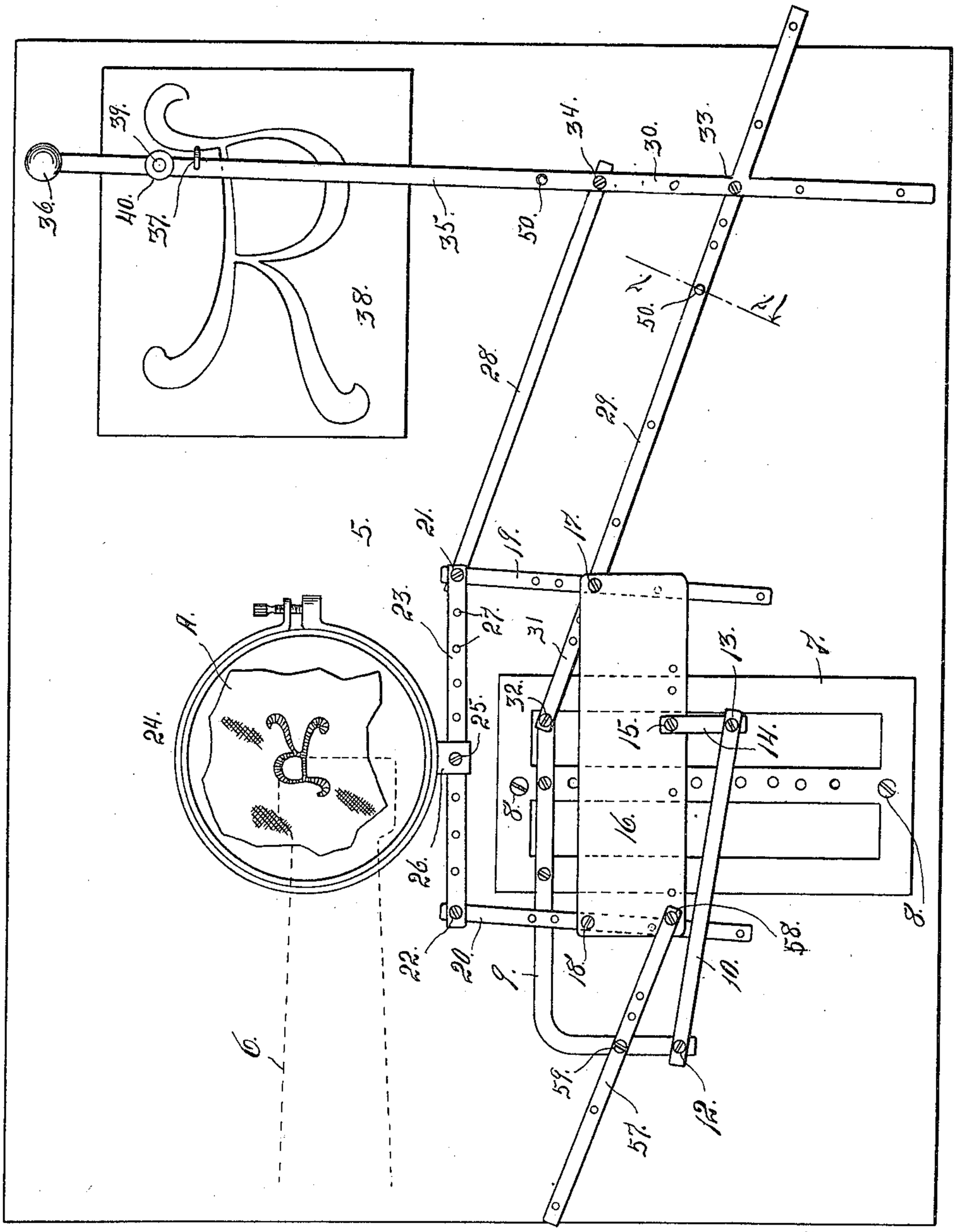
H. RICHTER.

EMBROIDERY ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED JUNE 14, 1909.

994,033. Patented May 30, 1911.

3 SHEETS—SHEET 1.



Witnesses
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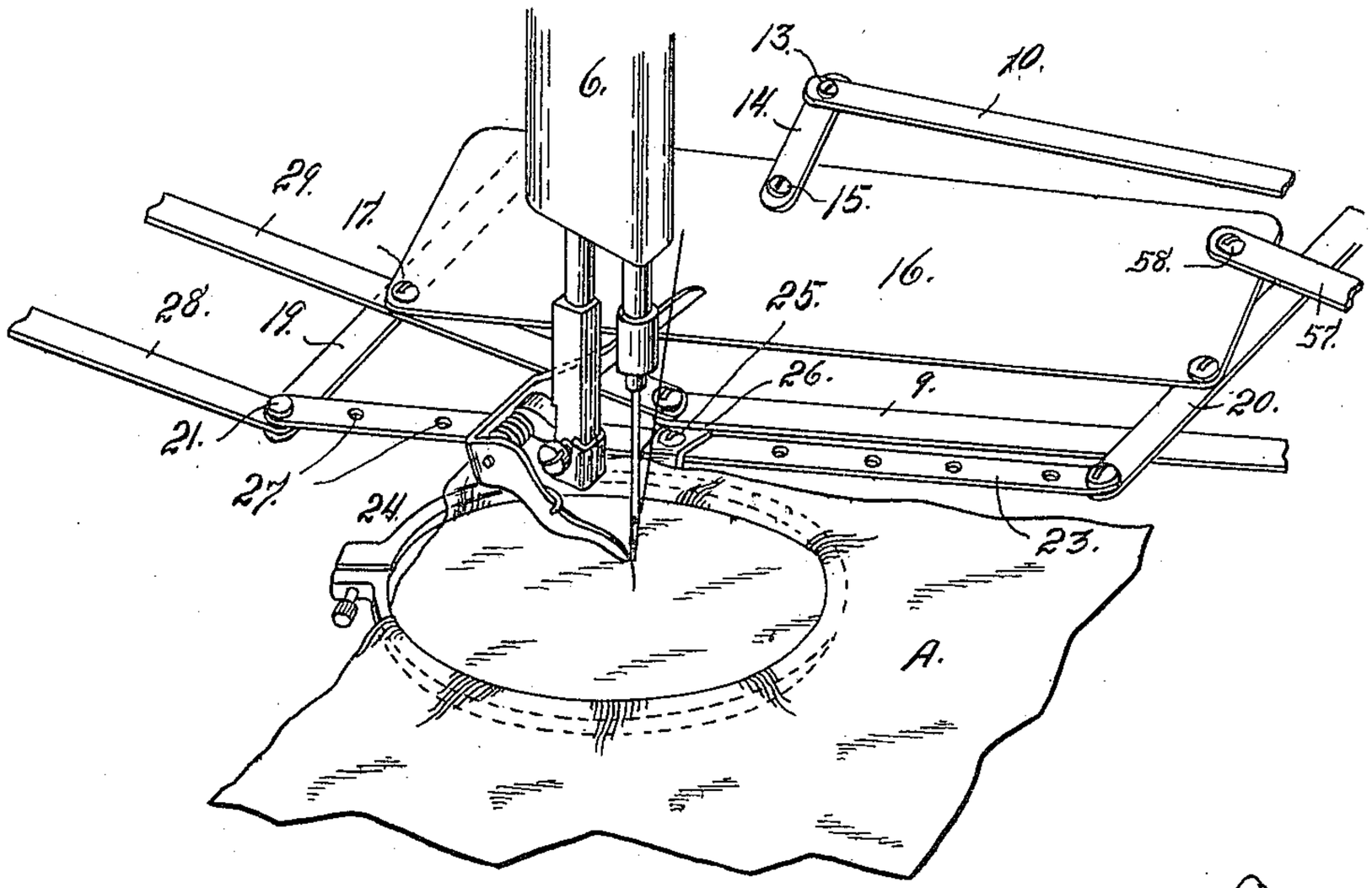

Fig. 2.

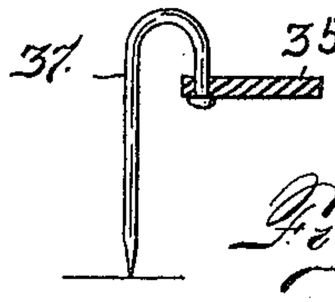

Fig. 4.

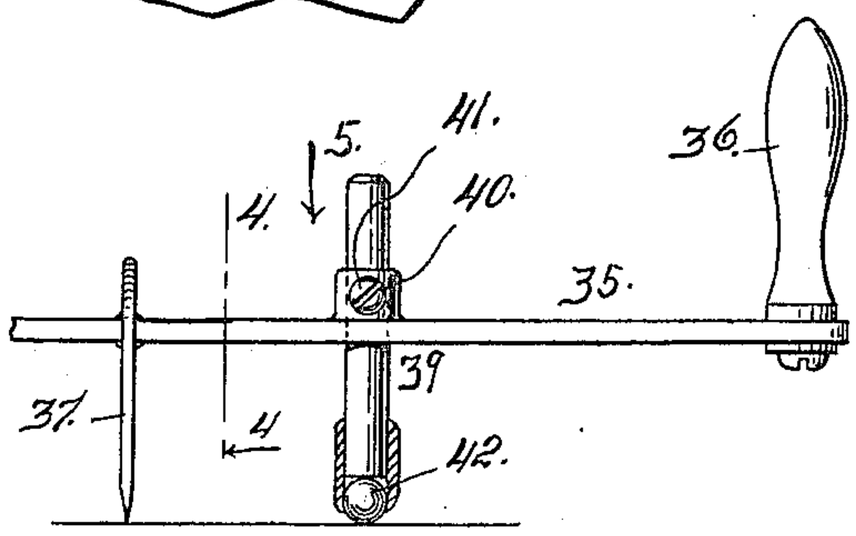

Fig. 3.

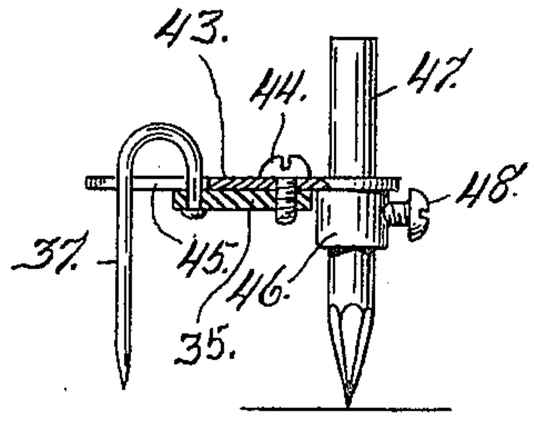

Fig. 6.

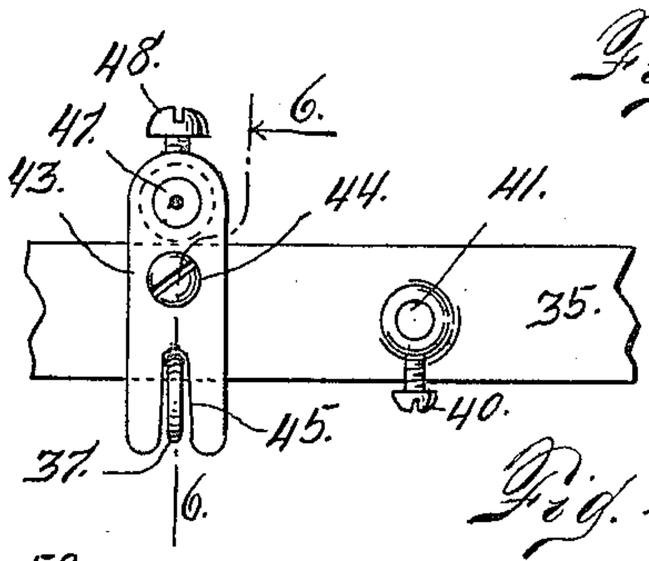

Fig. 5.

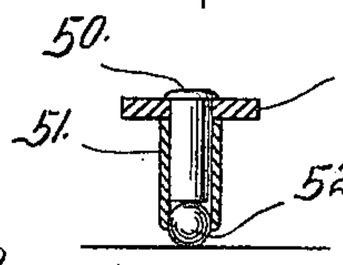

Fig 7

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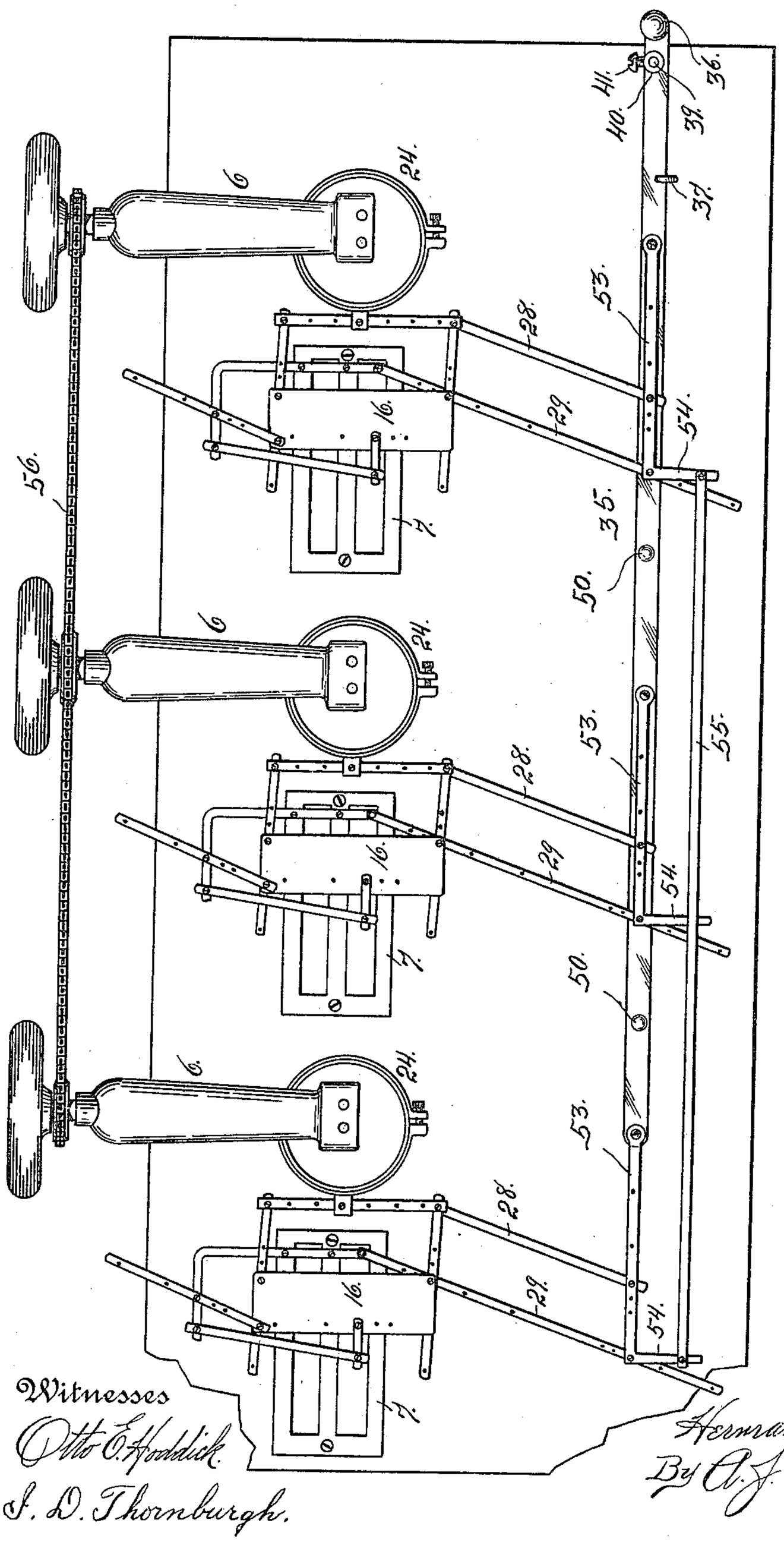

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UNITED STATES PATENT OFFICE.

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EMBROIDERY ATTACHMENT FOR SEWING-MACHINES.

994,033. Specification of Letters Patent. Patented May 30, 1911.

Application filed June 14, 1909. Serial No. 502,185.

To all whom it may concern:

Be it known that I, HERMANN RICHTER, a subject of Germany, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Embroidery Attachments for Sewing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an attachment for sewing machines, adapted to manipulate a holder for embroidery goods or the fabric upon which the embroidery work is to be done.

My improved device when in use is attached to the table of a sewing machine or other suitable support and the needle of the machine operating in the ordinary way performs the embroidery function, the holder being moved horizontally while the needle operates in the regular way.

My improved device operates somewhat upon the principle of a pantograph and is so constructed that the work holder may be adjustably attached to one arm thereof. The construction is also such that when the manipulating arm is moved over the design to be copied, a corresponding movement is imparted to the work holder. Furthermore, my improved construction in its entirety embraces bars arranged in the form of a number of parallelograms. One arm of the device is stationary, being that secured to the table of the sewing machine. To another arm the work holder is attached while the manipulating arm which has a pointer which the operator moves over the design to be copied, forms an extension of one of the arms of a parallelogram. As the pointer of this manipulating arm is moved over the design a corresponding movement is imparted to the work holder but of a less degree, the object being to reproduce a comparatively large design on a small scale by the use of a sewing machine needle which is arranged to act upon the work within the work holder. The latter may be of any suitable construction as the usual wooden hoops, one located within the other, the work being held between them.

As nothing is claimed in this application upon any particular construction of work holder, I have shown a conventional form only.

An important feature of my present invention consists of a pin forming the support for the manipulating arm, the latter being vertically adjustable upon the arm, whereby the latter may be raised or lowered with reference to the pointer carried by the arm and which is moved over the original design which is to be reproduced but on a different scale, by the sewing machine needle. This riding pin may have a bearing ball at its extremity to facilitate its movement over the surface of the table or other support to which the device is attached. By the use of this supporting or riding pin the pointer may be raised to a plane just above the surface upon which the design is formed. In this way the operator has the full advantage of the pointer's function without the necessity of holding the manipulating arm at a sufficient distance above the surface, to allow the pointer to just clear the design.

It sometimes happens that it is desirable to enlarge a small design. In this event the small design is placed upon the work holder under the sewing machine needle, the latter being inactive, and held in the raised position. In this event the manipulating arm is equipped with a pencil whose point is so adjusted that it rests upon the paper or fabric upon which the enlarged design is to be formed. The instrument is then operated by the use of the manipulating arm to cause the outlines of the small design to pass under the sewing machine needle, and during this operation the point of the pencil will form the same design upon a relatively large scale. The large design, however, will not be very accurate but will be sufficient for the operator's purpose, since the irregularities may be readily corrected.

Another feature of my improved construction consists in equipping a number of the bars of the device with supporting pins adapted to engage the upper surface of the table or other support with which the device is connected. This facilitates the work since when the device, or the arms thereof, are positively supported, the operator is not

obliged to exercise any care in regard to this feature and can give his entire attention to the proper manipulation of the arm whereby the pointer may be caused to accurately follow the outlines of the design to be reproduced.

Having briefly outlined my improved construction I will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

Figure 1 is a top plan view of my improved instrument shown attached to the table of a sewing machine, the arm with which the head of the machine is provided being indicated by dotted lines. Fig. 2 is a fragmentary perspective view of the device shown in connection with the needle of the sewing machine and the work holder. Fig. 3 is a detail view showing a portion of the manipulating arm with its support, the tracing pointer also being illustrated. Fig. 4 is a section taken on the line 4—4. Fig. 5 is a top plan view of the construction shown in Fig. 3, a view looking in the direction of arrow 5, Fig. 3. Fig. 6 is a section taken on the line 6—6, Fig. 5. Fig. 7 is a section taken on the line 7—7, Fig. 1, the parts being shown on a larger scale. Fig. 8 is a top plan view illustrating a number of my improved pantographic instruments operated by a single arm, each pantograph being connected with a work holder shown in operative relation with the head of a sewing machine.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the table of a sewing machine and 6 the arm with which the head of the machine is equipped. To the table 5 is attached a frame 7 in such a manner that it is made stationary. As shown in the drawing, it is secured by fastening screws 8. This frame is stationary and to it is attached and also made stationary, an arm 9, to which one extremity of an arm 10 is pivotally attached as shown at 12. The opposite extremity of the arm 10 is pivoted as shown at 13 to one extremity of a short arm 14 pivotally connected as shown at 15 with a plate 16 whose opposite extremities are pivotally connected as shown at 17 and 18, with two arms 19 and 20. These arms are also pivotally connected as shown at 21 and 22 with an arm 23, to which the work holder 24 is secured by means of a fastening screw 25, which passes through an opening formed in the arm 23, and a registering opening formed in a lug or ear 26 rigidly connected with the work holder. The frame 23 is provided with a series of orifices 27, whereby the work holder may be adjusted upon the arm 23 as convenience may require. It will thus be observed that the plate 16, together with the arms 19, 20 and 23, forms a parallelogram. The arm 19 also forms a member of a parallelogram whose other members consist of parts 28, 29 and 30. The part 29 has an extension 31 extending beyond the pivot screw 17 which passes through one extremity of the part 29 as well as through the plate 16 and the arm 19. The extension 31 is pivotally connected as shown at 32, with the stationary arm 9. The opposite extremity of the part 29 is pivotally connected as shown at 33, with one extremity of the part 30 whose opposite extremity is pivoted at 34 to one end of arm 28. The pivot screw 21 connecting the arms 19 and 23 also forms the pivot for one end of the arm 28.

The parallelogram member 30 is simply a part of the manipulating arm 35, one end of which is provided with a handle 36, which the operator grasps when actuating the device. This manipulating arm is also provided with a pointer 37 whose extremity follows the outlines of the design to be copied. In the present instance the letter R is illustrated and is supposed to be formed upon a piece of fabric 38 which is secured to the table 5 in any convenient manner. This manipulating arm 35 may be supported by a pin 39 passing through an opening formed in the manipulating arm and also through a sleeve 40 with which the arm is provided. The pin is locked in any desired position of adjustment within the sleeve 40, by a screw 41. The lower extremity of this pin as shown in the drawing is equipped with a ball bearing 42 to facilitate its movement over the surface upon which the design is mounted.

Applied to the manipulating arm in the vicinity of the pin 39, is a plate 43. As shown in the drawing this plate is secured to the arm by a screw 44. One extremity of the plate is slotted as shown at 45, to straddle the upper bent extremity of the pointer 37. The extremity of the plate 43 opposite the slot 45 is provided with an opening. Below this opening the plate is equipped with a sleeve 46, a pencil 47 being passed through the opening and the sleeve and held in the desired position of vertical adjustment by said screw 48.

In case it is desired to re-produce a small design upon a larger scale, the pencil 47 is so adjusted that it will engage a surface upon which the larger design is to be formed. The small design is then placed under the sewing machine needle, the latter being raised from the fabric carrying the design. Then by means of the manipulating arm, the instrument is actuated to cause the outlines of the small design to pass in succession under the point of the sewing machine needle, and during this operation the point of the pencil 47 will reproduce the small design on a larger scale, but with more or less irregularity. The general outlines, however, will

be correct. The large design may then be used for re-producing small embroidered designs, by the operation of the needle, the fabric being shifted in the well known manner.

In order to support the manipulating arm 35, as well as the part 29, bearings 49 may be applied to the under surface of the bar and screwed in place by rivet pins 50. (See Fig. 7.) In this case a sleeve 51 extends below the arm 29, the rivet pin 50 being inserted in the sleeve from above and through an opening formed in the arm. A ball bearing 52 is inserted in the lower extremity of the sleeve and is adapted to engage the surface above which the movable parts of the device are supported.

When the device is in use, the fabric A upon which the design is to be reproduced, is applied to a holder 24 of any suitable construction. This work holder is then connected with the arm 23 of the instrument and the fabric upon which the design is to be re-produced is brought under the sewing machine needle. Then as the machine is operated, the work holder is manipulated by operating the arm 35, so that the pointer 37 shall follow the outlines of the relatively large design to be re-produced, during which operation the said design will be re-produced on a smaller scale in embroidery form by the sewing machine needle carrying thread or silk of any desired color or character. In order to prevent the pointer from sticking in the fabric carrying the design, the supporting pin 39 is so adjusted that it engages the surface of the fabric, whereby the extremity of the pointer is supported just above the design.

If it is desired to reverse the operation or re-produce a small design upon a larger scale, the fabric containing the small design is applied to the work holder, the latter being connected with the instrument in the manner heretofore explained. The pencil 47 is then so adjusted that its point will engage the surface of the fabric upon which the larger design is to be formed, the pointer 37 being, of course, raised above the surface of the fabric. The instrument is then so manipulated that the outlines of the small design are caused to pass under the point of the sewing machine needle, during which time the pencil carried by the plate 43 mounted upon the manipulating arm, will reproduce the small design on a relatively large scale, but with comparatively irregular outlines, as heretofore explained.

When the instrument is used for reproducing a large design on a relatively small scale in embroidery form by a sewing machine, the pencil 47 is not employed, in which event it is vertically adjusted to maintain its point above the level of the surface upon which the instrument is mounted.

If desired, a number of the instruments may be operated from a single, relatively long manipulating arm 35. (See Fig. 8.)

In order to stiffen the arm 35 and insure that all the instruments may be operated in harmony or synchronism, arms 53 are applied to the arm 35. Each of these arms has a member 54 extending at right angles to the body of the arm. The two extreme members 54 are connected by a rod 55, which rests intermediate its extremities upon the intermediate arm or arms 54. This makes a structure sufficiently rigid to make it practicable to operate a series of instruments in synchronism by the use of a single main manipulating arm 35. As shown in Fig. 8, three sewing machine heads 6 are illustrated, all of them being connected to be operated by a sprocket chain 56. Since the operation of a number of the instruments is precisely the same as that of a single instrument, further explanation is not thought necessary.

In order to strengthen the instrument and limit, as far as may be, the possible lost motion within the various joints of the apparatus, I equip the latter with an arm 57, which is pivotally connected with the plate 16, as shown at 58 and with the rigid bar 9 as shown at 59.

Having thus described my invention, what I claim is:

1. The combination with a work holder, of a pantographic instrument to which the work holder is secured, the said instrument having a manipulating arm, a sleeve mounted on the arm, which is perforated to register with the opening in the sleeve, a pointer also mounted on the arm the said pointer having an upward bend above the arm and a marker mounted on the opposite side of the arm from the pointer and vertically adjustable for the purpose set forth.

2. The combination with a work holder, of a pantographic instrument to which the work holder is secured, the said instrument having a manipulating arm, a pointer attached to the arm, and having a bend formed therein and extending above the surface of the arm, a plate applied to the arm and extending crosswise thereof, the said plate projecting beyond the arm on both sides, one projecting extremity being slotted to straddle the bend of the pointer, while the other extremity is perforated and provided with a sleeve, a marker inserted in said perforation and passing through the sleeve, the said marker being vertically adjustable for the purpose set forth.

3. The combination with a work holder, of a pantographic instrument to which the work holder is secured, the said instrument

having a manipulating arm, a pointer mounted on the arm, the pointer having an upward bend above the arm, a sleeve mounted on the opposite side of the arm from the pointer, and a marker inserted in the sleeve and vertically adjustable for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HERMANN RICHTER.

Witnesses:
A. J. O'Brien,
Jessie F. Hobart.