

T. V. RANKIN.
SAWING MACHINE.

No. 474,189.

Patented May 3, 1892.

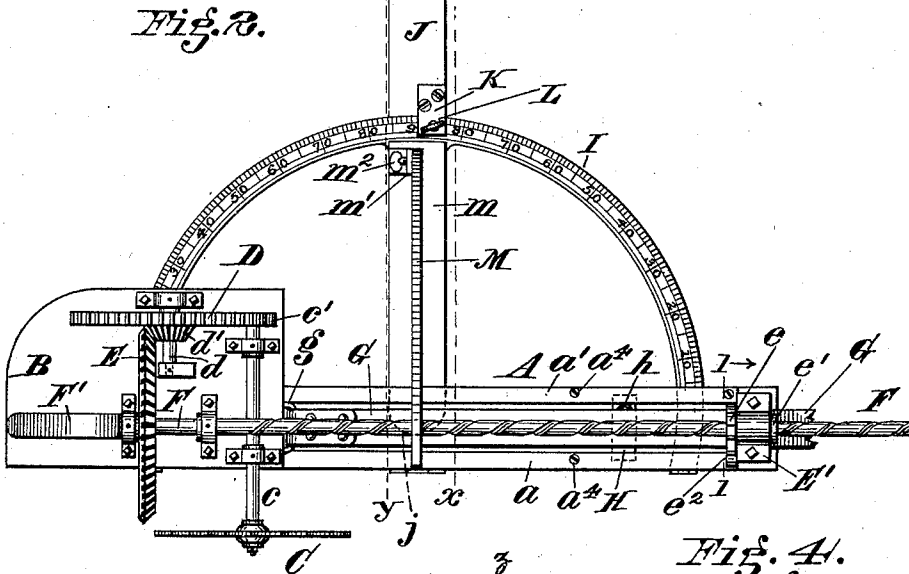
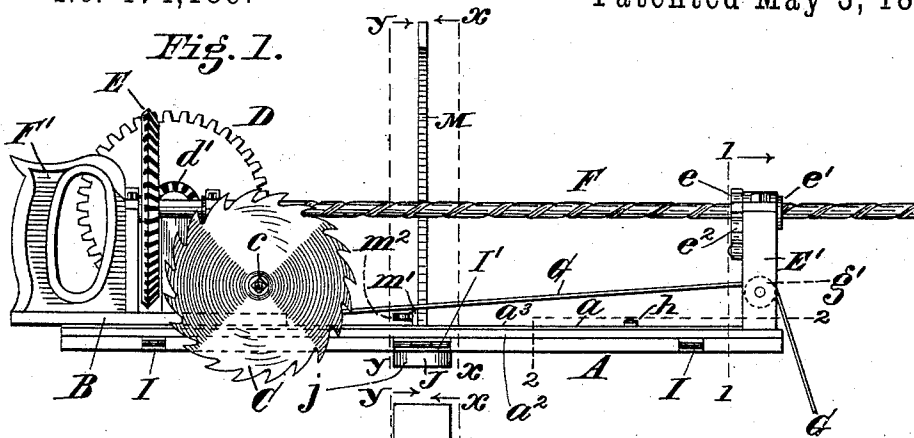


Fig. 3.

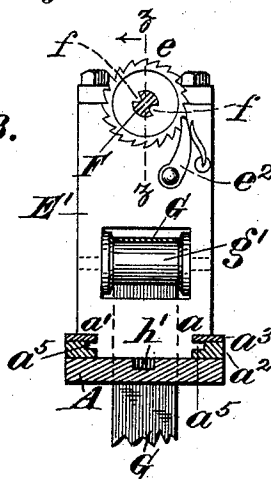
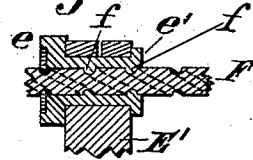


Fig. 4.



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Fig. 5.

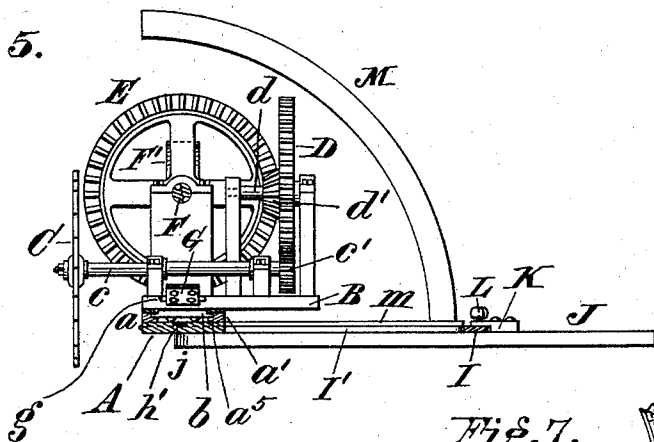


Fig. 6.

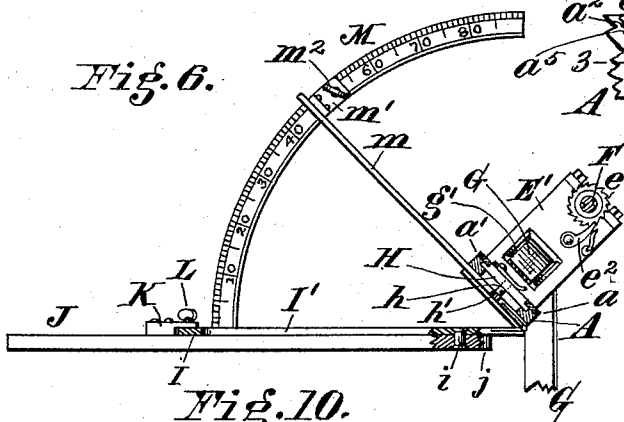


Fig. 7.

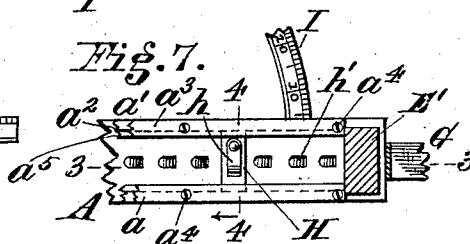


Fig. 8.

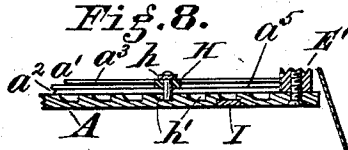


Fig. 9.

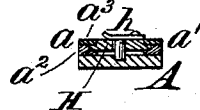
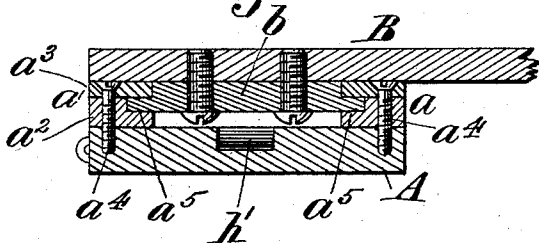


Fig. 10.



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UNITED STATES PATENT OFFICE.

THOMAS V. RANKIN, OF CINCINNATI, OHIO.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 474,189, dated May 3, 1892.

Application filed November 23, 1891. Serial No. 412,761. (No model.)

To all whom it may concern:

Be it known that I, THOMAS V. RANKIN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Sawing-Machines, of which the following is a specification.

My invention relates more particularly to hand sawing-machines which are especially designed and adapted to execute bevel and other cross-cut work, the construction and arrangement thereof being fully hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal elevation of my invention, showing the parts in their normal condition or the position they assume for ordinary right angle or square cross-cut sawing, the auxiliary foot-propelling strap being shown broken off at the fore end of the machine and the saw-carriage lying at or near the tail end of the bed-plate ready for a stroke or forward movement through the work; Fig. 2, a plan view of the same; Fig. 3, a transverse sectional elevation in the direction of the arrow on line 1 1 in Figs. 1 and 2, but on a larger scale; Fig. 4, a broken vertical section on line *zz* of Fig. 3; Fig. 5, a transverse sectional elevation in the direction of the arrow on line *xx* in Figs. 1 and 2; Fig. 6, a transverse sectional elevation in the direction of the arrow on line *yy* in Figs. 1 and 2, excepting that the saw-carriage bed-plate and accompanying reciprocating devices are set at an angle of forty-five (45°) degrees, the position they assume when work of a corresponding angle or bevel is to be performed, a portion of the device being broken and in section to show the swivel or central stud on which the sawing devices may be turned in a horizontal plane in setting them for bevel work other than ordinary straight cross-cut or right-angled work; Fig. 7, a broken sectional plan on line 2 2 of Fig. 1; Fig. 8, a broken longitudinal section on line 3 3 of Fig. 7; Fig. 9, a transverse sectional elevation in the direction of the arrow on line 4 4 of Fig. 7; and Fig. 10 a broken transverse section, full size, simply showing the sliding connection between the saw-carriage base-plate and the longitudinal bed-plate of the machine, the remaining parts being omitted.

A represents the longitudinal bed-plate of my machine provided along its upper face with the side guides or ways *aa'*, which form a straight track for the reciprocating movements of the saw-carriage, as most clearly shown in Figs. 2, 5, and 10. These side guides are each preferably formed in two parts, comprising the lower bars *a²* and upper bars *a³*, which are of like width and jointly secured in place on the bed-plate by means of screws *a⁴*. The lower bars *a²* are rabbeted along their upper inner edges to form the inner grooves *a⁵* in said side guides.

B represents the base-plate of the saw-carriage, having one or more transverse plates or bars *b* secured to its under side, these bars *b* being shouldered or rabbeted at their opposite ends to correspond with and fit the grooves *a⁵* of the side guides, as clearly shown in Figs. 5 and 10. C represents a circular saw mounted perpendicular to said base-plate B on the outer end of the transverse shaft or arbor *c*, the latter being in turn mounted in bearings on said base-plate B.

c' represents a small spur gear or pinion keyed to the inner end of saw-arbor *c* and driven by an engaging large spur-gear D, mounted on a short transverse shaft *d*, the latter being in turn mounted in bearings on said base-plate B to the rear of said saw-arbor. *d'* is a bevel-pinion mounted on shaft *d*, adjacent said spur-gear D, and driven by an engaging bevel-gear E, which is mounted at the tail end of a longitudinal screw-shaft F. The screw-shaft or spiral spindle F is journaled at its rear smooth end in bearings on said base-plate B, and its remaining spiral portion engages the central opening of a ratchet-wheel *e*, the latter having a flanged hub *e'*, which is journaled in a box at the top of standard or post E'. The standard E' is mounted upon the fore end of the bed-plate A and is supplied on its inner face with a spring-controlled detent or pawl *e²*, which engages the ratchet-wheel *e* to prevent its turning backward, and also for the purpose I shall now describe. The central bore of the ratchet-wheel *e* is constructed with one or more spiral threads or ribs *f*, corresponding in pitch and number with the spiral grooves (two being shown in the drawings) in the longitudinal screw shaft or spindle F and de-

signed to cause the rotary movement of said spindle F, when the saw-carriage is advanced or moved forward over its track, the said detent e^2 preventing said backward movement of said ratchet-wheel, thus simultaneously driving the train of gear and they in turn rotating the saw for cutting. In the reverse or backward movement of the saw-carriage the spiral-grooved spindle F does not revolve, owing to the fact that the ratchet-wheel e is free to revolve forward, and thus the saw and its train of gears are at rest during said reverse movement.

F' represents the handle (of ordinary hand-saw handle or plane-stock form) attached at the rear end of the saw-carriage for its propulsion in either direction.

An auxiliary foot device is preferably provided to aid the operator in executing work on very hard lumber or expediting and facilitating work on any lumber. This foot device is composed of a belt or chain G, attached at one end to the loop or eye g in the fore end of the saw-carriage and leading over a roller or idler g' , journaling in an opening in the standard E' to a suitable foot-treadle, (not shown,) or, if desired, to any other motive power.

H represents a transverse bar or plate shouldered at its opposite ends to fit the inner grooves a^2 in the side guides and designed to serve as a stop gage or abutment on the bed-plate to limit the forward movement of the saw-carriage. This stop-gage is provided with an automatic spring-catch h , the lower end of which engages either one of a longitudinal series of notches h' in the upper face of the bed-plate A, whereby it may be adjustably set or locked in place at any point on the bed between the saw-carriage and standard E', and thus shorten or lengthen the stroke of said saw-carriage to suit the width of material to be cut. The outer end of the spring portion of the catch h is upturned or formed into a lip to facilitate the disengagement of its pendent portion from the notches in the bed-plate when desired. When said catch has been raised or disengaged from the bed-plate, the stop-gage may be readily slid or moved in either direction in the side guides.

I represents a horizontal segment or arc of half a circumference graduated in degrees from zero to ninety each way and properly numbered, its opposite ends being hinged in recesses formed in the bottom of the bed-plate A, as shown in Figs. 1 and 8, so that said bed-plate and the hereinbefore described sawing devices supported thereby may hinge or be arranged at an inclination thereon.

I' is a radial bar or plate projecting inwardly from the segment I, midway between its ends, and also hinged at its inner end in a recess formed in the bottom of bed-plate A, midway between the ends of the latter.

J is a long lateral bar, upon which the segment I and its accompanying saw devices oscillate in a horizontal plane, the double-headed pin or bolt j forming the center of oscillation

and also the coupling or means of connection between the said radial bar I' of the segment and said bar J, as clearly shown in Fig. 6. Bar J forms a squaring gage or abutment which is brought against one edge of the work for the sawing operation, the portion of the work to be cut away projecting beyond its inner rounded end j the distance required.

K is an index-block attached to the bar J at one side the center thereof and rabbeted or shouldered on its inner lower corner, so that it may project over the segment I, a thumb-screw L passing through said rabbeted portion of the index-block for frictional engagement with said segment and thereby firmly clamping it in place at the desired angle. Segment I enables the arrangement of the bed-plate and sawing devices at any angle in a horizontal plane to a scope of one hundred and eighty degrees, this being ninety degrees in either direction, the parts being readily and instantly adjusted to suit the desired angle and to saw either square, bevel, or miter work.

M represents a graduated arc or quadrant of ninety degrees suitably numbered and projecting from the said radial bar I', being disposed inwardly (toward the sawing devices) and passed through a slot in an arm m , which latter projects laterally from the bed-plate immediately over the said radial bar I'.

m' represents an index block or plate on the arm m , adjacent the arc M, and m^2 is a thumb-screw passed through said index-block m' for frictional engagement with said arc, and thereby firmly clamping or sustaining the arm m in place at the angle it is desired to arrange the bed-plate and sawing devices.

The hinging of the bed-plate and its accompanying saw devices to the outer ends of the graduated segment I, and the provision of arc M in connection therewith, enable the machine to cut both square and bevel work, the bevel-work being at angles perpendicular or transverse to the angles presented by said segment I.

In the operation of my device the saw-carriage may be readily reciprocated over its straight track, and so geared as to rotate the saw at any desired speed, all the angling or beveling devices being very readily changed at any time to suit the degree or angle required, whereby soft and hard wood alike may be sawed either square, cross-cut, or at any angle. The momentum the saw attains before reaching the work (which is about one-third the length of the bed) enables the work to be done with ease and a clean cut secured.

It is obvious that for ordinary square cross-cut sawing, which is straight across the grain, the segment I and arc M could be entirely dispensed with and omitted from the machine altogether and the balance of my machine operate just as well. It is also obvious that either of the arcs I and M could be dispensed with and the machine operate with but one of them, as desired, the changes re-

quired in either event being immaterial and unnecessary to describe or show herein.

I claim—

1. In a sawing-machine, the combination of
5 a bed-plate having a suitable track thereon,
a handled saw-carriage reciprocating on said
track, a circular saw mounted on said car-
riage, a longitudinal spirally grooved or
10 threaded shaft connected by a train of gear-
ing with said saw, the outer end of which
shaft engages a feather in a standard or post
at the fore end of said bed-plate, and a suit-
able abutment bar or plate, which is rested
15 against one edge of the work, substantially as
and for the purpose herein set forth.

2. In a sawing-machine, the combination of
the bed-plate having a suitable track or guide-
way thereon, a handled saw-carriage recipro-
cating on said track or guideway, a circular
20 saw mounted on said carriage, a longitudinal
driving spiral shaft connected by a train of
gearing with said saw, the outer end of which
shaft engages a feather in a standard or post
at the fore end of said bed-plate, a lateral
25 abutment bar or plate, which is rested against
one edge of the work, and a horizontal grad-
uated segment attached to said bed-plate and
connected by a center bolt or swivel with said
abutment-bar, substantially as and for the
30 purpose herein set forth.

3. In a sawing-machine, the combination of
the bed-plate having a suitable track or guide-
way thereon, a handled saw-carriage recipro-
cating on said track, a circular saw mounted
35 on said carriage, a longitudinal driving spi-
ral shaft connected by a train of gearing with
said saw, the outer end of which shaft engages
a feather in a standard at the fore end of said
bed-plate, a lateral abutment bar or plate,
40 which is rested against one edge of the work
and to which the bed-plate is hinged, an up-
right graduated quadrant projecting from
said abutment-bar, and a lateral arm or plate
projecting from said bed-plate over said abut-
45 ment-plate and which engages said quadrant,
substantially as and for the purpose specified.

4. In a sawing-machine, the combination of
the bed-plate having a suitable track or guide-
50 way thereon, a handled saw-carriage recipro-
cating on said track, a circular saw mounted

on said carriage and connected by a suitable
train of gearing with a longitudinal driving
spiral shaft, the outer end of which shaft en-
gages a feather in a standard at the fore end
of said bed-plate, a lateral abutment-bar which
55 rests against one edge of the work, a horizon-
tal graduated segment, to the opposite ends of
which said bed-plate is hinged, and which seg-
ment is connected by a center bolt or swivel
with said abutment-bar, an upright graduated
60 quadrant projecting from said segment, a lat-
eral arm projecting from said bed-plate over
a central radial bar on the said segment, and
suitable clamping devices for holding the saw-
frame at the desired angle on both said seg-
65 ment and quadrant, substantially as and for
the purpose specified.

5. In a sawing-machine, the combination of
a bed-plate having a suitable track or guide-
70 way thereon, a handled saw-carriage recipro-
cating on said track, a circular saw mounted
on said carriage, a spiral shaft connected by
a train of gearing on said carriage with said
saw, and a spiral feather in the upper end of
75 a standard, which is mounted at the fore end
of said bed-plate, said saw-carriage and its
accompanying gears, saw, and spiral shaft on
being propelled forward engaging said spiral
feather, whereby said spiral shaft and gears
80 are rotated, and they in turn driving the saw,
substantially as herein set forth.

6. In a sawing-machine, the combination of
a spiral or screw shaft suitably mounted at
one end on a saw-carriage, a track or bed-plate
85 for said carriage, a circular saw and interme-
diate mechanism between it and said spiral
shaft, and a suitably-controlled ratchet-wheel
mounted at the fore end of said bed-plate and
internally threaded to correspond with and
90 engage the spiral groove in said shaft, where-
by said shaft is rotated on its forward stroke
to in turn impart or communicate motion to
the saw and at rest on the return or backward
stroke, substantially as herein set forth.

In testimony of which invention I have 95
hereunto set my hand.

THOMAS V. RANKIN.

Witnesses:

JOHN E. JONES,
C. B. DONALDSON.