

Aug. 8, 1961

B. S. NICKERSON

2,995,098

PANTOGRAPH ATTACHMENT FOR SEWING MACHINES

Filed Aug. 27, 1959

2 Sheets-Sheet 1

Fig. 1.

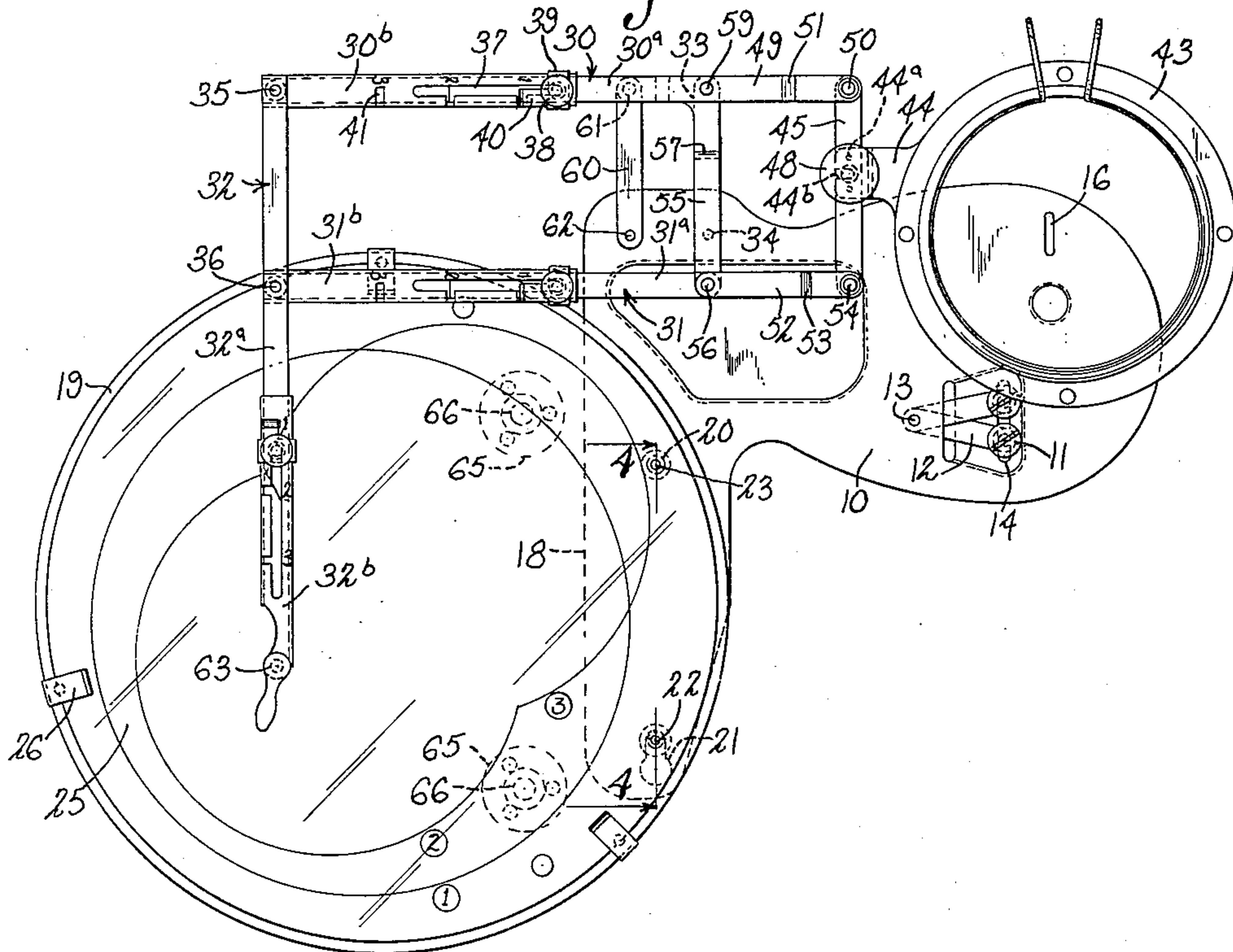


Fig. 2.

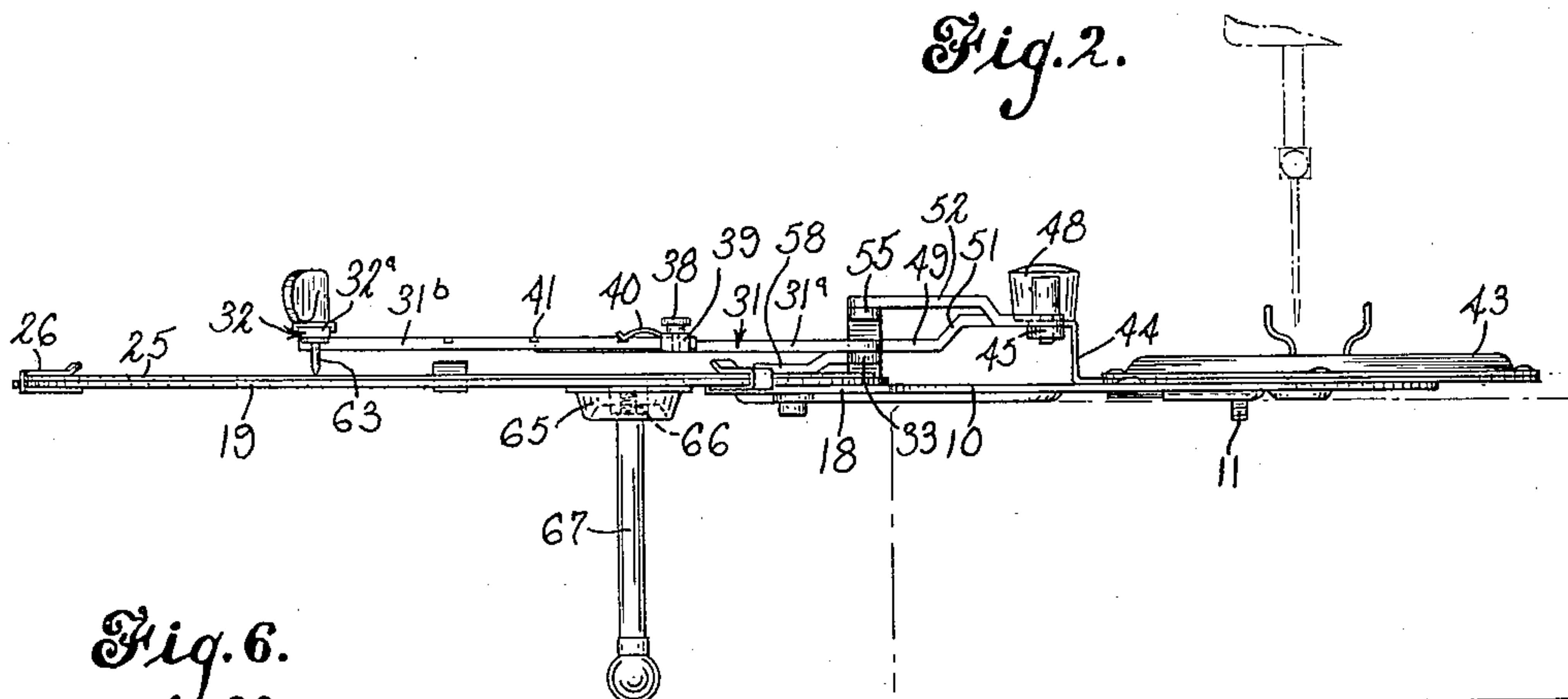
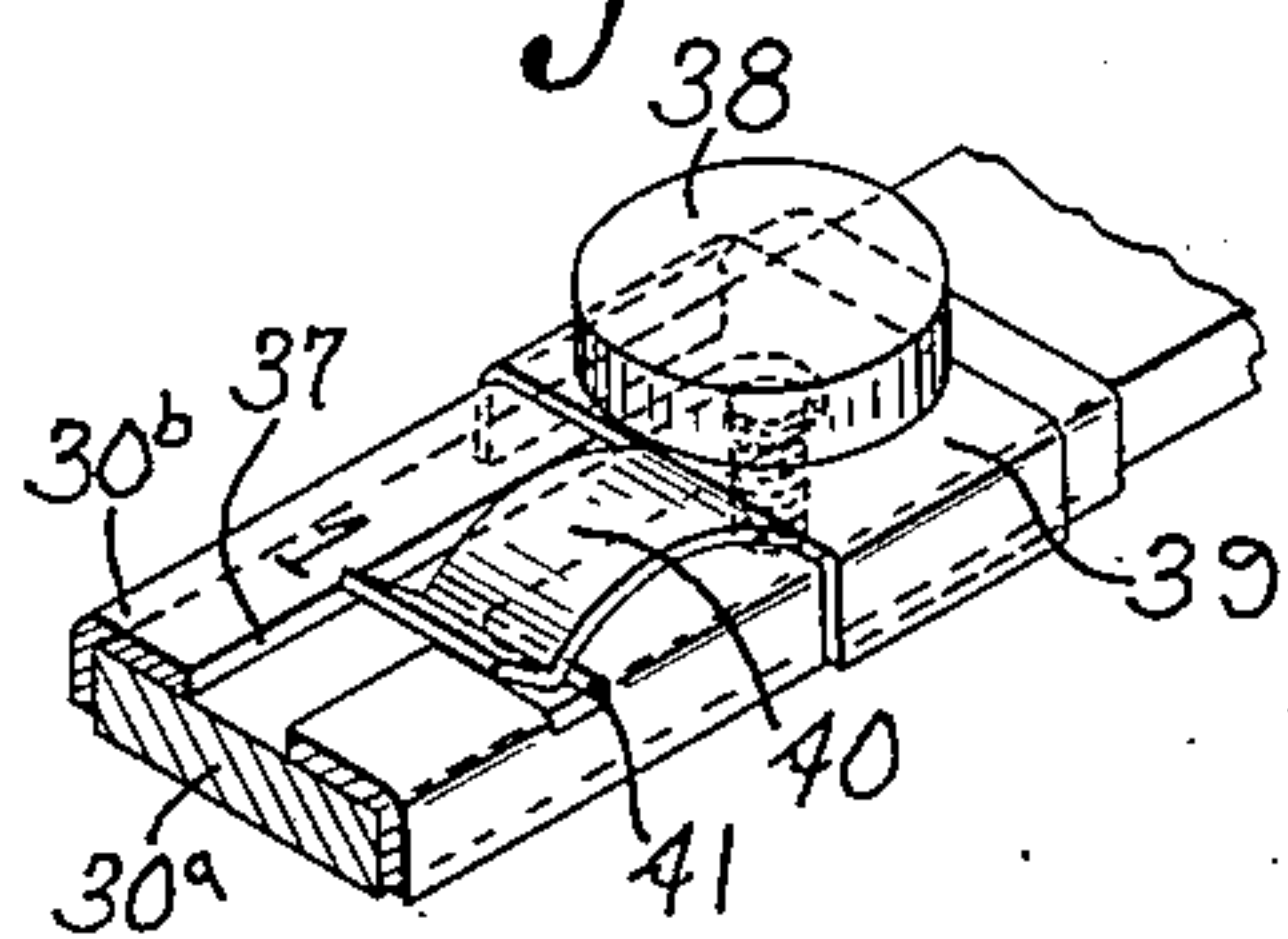


Fig. 6.



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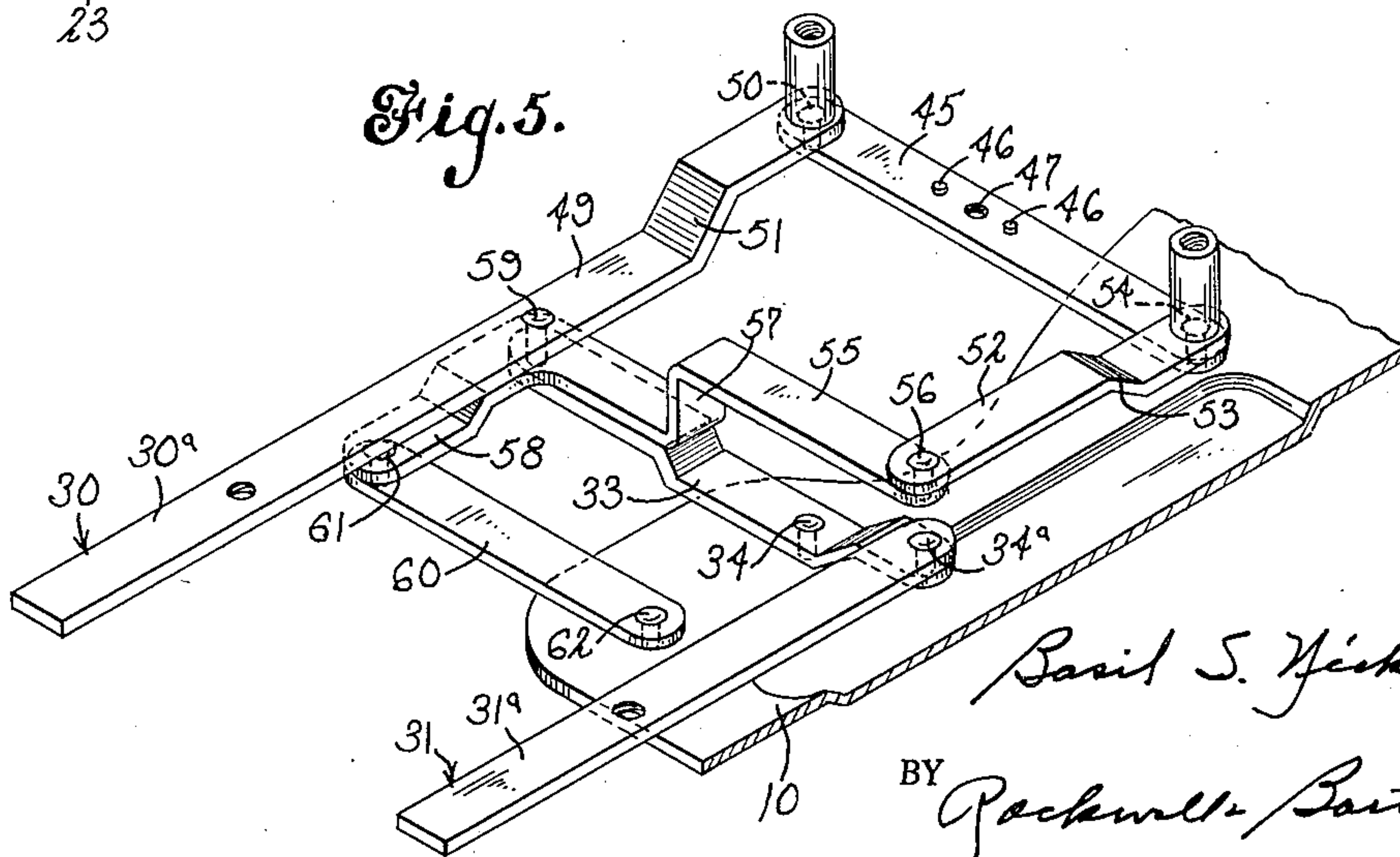
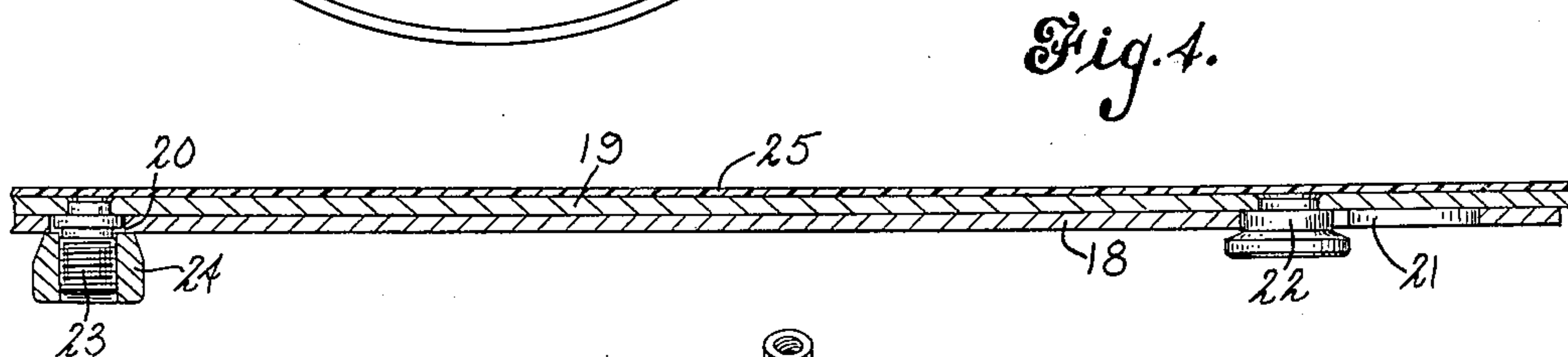
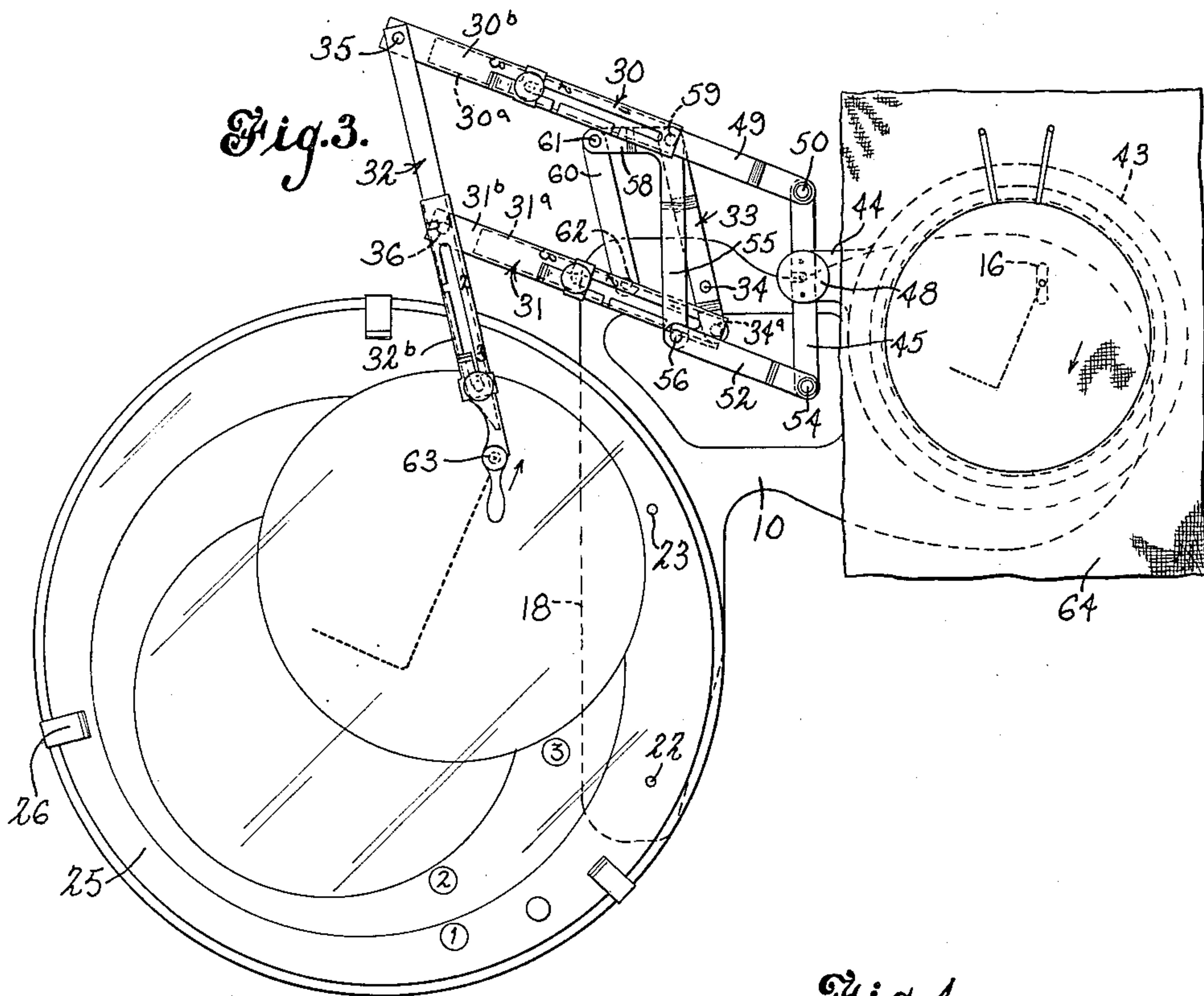
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PANTOGRAPH ATTACHMENT FOR SEWING MACHINES

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2 Sheets-Sheet 2



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PANTOGRAPH ATTACHMENT FOR SEWING MACHINES

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6 Claims. (Cl. 112—102)

This invention relates to a pantograph attachment for sewing machines and more particularly to an attachment whereby any desired design appearing upon a template or pattern supported by the attachment may be sewn upon a piece of material. The present structure represents an improvement in certain respects over the structure shown in U.S. Patent No. 2,932,267, issued April 12, 1960.

In an attachment of this kind it is desirable that the design which is sewn upon the material be in the same position as it appears on the pattern which is used as a model and which is to be copied as in most instances the resulting product will be in a position reversed as compared to that in which it appears upon the template. It is also desirable that the device be readily adjustable so that the resulting design may be made larger or smaller as desired. Further it is desirable that the attachment be so constructed that it may be readily used by the user of an ordinary domestic household sewing machine and be easily manipulated as well as conveniently attached to the bed of the machine.

In general the device of the present application comprises a supporting plate adapted to be attached to the bed of the sewing machine, this plate having means for supporting the pattern or template which is to be copied. A pantograph is pivotally attached to this plate and is provided upon an extended portion of one leg thereof with a stylus adapted to follow the pattern. A support for the cloth or material upon which the design is to be made is connected to the pantograph by a suitable structure shown as a parallelogram, the legs of which are pivotally connected together so that this support or carrier for the material will be moved with respect to the needle of the sewing machine over a course corresponding to the pattern or design to be copied.

Certain of the legs of the pantograph are adjustable in length as is also the extended portion of one leg which carries the stylus so as to adjust the size of the resulting design made upon the material, this adjustment being made in the present instance with the use of telescopically arranged members which may be lengthened or shortened by definite increments which correspond to the adjustment of the stylus-supporting leg.

As the supporting plate including the portion which supports the pattern is of somewhat large area, it sometimes occurs that the latter will not be accommodated by the bed plate of the machine particularly when the device is used with a portable sewing machine. Therefore, means are provided to support this plate from the table or other member upon which the portable machine is placed and which is at a considerably lower level than the bed plate of the sewing machine itself.

One object of the present invention is to provide a pantograph attachment for sewing machines which shall be economical to construct and which at the same time will be efficient in operation.

A still further object of the invention is to provide a pantograph attachment for sewing machines which will enable the user to copy upon a piece of material a pattern or design upon a template and wherein adjustment of the apparatus may be readily and easily effected without complete detachment of the parts.

Still another object of the invention is to provide a pantograph attachment for sewing machines of the char-

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acter described in which the pattern-supporting plate may be fixed in relation to the bed plate of the sewing machine with which the attachment is used and means provided upon this supporting plate to determine the position of the pattern to be copied according to the adjustment of the legs of the pantograph.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

FIG. 1 is a top plan view of a pantograph attachment embodying my invention;

FIG. 2 is a side elevational view thereof;

FIG. 3 is a view similar to FIG. 1 but showing the parts in another position and showing the pantograph adjusted for a design of a different size;

FIG. 4 is a sectional view on line 4—4 of FIG. 1 showing the connection between the pattern-supporting plate and the frame or plate of the attachment;

FIG. 5 is a perspective view of the parallelogram connecting the pantograph to the work-holding frame; and

FIG. 6 is an enlarged perspective view showing the means for securing the telescoping sections of the legs of the pantograph in adjusted position.

To illustrate one embodiment of the invention there is shown in the drawings a sewing machine attachment comprising a supporting plate 10 which is adapted to be secured to the base of the head of the sewing machine. To this end screws 11 are mounted in short arms or links 12 pivoted to the plate 10 at 13. The plate 10 is provided with a slot 14 to provide for adjustment of the screws with respect to the bed of the machine so that the latter may be readily aligned with threaded openings in the base of the machine head. The plate 10 is adapted to extend over the feed dog of the sewing machine when the attachment is in place and is provided with an elongated needle opening 16 which will register with the needle opening (not shown) in the bed of the machine.

The plate 10 is provided with a laterally extending arm 18 to which may be secured a circular pattern plate or support 19 (FIG. 4) for supporting the pattern or template containing the design which is to be copied. As shown more particularly in FIG. 4, the portion 18 of the plate 10 is provided with a circular opening 20 and an elongated opening 21 of substantially keyhole shape. The template support 19 is provided with a headed stud 22 designed to be received in the opening 21 and a threaded stud 23 adapted to be inserted through the opening 20 and receive the nut 24 to fixedly secure the support 19 to the member 18.

The pattern or template is designed to be placed upon the member 19 and may be conveniently covered by a transparent plastic sheet 25 (FIG. 4) of circular shape which serves as a pattern guide. The sheet 25 may be detachably held in place by U-shaped spring clips 26 (FIGS. 1 and 3) which embrace the edges of the supporting member 19 and the plastic sheet 25 so that this sheet may be readily removed to place the pattern sheet below it. The transparent plastic sheet 25 may be provided with a plurality of circular lines shown at 1, 2 and 3 in FIGS. 1 and 3. These circles, as explained later, are employed to position or center the pattern according to the adjustment of the legs of the pantograph which will determine the size of the resulting design as compared to that upon the pattern which is being copied.

The pantograph comprises the four legs 30, 31, 32 and 33, the latter being pivoted at 34 to the base 10. Two of these legs are adjustable in length between their pivots and each consists of two telescoping parts. The leg 30 comprises a member 30^a telescopically received within a section 30^b of U-shaped form, which section is pivoted to the member 32 at 35 while the leg 31 com-

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prises the member 31^a telescopically received within the U-shaped portion 31^b pivoted at 36 to the leg 32. The latter is extended beyond its pivot 36 to lie over the pattern plate 19 and this portion is adjustable in length as its extended end 32^a is telescopically received within a member 32^b of U-shaped form in section.

In order to secure the adjustable sections of the legs 30, 31 and 32 together in definite positions the structure shown in FIG. 6 is employed, this structure being described in connection with the member 30^a but it will be understood that the same is employed in connection with the other adjustable legs of the pantograph. The U-shaped member 30^b is provided with a slot 37 adapted to receive the threaded shank of a headed screw 38 which is threaded into the member 30^a. A channel-shaped clip 39 is positioned between the head of the screw and the member 30^b so that it may be tightened to frictionally hold the members together. Attached to this clip is a spring detent 40 having a free end portion designed to enter one of the three recesses 41 provided in the member 30^b. These recesses are designated as 1, 2 and 3 on FIGS. 1 and 3 of the drawings and, as will be explained later, will determine the adjusted lengths of the legs of the pantograph to be used when the pattern is centered in a corresponding one of the circles 1, 2 and 3 upon the plastic cover 25.

It will be understood that the same type of connection is employed between the members 31^a and 31^b and between the members 32^a and 32^b as has just been described in connection with FIG. 6. Thus each of these three members may be correspondingly adjusted to definite lengths as determined by the detents 40 and the recesses 41, it being understood that when the detent of one arm is set in the recess marked No. 1, the lengths of the remaining arms will be correspondingly adjusted.

The work-holding member designated generally at 43 is provided with an ear 44 detachably secured to one arm 45 of a parallelogram structure shown particularly in FIGS. 1, 3 and 5. For this purpose the arm 45 may be provided with pins 46 to be received in sockets 44^a in the ear 44, and a threaded opening 47 to receive a headed screw 48 passing through a slot 44^b in the ear 44 to secure the work-holding member rigidly to the arm 45. A second arm or side of the parallelogram is constituted by an extension 49 of the member 30^a, the end of which is pivoted at 50 to the side 45. The member 49 is upwardly offset, as shown at 51.

A third side of the parallelogram is constituted by the arm 52 downwardly offset, as shown at 53, and pivoted to the side 45 at 54. The fourth side of the parallelogram comprises the member 55 pivoted at 56 to the arm 52 and downwardly offset at an intermediate portion, as shown at 57. This member is of generally L-shaped form and comprises a second arm 58 lying below the side member 49 and pivoted thereto at 59, the pivot 59 being located at the vertex of the angle formed by the members 55 and 58.

The leg 33 of the pantograph lies below the side 55 of the parallelogram and is pivoted at 34^a to the end of the leg 31^a and pivoted at 59 to the end of the leg 30^a. A link 60 is pivoted at 61 to the free end of the arm 58 and pivoted at 62 to the base plate 10, the length of this link between its pivots being substantially equal to the distance between the pivots 59 and 34. A stylus 63 is mounted upon the free end of the member 32^b of the extension of the arm 32.

It will be seen from the above construction of the pantograph and parallelogram that as the stylus is moved over a pattern positioned upon the pattern plate 19 the workholding member 43 will be made to follow a corresponding course but in the opposite direction, thus resulting in the embroidering of the same design upon the work as appears upon the pattern plate, the parts of which will be similarly related and not in reverse positions. Movement of the stylus, for example, in the direction of the arrow shown in FIG. 3 will result in a

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movement of the work holder and material 64 in the direction of the arrow shown thereon which will, it is seen, copy the pattern upon the pattern plate. The pattern guide 25 is of the same dimensions as the pattern plate 19 so that it may always be centered upon the plate by the clips 26, and the pattern itself may be located by the circles 1, 2 and 3 corresponding, of course, to the adjustment of the legs 30, 31 and 32 of the pantograph.

If the device is used in connection with a portable sewing machine where the bed plate of the machine is supported at some distance above the table, it is desirable to provide a support for the pattern plate 19. To this end bosses 65 may be provided on the under side of this plate, these bosses having threaded sockets 66 to receive the free ends of threaded posts or feet 67, as shown, for example, in FIGS. 1 and 2. The posts 67 may be readily removed when it is not desired to use them.

The operation of the device is believed to be clear from the foregoing description. The pattern will normally be placed below the transparent pattern guide 25 and centered in one of the circles 1, 2 and 3 depending upon the scale on which it is desired to reproduce the pattern. The legs 30, 31 and 32 will be adjusted according to the position of the pattern below the guide. That is, if the pattern is centered by circle No. 1, the legs will be adjusted so that the detents 40 will lie in recesses No. 1, as shown in FIG. 1 of the drawings. If, however, the pattern is centered in circle 3, the legs of the parallelogram will be adjusted to a position wherein the detents 40 lie in recesses No. 3, as shown on FIG. 3 of the drawings. Movement of the stylus over the pattern will result in a change in position of the pantograph and parallelogram from that shown in FIG. 1 to that shown in FIG. 3, the work support 43 being moved correspondingly to the arm or side 45 of the parallelogram to which it is rigidly secured.

While I have shown and described one embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support adapted to be secured in place upon the bed of a sewing machine, a pattern plate carried on said support, a pantograph comprising four pivoted legs, one of which is pivoted intermediate its ends to said support and another of which is extended beyond its pivot and provided with a stylus on its extended end overlying said pattern plate, a parallelogram operatively connected to said pantograph, one side of which constitutes the extended end of one leg of a pantograph, a work holder secured to another side of the parallelogram, said stylus-carrying leg and the two adjacent legs of the pantograph pivoted thereto being adjustable in length, and each comprising two telescoping members, means for securing said members in predetermined adjusted positions, and a pattern guide mounted on the pattern plate and having means thereon to locate a pattern in a plurality of definite positions corresponding to certain extended positions of said extensible legs.

2. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support adapted to be secured in place upon the bed of a sewing machine, a pattern plate carried on said support, a pantograph comprising four pivoted legs, one of which is pivoted intermediate its ends to said support and another of which is extended beyond its pivot and provided with a stylus on its extended end overlying said pattern plate, a parallelogram operatively connected to said pantograph, one side of which constitutes the extended end of one leg of a pantograph, a work holder secured to another side of the parallelogram, said stylus-carrying leg and the two adjacent legs of the pantograph

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pivoted thereto being adjustable in length, each comprising two telescoping members, means for securing said members in predetermined adjusted positions, a pattern guide mounted on the pattern plate and having means thereon to locate a pattern in a selected one of a plurality of definite positions, and each of said positions corresponding to an adjusted position of the adjustable legs of the pantograph.

3. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support to be secured to the bed of a sewing machine, a pattern plate carried by said support, a pantograph comprising one leg having a stylus at one end thereof overlying said support, a second leg pivoted to the other end of the first leg, a third leg also pivoted to the first between the second leg and the stylus, and a fourth leg pivoted to the second and third legs at points substantially equidistant from their pivots with the first leg and pivoted between its ends to the support, said second leg being extended beyond its pivot with the fourth leg and constituting one side of a parallelogram, the other sides of said parallelogram comprising a first arm member pivoted to said one side coincidently with the pivot of the fourth leg and extending therefrom toward the third leg of the pantograph, a second arm member pivoted to said one side and having a work holder secured thereto, and a third arm pivoted to said first and second arms, said first arm member being of L-shaped form and having a portion extending away from said one side, and a link connecting said portion with the frame.

4. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support adapted to be secured in place upon the bed of a sewing machine, a pattern plate carried by said support at substantially the same level as the support, a pantograph comprising four pivoted legs, one of which is pivoted intermediate its ends to said support and another of which is extended beyond its pivot and provided with a stylus on its extended end overlying said pattern plate, a parallelogram operatively connected to said pantograph, one side of which constitutes the extended end of one leg of a pantograph, a work holder secured to another side of the parallelogram, and supporting legs detachably secured to said pattern plate and extending downwardly therefrom to support the latter at a level at a substantial distance below said support.

5. A sewing machine attachment for copying designs

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or the like upon a piece of material, said attachment comprising a support adapted to be secured in place upon the bed of a sewing machine, a pattern plate carried on said support, a pantograph comprising four pivoted legs, one of which is pivoted intermediate its ends to said support and another of which is extended beyond its pivot and provided with a stylus on its extended end overlying said pattern plate, a parallelogram operatively connected to said pantograph, one side of which constitutes the extended end of one leg of a pantograph, a work holder secured to another side of the parallelogram, means detachably securing said pattern plate to said support, said means comprising spaced openings in the support, one of which is of keyhole shape, and members projecting downwardly from the pattern plate for reception in said openings.

6. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support adapted to be secured in place upon the bed of a sewing machine, a pattern plate carried on said support, a pantograph comprising four pivoted legs, one of which is pivoted intermediate its ends to said support and another of which is extended beyond its pivot and provided with a stylus on its extended end overlying said pattern plate, a parallelogram operatively connected to said pantograph, one side of which constitutes the extended end of one leg of a pantograph, a work holder secured to another side of the parallelogram, a pattern guide mounted on the pattern plate and having means thereon to locate a pattern in a plurality of definite positions, said pattern guide comprising a transparent sheet member of substantially the same dimensions as said pattern plate, and U-shaped clips extending over the edges of said pattern plate and pattern guide to detachably hold the latter in place.

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