

No. 614,802.

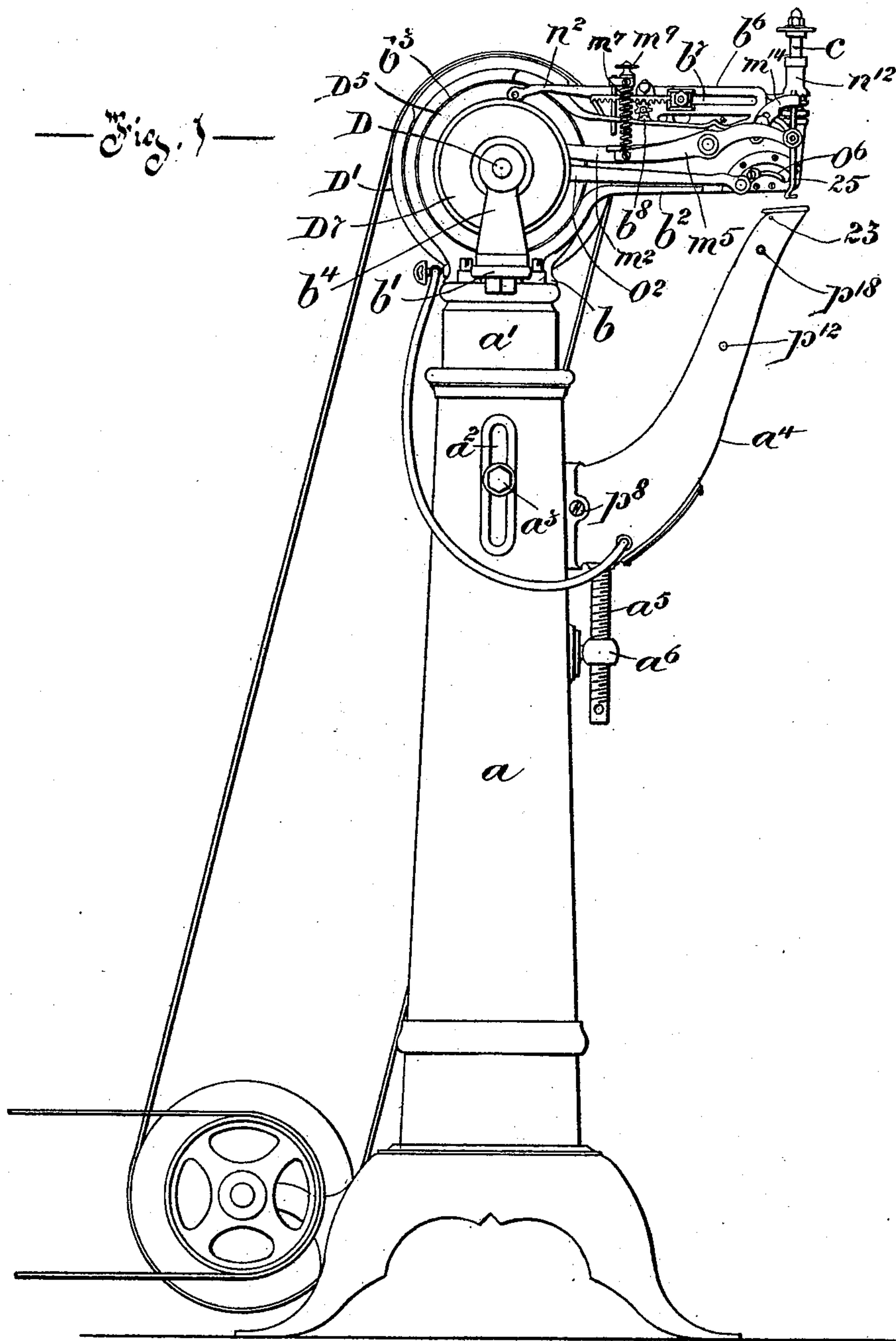
Patented Nov. 22, 1898.

E. DUPLESSIS.
SHOE SEWING MACHINE.

(No Model.)

(Application filed Dec. 27, 1894. Renewed Apr. 11, 1898.)

16 Sheets—Sheet 1.



Witnesses

R. A. Kimber
R. A. Kimber

Inventor

E. Duplessis
By *His Attorney*
Wm. N. Tramm

No. 614,802.

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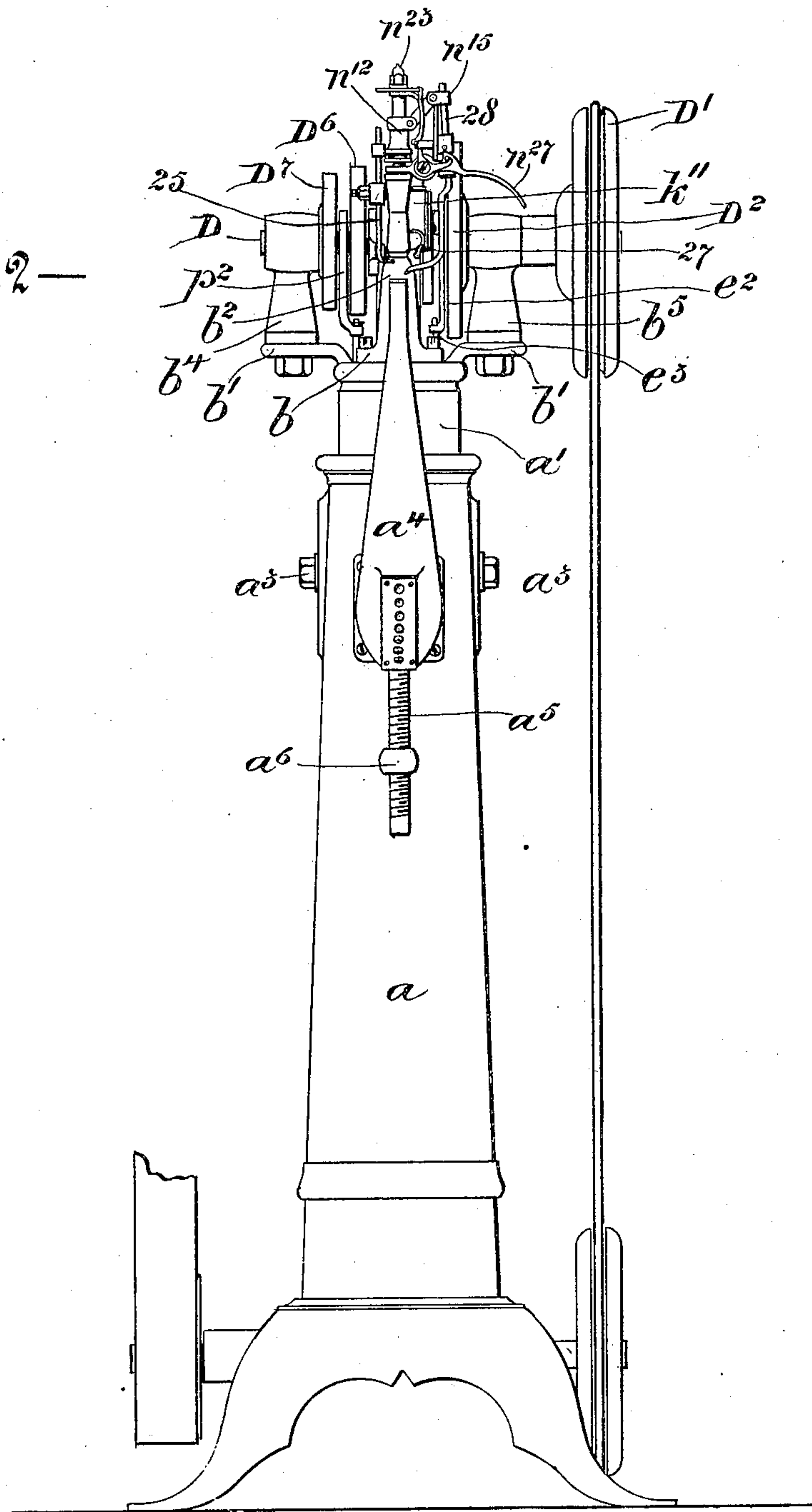
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16 Sheets—Sheet 2.

—Fig. 2—



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[Signature]
R. A. K. K. K.

Inventor

E. Duplessis

By

his Attorney

Oliver N. Wain

No. 614,802.

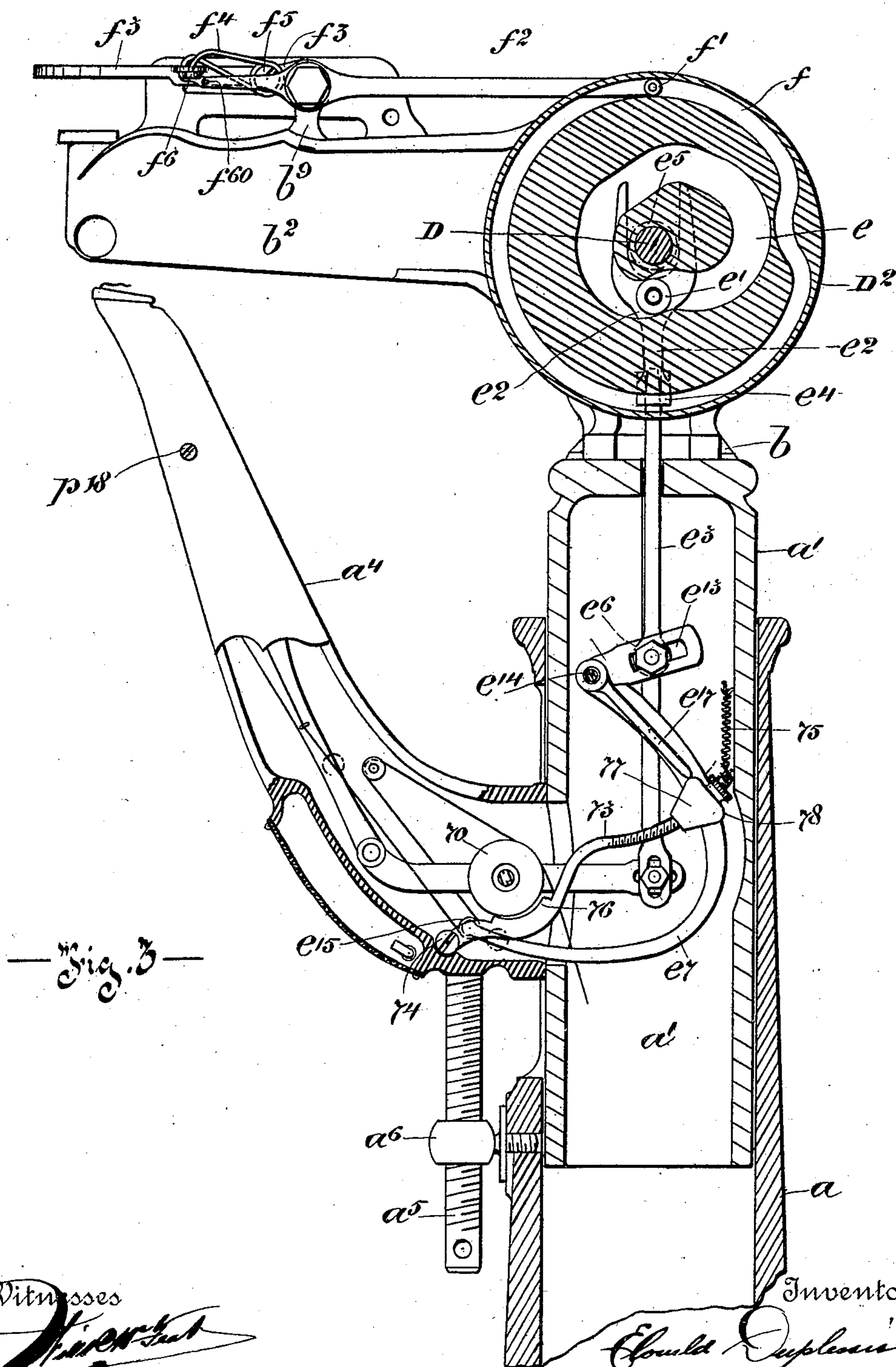
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16 Sheets—Sheet 3.



Witnesses
[Signature]
R. A. Kimber

Inventor
E. Duplessis
By *his* Attorney
Alb. N. Trane

No. 614,802.

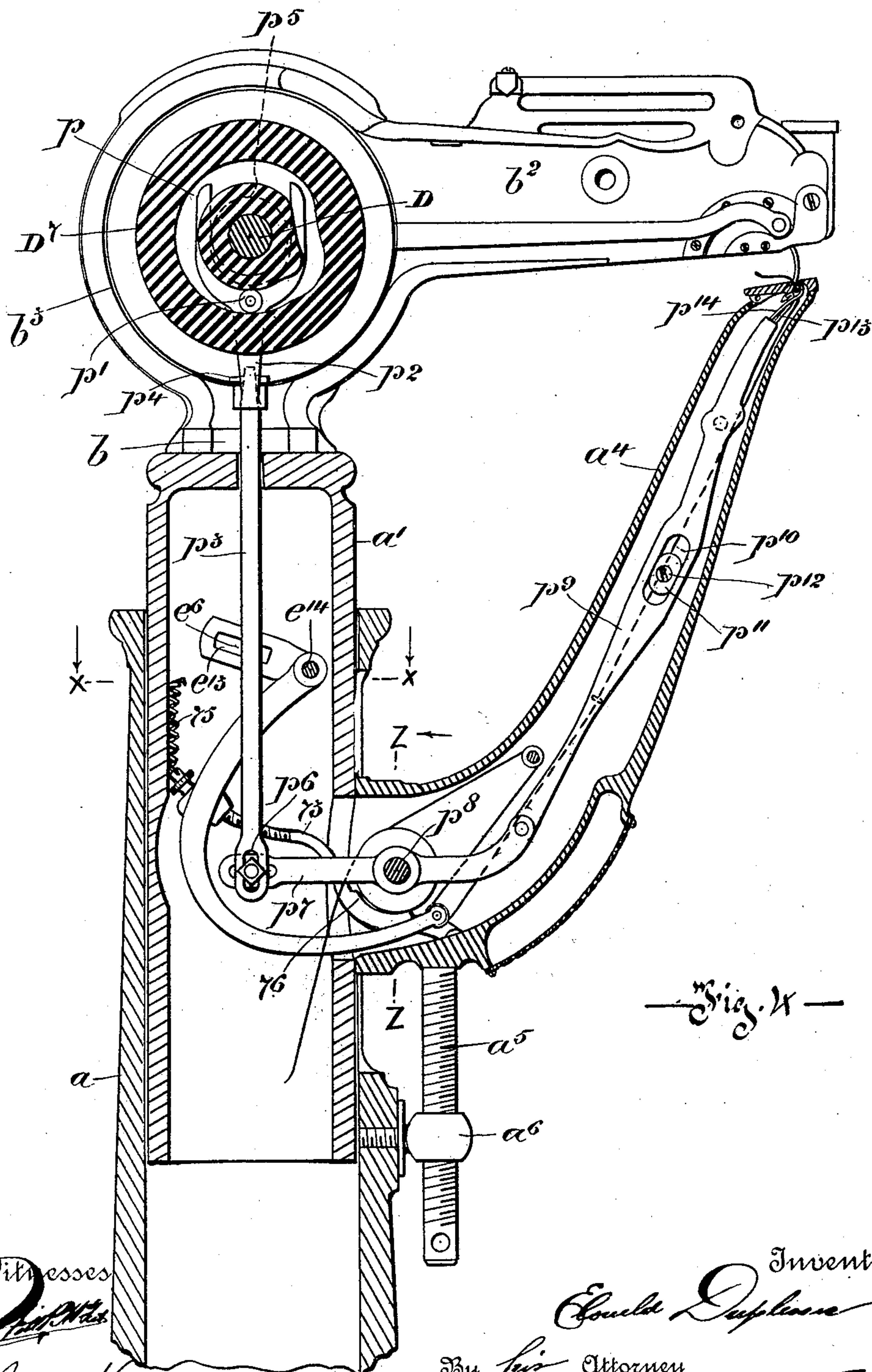
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16 Sheets—Sheet 4.



—Fig. 4—

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W. A. Kimber

Inventor
E. Duplessis
By his Attorney
Alm N. Trane

No. 614,802.

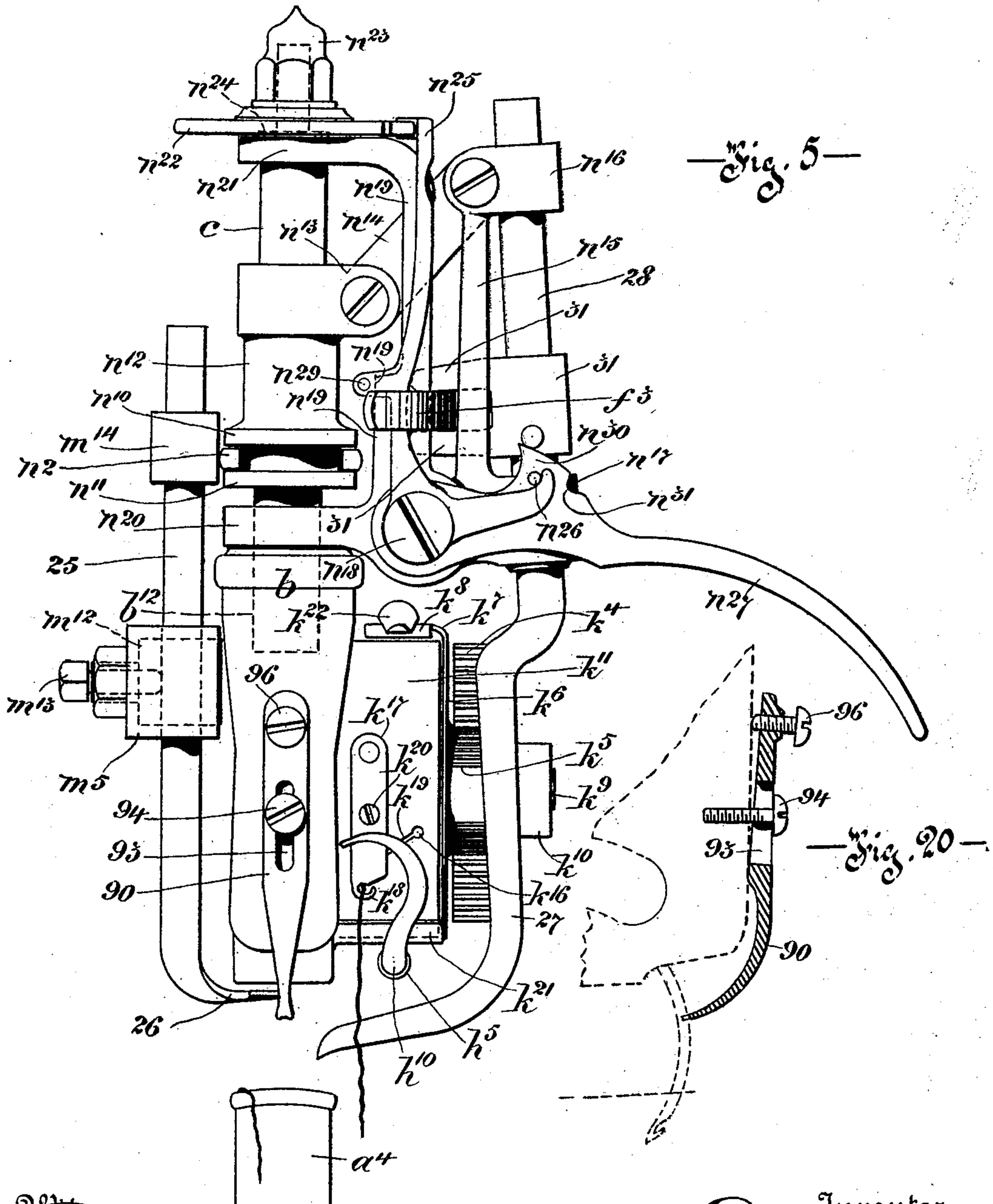
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16 Sheets—Sheet 5.



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[Signature]
W. A. Kimber

Inventor
E. Duplessis
By *his* Attorney
Alon N. Traue

No. 614,802.

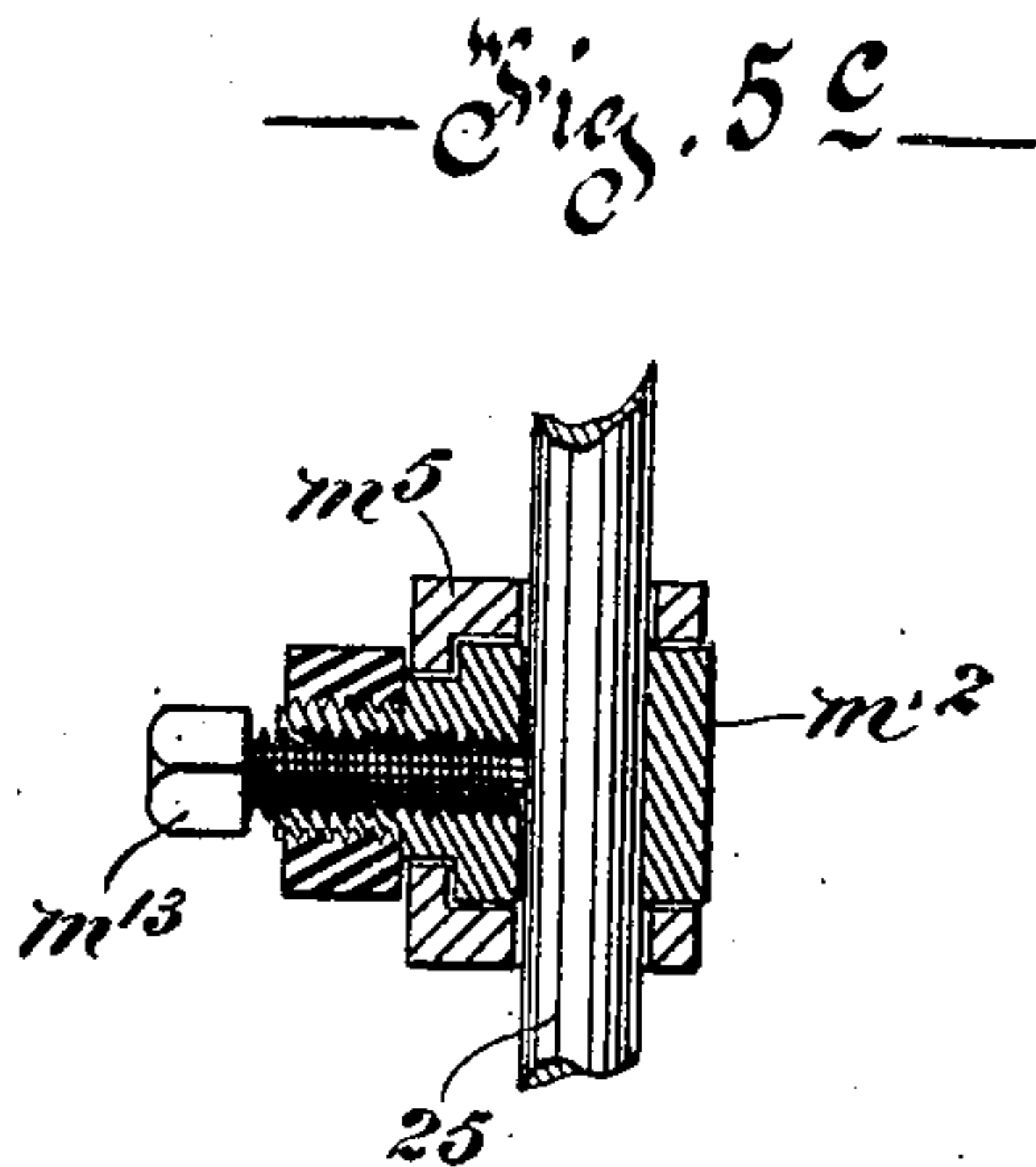
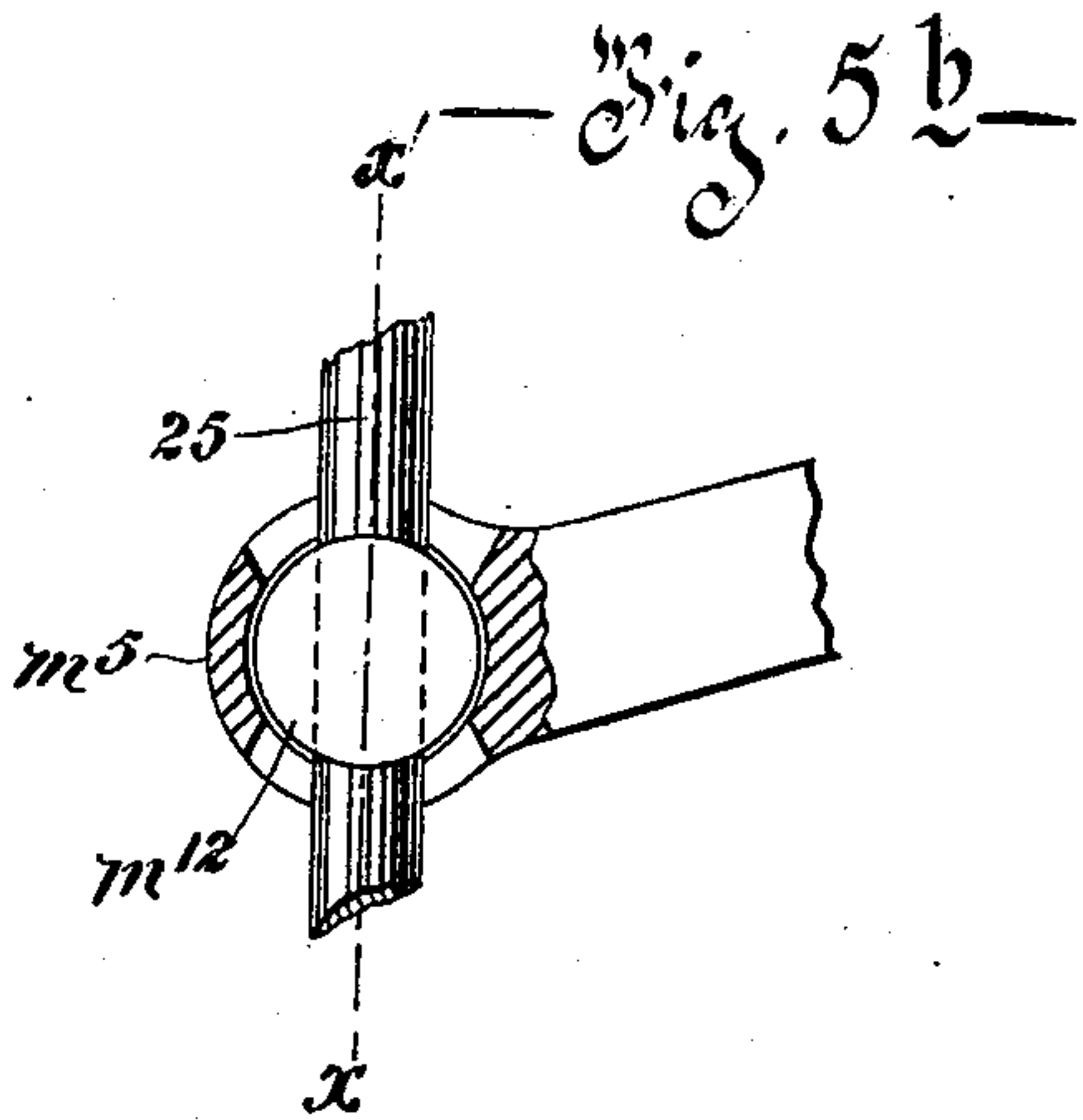
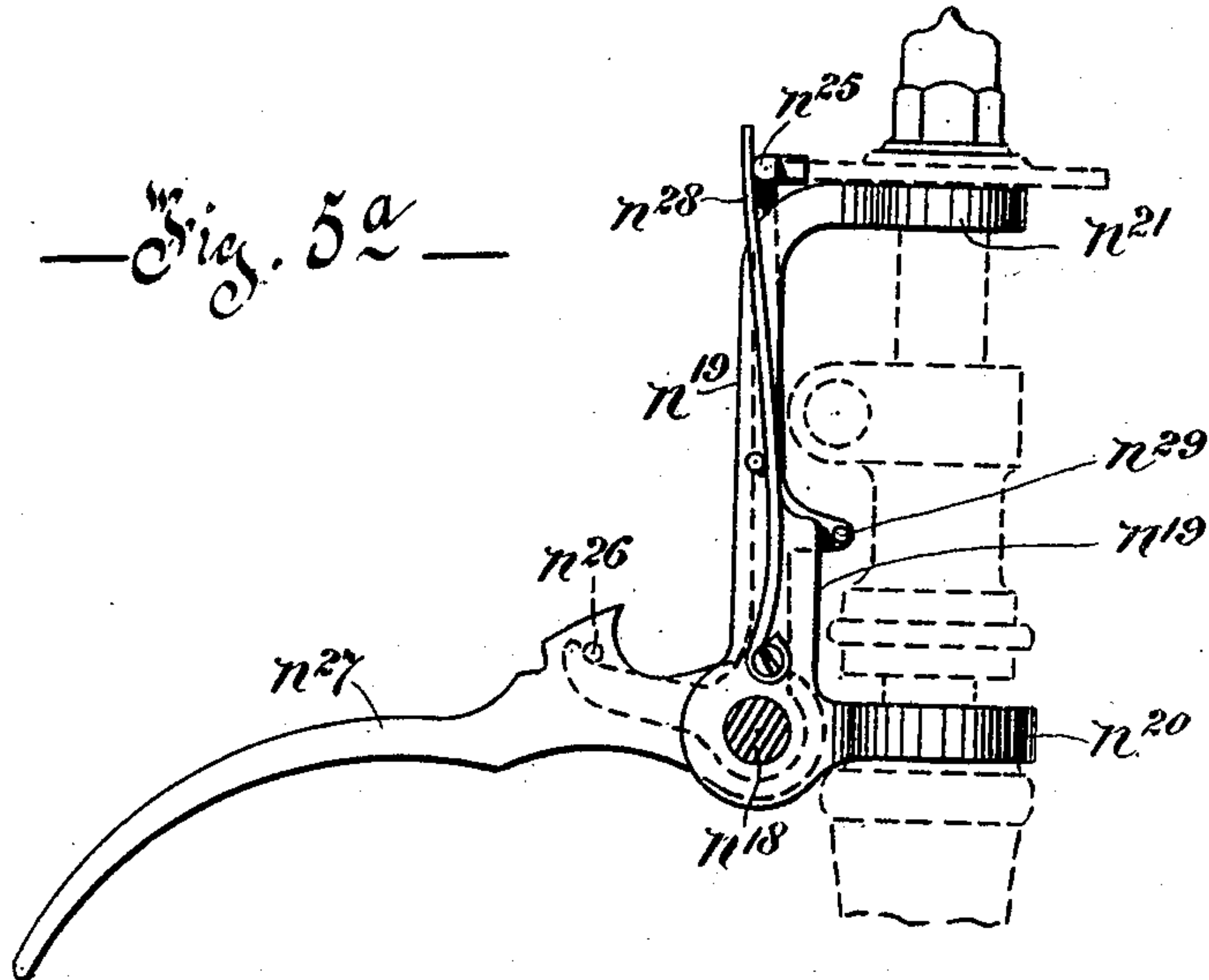
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16 Sheets—Sheet 6.



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Rep. *[Signature]*

Inventor
E. Duplessis
By *[Signature]* his Attorney

No. 614,802.

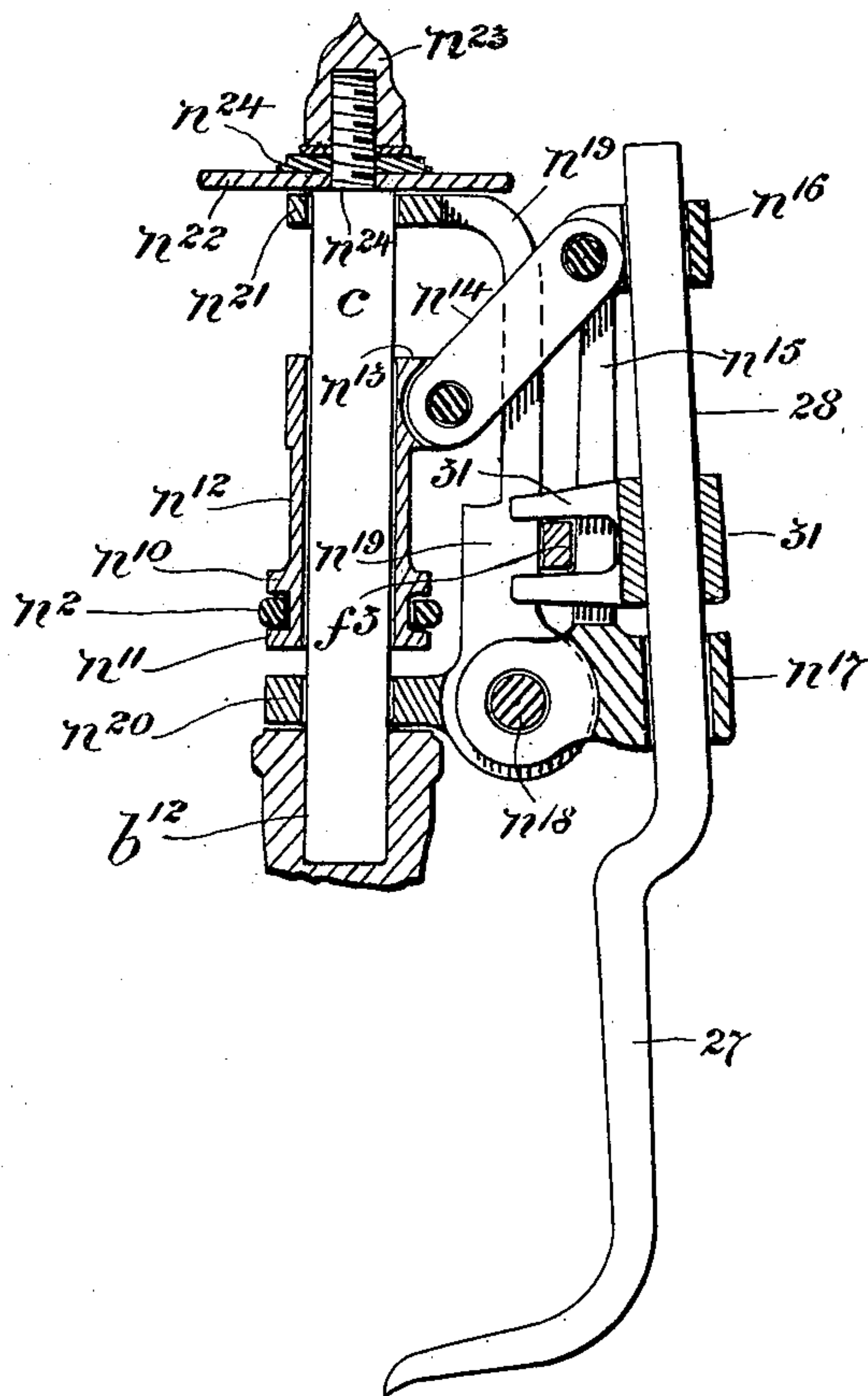
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(No Model.)

16 Sheets—Sheet 7.



— Fig. 5d —

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[Signature]
Rupert L. Kimber

Inventor
Eloild Duplessis
By his Attorney
[Signature]

No. 614,802.

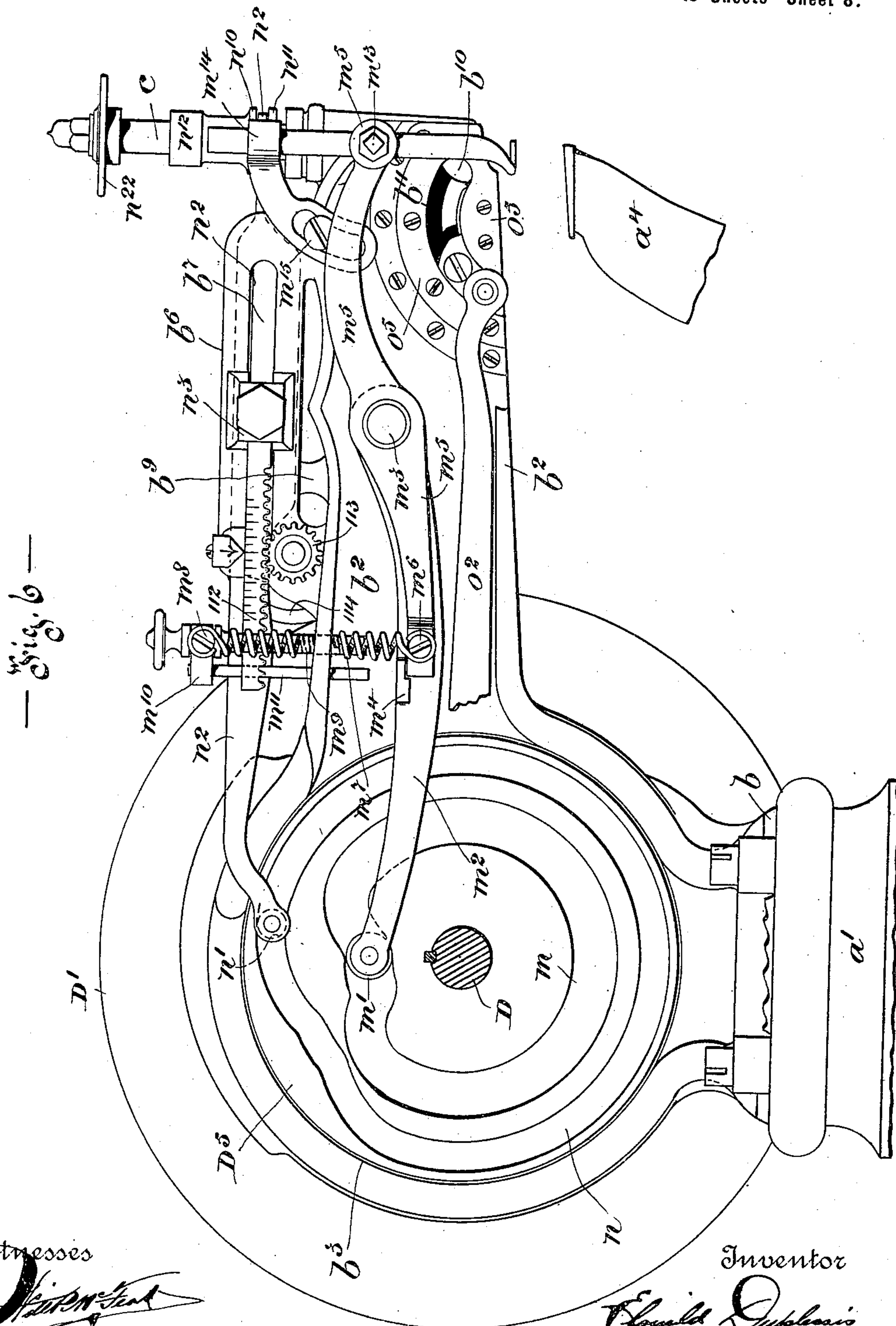
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16 Sheets—Sheet 8.



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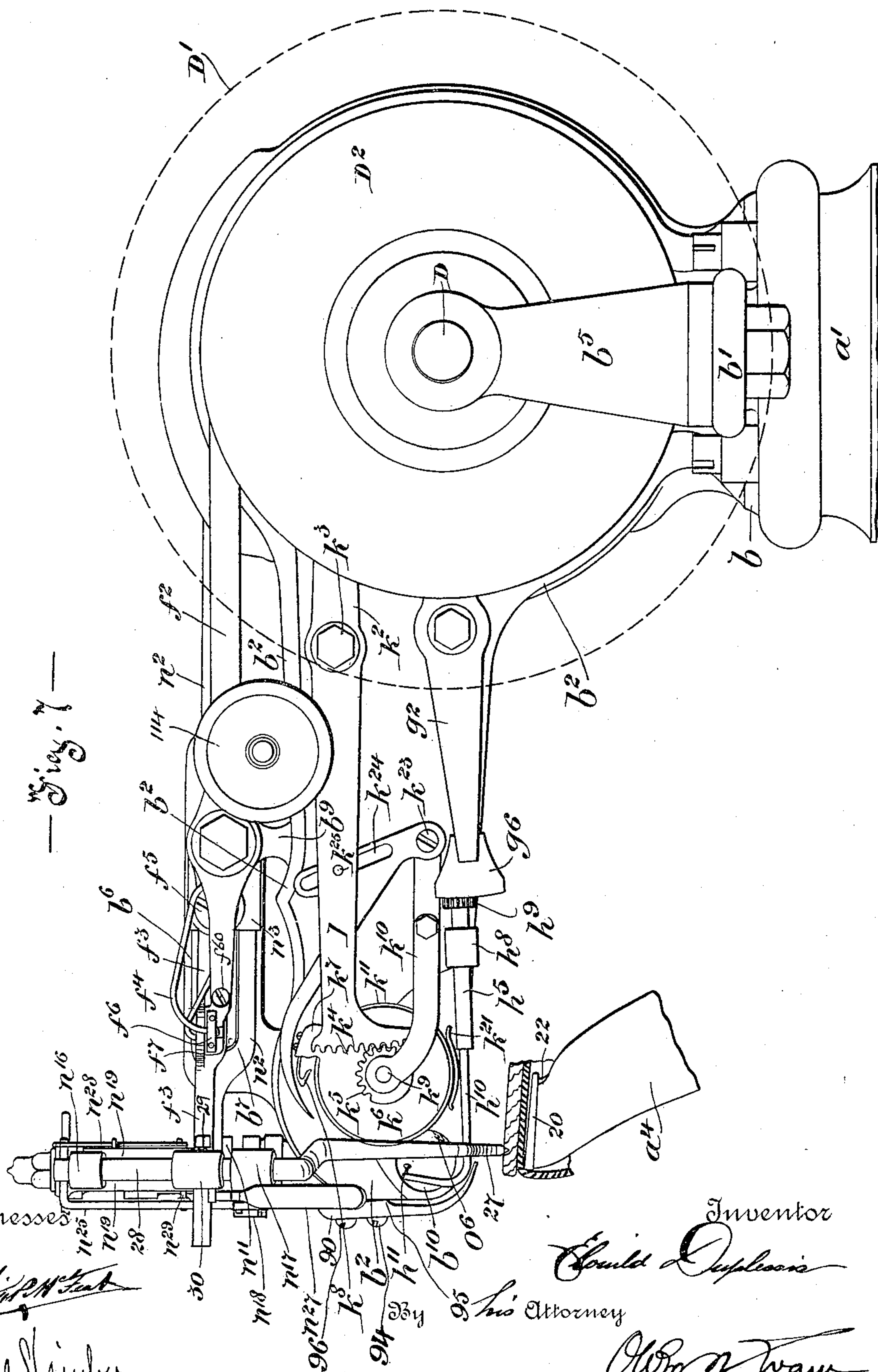
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(Application filed Dec. 27, 1894. Renewed Apr. 11, 1898.)

(No Model.)

16 Sheets—Sheet 9.



Witnesses
R. A. Kimber

Inventor
E. Duplessis
his Attorney
Wm. N. Warr

No. 614,802.

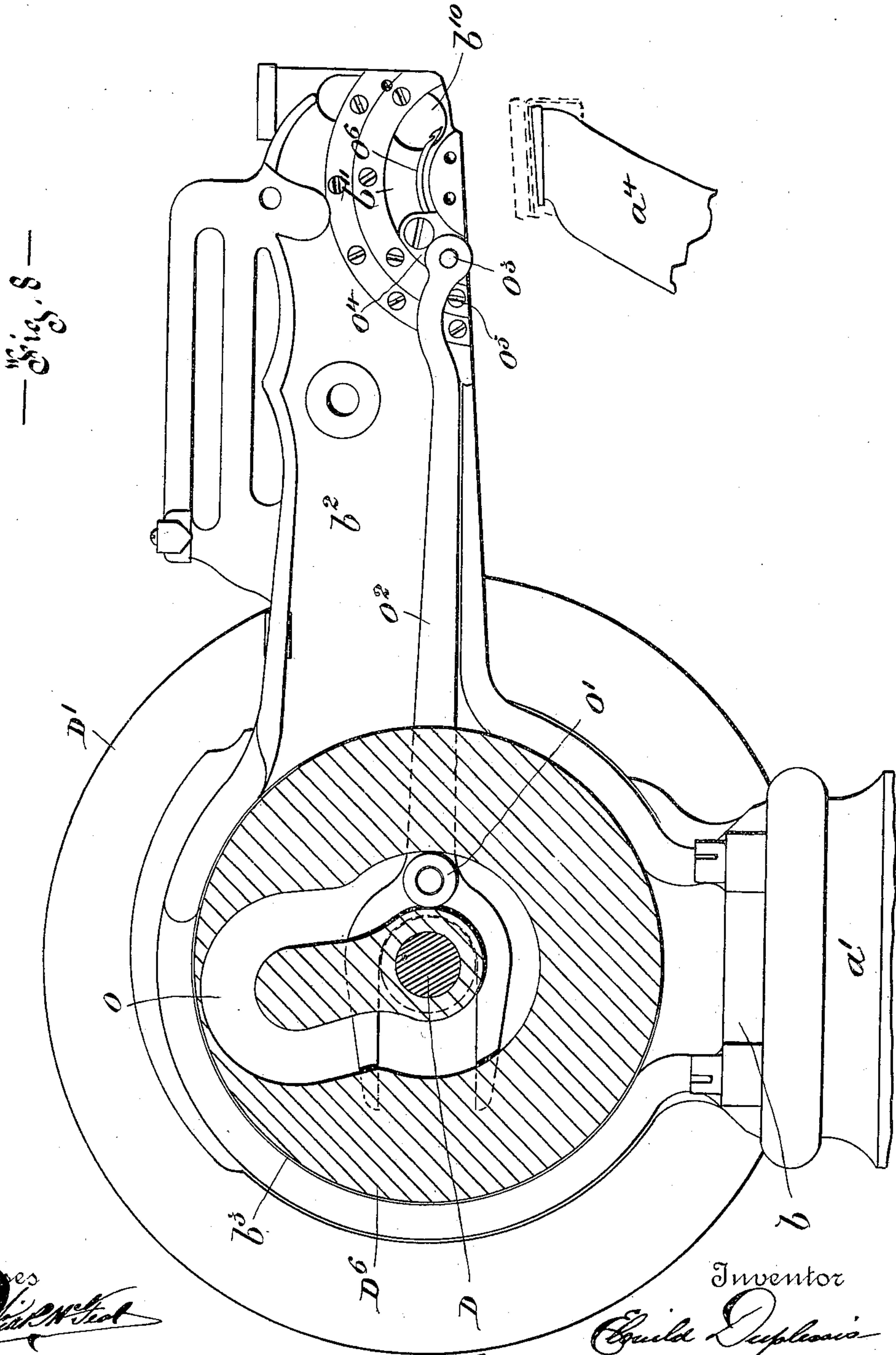
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(No Model.)

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16 Sheets—Sheet 10.



Witnesses
Wm. H. Kent

R. A. Kimber

By *his* Attorney

Alm N. Howe

Inventor

E. Duplessis

No. 614,802.

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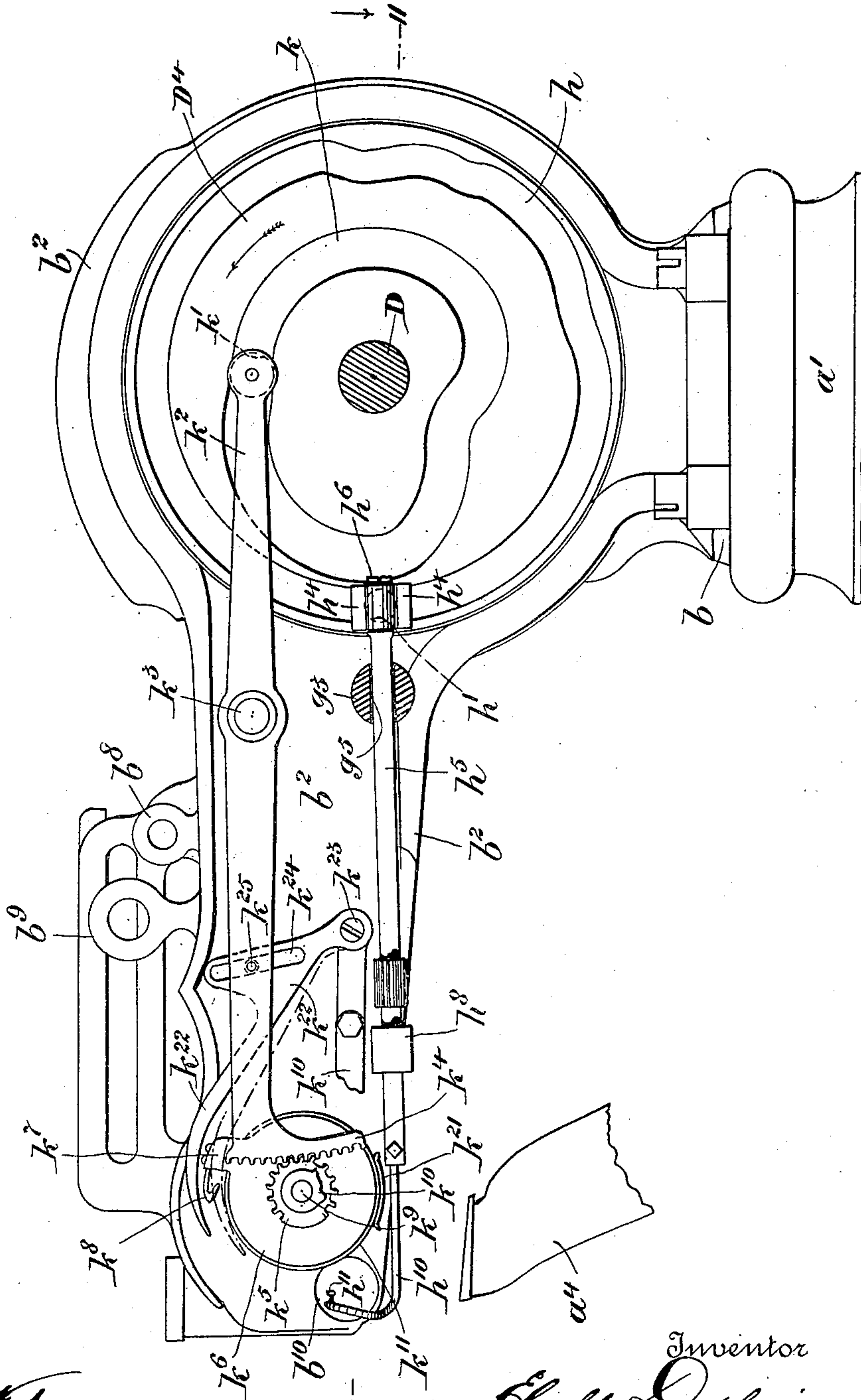
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SHOE SEWING MACHINE.

(No Model.)

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16 Sheets—Sheet II.

—Fig. 9—



Witnesses

Wm. H. H. H.

W. H. H. H.

Inventor

E. Duplessis

By *his* Attorney

Wm. H. H. H.

No. 614,802.

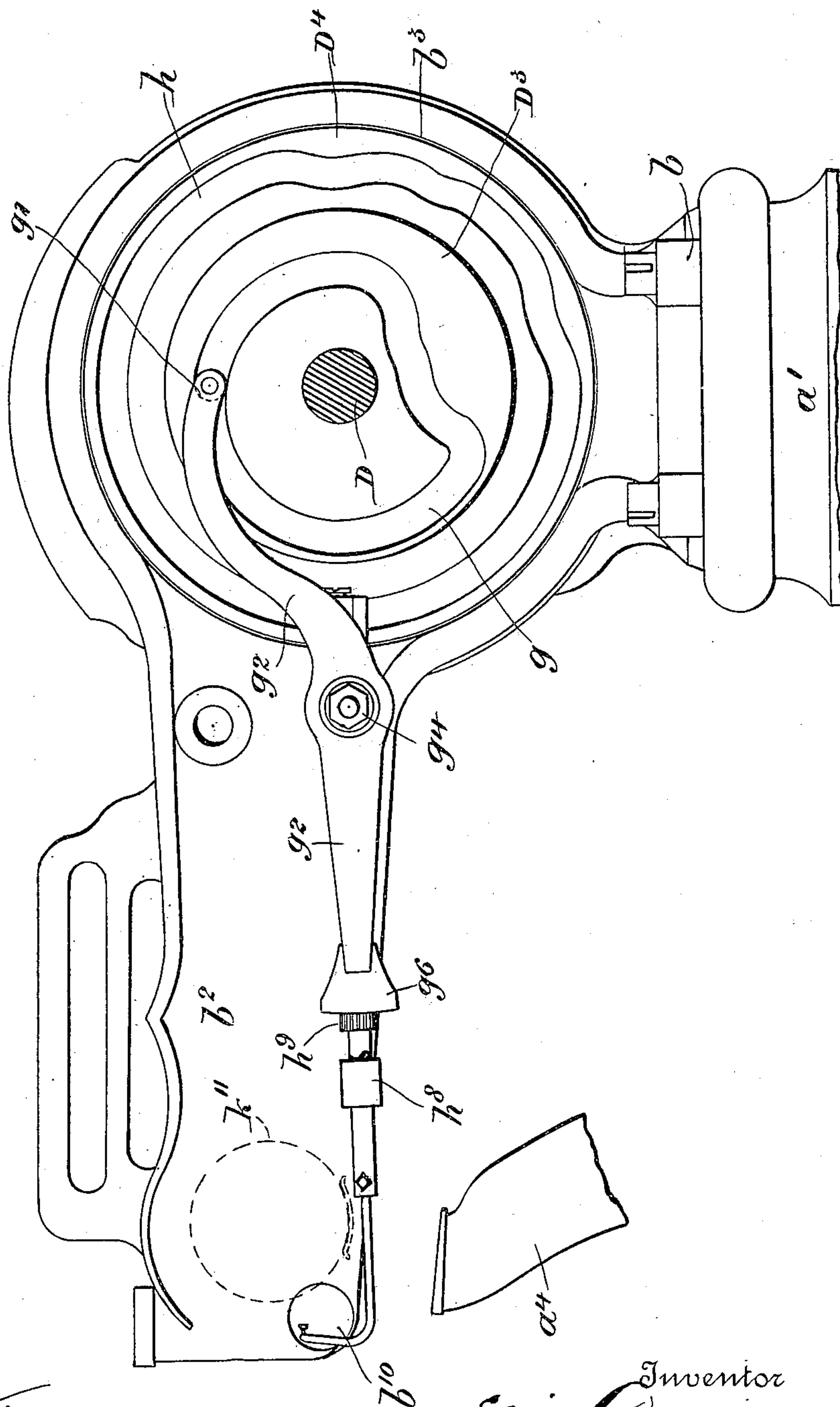
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(No Model.)

(Application filed Dec. 27, 1894. Renewed Apr. 11, 1898.)

16 Sheets—Sheet 12.



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Wm. P. M. Frost

R. A. Krul

Inventor

Should Depression

By *his* Attorney

torney
 John. Trave

No. 614,802.

Patented Nov. 22, 1898.

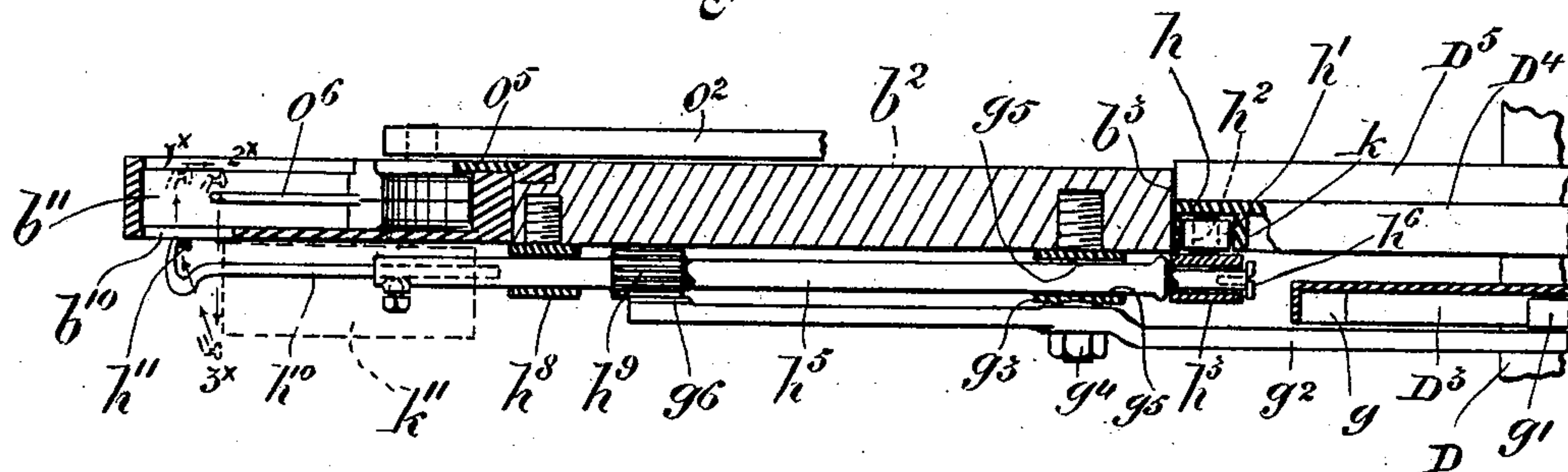
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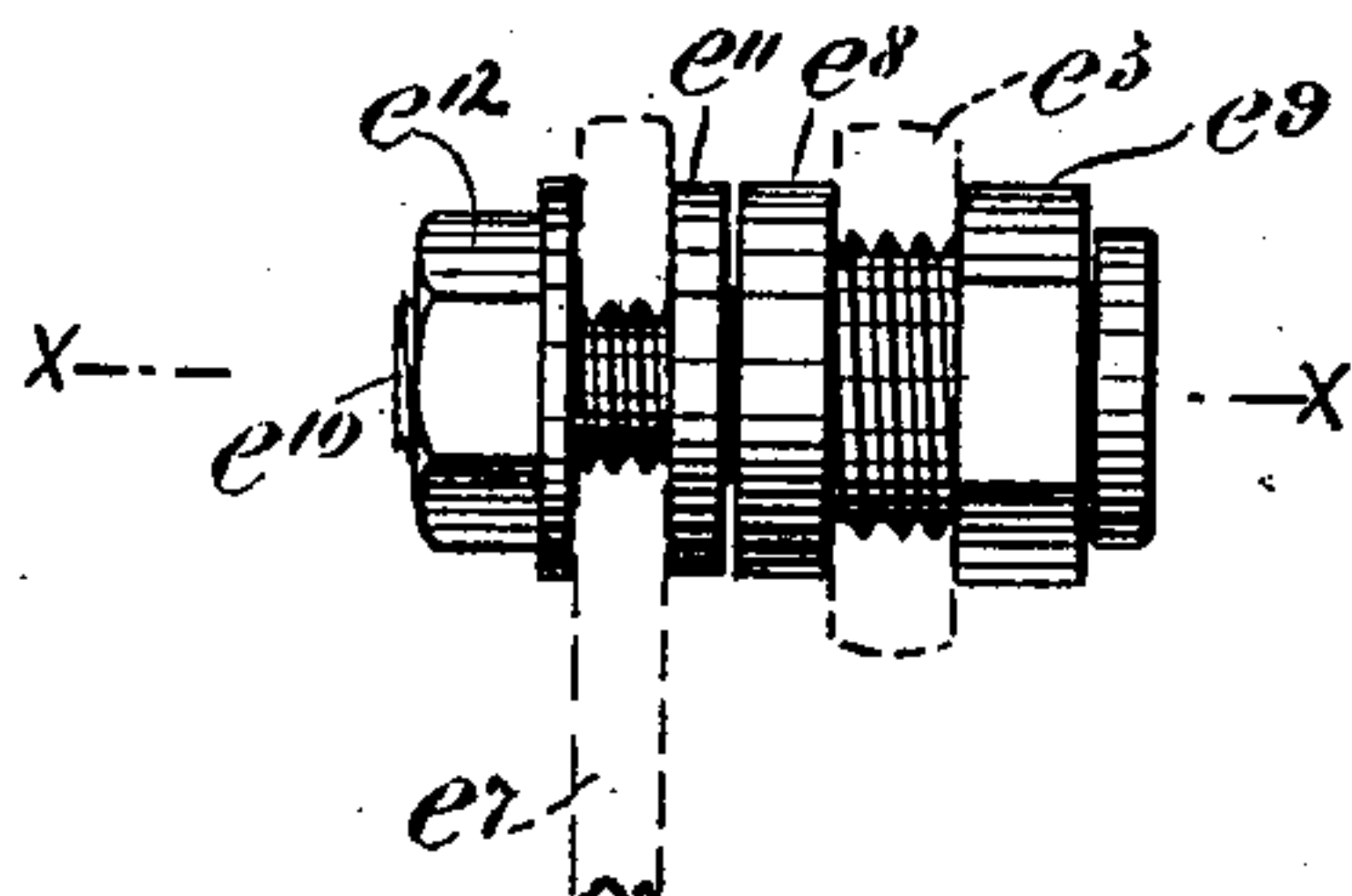
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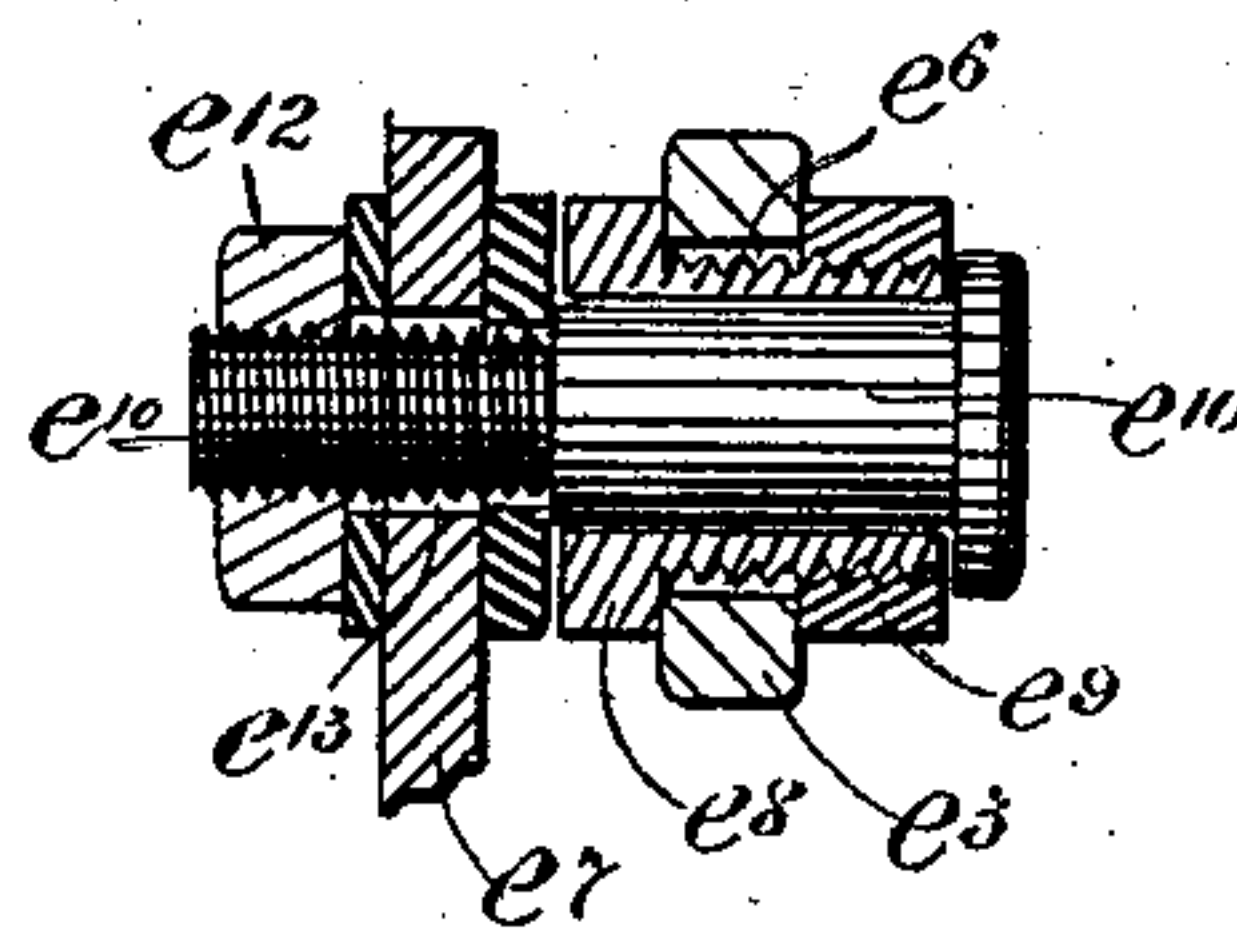
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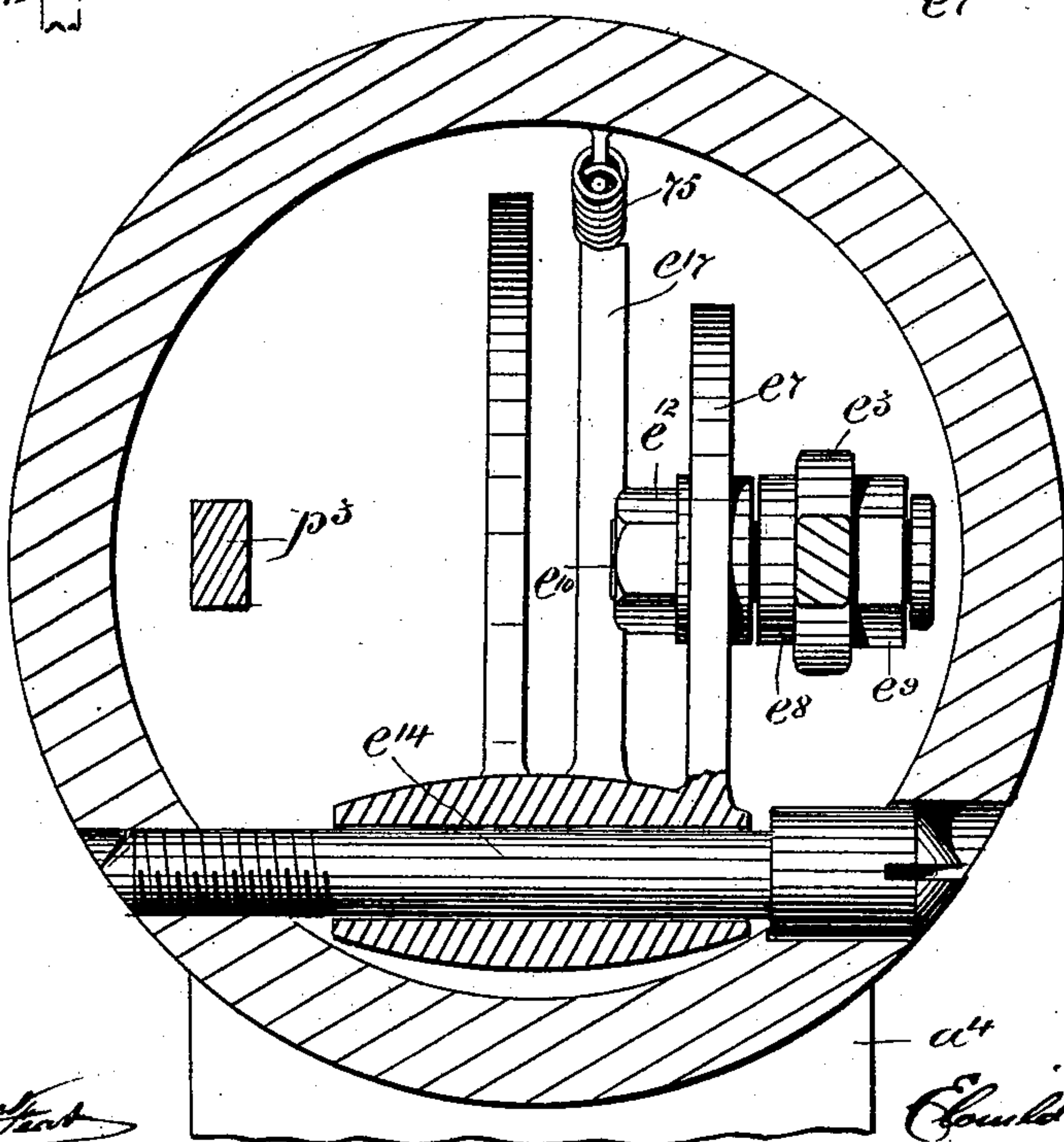
— Fig. 12 —



—orig. 35—



—Fig. 14—



Witnesses

Wm. M. Felt

R. A. Kimber

a^t Inventor

Could Depression

By his Attorney

Alvin. Trane

No. 614,802.

Patented Nov. 22, 1898.

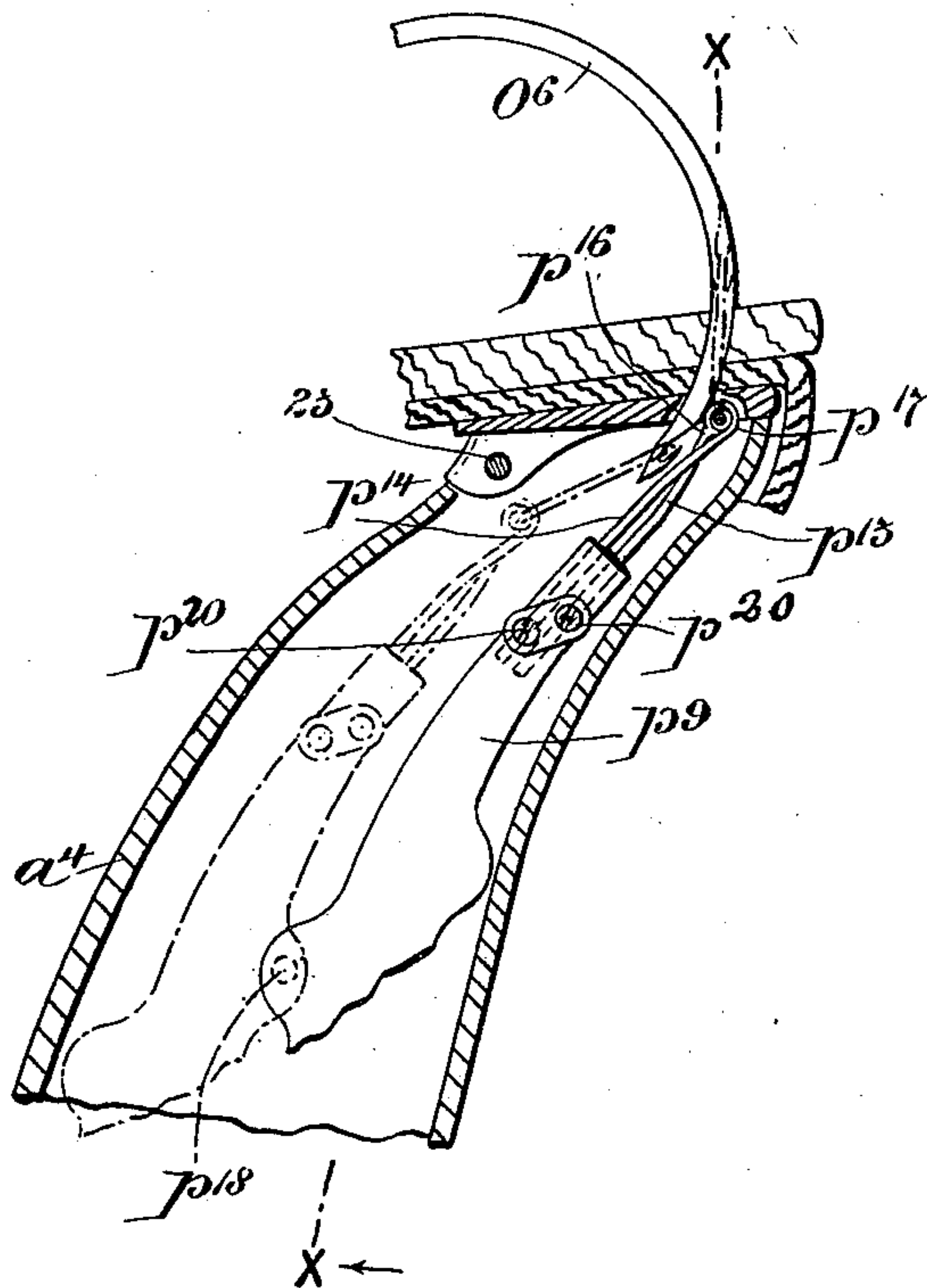
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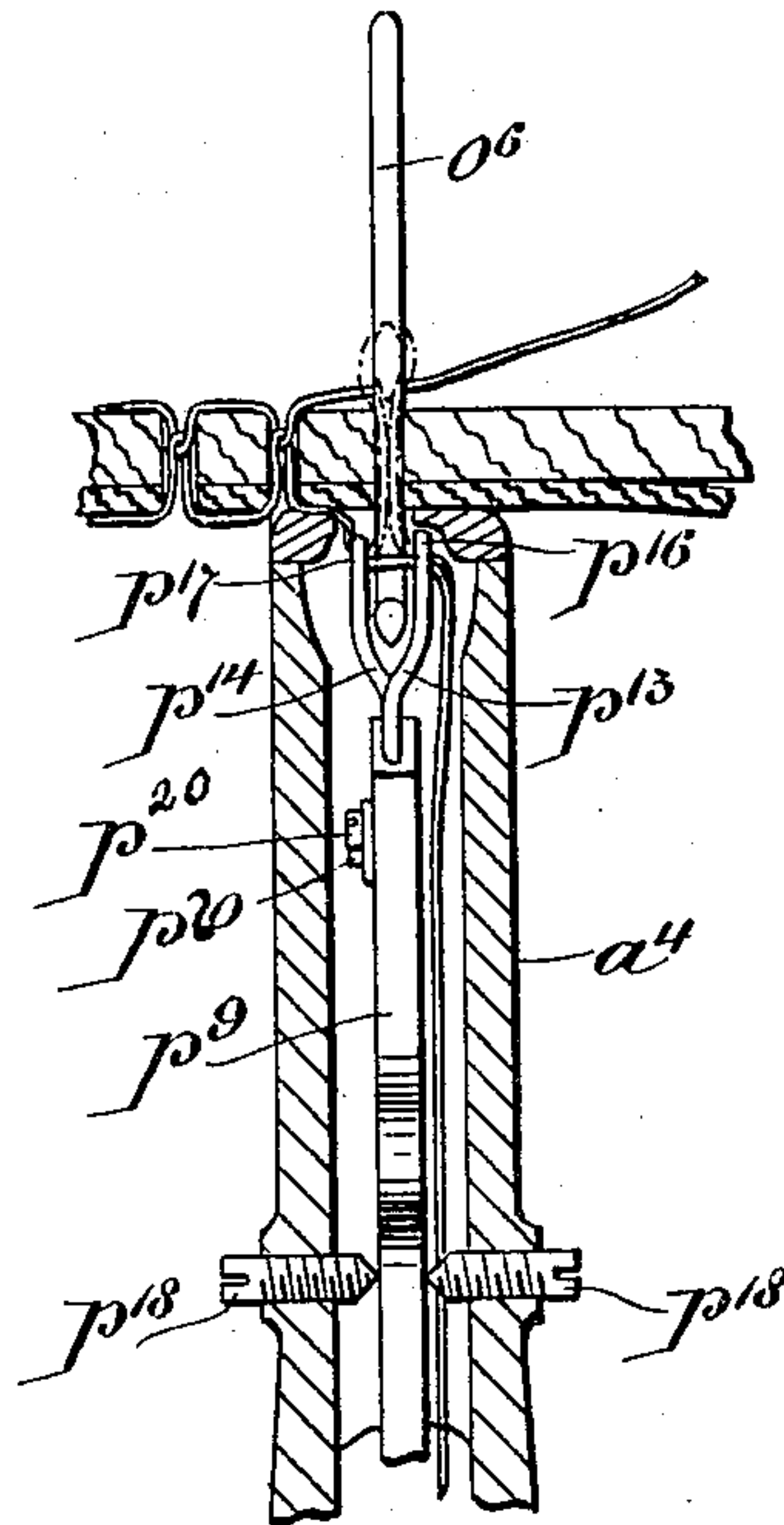
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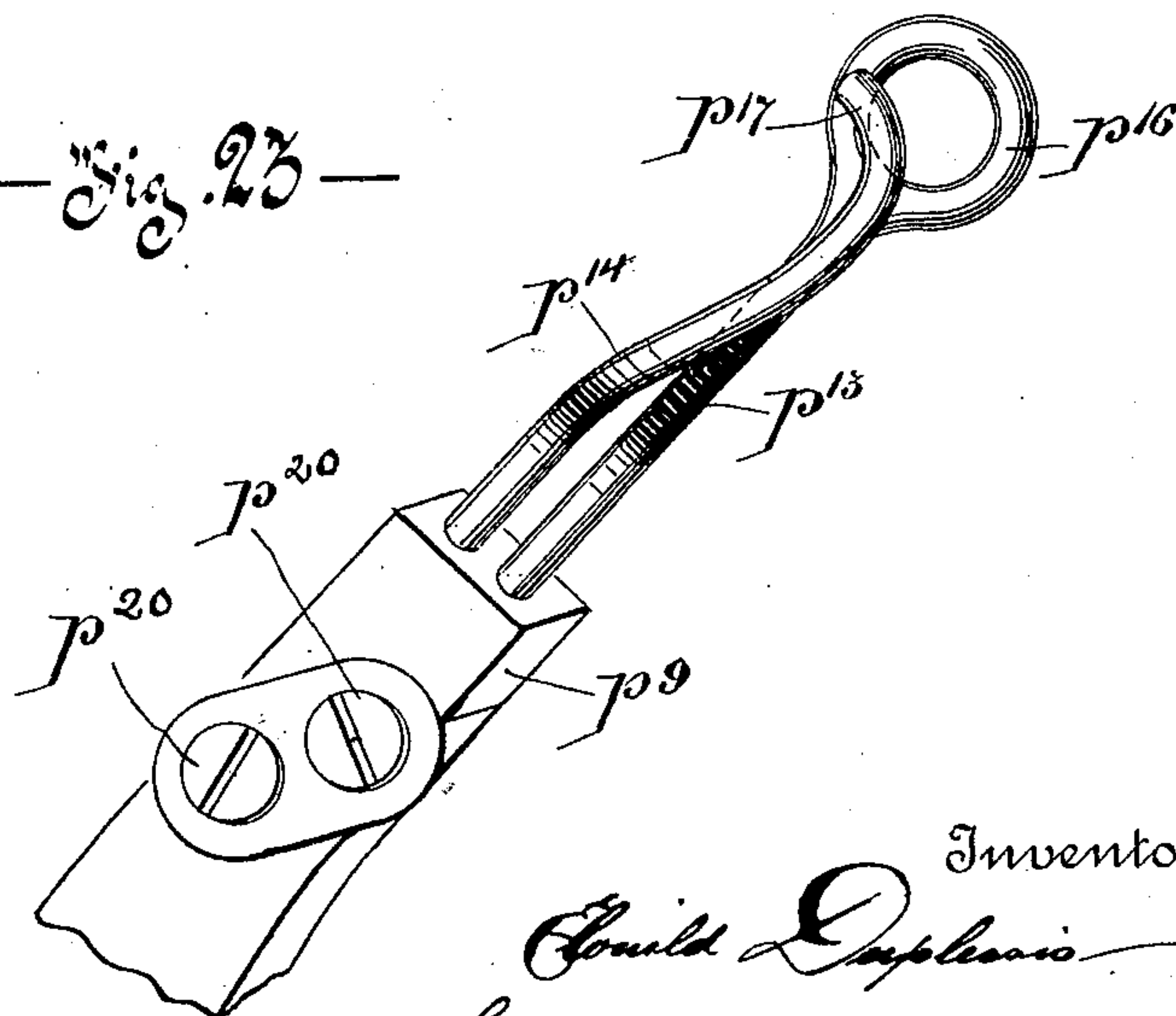
—Fig. 21—



—Fig. 22—



—Fig. 23—



No. 614,802.

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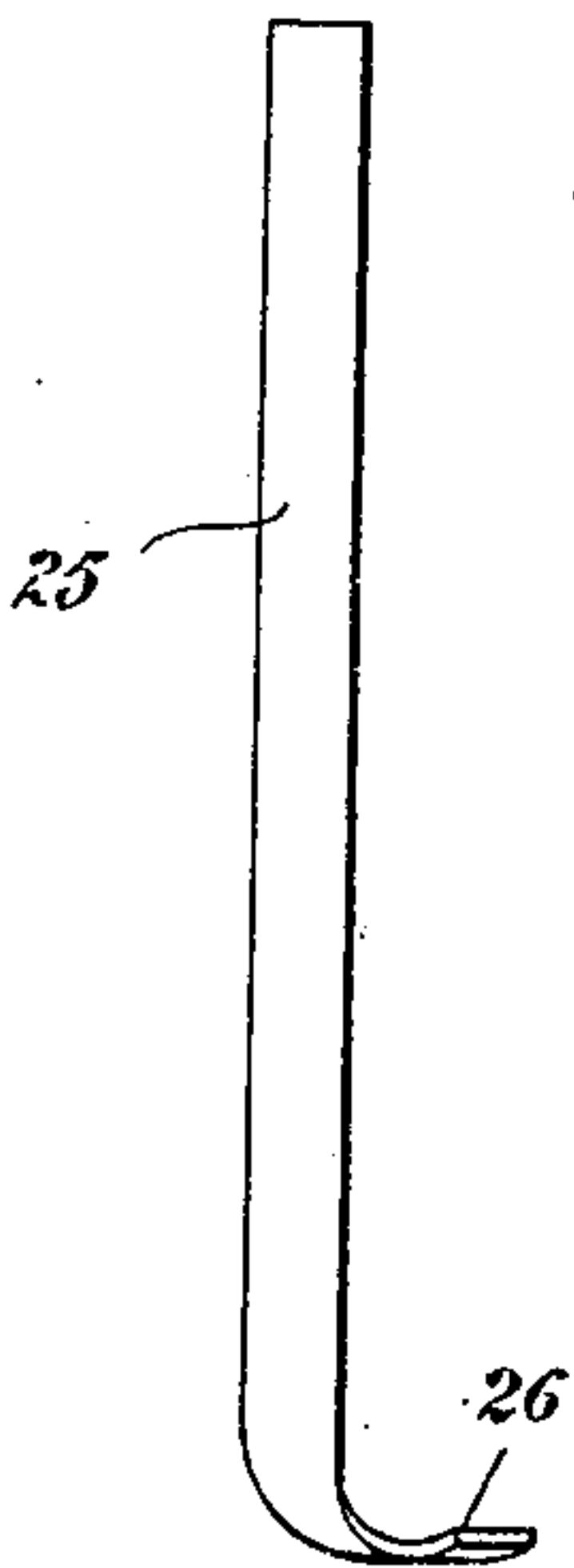
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(No Model.)

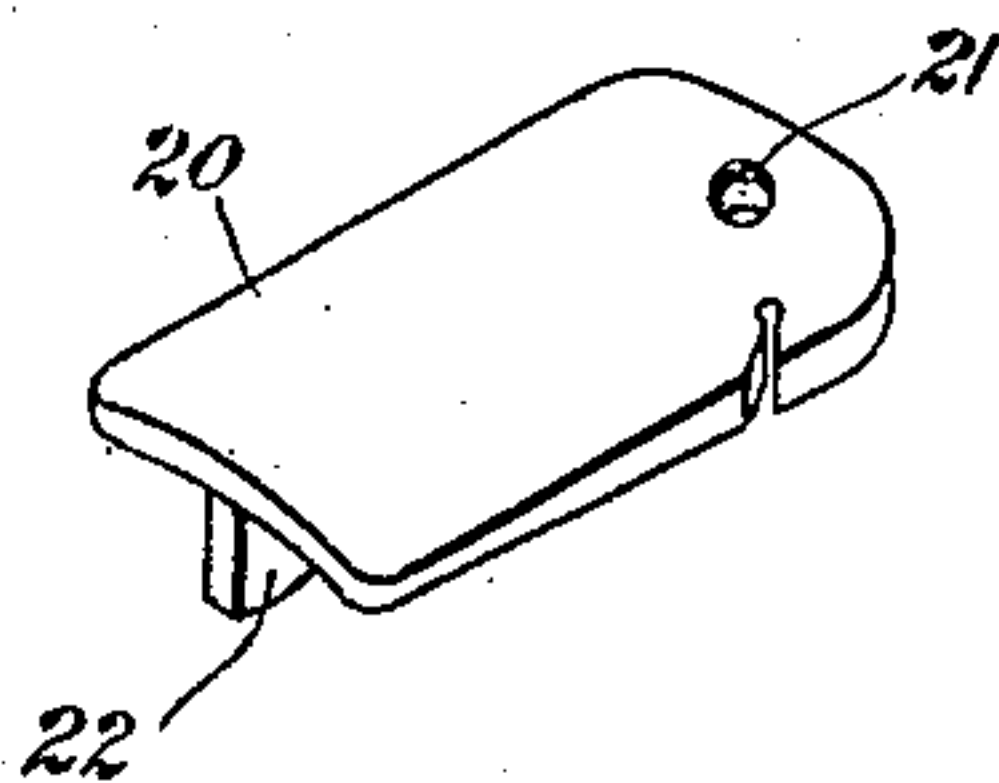
(Application filed Dec. 27, 1894. Renewed Apr. 11, 1898.)

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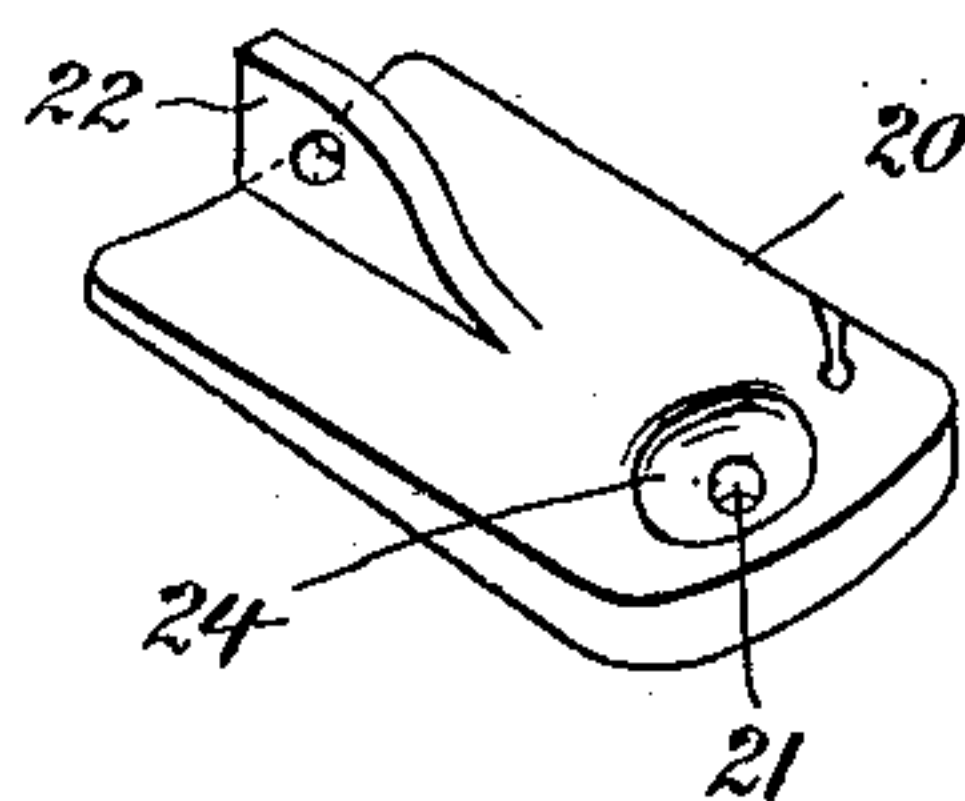
— Fig. 26 —



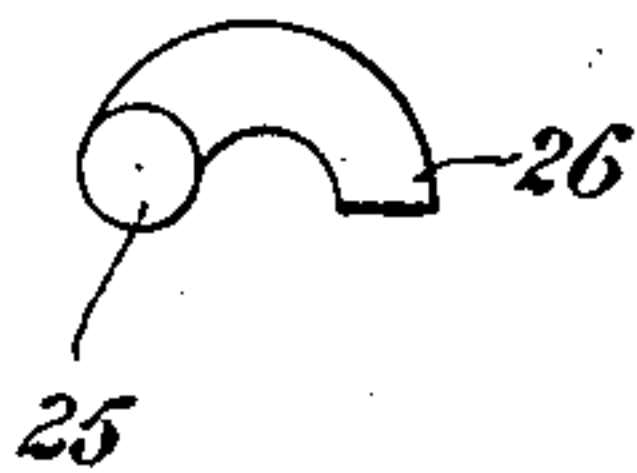
— Fig. 24 —



— Fig. 25 —



— Fig. 27 —



Witnesses
[Signature]
R. A. Kember

Inventor,
E. Duplessis
By *his* Attorney
Almon W. Waver

UNITED STATES PATENT OFFICE.

ELOUILD DUPLESSIS, OF ST. HYACINTHE, CANADA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO EMILE ARTHUR MARCHILDON, OF SAME PLACE.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 614,802, dated November 22, 1898.

Application filed December 27, 1894. Renewed April 11, 1898. Serial No. 677,246. (No model.)

To all whom it may concern:

Be it known that I, ELOUILD DUPLESSIS, of the city of St. Hyacinthe, in the county of St. Hyacinthe and Province of Quebec, Canada, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to wax-thread lock-stitch sewing-machines; and its object is to produce a machine with some of its instrumentalities or tools readily removable and interchangeable in order to allow other instrumentalities or tools to be substituted therefor, thereby enabling several kinds of work to be done, such as the McKay turned shoe, welted work, edge-stitching, and a variety of plain sewing.

The invention also has the effect of providing a lock-stitch sewing-machine to do either one of the various kinds of work just mentioned that will be simple in construction and exceedingly free from friction; but I will only include in this application the machine when fitted with the readily removable and interchangeable instrumentalities or tools necessary to do through-and-through sewing, where a horn is required, as in McKay work, the machine as adapted to do the other kinds of work being described and claimed in subsequent applications, Serial Nos. 559,088 and 559,199, filed, respectively, on August 12, 1895, and August 13, 1895.

A machine constructed according to my present invention embodies a needle, a readily-removable presser-foot, a readily-removable feed device, a thread-carrier, a thread-case, and a thread-hook, which, with their operating and carrying parts, are carried by the machine-head, a work-support or horn carried by the pedestal, a readily-removable work-table, a needle-threader, and a tension device carried by the horn, a clamping device carried partly by the horn and partly by the pedestal, and a take-up device carried by the pedestal.

For full comprehension of the invention reference must be had to the annexed drawings, forming a part of this specification, in

which like symbols indicate corresponding parts, and wherein—

Figure 1 is a side elevation of the entire machine; Fig. 2, a front elevation of the same; Fig. 3, an enlarged right-hand side elevation of the upper portion of the machine, partly in section and illustrating the take-up; Fig. 4, an enlarged left-hand side elevation of the upper portion of the machine, also partly in section and illustrating the threader. Fig. 5 is an enlarged front view of the machine-head with needle brace or guard in place. Fig. 5^a is a detail rear side elevation of the horizontally-swinging frame of the feed device; Fig. 5^b, a detail side elevation, partly in section, of the carrying end of the presser-foot bar; Fig. 5^c, a transverse vertical section of the carrying end of the presser-foot lever, taken on line *x x*, Fig. 5^b; Fig. 5^d, a detail sectional view of the devices whereby the necessary feed movements are imparted to the feed device from its actuating-levers. Fig. 6 is a left-hand side elevation of the machine-head, partly broken away to particularly illustrate the presser-foot mechanism, part of the feed mechanism, and the means for regulating the length of stitch. Fig. 7 is an enlarged right-hand side elevation of the machine-head; Fig. 8, a detail side elevation of the needle-operating mechanism. Fig. 9 is a detail side elevation of the thread-case, thread-hook, and guide mechanism and part of the means for operating the thread-carrier. Fig. 10 is a detail side elevation of another part of the means for operating the thread-carrier. Fig. 11 is a horizontal section on line 11 11, Fig. 9; Fig. 12, a detail elevation of connection between take-up rod and lever; Fig. 13, a horizontal section on line *x x*, Fig. 12; Fig. 14, an enlarged horizontal section on line *x x*, Fig. 4; Fig. 15, a detail end elevation of thread-case with side partly broken away; Fig. 16, a side elevation showing tension device; Fig. 17, a transverse vertical section on line *x x*, Fig. 15, with bobbin removed; Fig. 18, a detail view of bobbin; Fig. 19, an enlarged transverse vertical section on line *Z Z*, Fig. 4; Fig. 20, a detail sectional view of needle-guide; Fig. 21, an en-

larged detail sectional view of nose of horn, illustrating operation of threader; Fig. 22, a transverse vertical sectional view taken on line $x x$, Fig. 21; Fig. 23, an enlarged detail perspective view of threader; Figs. 24 and 25, detail perspective views of the work-table; Figs. 26 and 27, detail views of the presser-foot.

The several arrows adjacent to the figures of the lines on which the various sectional views are taken indicate the directions of the views.

The pedestal a of the machine is preferably of the type common to boot and shoe wax-thread sewing-machines, except that it has an upper adjustable portion or neck a' of less diameter than the pedestal-body and movable vertically through the openings in the top end of the latter, which is slotted, as at a^2 , on opposite sides, and suitable set-screws a^3 , passing through the slots, provided for fixing it at any desired height. This movable neck a' carries the head portion of the machine to be presently described, and also has bolted to it near its lower end a work-support preferably in the form of a hollow horn a^4 , the front side of the pedestal-body a being slitted from its top end downward sufficiently to accommodate such horn, which projects through it, and as a means for securing the adjustment of these parts relatively to the pedestal a vertical screw a^5 is threaded through a bracket-arm a^6 , projecting from the face of the pedestal-body a , and has its upper end bearing beneath the base of the horn, while its lower end is provided with an aperture to receive the end of any suitable bar whereby it can be rotated.

The reason for making the machine-head and work-support adjustable is to accommodate operators who in some cases are inconvenienced one way or another by the fixed height of machines of this type.

The usual running-gear and attachments are, as heretofore, situated at the base of the pedestal, but as they form no part of my invention they need not be further alluded to.

The framing of the head portion of the machine comprises a base-plate b , having openings down through the center to communicate with the interior of the pedestal and lateral extensions $b' b'$, this base being screwed to the top of the neck portion a' .

b^2 is a vertical and forwardly-projecting web integral with the base-plate b and having an opening b^3 to accommodate the operating-cams and their shaft, and $b^4 b^5$ are left and right hand standards bolted to the lateral extensions $b' b'$. The web b^2 also has formed in one with it an upwardly-projecting ridge or extension b^6 , extending along its upper edge from its forward end rearward for about half the length of the web and slotted, as at b^7 , to accommodate an adjustable sliding block forming a part of the mechanism to be presently described for regulating the length of stitch. Projections $b^8 b^9$ are also formed on

the upper edge of the web b^2 , the one, b^8 , forming a bearing for a spindle forming a part of said stitch-regulating mechanism, and the latter, b^9 , serving as a part to which one of the feed-operating levers is pivoted.

Near the lower forward end of the web b^2 a circular transverse opening b^{10} is formed to allow of the operation of the thread-carrier, as will be hereinafter described, and at right angles to such opening b^{10} a second opening b^{11} is formed, extending up from the lower edge of the web, passing but connecting with the opening b^{10} , as shown in Figs. 8 and 11, to allow the operation of and accommodate the needle and needle-segment. The upper forward end of the web b^2 is also bored vertically, as at b^{12} , to receive the lower end of a vertical standard c , by which various parts to be hereinafter described are carried.

D is the shaft, mounted in the standards $b^4 b^5$ and carrying a driving-pulley D' , a disk D^2 , having cam-grooves e and f cut in its face, a second disk D^3 , having a cam-groove g cut in its face, a third disk D^4 , having cam-grooves $h k$ cut in its face, a fourth disk D^5 , with cam-grooves $m n$ cut in its face, a fifth disk D^6 , with cam-groove o also cut in its face, and a sixth disk D^7 , also having a cam-groove p cut in its face.

Looking at the front of the machine and beginning at the right-hand end disk D^2 , I will proceed throughout the series of disks and describe the several parts operated by the respective cam-grooves cut in the faces of such disks, starting with cam-groove e for operating the take-up. The form of this groove e is clearly shown in Fig. 3, and it receives a roller e' , which is axially mounted on the side of a vertically-reciprocating rod, preferably formed in two parts or lengths $e^2 e^3$ and adapted to project laterally into said groove. The parts $e^2 e^3$ of this rod are connected together through a collar-and-pin connection, such as e^4 , and the upper part e^2 , which carries the roller e' , is forked at its opposite end to bear on either side of a ring e^5 , carried by the shaft D to steady and keep the rod always in a true vertical position. The lower part e^3 of the rod passes down through an opening in the top of the movable neck portion of the pedestal, and at its lower end is formed with an eye e^6 to allow of its being pivotally connected with the take-up lever e^7 , preferably in the following manner.

Reference being had to Figs. 12 and 13, a flanged sleeve e^8 , with screw-threaded end, is first passed through the eye e^6 , so that the flange will bear against the inner side of the end of rod e^3 , and the screw-threaded end projects on the opposite side sufficiently to receive a nut e^9 , which, being screwed up tightly against the side of the rod e^3 , connects the sleeve and rod together, after which a bolt e^{10} , having a circular portion which can freely rotate in the sleeve and a screw-threaded end portion to receive a nut e^{12} , is passed through such sleeve e^8 . A washer e^{11} is then set in place

at a point out of contact with the flanged inner end of the sleeve and the remaining end of the bolt passed through a slot e^{13} in the short arm of the take-up lever e^7 to receive
 5 a washer and the nut e^{12} , which is screwed up tightly to effect a rigid connection between such take-up lever and the bolt, thus furnishing a rigid pivot capable of free rotation in the sleeve carried by the vertical-rod
 10 connections $e^2 e^3$.

The take-up lever is of bell-crank form and fulcrumed within the movable neck portion of the pedestal upon a pivot pin or bolt e^{14} , as shown in Figs. 3 and 14, passed through
 15 an opening in one side of the neck portion and screw-threaded into the opposite side of same, the head being shaped to conform with the periphery of such neck portion, so as not to interfere in any way with the adjustment
 20 of this latter within the pedestal proper.

The long arm of the take-up lever is curved, as shown in Fig. 3, to allow of its working within the horn a^4 and carries a sheave e^{15} on its outer end, and near its inner end, in close
 25 proximity to its fulcrum-point, is cast a projection in the form of a rod o^{17} and projects downward to engage with and operate the tension-lever.

The cam-groove f on the disk D^2 acts in conjunction with the cam-groove n in the disk D^5 to operate the feed mechanism. I will first describe the parts actuated by the groove f . This groove f is of the form shown in Fig. 3 and receives a roller f' , carried by
 30 the inner end of a lever f^2 , fulcrumed on the projection b^9 and having its outer end bent inward beneath and flexibly connected with a secondary lever f^3 , which is in the form of a straight arm, having its inner end pivotally
 35 connected with the fulcrum-pin of the lever f^2 and its outer end curved concentric with the spindle c , (see Fig. 5,) carried in the front end of the web or frame b^2 , and the flexible connection between it and the lever f^2 is preferably effected by means of a coiled spring f^4 ,
 40 taken around a stud f^5 , projecting from the side of the lever f^3 and having one end connected to such lever and the other to the lever f^2 , preferably by means of a clamping-plate f^6 , holding the end of the spring securely in a groove cut in the face of the lever f^2 .
 45 50

The forward end of the lever f^2 , as before mentioned, is bent in beneath the lever f^3 , and a lug f^7 is preferably formed on the side of the lever f^3 , up against the under side of which the lever f^2 is pressed by the action of the spring f^4 , and such lever f^2 operates to impart a vertical reciprocating movement to
 55 a feed-dog, which I will describe subsequently to describing the cam-groove n and parts operated by it, which latter I will now describe.

The cam-groove n is of the form shown in Fig. 6 and acts in conjunction with cam-groove f , as before mentioned, for operating the feed, and its particular function is to

impart the necessary horizontal or lateral reciprocating motion to the feed-dog, which motion in one direction is the feed movement proper thereof. 70

The groove n receives a roller n' on the inner end of lever n^2 , which is fulcrumed to a movable block n^3 , adapted to be adjusted along the slot b^7 in the upwardly-projecting
 75 ridge b^6 of the web b^2 by means of a rack 112 and pinion 113, the pinion being operated by hand-wheel 114 to impart a sliding movement to the rack, which is rigidly connected to fulcrum-block n^3 , thereby securing a diminished
 80 or lengthened movement of the outer end of lever n^2 , according as the fulcrum-block n^3 is moved from or to the cam n .

The outer end of the lever n^2 is forked to enter between two annular shoulders $n^{10} n^{11}$,
 85 formed on the lower end of a sleeve n^{12} , which has a laterally-projecting lug n^{13} at its upper end and is fitted loosely on the vertical standard c at the upper forward end of the web b^2 . 90

A link n^{14} has one end loosely pivoted to the lug n^{13} and its opposite end to the upper end of a vertical carrier-frame n^{15} for the feed device, such frame having sleeves $n^{16} n^{17}$ at its ends to receive the shanks of the various
 95 forms of feeding devices that may be used and being pivotally connected at its lower end at n^{18} to a horizontally-swinging frame n^{19} , pivotally connected with the standard c through arms $n^{20} n^{21}$, formed with openings to
 100 encircle such standard. This horizontally-swinging frame is to allow of the adjustment or rotation of the feed device to different positions about the nose of the horn in order to secure feed in various directions, as this
 105 is necessary in view of the horn being stationary.

To set the frame n^{19} and feed in the required position, a notched disk n^{22} is located above the arm n^{21} and held rigidly upon the
 110 standard c by means of a screw cap or nut n^{23} , forcing it against a shoulder n^{24} on such standard, a spring-operated latch being used to engage the notches in the disk n^{22} and such latch being in the form of a lever n^{25} ,
 115 fulcrumed at n^{18} and having a vertical arm adapted to engage the notches in the disk n^{22} and a horizontal arm adapted to be engaged by a pin projection n^{26} on a hand-lever n^{27} , also fulcrumed at n^{18} , the spring n^{28} for
 120 operating such latch being shown in detail in Fig. 5^a. The vertical arm of the lever n^{25} is provided with a pin projection n^{29} , adapted to come in contact with the frame n^{19} and so limit the outward movement of the lever. 125
 The hand-lever n^{27} is also used for elevating the feed device and is formed with a beveled projection n^{30} and a notch n^{31} on its upper side to bear upon and engage a pin projection on the side of sleeve 31, secured to the
 130 shank of the feed device.

The cam-groove g in disk D^3 is of the form shown in Fig. 10 and acts in conjunction with the cam-groove h in disk D^4 to operate the

thread-carrier, the groove g receiving a roller g' , carried by the inner end of a lever g^2 , fulcrumed on the diminished outer end of a block g^3 and held in place thereon by means of a nut g^4 . The inner end of this block, which is perforated, as at g^5 , is also diminished and screw-threaded to take into a similarly-screw-threaded boring in the web b^2 , as is shown in Fig. 11, and lever g^2 carries at its outer end a segmental toothed rack g^6 , while the cam-groove h is of the form shown in Figs. 9 and 10 and receives a roller h' , carried on a stud-bearing h^2 , as shown in Fig. 11, on the side of a sleeve h^3 , having wing-plates h^4 , cast in one with it and bearing upon the sides of groove h to steady the sleeve and keeps roller h' from being displaced by the rotation of a sliding rod h^5 , the diminished or inner end of which carries such sleeve loosely retained thereon by means of screw h^6 . This sliding rod passes through and is carried in the perforation g^5 in the block g^3 on the side of web or frame b^2 , to which the lever g^2 is fulcrumed, and through bearing h^8 , also on the side of the web, and is adapted to receive a reciprocating movement from groove h and a rotary movement from groove g through pinion h^9 , carried rigidly on the rod h^5 , segmental toothed rack g^6 , and lever g^2 , on which such segmental toothed rack is carried.

The forward end of the rod h^5 is bored longitudinally and receives the rear end of the thread-carrier proper in the form of a finger h^{10} , bent, as shown particularly in Figs. 5, 9, and 11, so that its free end will project in front of the thread-case and carry the thread in a hook h^{11} at its extreme end from the needle to the thread-case, as shown clearly in Fig. 11.

The cam-groove k in the disk D^4 is of the form shown in Fig. 9 and operates the oscillating thread-hook and a device for preventing any accidental displacement of the thread-case when the oscillating hook is thrown back to release the thread after it has taken it around the case.

The groove k receives a roller k' , carried on the inner end of a lever k^2 , which is fulcrumed at k^3 to the web or frame b^2 and has its outer end terminating in a segmental toothed rack k^4 . This rack k^4 intermeshes with a pinion k^5 , which is formed in one with and centrally of the side of a circular plate k^6 , which has a peripheral projection k^7 , to which is secured the oscillating thread-hook k^8 , the plate and pinion being centrally bored and mounted upon a stud-bearing k^9 in one end of a bracket-arm k^{10} , which is secured at the other end to the web or frame b^2 and bent outward and parallel with such web, so as to leave sufficient space between it and the web for the pinion and plate just mentioned and the thread-case now to be described.

The case inclosing the upper thread is shown in detail in Figs. 15, 16, 17, and 18, and consists of a shallow cylindrical box k^{11} , one side or end of which is open and the other and

closed side of which has a central boss or pin k^{12} , which is preferably passed through a central opening in such closed side to project into the case, and carries in grooves formed along its periphery and end a spring-clip k^{13} , parts of which project beyond the periphery but are compressible. The head of this pin k^{12} provides a projection necessary to establish a space between the periphery of the case and the frame of the machine to enable the thread to pass freely around same.

The thread-reel or bobbin is formed with two circular side plates k^{14} , which are connected by a centrally-tubular core k^{15} , adapted to fit over the pin k^{12} in the thread-case and be held in place thereon by frictional contact with the projecting parts of the spring-clip k^{13} , which are compressed by it.

The periphery of the thread-case k^{11} is perforated, as at k^{16} , to allow of the passage of the thread therethrough, and adjacent to such perforation a tension-plate k^{17} is arranged, one end of which is riveted to the case and the other end of which is bent inward to bear upon the periphery of the case and formed with a hook k^{18} , a slot k^{19} in the periphery of the case extending from the perforation k^{16} to a point beneath the tension-plate near the hook thereof, and an adjoining screw k^{20} , passing through an aperture in the tension-plate and screwed into the periphery of the case, being used to regulate the pressure of such plate.

The thread-case is stationary, being merely supported by a curved shelf or ledge k^{21} , projecting from the side of the web or frame b^2 and prevented from displacement at one time by the thread-hook k^8 , when it is thrown forward, and at another time (when it is thrown back) by means of a device consisting of a rocking bell-crank lever k^{22} , fulcrumed to the web or frame b^2 , at k^{23} , one arm of which is slotted, as at k^{24} , to allow of a sliding connection with and its operation by lever k^2 through a projection k^{25} on the side of such lever k^2 , and the outer end of the other arm is curved so as to partially encircle the thread-case when the oscillating hook is thrown back, as shown in chain lines in Fig. 9.

The cam-groove m in the disk D^5 is of the form shown in Fig. 6 and used to operate the parts for raising and lowering the presser-foot. The groove receives a roller m' , carried on the end of a lever m^2 , fulcrumed at m^3 to the web b^2 , and having a lateral projection m^4 on one side. This lever has a flexible connection with a secondary lever m^5 , which I will now describe.

The secondary lever m^5 is curved somewhat and fulcrumed centrally of its length at the same point m^3 on the web as the lever m^2 , its inner or rear end carrying a screw m^6 , with which one end of a retractile coiled spring m^7 (which is shown partly broken away) is connected, its other end being connected by means of a screw m^8 to a device for adjusting the tension of such spring, consisting of

a screw-bolt m^9 taking in a screw-threaded boring in the web b^2 , such bolt carrying loosely thereon block m^{10} , which also carries a guide-roll m^{11} , sliding vertically through a second boring in the web. The purpose of this flexible connection between the two levers m^2 and m^5 is to allow the lever m^5 a certain amount of independent play or automatic adjustment, as is required by the variations in the elevation of the presser-foot caused by the varying thickness of the stock being operated upon. The lateral projection m^4 on lever m^2 serves to maintain levers m^2 m^5 in their proper relative position. The presser-foot 25 is carried adjustably with relation to the work by a swiveling-block m^{12} in the outer end of such lever m^5 and held in place in such block by set-screw m^{13} .

m^{14} is an adjustable guide for the upper end or shank portion of the presser-foot and is in the form of a curved arm slotted and held to the web b^2 by a set-screw m^{15} .

The cam-groove O in the disk D^6 is of the form shown in Fig. 8 and used to operate the needle. The groove receives a roller o' on the inner end of a connecting-rod o^2 , having its outer end pivotally connected at o^3 with the needle-segment o^4 , which is held in place in its guideway by suitable retaining-plates o^5 , as shown in Figs. 6, 8, and 11, and carries the curved needle o^6 .

The cam-groove p in the disk D^7 is of the form shown in Fig. 4 and receives a roller p' , which is axially mounted on the side of a vertically-reciprocating rod, preferably formed in two parts or lengths p^2 p^3 and adapted to project laterally into said groove. The parts p^2 p^3 of this rod are connected together through a collar-and-pin connection, such as p^4 , and the upper part p^2 , which carries the roller p' , is forked at its opposite or upper end to bear on either side of a ring p^5 , carried by the shaft D, to steady and keep the rod always in a true vertical position.

The lower part p^3 of the rod passes down through the top of the movable neck portion of the pedestal and at its lower end is formed with an elongated eye p^6 to allow of its being adjustably and pivotally connected in a similar manner, as illustrated in Figs. 12 and 13, with one arm of a lever p^7 , fulcrumed on a rod p^8 , (which is shown in detail in Fig. 19,) and carries the tension-wheel and its operating-spring, as will be hereinafter described, the other arm of this lever p^7 being pivotally connected to the lower end of a reciprocating bar or section p^9 , slotted, as at p^{10} , to receive a block p^{11} , pivotally secured upon a pin p^{12} within the horn and with which it has a sliding connection. The upper end of this section p^9 carries the threader portion proper. This threader portion proper, as will be seen by reference to Figs. 21, 22, and 23, consists of a pair of spring-fingers p^{13} p^{14} , carried in the upper end of the bar p^9 and secured therein by set-screws p^{20} , by the loosening of which the

fingers can be adjusted higher or lower, as may be desired, with relation to the needle.

The upper free end of each finger is formed one (13) with an eye p^{16} and the other with a hook p^{17} , the eye and hook being for the purpose of placing the thread in the barb of the needle, the hook p^{17} allowing of the withdrawal of the thread by the needle. As a means for adjusting or locating the threader relatively to the needle, adjusting-screws p^{18} are carried by the sides of the horn, as shown in Fig. 22, and adapted to bear loosely upon either side of the bar p^9 without in any way interfering with its motion.

The thread-tension device which I prefer to use is shown in Fig. 3 and in detail in Fig. 19, and consists of a sheave 70, mounted loosely on the fulcrum-rod p^8 of the threader-lever before mentioned and having two peripheral V-shaped grooves 71 72, the former of which receives the thread and latter of which presents two friction-faces for a friction-lever 73 (presently to be described) to bear upon. Acting upon this sheave 70 is a flanged sleeve 7^a , loosely mounted on said rod p^8 and forced against one side of the web of such sheave by means of a coiled spring 7^b , encircling the rod and having one end bearing against the sleeve 7^a and the other end against the hub of an adjusting hand-wheel 7^c , screw-threaded on the outer end of such rod, the pressure of the sleeve 7^a upon the sheave 70 serving to force it in turn against a sleeve 7^d , similar to the one 7^a , but rigidly mounted on the rod p^8 .

The lever 73 has one end fulcrumed at 74 in the base of the work-support or horn at a point below the sheave 70 and its opposite end flexibly connected with the pedestal by a coiled spring 75 76, being a lateral shoe projection from its upper side with its edge shaped to conform to the groove 72 in the sheave 70.

The lever 73 requires to be furnished with a rise or projection of some sort to be acted upon by the downwardly-projecting oscillating finger e^{17} , and in order that the action of the lever 73 can be varied and the extent to which the thread from the thread-case is drawn through the work regulated I prefer to make such rise or projection in the form of an adjustable block-nut 77, fitting over and having a screw-threaded connection with the lever and formed with a lateral extension 78, such nut or block being movable along the lever in either direction.

The stationary needle guide or brace, as shown in Figs. 5 and 7 and in detail in Fig. 20, is in the form of a finger 90 and preferably adjustably secured to the front of the web b^2 , as at 94, projects downward and is bent inward, so that its lower end, which is recessed to conform to the needle, will engage and thereby guide and brace it during its operation. The brace is slotted at 93 for the passage therethrough of a retaining-screw

94 and also to allow of vertical adjustment, while a fulcrum projection 95 is formed on its inside face to bear against the web and allow of lateral adjustment by means of an adjusting-screw 96, carried by its upper end and adapted to bear upon the web.

Thus far I have described all the parts of the machine which are common to and which operate the immediate parts, tools, or instrumentalities that act directly upon the work, and being interchangeable, as may be desired, for various kinds or characters of work—such as the McKay stitch “turned shoe” sewing, the stitching of welted work, edge-stitching, and plain straight sewing—and I will proceed to describe the particular instrumentalities necessary to the production of the McKay stitch. These particular instrumentalities consist of, first, a work-table, (shown more particularly in detail in Figs. 24 and 25, which are perspective views, respectively, of the top and under sides,) and it consists of a plate 20 of a size corresponding approximately with the nose of the horn and with plain upper surface perforated at 21 near one end for the passage of the needle and having a web 22 on its under side by which it can be held in place in the nose of the horn by set-screw 23, (see Fig. 21,) passing through the sides of the work-support and through the web 22, a recess 24, concentric with the opening 21, being formed in the under side of the table to accommodate the upper end of the threader in its operation with the needle; second, the presser-foot, already incidentally alluded to and which is in the form of a bar 25, with lower offset flattened bearing end 26, curved, as shown in detail in Figs. 26 and 27, to afford an extensive bearing-surface; third, a feed device comprising a feed-dog proper in the form of a curved bar 27 bent or made in crank form with its lower end pointed to effect a hold upon the work and its upper end or shank 28 having bearings in sleeves n^{16} and n^{17} and rigidly secured by set-screw 29 within a collar 30, having lateral fork projections 31, between which the outer end of lever f^3 is located, so that vertical movement can be imparted to the shank of the feed-dog. This feed device is clearly shown in Fig. 5. A horn is necessary in this embodiment of my invention only because the class of work generally done therewith—viz., sewing the sole to the upper of a boot or shoe with the sole uppermost—requires that the threader be inclosed to shield it and a sufficient space left between the stitch-forming instrumentalities and the pedestal to allow the boot or shoe being operated upon to be turned, so as to run the line of stitching around the edge of the sole thereof, the work-table being made as small as possible to facilitate the movement of the boot or shoe about same.

Owing to the simplicity of construction of the machine it will be only necessary for me to describe in detail the operation of the feed

mechanism, reference being had more particularly to Figs. 3, 5, 5^a, 5^d, and 7, from which and the description relating to the parts illustrated by such figures it will be obvious that when cam-groove n imparts, through the lever n^2 , a vertical movement to sleeve n^{12} , and as such sleeve is connected by link n^{14} to pivoted carrier-frame n^{15} , a rocking motion will be imparted to such carrier-frame n^{15} , thus giving to the feed device carried thereby the horizontal reciprocal movement necessary to feed the work and return to feed again. The vertical reciprocal movement necessary to lower the feed device into contact with the work before the feeding operation and to raise it therefrom after the feed has taken place is imparted from cam-groove f and through levers f^2 and f^3 , the outer end of the latter of which is straddled by the projections of the block 31, rigidly connected to the bar 28, this bar, which with its lower portion 27 constitutes the feed device, being loosely mounted and guided in sleeves n^{16} n^{17} of the rocking frame n^{15} . The operation of the machine is briefly as follows: The presser-foot is first lowered, the needle passes downwardly through the work and work-table into the nose of the work support or horn, where the threader threads the needle by placing the thread across the barb thereof, and by moving backward some distance, as shown in Figs. 21 and 22, establishes a length of thread (equal to the largest thickness of stock of work operated upon) on each side of the barb, and when this length is established the direction of movement of the threader is reversed, so as to follow the needle in its return movement and at the same rate of speed, thus allowing the length of thread over the needle to remain stationary, so as to avoid any movement of the thread across the barb of the needle as it is being drawn through the stock or work. The needle having drawn the thread through the work, the thread-carrier, which has had imparted to it a movement downward from its normal position, as shown in Figs. 5 and 11, to the position shown in dotted lines at 1^x in Fig. 11, remains stationary until the needle rises and stops, when the carrier is moved rearward to dotted position 2^x, engaging or taking the thread from the needle and conveying it to a position 3^x to be engaged and taken by the oscillating hook around the thread-case, afterward returning to its normal position, and following this the take-up and tension devices act upon the thread to tighten and complete the stitch, leaving the work ready to be fed, which feeding is effected after the presser-foot rises, and then the operation just described is repeated.

What I claim is as follows:

1. A wax-thread sewing-machine having stitch-forming instrumentalities, a work-support and a presser-foot, in the form of a bar with lower offset flattened bearing end horizontally and semicircularly curved to form an extensive bearing-surface extending from a point adjacent to the rear of the needle cir-

cularly rearwardly and laterally, such presser-foot being capable of vertical adjustment and lateral adjustment out of a vertical line with relation to the work.

2. In combination with the web of the machine-head, the main and secondary levers for operating the presser-foot, an adjustable yielding support for the inner end of said secondary lever carried by said web and an operative connection between said levers, with means for actuating the latter, for the purpose set forth.

3. In combination with the web of the machine-head the main and secondary levers for operating the presser-foot and yielding support for the inner end of said secondary lever, an adjustable screw carried by the web and connected to one end of said flexible support, and an operative connection between said levers with means for actuating the latter for the purpose set forth.

4. In combination with the web or frame of the machine-head, the driving-shaft and disk with cam-groove therein, of a main lever having one end operatively connected with said cam-groove and its opposite end fulcrumed to the frame, a secondary lever also fulcrumed to the frame, a yielding support for the inner end of the secondary lever carried by said web, an operative connection between said levers, and the presser-foot carried by the outer end of said secondary lever.

5. In combination with the frame and the lever carrying the presser-foot, a swiveling block mounted in the outer carrying end of such lever and perforated to receive the presser-foot, a set-screw passing through such block to secure the presser-foot in place, and means for retaining the parts in position.

6. In combination with the frame and the lever carrying the presser-foot, a swiveling block mounted in the outer carrying end of such lever and perforated to receive the presser-foot, a set-screw passing through such block to secure the presser-foot in place, and an adjustable guide for retaining the parts in position.

7. In a wax-thread sewing-machine, the combination with the frame and the standard thereon, of a feed device, carrier mechanism therefor comprising a horizontally-swinging frame pivotally connected with said standard, a carrier-frame pivotally connected with such swinging frame and means for setting said swinging frame in a fixed position and freeing it therefrom; the feed device being located in said carrier-frame, and means consisting of a sleeve n^{12} movable upon said standard, a link connection between said sleeve and the carrier-frame, a cam-operated lever for actuating said sleeve, and a cam-operated lever with a connection between it and said feed device for respectively imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, for the purpose set forth.

8. In a wax-thread sewing-machine, the

combination with the frame, the driving-shaft, the disk D^5 having cam-groove n and disk D^2 having cam-groove f , of a feeding device, a main lever and a secondary lever fulcrumed to the frame, the main lever having its inner end operatively connected with the cam-groove f and its outer end engaging beneath the secondary lever, a yielding connection between the levers, and the secondary lever projecting forward to engage and impart a vertical reciprocating movement to the feeding device, carrier mechanism for said feeding device, a lever fulcrumed to the frame having its inner end operatively connected with the cam-groove n and its outer end connected with said carrier mechanism to impart through said carrier mechanism a horizontal reciprocal movement to said feed device.

9. In a wax-thread sewing-machine, the combination with the frame, a standard thereon, feed device and carrier mechanism therefor, comprising an extension or frame projecting laterally from said standard and a carrier-frame pivotally connected with such laterally-projecting frame, the feed device being located in said carrier-frame, and means consisting of a cam, lever, slide-and-link connection for imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, of a stationary horn, for the purpose set forth.

10. In a wax-thread sewing-machine, the combination with the frame, a standard thereon, feed device, carrier mechanism therefor comprising a horizontally-swinging frame pivotally connected with said standards, a carrier-frame pivotally connected with such swinging frame and means for setting said swinging frame in a fixed position and freeing it therefrom; the feed device being located in said carrier-frame, and means for imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, of a stationary horn carrying operating parts, for the purpose set forth.

11. A wax-thread sewing-machine, the combination with the frame, a standard thereon, feed device, carrier mechanism therefor comprising a horizontally-swinging frame pivotally connected with said standard, a carrier-frame pivotally connected with such swinging frame and a notched plate and spring-operated latch with operating-handle for setting said swinging frame in a fixed position and freeing it therefrom; the feed device being located in said carrier-frame, and means for imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, of a stationary horn carrying operating parts, for the purpose set forth.

12. In a wax-thread sewing-machine, the combination with the frame, a standard thereon, feed device, carrier mechanism therefor comprising a horizontally-swinging frame pivotally connected with said standard, a carrier-frame pivotally connected with such swinging frame and means for setting said

swinging frame in a fixed position and freeing it therefrom; the feed device being located in said carrier-frame, and means for imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, of a stationary horn carrying operating parts, for the purpose set forth.

13. In a wax-thread sewing-machine, the combination with the frame, the standard thereon, feed device, carrier mechanism therefor comprising a horizontally-swinging frame pivotally connected with said standard, a carrier-frame pivotally connected with such swinging frame and a notched plate and spring-operated latch with operating-handle for setting said swinging frame in a fixed position and freeing it therefrom; the feed device being located in said carrier-frame, and means for imparting a rocking motion to such carrier-frame and a reciprocating movement to the feed device therein, of a stationary horn carrying operating parts, for the purpose set forth.

14. A wax-thread sewing-machine having an oscillating hooked needle, a non-rotatable thread-case, an oscillating thread-hook, and a threader, with their carrying and operating parts and an oscillating and reciprocating thread-carrier comprising a carrying part extending at right angles to the plane of its oscillation, a curved part formed integral with said carrying part and extending at right angles thereto and at right angles to the plane of oscillation of said needle, a lateral projection upon the side of the end of said curved part adjacent to said needle, and means for oscillating said carrier and means for reciprocating said carrier in a line parallel to the plane of oscillation of said needle, for the purpose set forth.

15. In a wax-thread sewing-machine, the combination with the frame, the driving-shaft, the disks D^3 D^4 having cam-groove therein, of a thread-carrier formed with a hooked end to temporarily hold the thread, a suitably-guided horizontal rod, in the outer end of which such carrier is set and the inner end of which rod is operatively connected with the cam-groove in disk D^4 to receive a horizontal movement therefrom, a pinion rigidly mounted on said rod, and a lever fulcrumed to the web of the frame, having one end operatively connected with the cam-groove in disk D^3 and the other end carrying a rack to mesh with the pinion carried by such rod and so impart an oscillatory movement to said rod for the purposes set forth.

16. In a wax-thread sewing-machine, the combination with the web or frame and the driving-shaft, of a disk mounted on such shaft and having a cam-groove in its face; a lever fulcrumed to the web or frame, the inner end of such lever having a working connection with said groove and the outer end thereof being provided with a toothed rack, a supporting-ledge formed on the web or frame, a thread-case resting on such ledge;

said thread-case having one side thereof open and the other side closed and flat and provided with a rise centrally thereof, a bracket-arm projecting from said web in front of the thread-case and an oscillating hook for carrying the needle-thread around said case, said hook being supported by said bracket-arm and having a pinion connected therewith and adapted to intermesh with said rack.

17. In a wax-thread sewing-machine, the combination with the web or frame, and the driving-shaft, of a disk mounted on such shaft and having a cam-groove in its face; a lever fulcrumed to the web or frame, the inner end of such lever having a working connection with said groove and the outer end thereof being provided with a toothed rack, a supporting-ledge formed on the web or frame, a thread-case resting on such ledge; a bracket-arm projecting from said web in front of the thread-case and an oscillating hook for carrying the needle-thread around said case, said hook being supported by said bracket-arm and having a pinion connected therewith and adapted to intermesh with said rack.

18. In a wax-thread sewing-machine, the combination with the web or frame, and the driving-shaft, of a disk mounted on such shaft and having a cam-groove in its face; a lever, the inner end of which has a working connection with said groove and the other end of which is provided with a toothed rack, a bracket-arm projecting from said web, an oscillating thread-carrying hook rotatably mounted on said bracket-arm and having a pinion connected therewith to intermesh with said rack.

19. In a wax-thread sewing-machine, the combination with the web or frame and the driving-shaft, of a supporting-ledge formed on same, a thread-case resting on such ledge, a bracket-arm projecting from said web in front of the thread-case, a movable thread-carrying hook supported by said bracket-arm, a disk mounted on such shaft and having a cam-groove in its face, a lever the inner end of which has a working connection with said cam-groove and the outer end of which is provided with a toothed rack, a pinion connected with said thread-carrying hook and intermeshing with said rack, and a retaining device in the form of a bell-crank lever pivoted to said lever and the other arm thereof partially encircling the thread-case, for the purpose set forth.

20. A needle-threader formed to present two thread-carrying parts spread apart to receive the needles between them and adjustable to accommodate various sizes of needles, with means for operating such threader.

21. A needle-threader formed of a pair of yieldingly-adjustable thread-carrying fingers spread apart to receive the needle between them.

22. A needle-threader formed of a pair of fingers immovable during the operation rela-

tively to each other one of which has an eye through which the thread is passed and in which it is permanently retained and the other a hook in which the thread is temporarily retained for the purpose set forth.

23. In a wax-thread sewing-machine, the combination with the frame, the driving-shaft, the disk having cam-groove therein and the horn or work-support, of the threader located in the nose of said horn, a vertical reciprocating rod operatively connected with said cam-groove and suitably guided, a lever pivoted in said horn with one arm of which said rod is connected and a single reciprocating bar or section supported in the horn one end of which bar is connected with the other arm of said lever and the opposite end carrying the threader as set forth.

24. In a wax-thread sewing-machine, the combination with the frame, the driving-shaft, the disk having cam-groove therein and the horn or work-support, of the threader located in the nose of said horn, a vertical reciprocating rod operatively connected with said cam-groove and suitably guided, a lever pivoted in said horn with one arm of which said rod is adjustably connected and a single reciprocating bar or section supported in the horn, one end of which bar is connected with the other arm of said lever, and the opposite end carrying the threader, as set forth.

25. In a wax-thread sewing-machine, the combination with the frame, the driving-shaft, the disk having cam-groove therein and the horn or work-support, of a vertically-reciprocating rod having its upper end directly connected with said cam-groove and suitably guided, a single bell-crank lever pivoted in the pedestal of the frame and having one arm slotted and carrying a laterally-projecting pin adjustable along such slot, such rod having a perforation at its free end to receive such pin, and the other arm carrying a thread-sheave, for the purposes set forth.

26. In a wax-thread sewing-machine, the combination with the frame, the driving-shaft, the disk having cam-groove therein and the horn or work-support, of a vertically-reciprocating rod having its upper end directly connected with said cam-groove and suitably guided, a single bell-crank lever pivoted in the pedestal of the frame and hav-

ing one arm slotted and carrying a laterally-projecting pin adjustable along such slot, such rod having a perforation at its free end to receive such pin, and the other arm being curved to enter and work in such horn and carrying a thread-sheave, for the purposes set forth.

27. In a wax-thread sewing-machine, the combination with the stitch-forming instrumentalities consisting of a curved needle, a threader, a thread-carrier, a thread-case and a thread-carrying hook, a tension and a take-up, and means for operating such instrumentalities, of a clamping device consisting of a lever having one end fulcrumed in the horn of the machine and the other end yieldingly connected in the pedestal of the machine, such lever having a rise or projection adapted to be acted upon and operated by the take-up mechanism for the purpose set forth.

28. In a wax-thread sewing-machine, the combination with the stitch-forming instrumentalities, consisting of a curved needle, a threader, a thread-carrier, a thread-case and a thread-carrying hook, a tension and a take-up and means for operating such instrumentalities, of a clamping device consisting of a lever having one end fulcrumed in the horn of the machine and the other end yieldingly connected in the pedestal of the machine, such lever having a rise or projection capable of adjustment along such lever adapted to be acted upon and operated by the take-up mechanism, for the purpose set forth.

29. In a wax-thread sewing-machine, the combination with the single integral take-up lever, its actuating mechanism and the thread-sheave of a tension device, of a clamping-lever fulcrumed adjacent to such sheave having an adjustable block thereon and exerting a yielding pressure upon said sheave, and a rod or finger carried by and projecting from said take-up lever to act upon said adjustable block and disengage said clamping-lever from the thread-sheave, and means for causing such clamping-lever to exert such yielding pressure, for the purpose set forth.

July 11, 1894.

ELOUILD DUPLESSIS.

In presence of—

WILL P. McFEAT,
FRED J. SEARS.