

(No Model.)

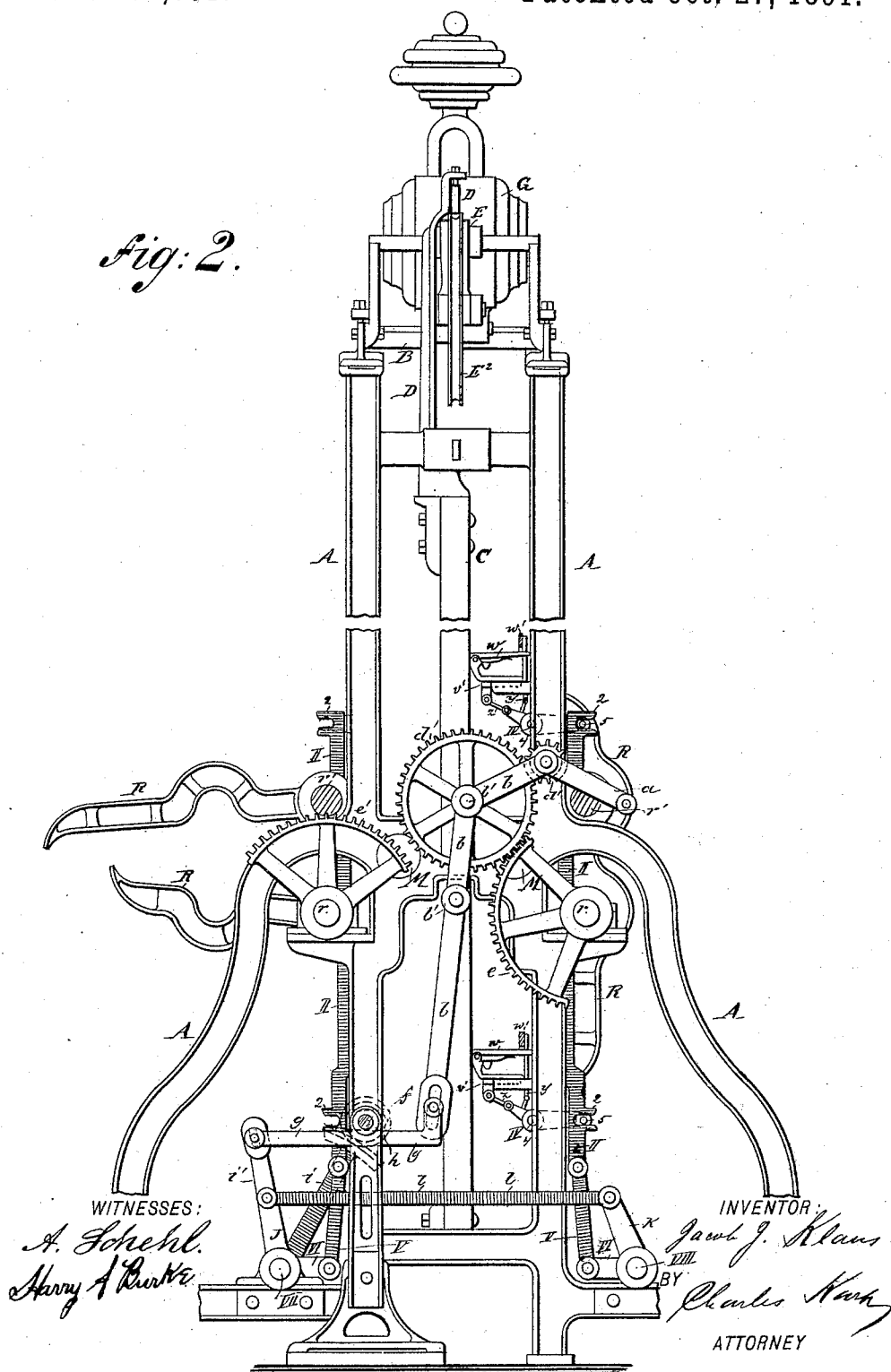
3 Sheets—Sheet 2.

J. J. KLAUS.
EMBROIDERING MACHINE.

No. 462,051.

Patented Oct. 27, 1891.

Fig: 2.



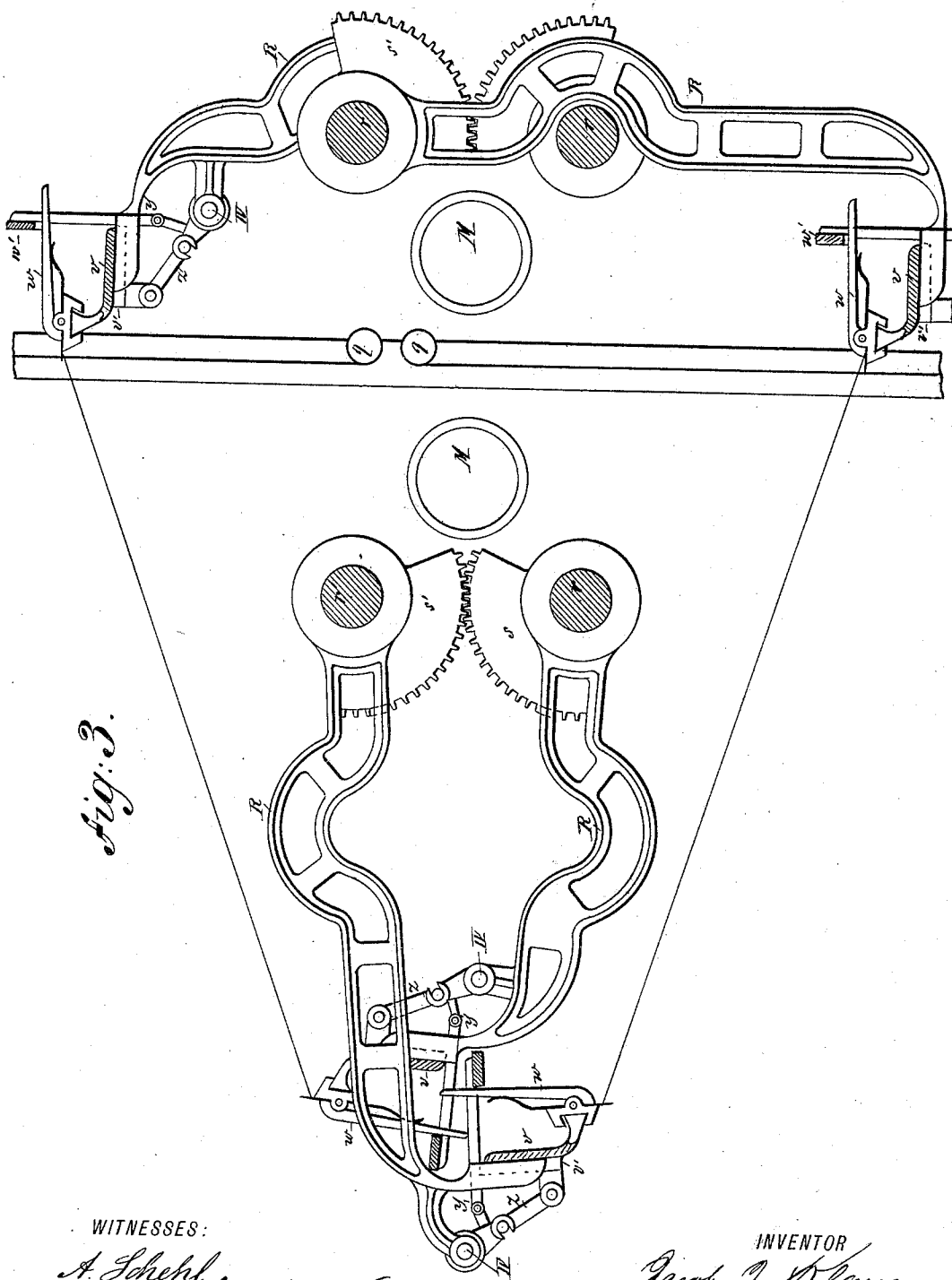
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EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 462,051, dated October 27, 1891.

Application filed November 15, 1890. Serial No. 371,551. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. KLAUS, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Embroidering-Machines, of which the following is a specification.

My invention has reference to improvements in embroidering-machines in which the embroidery is made by means of a series of needles by which the thread is passed through the cloth alternately from both sides; and the invention consists of an embroidering-machine having oscillating arms carrying the needle-grippers, which arms are mounted on shafts and by the turning motion of the latter are oscillated in such a manner that the needle-grippers on the ends of the said arms are carried to the cloth, where the needles are passed through the cloth and taken off by the needle-grippers on the corresponding opposite oscillating arms.

The invention consists, further, of additional details of construction to perform the oscillating motion of the needle-arms and to pass the needles through the cloth to be embroidered, which details will be fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved embroidering-machine. Fig. 2 is an end view of the same, partly in section on line $x x$, Fig. 1. Fig. 3 is a vertical section on line $x' x'$, Fig. 1, showing the arrangement and the working of the needle-arms, the drawing of Fig. 3 being made on a larger scale.

Similar letters and figures of reference indicate corresponding parts.

A A' in the drawings represent the end standards of the supporting-frame of my improved embroidering-machine, which end standards are connected with each other by the cross-bar B and the angle-irons A² A³. The supporting-frame is re-enforced by two traversing tubes M, the ends of which are screwed or otherwise secured to the insides of the standards A A'.

C is the frame carrying the cloth on which the embroidery is made. If two pieces of cloth are to be embroidered simultaneously, the two pieces are kept in position by the rollers

b, Fig. 3, the upper roller for the upper piece of cloth and the lower roller for the lower piece of cloth not being shown in the drawings. The cloth-supporting frame is guided in a vertical position by means of the horizontal guide-frames D D' and the vertical guide-pieces D² D³, and is counterbalanced by the lever-arms E E', provided with shifting weights H H', and on their outer ends with rollers E² E³, which run in the guide-frames D D', and by means of the weight G, to which the inner ends of said lever-arms are pivoted. The cloth-supporting frame C is connected with a pantograph K by means of the adjusting-frame I. The pointer of the pantograph is moved along on a pattern-card, so as to produce thereby the corresponding embroidering-stitches, which are made by a series of needles which pass through the cloth alternately from both sides, as well known in this class of embroidering-machines.

On the tubes M are mounted the brackets t, into which the longitudinal shafts $r r'$ are fitted. To the shafts $r r'$ a series of arms R are firmly secured, the inwardly-bent free ends of which are provided with guide-grooves, in which the flat cross-bars v are guided by means of sliding plates v' , attached to the under side of said cross-bars and fitting into the guide-grooves at the ends of the arms. The cross-bars v carry the grippers w for holding the needles, as clearly shown in Fig. 3. The shafts r are fitted in the standards A A' and are outside of the standard A provided with toothed segments $e e'$, which are firmly secured to the said shafts, Fig. 2. The shafts $r r'$, together with the segments, are rotated ninety degrees around their axes by means of the cog-wheels $d d'$ and the crank-handle a , the crank-handle being connected with the cog-wheel d' , which latter meshes with the cog-wheel d , as shown in Figs. 1 and 2. The alternating gearing of the cog-wheel d with the toothed segments e and e' is caused by the lever b , which is fulcrumed on the shaft b' , attached to the outside of the standard A, as shown in Fig. 1, and by the drawing-rod g , Fig. 2, so that when the rod g is drawn to the right-hand side the teeth of the cog-wheel d mesh with the teeth of the segment e' and when the rod g is drawn to the left-hand side the teeth of the cog-wheel

d mesh with the teeth of the cog-wheel *e*. This is performed in the following manner: The workman moves the treadles *p* and *p'* alternately down. The alternating downward motion is transmitted by the chains *n* and *n'* and the crescent-shaped chain-wheels *m* and *m'* to the shaft *f*, which latter receives a rotation on its axis to the right and then to the left hand side. This partial rotation of the shaft *f* is transmitted by a toothed wheel *h*, which is mounted on the said shaft, to the lever-arm *i*, which is provided at its free end with teeth meshing with the teeth of the toothed wheel *h*, and then to the lever-arm *i'* by means of the shaft VII, on which both lever-arms *i* and *i'* are mounted, as shown in Fig. 2. The drawing-rod *g* is pivoted to the free end of the lever-arm *i'* and is by the oscillating motion of the latter vertically shifted alternately to the right and left hand sides. The lower end of the angular lever *b* is thereby pushed to the right and then to the left hand side and the segments *e'* and *e* alternately engaged by the cog-wheel *d*, the teeth of which mesh with the teeth of the said segments, as aforesaid. The workman is thus enabled to turn first the shaft *r*, on which the segment *e'* is mounted, and then the shaft *r'*, to which the segment *e* is attached. The rotating motion of the shafts *r* and *r'* is transmitted to the upper shafts *r''* and *r'''* by the segments *s* and *s'*, Figs. 1 and 3. The treadle-motion, which is not shown in Fig. 2, is the same as in other embroidering-machines of this class. By the partial rotation of the shafts *r* and *r'* the oscillating motion of the arms *R* is attained, the upper ends of which carry the flat cross-bars *v*, to which the needle-grippers are attached, whereby the threads are drawn out, as shown in Fig. 3.

The cross-bars *w'* have the purpose to open or close the needle-grippers at the right moment when the needles are to be released from one series of the grippers and to be caught by the opposite series. This is attained by an upward and downward motion of the bars *w'*, caused by the lever mechanism *y*, mounted on the shafts IV. The shafts IV have laterally-extending arms 4, provided with pins 5, which pins project into fork-shaped guide-extensions 2 of the lever-bar II. The shafts IV receive their rotating motion from the treadle-shaft *f* and the lever-arm *i'* by means of a drawing-rod *l*, one end of which is pivoted to the lever-arm *i'* and the other end to the crank-arm *k*, which is attached to the shaft VIII outside of the standard A. The same connection of a second rod *l* with the shafts VII and VIII is made outside of the standard A'. From the shafts VII and VIII the lever-arms VI impart an upward and downward motion to the lever-links V and to the lever-bars II, connected with said lever-links, which lever-bars move thereby upward and downward on the guide-rods 1, which guide-rods are mounted on the tubes M, Fig.

1. By the upward and downward motion of the lever-bars II the same motion is imparted to the arms 4 of the shafts IV by means of the pins 5, engaged by the fork-shaped extensions 2 of the said lever-bars, and the shafts are thereby partially rotated, Fig. 2. The upper parts of the arms *R* on the left-hand side and their motion mechanism are not shown in Fig. 2. From the shafts IV the motion is transmitted to the flat cross-bar *w'* by means of the levers *y* and upon the slide-plates *v'* of the cross-bars *v*, carrying the needle-grippers *w*, by means of the levers *z*, which are pivoted to downward extensions of the said plates. By this arrangement it is rendered possible that the needles pass horizontally through the cloth into the opposite needle-grippers, which could not be attained if the lever mechanism described should be dispensed with. To the lever-bars II catchers III, of any construction, may be attached, which catchers have the purpose to keep the eight outer arms *R* and thereby the remaining arms *R* in proper horizontal position.

My improved machine works in the following manner: When the treadle *p* is moved down, the teeth of the cog-wheel *d* engage the teeth of the segment *e'* by the motion imparted from the treadle-shaft *f* to the elbow-lever *J*, drawing-bar *g*, and lever *b*, as before described. At this moment the arms *R* at the left-hand side are in a vertical position and the needle-grippers in a horizontal position toward the cloth-frame. By turning the crank-handle *a* of the cog-wheel *d'* the segment *e'* and the lower shaft *r* at the left-hand side receive a rotating motion, which motion is transmitted to the upper shaft *r''* on the same side by means of the toothed segments *s* and *s'*, as mentioned before, whereby the arms *R* are swung into a horizontal position and the threads in the needles drawn out. When the crank-handle *a* is turned back, the arms are swung into their former position, in which the needle-grippers are a distance of about one inch from the cloth. Now the second treadle *p'* is pushed down and the same motion imparted to the segment *e* and to the arms *R* on the right-hand side in the manner described. Simultaneously by the same motion the lever-bar II on the left-hand side is pushed upward and the lever-bar II on the right-hand side drawn downward, whereby the cross-bars *v*, with the needle-grippers *w* on the ends of the arms *R*, are pushed forward, so that the needles pass through the cloth into the opened needle-grippers on the opposite side. Then the lever *z*, by which the forward shifting motion is transmitted from the lever-bar II to the cross-bar *v*, is automatically released and the cross-bar *w'* is drawn down upon the upper shank of the needle-grippers by means of the levers *y*, whereby the needles in the left-hand grippers are released. The cross-bar *w'* on the right-hand side is lifted by the lever *y* and the grippers are closed. The cross-bar

v, with the grippers *w*, slides then back about one inch by the action of the lever *z*. At the beginning of the motion of the drawing-rods the catchers III on the left-hand side are pushed over the left-hand arms, while the right-hand catchers are released from the corresponding arms and the left-hand arms are kept in the vertical position. By turning the crank-arm *a* the right-hand arms are swung out and the threads are drawn out through the cloth. Then these arms are moved back into their former position and the working described begins from the other side, and so on.

15 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An embroidering-machine having four series of needle-gripper-carrying arms which are mounted on longitudinal shafts and are provided with toothed segments, the segments of the lower series of the arms meshing with the segments of the upper series in such a manner that by the rocking motion of the shafts two series of the oscillating arms are swung to and two series from the cloth to be embroidered, substantially as set forth.

2. An embroidering-machine having four series of oscillating arms, each arm carrying needle-gripping mechanism and being mounted on four longitudinal shafts, two of which are arranged on the front and two on the back side of the machine, the arms having toothed segments, the segments of the lower arms meshing with the segments of the upper arms, and the shafts being also provided with toothed segments, in combination

with a cog-wheel *d* and a fulcrumed lever *b*, by which rocking motion to the longitudinal shafts and simultaneously therewith oscillating motion to the arms are imparted, substantially as set forth.

3. In an embroidering-machine, the combination of toothed segments *e e'*, mounted on longitudinal shafts *r r*, located opposite each other, with a cog-wheel *d* and a fulcrumed lever *b*, by which lever the said cog-wheel is brought into gear with one or the other segment and thereby a rocking motion imparted to the corresponding shaft, and longitudinal rods *r' r'*, located above the shafts *r r*, both series being provided with the arms carrying the needle-grippers and having toothed segments which mesh with each other to impart the rocking motion of the lower shafts to the corresponding upper shafts, substantially as set forth.

4. In an embroidering-machine, the combination of oscillating arms mounted on horizontal rotating shafts and being provided at their free ends with guide-grooves, with longitudinal cross-bars carrying the needle-grippers and having sliding plates fitting in the guide-grooves of the oscillating arms, and a lever mechanism by which the cross-bars with the needle-grippers are slid in the guide-grooves of the arms, substantially as set forth.

Signed at New York, in the county and State of New York, this 17th day of October, 1890.

JACOB J. KLAUS.

Witnesses:

CHARLES KARP,
HARRY A. BURKE.