

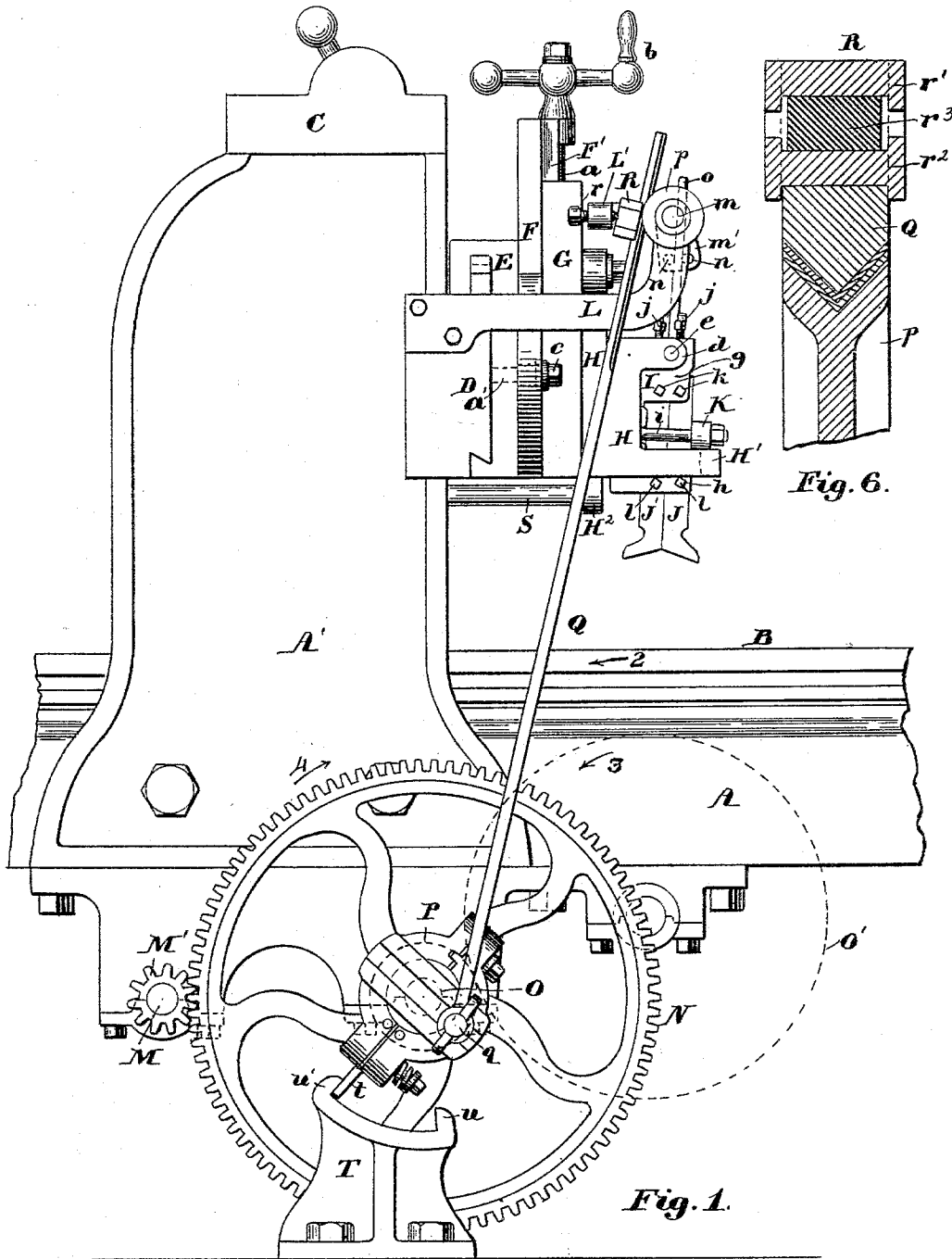
(No Model.)

2 Sheets—Sheet 1.

G. F. McINDOE.
METAL PLANING MACHINE.

No. 584,233.

Patented June 8, 1897.



Witnesses:
Walter E. Lombard
L. B. Greenleaf

Inventor
George F. McIndoe,
by N. P. Lombard
Att'y

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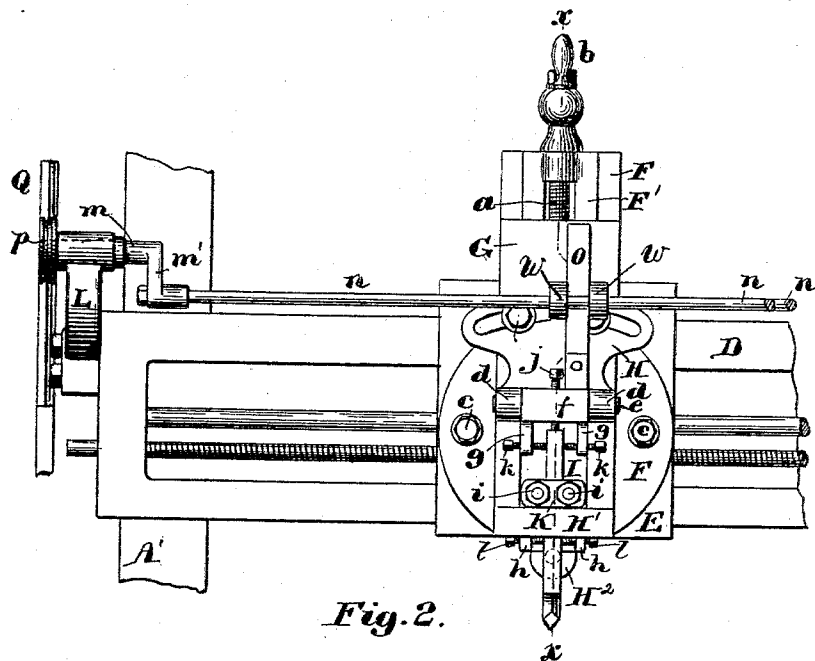


Fig. 2.

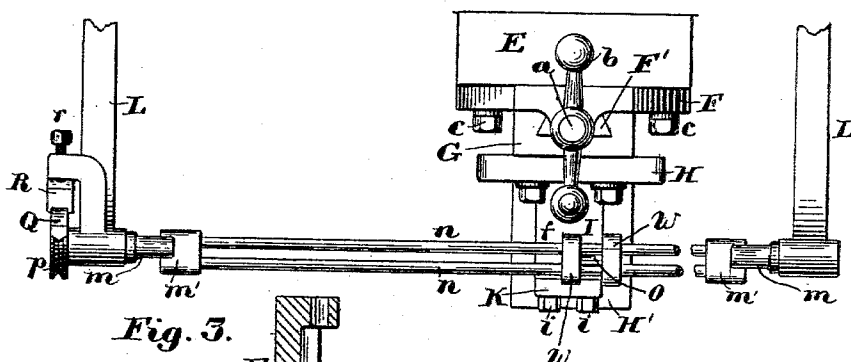


Fig. 3.

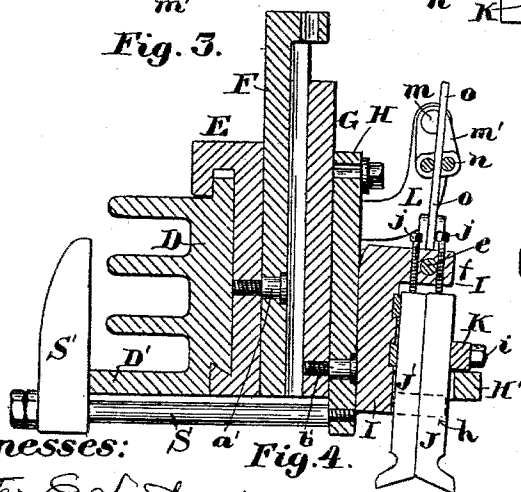


Fig. 4.

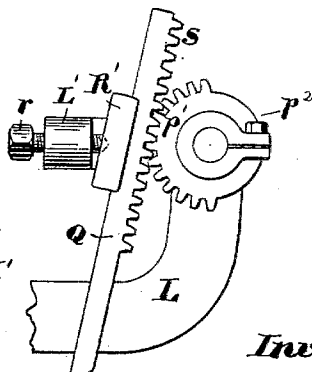


Fig. 5

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UNITED STATES PATENT OFFICE.

GEORGE F. MCINDOE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JAMES W. MCINDOE, OF SAME PLACE.

METAL-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,233, dated June 8, 1897.

Application filed September 26, 1896. Serial No. 607,031. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. MCINDOE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Metal-Planing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to metal-planing machines, and particularly to that class of such machines in which a tool acts upon the work during both forward and backward movements of the work-supporting table, and is an improvement upon the invention described in the Letters Patent No. 479,606, granted to me July 26, 1892; and it consists in certain novel features of construction, arrangement, and combination of parts which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended, and in which my invention is clearly pointed out.

Figure 1 of the drawings is an elevation of so much of the back side of a metal-planing machine as is necessary to illustrate my invention. Fig. 2 is a front elevation of the tool-box, its carriage, and portions of the tool-carrying cross-head and the tool-tilting mechanism. Fig. 3 is a plan of the tool-box, its holder, and portions of the tool-tilting devices. Fig. 4 is a vertical section on line *x x* on Fig. 2. Fig. 5 is a side elevation of a modification of the frictional mechanism for operating the tool-tilting rods. Fig. 6 is a partial section through the frictional device for tilting the tool-box, drawn to an enlarged scale.

The object of my present invention is to simplify the construction of a machine of the class referred to in the first paragraph, and thereby lessen the cost of its manufacture without detracting from the effectiveness of the machine or the beneficial results to be obtained therefrom.

The horizontal and vertical feed of the tool-carriage is obtained in substantially the same manner as in my before-cited patent, and therefore the feed mechanism is not shown in the present drawings or referred to further in this description.

In the drawings, A is a portion of the planer-bed, of usual construction, supported upon

legs and provided with suitable ways to guide the work-supporting table B and having the uprights A' bolted thereto.

C is the cap, and D is the tool-carrying cross-head, mounted upon and movable vertically on the uprights A', all in a well-known manner.

The cross-head D has mounted thereon so as to be movable longitudinally thereof the rectangular plate E, to the front face of which is pivoted at *a'* the plate F, provided on its front face with the vertical dovetailed slide or guide way F', upon which is fitted so as to be movable vertically thereon the plate G, which may be adjusted vertically by means of the screw *a* and operating-crank *b*, all in a well-known manner.

To the front face of the plate G is pivoted at *b'* so as to be movable about said pivot to a limited extent the tool-box holder H, which may be secured in any desired position by means of the clamping-bolts *c c* in a well-known manner.

The tool-box holder H is of novel construction in that it is provided at its lower end with the horizontally-projecting bail-like rectangular frame or yoke H' and somewhat above the middle of its height with the ears *d d*, projecting horizontally, as shown in Figs. 1 and 4.

The ears *d d* have set therein the fulcrum-pin *e*, upon which is mounted so as to be oscillated to a limited extent about said pin the tool-box I, provided with the top plate *f*, the ears *g g*, projecting downward from said top plate, and the ears *h h*, projecting horizontally from its lower end, as shown in Figs. 1, 2, and 4.

J and J' are the planer-tools, made rights and lefts and placed back to back and secured to the tool-box I by the bolts *i i* and yoke K.

The plate *f* has set therein the set-screws *j j*, the points of which bear upon the upper ends of the tools J and J' for the purpose of adjusting said tools vertically. The ears *g g* have set therein the set-screws *k k*, and the ears *h h* have set therein the set-screws *l l*, said screws *k* and *l* acting upon the sides of the tools J and J' for adjusting them laterally.

The cross-head D has secured to each end thereof a stand L, in each of which is mounted

a short shaft *m*, each carrying at its inner end a crank-arm *m'*, in the free end of each of which is mounted one end of each of two parallel rods *n n*.

5 The tool-box I has secured to its upper end the upwardly-projecting arm *o*, of sufficient length to be acted upon by the rods *n n*, between which it passes, when the tool-box is depressed to its lowest possible position.

10 The short shaft *m* at the rear side of the machine has secured thereto an operating-wheel, which may be a grooved leather-surfaced wheel *p*, firmly secured to said shaft, as shown in Figs. 1, 2, and 3; or it may be a
15 segment of a gear-wheel *p'*, having one side cut through and provided with a clamping-bolt *p²*, by which it may be clamped to said shaft with just sufficient force to cause said shaft *m* to turn with said wheel until the tool-
20 box has been tilted in either direction to the required distance and then to slip on said shaft.

M is the driving-shaft, having mounted on its rear end the pinion *M'*, which meshes into
25 and imparts motion to the spur gear-wheel *N* on the shaft *O*, upon which is a pinion engaging the table-operating gear *O'*, said pinion and gear being indicated only by dotted circles in Fig. 1. The shaft *O* also has mounted
30 upon its rear end a frictional hub *P*, of well-known construction, provided with a crank-pin *q*, upon which is mounted the lower end of the rod *Q*, the upper end of which engages the wheel *p* or *p'*, according to which type of
35 friction device it is desired to employ between said rod *Q* and the shaft *m*.

If the grooved wheel *p* is employed, a portion of the upper end of the rod *Q* will have its front side made V-shaped in cross-section
40 and covered with leather or other suitable frictional material, as shown in Fig. 6, and is pressed into contact with said wheel *p* by the set-screw *r*, set in the ear *L'*, formed upon or secured to the stand *L*, the point of said set-
45 screw bearing against the back of the yielding shoe *R*, composed of two metal plates *r'* and *r²*, with a block of rubber *r³* or other suitable spring interposed between them, as shown in Fig. 6. If, however, the toothed
50 segment *p'* or a toothed wheel be mounted on the shaft *m*, the upper portion of the rod *Q* will have a series of rack-teeth *s* formed upon its front face, which engage with the teeth of the segment *p'* and are held in engagement
55 therewith by the shoe *R'* and set-screw *r*, as shown in Fig. 5.

The tool-box holder *H* has formed upon its lower end the ear *H²*, in which is set the rearwardly-projecting rod *S*, which has firmly secured to its rear end the arm *S'*, which en-
60 gages the rear edge of the lower rib *D'* of the cross-head *D*, as shown in Fig. 4, for the purpose of relieving the strain upon the tool-box holder when the tool *J'* is operating upon the work and the tool-box is tilted into contact with the front bar of the bail or yoke *H'*, said strain being transmitted to the uprights *A'* by

virtue of a strong connection of said cross-head thereto.

The operation of my invention is as follows: 70
The parts being in the positions shown in the drawings and the machine being in operation, the table *B* is moving in the direction indicated by the arrow 2 on Fig. 1, and if an object to be planed is in position on said table 75 and the tools are adjusted to the proper position the tool *J* will cut a chip from said object, the shaft *O* revolving in the direction indicated by the arrow 4 until the movement of the table is reversed, as described in the 80 before-cited patent, the frictional device *P* remaining in the position shown until the motion of the driving is reversed, when the frictional device will partake of the motion of the shaft *O* until the arm *t* comes in contact 85 with the stop-lug *u* on the stand *T*, during which time the feed of the tool takes place, as described in said prior patent, being operated by a frictional device upon the opposite end of the shaft *O*, but not shown in the drawings, and the rod *Q* is moved upward, moving 90 the wheel *p* or *p'*, the cranks *m'*, and the rods *n n* about the axis of the shaft *m*, thereby tilting the tool-box *I* till the front ends of the ears *h h* or the front edge of the tool *J* comes 95 in contact with the front bar of the bail or yoke *H'* of the tool-box holder *H*, when the tool *J* will be raised and the point of the tool *J'* will be lowered sufficiently to take a chip from the object being planed, while the table 100 is being fed in the opposite direction to that indicated by the arrow 2. When the table has completed its motion in this direction and the motion of the shaft *O* is again reversed, the friction device *P* will move with said shaft 105 until the arm *t* comes in contact with the stop-lug *u'* on the stand *T*, when the rod *Q* will have been moved downward and moved the rods *n n* and the tool-box and tools into the positions shown in the drawings. 110

The rods *n n* have fitted thereon so as to be freely movable lengthwise thereof the two tie-yokes *w w*, one upon each side of the arm *o*, as shown in Figs. 2 and 3, for the purpose of preventing the springing of the rods *n n* 115 when acting upon said arm *o* to tilt or oscillate the tool-box. When commencing to plane a particular surface and the tools have been adjusted to the proper position for commencing the work, the yokes *w w* are both 120 moved into contact with the arm *o*, and as the tool is fed horizontally at each reversal of the motion of the table the yoke *w* in advance of said arm will be pushed along said rods by said arm, but will effectually prevent said 125 rods from springing, and if the feed is reversed, so as to move the tools in the opposite direction, the other yoke, having been moved into contact with the arm *o*, will be moved along said rod in the same manner. 130

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a metal-planing machine the combination with a vertically-movable cross-head

and a tool-carriage, movable horizontally thereon, of a tool-box holder pivoted to said carriage, movable therewith and provided with a bail-like frame or yoke projecting horizontally from its lower end; a tool-box pivoted at its upper end to said holder with its lower end projecting through the opening of said frame or yoke; means having provision for vibrating said tool-box about its pivot to alternately contact with the back plate of said holder, and with the front bar of said frame or yoke; the bar or rod *S* set in said holder and projecting under the cross-head; and the arm *S'* firmly secured to the rear end of said bar or rod in contact with the rear of said cross-head.

2. In a metal-planing machine, the combination with a vertically-movable cross-head, and a tool-carriage movable horizontally thereon, of a tool-box holder pivoted to said carriage and movable therewith, and provided with a bail-like frame or yoke projecting from its lower end as set forth; a tool-box pivoted at its upper end to said holder with its lower end projecting through the opening in said frame or yoke and provided with the upwardly-projecting arm *o*, and movable about its pivot to alternately contact with the back plate of said holder and with the front bar of said yoke; the short shafts *m m* each provided with a crank-arm *m'*; the parallel rods *n, n*, connecting said crank-arms and arranged to act upon opposite sides of said upwardly-projecting arm; and a frictional mechanism for moving said crank-arms and parallel rod about the axis of the shaft *m* alternately in opposite directions.

3. The combination in a metal-planing machine of a tool-box holder provided with a horizontally-projecting bail-like frame or yoke; a tool-box pivoted to said carrier with its lower end projecting through the opening

in said yoke; clamping bolts and bar for clamping a pair of tools, arranged back to back, to said tool-box; an upwardly-projecting arm formed upon or secured to the upper end of said tool-box; a pair of parallel rods arranged one upon each side of, and adapted to act upon said arm, and connected at each end to the free end of a crank-arm connected to a journal or short shaft mounted in a fixed bearing; a pair of tie-yokes connecting said parallel rods, one upon each side of said arm and freely movable on said rods; and a frictional mechanism for moving said crank-arms and parallel rods about the axes of said journals or shafts alternately in opposite directions.

4. In combination with the vertically-movable cross-head of a metal-planing machine, and a horizontally-movable tool-carriage mounted thereon; the tool-box holder *H* provided with the bail-like yoke *H'*; the tool-box *I* pivoted to said holder with its lower end projecting through the opening in said yoke; the arm *o* formed upon or secured to the upper end of said tool-box; the short shafts *m* provided with the crank-arms *m'*; the rods *n n*; the toothed wheel or segment *p'* frictionally mounted upon a shaft *m*; the rod *Q* provided with rack-teeth at its upper end engaging the teeth of the wheel or segment *p'*; and the crank-pin *q* fitted to a bearing in the lower end of the rod *Q*; the stand *L*; the shoe *R'*; and the set-screw *r*.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 24th day of September, A. D. 1896.

GEORGE F. MCINDOE.

Witnesses:

N. C. LOMBARD,
L. C. GREENLEAF.