

(No Model.)

2 Sheets—Sheet 1.

J. H. RUDOLPH.
SLATE DRESSING MACHINE.

No. 461,450.

Patented Oct. 20, 1891.

Fig. 1.

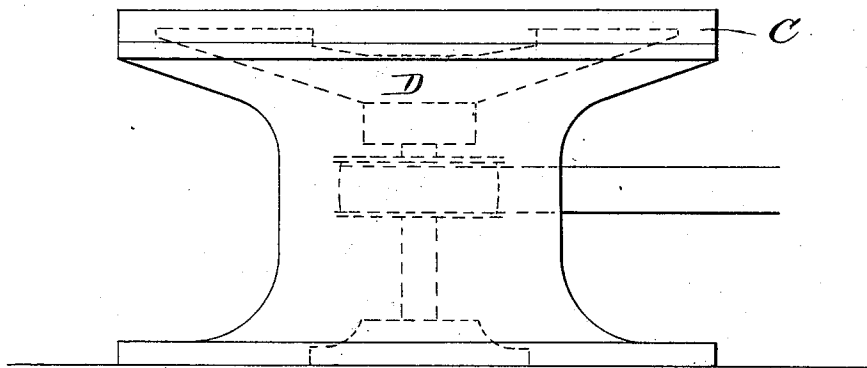


Fig. 2.

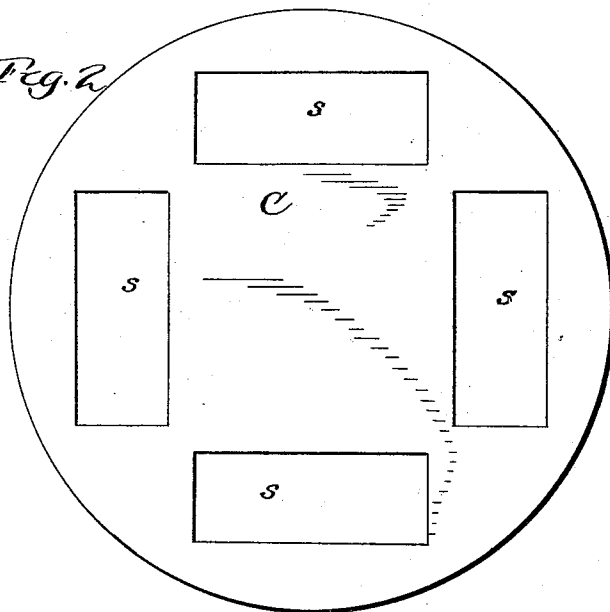
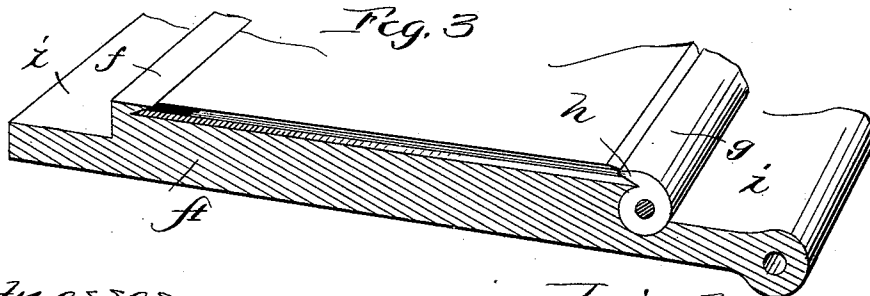


Fig. 3.



Witnesses
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J. H. Rudolph
by Eli S. Mar Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4

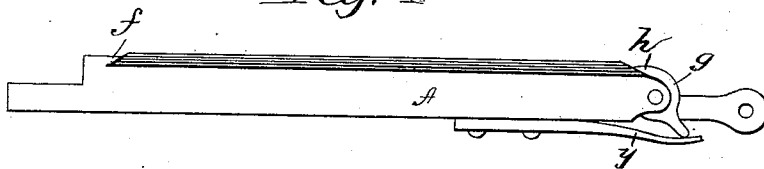


Fig. 5.

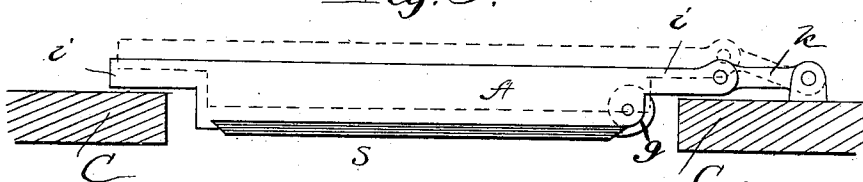


Fig. 6.

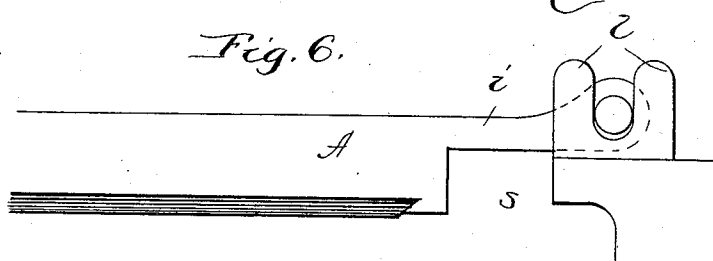


Fig. 7.

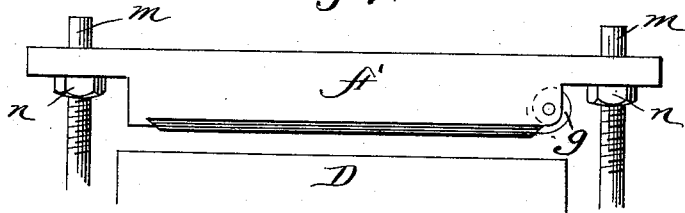
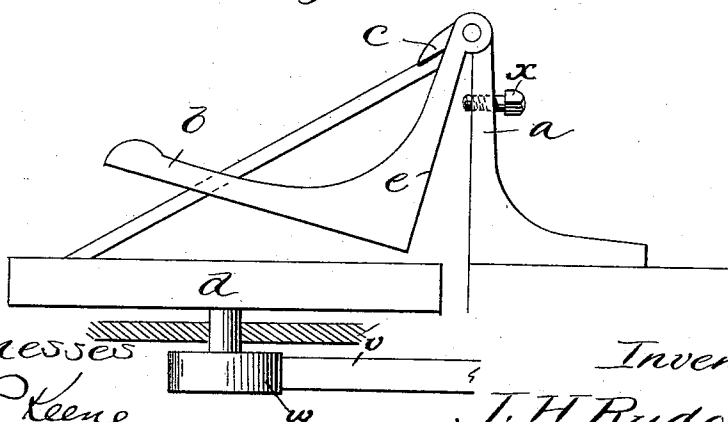


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

JUSTUS H. RUDOLPH, OF WALNUTPORT, PENNSYLVANIA.

SLATE-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 461,450, dated October 20, 1891.

Application filed June 16, 1890. Serial No. 355,589. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS H. RUDOLPH, of Walnutport, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Slate-Dressing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to the polishing of the surfaces of school-slates and the reduction of the slate to a uniform thickness throughout its extent. While designed specially for this purpose, the invention may be used for the reduction or polishing of like surfaces where the material is difficult to handle and a uniform surface desired upon one or both sides.

As the slate comes from the quarry it is of varying thickness and uneven surface. It is brittle and easily broken by pressure applied to the surface, and hence requires great care in the handling, especially in view of the fact that the sheets are usually very thin in order that the greatest possible yield may be obtained from the slate-quarry. These thin sheets of slate are usually slightly curved, and this increases the tendency to breakage and the necessity for great care in the manipulation of the slate in the reduction and polishing of the same. It is the object of my invention to provide a method of holding and applying this slate to the abrading-surface, whereby all tendency to rupture is avoided and an even and uniform surface produced without regard to the thickness of the slate or the amount of curvature. A further object is to provide means for carrying out of the main object of the invention.

The invention consists, primarily, in the art of grinding and polishing or reducing the surface of slate or like material by first securing said slate to a holder forming a rigid and perfectly true backing, against which the slate is securely clamped, and in applying the slate so held face downward to the action of an abrading-surface and allowing it to feed automatically by gravity.

The invention further consists in the devices and combination of devices hereinafter fully described and particularly claimed.

In the accompanying drawings, Figure 1 represents in side elevation a form of table, with the abrading-disk and the means for

driving it shown in dotted lines. Fig. 2 is a plan view of the table shown in Fig. 1. Fig. 3 is a detail view of the slate-holder with a slate in place, and Fig. 4 is a modified view of the clamp for the slate. Figs. 5 and 6 show the holder with modified means of pivoting the said holder, so as to allow uniform movement throughout its extent as the slate is reduced. Fig. 7 shows a means of adjusting and regulating the movement of the holder and the slate carried thereby. Fig. 8 represents a holder for the slate adapted to permit the sides or ends of the slate to be beveled off.

In carrying out my invention I take the sheets of slate and first bevel the edges by presenting the slate to the action of an abrading-disk while held at an angle thereto, as shown in Fig. 8, in which a post *a* supports an angular holder pivoted thereto, the slate passing through an opening in the base *b*, while its upper end fits beneath a flange *c*. An abrading-disk *d*, operated in any suitable manner, as by the belt and pulley *v w*, is directly beneath the base *b*, and hence the end of the slate, projecting through the base *b*, comes in contact with the abrading-surface at an angle, so that the edge of the slate is beveled. The action of the abrading-surface continues until the straight sides of the post *a* and the corresponding part of the holder *e* meet, thus forming a stop and preventing further downward movement of the angular holder. To vary the amount of bevel, a stop-screw *x* is provided to check the pivotal movement of the angular holder at any point. Instead, however, of the means described for beveling the edges of the slate, this may be effected by other means, though I prefer the means described. After the edges of the slate have been beveled I place the slate upon the face of the slate-holder *A*, which is preferably of metal and sufficiently strong for the purpose. On its face at one end it is provided with a raised ledge *f*, having its front edge forming one wall of an angular recess corresponding to the bevel of the slate edge, which is adapted thereto. At the opposite end of the holder is a clamp *g*, which, after the slate is placed upon the surface of the holder, is turned up until its projecting lip *h* engages the beveled edge of the slate. The clamp may be prevented from displacement by a spring *y*, bear-

ing against a projecting lug, such as shown in Fig. 4, or other means may be used for this purpose. The surface of this slate thus held by its beveled edges projects beyond the faces of the ledge *f* and the clamp *g*, and as it is held against a perfectly plain bearing there is no tendency to rupture, and any curvature in the slate is without effect in the operation of producing the surface, to interfere with the uniformity of the surface, as this curvature disappears in the clamping of a slate against the plane surface. The holder, with this slate carried thereby, is then inverted and applied to the lower surface of an abrading-disk until this surface of the slate becomes smooth and uniform, after which the slate may be removed and reversed in position and the opposite side reduced in like manner. In order to hold the slate in the two positions, the ends of the slate are beveled outwardly from one surface, while the sides are beveled outwardly from the opposite surface.

While the holder may be applied to the abrading-surface by the hand of the operator, I prefer to support the holder above an abrading-surface and to automatically regulate the downward movement of the holder, so as to insure an even surface on the side first polished and a definite reduction of the slate on the opposite side in order that the slate may not be ground down too thin. To this end I show in Figs. 1 and 2 a table C, which has a series of openings in its surface, and beneath the level of this table, in line with the openings, an abrading-surface D is revolved.

The enlarged views of Figs. 5 and 6 show the holder working in the openings and having projecting ledges *i i*, of greater extent than the opening. In Fig. 5 the holder is secured to the edge of the table by means of a link *k*, which allows the holder to move uniformly, so as not to cause any irregularity or inclination in the surface of the finished slate. In Fig. 6 the pivot of the holder is held between two upright lugs *l*, while in Fig. 7 the holder *A'* is guided in its movement by posts *m* and regulated as to its movement by nuts *n*, engaging screw-threads on the posts. It will thus be seen that by providing for the regular downward movement of the holder and a stop to limit its movement, which may be a table, as shown in Figs. 5 and 6, or the nuts, as in Fig. 7, or equivalent means, the slate held by the holder may be reduced to an absolutely even surface and to a uniform thickness, this thickness being predetermined by the amount of movement allowed the holder, as it will readily be seen that the abrading-surface will continue to act to reduce the surface of the slate until the downward movement of the holder is checked and the abrading action then ceases.

By employing the table C, with openings, and allowing the slate to feed automatically downward the grit and water which it is necessary to use are retained on the grinding-disk and the workman is protected from flying mud or grit. It may be pointed out also as an advantage arising from the arrangement of the disk with the grinding-face upward that as the grit and water float on its upper face the grit removed from the slate is caught and retained to aid in the grinding action.

It will be observed that by inverting the holder and presenting it to a grinding-surface below it the feed is entirely automatic, and the attendant need only adjust the holder in position and properly place the stops, and then the device requires no further attention until it is filled again. In this way one attendant can keep in operation a number of holders, and even should one holder be neglected it would have no disastrous effect, as the downward feed of the plate would be arrested by the stops at the proper time.

I claim as my invention—

1. In combination, a grinding-disk arranged with its grinding-face upward, a holder for the slate, arranged with its face downward and movably supported above the grinding-disk to fall automatically by gravity, and a stop for limiting the downward movement of the holder, substantially as described.

2. In combination, a grinding-disk arranged with its grinding-face upward, a holder for the slate, arranged with its face downward, and a top or covering plate above the grinding-disk, having an opening through which the slate-holder moves toward the grinding-disk.

3. The improvement in the art of grinding or polishing and straightening slate or like thin material, consisting in reducing the side edges toward one face and reducing the end edges reversely to receive an overhanging clamp, then clamping the slate by its side edges to a backing-plate to straighten the same, presenting it thus held to a grinding-disk, then reversing it and clamping it by its end edges to complete the straightening, and subjecting it as thus held to the action of the grinding-disk.

4. In combination, the grinding-wheel, a slate-holder having movement toward the same, and a stop for limiting said movement, the said holder being pivotally supported, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. H. RUDOLPH.

Witnesses:

H. N. LOCKE,
DAVID McKENNA.