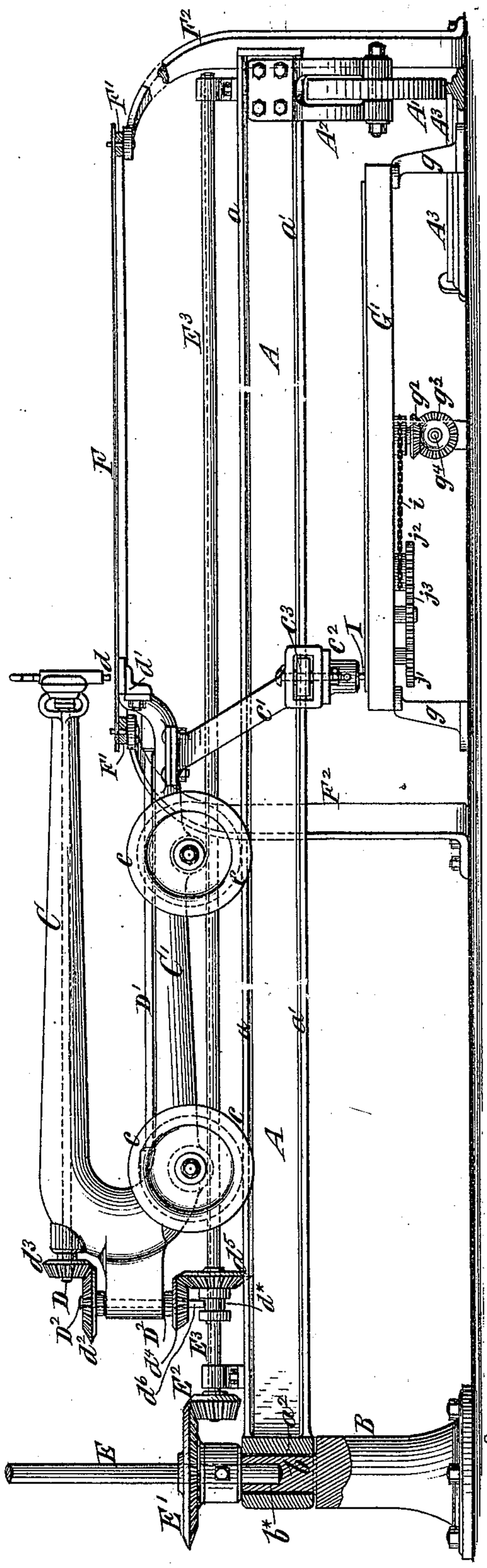
(o Model.) 4 Sheets—Sheet 1.

F. L. PALMER.

MACHINE FOR QUILTING BED COMFORTABLES, &c.

No. 334,275. Patented Jan. 12, 1886.

Fig. 1.



Witnesses:-
W. F. Whitehead.
Matthew Tolock

Inventor:-
Frank L. Palmer
by his Attys.
Brown & Hall

(No Model.) 4 Sheets—Sheet 2.

F. L. PALMER.

MACHINE FOR QUILTING BED COMFORTABLES, &c.

No. 334,275. Patented Jan. 12, 1886.

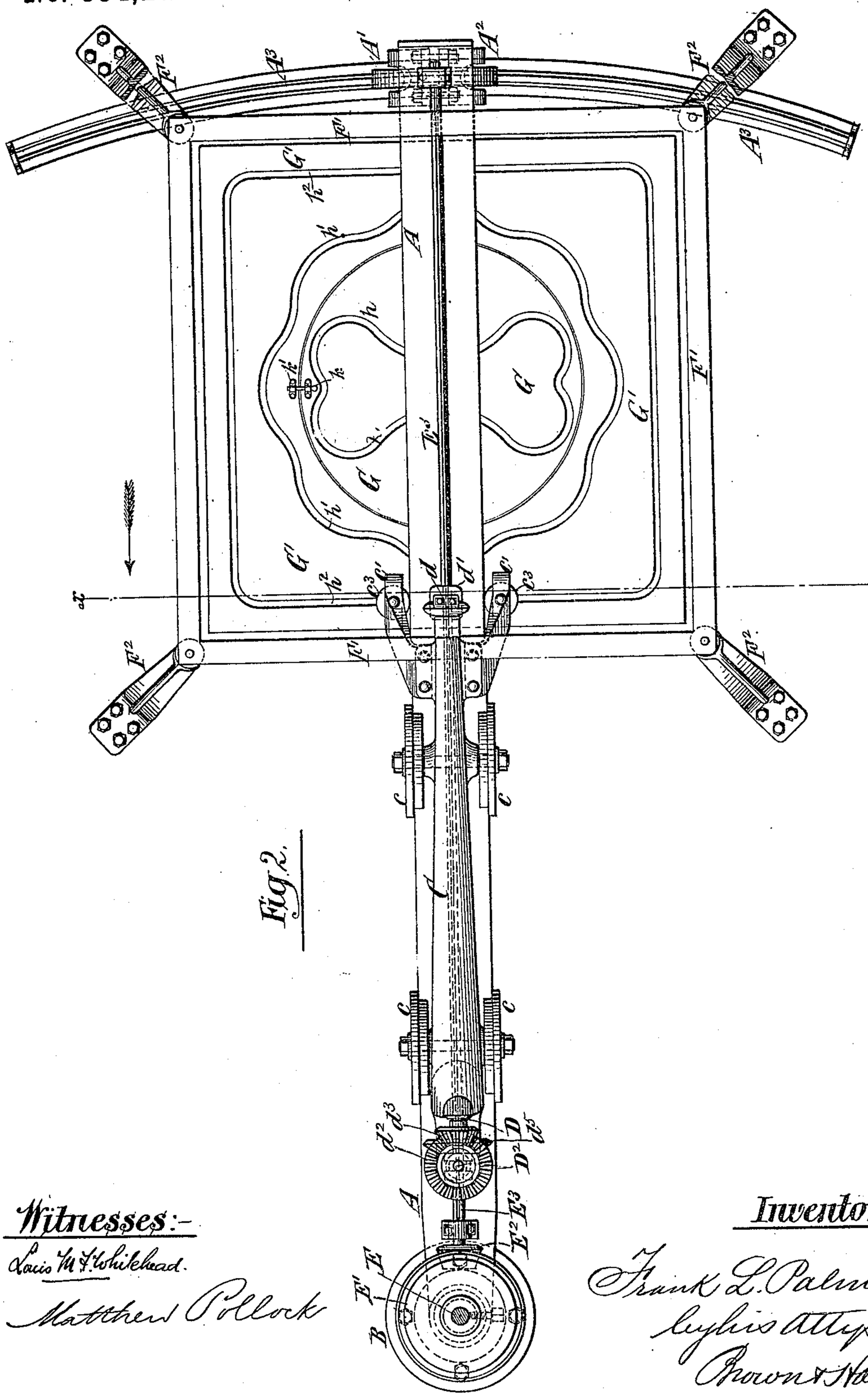


Fig. 2.

Witnesses:-
Louis M. F. Whitehead.
Matthew Pollock

Inventor:-
Frank L. Palmer
by his attys
Brown & Hall

(No Model.) 4 Sheets—Sheet 3.

F. L. PALMER.

MACHINE FOR QUILTING BED COMFORTABLES, &c.

No. 334,275. Patented Jan. 12, 1886.

Fig. 4.

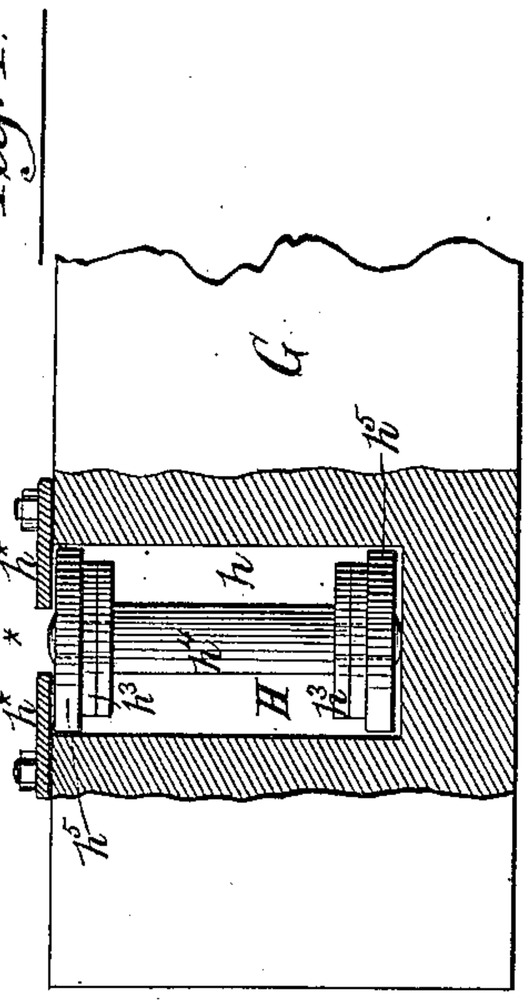
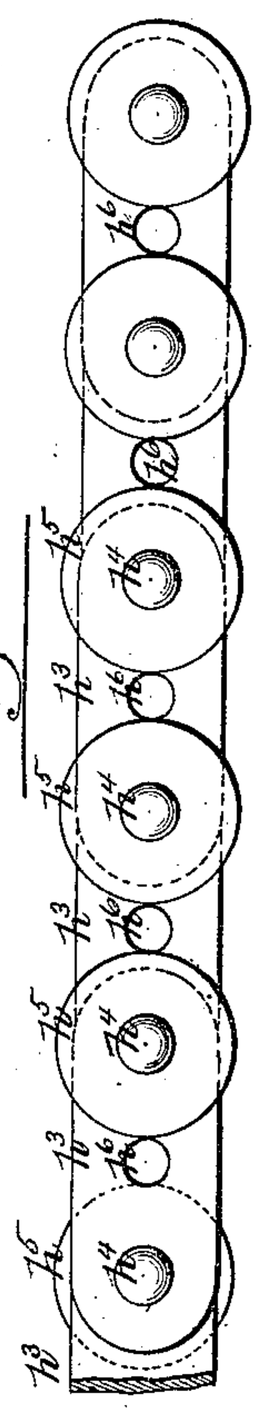


Fig. 3.

Fig. 5.



Witnesses:-

Louis M. T. Whitehead.

Matthew Pollock

Inventor:-

Frank L. Palmer

by his Attys

Brown & Hall

(No Model.)

4 Sheets—Sheet 4.

F. L. PALMER.

MACHINE FOR QUILTING BED COMFORTABLES, &c.

No. 334,275. Patented Jan. 12, 1886.

Fig 6.

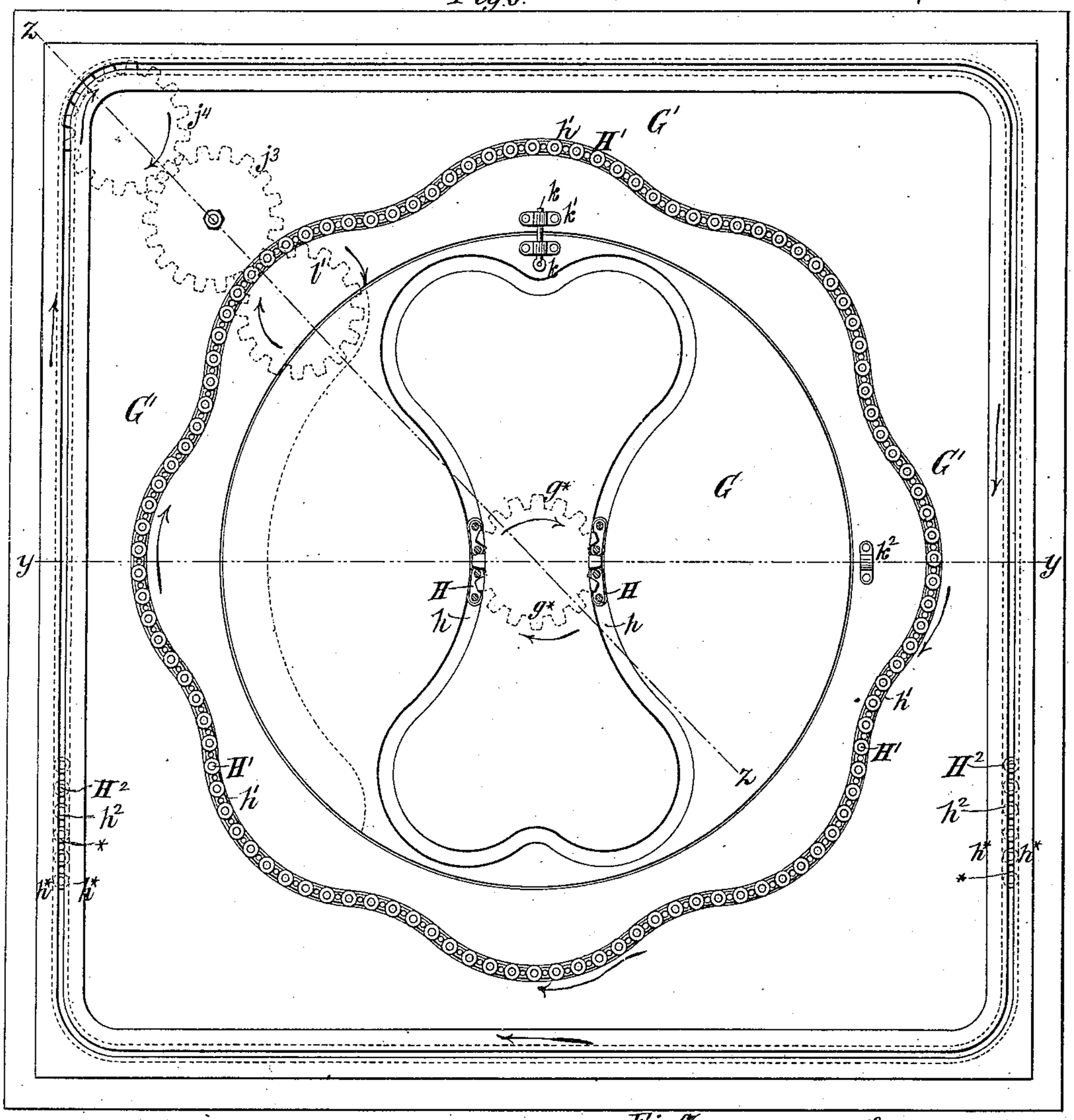


Fig 7.

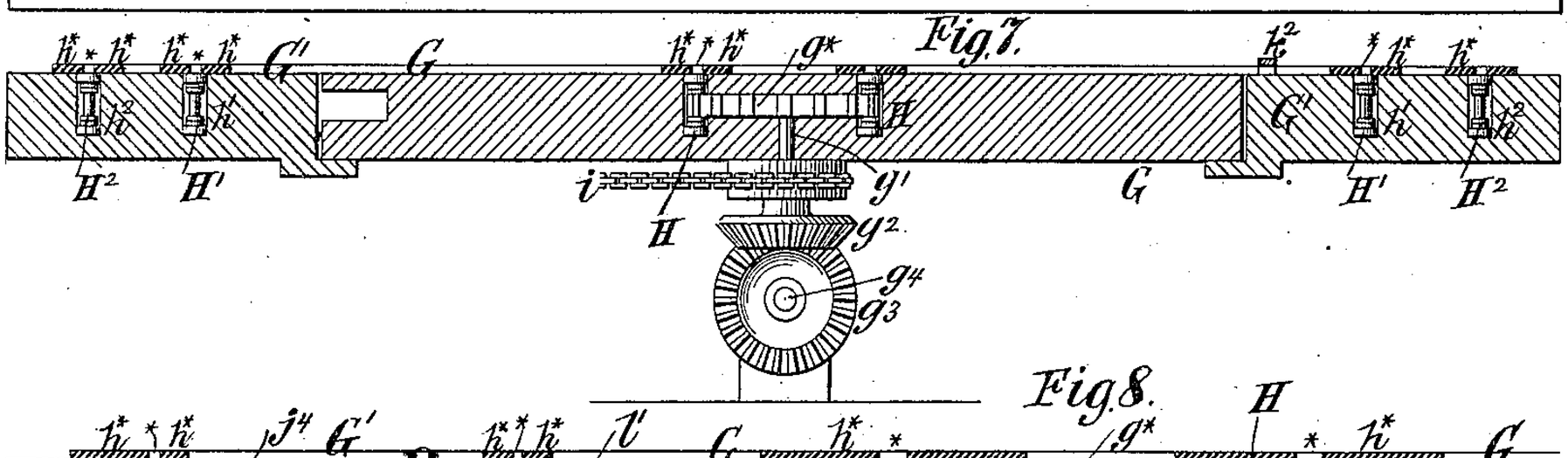
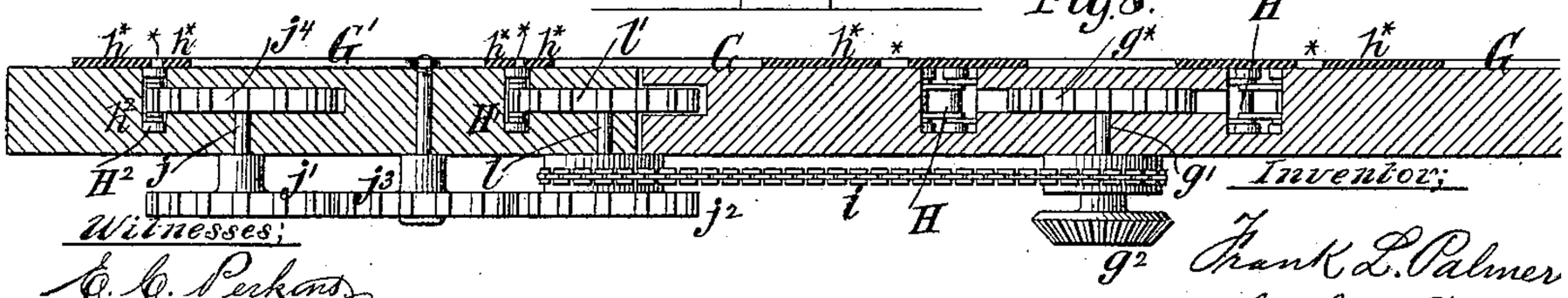


Fig 8.



UNITED STATES PATENT OFFICE.

FRANK L. PALMER, OF NEW LONDON, CONNECTICUT.

MACHINE FOR QUILTING BED-COMFORTABLES, &c.

SPECIFICATION forming part of Letters Patent No. 334,275, dated January 12, 1886.

Application filed April 9, 1885. Serial No. 161,654. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. PALMER, of New London, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Machines for Sewing and Quilting Bed-Comfortables, &c., of which the following is a specification.

My invention is applicable more particularly to machines for quilting bed-comfortables composed of two sheets or pieces of fabric and an interposed layer of wadding or padding; but such machines may also be employed in producing upon fabrics of large size patterns of ornamental sewing or quilting which are appropriate to their shape.

The invention relates to machines in which are employed fabric-supports, on which the fabric is to be stretched or extended, and a long-armed sewing-machine, the needle of which may operate upon any portion of the exposed fabric, and in which one of said parts, either the fabric-support or sewing-machine, has or is capable of a universal movement under control of a suitable pattern mechanism, so as to produce the relative change in position between the needle and fabric, which is necessary to form figures of the desired design.

In the accompanying drawings I have represented a machine which illustrates my invention, and in which are employed a frame whereon a fabric may be stretched or extended, stationary supports for said frame, and a sewing-machine movable to cause its needle to work upon different portions of the stretched or extended fabric. In this machine is employed a long beam or arm pivoted at one end upon a vertical axis, and provided at the other end with a supporting-wheel running upon an arc-shaped track or support. Upon this beam or arm is mounted a sewing-machine having wheels or rollers, whereby the machine may be moved toward and from the center of the arm, and upon the same, as on a track. These wheels or rollers of the sewing-machine constitute a second carriage having a reciprocating movement on the beam or arm, which latter is capable of a swinging movement on its pivot. By reason of this compound support, which is provided for the sewing-machine, the latter may be moved so that its needle may operate on any portion of the stretched or extended fabric, and I provide suitable gear or driving mechanism whereby the needle-operating shaft and the shaft which operates the looper or shuttle mechanism of the sewing-machine will be driven continuously during the swinging movements of the beam or arm and the reciprocating or radial movements of the sewing-machine upon the beam or arm.

It will be understood that the sewing-machine, when supported as above described, may be moved by hand to cause its needle to follow and quilt upon the extended fabric any design which may be delineated or marked thereon; but in order to render the machine automatic in its operation I prefer to employ pattern mechanism whereby such movements will be imparted to the machine. For this purpose I may employ pattern mechanism such as is shown in my Letters Patent No. 308,981, dated December 9, 1884, and which comprises a rack or track arranged in pattern form, and a positively-operating pinion or other device engaged with said rack or track and moving along the same by its positive rotation or operation.

I have now devised another pattern mechanism which operates somewhat upon the same principle as that just referred to, and which I may employ for producing the automatic movement of the sewing-machine. In this new pattern mechanism I employ an endless chain, belt, or other flexible traveler, which is arranged in pattern form, and which has imparted to it a continuous travel or movement. This traveling carrier may be held in pattern form, either by arranging it in a guide slot or groove or by passing it around rollers or guide-wheels, and if the sewing-machine is provided with a pin or tracker which is engaged or connected with the traveling carrier the machine will receive a movement which will cause its needle to produce on the fabric lines of stitching conforming to the design of the pattern. This particular pattern mechanism may be employed in connection with other supports for the sewing-machine than those here shown—for example, with supports consisting of two carriages, movable, as described, and shown in my aforesaid Letters Patent.

Instead of making the fabric-supports stationary and moving the sewing-machine, it is

obvious that the sewing-machine may be stationary and the fabric-frame mounted upon and movable lengthwise of the swinging beam or arm above referred to, and connected with the traveling carrier in the same manner in which the sewing-machine is connected in the example of my invention here shown.

In the drawings, Figure 1 is a partly sectional elevation of a machine for quilting fabrics embodying my invention. Fig. 2 is a plan thereof, the fabric being removed, so as to expose the pattern mechanism beneath. Fig. 3 is a transverse vertical section on the plane of the dotted line *x x*, Fig. 2. Fig. 4 is a sectional view upon a larger scale, illustrating a portion of the pattern mechanism. Fig. 5 is a plan upon the same scale as Fig. 4, illustrating a traveling carrier which I may employ. Fig. 6 is a plan of the pattern mechanism on a larger scale than Figs. 1, 2, 3, certain parts being removed to show clearly the traveling-carrier and the guide slot or groove in which it works. Fig. 7 is a transverse section on the plane of the dotted line *y y*, Fig. 6; and Fig. 8 is a partial transverse section on the plane of the dotted line *z z*, Fig. 6.

Similar letters of reference designate corresponding parts in all the figures.

A designates a long beam or arm, which may consist of a rolled iron beam of **I** shaped transverse section, having top and bottom flanges, *a a'*. This beam has at one end a bearing, a^2, fitted upon a vertical journal or pivot, *b*, forming part of the standard or post B.

C designates the upper arm, and C' the lower arm, of the sewing-machine, which is provided with wheels or rollers *c*, fitted to and adapted to travel upon the top of the beam or arm A. These wheels or rollers may be flanged, as best shown in Figs. 2 and 3, so as to embrace the top flanges, *a*, of the beam or arm, and to be guided laterally thereon. The machine also has at the forward end downwardly-projecting arms or hangers *c'*, united below the beam or arm A by the cross-piece c^2.

In the arms or hangers *c'* are wheels or rollers c^3, which bear upon the lower flanges, *a'*, of the beam or arm A, and so prevent the machine from canting or rocking in a lateral direction.

In the upper arm, C, of the machine is a needle-operating shaft, D, which, through suitable mechanism, imparts a reciprocating movement to the needle-bar *d*, and in the lower arm, C', of the sewing-machine is a shaft, D', which imparts the proper movement to the looper or shuttle mechanism arranged in the work-plate *d'*, which is at the outer end of the lower arm, C'.

The looper or shuttle mechanism constitutes no part of my present invention, but may be of any ordinary or suitable construction.

At the outer end of the beam or arm A is a wheel or roller, A', hung in suitable hangers or brackets, A^2, depending from the beam or arm, and adapted to roll or travel on the arc-shaped track A^3 below the machine.

From the above description it will be understood that the beam or arm A constitutes a lower carriage capable of a swinging movement on its vertical pivot or axis *b*, and the rollers of the sewing-machine constitute an upper carriage capable of movement to carry the machine toward and from the center or pivot of the beam or arm A. These two carriages provide for a universal movement of the sewing-machine, and I will now describe how the rotary motion may be imparted to the needle-operating shaft D, whatever be the position of the sewing-machine. I have here shown a driving-shaft, E, which is concentric with the axis or pivot *b*, and has a bearing, *b**, thereon. On this shaft is a bevel gear-wheel, E', which engages with the pinion E^2, as best shown in Fig. 1. The pinion E^2 is secured fast to a shaft, E^3, which is journaled in suitable bearings on the beam or arm A, and is grooved throughout the whole or greater part of its length. The sewing-machine carries a short shaft, D^2, the upper end of which is connected with the needle-operating shaft D by bevel-wheels d^2 d^3, and the lower end of which is connected by a bevel-wheel, d^4, with a bevel-wheel, d^5, on the shaft E^3. The bevel-wheel d^5 has in its hub an annular groove, *d**, with which engages a pin, d^6, projecting downward from the shaft D^2. The wheel d^5 is locked to the shaft E^3 by a feather or spline, so that it cannot rotate independently of the shaft, but may be moved freely along the shaft. By this mechanism it will be understood that the proper rotary motion will be imparted to the needle-shaft D of the sewing-machine, whatever be its position lengthwise of the beam or arm A, and whatever be the position of the beam or arm in its swinging movements.

I have not thought it necessary to illustrate any connections between the needle-operating shaft D and the looper or shuttle-shaft D'. The one may be operated from the other by any ordinary or suitable form of connections which may be arranged within the hollow frame of the sewing-machine, and to which my invention does not relate.

F designates a comfortable or other fabric to be quilted or sewed. As here shown, it is extended or stretched upon a rectangular frame, F', which in turn rests upon and is supported by standards F^2. When thus arranged, the lower arm of the sewing-machine moves below the fabric and the upper arm above the fabric.

When I say that the fabric is stretched or extended, I do not mean to limit myself to a fabric of approximately the same size as the frame F', but I may provide a frame having rollers at two opposite sides, from one to the other of which the fabric may be passed after the pattern between them has been quilted, and by which the exposed portion of the fabric is held stretched or extended.

In connection with the sewing-machine supports, as described, I may employ any suitable pattern mechanism for producing the

automatic movement of the sewing-machine; but the mechanism which is here shown is believed to be novel, and will now be described. It consists of a frame or plate comprising a central portion, G, and a fixed portion, G′, within which the central circular portion is fitted, and which is mounted upon suitable supports, *g*. The movable part of the pattern mechanism comprises one or more endless traveling carriers, which may consist of chains, belts, or analogous flexible devices. I have here shown three such traveling carriers, which are adapted to produce on the quilt or fabric a pattern appropriate to its shape. One traveling carrier, H, is arranged and supported by the central circular portion, G, of the pattern. Another traveling carrier, H′, is arranged around this central portion and in the portion G′ of the pattern. The third traveling carrier, H^2, is arranged in form of a rectangular figure, with rounded corners near the margin of the pattern-plate G′. I have shown these traveling carriers as arranged in grooves *h* *h*′ h^2 in the plate or board G G′, these grooves being in the same form as the parts of the pattern which are to be produced by their respective carriers. The groove *h* forms a central elongated figure of irregular design. The groove *h*′ forms a circular figure, the profile of which is serpentine or sinuous, and the groove h^2 forms a rectangular figure with rounded corners.

The traveling carriers are or may be confined in their respective grooves by flanges or caps *h**, forming between them a narrow slot, *, through which the carrier is exposed. The flanges *h** are removed from the portions *h* *h*′ of the grooves shown in Fig. 6, in order to show clearly the traveling carriers in said grooves; but such flanges are shown in position on the groove h^2.

One form of traveling carrier which I may employ I have shown in Figs. 4 and 5, and it consists of chain-links h^3, connected by pivot-pins h^4, and having anti-friction rollers h^5 loose on said pins. The pins or pintles h^4 of the chain may be shouldered at the ends, so as to receive the links h^3, as is ordinarily done with drive-chains. In the links h^3 are holes h^6, with which may be engaged a pin or tracker, I, carried by the cross-piece c^2 of the sewing-machine, and the pin or tracker I may be moved vertically by connections in said cross-piece, in order to free it from or engage it with the holes h^6 in the chain-links.

I propose to transmit a forward movement continuously in one direction to the several traveling carriers *h* *h*′ h^2 by mechanism such as is shown best in Figs. 6, 7, 8, or by any other suitable mechanism applicable for the purpose. At the center of the circular portion G of the pattern-plate I have shown a shaft, *g*′, which by means of bevel-wheels g^2 g^3 receives rotary motion from the shaft g^4, arranged in bearings below the machine. At the upper end of the shaft *g*′ is a sprocket-wheel or toothed wheel, *g**, which engages with the opposite portions of the chain H, as best shown in Fig. 6, but also in Fig. 7, and by rotating in the direction of the arrow, Fig. 6, moves the traveling carrier H continuously forward in one direction. Adjacent to the travelng carrier H′ is arranged a shaft, *l*, having at its upper end a sprocket or toothed wheel, *l*′, engaged with said carrier, and which is driven by an endless chain, *i*, from the center shaft, *g*′. By this means the wheel *l*′ is caused to move in the direction of the arrow shown thereon in Fig. 6, and imparts to the traveling carrier H′ a motion continuously in the direction of the arrow thereon in Fig. 6.

In the portion G′ of the pattern-plate I have shown a shaft, *j*, which by wheels or pinions *j*′ j^2 and an intermediate wheel or pinion, j^3, receives movement continuously from the shaft *l*. On the shaft *j* is a sprocket or toothed wheel, j^4, which is arranged at one corner of the figure formed by the traveling carrier H^2, and which by engaging with said carrier moves it forward continuously in the direction of the arrow shown in Fig. 6.

From the above description it will be understood that when the pin or tracker I of the sewing-machine is engaged with either of the traveling carriers here shown the sewing-machine will be moved automatically and its needle will be caused to travel along and sew the fabric in lines corresponding to the pattern form in which the traveling carriers are arranged. After the machine has been operated by the traveling carrier H to produce one figure the pin or tracker I may be moved out of engagement with said carrier and the sewing-machine moved by hand, so as to enable the pin or tracker to be engaged with the carrier H′. In like manner, after the machine has been moved by the carrier H′, the pin or tracker I may be raised and disengaged therefrom, and the machine may be moved to permit of the pin or tracker being engaged with the traveler H^2. The slots *, which are formed between the flanges *h**, permit the pin or tracker I to be engaged with the carrier traveling beneath, and in such slots the pin or tracker moves.

By turning the central portion, G, of the pattern-plate, I provide for producing a highly ornamental figure by means of a traveling carrier having a pattern form of simple design. I have shown the portion G of the pattern-plate as provided with a bolt, *k*, which may be engaged with one or the other of two keepers, *k*′ k^2, on the portion G′ of the pattern-plate. After the needle has been caused to produce a figure of the same form as the groove *h* upon the fabric, I may shove back bolt *k* and turn the central portion, G′, of the pattern-plate throughout a quarter of a circle, so that said bolt may be engaged with the keeper k^2. By the traveling carrier H the figure corresponding to the pattern-groove *h* may be repeated on the center of the extended fabric, and in a position at right angles to the first figure. It will be obvious that this rotary ad-

justment of the pattern provides for producing highly ornamental and seemingly complicated figures on the fabrics by means of a pattern of comparatively simple design, and it will be understood that a like result could be secured by turning the fabric after one figure had been produced upon it, in order that the same figure might be repeated in a different position on the fabric.

Although I have only shown my improved pattern mechanism as employed in connection with one form of supports which permit a universal movement of the sewing-machine, it will be understood that the same pattern mechanism can be employed in connection with other supports for the sewing-machine—such, for example, as are shown in Patent No. 308,982, granted to W. H. Palmer, Jr., December 9, 1884. It is also obvious that the peculiar system of supports or carriages for the sewing-machine might be provided for the fabric and the sewing-machine itself be stationary, as in my former patent, hereinabove referred to. The pivot *b* constitutes a center about which the sewing-machine may be swung.

It is obvious that the pivotal support of the swinging beam or arm may be elsewhere than at the end thereof.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for quilting or sewing fabrics, the combination, with a fabric-support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, consisting of a beam or arm, A, having a bearing, a^2, fitting a pivot, *b*, and provided at the end with a roller-support, A′, and a curved or arc-shaped track, A^3, for the roller-support, and a roller-carriage movable upon the beam or arm A^3 toward and from its supporting-pivot, substantially as and for the purpose herein described.

2. In a machine for quilting or sewing fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for the sewing-machine, consisting of a pivoted beam or arm, A, having a roller-support, A′, at the end, a curved or arc-shaped track, A^3, for the roller-support, and rollers or wheels *c* upon the sewing-machine running upon the top of the beam or arm A toward and from the pivot thereof, substantially as herein described.

3. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of a flexible traveling carrier arranged in pattern form, and a connection between said carrier and said movable part, substantially as herein described.

4. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for the sewing-machine, gearing for transmitting motion to the needle-operating shaft of the movable sewing-machine, and a pattern mechanism for controlling the movable sewing-machine, consisting of a flexible traveling carrier arranged in pattern form, and a connection between said carrier and the sewing-machine, substantially as herein described.

5. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of a flexible traveling carrier, a guide in pattern form, wherein said carrier moves, and a connection between said carrier and the movable part, substantially as herein described.

6. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of a traveling carrier, a plate having upon it a guide of pattern form, wherein the said carrier moves, and a connection between said carrier and the movable part, substantially as herein described.

7. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of a number of flexible traveling carriers arranged in pattern form, and a device, as pin or tracker I, whereby the movable part may be detachably connected with any one of the traveling carriers, substantially as herein described.

8. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of an endless chain or flexible traveling carrier arranged in pattern form, gearing for driving said chain or traveling carrier, and a connection between the latter and movable part, substantially as herein described.

9. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of an endless traveling carrier, a pattern-plate having in it a guide in pattern form for the said carrier, flanges overlap-

ping said guide to confine the carrier therein, and a connection between said carrier and movable part, substantially as herein described.

10. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism for controlling said movable part, consisting of a pattern-plate having a circular portion capable of being turned, and a surrounding portion, traveling carriers arranged in pattern form on both portions of the plate, and a device, as pin or tracker I, forming a detachable connection between said carriers and the said movable part, substantially as herein described.

11. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, consisting of a pivoted beam or arm and a roller-carriage movable thereon toward and from the pivot of the beam or arm, and pattern mechanism for controlling the said roller-carriage, consisting of a traveling carrier arranged in pattern form, and a connection between said carrier and the said roller-carriage, substantially as herein described.

12. In a machine for sewing or quilting fabrics, the combination, with a support whereon a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, and a pattern mechanism connected with the movable part for controlling its movements, and supports for the pattern mechanism capable of rotary movement to permit the operation of the pattern mechanism in different positions about the center of movement of its supports, substantially as herein described.

13. In a machine for sewing or quilting fabrics, the combination, with a support whereon a fabric may be stretched or extended, and a sewing-machine for operating thereon, of movable supports for one of said parts, pattern mechanism consisting of a traveling carrier connected with the movable part for controlling its movements, and a support for the traveling carrier capable of rotary movement to permit the operation of the traveling carrier in different positions, substantially as herein described.

14. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, a sewing-machine for operating thereon, and movable supports for one of said parts, of a pattern for controlling the movable part, comprising in itself a portion which is movable relatively to the remaining portions of the pattern, and a connection between the pattern and the part which it controls, substantially as herein described.

15. In a machine for sewing or quilting fabrics, the combination, with a support on which a fabric may be stretched or extended, a sewing-machine for operating thereon, and movable supports for the sewing-machine, consisting of a pivoted carriage capable of swinging movement, and a second carriage movable upon the first carriage toward and from the pivot thereof, of a pattern for controlling the movements of the sewing-machine, and a connection between the sewing-machine and pattern, arranged concentrically with the needle of the sewing-machine, substantially as herein described.

16. In a machine for sewing or quilting fabrics, the combination, with a support whereon a fabric may be stretched or extended, a sewing-machine for operating thereon, and movable supports for one of said parts, of a pattern plate having upon it a guide in pattern form and capable of rotary movement to change the position of said guide, and a connection between the movable part and said guide, substantially as herein described.

FRANK L. PALMER.

Witnesses:
C. HALL,
FREDK. HAYNES.