

(No Model.)

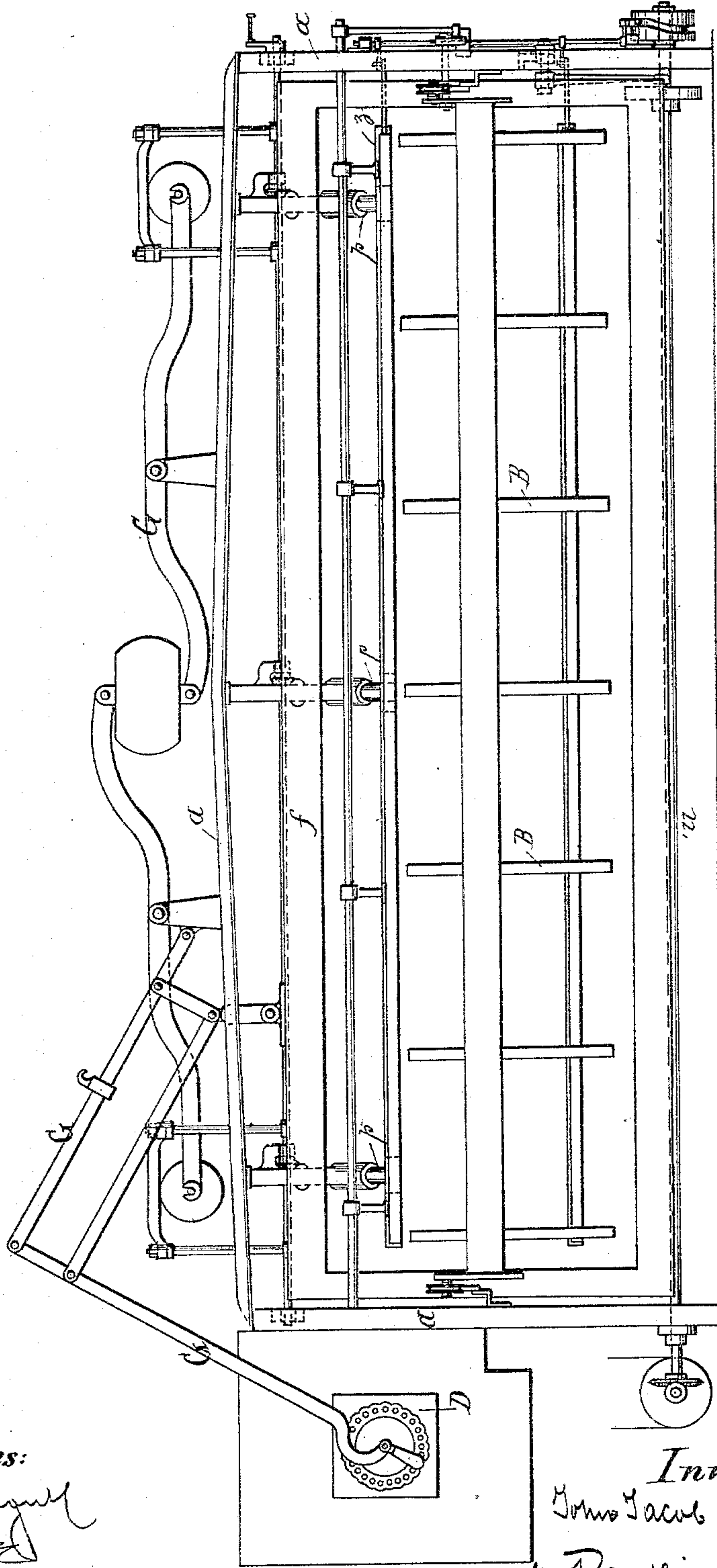
4 Sheets—Sheet 1.

J. J. EBNETER.
EMBROIDERING MACHINE.

No. 331,953.

Patented Dec. 8, 1885.

Fig. 1



Witnesses:

E. Lindbergh
H. Benson

Inventor:

John Jacob Ebner
By Bussell & Co. Attys

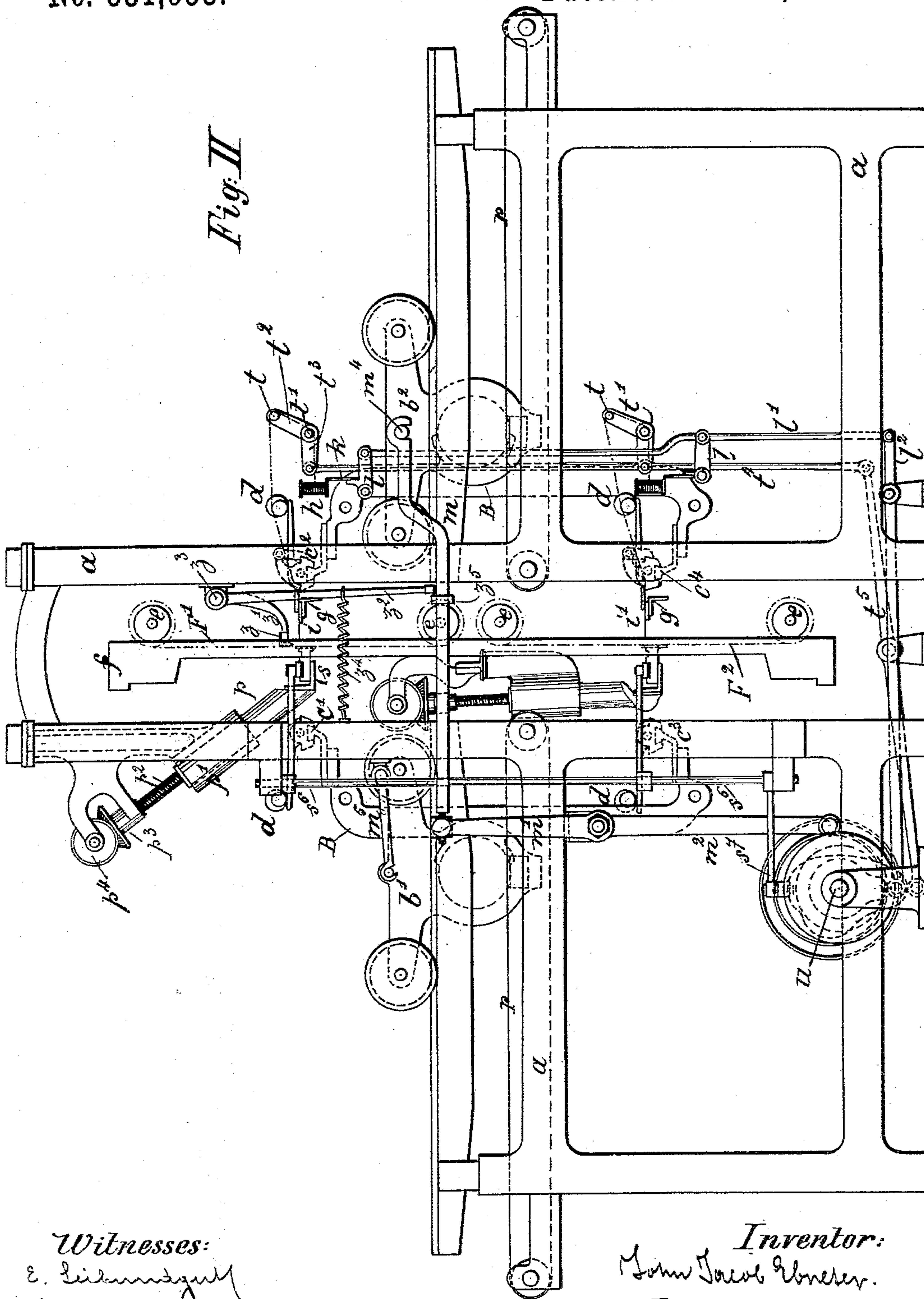
(No Model.)

4 Sheets—Sheet 2.

J. J. EBNETER.
EMBROIDERING MACHINE.

No. 331,953.

Patented Dec. 8, 1885.



Witnesses:
E. Lieberman
M. Bessan

Inventor:
John Jacob Reiser.
by Brusselsburg & Assys

(No Model.)

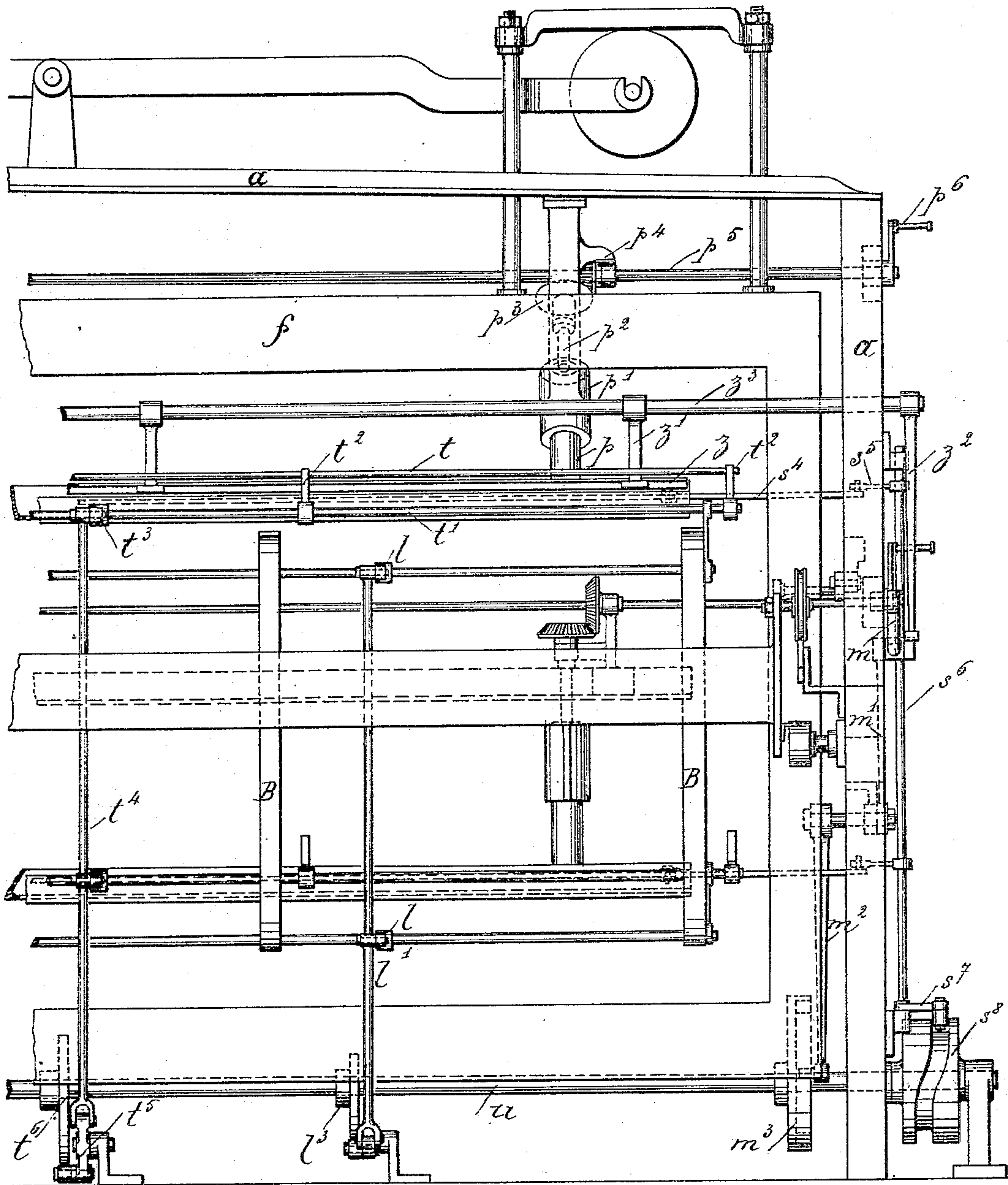
4 Sheets—Sheet 3.

J. J. EBNETER.
EMBROIDERING MACHINE.

No. 331,953.

Fig. III

Patented Dec. 8, 1885.



Witnesses:
E. L. L. L. L. L.
H. B. B. B. B.

Inventor:
John Jacob Ebnetter
by Bussfeldt & Co. Attys.

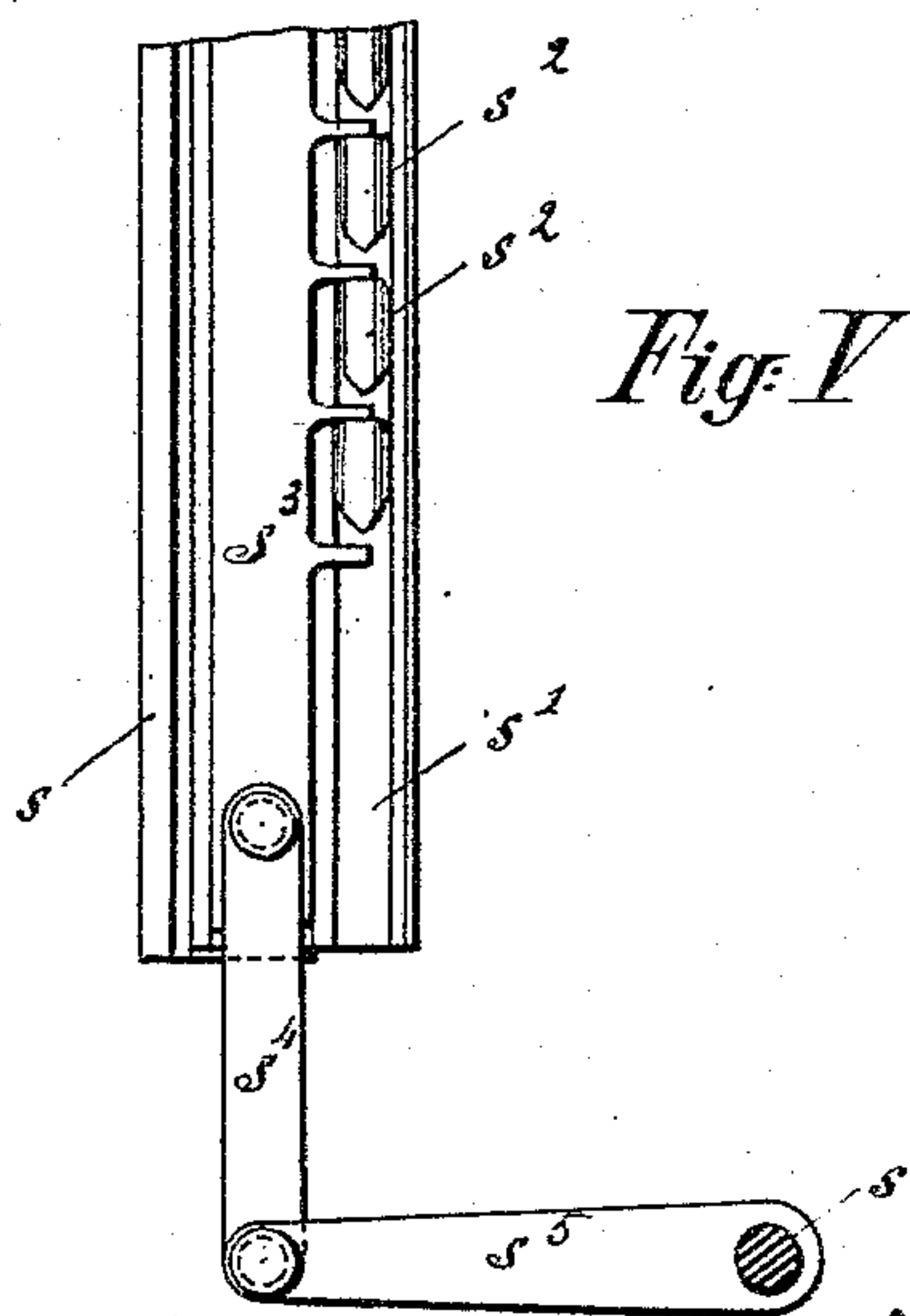
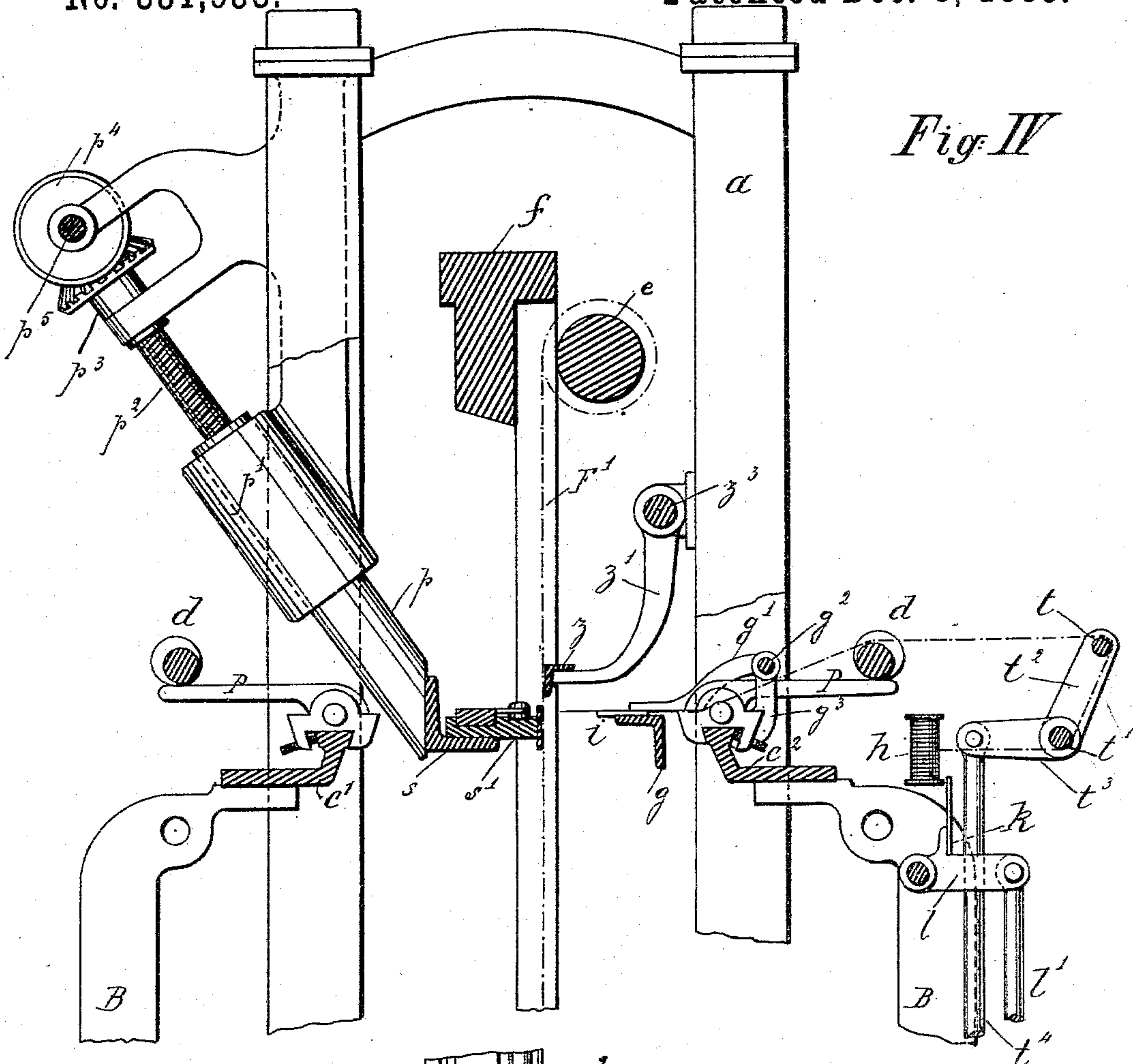
(No Model.)

4 Sheets—Sheet 4.

J. J. EBNETER.
EMBROIDERING MACHINE.

No. 331,953.

Patented Dec. 8, 1885.



Witnesses:
E. L. L. L. L. L.
H. B. B. B. B.

Inventor:
John Jacob Ebnetter
by Boushenshaw & Co.

UNITED STATES PATENT OFFICE.

JOHN JACOB EBNETER, OF ST. GALL, ST. GALL, SWITZERLAND.

EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 331,953, dated December 8, 1885.

Application filed September 30, 1884. Serial No. 144,332. (No model.) Patented in England July 18, 1884, No. 10,307; in Belgium July 31, 1884, No. 65,801; in Italy August 13, 1884, XXXIV, 105; in Austria-Hungary October 8, 1884, No. 25,877 and No. 4,577; in France December 3, 1884, No. 150,810, and in Germany March 27, 1885, No. 30,931.

To all whom it may concern:

Be it known that I, JOHN JACOB EBNETER, a citizen of the Republic of Switzerland, residing at St. Gall, in the Canton of St. Gall, Switzerland, have invented certain new and useful Improvements in Embroidering-Machines, of which the following is a specification.

The object of my invention is to provide a suitable device for a so-called "Heilmann" or common hand embroidering-machine in order that the latter may be used for embroidering with a continuous thread by means of shuttles working together with fixed or eye-pointed needles, besides performing the ordinary duty ascribed to such machines.

The advantages of my improvements are chiefly that fabrics can be embroidered with very different kinds of stitches without being removed to another machine, thus facilitating the work, while the quality of the embroidery is also greatly improved. In order to attain this object I provide one of the two carriages bearing the pinchers in a hand-embroidering machine with a special row of eye-pointed needles, which are brought to action whenever the embroidery has to be done with the continuous thread. These special needles correspond to a set of shuttles on the other side of the fabric, put to work or brought out of way simultaneously with the former. Whenever the eye-pointed needles and shuttles are set to work, the to-and-fro motion of the said carriage is modified, the way being shortened while the other carriage is stopped entirely, having no participation in this quality of work.

The mechanism for carrying my invention into effect is illustrated in the accompanying drawings, in which—

Figure I is a front view showing the general form of a machine exhibiting my improvements. Fig. II is a left-side elevation of the machine on a larger scale. Fig. III is a front view of the right part of the machine on same scale as Fig. II, some parts which are shown in other figures being removed to make the figure clearer. Fig. IV is a vertical section of a part of the machine parallel to the side ele-

vation and in larger scale. Fig. V represents a plan view of a portion of the flat rail supporting the rail carrying the shuttles and the shuttle-driver connected therewith.

Similar letters refer to similar parts throughout the several views.

In the drawings, the framing of the machine is shown at *a a*. As in a Heilmann machine, two carriages, *b'* and *b''* in Fig. II, which are movable forward and backward by endless belts *r r*, carry, by means of arms *B B*, four bars, *c' c'' c''' c''''*, which bear the pinchers *P P*, (see Fig. IV,) the latter being opened and closed by eccentric rods *d d*, for taking hold of the usual double-pointed needles alternatively on each other side of the fabric *F' F''*, which is placed in the screen or frame *f* and stretched and wound around rollers *e e*. The pattern-card *D*, which governs the attendant in moving the pantograph *G G*, and the latter are shown only in Fig. I. In other figures these parts have been omitted in order not to crowd the drawings, being features well known to all interested in the art of embroidering. The usual devices for perforating the fabric and festooning and other accessories are also not shown for same reason, and because they can be applied to the machine exhibiting my improvements without interfering with the latter in any way.

All the above-mentioned parts of the machine belong to the common hand embroidering or Heilmann machine. They may thus be modified in any known manner, and receive their motion by the means employed heretofore on such machines. The mechanism for imparting motion to the carriages *b'* and *b''* when the latter are used in the common way is thus not shown in the drawings, and will not be described, being the same as used in any embroidering-machine built on the Heilmann principle.

It should be remarked that the bars *c' c''* on Fig. II, bearing the pinchers, are alike to the bars *c' c''*, forming thus two sets of devices for performing the similar work of embroidering on two separate pieces of fabric, *F' F''*. According to this arrangement the corresponding parts pertaining specially to my improve-

ments, which are now to be specified, are also shown in two applications on Fig. II, but in one on Fig. IV.

The devices described in the following matter concern specially the parts of the embroidering-machine which are used when the stitches are made with eye-pointed needles and shuttles using a continuous thread.

To the bar c' on carriage b^2 another bar, g , parallel to the former, is attached at each end by means of an arm, g' , movable at its fulcrum, being connected with a pin, g^2 , to and supported by bracket g^3 , made fast to bar c^2 , as shown in Fig. IV. Other similar arms may be adapted at suitable distances on bar g in order to hold it more rigid. The bar g is provided with a row of eye-pointed needles, i , fixed to the former, thus remaining always on the same side of the fabric. The arms g' being movable, the bar g , with needles i , can be brought in position for the work with continuous thread or put out of way when the embroidering is done by double-pointed needles. The removing of bar g is done by swinging it up and back, the arm g' turning on its fulcrum. Whenever this operation is performed, the carriage b^2 is moved away from the fabric at suitable distance, otherwise the bar g would interfere with the arms z' of bar z , to be described later in my specification.

The continuous thread for the eye-pointed needles is wound on bobbin h , which is provided with the usual accessories—for instance, with a flat spring, k , acting at certain intervals as a tension on the bobbin. Spring k is fixed to rocking arm l and pressed against the bobbin or released by rod l' and lever l^2 , the latter being acted upon by a cam-wheel, l^3 , set on main shaft u . (See Figs. II, III, IV.) From the bobbin the continuous thread passes around rods t' and t and the eccentric rods d to the corresponding eye-pointed needles. This thread is stretched or loosened by motion of the arms t^2 and t^3 , rod t^4 , lever t^5 , and cam-wheel t^6 , the latter being set on shaft u . (See Fig. III.)

Whenever the embroidering is done with continuous thread, using the described eye-pointed needles i , the carriage b^2 , which bears the latter, receives a special motion, being brought against the fabric and away from it by rod m , rocking arms m' and m^2 , moved by cam-wheel m^3 . Rod m , being fixed to the carriage by a hook resting on pin m^4 , can be loosened from the carriage very easily, thus stopping the latter whenever necessary. Carriage b' , which is not working when the eye-pointed needles and the shuttles are operated, is held at rest by rod m^5 , having a fulcrum at one end and a hook at the other.

Another device used when the continuous thread is at work is the bar z , which is pressed against the fabric for tightening the latter by rocking arms z' and z^2 , which are fixed on the same rod z^3 , and spiral spring z^4 , acting on arm z^2 . Bar z is released by the arm z^2 being pushed by collar z^5 of rod m when the latter

moves the carriage b^2 away from the fabric. During the intervals when the bar z is released the frame f , supporting the fabric, can be moved by the pantograph, as is done usually in embroidering-machines.

As shown specially in Figs. IV and V, a rail, s , is provided, corresponding to bar g , but situated on the opposite side of the fabric. Rail s supports a flat rail, s' , which has suitable grooves to receive the shuttles s^2 s^2 , and a metallic plate, s^3 , acting as shuttle-driver. The latter is connected by a link, s^4 , and arm s^5 , to a vertical rod or shaft, s^6 . As will be seen on Fig. III, shaft s^6 receives an oscillating motion by the arm s^7 , which is provided with a cam corresponding to the groove of cam-wheel s^8 . This cam-wheel is fixed on main shaft u , and revolves with the latter. The shaft s^6 being connected, as described, with the shuttle-driver s^3 , the shuttles will make a suitable to-and-fro motion at each revolution of the main shaft u .

For carrying out the purpose of my invention, the rail s , which supports the shuttles, cannot be fixed directly to the frame of the machine, but must be movable, in order that it may be brought out of way when the embroidering is to be done no longer by the shuttles and eye-pointed needles, but with the double-pointed needles. For the object thus stated, rail s is made fast to three rods, p , one near each end of the rail and one at its center. These rods are made to slide in corresponding boxes, p' , which are fast on the frame of the machine, and may be either square or cylindrical, being in the latter case provided with a groove or other suitable device for preventing their revolving on their axis, allowing them only to slide up and down in the boxes p' . The rods p are hollow and provided with a screw-fillet fitting screws p^2 , as shown in Fig. IV. The screws are made to revolve by pinions p^3 and p^4 , shaft p^5 , and crank p^6 . It will be easily understood that by turning the crank-handle forward or backward the screws will lift or bring down the rail s .

I prefer to use the described means for moving rail s up and down; but it shall be understood that I might apply other known devices which may be suitable for the same purpose.

Having thus described the several parts of my improved embroidering-machine, I shall resume briefly how the embroidering is done.

For embroidering with a continuous thread by means of shuttles and eye pointed needles, rail s , with the shuttles, rail g , with the eye-pointed needles i , and the bar z , are brought in the suitable position toward the fabric and set in motion by the intermediate mechanism by applying driving power to main shaft u . Whenever the ordinary hand embroidering has to be done, the parts just named are removed out of way, rail s is removed from its place by turning the screws p^2 , by means of crank p^6 , rail g is swung back, and bar z is allowed to drop somewhat from its place by unfastening spring z^4 . Rod m is released from

carriage b^2 , and rod m^5 from carriage b' . Both
 carriages, supporting the bars c' c^2 c^3 c^4 , with
 pinchers P P, are set in motion by endless
 belts r and other mechanisms usual in ordinary
 5 hand embroidering-machines. I may thus al-
 ternatively make on the same fabrics different
 kinds of embroidering, and by adding the usual
 devices for perforating the fabric and festoon-
 ing I may add in an embroidery composed
 10 mainly of step-stitches all varieties of designs,
 which can only be produced on a hand em-
 broidering-machine.

For increasing the quantity of work to be
 done with the embroidering-machine on using
 15 the continuous thread, I may apply several
 rows of eye-pointed needles with correspond-
 ing shuttles, as is shown, for instance, on Fig.
 II, where i' represents a row of needles similar
 to needles i , with corresponding accessory de-
 20 vices.

I am aware that embroidering-machines
 have heretofore been provided with movable
 carriages carrying a series of needles, the
 whole working in conjunction with shuttles op-
 25 erated by cams, whereby the shuttles are given
 a to-and-fro motion. I therefore, in view of

these facts, specifically claim the invention
 herein shown and pointed out in the claim.

Having thus fully described my invention,
 what I claim, and wish to secure by Letters 30
 Patent, is—

In an embroidering-machine, the combina-
 tion of the carriage b^2 , rods m m' m^2 , pin m^4 ,
 cam-wheel m^3 , rotary shaft u , bars c^2 c^4 , arm B,
 eccentric rods d , frame f , rollers e e , bar g , arm 35
 g' , pin g^2 , bracket g^3 , eye-pointed needles i i' ,
 bar z , arm z' , fulcrum z^3 , spring z^4 , collar z^5 ,
 bobbin h , flat spring k , rocking arm l , rod l' ,
 lever l^2 , cam-wheel l^3 , rod t' and t , arms t^2 t^3 ,
 rods t^4 , and lever t^5 , cam-wheel t^6 , angle-rail s , 40
 flat rail s' , shuttles s^2 , metallic plate s^3 , link s^4 ,
 arm s^5 , vertical rod s^6 , arms s^7 , cam-wheel s^8 ,
 main driving-shaft u , rods p , boxes p' , screw
 p^2 , pinions p^3 p^4 , shaft p^5 , and crank p^6 , substan-
 tially as shown and described. 45

In testimony whereof I hereunto sign my
 name, in the presence of two subscribing wit-
 nesses, this 12th day of June, 1884.

JOHN JACOB EBNETER.

Witnesses:

EMIL BLUM,
 MORITZ VEITH.