2 Sheets—Sheet 1.

D. M. ROBERTSON.

Making Screws.

No. 16,778. Patented March 3, 1857.

Fig. 1.

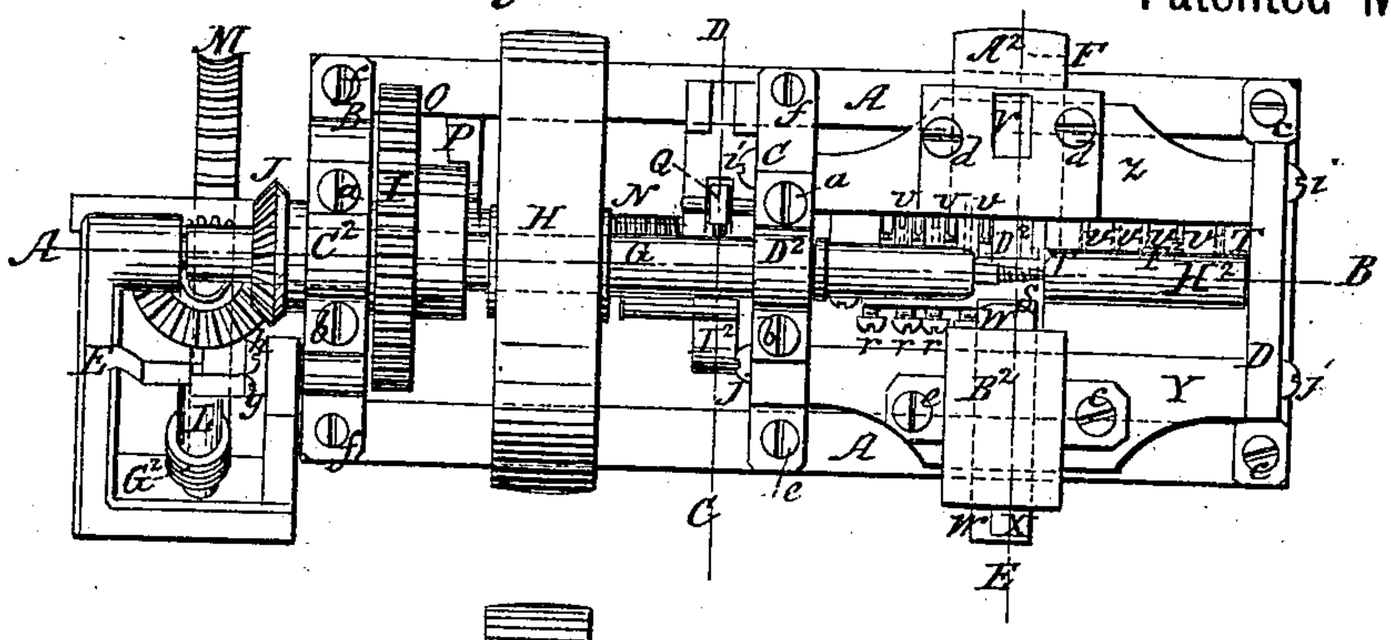

Fig. 2.

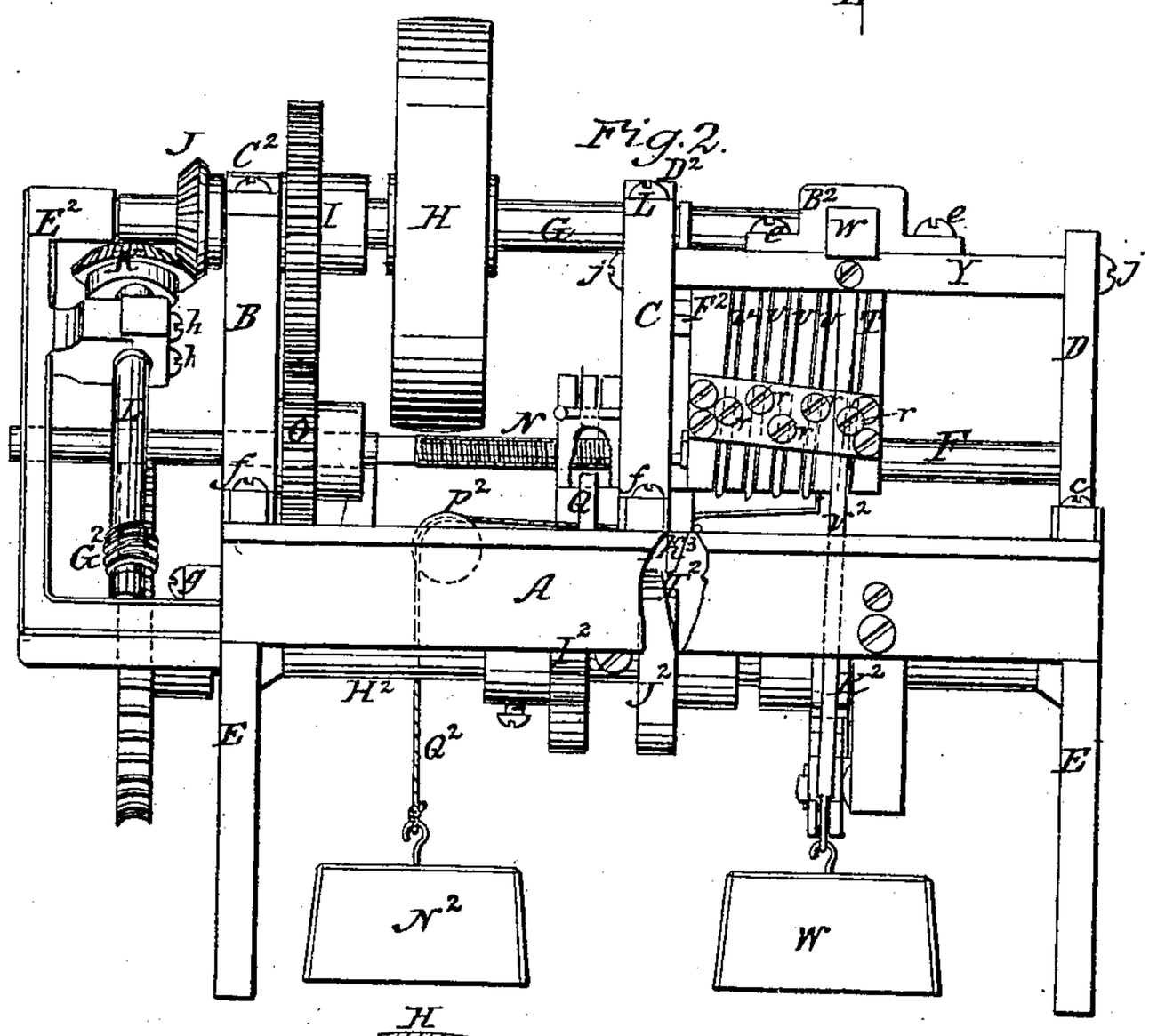

Fig. 5.

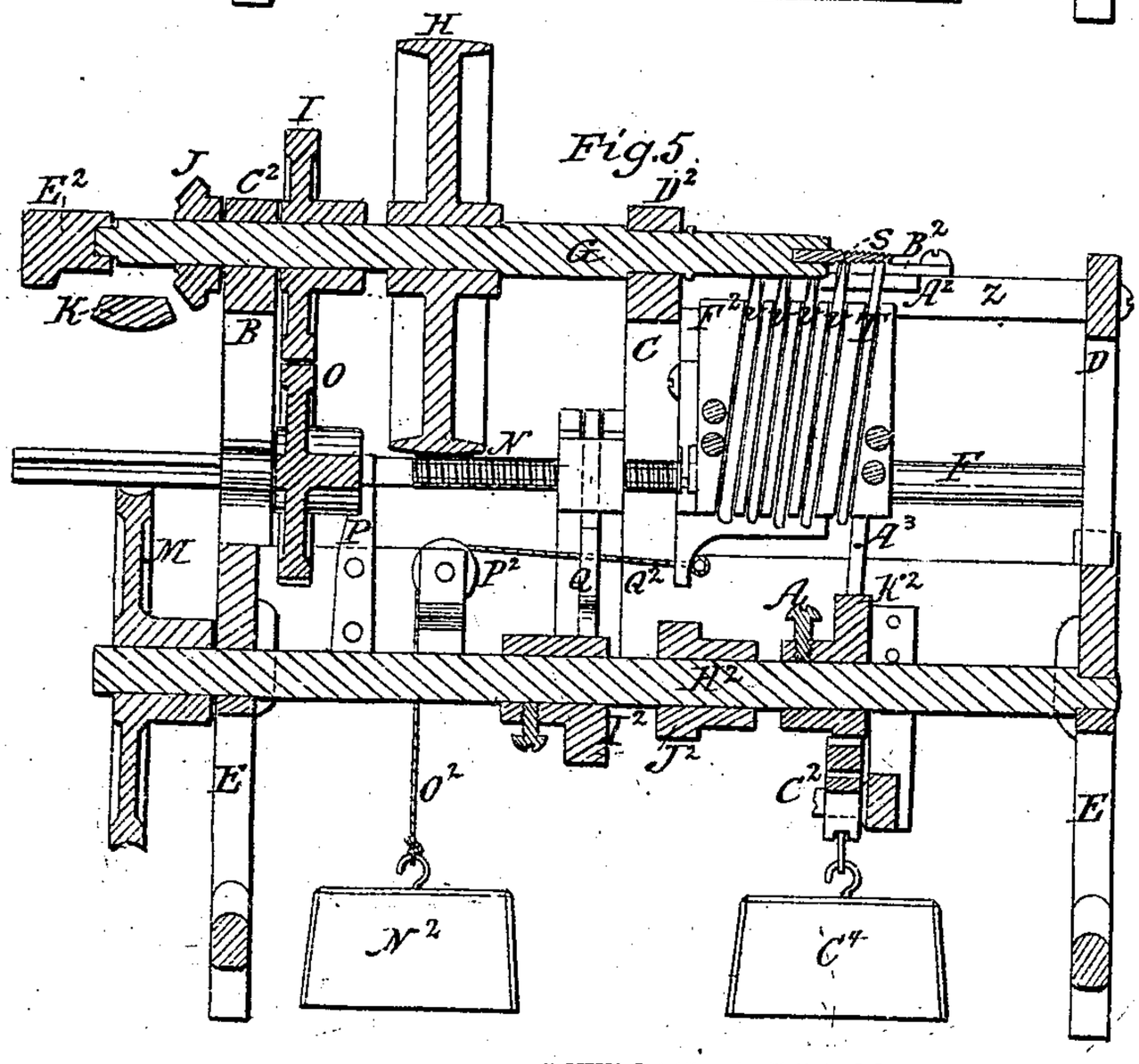

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Fig. 3

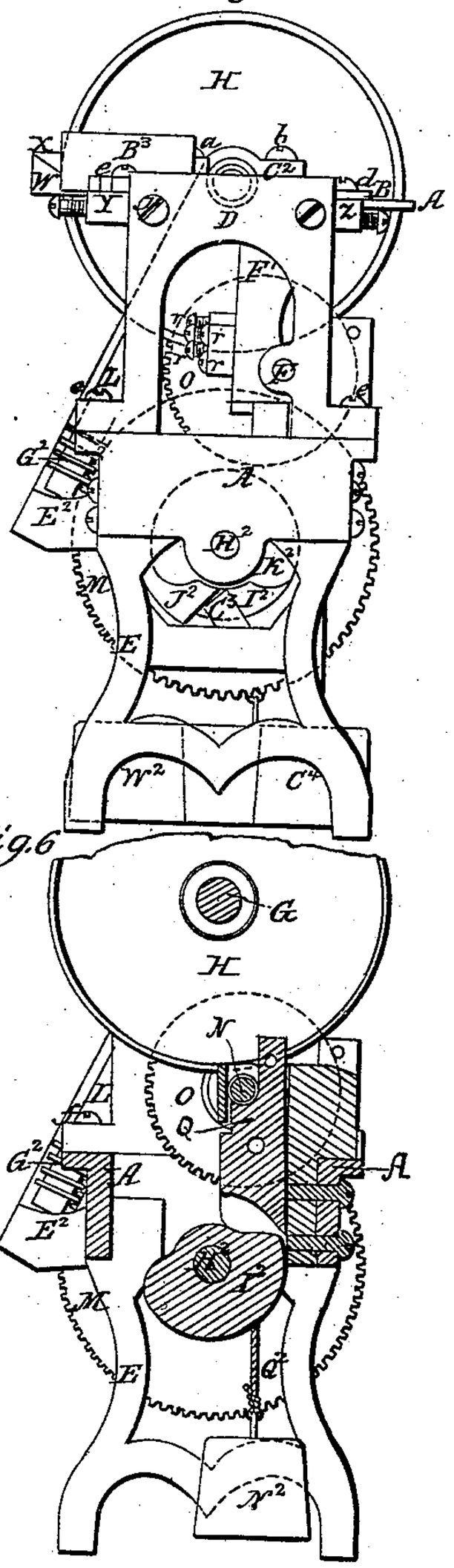

Fig. 4

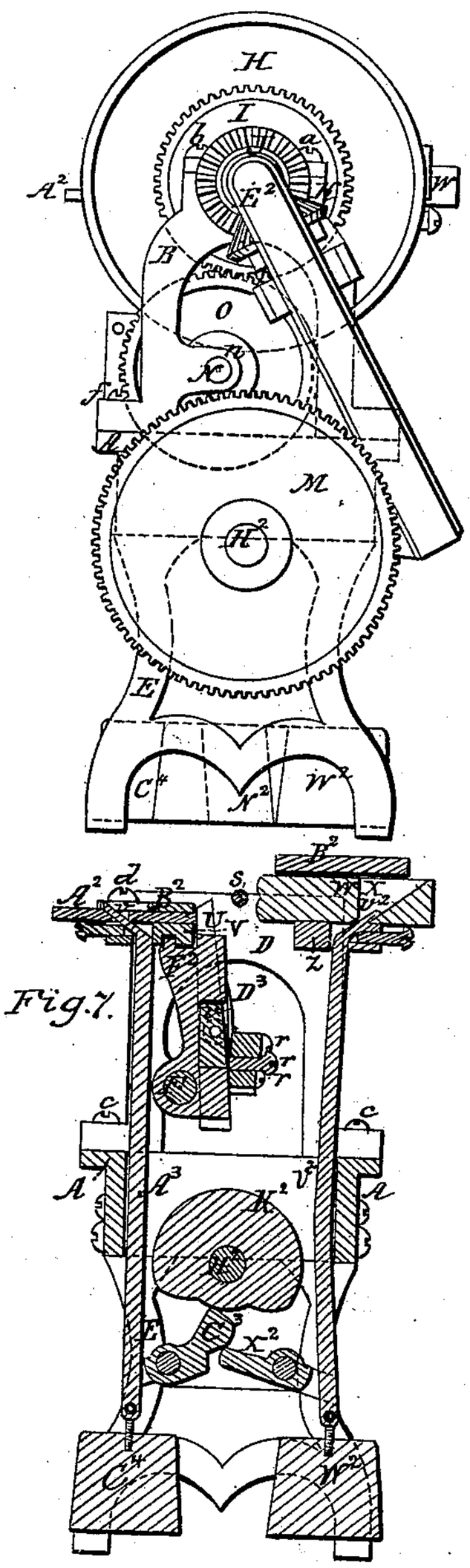

Fig. 6

Fig. 7.

UNITED STATES PATENT OFFICE.

DANIEL M. ROBERTSON, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN POINTING AND THREADING SCREWS.

Specification forming part of Letters Patent No. **16,778**, dated March 3, 1857.

To all whom it may concern:

Be it known that I, DANIEL M. ROBERTSON, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented a novel and useful Machine for Pointing and Threading Gimlet-Pointed Screws; and I do hereby declare that the following specification, in connection with the accompanying drawings and references thereon, constitutes a lucid, clear, and exact description of the construction and use of the same.

In referring to said drawings, Figure 1 denotes a plan or top view; Fig. 2, a side elevation of the same; Fig. 3, one end view of it; Fig. 4, an opposite end view of the same; Fig. 5, a longitudinal and vertical section of the same on line A B of Fig. 1, showing parts beyond. Fig. 6 denotes a transverse and vertical section on line C D, Fig. 1, also showing parts beyond. Fig. 7 is a transverse and vertical section on line E F, Fig. 1, showing parts beyond and in an opposite direction from the previous section.

The nature of my invention consists of my machine hereinafter described, so constructed that the tool holder and carrier which carries all the tools will be first moved with a slow feeding motion to cause the pointing or forward tool to remove the surplus metal from the end of the screw-blank necessary to impart to it the gimlet-pointed shape, which is followed immediately by the threading-tools for forming the thread to an exact nicety on the body of the blank and cutting the thread on the point of equal depth, and consequently leaving the wire at the bottom of the thread on the main body of the screw perfectly straight and true.

Before proceeding to describe the construction and use of my machine it will be proper to state that the longitudinal motion of the threading-tools on all machines heretofore used has been irregular by reason of the tools or tool-stocks swinging on a pivot or revolving on a cylinder, which forces these tools to move faster while forming some parts of the thread than others, besides their swinging motion, which will form the sides of the thread irregular, either of which defects must make every screw-thread irregular and imperfect and coarser in some places and finer in others, which will be readily seen, and it has been attempted to remove the surplus metal at the end of the blank to give it the gimlet-pointed shape by the threading-tools with the same speed of movement which does the threading. This is impossible to do practically, for no wire will stand to allow so much metal removed so sudden and in so large chips from its end; consequently a broken rough point is the result of such an experiment.

To enable persons skilled in the art to which my invention appertains to construct and carry out the same, I will describe it as follows: I construct a substantial iron frame, (seen at A in all the figures of the drawings,) which frame is elevated and supported on strong iron legs or supports. (Seen at E, Figs. 2, 3, 4, 5, 6, and 7.)

To the top of the frame A is secured the iron stands B and C, Figs. 1, 2, 3, and 4, by the screws *f*, same figures, to which the drive-shaft G is suspended, so as to freely revolve in the bearings C^2 and D^2, Figs. 1, 2, and 3, held by screws *a* and *b*, same figures.

The drive-pulley H, Figs. 1, 2, 3, 4, 5, and 7, is firmly secured to the shaft G, Figs. 1, 2, 3, 5, and 6, which is shaped, as desired, to receive and firmly hold and turn the wood-screw blank S, Fig. 1, for pointing and threading. The shaft G, Figs. 1, 2, 3, 5, and 6, carries the gear I, Figs. 1, 2, and 4, which gears into and revolves the gear O, Figs. 1, 2, 3, 4, 5, and 6, which turns the screw N by its spline *n*, Fig. 4, sliding through it for moving the threading-tools and tool-stock F^2, which carries them. The gear O is kept in position by the stand P, Fig. 1.

To the outer end of the frame A, (seen in all the figures,) I secure an iron stand frame (seen at E^2, Figs. 1, 2, 3, 4, 5, and 6,) by the screws *g*. The top of the stand E^2 constitutes a step for the end of the shaft G, Figs. 1, 2, 3, 5, and 6.

The shaft L, Figs. 1, 2, 3, and 6, is fitted so as to revolve in the stand E^2 in the box secured by the screws *h*, Figs. 1 and 2. The upper end of this shaft is provided with and fastened to a bevel-gear, (seen at K, Figs. 1, 2, 4, and 5,) which gears into and is driven by a corresponding bevel-gear J, Figs. 1, 2, 4, and 5, fixed to the drive-shaft G, Figs. 1, 2, 3, 5, and 6. To the lower portion of this shaft I secure a worm, (seen at G^2, Figs. 1, 2, 3, and 6,) which is fitted into and turns the worm-gear M, Figs. 1, 2, 3, 4, 5, and 6, which is fast-

ened to and slowly turns the cam-shaft H^2, Figs. 2, 3, 4, 5, 6, and 7, which is fitted so as to freely revolve in the frame A, as seen at Fig. 4, and which carries the cam I^2, Figs. 2, 3, 5, and 6, for raising the nut Q, Figs. 1, 2, 5, and 6, into the screw N, Figs. 1, 2, 3, 5, and 6, when the threading-tools are to be moved along to form the thread in the screw which is being made, and when the threading is completed the recess formed in the cam I^2 will allow the nut Q to drop from the screw N, when the weight N^2, Figs. 2, 5, and 6, pressing down the chord Q^2, Figs. 2, 5, and 6, which runs over the pulley P^2, Figs. 2 and 5, will draw back the tool-holder F^2, Figs. 1, 2, 5, and 7, into the right position to commence pointing and threading the next screw-blank, and so on.

The cam J^2, Figs. 2, 3, and 5, is beveled, as seen at T^2, Fig. 2, and this bevel comes directly in contact with the stand K^3, Figs. 2 and 5, which is secured to the tool-holder F^2, Figs. 1, 2, 3, 5, and 7, by which the pointing-tool T moves slowly to point the blank. When so pointed, the nut Q is elevated so as to connect it with the screw N, which then moves along by being connected to the nut Q to cause the threading-tools U and stock F^2, which carries them, to be moved to thread the screw-blanks with the utmost speed and accuracy. The first movement of the tool-stock being slow by the cam J^2 pressing it forward until the pointing-tool T points the screw-blank, then immediately the nut Q is raised by the cam I^2, so as to connect it with the screw N, which then moves along the right speed to cause the threading-tools to form the screw-thread on the blank in the least possible time and in the most perfect manner.

To the top and at one end of the frame A, Figs. 1, 2, 3, 4, 5, 6, and 7, I erect the stand D, Figs. 1, 2, 3, 5, and 7, which is securely held thereto by the screws *c c*, and I connect the top of it to the stand C by the plates Y and Z, Figs. 1 and 2, by the screws *i* and *j*, same figures.

To the top of the plate Y, Figs. 1 and 7, I fit to a recess a sliding guide, (seen at W, Figs. 1, 2, and 7,) which slides in the socket B^2, Figs. 1, 2, 5, and 7, and the recess under it for guiding and sustaining the screw-blank while being threaded, this socket being held down by the screws *e e*, Figs. 1 and 2. The guide W has a beveled slot X formed in it, to which is fitted the beveled cam U^2, Fig. 7, which is formed on the top of the rod V^2, Figs. 2 and 7. This rod reaches down and is connected to the weight W^2, Figs. 2, 3, 4, and 7, which is acted upon by levers (seen at X^2 and C^3) moved by the cam K^2 to slide this guide W, Figs. 2 and 4, by the raising of the rod V^2 forward, definitely moved and held against the screw-blank to sustain it while being threaded, and to definitely draw back the guide W by the downward movement of the rod V^2 by the weight W^2 to allow the screw S to be freely discharged from the shaft G, in which and by which it is turned to be pointed and threaded.

I form a shaft (seen at F, Figs. 2, 4, and 6) and fasten it stationarily to the stands C and D exactly parallel or on a line with the drive-shaft G for the tool-holder to move upon, so as to form the screw-thread exactly on a line or straight with its straight surface and to form them even and smooth on the gimlet-point and to form all the threads the same distance apart on all parts of the screw-blank, which is necessary for the screw to hold well when in use, for it is certain that if the threads are not even and of equal distance apart the screws will not hold so well in the wood and will drive harder than if they were even.

To the plate Z, Figs. 1, 5, and 7, I fit the sliding guide-plate (seen at A^2) held down by the cap B^3 and screws *d d*, its inward edge being shaped or formed exactly as the bottom of the thread of the screw should be. This guide is moved inward by the movement of the cam V, Fig. 1, and rod A^3, Fig. 5, upward by the cam K^2 pressing down the inner end of the lever C^3 and forces up its opposite end, to which the cam V and rod A^3 are connected. The perpendicular part of the rod A^3 is fitted closely to the plate Z, so that when the rod is fully raised the guide-plate A^2 will have a direct and firm metallic bearing against the surface of the rod A^3, and this in turn presses against the surface of the hole in the plate Z, to which it is fitted, thus constituting a very firm support for the guide-plate A^2 when the pointing-tool T and threading-tools U are moved along to point and thread the blank for the screw. The back surfaces of these tools come directly against the edge of the plate A^2 one after another until they are all past the blank and the pointing and threading completed. Then the cam V is lowered by the turning of the cam K^2 and downward pressure of the weight C^4 drawing back the plate A^2, after which the tool-stock is drawn back by the weight N^2 into position to operate upon the next screw-blank, and so on.

It will be seen that the cam K^2 moves both the guides W and guide A^2 to hold the screw-blank and to guide the pointing and threading tools together at the same time and apart at the same time, as will be seen in Fig. 7.

It will be seen that the red lines in various parts of my machine show the opposite extreme movement of the parts from that shown in black lines, so that their movements from point to point will be seen at a glance.

The pointing and threading tools are formed of two parts connected together by a swinging joint, the lower portion being held by the screws *r* firmly to the tool-stock F^2, while their upper ends are allowed to move forward by the guide-plate A^2. A spring (seen at D^3, Fig. 7) presses these tools back against the plate A^2.

The use or operation of my machine will be

fully understood from the foregoing description of construction, the screw-blanks being fed to the spindle G by any desired means.

I believe I have described and represented my improvements in machines for pointing and threading screws so as to enable any person skilled in the art to make and use them.

I will now state what I desire to secure by Letters Patent, to wit:

1. A pointing-tool arranged in connection with one or a series of threading-tools and traversed slower than the threading-tools and so far in advance of them as to form the point of the screw-blank and prepare it for the threading-tools, substantially as described, whether the pointing-tool is traversed by the devices described or by such other devices as will answer the purpose.

2. The plate or guide A^2 when made to traverse, substantially as described, whether it is operated by the devices described or such others as will answer the purpose.

3. The guide or rest W when made to traverse, substantially as described, whether it is operated by the devices described or such others as will answer the purpose.

DANIEL M. ROBERTSON.

Witnesses:

HENRY G. LOWELL,

JACOB B. DANIELS.