No. 670,128. Patented Mar. 19, 1901.

W. H. CHAPPELL.

MACHINE FOR PLANING METAL.

(Application filed June 28, 1899.)

(No Model.)

Fig. 6.

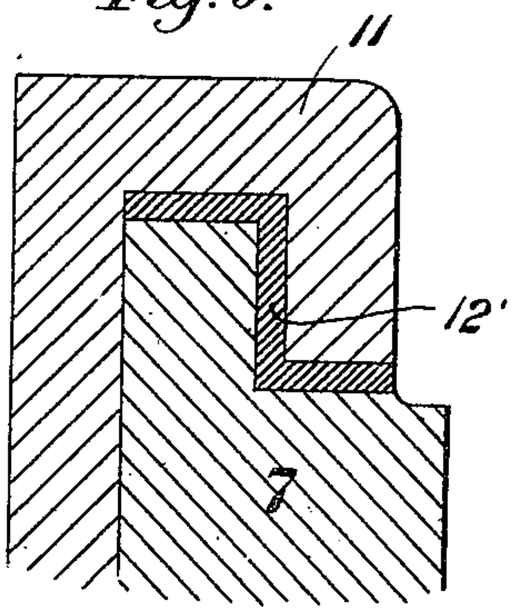


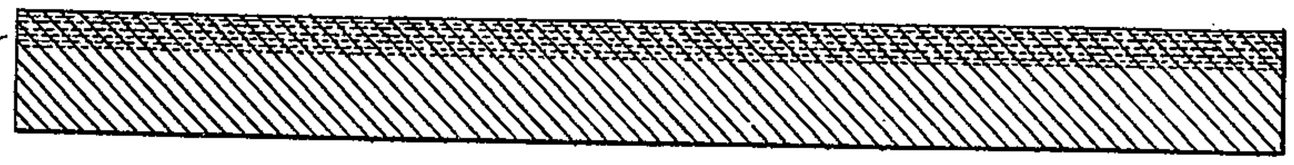
Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. CHAPPELL, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR PLANING METAL.

SPECIFICATION forming part of Letters Patent No. 670,128, dated March 19, 1901.

Application filed June 28, 1899. Serial No. 722,111. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CHAPPELL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in Machines for Planing Metals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in side elevation of a planing-machine constructed in accordance with and adapted to carry out my invention. Fig. 2 is a cross-sectional view thereof, taken on the line 11 11 of Fig. 1. Fig. 3 is an enlarged detail cross-sectional view of the cross-rail of the planer with the tool-carrying saddle mounted thereon, illustrating the inserted strip of hardened bearing metal for the sliding tool-supporting saddle. Fig. 4 is a diagrammatic cross-sectional view illustrating the successive lateral cuts and successively lower subsequent series of such lateral cuts as made in the present practice of the art of planing metals. Fig. 5 is a similar view illustrating the successively lower single cuts for the full breadth and length as practiced under my present invention. Fig. 6 is an enlarged detail view of a portion of the cross-rail, showing the tool-carrying saddle mounted thereon with an intervening bearing-strip.

My invention relates to the art of planing metals; and it consists in a machine for reducing the thickness of bodies of metal of large area by uniformly removing an equal amount of metal at each operation in very thin layers or continuous shavings of entire width, so that at each cut the metal operated upon is uniformly reduced in thickness at every part.

At present the usual practice in planing metal of any considerable area, so far as I am informed, is to reduce the metal by a series of longitudinal cuts traversing the area of the piece from one side to the other, which operation or series of longitudinal cuts progressing laterally across the metal operated upon is repeated for a sufficient number of times to reduce the metal to the desired thickness, after which it is rendered smooth by what is known as a "finishing cut," made in a similar manner. This operation involves a separate longitudinal cut for each consecutive lateral reduction, involving complicated mechanism for feeding the tool laterally in both directions and entailing considerable loss of time due to the return movement of the table of the planer preparatory to the next cut, and when this series of lateral adjustments is repeated a great number of times, as becomes necessary, this loss of time, even though reduced by accelerated speed of the return movement, amounts to a large proportion of the entire time consumed in the whole operation. A further disadvantage in this present practice consists in the appreciable difference of depth between the first and last lateral cuts due to the wear upon the tool, which tool being of comparatively small size is subject to rapid wear, resulting not only in the variations in its cutting depth due to such wear, but also in frequent necessary removals for regrinding.

By my invention the foregoing objections are entirely overcome and the work is accomplished in a much more rapid and efficient manner, while being uniform and accurate throughout, thus securing very desirable advantages in this art.

In the operation of planing metals I have found that by constructing the planing-machine in such a manner as to afford a largely excessive rigidity and strength in the machine and in its motive power and by making the cutting-knife sufficiently wide to engage the object operated on from side to side I am enabled to remove the entire surface at one operation. By so controlling the downward feed of the knife as to cause it to engage but a very thin layer of metal at each operation the strain is reduced to a minimum, and to aid the operation the travel of the bed of the planer is made comparatively slow, thus relieving the tool as much as possible from wear and preventing undue heating.

Referring now to the drawings, 2 represents the bed-frame of the planer, upon which is mounted the longitudinally-traveling table 3, actuated through the usual train of gearing (indicated in dotted lines in Fig. 1) and transmitting motion to the table through rack 4. The reduction in speed through such gearing I prefer to make within very wide limits, the difference in proportion being as between

the speed of the drawing-pulley 5 and that of the rack-gear as great as two hundred and fifty in such pulley to one in the driving-gear.

All of the proportions of the machine are made in conformity with the objects in view, which are to always maintain the existence of a large factor of surplus reserve or latent strength conforming to the proposition involved in the invention, which is to effect through such means the removal of areas of metal greatly in excess of such amounts as are possible or practicable under the present method by the application of the knife to such increased areas at slower speed with less incision and with an impelling power of sufficient force, both active and latent, to insure the absolute and undeviating progress of the work without possibility of hesitation, chattering, or undue strain. In conformity with this design it will be seen that the side housings 6 project backwardly along the sides of the frame for a very considerable distance and are firmly secured to the frame by numerous bolts. The cross-rail is made of sufficient width to correspond to the other proportions of the machine, and the knife-holder 8 is made equally massive, and the knife 9 is made of a height at least equal to or exceeding its efficient width, of sufficient thickness to insure ample strength, and provided with a cutting-blade 10, projecting forwardly on a plane approximating to a horizontal, so as to accomplish the cutting action as nearly as possible in the manner of a shear.

Owing to the very considerable weight of the knife and its support, mounted on the saddle 11, which is slidingly mounted on the cross-rail 7, I have provided a means for preventing undue wear of the upper edge of the cross-rail, which means consist of a bar 12 of hardened steel set in and running the full length of the upper edge of the cross-rail. This bar is fitted into a finished groove, and the top of the cross-rail and top edge of the bar are then ground down to a common level adapted to receive the upper bearing-flange of the saddle. As the bar wears down the softer metal of the casting will wear with it, and the pressure of the bar will act to greatly retard such wear. In Fig. 6 I have also illustrated a further modification, wherein a 2-shaped wearing-strip 12′ is set upon the upper side of the cross-rail 7, forming a bearing for both the horizontal and vertical wearing-faces of the saddle 11.

The vertical adjustment of the tool-holder proper is secured through the usual screw 13.

The traveling table 3 is slidingly mounted on top of the bed-frame 2 in suitable slideways, flat, as shown, or in the usual V-grooves. Downwardly and inwardly projecting gibs 14 longitudinal of the table bear upwardly against corresponding bearing-faces along each side of the bed-plate, by which means the sliding table is held securely down during its forward and back travel in an undeviating level position. This is a feature of great advantage where excessive strain during the cutting operation is exerted upwardly by the driving-pinion in engagement with the rack 4. It is to be noted that the return travel by reason of well-known reversing mechanism is at a proportionately faster speed than the forward or working speed, which is reduced in proportion to the character of the work in hand.

The advantages of my invention will be appreciated by those skilled in the art, as in this manner I am enabled to plane large surfaces at least four times as fast as by the present practice of transverse feeding which I have described, at the same time securing an absolutely flat surface at less cost than has been possible heretofore.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

In a machine for planing metals, the combination of a bed-plate provided with longitudinal bearing ways or faces, under side bearing-faces along the outer sides of the bed-plate, a traveling work-bearing table mounted on the ways of the bed-plate and provided along the outer sides with downwardly and inwardly projecting gibs bearing upwardly against the under side bearing-faces, a central rack on the under side of the table, means for transmitting motion to the table, housings secured to the sides of the bed-plate frame projecting upwardly and extending backwardly to form a substantial backing, a cross-rail mounted on the front faces of the housings provided with a wearing-strip of hardened metal inserted in its upper edge, an enlarged tool-holder mounted thereon and adapted to bear on the upper edge and on the wearing-strip, a cutting-tool mounted on the holder of a width sufficient to extend beyond both edges of the surface to be planed having a cutting-blade projecting forwardly on a plane approximating a horizontal, and means for vertically adjusting the tool-holder and tool so as to engage very thin shavings of metal for the full width of the metal operated on, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM H. CHAPPELL.

Witnesses:

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