cant laterally forward upon the head-block are actuated by means of pinions which engage with toothed racks upon the under side of said knees, the construction and arrangement of devices being usually such that both ends of the log are carried forward simultaneously.

This part of the invention consists in a novel construction and combination of devices whereby a single pinion, which is driven continuously in one direction, is made to move the knees either forward or backward such distances and at such times as may be desired by the operator, both the direction and the distance traveled by said knees being indicated upon a disk or dial-plate so located as to be readily seen by the attendant.

The second part of the invention consists in slotting the side pieces or stringers of the carriage upon which the head-blocks rest, and connecting said head-blocks (one or both) with the carriage, by means of a tongue or tenon, which is framed into the slot, in a manner which will be hereinafter described, so that the head-blocks may be readily adjusted to receive logs of different lengths.

In the drawing—

A represents the floor of the mill;

B B are posts; and

C C, girts forming a frame-work, upon which are mounted various parts of the mechanism.

D is a side piece or stringer of the carriage. There may be, if preferred, two of these stringers, one upon each side.

These stringers may be connected by girts, thus forming a carriage, upon which the head-blocks are supported.

The head-block is composed of bed-pieces E E, girts E^1, and ways E^2, in which the knees E^3 slide freely, as will be readily understood from the drawing without further explanation.

Each stringer is slotted, as at *d*, figs. 1 and 3, and the girts E^1 are tenoned so as to pass through and move freely in said slot.

The girt E^1 is shouldered, as at *e e*, fig. 3, the outer end of the tenon being confined in bed-piece E, thereby locking the head-block securely to the carriage, and yet permitting it to slide longitudinally thereon when required.

F is a gear-wheel, mounted on a shaft, F′, (shown in fig. 3,) which runs lengthwise of the carriage below the head-block.

This shaft drives two spur-pinions, G, one of which is mounted in and travels with each of the head-blocks, and is connected, by means of transmitting-pinion G^1, with a toothed rack, G^2, secured to the lower side of the knee.

Pinions G are mounted loosely upon shaft F′; that is, they can slide lengthwise of the shaft with the head-blocks, but they are keyed or feathered to it, (the shaft,) so as to revolve with it. Thus a rotary movement of wheel F imparts a reciprocating motion to the knee, as will be readily seen.

H is a hollow shaft, mounted in a vertical position in the frame-work, so that it can slide up and down freely. It rests at the bottom in a suitable step on one end of a lever, I, located below the floor A and pivoted at I^1.

The opposite end of this lever is actuated by a pin, I^2, or its equivalent, which passes through the floor, and also by another lever, which will presently be described.

I^3 is a slotted or forked guide-block, attached to the floor near that end of lever I which supports shaft H, and serving to prevent any lateral motion of the lever and of the bottom of the shaft.

J is a bell-crank, pivoted to lever I at *i*.

J′ is a locking-plate or stop, made preferably of metal, and secured to the lower end of the guide-block I^3.

K is a tripping-rod, located within the hollow shaft H, and connected with the horizontal arm of bell-crank J.

K′ is a disk secured to the upper end of tripping-rod K.

The upper end of tubular shaft H is provided with a coarse right-hand screw-thread.

H^1 is a toothed nut, the thread of which corresponds to that upon shaft H, so that, by turning it (the nut) around, it may be moved up or down upon the shaft, in a manner and for the purpose which will be hereinafter explained.

H^2 is a spur-wheel, keyed to the upper end of shaft H.

Fig. 6 represents a tripper, composed of a collar, L, from which rise four stems, *l*.

* Said Chase assigns to said Smith.

This collar surrounds shaft H, between nut H^1 and spur-wheel H^2, the stems *l* running up through perforations in wheel H^2, as plainly shown in fig. 2.

This tripper turns with shaft H and wheel H^2, but is free to rise and fall independently of them when actuated by nut H^1, upon which it rests.

M M^1 are bevel-gears, keyed to shaft H.

N is a driving bevel-pinion, mounted on the horizontal shaft N′.

The bevel-wheels M M^1 are made to engage alternately with pinions N as the shaft H is raised or lowered by means of lever I.

M^2 is a long pinion, keyed to shaft H, and engaging with wheel F. It is of such length that it remains always in gear, whatever may be the position of shaft H—that is, whether said shaft be raised or lowered by lever I.

O is a horizontal shaft, mounted in suitable bearings upon the frame-work.

O^1 O^2 are gear-wheels, keyed to one end of shaft O.

Wheel O^1 is always in gear with the teeth formed upon nut H^1, this nut being long enough to remain in mesh whether it is run up or down on the thread on shaft H; in fact, in the drawing it is made very much longer than is necessary.

Wheel O^2 is operated by wheel H^2 whenever it (wheel H^2) is dropped down into mesh by shaft H being lowered.

O^3 is a small bevel-pinion, keyed to the opposite end of shaft O.

Wheel O^3 meshes into a larger one, P, keyed to the upper end of a vertical shaft, P′.

At the lower end of shaft P′ there is a dial-plate, Q, which is traversed by an index-finger or vibrating arm, Q′, firmly attached to shaft P′.

q is a pin, adapted to fit in a series of holes in the face of the dial-plate Q.

R is a lever, placed below the floor of the mill, and between the floor and one end of lever I, crosswise, thereby serving as an adjustable stop to limit the upward movement of this end of lever I, and consequently the downward movement of the opposite end of this lever and shaft H.

Lever R is pivoted to the floor at *r*, and is actuated by means of a hand-bar, R′, which passes through the floor and is pivoted to the free end of the lever, as plainly shown in figs. 2, 4, and 5.

Bar R′ has a jaw or shoulder, r^1, upon one side, shown in full lines in fig. 4 and in dotted lines in figs. 2 and 5.

This jaw is adapted to engage with a suitable stop, r^2, formed in or attached to the floor for the purpose of maintaining lever I and the parts operated thereby in a certain position, as will be presently explained.

In operating my machine motion is communicated to shaft N′ from the saw-arbor or from any other desired point, which will impart to said shaft a continuous rotary motion in the direction indicated by the arrow *x* in figs. 1 and 2.

In figs. 1 and 2 the devices are in a position adapted to receive a log for sawing.

It will be observed that lever I is depressed far enough to elevate shaft H to such point that bevel-wheels M M^1 are neither of them in mesh with driving-pinion N, lever I being held in this position by lever R, which is in turn held down by bar R^1, as shown in fig. 2.

We now move pin *g* forward (that is, with the saw) one hole, and carry the vibrating arm Q′ around in the same direction until it strikes and rests against the pin. This movement turns the nut H^1 around from left to right, (that is, with the sun,) and screws said nut down upon shaft H a short distance, which allows tripper L *l* to drop away from disk K′.

Now, by pressing with the foot upon pin I^2, that end of lever I is still further depressed, and the opposite end, together with shaft H, is elevated until bevel-wheel M is brought into mesh with driving-pinion N, the parts being locked in this position by bell-crank J engaging with locking-plate J′, the position of the locking devices being plainly shown in fig. 5.

Shaft H is now rotated with the sun by the action of pinion N, and the knees are moved forward toward the saw until the wheel M is allowed to drop out of mesh, as follows:

It will be seen that, while the arm Q′ rests against pin *q*, the nut H cannot be turned to the right, (or with the sun,) but as the shaft H is, while the knees are moving forward, turning to the right, the result is the same as if the nut were being turned to the left; that is, the nut is backed off from the screw on the shaft.

The effect of this upward movement of the nut is to lift the tripper L *l*, disk K′, and tripping-rod K, thereby withdrawing the vertical arm of the bell-crank J from the locking-plate J′, which allows the end of lever I, shaft H, and wheel M to drop, and, of course, check the forward movement of the knees.

The pin *g* may now be moved forward to another hole, and the operation repeated, and so on until the log is sawed up.

When it is desired to run the knees backward to put on another log, the operator releases the bar R′. This allows the shaft H to drop low enough to bring the wheel M^1 into mesh with pinion N and drive shaft H backward, that is, against the sun, and of course withdraws the knees to such point as may be required.

When the shaft H is dropped down, as above described, it brings gear-wheel H^2 into mesh with wheel O^2, and, as this wheel is rigidly connected with shaft O, the vibrating arm Q′ is carried backward over the dial Q just in proportion to the distance that the knees are withdrawn; and as wheels O^1 O^2 move together, nut H^1 is carried around with shaft H without materially changing its position relative to that shaft during this backward movement, but can be readily adjusted so as to allow the bell-crank to lock wheel M in mesh with pinion N whenever the log is to be again fed forward.

By graduating the holes in the dial Q the point to which arm Q′ must be moved forward in order to trip the bell-crank at the proper time may be easily determined for any thickness of boards or plank; or, if preferable, a pawl may be applied to arm Q and made to engage with a ratcheted rim on the face of the dial.

It is evident that, in case gears H^2 and O^2 for moving the vibrating arm backward are dispensed with, the tripper L *l* may also be dispensed with, as tripping-rod K may be shortened so as to bring disk K′ down where it can be operated directly from nut H^1.

Having now described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination of shaft F′, gear-wheel F, shafts H N′, gears M M^2 N, lever I, and pin I^2, substantially as described.

2. The combination of shaft F′, H, and N′, gear-wheels F M^1 M, pinions N M^2, levers I R, pin I^2, and bar R′, substantially as described

3. In combination with tubular shaft H and lever

I, the tripping-rod K, bell-crank J, stop J′, disk K′, and nut H^1.

4. The combination of vibrating arm O^1, shafts O P′, gears P O^1, and nut H^1, substantially as described.

5. The combination of shafts O P′, gears P O^1 O^2 O^3 H^2 with nut H^1, tripper L *l*, and shaft H, as set forth.

6. The slotted side piece or stringer D, in combination with the tenoned girts E^1, bed-piece E, and ways E^2, these parts being constructed and arranged substantially as described, whereby the head-block may be adjusted longitudinally upon the carriage, as set forth

W. DEAN SMITH.
ANDREW J. CHASE.

Witnesses:
E. R. SHEPARD,
L. D. WITHERILL.