(No Model.) 2 Sheets—Sheet 1.

F. SHENTON.

SLATE CHAMFERING MACHINE.

No. 451,778. Patented May 5, 1891.

Fig. 1.

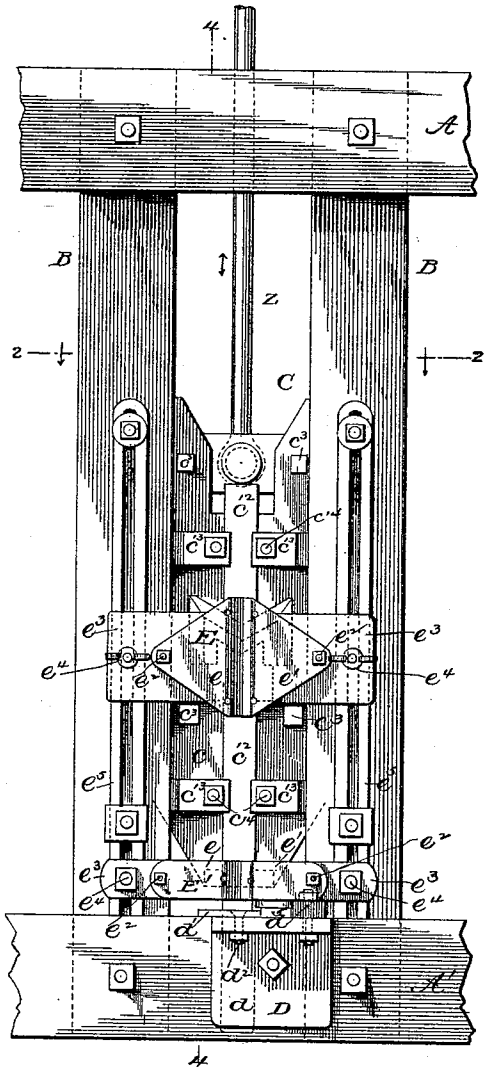
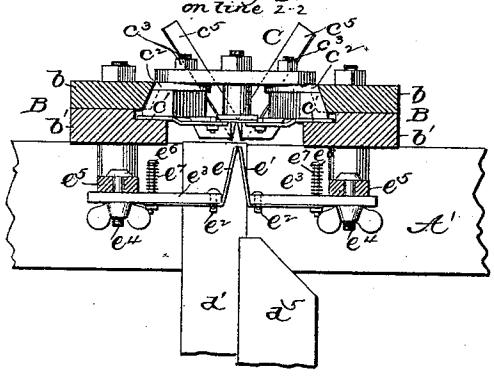


Fig. 2. on line 2-2



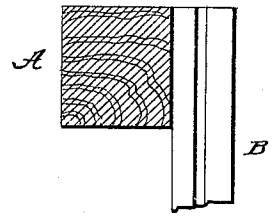
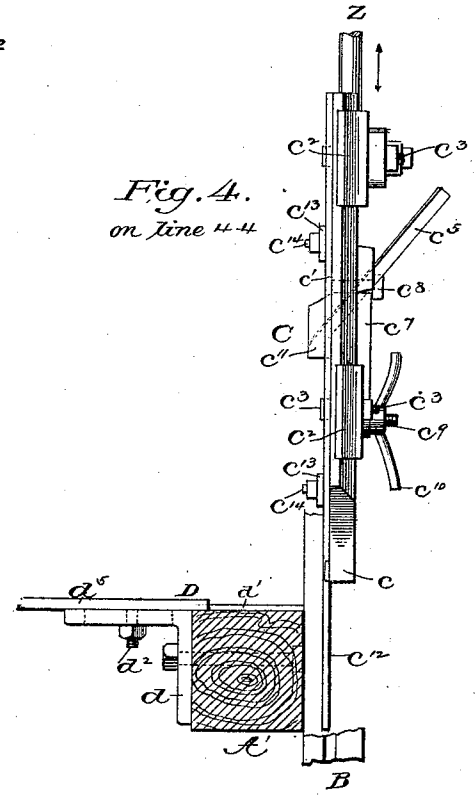


Fig. 4. on line 4-4



Witnesses: W. W. Mortimer. H. R. Kennedy.

Inventor: Francis Shenton By his Atty Phil. T. Dodge.

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(No Model.) 2 Sheets—Sheet 2.

F. SHENTON.

SLATE CHAMFERING MACHINE.

No. 451,778. Patented May 5, 1891.

Fig. 3.

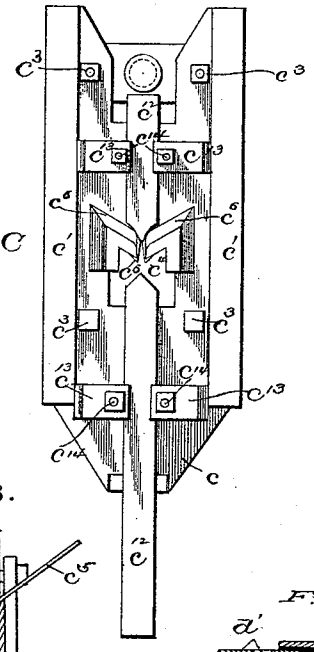


Fig. 5.

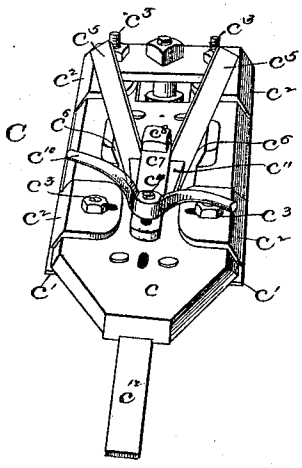


Fig. 8.

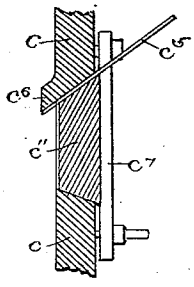


Fig. 9.

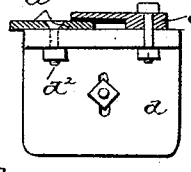


Fig. 7.

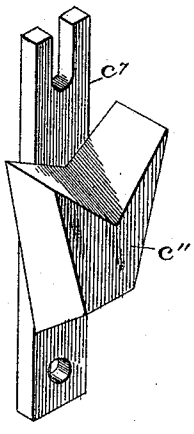


Fig. 6.

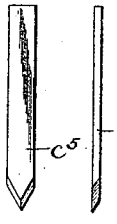
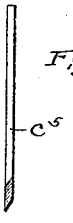


Fig. 6*.



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By his Atty

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UNITED STATES PATENT OFFICE.

FRANCIS SHENTON, OF SLATINGTON, PENNSYLVANIA.

SLATE-CHAMFERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 451,778, dated May 5, 1891.

Application filed November 29, 1889. Serial No. 331,871. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS SHENTON, of Slatington, in the county of Lehigh and State of Pennsylvania, have invented certain Improvements in Slate-Chamfering Machines, of which the following is a specification.

This invention relates to a machine for chamfering or beveling the faces of school-slates around the edges that they may the more readily enter the grooves of the frames in which they are to be mounted. It is designed more particularly as an improvement on the mechanism for a like purpose set forth in Letters Patent No. 226,795, granted to me on the 20th day of April, 1880.

The principal aims of the present invention are to improve the cutting action of the knives, prevent the rupture of the slate, and facilitate the removal and insertion of the knives.

As the invention relates entirely to the mechanism for supporting and cutting the slate and as the reciprocating knife may be operated by mechanism such as shown in the former patent, or by any equivalent mechanism, I have omitted such parts from the drawings.

In the accompanying drawings, Figure 1 is a front elevation of a slate supporting and trimming mechanism in accordance with my present invention. Fig. 2 is a section on the line 2 2 of Fig. 1, looking in a downward direction. Fig. 3 is a front face view of a reciprocating cutting-head. Fig. 4 is a section on the line 4 4, Fig. 1, showing the edge of the cutter-head in elevation. Fig. 5 is a perspective view showing the cutter-head as seen from the back. Fig. 6 is a view of one of the knives. Fig. 6^a is an edge view of the same. Fig. 7 is a view of the clamping-plate by which the knives are held in place. Fig. 8 is a vertical central section through the cutter-head, showing the manner in which the knives are held therein. Fig. 9 is an end view of the slate-supporting table.

Referring to the drawings, A A′ represent horizontal timbers forming part of a main frame; B B, two vertical guides rigidly bolted to the timbers to receive and sustain the vertically-reciprocating cutter-head C, which is operated by a pitman Z, or other suitable operating device, by which it is carried upward and downward between the guides past the edge of a fixed table D, on which the slate is sustained, and also past guides E E′, fixed in position above the table to maintain the slate on edge. The vertical guides B consist each, as shown in Fig. 2, of two metal bars *b b′*, lying one against the other, with their operative edges so shaped as to embrace and guide the edge of the cutter-head. The cutter-head C consists of a large metal plate *c*, provided on one face with hardened wearing-strips *c′* and on the opposite face with wearing-blocks c^2, of brass or similar material, secured by bolts c^3, and slotted so that they may be set out horizontally against the vertical guides to compensate for wear. The rear guide-bars *b b* have their edges beveled to bear against the correspondingly-beveled ends of the blocks c^2, so that when the latter are set outward the head is crowded forward snugly against the bars *b* to keep the parts in close running order.

Midway of its length the cutter-head C is provided with an opening c^4 therethrough from front to rear for the admission of the two knives c^5. Each of these knives consists, as shown in Figs. 6 and 6^a, of a flat blade having its end beveled from the two edges to a central point, or, in other words, made of a pointed form, so that it presents two converging cutting-edges. The knife is ground or sharpened from one face only, so that the cutting-edges lie at the opposite face. Thus formed the knives may be changed in position from right to left, and vice versa, so as to bring the right or left edge into position without turning them over. This form is advantageous, in that the knives may be transposed so as to bring one or the other of the edges into action, and that it admits of the knives being used for a long period without regrinding, so that the life or duration of the knives is greatly increased. They are inserted through the cutter-head from the back, their lower ends converging toward the center of the head, so that their inner edges stand, as shown in Figs. 2 and 3, at a slight angle to each other.

The cutter-head is formed with flat inclined seats c^6, against which the blades are firmly seated, being held upward in place by a fastening-plate c^7, such as shown in the several

figures. This plate is applied from the back of the cutter-head, one end being slotted and slipped beneath the head of a stud or bolt c^8, while the opposite end is slipped over a threaded stud c^9 and secured by a nut c^{10}. On its face the plate has a projection c^{11}, which fits between and against the knives, so as to hold them firmly to their places. It is to be observed that the knives receive a firm and solid support between flat faces on both sides to a point very near the cutting-edge, so that there is no liability of their springing or breaking under the strains to which they are subjected. It is to be observed that in order to thus support the knives the cutter-head has a projection or boss on the face to bear upon the upper sides of the knives at their extreme forward ends. This projection, through which the opening for the knives is formed, acts, in connection with the clamping-block, to confine and sustain each knife firmly, so that it cannot spring, break, or work out of position.

When the machine is rapidly operated upon hard slate, it has been found in the past exceedingly difficult to support the knives firmly and at the same time be free from liability to give way at the ends; but the construction herein described, the result of long practical experience, is found to fully answer the desired end.

To prevent the edge of the slate from wearing the face cutter-head, I provide the latter above and below the knives with the two vertical hard-metal plates c^{12}, held in place by overlapping plates c^{13} and bolts c^{14}. As the plates c^{12} become worn, they may be reversed, and finally removed and replaced by others.

It is to be noticed that the inner or cutting edge of each knife rises from the point toward the heel and that the operative edges of the two knives converge from the points upward. When, therefore, the edge of a slate is presented in an upright position against the face of the descending cutter-head, the two knives act on opposite faces of the slate chamfering or beveling them, so that in horizontal section the slate is diminished in thickness toward the outer edge. Owing to the position of the knives, their cutting action commences at a point, and they act from the body of the slate outward toward the edge. This is highly advantageous, in that it prevents that fracturing and scaling of the surfaces adjacent to the line of cut which attends the use of knives presenting a horizontal edge or knives cutting from the outer edge of the slate inward. When the knives have become dulled, the block c^7 is released and the knives transposed, so as to bring their opposite and unused edges into action.

The table for supporting the slate during the cutting action consists of a bracket d, bolted to the lower bar or sill A, and of a horizontal steel plate d', removably secured to the top of the bracket by a bolt d^2, and extending thence inward over the sill A to the guides B. The bracket is slotted, as shown, so that the plate may be advanced as its end is worn away, and when worn on one side it may be inverted to present a new surface for use. A gage bar or guide d^5 is also bolted to the bracket and projects above the plate d' to bear against the side of the slate and insure its presentation at right angles to the face-plate.

To facilitate the introduction of the slates in an upright position, the guides E E′ are provided. Each of these guides consists of two independent L-shaped plates e e', arranged on opposite sides of the position to be occupied by the slate and jointed or pivoted at e^2 to a sustaining-plate e^3, which is in turn connected by a bolt e^4 to the fixed vertically-slotted bar e^5, so that the guide may be raised or lowered according to the width of the slate to be acted upon. The plates e e' have their ends projected inward in converging lines toward the face-plate, so that they offer a converging or V-shaped entrance for the slate, which is rested edgewise upon the table below and pushed horizontally between the guide-plates to the cutter-head.

Each of the plates e is connected at the rear end to a bolt e^6, passing through the support e^3 and surrounded by a spiral spring e^7. This arrangement holds the ends of the closing-plates e e' inward, so that they closely embrace the slate passing between them, but at the same time permits them to yield, as the variations in the thickness of the slate may require. The essence of my invention in this regard consists in the use of the yielding converging guides E E′ in front of the cutter-head, and it is manifest that they may be varied in form and arrangement in many respects without changing their mode of action or departing from the limits of my invention.

It is to be observed that in my machine the cutter-head moves vertically, while the guides e e' for the slate are arranged to yield horizontally and to act upon the smooth surfaces of the slate at a distance from the edge to be chamfered, the guides and the chamfering-knives acting on different portions of the slate. This causes the chamfering-knives to cut the straight clean edge, which will be sure to enter the channeled slate-frame, although the faces of the slate may be slightly curved or winding, as is frequently the case.

Having thus described my invention, what I claim is—

1. In a slate-chamfering machine, the reciprocating head having therethrough an opening with the two inclined top surfaces c^6, in combination with the two beveled cutter-blades c^5, extended through the opening and seated against said surfaces, the wedge-like plate c'', having one end fitted to and seated against the blades and the opposite end seated within and against the end wall of the

opening, and means, substantially as shown, for holding said plate in place.

2. In a slate-chamfering machine, the reciprocating cutter-head having therethrough the opening with the inclined converging sides or faces to receive the knives, the adjustable confining-block fitted within the opening, and the two knives, each with two cutting-edges adapted for transposition in the block, substantially as shown.

3. In combination with the cutter-head having the knives to chamfer the slates, the removable strips c^{12}, applied to the head, substantially as shown.

4. In a slate-chamfering machine, the combination of a rest or support to sustain the slate endwise, a reciprocating head having two converging cutters to embrace and chamfer the edge of the slate, and two slate-guides located above the rest to permit the passage of the slate between and adapted to yield in a direction at right angles to that in which the cutter-head travels.

5. In combination with the reciprocating head provided with chamfering-knives, the vertical bars e^5, the plates e^3, secured to and vertically adjustable thereon, the angular guide-plates e e', fulcrumed on plates e^3, and the springs acting upon the guide-plates.

6. In a slate-dressing machine, the reciprocating head provided with the two chamfering-knives, in combination with the slate-sustaining table d, the bar d^5 thereon, and the two yielding guides e', as shown.

In testimony whereof I hereunto set my hand, this 24th day of October, 1889, in the presence of two attesting witnesses.

FRANCIS SHENTON.

Witnesses:
DAVID MCKENNA,
W. R. MCDOWELL.