2 Sheets—Sheet 1.

J. G. DIMOND.

MACHINE FOR GRINDING AWL BLANKS.

No. 187,257. Patented Feb. 13, 1877.

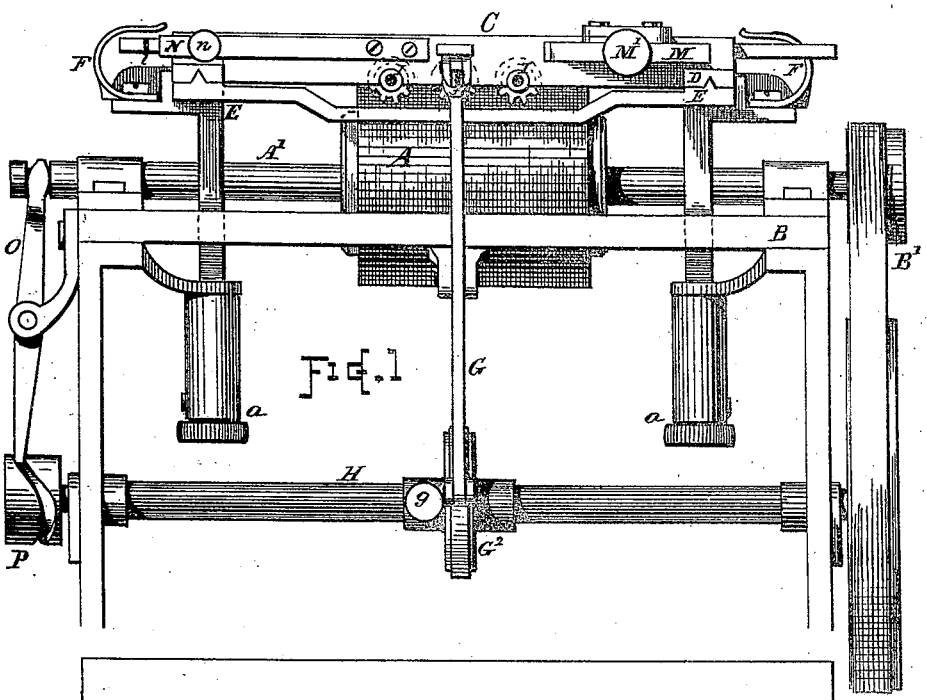

Fig. 1

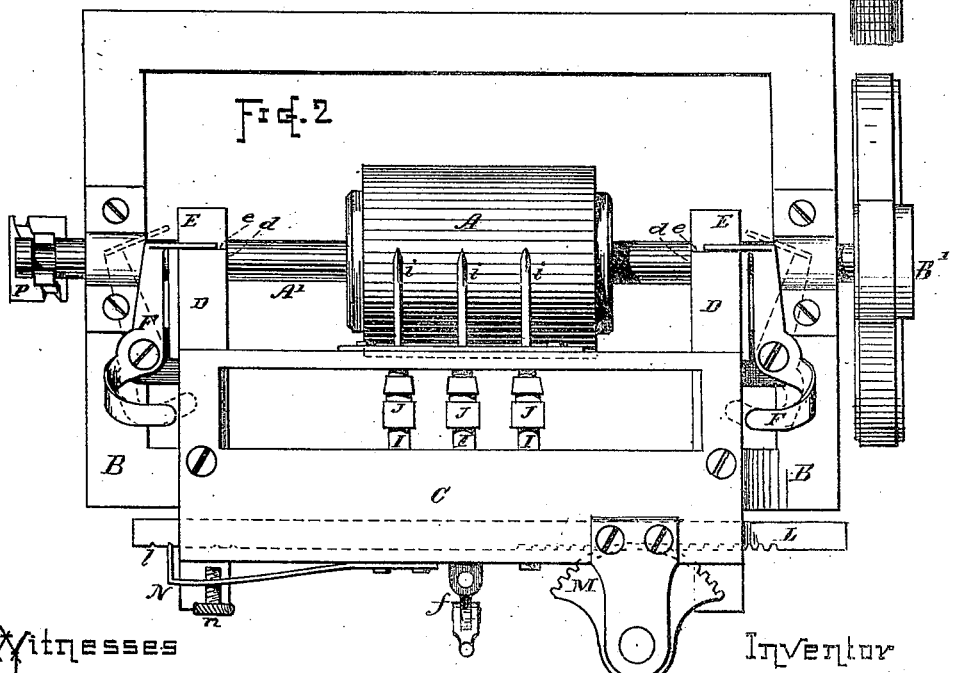

Fig. 2

Witnesses

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2 Sheets—Sheet 2.

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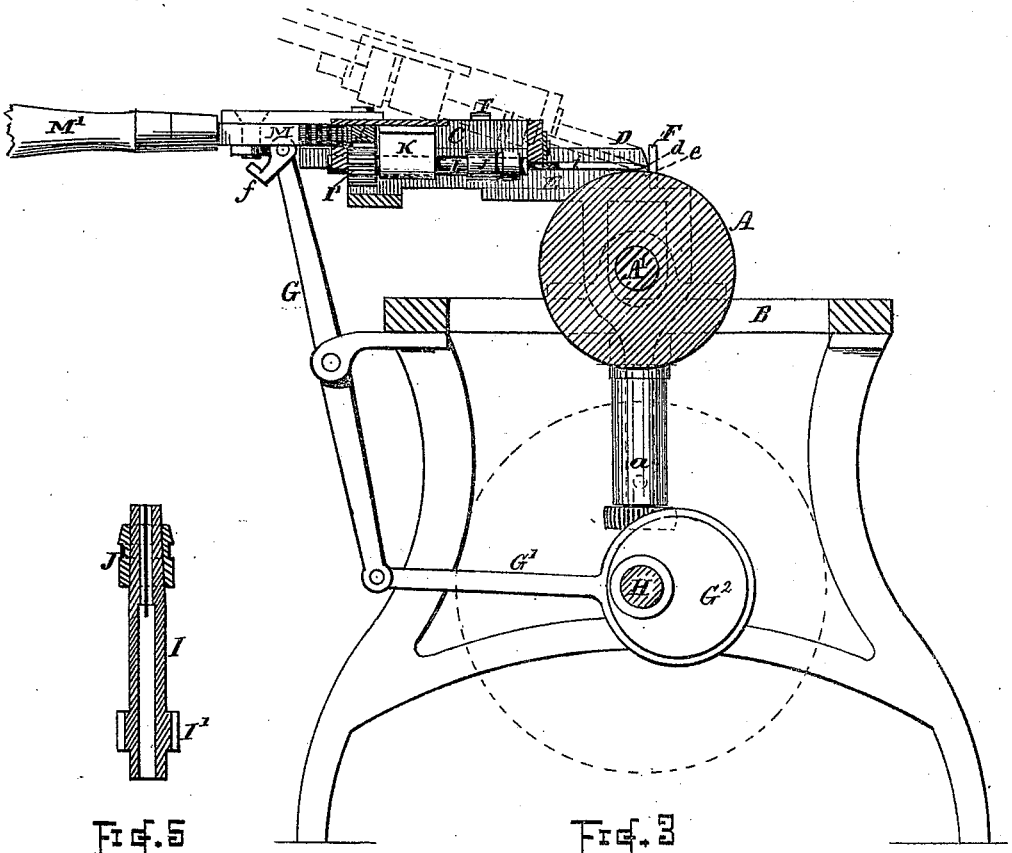

Fig. 3

Fig. 5

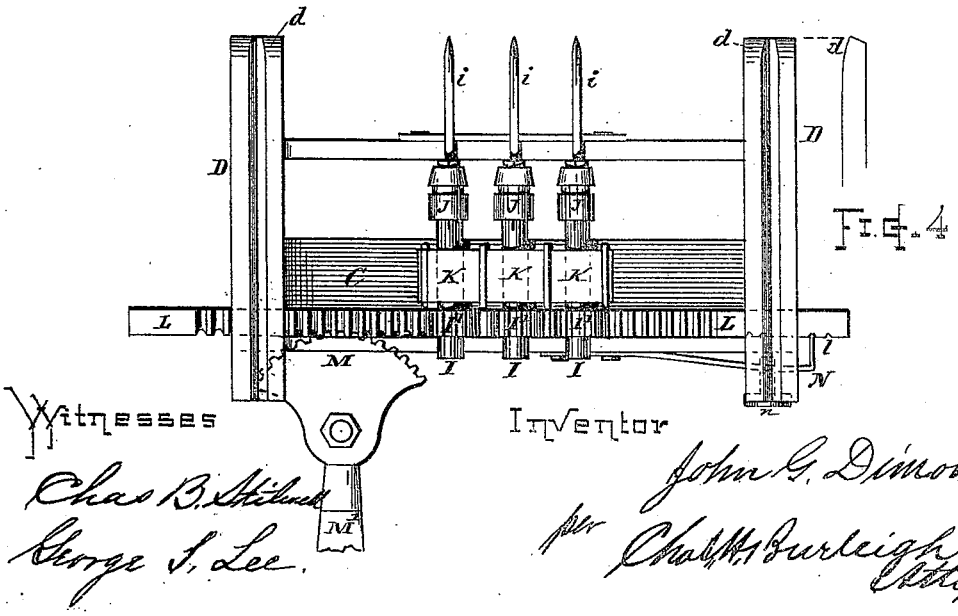

Fig. 4

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN G. DIMOND, OF OXFORD, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR GRINDING AWL-BLANKS.

Specification forming part of Letters Patent No. 187,257, dated February 13, 1877; application filed June 23, 1876.

To all whom it may concern:

Be it known that I, JOHN G. DIMOND, of Oxford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Awls; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a front view of mechanism constructed in accordance with my invention. Fig. 2 represents a plan view of the same. Fig. 3 represents a transverse vertical section of the same. Fig. 4 shows a bottom view of the awl-holding frame; Fig. 5, a detail view of the awl-clamp.

The nature of my invention consists in the employment, in combination with a grinding-wheel, of mechanism for supporting and guiding a series of two or more awls in contact with the grinding-surface of said wheel, so that the entire series may be simultaneously ground to a uniform size and shape, as hereinafter set forth.

Another feature of my invention consists in the employment, in machinery for making awls, of mechanism organized to operate substantially as hereinafter set forth, whereby an entire series of awls can be simultaneously rotated and adjusted to corresponding positions, for the purpose of forming the bevels of the points of uniform shape, and at equal angles.

Other minor features of this invention are fully set forth in the following description and claims.

In the drawings, A denotes the grinding-wheel, which may be of emery, stone, metal, or any other suitable material used for grinding purposes. Wheel A is mounted upon a shaft, A′, supported by a suitable frame, B, and operated by belt and pulley B′, or in other convenient manner. C indicates the awl-holding bar or carriage, provided at its ends with pattern-pieces D, which rest upon adjustable guiding-supports E, the latter being in turn supported upon the main frame B, and rendered vertically adjustable in relation to the grinding-wheel by the screw device *a a*, or other suitable mechanism. The guides E are made to serve as ways upon which the pattern-pieces D can slide, to allow the carriage a reciprocating motion, the plane of said motion being tangential or nearly so with the periphery of the grinding-wheel A. The front ends *e* of said guides E are also rounded off with a curve corresponding with the curve of the grinding-surface on wheel A, and the front ends of the pattern-pieces D are rounded with a curve, *d*, similar to which the awl-points are to be formed, so that, by raising the rear part of the carriage C, as indicated by dotted lines in Fig. 3, the two curved surfaces *d* and *e* roll upon each other, and regulate the action of the grinding-surface upon the material from which the awls are formed. Lock-pieces F are attached to the guide-frame E, which can be swung to different positions, as shown by full and dotted lines, Fig. 2, in one position to serve as a stop against which the end of the pattern D is set, and in the other position to serve as a lock for holding the carriage C squarely down upon the guideways E, while it is operated with its reciprocating movement. G indicates a lever, operated by the connecting-rod G^1, and eccentric cam G^2 on the driving-shaft H, for the purpose of imparting reciprocating motion to the carriage-bar C. Said lever G is joined with the carriage C by a hook, *f*, and loops, whereby it can be connected and disconnected at pleasure. Eccentric G^2 is provided with hand set-screw *g*, so that it may readily be loosened on the shaft H, when not required for use. I I I indicate the clamps in which the awls *i* are supported while being formed. Said clamps are formed, as shown in Figs. 4 and 5, of short spindles, having longitudinal openings through their axes, into which the awl-shanks fit, and are there clamped by means of collars J forced onto the ends of the spindles, said ends being split and tapered, so that they are caused to close firmly in upon the shanks.

The awl-clamps I are arranged in close series along the under side of the carriage-bar C in a plane with the pattern-pieces D, and at right angles to the carriage, which is provided with suitable depressions for their reception, and to which they are retained by loops K, or other suitable attachments, which

permit of their ready removal and replacement from the bar C.

The clamp-spindles I are each provided with a small spur-gear, I′, which meshes with a rack, L, fitted in the carriage-bar C, and arranged for longitudinal movement by means of the segment-gear M and hand-lever M′, whereby the entire series of clamps can be simultaneously rotated, and each to an equal extent, for the purpose of turning the awls and changing their position on the grinding-surface.

Notches *l* are formed on the rack-bar L, and a latch-spring, N, is fixed to the side of the carriage, for entering said notches, to facilitate the adjustment of the clamps, and to retain them in adjusted position.

The wheel A and its shaft A′ are made to traverse back and forth longitudinally with their axis by means of an oscillating lever, O, and operating-cam P, so that the surface of said wheel A will be subjected to equal wear on all parts.

The operation of making awls is as follows: The wire or rods *i*, from which the awls are to be formed, are placed in position, and the clamps arranged on the carriage-bar C, which latter is then placed on the guide-ways E, and the locks F turned to the position indicated by dotted lines, Fig. 2. The carriage-bar C is then operated with a back and forward motion by aid of the eccentric G^2, lever G, and hook *f*, carrying the awl-rods in a direction parallel with their axes, in tangential contact with the periphery or grinding-surface of the revolving wheel A, while at the same time a rotary motion is imparted to the clamps I and awl-rods *i* by a back and forward movement of the crank-lever M′, which works the rack L, the spring N, in the meantime, being held out from the notches *l* by the aid of screw *n*.

In the above manner the awl-bars are all ground to a uniform size, and to cylindrical form, their thickness being governed by the vertical adjustment of the guides E in relation to the surface of the grinding-wheel A.

When the bars *i* have been properly sized, the lock-pieces F are turned to the position shown in full lines, and the hook *f* disengaged from the carriage, while the spring N is set in the first notch *l* of the rack L. The ends of the patterns D are then placed against the stop F, and the first bevel of the awl-points is formed by raising the rear part of the carriage, as indicated by dotted lines, Fig. 3, with the curved surfaces *d* and *e* in contact, and rolling upon each other. The other bevels of the awl-points are formed in similar manner, first adjusting the clamps to the proper positions, by moving the rack L so as to allow the spring N to fall into the notches *l*, corresponding to the respective required positions of the clamps and awl-bars.

It will be observed that, by the use of my improved mechanism, a large number of awls can be simultaneously formed, the number being only limited by the length of the grinding-wheel and carriage-bar; also, that the size of the awls, the angles of the bevels, and the curvature of the points will be uniform throughout the entire series, while the quality and finish of the awls are further enhanced by reason of the grinding being done in the direction of their length, the effect being to render the awls less liable to break, and also to work easier when in use.

Having described my improvements in machinery for making awls, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The vibrating carriage-bar C, provided with pattern-pieces D, and carrying a series of awl-clamps, in combination with the grinding-wheel A and supporting-guides E, for the purposes set forth.

2. The combination, with the carriage-bar C, of the rotating awl-clamps I, gears I′, rack L, segment M, and lever M′, substantially as and for the purposes set forth.

3. The combination, with the grinding-wheel A, and its supporting-frame, of the adjustable grinding-frame E *e*, pattern-pieces D *d*, lock-pieces F, carriage-bar C, and awl-clamps I, substantially as and for the purposes set forth.

4. The combination, with the awl-clamps I, rack L, and segment-gear levers M M′, of the spring N and notches *l*, or other stop device, for indicating the adjustment of the parts, for the purpose set forth.

5. The combination, with the wheel A, carriage-bar C, and awl-clamps I, of shaft H, eccentric G^2, rod and lever G^1 G, and hook *f*, as and for the purpose set forth.

JOHN G. DIMOND.

Witnesses:

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H. C. PEASE.