R. L. & R. S. GREENLEE.

Mortising and Boring Machines.

No. 199,285. Patented Jan. 15, 1878.

Fig. 1.

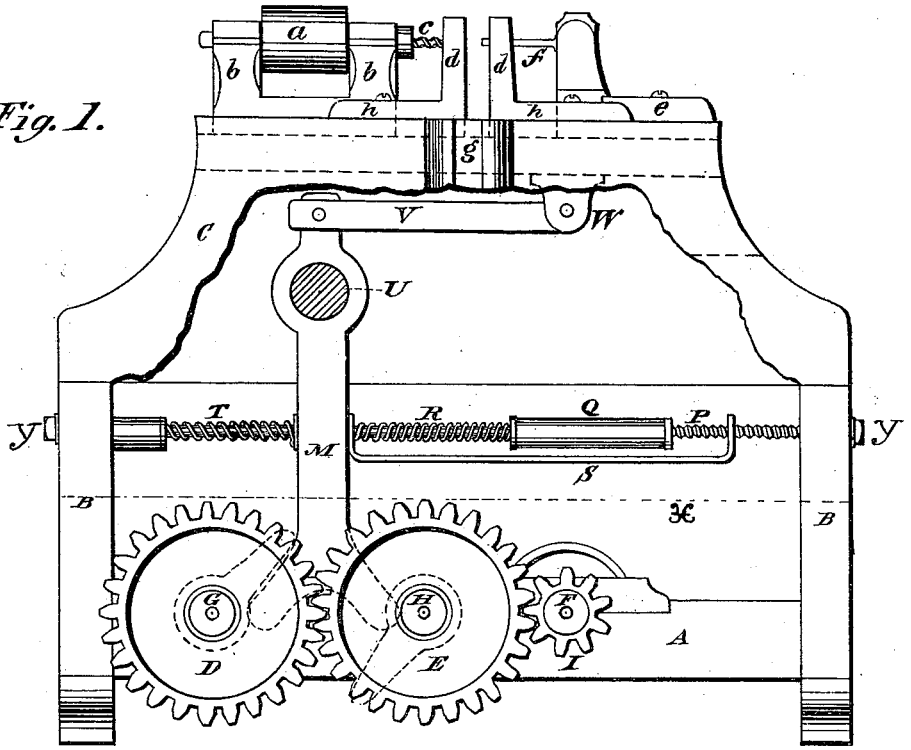
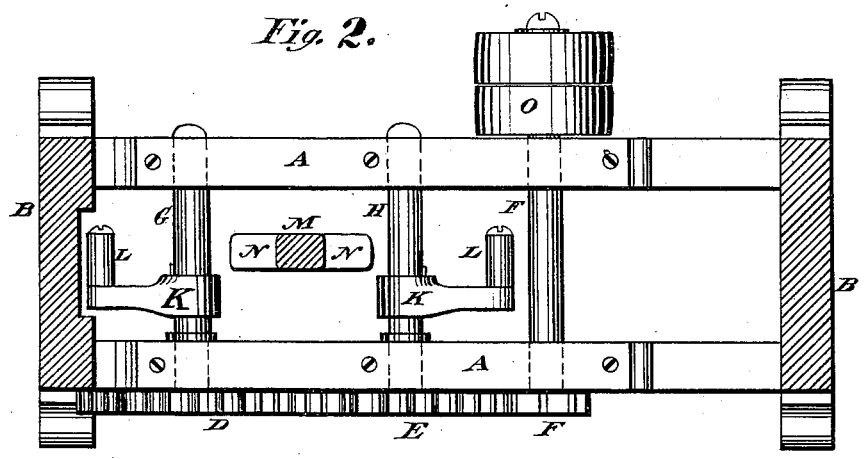


Fig. 2.



Witnesses:
Peter McNaylor.
Austin Nichols.

Inventor:
Robert L. Greenlee
Ralph S. Greenlee
By G. G. L. Chapman Atty

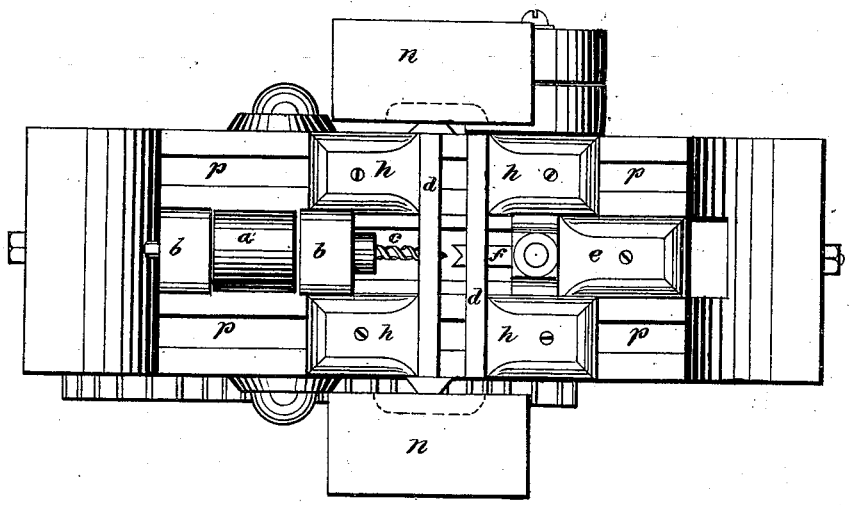
2 Sheets—Sheet 2.

R. L. & R. S. GREENLEE.

Mortising and Boring Machines

No. 199,285. **Patented Jan. 15, 1878.**

Fig. 3.



Witnesses:
Peter M. Naylor.
Austin Nichols

Inventor:
Robert L. Greenlee
Ralph S. Greenlee
By G. L. Chapman, Atty

UNITED STATES PATENT OFFICE.

ROBERT L. GREENLEE AND RALPH S. GREENLEE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN MORTISING AND BORING MACHINES.

Specification forming part of Letters Patent No. **199,285**, dated January 15, 1878; application filed May 18, 1877.

To all whom it may concern:

Be it known that we, ROBERT L. GREENLEE and RALPH S. GREENLEE, of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Mortising and Franking Machines, of which the following is a specification:

The nature of the present invention consists in a substantial frame, on the top of which, in suitable guides, is mounted a reciprocating carriage carrying a rotating bit or auger and a mortising-chisel. There is also mounted on the top of this frame a compound adjustable guide for regulating the position of the material to be mortised or franked.

The carriage carrying the bit and chisel has the proper reciprocating movement given to it by means of a cam-lever, connecting-rod, arms on rotating shafts in the lower part of the frame, and an adjustable spring, as the whole is hereinafter fully described and shown.

In the drawings, Figure 1 is an elevation of the side of the mechine embodying our improvement, with the face of the upper frame removed to show more clearly the arrangements inside. Fig. 2 is a horizontal section of Fig. 1 on line *x*. Fig. 3, Sheet 2, is a top or plan view of the machine.

A B C represent the frame of the machine, which is, in practice, of cast-iron. On the top of this frame part C is mounted a reciprocating carriage, *e*, by means of the ordinary dovetail groove. This carriage, by means of bearings *b b*, supports a rotating bit or auger, *c*, which is driven in the ordinary manner by a belt running over a pulley, *a*, and it supports, by means of an upwardly-projecting standard, *e'*, a mortising-bit, *f*. Nearly centrally on the top of the frame part C is affixed an adjustable guide, *d d*, which, by means of supporting-carriages *h h*, running in dovetail grooves *p p* in the frame, can be set in any desired position to bring material to be mortised properly to the bit and chisel.

The small tables *n n*, Fig. 3, are provided with shanks, which have a vertical adjustment in dovetail grooves *g*, Fig. 1, on the outsides of the frame part C.

In practice it is first necessary to move the central longitudinal carriage *e* forward in the proper direction to make a hole through a piece of material supposed to lie between the guides *d d* by means of the bit *c*, and then to move the carriage back, so that the bit may be removed and the chisel cut the mortise. To attain this movement the following novel means are employed: A cam-lever, M, is pivoted at U to the frame part C of the machine, and at its lower end it is forked, and terminates in what we term "cams," and at its upper end it is pivoted to a connecting-rod, V, which, at its opposite end, is pivoted to a lug, W, projecting down from the said carriage *e*. By means of suitable bearings three shafts, G H F, are placed laterally on the frame part A, F being the drive-shaft, which, by means of suitable gear D E I, rotates the shafts H F. These two latter shafts carry arms K L, the parts L of which, being thimbled, alternately swing the cam-lever M N on its pivot U, and, as a result, move the carriage *e* back and forth to get the positions required for the bit *c* and chisel *f*. To bring the cam-lever M N back to its proper position after it has been swung by the arms L for the removal of the piece of lumber from between the guides *d d* preparatory to making another mortise or removing it from the machine, a rod, *y*, is put through the end frame parts B and through the lever M, and on this rod, on both sides of the lever, is placed coil-springs T R, which, by proper force, keep the lever vertical, or nearly so, when not operated on by the arms L, in which position the piece of lumber being worked can be removed from between the guides *d d*. To give the spring R greater power, a clamp, S, is placed on the rod *y*, and between its outer end and the spring R a hand-nut is placed, whereby, when the nut is turned, the spring is compressed.

In practice a weight may be substituted for the springs T R; or rubber springs may be used to bring the lever M to a vertical position.

Only one bit and one chisel are shown; but a nest of bits may be employed, and a hollow chisel may be used to cut a mortise, and the devices may have their positions changed so as to make vertical mortises.

What we claim as new is—

1. The reciprocating carriage *e*, provided

with a mortising-chisel, *f*, and rotating bit or bits *e*, facing to each other, and placed a suitable distance apart to mortise lumber between them, said carriage being driven by suitable mechanism, as and for the purpose set forth.

2. The combination of the carriages *e* and *h h*, carrying the guides *d d*, connecting-rod V, cam-levers M N, rod *y*, spring R T, adjusting-nut Q, clamp S, bit *e*, and chisel *f*, as and for the purpose set forth.

ROBERT L. GREENLEE.
RALPH S. GREENLEE.

Witnesses:
G. L. CHAPIN,
WILLIAM M. GOGGIN.