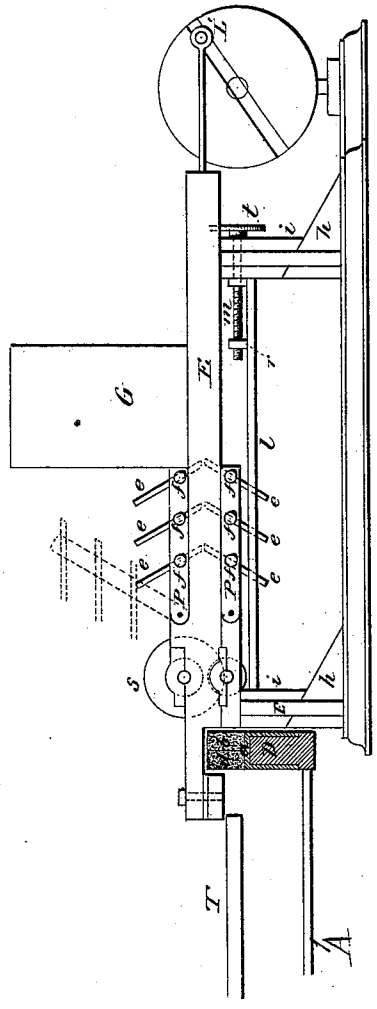
(No Model.) 3 Sheets—Sheet 1.

F. W. MALLETT.

SLATE DRESSING MACHINE.

No. 256,016. Patented Apr. 4, 1882.

Fig. 1



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(No Model.) 3 Sheets—Sheet 2.

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SLATE DRESSING MACHINE.

No. 256,016. Patented Apr. 4, 1882.

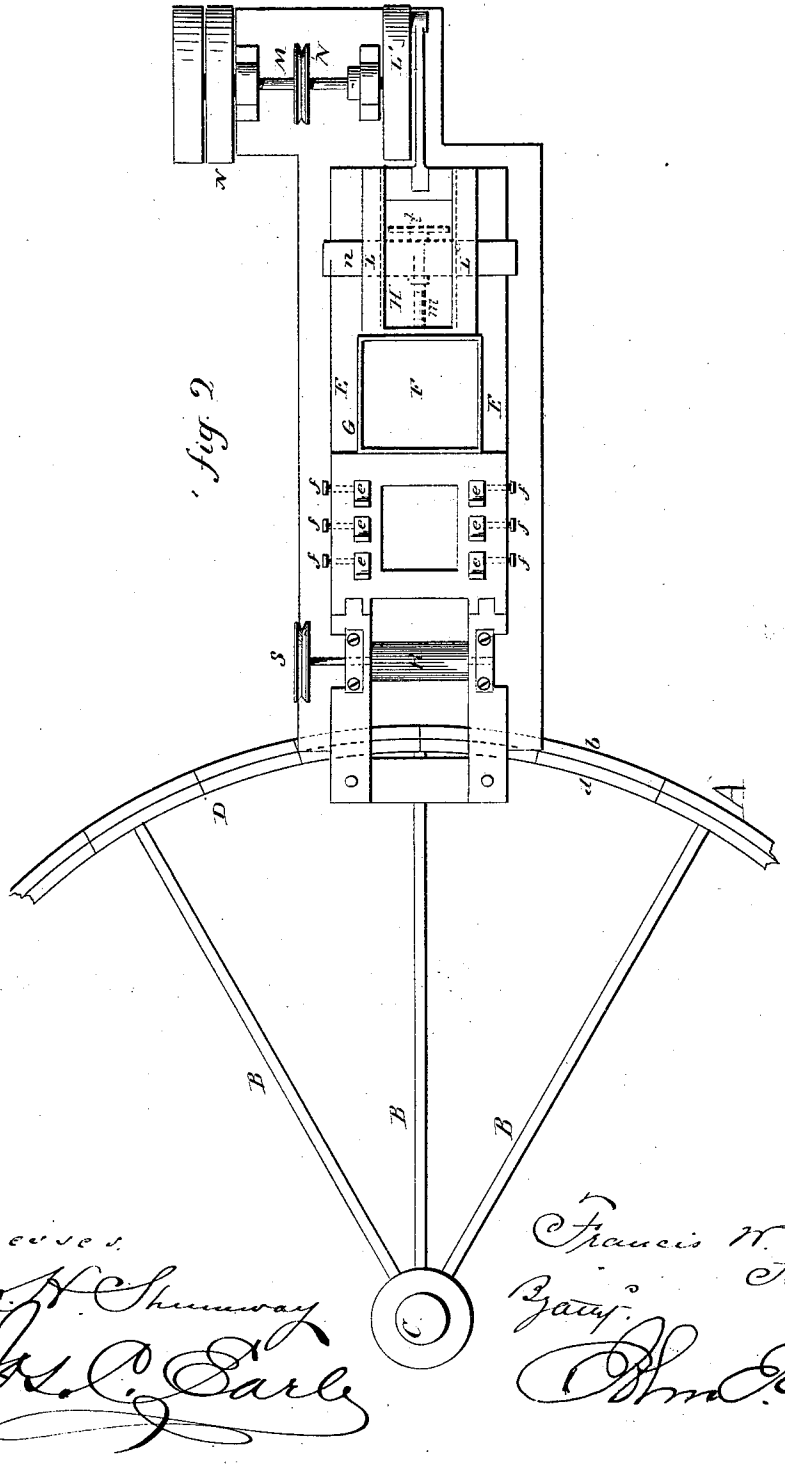

Fig. 2.

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SLATE DRESSING MACHINE.

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Fig. 3

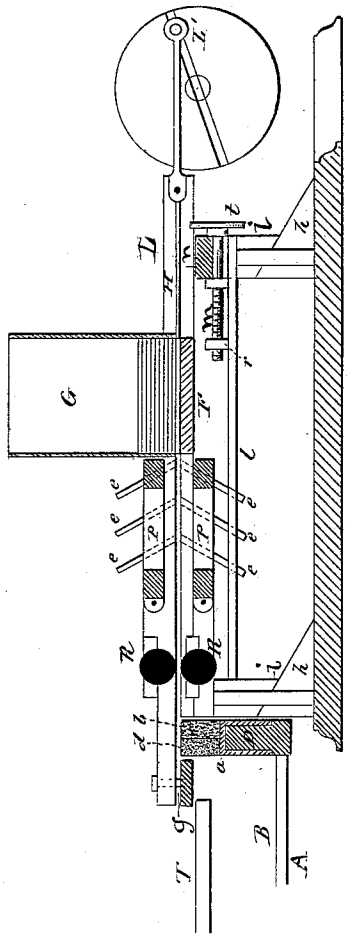
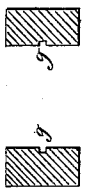


Fig. 4



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UNITED STATES PATENT OFFICE.

FRANCIS W. MALLETT, OF SLATINGTON, PENNSYLVANIA.

SLATE-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 256,016, dated April 4, 1882.

Application filed December 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. MALLETT, of Slatington, in the county of Lehigh and State of Pennsylvania, have invented a new Improvement in Slate-Dressing Machines; and I do hereby declare the following, when taken in connection with the accompanying two sheets of drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view; Fig. 2, a top or plan view; Fig. 3, a longitudinal section; Fig. 4, a transverse section.

This invention relates to an improvement in machines for dressing and finishing the surface of slates such as used for school and other purposes, the object being to construct a machine which shall receive a pile of undressed slates and then successively deliver the slates to the apparatus, which will properly dress and finish the surface, and to employ in such apparatus a moving grinder which shall travel over the surface of the slate as it is fed through the apparatus; and the invention consists principally in a grinding-wheel presenting near its periphery a grinding-surface substantially parallel with the plane of the wheel, combined with apparatus which will successively present the slates to be ground to the said grinding-surface and move them gradually over said surface, as more fully hereinafter described.

A represents a portion of the grinding-wheel, which is made of large diameter—say about twelve feet—its rim supported from the center by spokes B, and is mounted upon a shaft, C, preferably a vertical shaft, and so that the wheel will revolve in a horizontal plane. The rim D of this wheel is made to extend upward above the plane of the wheel, and on its upper surface, *a*, the grinding material is arranged. This is best made from two or more grades of emery—say the first, *b*, of a coarser, and the next, *d*, finer. These may be applied in segments secured to the rim or otherwise, so that the grinding-surface is presented in a plane substantially parallel with the plane of the wheel—that is, the plane in which the wheel revolves.

Power is applied to the shaft to impart revolution to the wheel in the usual manner for applying power to driving-shafts.

The feeding apparatus consists of a frame-work, E, on which is a bed, F, which forms the bottom of the receiver G. This receiver is in size corresponding to the size of the slate-blanks to be ground. Immediately in rear of this receiver, and in a plane parallel with it, is arranged a follower, H. This follower is supported in guides L, within which it moves back and forth in a plane slightly above the plane of the bed on which the pile of slates lies, and is in thickness no greater than either of the individual slates in the receiver, but is narrower than the slates. To this follower H a reciprocating movement is imparted from a crank, L′, on the driving-shaft M, to which power is applied through the driving-pulley N or otherwise, and so that as the follower H advances toward the receiver it will pass into a slot at the bottom of the receiver, strike the outer end of the lower slate, and force it forward from beneath the pile through a corresponding slot in the opposite side. Then as the follower retreats the pile will fall and bring the next in succession in front of the follower, and so that when the follower again advances it will force that second slate out from beneath the pile in like manner as it did the first, and, so continuing, successively force the slates forward.

Forward of the receiver for the slates cutters *e* are arranged at each side and above and below the path of the blank slate, and so as to bear upon the upper and lower surface of the blank near the edge and dress the slate at that point to the required thickness—say such as necessary for its insertion into the grooves in the frame. These cutters are each hung in a carriage, P, hinged so as to be turned away from the work, as indicated in broken lines, Fig. 1, for adjustment or examination. These cutters are similar to the cutter of a joiner's plane, and are arranged relatively to the surface to be worked upon in similar manner to a plane-iron, here represented as set by screws *f* through the edge of the respective carriages; but they may be otherwise adjusted, and are secured in their proper relative position to the slate to be dressed, so that as the slate is moved forward by the follower it passes between the

cutters at the two sides, and is there dressed to the requisite thickness. The object of using several cutters is that the first may cut a little, the second still deeper, and the third finish, or so on, according to the number of cutters. Passing from the cutters, the slate enters a groove, *g*, in each side of the framework, (see Fig. 4,) which conducts it to a pair of driven elastic rolls, R R, one above and the other below. These rolls are driven by the application of power to their shaft through a pulley, S, or otherwise. Their surface is best made from india-rubber; but other elastic or flexible material may be employed. The slates trimmed are forced by each successive slate forward toward the rolls until the first is within the grasp of the two rolls. Then those rolls, revolving, draw the slate along independent of the follower, so that the slates are successively carried along and fed by the rolls R forward.

The grooves *g* are arranged relatively to the grinding-surfaces *b d* of the grinding-wheel so that the surface to be ground will extend below the plane of the grooves to the extent of the required grinding; or the grinding may be, as represented in Fig. 1, flush with the under side of the grooves, which will produce the slate flat from edge to edge. In case of the beveled edge, however, the bevel will be produced by the cutters; then the grinding-surface will be slightly below the lower level of the grooves. The grooves continue beyond the grinding-rim of the wheel, as shown, the lower guide being cut away for the passage of the rim, as seen in Fig. 1. The slates are then delivered through the grooves as fast as their under surface is ground to within the wheel, where they fall upon a table, T, or may be taken away by hand. Around the wheel several of these machines are arranged, each standing radially from the center of the wheel, so that one grinding-wheel may serve for several feeding devices. After grinding upon one surface the slate is taken to a second machine, inverted, and its opposite side dressed in like manner.

The feeding devices may be arranged in pairs, so that one will present the slate one side to the grinder; then, transferred to the next machine, the opposite side will be ground.

The several feeding devices to the same wheel may take different sizes of slates.

The device for bringing the slates to a thickness upon the edge may be dispensed with and that work done on an independent machine; but I prefer to combine them with the grinding apparatus, as it saves one handling of the slates.

By this construction the most perfect work is accomplished. The slate is firmly held to the surface of the grinding-wheel, so that no irregularities of grinding can occur, as where the grinding is done by a cylinder instead of a flat surface, as in this case.

The wheel may be made adjustable vertically with relation to the grooves which guide the slate; but I prefer to make the adjustment in the feeding mechanism itself. This is best done by arranging inclines *h* at each end of the machine, and then introducing a wedge, *i*, at each end between the said incline and the guides above, then connecting the wedges at one end with those at the other end by a rod, *l*, with which the leading-screw *m* engages, the said leading-screw arranged in a cross-piece, *n*, free to be revolved, but without longitudinal movement, and working in a nut, *r*, on the rod *l*. This screw is provided with a hand-wheel, *t*, so that by turning the hand-wheel in one direction the wedges will be drawn down the inclines and lower the apparatus relatively to the wheel, or, moved up the inclines, will raise the apparatus relatively to the wheels—an adjustment well known in mechanics. Other adjustment, however, may be supplied, it only being desirable that some kind of an adjusting apparatus should be employed.

The receiver may be dispensed with and the blanks delivered singly into the guideways in front of the follower; or the receiver, the cutters, and the follower may be dispensed with and the blanks delivered single to the feed-rolls, which will take the slates successively, each succeeding slate entering the guides, and by the movement imparted to it force the next preceding slate forward over the guides; or the feed-rolls may be dispensed with and the follower alone used as a means for feeding the slates into the grooves, each succeeding slate forced by the follower driving the previous slate forward over the grinding-surface.

I claim—

1. The combination of the following elements: a wheel having its rim provided with a grinding-surface in a plane substantially parallel with the plane of the wheel, the said rim having a space within it, into which the blanks will pass after having been operated upon by the grinding-surface, guides to receive and conduct the blanks in a plane parallel with the grinding-surface of the said wheel, and a feeding device, substantially such as described, outside the grinding-wheel, to force the blanks successively through the guides radially over the grinding-surface, substantially as described.

2. The combination of the following elements: a wheel having its rim provided with a grinding-surface in a plane substantially parallel with the plane of the wheel, guides to receive and conduct the blanks in a plane parallel with the grinding-surface of the said wheel, and a feeding device, substantially such as described, to force the blanks successively through the guides over the grinding-surface, with stationary cutters arranged at opposite edges of the slate, substantially as and for the purpose described.

3. The combination of the following elements: a wheel having its rim provided with a grinding-surface in a plane substantially parallel with the plane of the wheel, guides to receive and conduct the blanks in a plane parallel with the grinding-surface of the said

wheel, and a feeding device, substantially such as described, to force the blanks successively through the guides over the grinding-surface, and an adjusting device, substantially such as described, to adjust the guide and feeding mechanism relatively to the grinding-surface, substantially as described.

4. The combination of the following elements: a wheel having its rim provided with a grinding-surface in a plane substantially parallel with the plane of the wheel, guides to receive and conduct the blanks in a plane parallel with the grinding-surface of the said wheel, and a feeding device, substantially such as described, to force the blanks successively through the guides over the grinding-surface, a receiver for the blanks to be ground, and a reciprocating follower moving through slots in the said receiver at the bottom to successively take the blanks from the bottom and deliver them to said guides, substantially as described.

5. The combination of the following elements: a wheel having its rim provided with a grinding-surface in a plane substantially parallel with the plane of the wheel, a follower to which a reciprocating movement is imparted in a plane parallel with the surface of the grinding-wheel, guides to receive the blank to be ground, extending over the grinding-surface, and feed-rolls to force said blanks over the grinding-surface of the wheel, substantially as described.

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Witnesses:

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R. D. SMITH.