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# SUPPORTING MEANS FOR OSCILLATING SEWING MACHINE HOOKS

Filed July 18, 1947

2 Sheets-Sheet 1

Fig. 1.

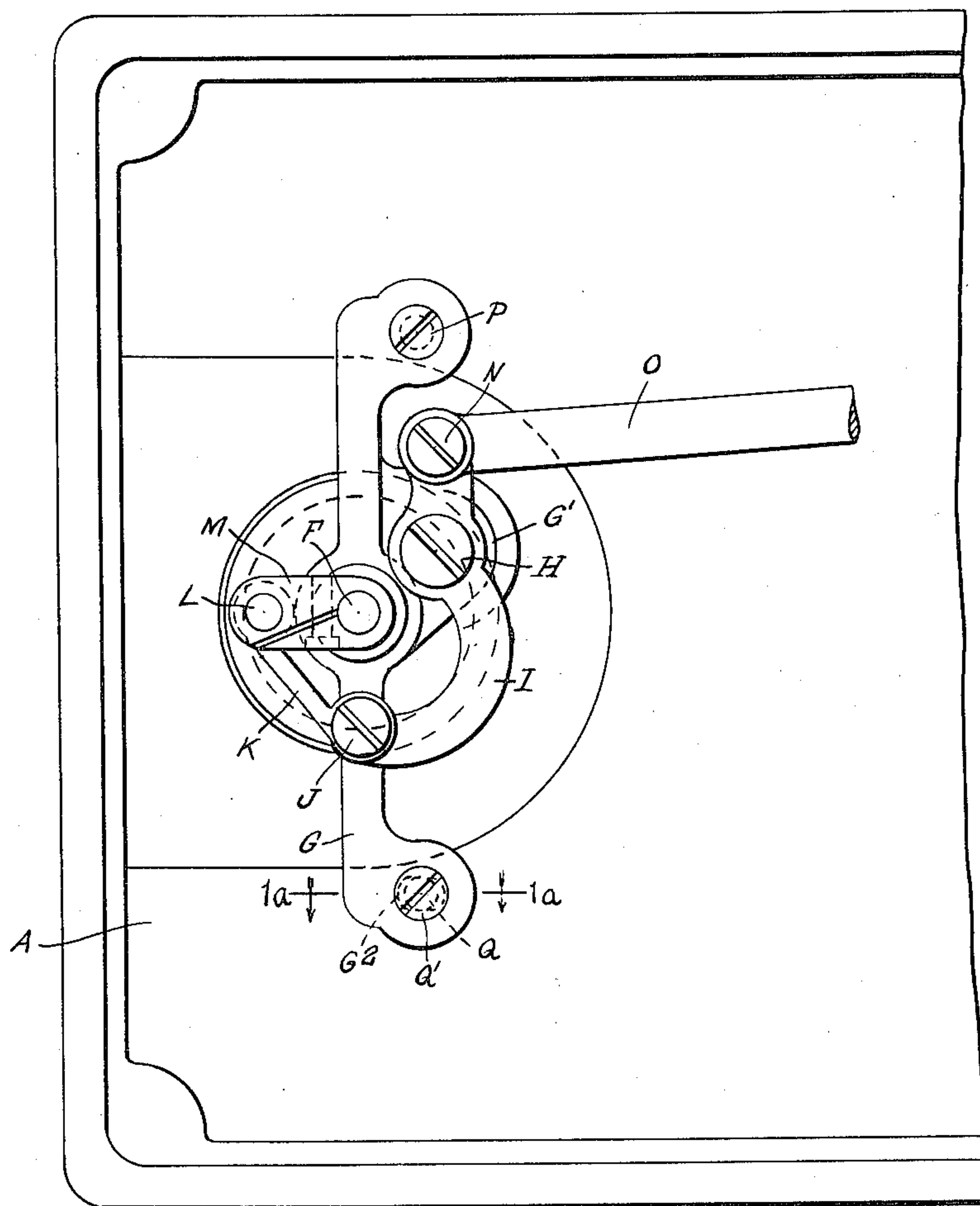
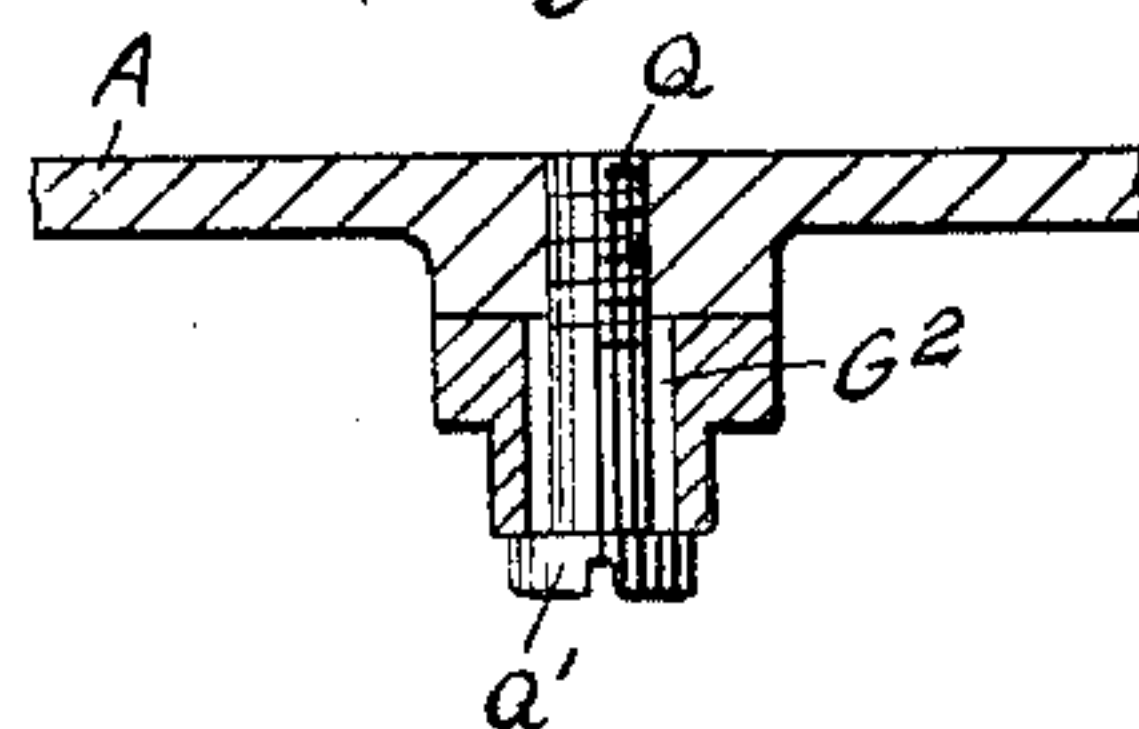


Fig. 1a.



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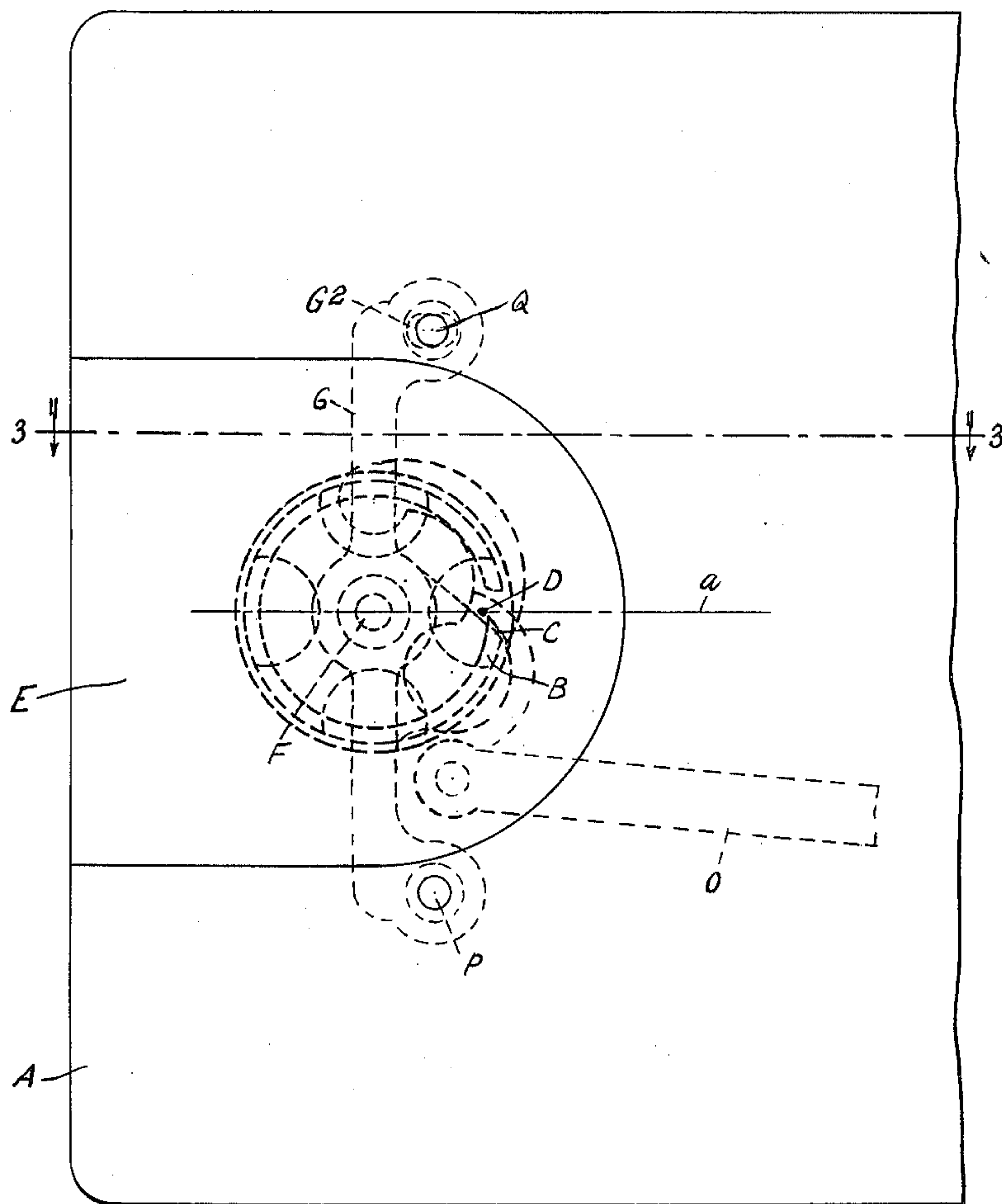
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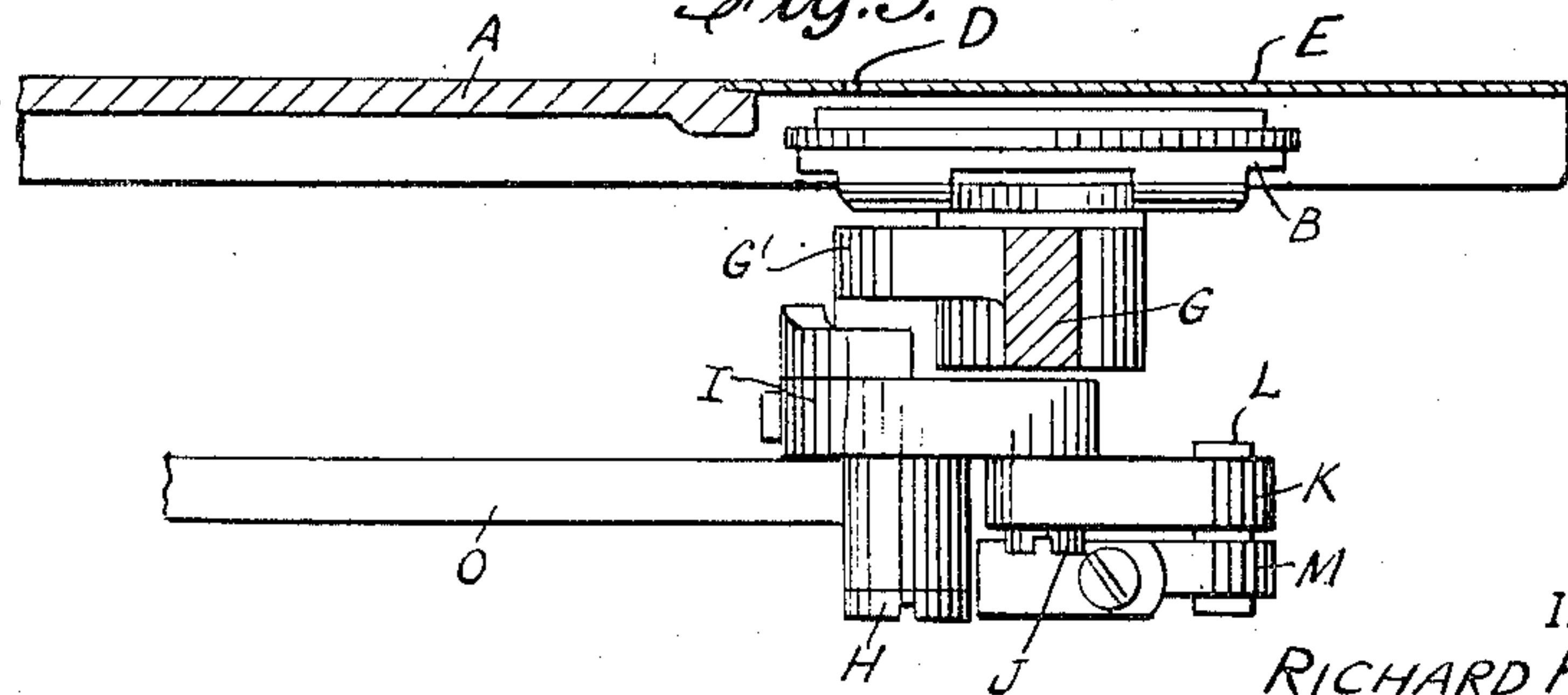
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*Fig. 2*



*Fig. 3*



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# UNITED STATES PATENT OFFICE

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## SUPPORTING MEANS FOR OSCILLATING SEWING MACHINE HOOKS

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4 Claims. (Cl. 112—184)

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The present invention relates to sewing machine mechanisms of the well known type in which a needle thread loop is passed around a bobbin holder mounted in a hook member of the rotary type oscillating about a vertical axis.

In a preferred form of sewing machine mechanism of said type, the hook member is secured to the upper end of a vertical hook shaft and the latter is journaled in a bracket beneath the bed plate portion of the sewing machine frame and detachably secured to the latter. The hook member so supported, is oscillated by means comprising a lever pivotally mounted on said bracket and having one end connected by a link to an arm secured to the hook shaft, and having its opposite end pivotally connected to a link which extends longitudinally of the bed and is longitudinally reciprocated to oscillate the hook in suitable timed relation with the reciprocations of the sewing machine needle. In sewing machine mechanisms of the type specified, the path of movement of the beak or loop taker of the oscillating hook member must be accurately positioned relative to the portion of the sewing machine needle beneath the bed plate during the loop taking operation.

The general object of the present invention is to provide a simple and effective arrangement for adjusting the position of the hook supporting bracket relative to the sewing machine framework so as to accurately position the path of movement of the hook relative to the needle path of movement. A more specific object of the invention is to effect the described relative adjustment of said paths of movement without making any other significant change in the relation of relatively movable portions of the sewing machine mechanism.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages, and specific objects attained with its use, reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawings:

Fig. 1 is an inverted plan view of part of the work bed or base portion of the sewing machine frame, and mechanism mounted thereon;

Fig. 1a is a partial section on the line 1a—1a of Fig. 1.

Fig. 2 is a top plan view of the sewing machine

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frame portion shown in Fig. 1, with a dotted line showing of some under-bed mechanism parts; and

Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

In the drawings, A designates the bed plate or base portion of a sewing machine frame of conventional type. The sewing machine mechanism comprises a hook B of the rotary type having a chamber open at its upper end to receive a bobbin (not shown), and formed with a loop taking beak C adapted to engage a loop forming portion of the needle thread on each movement of the vertically reciprocating sewing machine needle downward into the under-bed space through the needle opening D formed in the removable throat plate E mounted on and normally constituting a stationary portion of the bed A. The hook B is secured to the upper end of the vertical hook shaft F which is journaled in a bracket G beneath the frame portion A and secured to the latter as hereinafter explained. The bracket G comprises an elongated bar-like horizontal body portion extending transversely across the longitudinal center line *a* of the bed A. The bracket G has a lateral extension G' which supports a vertical pivot H alongside the hook shaft F. Journaled on the pivot H beneath the bracket portion G' is a bent lever I having one arm connected at its free end by a pivot J to one end of a link K. The latter has its other end pivotally connected by a pivot L to a horizontal arm M rigidly secured to a lower end portion of the hook shaft F extending below the portion of the bracket G in which the hook shaft is journaled. The second arm of the lever I is connected by a pivot N to one end of a link O extending longitudinally of the bed. The end of the link O remote from the lever I is connected to mechanism which is not shown but may be of well known type, for giving the link O longitudinal reciprocatory movements to thereby oscillate the hook shaft F and hook member B in timed relation with the up and down movements of the sewing machine needle.

For satisfactory operation, it is highly desirable that as the beak C moves through its loop taking position, it should pass about as close to the needle as is practically possible. With the manufacturing practices customarily employed in the large scale production of sewing machines of the type disclosed, it is difficult to detachably secure the bracket to the bed plate by screws or bolts in such a predetermined position that the path of movement of the hook will in all cases be



properly related to the path of movement of the sewing machine needle. In accordance with the present invention, I avoid this difficulty by connecting one end of the bracket G to the bed plate A by a vertical pivot member P having its upper end anchored in the bed plate, and having a cylindrical body portion fitting snugly in a round hole extending through the end of the bracket G. The opposite end of the bracket G is connected to the bed plate A by a clamping bolt Q which has its upper threaded end screwed into a threaded socket formed for the purpose in the bed plate A, and having a head portion Q' which is normally in clamping engagement with the underside of the bracket G at the margin of the opening G<sup>2</sup> in the bracket through which the bolt Q extends.

The opening G<sup>2</sup> is shaped to permit of a small angular adjustment of the bracket G about the pivot bolt P to thereby move the hook shaft in the longitudinal direction of the bed plate as required to insure the proper spacing of the path of movement of the tip of the beak C relative to the path of movement of the vertical and vertically reciprocating sewing machine needle.

The described arrangement permits of an accurate adjustment of the axis of the hook shaft F longitudinally of the bed A, required to insure that the tip of the beak C of the rotary hook passes close enough to the sewing machine needle in its loop seizing operation. To effect such adjustment all that is required is the loosening of the clamping bolt Q and the angular movement of the bracket G about its pivot P needed to properly position the paths of movement of the beak tip and needle, and the retightening of the clamping bolt Q. The small adjustment thus readily effected does not significantly effect the operative relation of relatively movable portions of the sewing machine mechanism other than the minimum distance between the positions of the tip of the beak C and the needle passing vertically through the needle opening D. While the adjustment of the bracket G theoretically entails some movement of the pivot N and resultant angular adjustments of the lever I about the pivot bolt H, and some angular adjustment of the beak C about the hook shaft F, the distance between the pivots P and N is so relatively small as to make the last mentioned adjustments insignificant and inconsequential. The adjustment given the hook shaft axis as above described is ordinarily of the order of a couple of thousandths of an inch. The fact that the angular adjustment given the end of the bracket G engaged by the clamping bolt is approximately double that given the hook shaft, facilitates the proper hook shaft adjustment.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims, and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

Having now described my invention, what I

claim as new and desire to secure by Letters Patent, is:

1. The combination with a sewing machine bed plate formed with a needle hole, of an oscillating hook member beneath said bed plate and having a vertical shaft and loop-taking beak laterally displaced from the axis of said shaft, means for supporting said member with the axis of said shaft displaced from the axis of said hole comprising a supporting bracket having a bearing receiving said shaft, a vertical pivot pivotally connecting said bracket and said bed plate at a distance from the plane including the axes of said shaft and hole, clamping means engaging a portion of said bracket at a distance from said plane and at the opposite side of the latter from said pivot and clamping said portion to said bed plate with said bracket in different angular adjustments about said pivot, and means for oscillating said hook member about the axis of said shaft comprising a lever pivotally mounted on said bracket to oscillate about a vertical axis and pivotally connected to said hook member at a distance from the axis of said shaft.

2. A combination as specified in claim 1, in which the means for oscillating said hook member includes a reciprocating element and a pivotal connection between said lever and element movable along an arc displaced from said plane and at the same side of the latter as said pivot.

3. A combination as specified in claim 1, in which said clamping means is a vertical clamping screw in threaded engagement with said bed and in which said bracket portion is formed with a hole elongated in a horizontal direction parallel to said plane and through which said screw extends.

4. In a sewing machine, the combination with a bed plate formed with a needle hole, a rotary hook element having a vertical shaft, a supporting bracket formed with a bearing for said shaft, a reciprocating member, a pivot supported by said bracket alongside said shaft, a lever journaled on said pivot, a pivotal connection between one arm of said lever and said member, means including a link connecting the other arm of said lever to said hook shaft and oscillating the latter when said member is reciprocated, a second pivot connecting said bracket and bed at one side of said member, and a clamping screw at the opposite side of said member from said second pivot and releasably clamping an adjacent portion of said bracket to said bed in different angular adjustments of the bracket about said second pivot, said member and lever being formed and disposed for movement of said pivotal connection toward and away from the plane including the axes of said second pivot and hook shaft.

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