A. E. HIX.

STENCIL PEN.

No. 185,827. Patented Jan. 2, 1877.

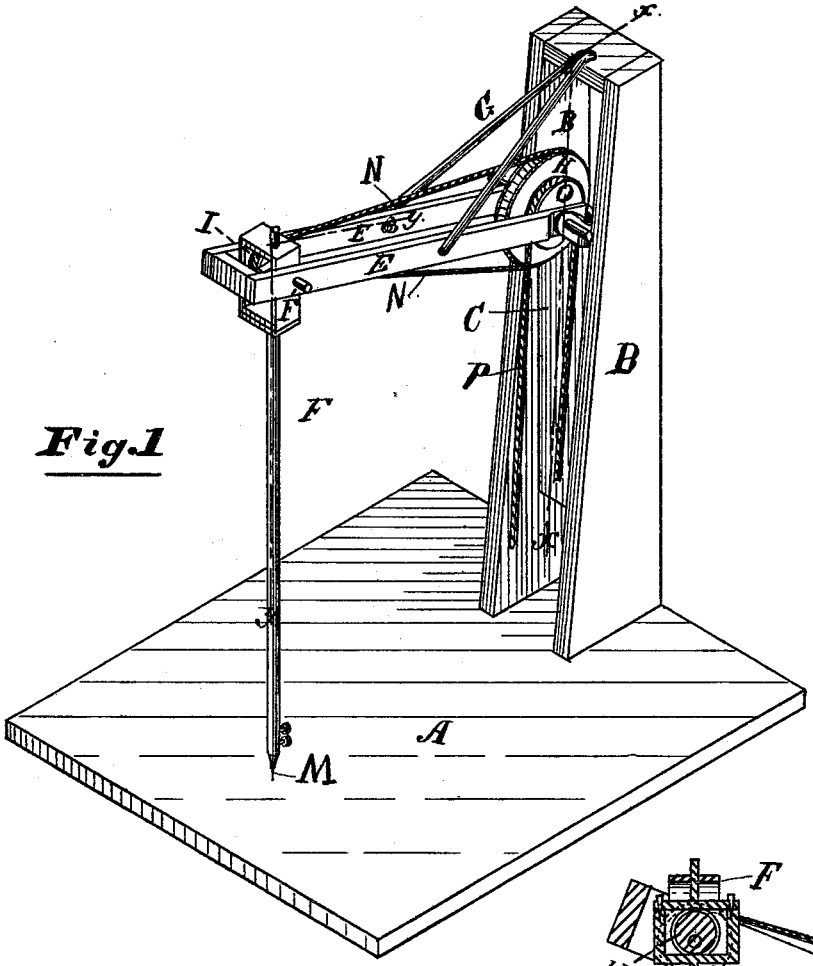

Fig. 1

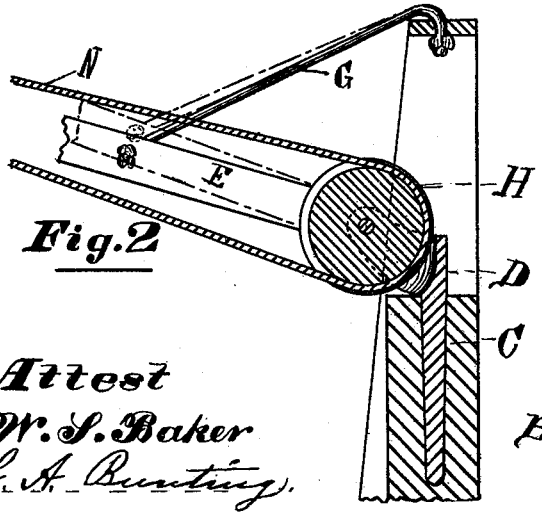

Fig. 2

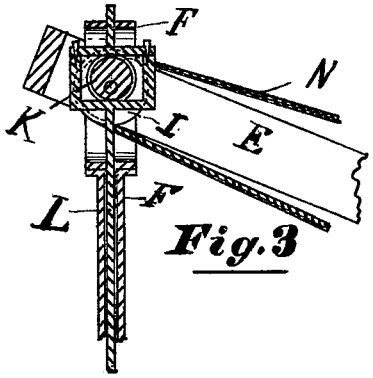

Fig. 3

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UNITED STATES PATENT OFFICE.

ALBERT E. HIX, OF SYCAMORE, ILLINOIS.

IMPROVEMENT IN STENCIL-PENS.

Specification forming part of Letters Patent No. **185,827**, dated January 2, 1877; application filed July 29, 1876.

To all whom it may concern:

Be it known that I, ALBERT EUGENE HIX, of Sycamore, in the county of De Kalb and State of Illinois, have invented a new and useful Improvement in Stencil-Pens, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of the apparatus; Fig. 2, a vertical section taken on the line *x x*, Fig. 1, a portion of the apparatus being broken away; and Fig. 3, a detail vertical section taken on the line *y y*, Fig. 1.

My invention relates to mechanism for preparing paper stencils to be used in making copies in the same way as those prepared by what is known as the "Electrical Pen."

The invention consists in mounting the pen or needle on an arm which has both a horizontal and vertical motion, so as to give the needle the required freedom of movement; and, also, in the special devices for driving the needle, as will be hereinafter fully set forth.

In the drawings, A represents a portion of the desk or table, and B B two upright posts or standards rigidly attached to the table, and joined together at their upper ends, so as to constitute a rigid and firm supporting-frame. The standards B B, instead of being attached to the desk or table, may be fastened to the wall of a room, or any other firm support which will enable the apparatus to be conveniently disposed for practical use. Between the standards B is secured a solid block, C, which is provided with a socket, as seen in Fig. 2 of the drawings. Within the socket in the block C is set a pin, D, the upper end of which is forked and bent outward, so as to receive one end of a swinging arm or light frame, E E, which is pivoted at its inner end to the ears of the pin D. The upper end of the tube F is pivoted to the outer end of the swinging frame E by means of a rectangular box, F′, upon the upper end. An elastic cord, G, is attached to the swinging frame E, some distance in front of its pivotal connection, and also to the top of the support B B. This cord should be sufficiently strong to prevent the frame E from falling by its own weight and the mechanism attached thereto, but at the same time should yield easily, so as to permit the needle to be held down to the paper without the exertion of much force. Instead of an elastic cord, a spring or other suitable elastic support may be employed.

Upon the pivot connecting the pin D and the arms E is placed a driving-pulley, H, located between the arms E E. A second small pulley, I, is mounted upon the pivot which joins the frame E and the needle-tube F, the pulley being within the box F′. An eccentric or cam, K, is fastened to the pulley I and made a part thereof.

The needle-pitman L is forked at its upper end, as seen in Fig. 3 of the drawings. A cross-bar is fastened to the free ends of the forked pieces, so as to form with them a suitable bearing for the eccentric K, which they are arranged to surround. The pitman L extends down through the tube F, and a needle, M, is attached to its lower end, and projects slightly through the lower end of the tube F, which is pointed and contracted to fit closely around the needles, as seen in Fig. 1 of the drawings.

A band, N, passes over the pulleys H and I, and it is evident, therefore, that if motion is communicated to the pulley H, a vibrating movement will be given to the needle M by means of the eccentric K and pitman L. A pulley, O, is mounted upon the same axis as the pulley H, to which it is secured, if the latter is a loose pulley; but if the pulley H is fastened to its journal-shaft, the pulley O may be separate therefrom, but secured to the journal-shaft. The pulley O is rotated by means of the band P, which passes around it, and is driven by an ordinary treadle and track, or any other simple device of like nature. This latter device I have not shown, as it is so common that its operation in this connection will be readily understood. By the motion of the pulley O the necessary motion is given to the pulley H to reciprocate the needle M, the vibrations of which may be made as rapid as desired by arranging the driving-pulleys suitably with reference to their size. The ears of the pin D project in front of the standard B, and are sufficiently contracted to permit the swinging around of the frame E to a considerable extent.

It will be seen that with my device the

needle may be moved in three directions—that is to say, it may be moved in the arc of a circle; by turning the pin D in its socket it may be swung back and forth in straight lines upon its own pivot; and it may be raised and lowered by raising and lowering the frame E on its pivotal connection. Sufficient freedom of motion is thus obtained for the needle to permit letters or other characters to be traced upon paper while the needle is vibrated, thereby forming a stencil, which is afterward used in making copies, in the usual manner.

By arrangement of the driving mechanism and supporting parts the needle is relieved from any great weight, and therefore can be guided upon the paper to form the stencil with great ease. The elastic cord G also assists in this direction, and acts to withdraw the puncturing-needle from the paper so soon as it is released.

I am aware that stencil-papers for copying have been prepared by an instrument called the "Electrical Pen," by which the puncturing-needle is driven by a small electrical engine mounted upon the needle-arm, and therefore I do not claim, broadly, a vibrating needle for making stencil-papers.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the swivel-pin D, swinging frame E, pivoted thereto, and needle-tube F, pivoted to said-frame, substantially as described.

2. The combination of the pulleys H and O, bands N and P, pulley I, eccentric or cam K, pitman L, and needle M, substantially as and for the purpose set forth.

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Witnesses:
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