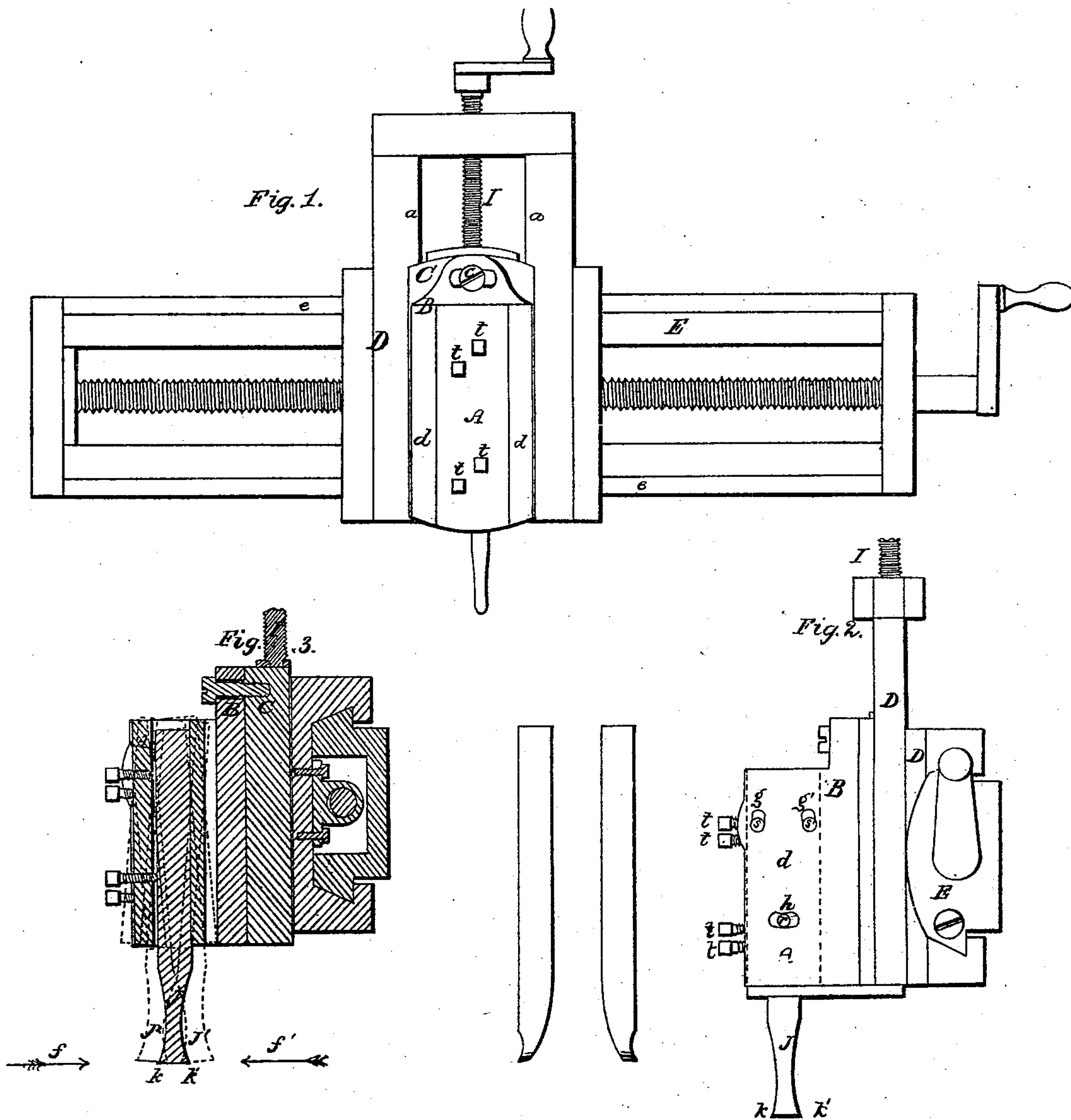


*C. Hall,*  
*Tool Holder for Planing Machine,*  
*No 61,420,* *Patented Jan. 22, 1867.*



*Witnesses.*  
*F. W. Hurster*  
*Chas. H. Leonard.*

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# United States Patent Office.

CHARLES HALL, OF NEW YORK, N. Y.

*Letters Patent No. 61,420, dated January 22, 1867.*

## IMPROVED TOOL-HOLDER FOR PLANING MACHINES.

*The Schedule referred to in these Letters-Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES HALL, of the city, county, and State of New York, have invented certain new and useful improvements in Tool-Holders for Planing Machines for planing metals; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a face view of the tool-holder and appurtenances of a planing machine with my improvements embodied therein.

Figure 2 represents an end view of the same.

Figure 3 represents a transverse section of the same; and

Figure 4 represents views of a pair of tools suitable for use in the machine.

Planing machines are constructed to impart a reciprocating motion either to the work or to the tool. The tool is constructed with but one cutting edge, and the tool-holder is generally pivoted to its support so as to hold the tool stationary only when the work is being moved toward the cutting edge of the tool, leaving it free to move away from the work when the latter is moved toward its back, or, in case of a travelling tool-holder, when the back of the tool is moved toward the work. Such machines, therefore, cut only when the carriage holding the work or tool is moving in one direction, and the time occupied in returning or retrograding the carriage previous to making a new cut is lost. Planers have been devised to obviate this defect by using two tool-holders, set back to back, and also by causing the same tool-holder to turn half round upon a vertical axis at each stroke of the carriage; but these modes require greater complexity in the machinery than the ordinary mode, and for that or some other reason have not come into general use. Planers have also been devised with a tool stock vibrating upon a single central line, and holding a double-edged tool, but the mechanism for determining the movement of the tool stock has been defective, and they have not come into general use. The object of my invention is to enable the tool of the planer to operate with certainty and accuracy at each stroke of the carriage without increasing the complexity of the machine; and to this end my invention consists of the combination of the tool stock with its support by slots and pins or their equivalents, in such manner that the tool stock is permitted to move a limited distance (in the line of movement of the carriage,) in two opposite directions, so that at each stroke of the carriage one cutting edge of the tool or tools used is thereby thrown out of its plane of operation, and a reverse cutting edge is thrown into its plane of operation.

The mode in which I prefer to carry this invention into effect, when the work is moved along by the table of the planer, is represented in the annexed drawings. In this example the tool stock A is a rectangular box, which is mounted upon a support or rest B; this rest is pivoted upon a base, C, which is arranged to slide in the usual manner in the upright guides, *a a*, of a tool carriage, D, and is controlled by an upright feed-screw, I. The tool carriage D also is arranged to slide in the usual manner transversely to the planer upon the guides *e e*, of the cross-slide E, which is supported in the usual manner upon the standards of the frame of the planer. As, however, such standards, and the frame and table or carriage for the work, and the other mechanism of the planer form no part of my invention, and may be constructed in any of the usual modes, I do not deem it necessary to describe them. The tool rest B is clamped to its bed in the usual manner by a clamp-screw, *c*. The tool stock is not fixed rigidly to the tool rest B, but is held laterally between cheeks, *d d*, and is arranged to vibrate a limited distance in the line of movement of the work, and in the directions indicated by the arrows *f f'* in fig. 3. For this purpose, each cheek *d* of the tool rest, is perforated with three slots, *g g' h*, the upper two being oval in a vertical direction, and the lower one being curved horizontally. Moreover the tool stock is fitted at each side with three pins, *s s' r*, which are received in the said slots. This mode of connecting the tool stock and tool rest permits the lower end of the former to move from a central position in either direction until the pins come in contact with the ends of the slots. The upper pins *s s'* are placed at equal distances each side of the central line of the tool in the tool stock, and the lower pin *r* is placed in that central line. The tool may be a double-headed tool with two cutting edges, as shown at figs. 2 and 3, or two single-edged tools with their edges pointing in opposite directions, as represented at fig. 4, may be placed side by side in the tool stock A, which is provided with set-screws *t t t*, to secure the tools in their places. When a planer fitted with such a tool stock is in operation, the table carrying the work to be planed is moved to and fro beneath the tool



stock in the directions of the arrows  $ff'$ , fig. 3, and the tool stock hangs in a central position when the tool is not acting upon the work. When the work is moved in the direction of the arrow  $f$ , and is thereby borne against the cutting edge  $k$  of the tool  $J$ , the tool stock yielding to the pressure moves in the direction of the arrow as far as the slots permit, thereby holding the tool in the proper position, as indicated by the red lines  $J^1$ , for one of its cutting edges to operate. The tool remains in this position until the work has been carried past it, when, as the pressure ceases, the tool resumes its central position; but, when by the return movement of the table, the work is removed in the direction of the other arrow  $f$ , and is thereby borne against the other cutting edge  $k$  of the tool, the tool stock, yielding to the pressure, moves in the direction opposite to that in which it moved during the preceding stroke of the table, until such movement is stopped again by the slots  $g h$ , thereby holding the tool in the position indicated by the red lines  $J^2$ , for its other cutting edge to operate; and the tool retains this position until the work is carried past it, when, as the pressure is removed, it again resumes its central position.

From the drawings and the foregoing description it will be perceived that the tool cuts in both directions, and that the vibration of the tool stock to bring one cutting edge into operation lifts the other out of its plane of operation so that it becomes inoperative for the time. It will also be perceived that when the tool stock turns from its central position in the direction of the arrow  $f$ , it turns upon the pins  $s$  as a centre, and when it turns in the opposite direction from its central position it turns upon the pins  $s'$  as a centre. In either case the cutting edge of the tool is lower in the central position when the work first strikes it, than it is in its cutting position, hence the tool cannot fail to bite into and act upon the work even when taking a fine cut. If the tool be so formed that both its cutting edges lie in the same longitudinal plane when in operation, and are then at the same distance from the table of the carriage, the feed motion of the tool should be operated at each stroke of the table; but if the tool be so ground that one of its edges cuts in a different line from the other, then the feed motion may be operated at the termination of each two strokes as is customary. This latter mode of grinding and feeding the tool permits one of its edges to be used for roughing, and the other for finishing, which I consider to be a good mode of operating. If two single edge tools are to be used, they may be clamped in the tool stock, side by side, with their edges pointing in opposite directions, and one may be used to rough the work, and the other to finish it, or both may be set to work equally.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the tool stock of a planer, with its support or rest by means substantially as above set forth, so that the tool stock can move a limited distance in two directions in the line of cutting, whereby two opposite cutting edges may be alternately brought into operation and held there.

In testimony whereof I have hereunto set my hand this 24th day of May, 1866.

CHARLES HALL.

Witnesses:

E. S. RENWICK,

W. L. BENNEM.