(No Model.)

C. T. LANMAN.

METAL PLANER.

No. 260,211. Patented June 27, 1882.

Fig. 1.

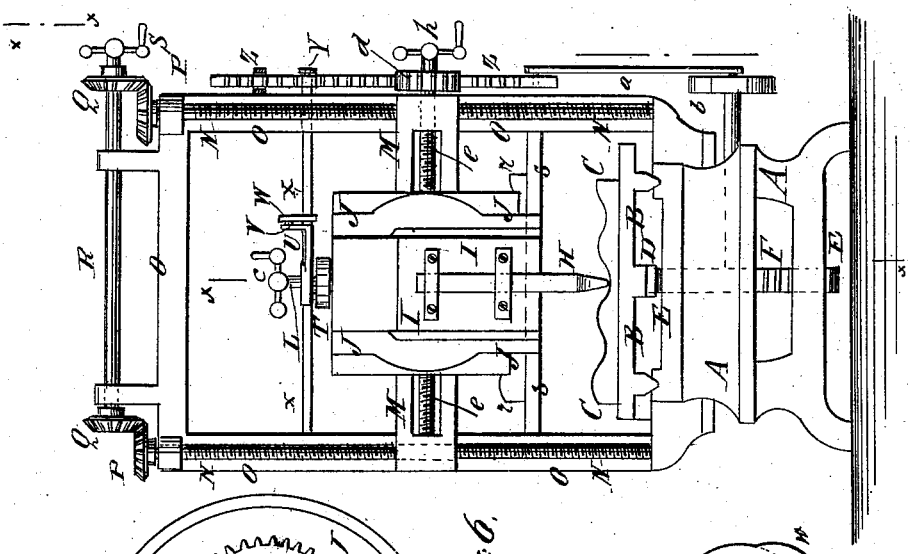


Fig. 3.

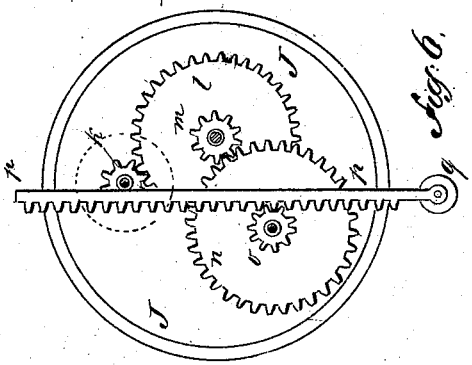


Fig. 6.

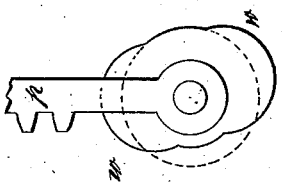


Fig. 2.

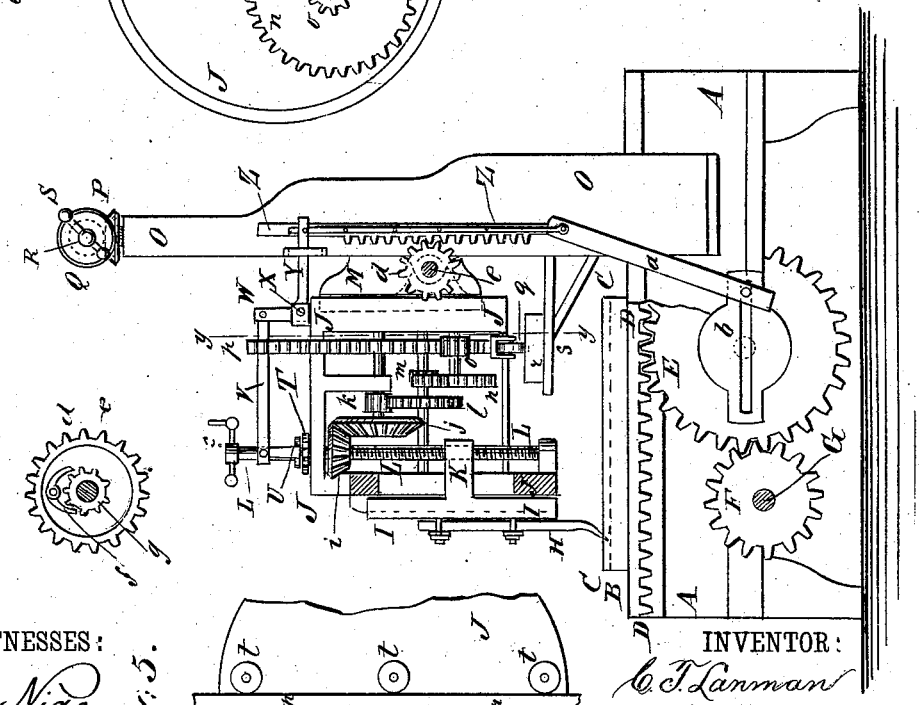
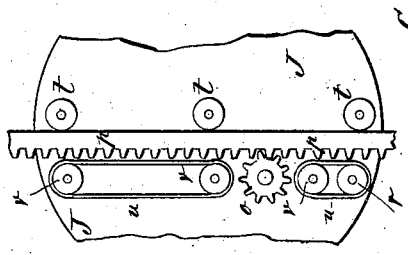


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES T. LANMAN, OF BROOKLINE, MASSACHUSETTS.

METAL-PLANER.

SPECIFICATION forming part of Letters Patent No. 260,211, dated June 27, 1882.

Application filed February 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. LANMAN, of Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Metal-Planers, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of my improvement shown as applied to an ordinary planer. Fig. 2 is a side elevation of the same, partly in section through the broken line *x x*, Fig. 1. Fig. 3 is a sectional front elevation of the improvement, taken through the line *y y*, Fig. 2. Fig. 4 represents the pawl, ratchet, and gear-wheel for operating the screw that gives lateral motion to the tool-carrying mechanism. Fig. 5 is an elevation of the guide-rack and the mechanism to keep the said rack in place. Fig. 6 shows a modification of the mechanism for operating the guide-rack.

This invention has especial reference to machines for planing irregular forms, and has for its object to cause the planing-tool to rise and fall automatically to give the required shape to the work.

The invention consists in the combination, with the tool-holder and the laterally-moving frame carrying the said tool-holder, of a swiveled screw, a rack-bar having a small wheel pivoted to its lower end, and a train of gear-wheels connecting the said screw and rack-bar, whereby the tool will be raised and lowered automatically to give the required form to the work; and, also, in the combination, with the rack-bar and the laterally-moving frame that carries it, of rollers resting against the rear-edge of the rack-bar and pairs of rollers and their bands resting against the forward or toothed edge of the said rack-bar, whereby the rack-bar is kept in position and made to move with the least possible friction, as will be hereinafter fully described.

A represents the base-frame of the machine, upon the top of which rests and slides the table B. To the table B is secured in the ordinary manner the work C to be planed. To the lower side of the table B is attached, or upon it is formed, a rack-bar, D, the teeth of which mesh into the teeth of the large gear-wheel E, journaled to the base-frame A. The teeth of the gear-wheel E mesh into the teeth of a smaller gear-wheel, F, attached to the shaft G, to which motion may be given from any convenient power.

H is the planing-tool, which is clamped to a holder, I. The holder I rests against and slides up and down upon the front of a frame or case, J. Upon the inner side of the holder I is formed a nut, K, which projects through a slot in the case or frame J, to receive the screw L, so that the cutter can be fed up or down by turning the said screw L. The frame J rests and slides upon a cross-bar, M, the ends of which have screw-holes formed in them to receive the screws N, so that the said frame and its attachments can be raised and lowered by turning the said screws N. The screws N are swiveled to an upright frame, O, the lower end of which is attached to the central part of the base-frame A.

To the upper ends of the screws N are attached beveled-gear wheels P, the teeth of which mesh into the teeth of the beveled-gear wheels Q. The gear-wheels Q are attached to a horizontal shaft, R, which revolves in bearings attached to the upper end of the frame O, and to one end of the said shaft R is attached a hand-wheel or crank, S, by means of which the said shaft R can be readily turned.

To the swiveled screw L, at the top of the frame J, is attached a ratchet-wheel, T, with the teeth of which engage the teeth of a double lever-pawl, U, pivoted to the smooth upper part of the said swiveled screw L.

To the double lever-pawl U is pivoted the end of a connecting-rod, V, the other end of which is pivoted to the arm W, rigidly attached to the rod X, so that the swiveled screw L will be turned forward by rocking the said rod X. The rod X works in bearings attached to the frame J, and upon the said rod X slides the inner end of the lever Y, the outer end of which is pivoted to the upper end of the rack-bar Z. The rack-bar Z slides upon guides attached to the upright frame O, and to the lower end of the said bar is pivoted the upper end of a connecting-rod, *a*, the lower end of which is connected adjustably with the journal of the gear-

wheel E by a slotted crank-arm, *b*, or other suitable means. With this construction the screw L will be turned automatically to feed the cutter H up or down to its work.

To the upper end of the swiveled screw L is attached a hand-wheel or crank, *c*, for convenience in turning the screw L to raise the cutter H away from the work or to adjust it to the thickness of the work or for a hand-feed. The teeth of the rack-bar Z mesh into the teeth of a gear-wheel, *d*, that works loose upon the shank or smooth part of the screw *e*, and is provided with a double pawl, *f*, which engages with the teeth of a ratchet-wheel, *g*, rigidly attached to the said shank of the screw *e*, so that the screw *e* will be turned forward or backward by the reciprocating movement of the rack-bar Z. The screw *e* is swiveled to the cross-head M and passes through a nut attached to or a screw-hole formed in the rear part of the frame J, so that the said frame will receive a lateral movement by the revolution of the screw *e*.

To the end of the screw *e* is attached a hand wheel or crank, *h*, for convenience in adjusting the frame J in any desired position.

To the upper part of the screw L is attached a beveled-gear wheel, *i*, the teeth of which mesh into the teeth of the beveled-gear wheel *j*. The gear-wheel *j* is journaled to the frame J, and with the said gear-wheel *j* is rigidly connected a small gear-wheel, *k*, the teeth of which mesh into the teeth of the larger gear-wheel *l*, journaled to the frame J. With the gear-wheel *l* is rigidly connected a small gear-wheel, *m*, the teeth of which mesh into the teeth of the larger gear-wheel *n*, journaled to the frame J. With the gear-wheel *n* is rigidly connected a small gear-wheel, *o*, the teeth of which mesh into the teeth of an upright rack-bar, *p*.

To the lower end of the rack-bar *p* is pivoted a small wheel, *q*, which rolls along a pattern, *r*, of the exact form to be given to the work. The pattern *r* is secured to a table, *s*, attached to the upright frame O.

The gear-wheels *i j k l m n o* are so constructed as to size and number of teeth that the tool H will be raised the same distance as the rack-bar *p* rises when the pattern is of the full size of the required work.

If desired, the gear-wheels can be constructed to raise the tool more or less than the rack-bar *p*, in the ratio in which the pattern is less or greater than the required work.

The rear edge of the rack-bar *p* rests against a number of rollers, *t*, pivoted to the frame or case J, and the toothed forward edge of the said rack-bar *p* rests against two bands, *u*, passing around pairs of rollers *v*, one pair of rollers and their band being placed above the gear-wheel *o* and the other pair of rollers and their band being placed below the said gear-wheel *o*, as shown in Fig. 5. With this construction the rack-bar *p* will be kept in place and made to move up and down with the least possible amount of friction.

If desired, the pattern *r* may be omitted and the wheel *q* replaced by an irregular wheel, *w*, to roll upon a plain surface, and so formed as to raise and lower the rack-bar *p* at the proper times and to the necessary extent.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a metal-planer, the combination, with the tool-holder I and the laterally-moving frame J, of the swiveled screw L, the rack-bar *p*, having wheel *q*, and the connecting gear-wheels, substantially as herein shown and described, whereby the tool will be raised and lowered automatically to give the required form to the work, as set forth.

2. In a metal-planer, the combination, with the rack-bar *p* and the frame J, of the rollers *t* and the pairs of rollers *v* and their bands *u*, substantially as herein shown and described, whereby the said rack is kept in position and made to move with the least possible friction, as set forth.

CHARLES T. LANMAN.

Witnesses:
PETER W. PIERCE,
LUTHER BRIGGS.