J. H. NANGLE.

BEADING MACHINE.

APPLICATION FILED MAR. 21, 1911.

1,033,190.

Patented July 23, 1912.

3 SHEETS—SHEET 1.

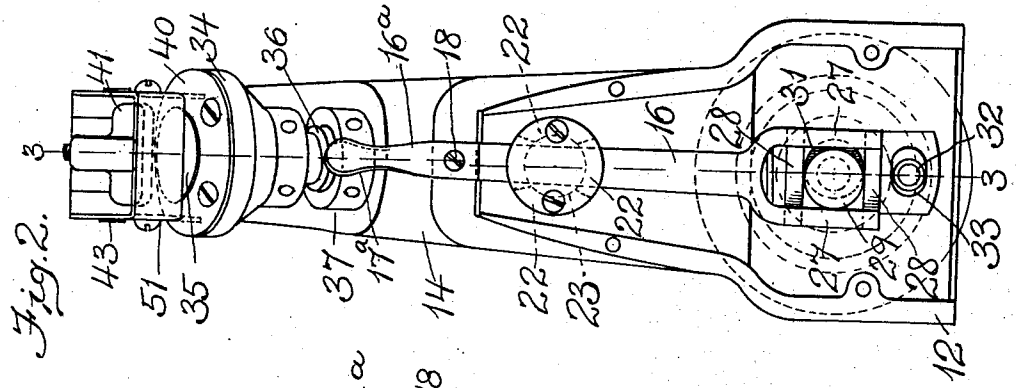

Fig. 2.

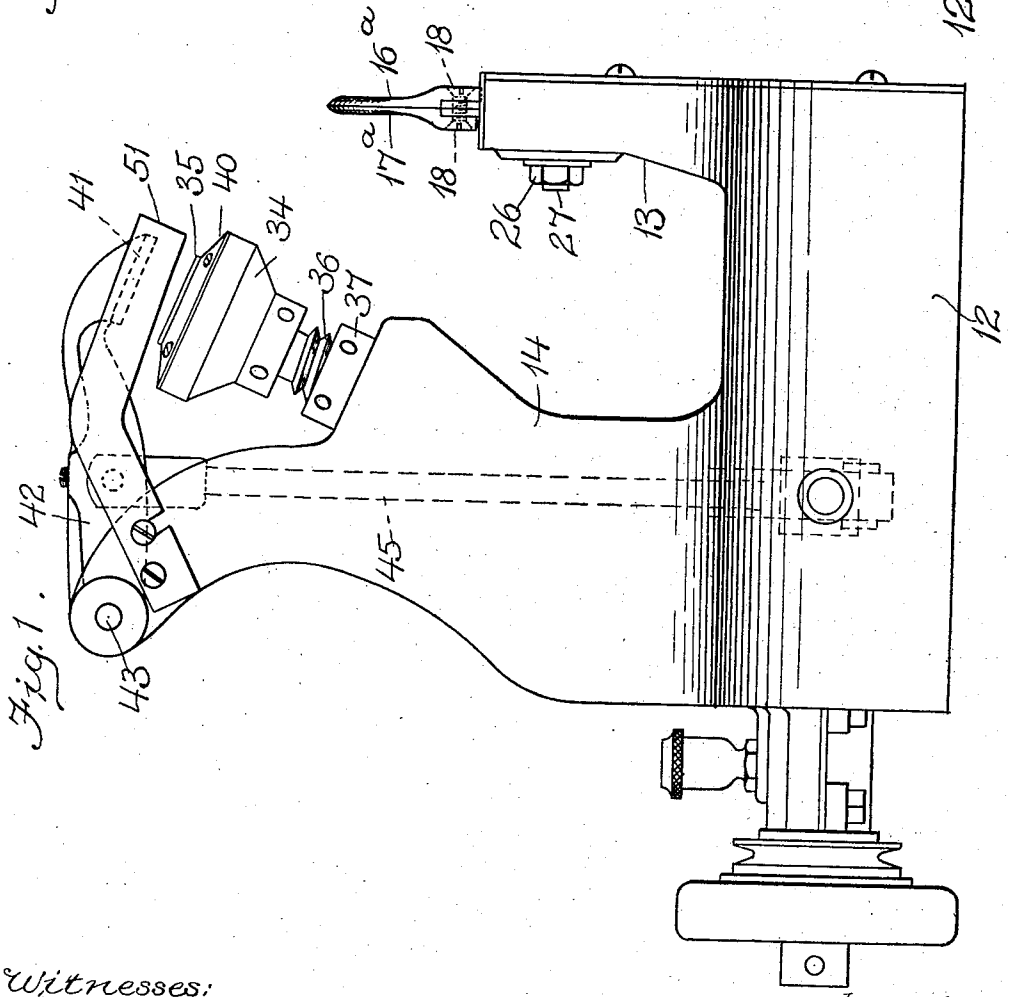

Fig. 1.

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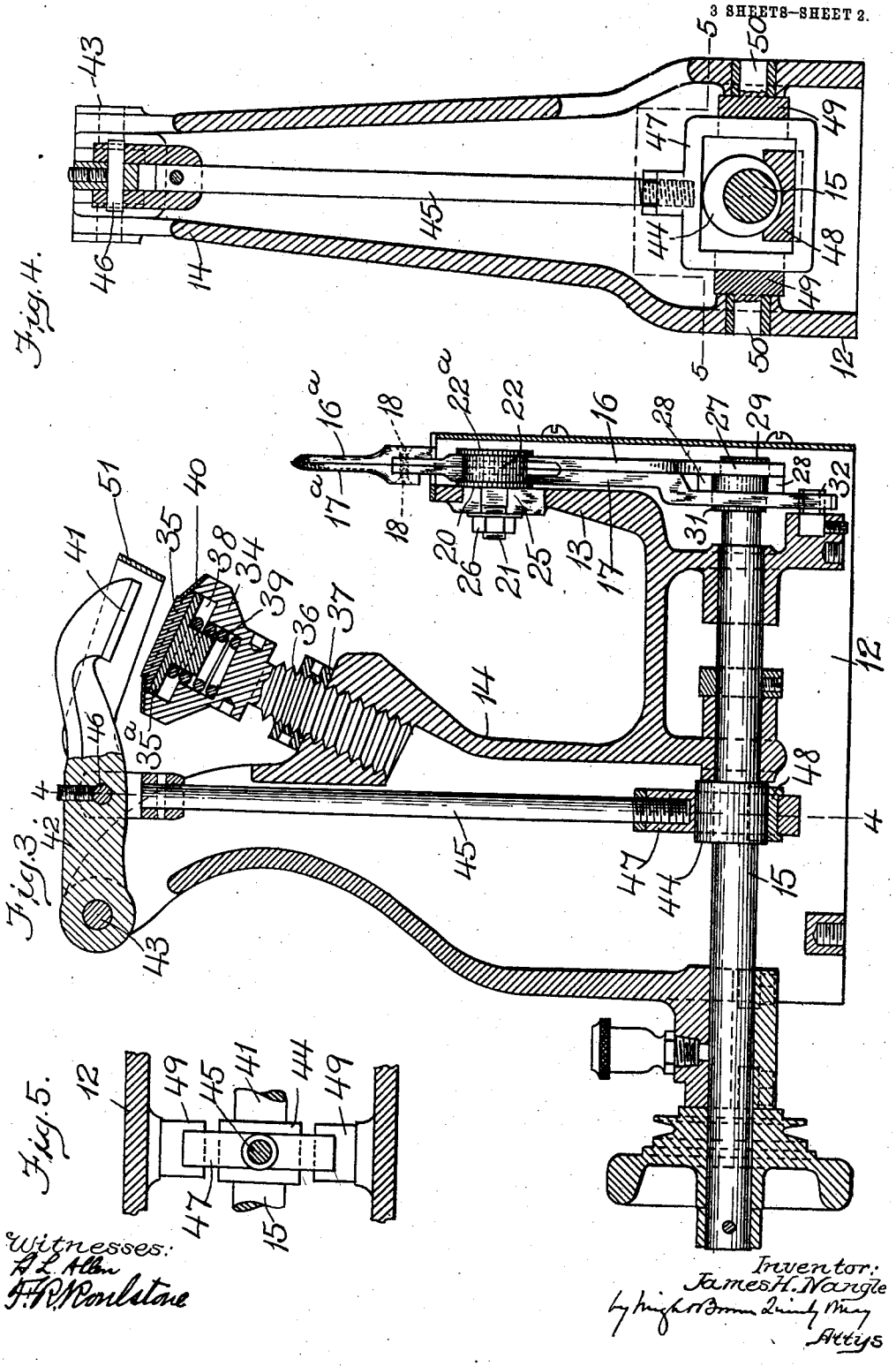

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3 SHEETS—SHEET 3.

Fig. 6.

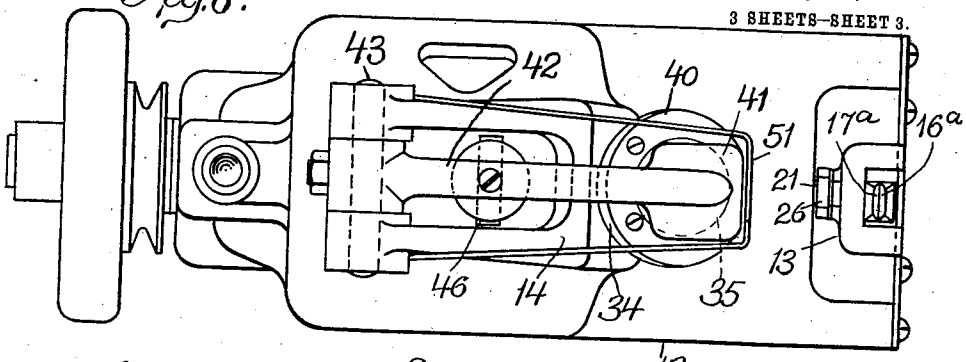


Fig. 7.

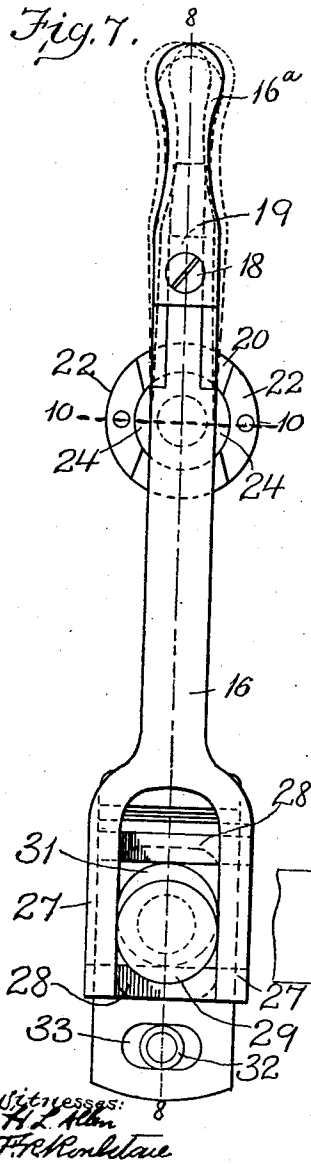


Fig. 8.

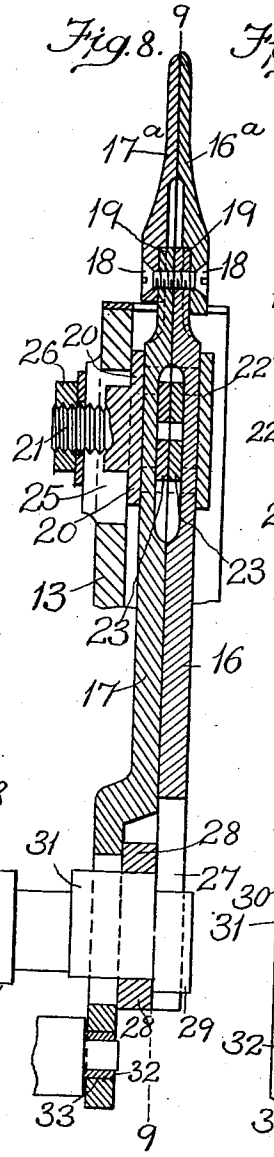


Fig. 9.

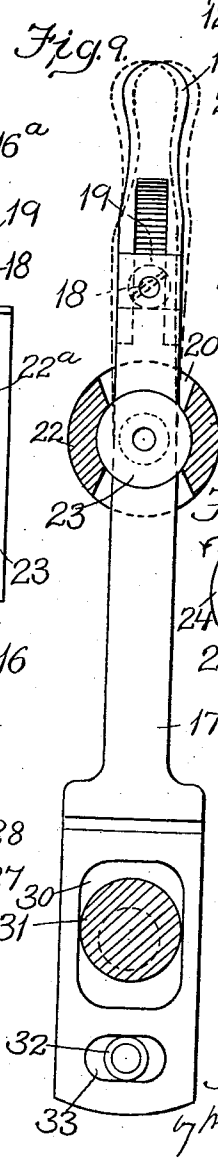


Fig. 11.

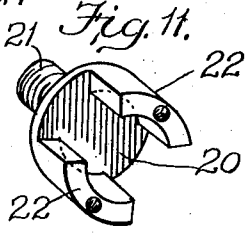


Fig. 10.

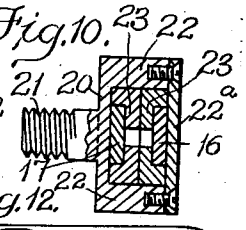


Fig. 12.

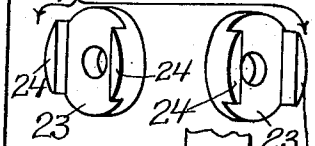
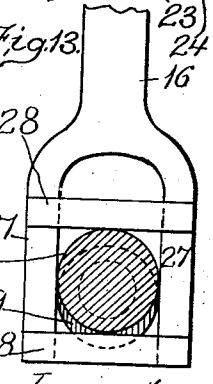


Fig. 13.



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UNITED STATES PATENT OFFICE.

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BEADING-MACHINE.

1,033,190. Specification of Letters Patent. Patented July 23, 1912.

Application filed March 21, 1911. Serial No. 615,918.

To all whom it may concern:

Be it known that I, JAMES H. NANGLE, a citizen of the United States of America, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Beading-Machines, of which the following is a specification.

This invention relates to machines for forming a well defined fold or crease on parts of uppers of boots and shoes preparatory to stitching together the folded parts along the line close to and parallel with the fold.

In making boot and shoe uppers it is customary to first stitch the lining to the outer or leather portion of the upper, the parts being stitched together wrong side out and then turned to locate the seam on the inside and out of sight. A fold is formed extending along the upper close to and parallel with the seam that unites it to the lining and this fold is made permanent by a line of stitches extending through the two parts of the upper formed by the fold and close to the folded edge, the latter constituting the upper end or ankle portion of the upper, the exposed edges of the sides of the front opening in a buttoned or laced shoe, and other exposed edges. A beading machine is used to form the fold in the upper preparatory to the formation of the binding stitches, said machine being provided with two flat-sided rubbing or beading tools which are located side by side and are oscillated in parallel planes, these tools being inserted between the upper and lining and reciprocated in opposite directions to partially form the fold in the upper, the machine being also equipped with a bed or anvil and a reciprocating hammer which coöperate in flattening down and sharply defining the fold.

My invention has for its object to provide certain improvements in the beading tools and the mechanism for operating the same, and in the hammer of seam-flattening mechanism, the said improvements increasing the durability and efficiency of the machine.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings which form a part of this specification: Figure 1 represents a side elevation of the beading machine embodying my invention; Fig. 2 represents an end elevation of the same; Fig. 3 represents a section on line 3—3 of Fig. 2; Fig. 4 represents a section on line 4—4 of Fig. 3; Fig. 5 represents a section on line 5—5 of Fig. 4; Fig. 6 represents a top plan view of the machine; Fig. 7 represents a side elevation showing the beading tools and mechanism which operate the same; Fig. 8 represents a section on line 8—8 of Fig. 7; Fig. 9 represents a section on line 9—9 of Fig. 8 and an elevation of the parts at the left of said line; Fig. 10 represents a section on line 10—10 of Fig. 7; Fig. 11 represents a perspective view of the adjustable fulcrum holder hereinafter described; Fig. 12 represents in separate perspective views the oscillating fulcrum pieces; Fig. 13 represents a side view or portion of one of the beading levers and a sectional view of the cam which operates the same.

Similar reference characters indicate the same or similar parts in all the figures.

The frame of the machine comprises a base portion 12, a post 13 through which the beading levers extend and a hollow arm or standard 14 which supports the hammer bed or anvil and the hammer. Journaled in bearings in the base portion of the frame is a horizontal driving shaft 15 provided with cams which actuate the beading levers and the hammer, as described hereinafter.

16 and 17 represent the beading levers which extend through the post 13 and are adapted to oscillate therein in parallel planes. The levers 16 and 17 are provided at their upper ends with beading tools 16^a and 17^a, these tools having flat inner sides which are practically in contact with each other, and practically flat outer sides which are rounded or beveled at their marginal portions to form relatively thin edges on said tools. The beading tools are detachably secured to the levers by means of screws 18, each lever having an upper end portion formed as a seat, and the inner side of the shank of each beading tool being provided with a recess 19 (Fig. 8) fitted closely on the corresponding seat, the form of the seats and recesses being such that the beading tools, while readily detachable from the levers are rigidly held thereon when in use. The seat or upper end portion of each lever is a duplicate of the other so that each beading tool may be applied to either lever, provision being thus made for interchanging the tools, so that when the outer tool which is subjected to the greatest wear has been partially

worn away, it may be removed and replaced by the inner tool and subsequently applied to the inner lever to replace the inner tool. It is desirable that there be no marked difference between the thickness of the two tools although a uniform reduction of the thickness of the two tools is not objectionable. By making the tools removable from their levers and interchangeable, as described, I am enabled not only to greatly prolong the usefulness of the tools, but also to enable new ones to be substituted for those that have become useless by wear.

The levers 16 and 17 are adapted both to move endwise and to oscillate in a fulcrum casing (Fig. 11) composed of a head or disk 20 having a screw-threaded shank 21 projecting from one side, and segmental ears 22 projecting from the opposite side, said ears being separated by segmental spaces, as shown by Fig. 11. The inner sides of the ears 22 form segmental bearings for a pair of circular fulcrum pieces 23 which are adapted to rock or oscillate, each being provided with a pair of guide flanges 24 having straight inner sides which bear on the edges of the levers 16 and 17 and permit endwise movement of said levers. The fulcrum pieces being adapted to turn in the fulcrum casing, permit the levers to oscillate to impart the desired oscillating movement to the beading tools, as indicated by full and dotted lines, Figs. 7 and 9. The shank 21 of the fulcrum casing extends through a slot 25 in the rear side of the post 13, and is provided with a clamping nut 26 which bears on the post or on a washer interposed between it and the post, and is adapted to support the fulcrum casing at different heights to vary the throw or amplitude of the oscillating movements of the beading tools. In some kinds of work, particularly in beading the scalloped edges of the button-hole and button-hole flies of button shoes, it is desirable to reduce the throw of the beading tools to the minimum, while in beading straight edges it is desirable to give the tools a throw of maximum length. The adjustable fulcrum casing enables the throw of the beading tools to be quickly and conveniently adjusted to the extent desired.

The lower end portion of the lever 16 is widened and provided with branches 27 having vertical sides, the lever being provided with fixed cross bars 28. The lever branches 27 and cross bars 28 bear on cams 29 and 31 affixed to the driving shaft 15, said cams being adapted to simultaneously oscillate the lever 16 and move it endwise, thus imparting to the lever 16 and the beading tool 16^a the movement indicated by full and dotted lines in Fig. 7.

The lower end portion of the lever 17 is widened and provided with an orifice 30 which is vertically elongated. The sides of said orifice bear on the cam 31 affixed to the shaft 15. The lever 17 is prevented from moving endwise by a stud or trundle roll 32 supported by the frame of the machine and projecting into a horizontal slot 33 in the lower end portion of the lever. The rotation of the cam 31 therefore oscillates the lever 17 and the tool 17^a without moving the same endwise, the movements of the tool being as indicated by full and dotted lines, Fig. 9.

It will be seen from the foregoing that each lever and the tool carried thereby is positively operated so that each tool has its predetermined stroke regardless of the pressure of the work upon it, the beading tools being therefore adapted to act as effectively on heavy as on light work. The fulcrum pieces 23 are interposed between the levers 16, and 17, said levers being reduced in thickness where they engage the fulcrum pieces, as shown by Fig. 8. The fulcrum pieces therefore act as stops or gages to prevent injurious or wearing-rubbing pressure of one lever against the other, the parts being adjusted so that the levers are as close to each other as possible without injurious rubbing contact.

34 represents a casing or holder for a hammer bed or anvil 35, said holder being provided with a screw-threaded shank 36 engaged with a threaded orifice in the arm or standard 14 and locked at any desired adjustment by a jam nut 37. The holder 34 is provided with a socket 38 in which the bed 35 is movable, a spring 39 being provided which normally forces the bed outwardly against a stop flange 40 attached to the holder. The bed is preferably composed of an outer layer or facing of relatively compressible material such as vulcanized fiber, and an inner metallic body portion 35^a.

41 represents a hammer formed on a lever 42 which is pivoted at 43 to ears on the arm 14. The hammer is oscillated by means of a cam 44 affixed to the shaft 15 and a connecting rod 45 pivoted at 46 to the lever 42 and provided with a frame or strap 47 which surrounds the cam 44, a bearing block 48 of relatively antifrictional material such as vulcanized fiber being preferably interposed between the cam and one side of the frame, as shown by Figs. 3 and 4. The ends of the frame 47 are engaged with guides 49 having trunnions 50 fitted to turn in bearings in the frame of the machine, the guides being therefore adapted to rock or oscillate slightly as required by the slightly curvilinear movement of the upper end of the connecting rod. By forming the hammer on a pivoted lever and connecting the lever with the driving mechanism at a point between the hammer and pivot or fulcrum of the lever, I am enabled to rapidly oscillate the lever, giving it a positive movement in both

directions, with less jar, vibration and noise of operation, than would be the case if the lever were extended outwardly from the fulcrum 43 and connected with the driving mechanism at a point outside said fulcrum. The adjustability of the hammer bed enables it to be adapted to the thickness of the material, while the yielding support of the hammer bed, by the spring 39 prevents injury to material of maximum thickness.

The construction of the machine is such that it is adapted to operate very steadily, the noise and jar being reduced to a minimum.

51 represents a guard which is arranged to prevent injury to the fingers of the operator by the hammer.

I claim:—

1. A beading machine comprising a pair of levers adapted to oscillate in parallel planes, each having a reduced outer end to form tool seats in the same plane, beading tools each having a shank the inner face of which is recessed to form a shoulder adapted to rest upon either of said seats, whereby said tools may be interchanged, and means for detachably securing said shanks to said levers.

2. A beading machine comprising a pair of levers located side by side and provided with beading tools, a fulcrum holder mounted on the frame of the machine, and fulcrum pieces mounted in said holder and disposed in contact with each other between said levers and adapted to oscillate in said holder and having guides in which the levers may move endwise, and means for imparting longitudinal reciprocation to one of said levers.

3. A beading machine comprising a pair of levers located side by side and provided with beading tools, a fulcrum holder mounted on the frame of the machine and fulcrum pieces mounted in said holder and disposed between said levers and adapted to oscillate in said holder and having guides projecting from their outer faces in which the levers are movable endwise, the fulcrum holder being adjustable lengthwise of the lever, and provided with means whereby it may be secured at any position to which it may be adjusted.

4. A beading machine comprising a pair of levers located side by side and provided with beading tools, a fulcrum holder mounted on the frame of the machine and fulcrum pieces adapted to oscillate in said holder and having guides in which the levers are movable endwise, the fulcrum pieces being in contact with each other between adjacent portions of the levers.

5. A beading machine comprising a post provided with a longitudinal slot, a fulcrum holder having a shank extending through the slot, means for adjustably locking the shank to the post, a power shaft in the base of said post, cams on said shaft, levers straddling said cams and extending through said fulcrum holder, fulcrum pieces rotatably mounted in said fulcrum holder between said levers and provided with means to guide said levers when moved by said cams, and beading tools carried by said levers.

6. A beading machine comprising a post provided with a longitudinal slot, a fulcrum holder having a shank extending through the slot, means for adjustably locking the shank to the post, a power shaft in the base of said post, cams on said shaft, levers straddling said cams and extending through said fulcrum holder, fulcrum pieces rotatably mounted in said fulcrum holder between said levers and provided with flanges on their outer faces to guide said levers when moved by said cams, and beading tools carried by said levers.

7. A beading machine comprising a support, a shaft therein, cams carried by the shaft, beading levers pivotally connected to said support and oscillated by said cams, one of said levers being also moved longitudinally by the cams, the other lever being provided with an end slot, means carried by the support for engaging the slot to prevent longitudinal movement of the lever, a fulcrum holder in said support, and fulcrum pieces mounted therein and provided with flanges to guide said levers.

8. A beading machine comprising an adjustable fulcrum holder provided with oppositely disposed spaced segmental flanges, a pair of oppositely projecting fulcrum pieces pivotally movable in said holder and provided with spaced parallel guide flanges, and a pair of oscillating beading levers guiding by the flanges of the fulcrum pieces.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JAMES H. NANGLE.

Witnesses:
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P. W. PEZZETI.