J. W. Fowle,

Mortising Machine.

No. 111,834. Patented Feb. 14. 1871.

Fig. 1.

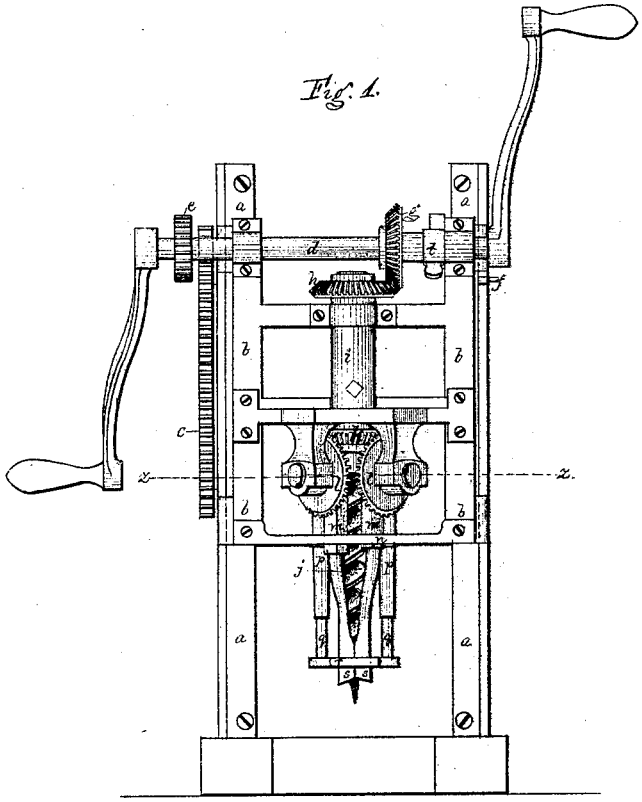

Fig. 2.

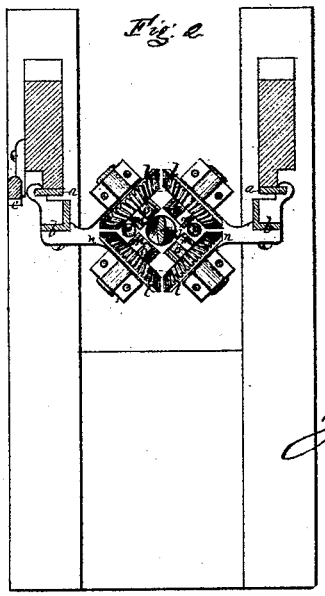

Fig. 4.

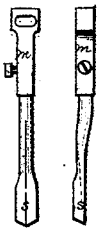

Fig. 3.

Witnesses { W. B. Crosby. C. Warren Brown.

Joseph W. Fowle.

United States Patent Office.

JOSEPH W. FOWLE, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 111,834, dated February 14, 1871.

IMPROVEMENT IN MORTISING-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, JOSEPH W. FOWLE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Mortising-Machines; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to that class of mortising-machines which make use of a boring device to remove the bulk of the material to be cut away, the hole made by the boring being enlarged and finished into rectangular shape by the action of a hollow-square chisel, within which the borer is contained, the borer acting to deliver out of the hole the cuttings made by the chisel as well as those made by itself.

In my invention I make use of four separate chisels surrounding the borer, which, by preference, is a common twisted auger, provided with a gimlet-pointed screw-threaded center, and with or without cutting-lips or spurs, the chisels being so arranged as to box in or encompass the auger, and to move into the material with the auger, the chisels having also imparted to them short reciprocating movements, so that the cutting-edges of the chisels operate to cut a clean well-defined outline of a rectangular hole by a series of short strokes.

By preference I employ chisels so made that the edge of each forms an angle of ninety degrees, and has a length equal to one-fourth of the perimeter of the finished hole; but the chisels might be made flat instead of angular, though in such case the angles of the hole made would not be so perfect, and the chisels, not being so stiff as are the angular chisels, would be more apt to spring and break.

The chisels I surround by a guiding-band, which rests on the surface of the material to be mortised, and yields as the cutters enter said material, and, by an adjustable stop applied thereunto, may be made to operate to gauge the depth of the hole to be mortised.

Figure 1 is a front elevation of a machine so constructed as to embody my invention.

Figure 2 is a section taken in the plane of the line *z z*, showing parts of the machine in plan beyond.

Figure 3 is a reversed plan of the piece which acts as the chisel-guide and depth-gauge, and exhibits also the cutting-edges of the chisels and auger.

Figure 4 embraces a corner and an edge view of one of the chisels, and the stock in which it is secured and by which it is operated.

The frame used is so similar to those employed in other machines for the same purpose that special description of it, beyond reference to the drawings, is not needed.

On this frame are ways *a*, on which a carriage, *b*, is so mounted that it can move up and down thereon.

A rack, *c*, is also fixed on the frame, so that when (by sliding endwise the shaft *d*) the pinion *e* is geared into said rack, the frame *b* can be moved up or down by rotating shaft *d*.

A spring-catch, *f*, is arranged so as to sustain the carriage *b* at a convenient position while adjusting material to be mortised.

On shaft *d* is a bevel-gear, *g*, which, when pinion *e* is out of mesh with rack *c*, takes into a similar bevel-gear, *h*, on a vertical shaft, *i*, mounted in bearings in carriage *b*, and provided with means at its lower end for receiving and holding the auger *j*.

Just above the lower end of the shaft *i* is fixed the bevel-gear *k*, which meshes into four bevel-gears *l l l l*, supported by suitable bearings connected to carriage *b*.

Each of the gears *l* carries a wrist or crank-pin, *o*.

Each crank-pin works in a slot formed in the upper end of a chisel-stock, *m*, so that, by rotations of gears *l l l l*, all of the chisel-stocks are reciprocated, the stocks being guided by fitting the piece *n* where they pass through it, said piece being secured to carriage *b*.

In piece *n* are secured two guide-tubes, *p*, in which are fitted, so as to slide therein, two rods, *q*, and to the lower ends of these rods is fixed the piece *r*, which serves to guide the cutters *s*, and may be made to act as a gauge to determine the depth of the mortises to be cut by having an adjustable collar on one of the rods *q*, located between piece *r* and the end of one of the tubes *p*. Heads on rods *q*, or pins in them, prevent the rods and the piece *r* from becoming detached from the machine.

It will now be seen that when shaft *i* is rotated so as to turn the auger, the cutters *s* will reciprocate, and that if carriage *b* is released from the spring-catch *f*, the carriage and its attachments will descend until the pointed screw of the auger touches the material to be mortised, and the weight of the carriage and the rotations of the auger cause the said pointed screw to feed or draw the cutters in the material submitted to their action, the auger throwing the chips made out of the hole.

The reciprocations of the chisels may be arranged relatively to each other, as may be desired.

When the desired depth of mortise is obtained the latch *t* is lifted, which allows the operator to slide the shaft *d* endwise, so as to disconnect the bevel-gears *g* and *h*, and to connect pinion *e* and rack *c*, and then, by turning the shaft *d*, the cutters and carriage *b* are elevated to the place where the spring-catch *f*, will sustain the carriage. When the material is adjusted to receive a second operation from the cutters, the shaft *d* is moved endwise in a reverse direction, and

the latch *t* is dropped into its place to keep the bevel-gears *g h* in mesh.

When the boring-tool is not supplied with a center or point which will cause it to feed itself into the material, or when the material is of such nature as will not permit the use of such a feeding center, then the whole frame may be pressed to the work by a feeding mechanism, or by a more simple device, such as a lever and weights.

In practice I prefer to make the cutting-edges of the chisels angular, as shown, so as to give the advantage obtained by a drawing stroke, but the cutting-edges might be arranged in a plane at right angles to the axis of the auger.

I claim—

1. In a mortising-machine, in which a boring-tool is used to remove the bulk of the material to be cut away, the combination of the slotted chisels with their driving mechanism, as herein shown and described.

2. The combination of the chisel-guiding and depth-gauging piece *r* with the combined boring-tool and chisels, substantially as and for the purpose set forth.

JOSEPH W. FOWLE.

Witnesses:

J. B. CROSBY,

C. WARREN BROWN.