

W. A. ROBERTSON.
PLANING MACHINE.
APPLICATION FILED SEPT. 4, 1908

939,093.

Patented Nov. 2, 1909.

4 SHEETS—SHEET 1.

Fig. 2.

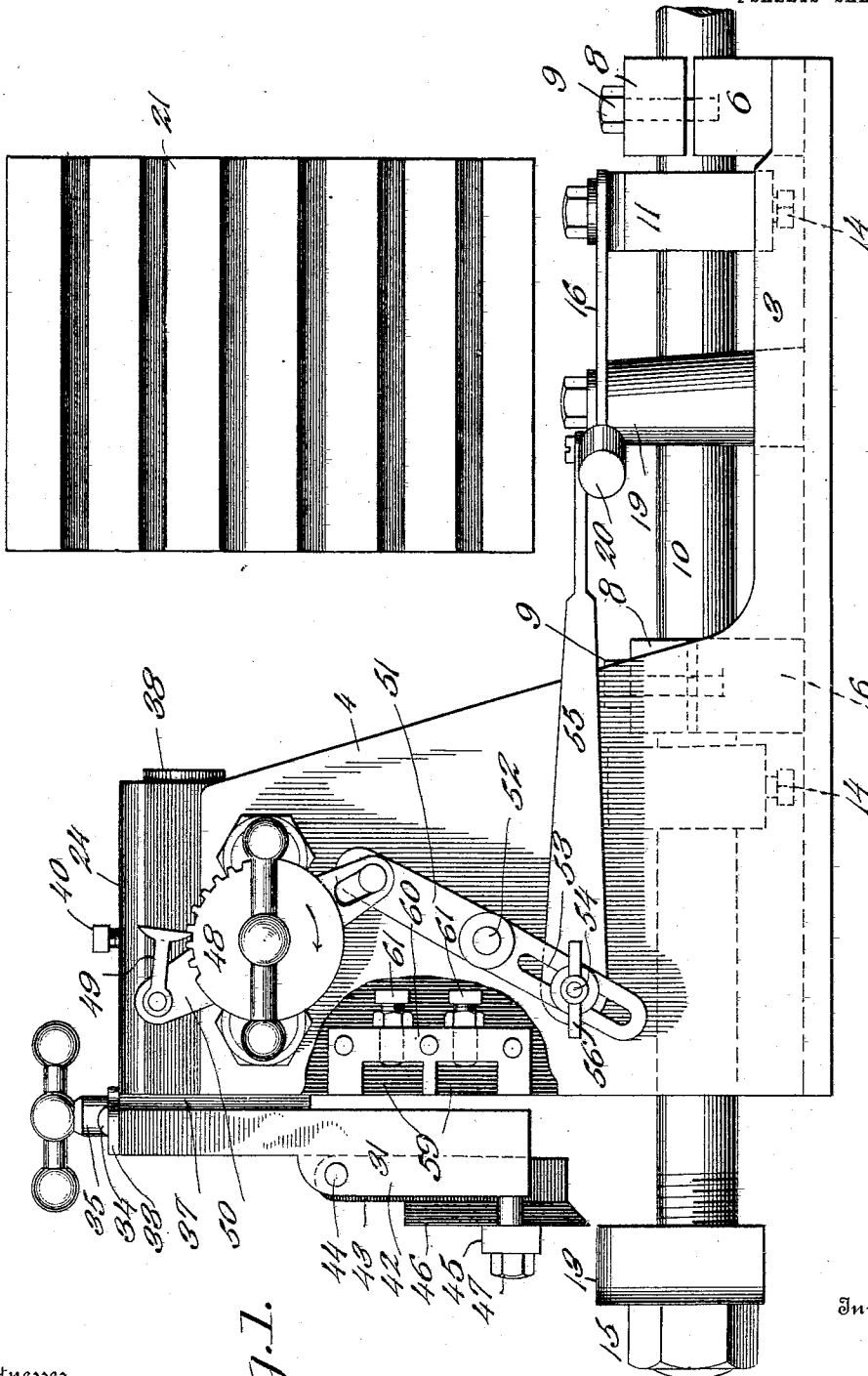


Fig. 1.

Witnesses
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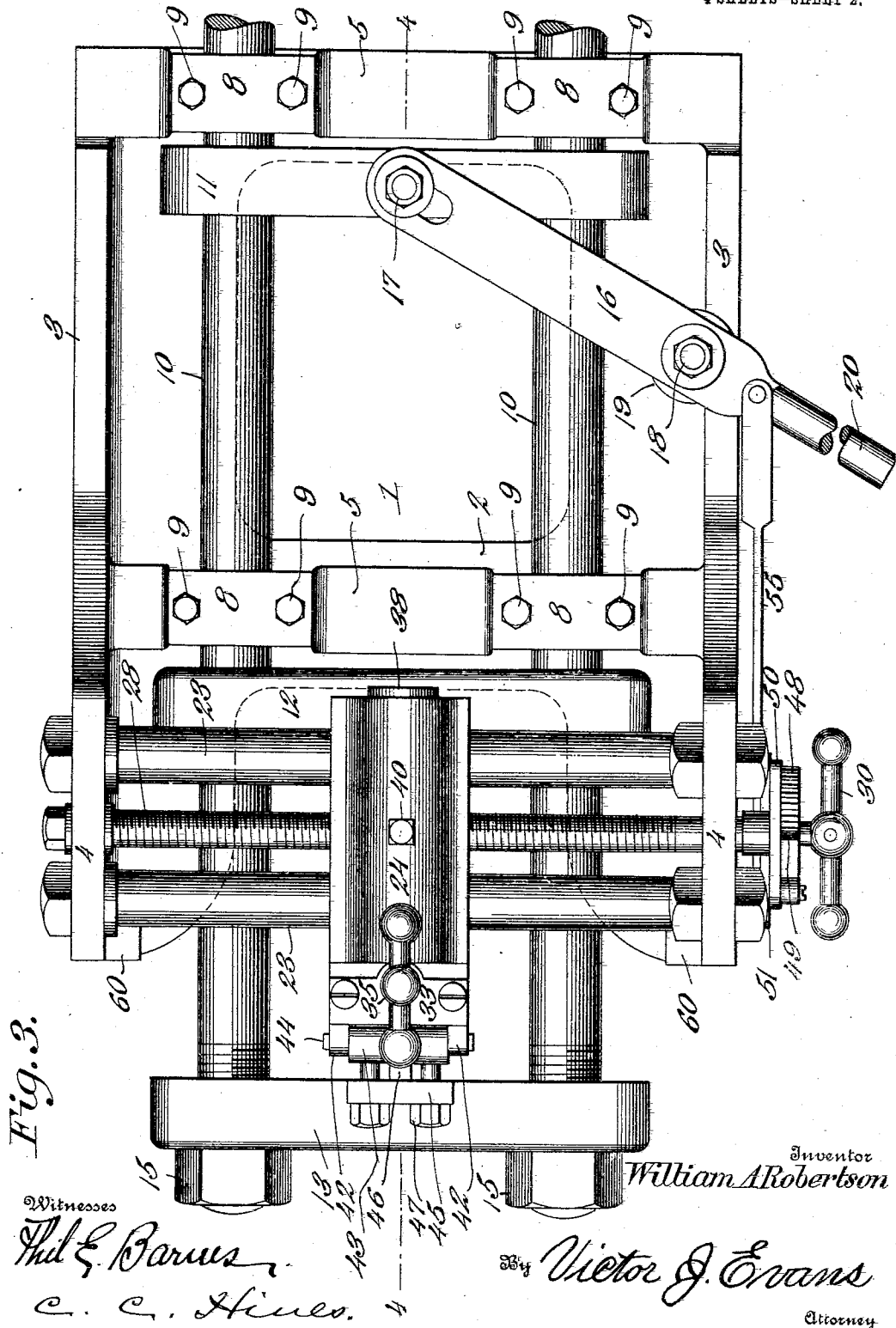


Fig. 3.

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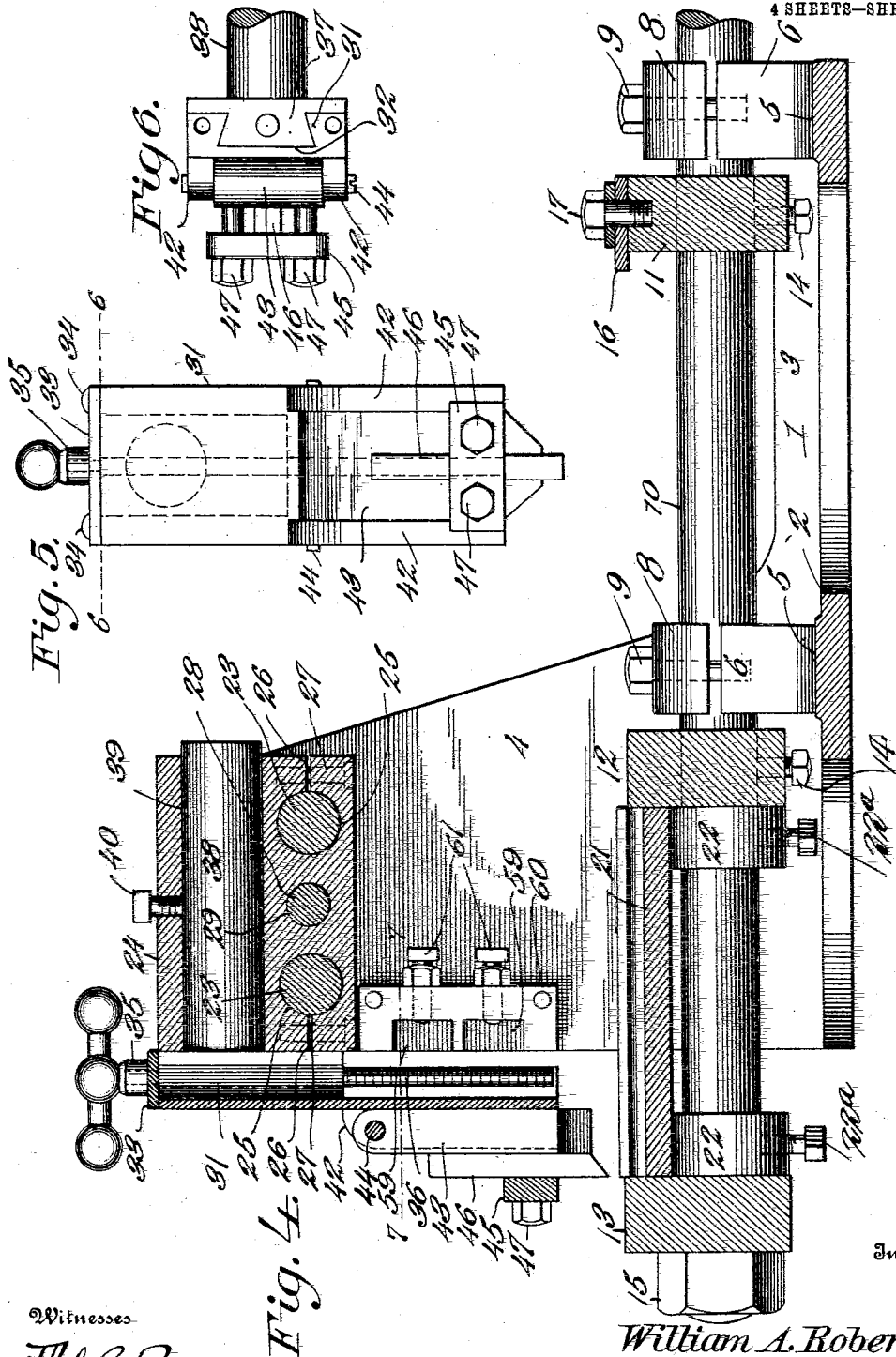
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4 SHEETS—SHEET 3.



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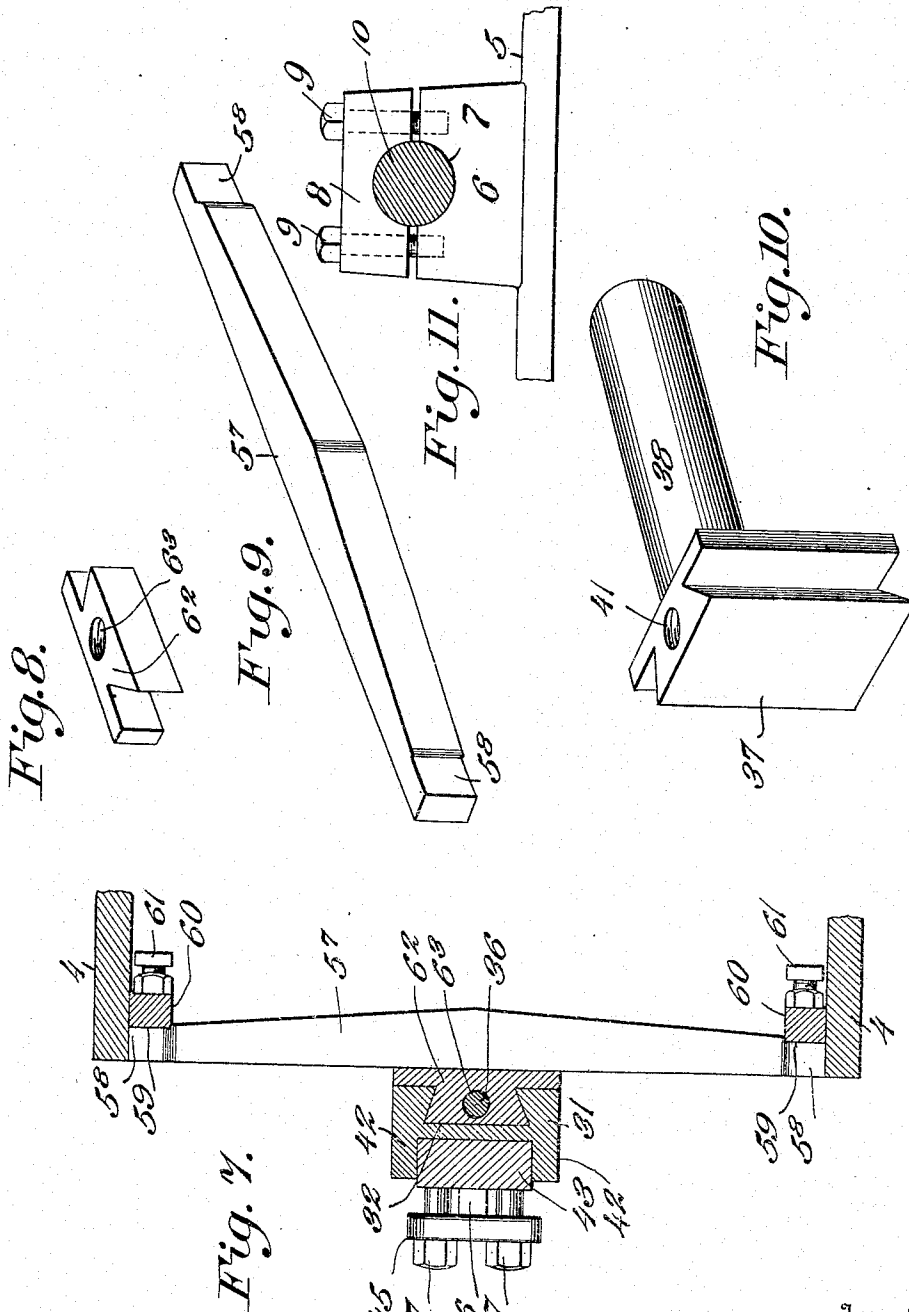
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

WILLIAM A. ROBERTSON, OF CHARLOTTETOWN, PRINCE EDWARD ISLAND, CANADA.

PLANING-MACHINE.

939,093.

Specification of Letters Patent.

Patented Nov. 2, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM A. ROBERTSON, a subject of the King of Great Britain, residing at Charlottetown, Prince Edward Island, in the Dominion of Canada, have invented new and useful Improvements in Planing-Machines, of which the following is a specification.

This invention relates to manually-operated metal planing machines, and has for its object to provide a planer of this character which is simple of construction, efficient in use and comparatively inexpensive of production, and which embodies a novel construction of parts whereby increased convenience is afforded and the efficiency of planers of this type increased.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation, with a portion broken away, of a planer constructed in accordance with my invention. Fig. 2 is a top plan view of the work-plate. Fig. 3 is a top plan view of the planer. Fig. 4 is a vertical longitudinal section thereof. Fig. 5 is a front view of the tool-holder. Fig. 6 is a section of the same on line 6—6 of Fig. 5. Fig. 7 is a horizontal transverse section on line 7—7 of Fig. 4. Fig. 8 is a perspective view of the retainer block. Fig. 9 is a perspective view of the stay bar. Fig. 10 is a similar view of the support for the tool holder. Fig. 11 is a detail view of a portion of the frame.

Referring now more particularly to the drawings, the numeral 1 designates in general the frame of the machine, which comprises a base or bed plate 2, side bars 3, and standards or uprights 4 projecting from said side bars at the forward end of the frame. Raised portions or ribs 5 are formed upon the bed plate at the rear end thereof and between the rear ends of the standards 4, and integral with each of these ribbed portions of the frame are bearing blocks or bosses 6, of the form disclosed in Fig. 11. These blocks or bosses are arranged in

aligned pairs on opposite sides of the longitudinal center of the frame, and each is provided with a bearing recess 7 and a recessed cap 8 secured thereto by adjusting screws 9.

A longitudinally movable work carriage is mounted upon the frame between the side bars 3 and standards 4, and comprises a pair of parallel longitudinal rods 10 which are arranged to slide in the recessed bearing blocks 6 and caps 8, and which are connected by cross-bars 11, 12 and 13. The rear cross-bar 11 and the intermediate cross-bar 12 are provided with openings through which the rods pass and are fixed in position upon said rods by binding screws 14, while the front cross-bar 13 is fitted loosely for sliding movement on the forward ends of the rod, which ends of the rods are threaded for the reception of retaining and clamping screws 15, by which said front cross-bar is held and adjustably mounted in position. By means of the screws 9 the frictional engagement of the rods of the work carriage with their bearings may be regulated, to adapt the carriage to slide with greater or less freedom on the frame. The carriage is adapted to be reciprocated through the medium of an operating lever 16 pivotally connected by a bolt 17 with the rear cross-bar 11 and pivotally mounted upon a bolt 18 on a post or stud 19 projecting upward from the bed plate at one side of the frame, the outer end of the lever terminating in a suitable handle 20. The bars 12 and 13 constitute the stationary and movable jaws of a clamp to directly engage and hold the work or to engage and clamp in position a work table 21 on which the work is supported. This work table comprises an oblong rectangular plate having depending eyes 22 to slidably engage the rods, and said plate is adapted to be arranged and clamped between the bars 12 and 13, as fully shown in Fig. 4. In applying the work table, the bar 13 and nuts 15 are removed, the table slipped upon the ends of the rods and the bar and nuts reapplied, and the nuts turned up to the desired degree to clamp the table between the bars. If desired, however, the table may be dispensed with and the work clamped directly between the bars

12 and 13, or the said bars 12 and 13 may be removed and the table fastened to the rods 10 by set screws 22^a on the eyes 22.

Extending between the upper ends of the standards 4 and suitably secured thereto are spaced guide rods or bars 23 on which is slidably mounted, for movement transversely of the frame and transversely of the line of movement of the work carriage, a tool carriage 24. This tool carriage consists of a body or block of suitable size and dimensions and is provided with transverse openings 25 through which the rods extend. The front and rear edges of the tool carriage are provided with transverse slots 26 intersecting the respective openings 25 and the divided portions of the block are connected by adjusting screws 27, whereby such portions of the block, which are made slightly resilient by the formation of the slots, may be adjusted by the screws to frictionally engage the guide rods to a greater or less degree to allow the tool carriage to have greater or less freedom of sliding movement on the rod. A feed screw 28 is journaled on the standards and extends across between the guide rods 23 and through a threaded opening 29 in the tool carriage and is provided at one end with a hand bar 30 by which it may be turned to move the tool carriage back and forth at right angles to the plane of movement of the work carriage.

The forward end of the tool carriage terminates in line with the forward edges of the standards 4, and arranged at said forward end of the tool carriage is a tool holder 31, comprising a body of oblong rectangular form and provided in its rear surface with a dovetailed vertical slot or guideway 32, the upper end of the guideway being closed by a cross-piece 33 fastened in position by securing screws 34. This cross-piece is provided with a central boss 35 in which is swiveled the upper end of an adjusting screw 36 which extends down into said dovetailed slot. The tool holder is adjustably mounted upon a dovetailed head block 37 having a rearwardly projecting stem or shank 38 removably fitted within an opening 39 in the tool carriage and secured in position by a set screw 40, the rear face of said head bearing against the front portion of the carriage. The head block corresponds substantially in dimensions, vertically and transversely, with the front of the tool carriage and is provided with a threaded bore 41 through which the upper half of the adjusting screw 36 extends, whereby upon turning said screw in one direction or the other the tool holder may be vertically adjusted relatively to the work table or the clamped piece of work on the dovetailed head as a fixed support. The lower front portion of the tool holder is

provided with spaced flanges 42 between which is disposed a plate or jaw 43 pivotally mounted at its upper end upon a cross pin or bolt 44 carried by the flanges. This plate or jaw is held from lateral movement by the flanges, and clamped between the same and a cross-bar or clamping member 45 is a cutting tool 46 adjustably secured to the pivoted jaw by stud bolts 47. By loosening these bolts the tool may be set to approximately cut the desired thickness from the work, but where a fine and absolute adjustment is required the tool holder is adjusted by turning the adjusting screw 36. Owing to its pivotal connection to the tool holder, the clamping member 43 carrying the tool may swing forward to enable the tool to be lifted on the return or non-working stroke of the work carriage to clear the cut.

In the operation of the machine, it will be understood that upon the forward movement of the work carriage actuated by the lever 16 the tool will act upon the work, and in order to adjust the tool carriage laterally at the end of each cutting operation to present the cutting tool to a new or uncut portion of the work mechanism is provided for intermittently turning the feed screw 28 to shift the tool carriage the desired distance on each return movement of the feed carriage. This mechanism comprises a ratchet wheel 48 fixedly mounted upon one end of the feed screw 28 and adapted to be engaged by a feed pawl or dog 49 pivotally mounted upon the upper end of a rocker arm 50. The arm 50 is centrally journaled or pivoted upon the feed screw between the ratchet wheel and adjacent standard 4 and is pivotally connected at its lower end to the upper arm of an intermediately pivoted feed lever 51 pivotally mounted upon a pivot bolt or screw 52 projecting from said standard. The lower arm of said lever 51 is longitudinally slotted, as at 53, to receive a pivot bolt 54 upon the adjacent end of a link 55, which pivotally connects said feed lever with the operating lever 16. A wing-nut 56 engages the screw 54 and adjustably connects the link and feed lever so that the stroke of said feed lever may be varied to adapt the feed mechanism to turn the feed screw to a greater or less degree and to correspondingly shift the tool carriage 24 to a greater or less extent. When the handle 20 of the operating lever 16 is swung rearwardly to force the work carriage forwardly on its return or inactive stroke, the link 55 is drawn rearwardly therewith and through the action of the feed lever the rocker arm is swung to feed the pawl rearwardly, thus causing it to engage the teeth of the ratchet wheel and turn the latter to actuate the feed screw, to

move the tool carriage to the determined extent. When the operating lever is swung in the reverse direction the work carriage and parts of the feed mechanism will be returned to their normal position and the pawl will ride loosely on the teeth of the ratchet wheel, so that the tool carriage will be held stationary during the rearward or acting stroke of the work carriage.

10 The operation of the machine will be apparent from the foregoing description and the simplicity and convenience of the construction of the machine will be manifest. When the work extends any considerable distance above the clamping jaws or work table 15 it will be readily understood that the support given to the tool during its cutting stroke by the dovetailed supporting head will be sufficient, but where the work does not extend to any considerable extent above the clamping jaws or work table there is considerable strain upon the lower portion of the tool holder. In order to provide under such conditions of service for the effective 25 support of the tool holder, I provide a reinforcing means consisting of a reinforcing or backing bar 57 having a flat front face and having its rear face inclined on divergent lines from points adjacent its ends to the center of the bar to render the latter of greatest strength midway of the same. The inclined rear surfaces of the bar are cut away to form straight ends 58 which are adapted to fit within sockets 59 of brackets or holders 60 35 secured to the uprights 4, the forward ends of the sockets being open for the application and removal of the bar. These sockets of the brackets or holders are arranged at different elevations so that the bar may be correspondingly disposed, and mounted upon the brackets are set screws 61 arranged in line with the sockets by which the depth of insertion of the ends of the bar may be regulated. Provided for coöperation with the 45 backing bar is a dovetailed reinforcing block 62 provided with a threaded opening 63 by which it may be mounted upon the lower end of the feed screw 36 below the dovetailed head 37. This reinforcing block 50 forms a supplemental dovetailed head to guide the tool holder in its vertical movements and to stay and support the lower end thereof immediately in rear of the tool. When arranged in position the rear surface 55 of the reinforcing block bears against the center of the flat front face of the bar and is clamped against independent movement between the bar and tool holder by the set screws 61, which may be adjusted to clamp 60 the auxiliary parts with greater or less force. It will thus be seen that by the use of these auxiliary appliances the cutting tool when adjusted low down to act upon a correspond-

ingly arranged piece of work may be effectually braced and reinforced in its cutting action, while said appliances may be readily and conveniently removed when the work extends upward to a greater or less degree so that it will not interfere with the normal operation of the tool holder in acting upon high work. 70

Having thus fully described the invention, what is claimed as new is:—

1. A hand planing machine embodying a frame, a work carriage mounted to reciprocate on the frame, and including sliding rods having threaded end portions, relatively stationary and adjustable cross-bars carried by the rods, and nuts on the threaded ends of the rods for adjusting the adjustable cross-bar, said cross-bars forming the jaws of a work clamp, a tool carriage movable at right angles to the work carriage, means for reciprocating the work carriage, and means for intermittently feeding up the tool carriage on the return strokes of the work carriage. 75

2. A hand planing machine embodying a frame, a tool support carried thereby, a work carriage embodying rods slidable on the frame and having relatively fixed and movable cross-bars forming the jaws of a work clamp, adjusting nuts on the rods for adjusting said movable cross-bar, and a table adapted to be clamped between said cross-bars and provided with eyes to engage the rods. 80

3. A hand planing machine embodying a frame, a reciprocating work carriage thereon, a tool carriage mounted for movement at right angles to the work carriage, a dovetailed head removably mounted upon the tool carriage, a tool holder having a dovetailed slot-receiving the head, a feed screw carried by the holder and having a threaded engagement with the head, whereby the holder may be adjusted relatively to the work, a reinforcing bar adapted to be applied to the frame below the tool carriage, and a supplementary head adapted to bear against said bar and to engage the screw and the lower portion of the dovetailed slot in the holder below the first mentioned head. 100

4. In a planing machine, and in combination with a feed carriage, and a tool carriage movable at right angles thereto, said tool carriage being provided with a dovetailed supporting head, a tool holder having a dovetailed slot receiving the head, a feed screw carried by the holder and having a threaded engagement with the head, receiving brackets on the frame of the machine, a reinforcing bar adapted to fit within said brackets below the tool carriage, and a supplemental dovetailed head having a threaded passage and adapted to fit within the dove- 115 120 125

tailed slot of the holder and engage the screw below the supporting head and to bear against said bar, and adjusting screws upon the brackets engaging the bars.

- 5 5. In a planing machine, and in combination with a work carriage, and a tool carriage movable at right angles thereto, said tool carriage having a receiving opening at right angles to its plane of movement, a
10 vertically arranged dovetailed head having a stem extending horizontally from its rear face and removably secured within said receiving opening, said head also having a vertical threaded passage, a vertically mov-

able tool holder formed in its rear face with 15 a vertical dovetailed slot receiving said head, an adjusting screw mounted upon the top of the tool holder and depending therefrom and working in said threaded opening in the head, and means for operating said 20 carriages.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. ROBERTSON.

Witnesses:

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JENNIE S. HALE.