Oct. 30, 1923. 1,472,247

G. W. JACQUES

FASTENER SETTING DEVICE

Filed Sept. 25, 1918 2 Sheets-Sheet 1

Fig. 1.

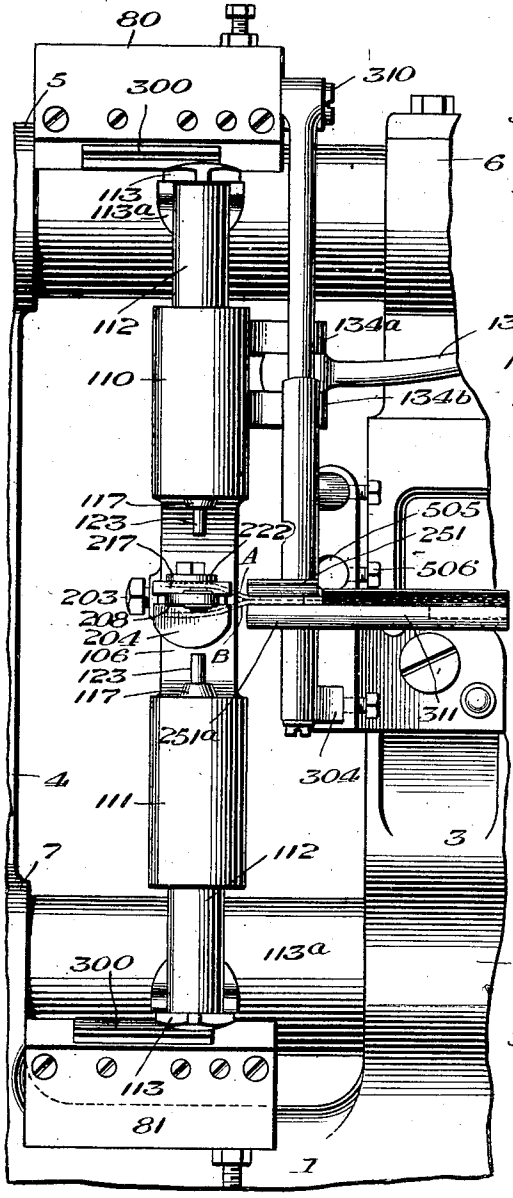
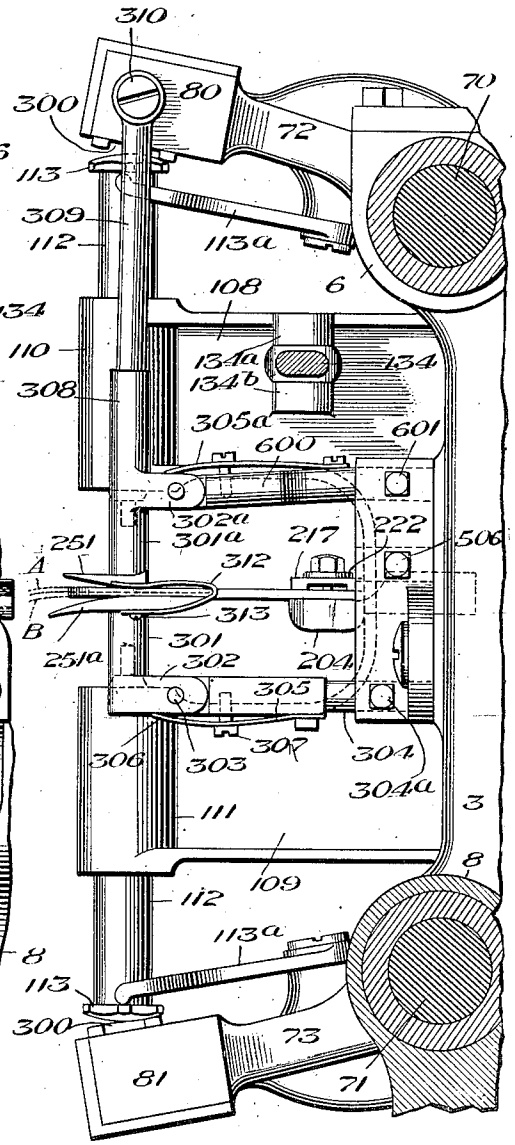


Fig. 2.



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George W. Jacques
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Filed Sept. 25, 1918 2 Sheets-Sheet 2

Fig. 3.

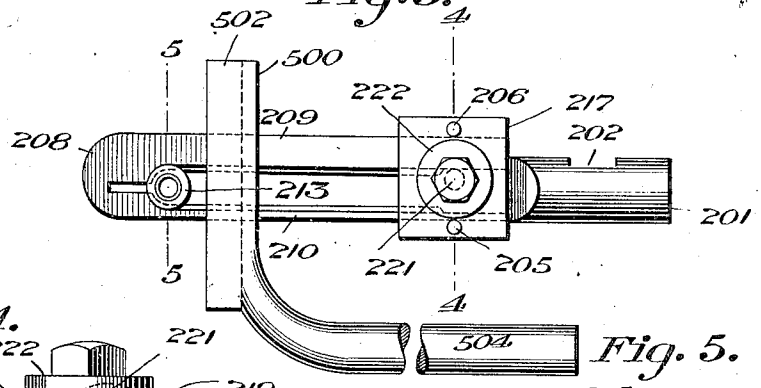


Fig. 4.

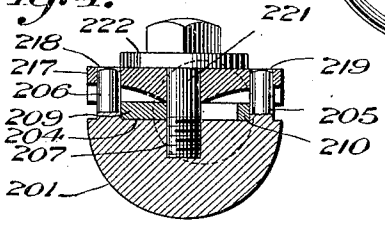


Fig. 5.

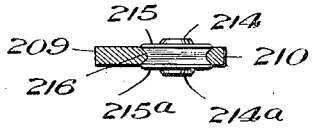


Fig. 6.

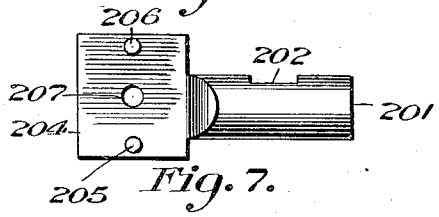


Fig. 7.

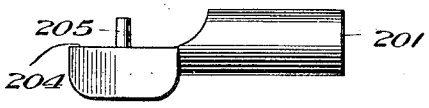


Fig. 10.

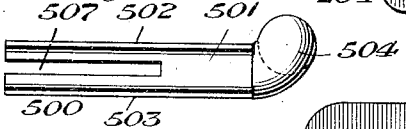
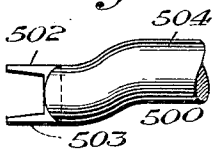


Fig. 8.

Fig. 11.



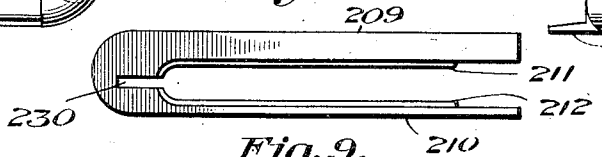
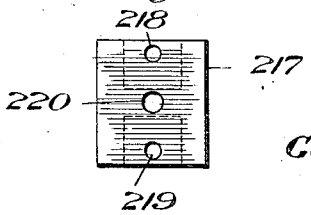


Fig. 9.



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Patented Oct. 30, 1923. 1,472,247

UNITED STATES PATENT OFFICE.

GEORGE W. JACQUES, OF STRATFORD, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FASTENER-SETTING DEVICE.

Application filed September 25, 1918. Serial No. 255,680.

To all whom it may concern:

Be it known that I, GEORGE W. JACQUES, a citizen of the United States, residing at Stratford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Fastener-Setting Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for setting fasteners in sheet material and more specifically to machines of the duplex type such as are employed in setting eyelets or lacing hooks simultaneously in or near the edges of two superposed pieces of material.

In machines of the above character it is common to provide work-engaging members comprising a work support, and in some cases an auxiliary work support, for assisting the operator in presenting the material to the operating tools, together with presser feet for holding the work with considerable pressure against the opposite faces of the support during the operation of the tools. The present invention has for one of its objects, the simplification of the above parts. As herein illustrated, the main work support is eliminated and the auxiliary work support is combined with one of the presser feet to form a single unitary device. By this arrangement the mechanism has been rendered less complex, whereby the cost of manufacture is decreased and at the same time, by the omission of the usual fixed work support located between independently movable presser feet, a uniform pressure upon both pieces of material is insured and thus is avoided any possibility of unequal feeding of said pieces of material such as frequently occurs in present commercial machines and which results in an uneven spacing of the fasteners with consequent damage to the work.

The invention also provides for mounting the work-engaging members for movement relatively to each other to produce the necessary work-holding pressure and to facilitate introduction of the work therebetween, resilient means of simple form being provided which tend to maintain said members in parallel relation.

This invention also provides an improved edge-gage for guiding the edge of the material to regulate the distance at which the line of fasteners shall be spaced from the edge, said edge gage, the presser foot, and the combined work support and presser foot being supported for relative adjustment whereby the distance of the line of fasteners from the edge of the material may be varied at will and by reason of which the normal distance between said presser foot and the combined work support and presser foot may be determined.

Another feature of the invention consists in an improved tool constituting a duplex punch-anvil and set. Said tool is illustrated as a disk, the two opposite faces of which are formed to provide fastener-clenching surfaces surrounding the punch-beds.

Other features consist in an improved holder for said duplex tool and in certain formations of the tool and holder by which they are held in cooperative relation to each other to provide for the substitution of one tool for another.

Still other features of the present invention together with improved structural details and combinations of parts will be hereinafter described at length in the specification and particularly pointed out in the claims, reference being had to the accompanying drawings in which,—

Fig. 1 is a front elevation of so much of a machine of the above type as is necessary to illustrate the application thereto of the present invention, the edge gage being omitted for clearness of illustration;

Fig. 2 is a side elevation of the parts shown in Fig. 1;

Fig. 3 is a plan view of the combined punch anvil and set and its supporting device, together with the edge gage,—the parts being shown in normal, relative position, but detached from the machine;

Fig. 4 is a vertical section on the line 4—4 of Fig. 3 but to enlarged scale;

Fig. 5 is a vertical section on line 5—5 of Fig. 3, to enlarged scale;

Figs. 6, 7, 8 and 9 are detail views to enlarged scale of the parts constituting the supporting device for securing and holding the combined punch anvil and set, and

Figs. 10 and 11 are detail views of the edge gage.

1 indicates the main frame of the machine having projecting upwardly therefrom a

pair of spaced brackets 3 and 4. 5, 7 and 6, 8 indicate pairs of bosses carried by the respective brackets at their upper and lower portions, said bosses having formed therein bearing openings in which are rotatably mounted a pair of parallel shafts 70, 71. Fixed to the respective shafts 70 and 71 are a pair of forwardly extending lever arms 72, 73, the free extremities of said arms carrying hammer members 80, 81 adapted for imparting operative movement to the tools hereinafter described. Any suitable mechanism, not herein shown, may be employed for intermittently oscillating the shafts 70, 71 in opposite directions, whereby to cause the hammer members 80, 81 to move toward each other in imparting the operative movement to the tools.

106 is a yoke-like frame pivoted upon a vertical axis at the rear thereof and not shown, and provided with forwardly extending arms 108, 109, said arms being furnished at their free extremities with bosses 110, 111 having bearing openings in which sleeve members 112, having enlarged heads 113, are arranged for vertical sliding movement. The opposed ends of said members 112 shown at 117 are so formed as to provide sets for clenching the fasteners in the material. Within the sleeves 112 are slidably mounted members carrying at their opposed extremities hollow punches 123, the opposed ends of said punch carriers being arranged to be actuated by the hammer members 80, 81, and to project beyond the enlarged heads 113 of said sleeves at certain times in the operation.

The yoke frame 106 is provided on its forward face at a point intermediate the bosses 110, 111 with an opening for the reception of a bracket 201 (see Fig. 3), said bracket being provided with a flat surface at 202 for engagement by the end of a set screw 203 (Fig. 1) threaded into an opening in the side of the yoke frame 106 and engageable with said surface 202, whereby to securely fix the bracket 201 in the yoke 106. The bracket 201 provides at its free extremity a flat bearing surface 204. Projecting upwardly from said surface, near its lateral edges, are a pair of pins 205, 206, and intermediate of said pins a threaded opening 207 is formed in said bracket. 208 is a U-shaped frame having spaced arms 209, 210, one or both of said arms being resilient, as herein shown the arm 209 being relatively rigid,—the normal width of said U-shaped frame being slightly greater than the distance between the pins 205, 206. The arms 209, 210 upon their confronting faces are provided with flanges or fins 211, 212, of substantially V form in section. 213 is a combined punch anvil and set of duplex form, the opposite faces of which comprise central, upstanding bosses 214, 214ª forming punch anvils, surrounding which are clenching surfaces or sets 215, 215ª, this duplex punch anvil and set being substantially of the character shown in the patent to Peck, 689,222, December 17, 1901, with the exception that in the Peck patent such combined anvil and set is of the single type, whereas the present anvil and set is of duplex type. As will be noted, (Fig. 5) this combined anvil and set is of disc-like form, the edge portion thereof being provided with a circumferential groove 216.

217 is a cover plate provided with spaced apart openings 218, 219 arranged for engagement with the pins 205, 206, respectively. Centrally of the openings 218, 219 the cover plate is provided with an opening 220 in alignment with the opening 207 in the bracket 201. 221 is a bolt arranged to pass downwardly through the opening 220 and into threaded engagement with the opening 207, a washer 222 being interposed between the top surface of the cover plate 217 and the head of the bolt 221. In order to assemble the parts above described, the U-shaped frame is withdrawn from the bracket 201 and the disc 213 forming the combined anvil and set is slipped between the arms 209, 210 and in position for the groove 216 in said disc to be engaged by the opposed fins 211, 212. The disc is then moved inwardly between said arms until it seats against the inner face of the opening between said arms, the frame being slotted as at 230, if desired, in order to add to the resiliency thereof. When the disc is properly seated at the inner end of the space between the arms, the free extremities of the latter are sprung or deflected toward each other sufficiently to permit of their being inserted between the pins 205, 206. The cover plate 217 is then positioned above the extremities of said frame and in engagement with the pins 205, 206, the bolt 221 being passed through the opening 220 and screwed into the opening 207 whereby the several parts are locked in position.

By the engagement of the fins 211, 212 with the groove 216 of the anvil disc, the latter is held rigidly against movement in a plane perpendicular to the face of said frame, while it is held against any lateral movement in said frame by the pinching of the latter against its sides, the long leverage provided by the arms 209, 210 permitting a very considerable pressure to be brought against the sides of the disc for holding the latter in position, and as the distance between said arms, when positioned between pins 205, 206, decreases slightly from the point of contact with the disc to the free extremities of the arms, it is evident that any movement of the disc longitudinally of the arms is prevented. The punch anvil and set is thus held in very rigid relation to the

yoke member 106 but by unscrewing a single bolt may be readily removed from the machine for repairs or for the substitution of another anvil of different form or size.

In the operation of the machine as thus described, two pieces of material being located respectively upon opposite sides of the duplex anvil and set 213, the hammer members 80, 81 are caused to swing toward each other, and in contacting with the upper ends of the punch carriers thereby cause the punches 123 to move from opposite directions toward the opposed anvils 214, 214ª.

The sets 117 also move outwardly equally with the punches at this time by contact of the heads 113 with the hammer members but are not moved sufficiently to contact with the opposing sets 215, 215ª. As the punches move toward the anvil disc 213, they are caused to pass into and through the hollow shanks of a pair of eyelets or similar fasteners which are presented in proper position for this action either by hand or any suitable automatic feeding mechanism such as is common in the art but not herein disclosed. As the hammer members complete their down-stroke the punches are forced through the material and into engagement with the respective anvils, 214, 214ª. The yoke frame 106 is now given a lateral swinging movement about its pivot by means of a link 134 having pivotal engagement with bosses 134ª, 134ᵇ projecting from the face of said frame. During such movement the ends of the punch carriers, which at this time lie substantially flush with the surfaces of the enlarged heads 113, are brought into alignment with slots 300 in the respective hammer members 80, 81. The hammers are now given a further movement toward each other, thereby moving the sleeves 112 toward anvil disc 213, and by engagement of the sets 117 carried upon the ends of said sleeves with the eyelets encircling the punches, said eyelets are forced into the openings in the material and are clenched against the opposed sets 215, 215ª, the ends of the punch carriers during such further movement of the hammer members projecting into the slots 300 in the latter.

During the lateral swinging motion of the yoke member 106, the punches 123, are in engagement with the material which is thus fed laterally into the position in which the eyelets are set. After the setting of the eyelets, the hammers in being retracted cause the sleeves 112 to move away from each other by engagement of the forked arms 113ª carried by the respective hammers with the under sides of the heads 113, whereupon the frame 106 is swung laterally to its initial position.

In order to properly hold the work during the backward swinging movement of the yoke frame, and also to position it properly during the operation of the tools, a pair of opposed work-engaging members have been provided. The member 251ª is fixed upon an upwardly extending arm 301 of a lever 302, the latter being pivoted at 303 upon the extremity of an outwardly extending bracket 304. The bracket 304 comprises a substantially cylindrical stem portion adapted to be received in a suitable opening in the machine frame wherein it may be secured by a set screw 304ª (Fig. 2) or equivalent means, the bracket thus being capable of bodily adjustment in a front-to-rear direction. 305 is a leaf spring fixed to the under side of said bracket and bearing at its free extremity at the point 306 beneath the lower surface of the lever 302, thereby normally holding the same in the position shown in Fig. 2. An adjusting screw 307 is provided for varying the tension of said spring.

The member 251 which serves as the upper presser foot is mounted upon an arm 301ª of a lever 302ª similar to the lever 302, said lever 302ª being pivoted to the front extremity of a bracket 600 substantially like bracket 304 and similarly adjustably fixed in an opening in the frame by a set screw 601. Lever 302ª is acted upon by a spring 305ª similar to the spring 305 and likewise adjustable. By the above arrangement it will be evident that the members 251, 251ª tend to move toward one another and normally to maintain their opposed surfaces in contact.

The lever member 302ª is provided with a sleeve 308 projecting upwardly in alignment with the arm 301ª thereof, said sleeve serving for the reception of a rod 309 freely slidable therein, the upper end of which is pivoted upon a pin 310 projecting laterally from the face of the upper hammer 80.

The member 251ª has fixed thereto or integral therewith a part 311, shown as projecting laterally and to the right thereof (see Fig. 1), said part 311 serving as a work support for assisting the operator in supporting the material as the latter is moved forwardly into contact with the work-engaging members and the operating tools. In some cases, particularly in corset work, the strip of material operated upon is of considerable length and requires some support in order to maintain it properly in alignment with the operating tools, and in previous machines, it has been customary to employ a support directly between the two presser feet and against the opposite surface of which said presser feet press the respective strips of material. It has also been common in many cases to provide an additional, auxiliary support at some distance from the main work support and over which the strips of material were permitted to pass. In the present machine by the above arrangement, the main support has been

eliminated, and the member 251ª with its lateral extension 311 has been made to serve both as a presser foot and auxiliary work support, being thus in effect a combined presser foot and work support and the sole work support in advance of the punch and setting mechanism.

By the elimination of the main work support, the two strips of material being held directly between the two presser foot elements are necessarily subjected to an equal pressure, and as the two strips of material are in physical contact with each other, any movement of one tends to move the other due to the frictional engagement of the two. Thus any tendency toward unequal feeding of the two strips is to a very large extent avoided, enabling the machine to set the fasteners in the opposite strips of material at uniform distances apart which is an essential feature in a machine of this character.

In order to assist the operator in maintaining the material upon the work support 311, a resilient holder 312 in the form of a bent spring has been provided, said spring being secured to the under surface of said support 311 at the point 313 and extending rearwardly and upwardly over the edge of said work support, and into substantial contact with its upper surface.

500 is an edge-gage member comprising a work-edge contacting surface 501 and a pair of forwardly projecting flanges 502, 503 extending outwardly from the upper and lower edges respectively of said surface. The member 500 is provided with a cylindrical stem 504 projecting rearwardly from the surface 501 and arranged to be received within an opening 505 (Fig. 1) in the machine frame wherein it may be adjustably secured by means of a set screw 506. 507 is a longitudinal slot or cleft in member 500 providing for the reception of the anvil supporting frame 208 and wherein the latter slides during the work-feeding movement of the punches. In consequence of this relation of the edge-gage and the frame 208 each is adapted to brace the other and they positively maintain their cooperative relation. For example, the element 208 is effective to prevent the edge-gage from turning about the axis of its shank 504 even if the set-screw 506 were loose; and when the set-screw is tight the edge-gage is effective to brace the element 208 against flexure.

By reason of the independent adjustable mounting of the edge-gage member, it is possible to vary the distance of the line of fasteners from the edge of the material.

Moreover, due to the fact that the brackets 600 and 304 are relatively adjustable, it will be seen that the pressure between the work-contacting members 251, 251ª may be varied in accordance with the thickness of material to be operated upon, bodily movement of bracket 600 in a front-to-rear direction tending to move member 251 toward member 251ª in swinging about pivot pin 310.

In presenting material to the machine, the operator places the edges of the two strips A, B, in substantial alignment and pushes said edges between the presser foot 251 and the member 251ª, the latter readily moving downwardly about its pivot 303 for permitting insertion of the work, but in swinging upwardly under action of the spring 305 the surface of said member has a slight movement to the rear due to the position of pivot 303, such movement tending to move the work rearwardly and into proper relation to the edge gage. During the operation of the machine, at each downward movement of the hammer 80, the presser foot 251 is rocked about its pivot due to the engagement of the rod 309 with the sleeve 308 and such rocking movement tends to feed the material rearwardly a slight amount, thus keeping the material at all times correctly positioned relatively to the edge gage and in position for proper operation of the tools thereon. The springs 305, 305ª keep the work-engaging members always in contact with the work with sufficient pressure to maintain the work against movement except when the latter is positively pulled along between said members by the lateral movement of the punches while in engagement with the material.

Having thus now described the invention and a preferred embodiment of the same what I claim and desire to secure by Letters Patent of the United States is,—

1. In a fastener setting machine having means for setting fasteners and for feeding the material, in combination, a presser foot pivoted for rocking movement in a plane perpendicular to the surface of the material and transverse to the line of feed, a leaf spring for normally holding said presser foot in contact with the material and means for adjusting the tension of said spring.

2. In a fastener setting machine, in combination, a pivotally mounted presser foot member, a work support fixed thereto and extending laterally therefrom, and means for feeding work over said work support.

3. In a machine of the class described, means for feeding the material, a presser foot member for engaging the material, means for mounting said member to permit the latter to move in a plane perpendicular to the direction of feed of the work, and a work support fixed to said presser foot member.

4. In a machine of the class described, a fixed support, a presser foot member pivoted to said support for movement with respect

thereto, a work support integral with said presser foot member, a spring carried by said fixed support and engaging the presser foot member for opposing movement of the latter in one direction, and means for adjusting the tension of said spring.

5. In a presser foot device for fastener setting machines, in combination, a fixed support, a bracket pivoted to said support, a presser foot member mounted upon said bracket, a work support integral with said presser foot member and extending laterally therefrom, and means for maintaining the work in contact with said work support during the feed of the work.

6. In a duplex fastener setting machine, in combination, opposed operating tools, a pair of pivotally supported work-engaging members constituting presser feet and having opposed, work-contacting surfaces, a support for work while being fed thereover to said tools fixed to one of said members and extending laterally therefrom, and means for rocking the other of said members about its pivot in time with the operation of said tools.

7. In a duplex fastener setting machine, in combination, a pair of opposed, reciprocatory operating tools, a pair of work-engaging members comprising opposed work-contacting surfaces and constituting presser feet, means tending to move said surfaces into contact and means permitting bodily adjustment of one of said members in a direction perpendicular to the path of movement of said tools.

8. In a duplex fastener setting machine, in combination, opposed reciprocable operating tools, a pair of pivotally supported brackets, presser foot members carried by the respective brackets and comprising opposed, work-contacting surfaces, and means permitting bodily and independent adjustment of the respective brackets in a direction perpendicular to the path of movement of said tools.

9. In a duplex fastener-setting machine, a duplex gage for guiding the edges of two confronting parts of the work, said gage having a cleft to register with the space between said work-parts, a member arranged to extend through said cleft and between said work-parts to hold fastener-setting elements between the latter, and means other than said member to maintain said gage in a predetermined position.

10. In an anvil-holding device for fastener setting machines, in combination, a U-shaped frame having spaced arms, and means engageable with the free extremities of said arms for holding said arms in clamping relation against the sides of an anvil member spaced therebetween and at one side of said member.

11. In a fastener sitting machine, an anvil member having its edge formed with a groove therein, and a support for said anvil comprising a pair of spaced arms provided upon their opposed edges with projecting fins, said fins being arranged for engagement with the groove in said anvil whereby to support the same in operative position.

12. In a machine of the class described, in combination, a disc-like anvil having a circumferential groove in its edge, and a support for said anvil comprising a U-shaped frame having spaced arms, V-shaped fins projecting from the opposed edges of said arms, and arranged to be positioned within the groove in said anvil, and means for holding the free ends of said arms in fixed relation whereby to clamp said anvil in operative position.

13. In an anvil holding device for fastener setting machines, a bracket having a bearing surface, a pair of pins spaced apart and upstanding from said surface, a U-shaped frame having spaced, resilient arms, the extremities of said arms lying between and being pressed toward one another by engagement with the respective pins, a cover plate having openings arranged for the reception of said pins, and means for securing said cover plate to said bracket and in clamping relation to said arms.

14. In combination, an anvil member, a substantially U-shaped support having arms to engage either side of said member, and means engaging the free ends of the arms at one side of said member for retaining said member in position.

15. In a machine of the class described, an anvil member, a support for said anvil member comprising a U-shaped frame having spaced arms engageable with either side thereof and projecting beyond the same, and means engaging the free ends of said arms to clamp said anvil therebetween.

16. In a machine of the class described, a bracket, an anvil member, a support comprising a frame having spaced arms engageable with either side of said anvil, and means carried by said bracket engaging the free ends of said arms to clamp said anvil therebetween.

17. In a machine of the class described, a bracket, an anvil member, a support comprising a frame having spaced arms engageable with either side of said anvil and pins carried by said bracket and engageable with the outer edges of the free ends of said arms to hold said arms therebetween in clamping engagement with said anvil.

18. In a machine of the class described, a bracket, an anvil member, a support comprising a frame having spaced arms engageable with either side of said anvil and pins carried by said bracket, engageable with the outer edges of the free ends of said arms to hold said arms therebetween in clamping

engagement with said anvil, and a member for retaining said free ends between said pins.

19. In a machine of the class described, a work rest, an edge gage, means to feed work over said work rest past said edge gage, and means to move said work rest to urge the work toward said edge gage.

20. In a fastener-setting machine, a work-support, a punch movable laterally to feed the work relatively to said work-support, and an edge-gage for guiding the work, said work-support being movable in a direction to urge the work against said edge-gage.

21. In a fastener-setting machine, two members arranged to cooperate with each other to clamp the work between them, a punch movable laterally to feed the work, and an edge-gage for guiding the work, said clamping members being movable to urge the work against said edge-gage.

22. In a fastener-setting machine, a work support, a punch movable to feed the work step by step relatively to said work-support, an edge-gage for guiding the work, and means for moving said work-support, during non-feeding periods of the punch, to urge the work against said edge-gage.

23. A fastener-setting machine comprising mechanism for punching and feeding the work, and a stationary edge-gage for guiding the work, said mechanism including a work-engaging device that moves with the work while the latter is being fed, said device and said gage having connecting portions formed and arranged to have sliding engagement with each other whereby one is braced by the other.

24. A fastener-setting machine comprising fastener-setting mechanism, work-feeding mechanism, and a stationary edge-gage for guiding the work, said fastener-setting mechanism including a setting tool and a carrier therefor that move with the work while the latter is being fed, said carrier and said gage having connecting portions formed and arranged to have sliding engagement with each other whereby one is braced by the other.

25. A fastener-setting machine comprising a fastener-setting tool, a holder having integral resilient clamping portions arranged to clamp said tool between them, said tool and said clamping portions having cooperative flange-and-groove formations, and means for detachably supporting said holder and maintaining clamping action of said resilient portions.

26. In a machine of the class described, a movable presserfoot member, means arranged to cooperate therewith to clamp the material, a work-support carried by said presserfoot member, and means for feeding the work relatively to said work-support.

27. In a machine of the class described, means for feeding the material, a movable presserfoot member, means arranged to cooperate therewith to clamp the material, a work-support carried by said presserfoot member, and means arranged to cooperate with said work-support to clamp the work.

28. In a fastener-inserting machine, fastener-inserting mechanism, a movable work-support, means for feeding the material along said support, means arranged to clamp the material continuously on said work-support, and means arranged to clamp the material intermittently on said work-support.

29. In a fastener-inserting machine, fastener-inserting means, a work-support, means arranged to clamp the material continuously on said work-support, other means arranged to clamp the material intermittently on said work-support, and means for feeding the material relatively to said work-support and both of said clamping means.

30. In a fastener inserting machine, fastener-inserting mechanism, a work-support, means arranged to clamp the material continuously on said work-support, means arranged to feed the material relatively to said work-support and said clamping means, and means arranged to clamp the material intermittently between the first said clamping means and said feeding means.

In testimony whereof, I have signed my name to this specification.

GEORGE W. JACQUES.