

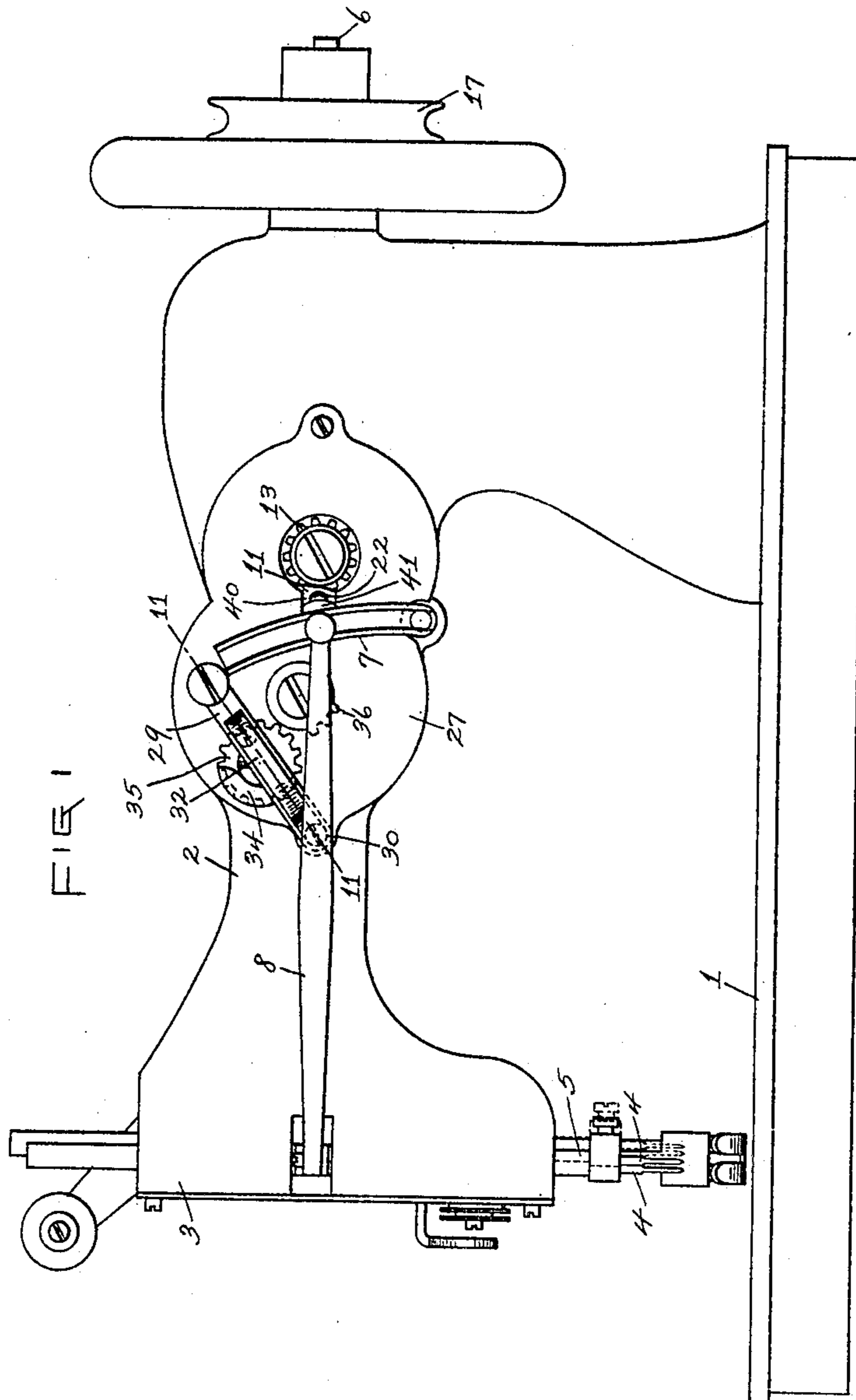
No. 819,811.

PATENTED MAY 8, 1906.

P. E. SCHOEN.
SEWING MACHINE.

APPLICATION FILED SEPT. 15, 1904.

4 SHEETS—SHEET 1.



WITNESSES
S. B. Smith
E. M. O'Reilly

INVENTOR
Paul E. Schoen
By Mosher & Curtis
attys

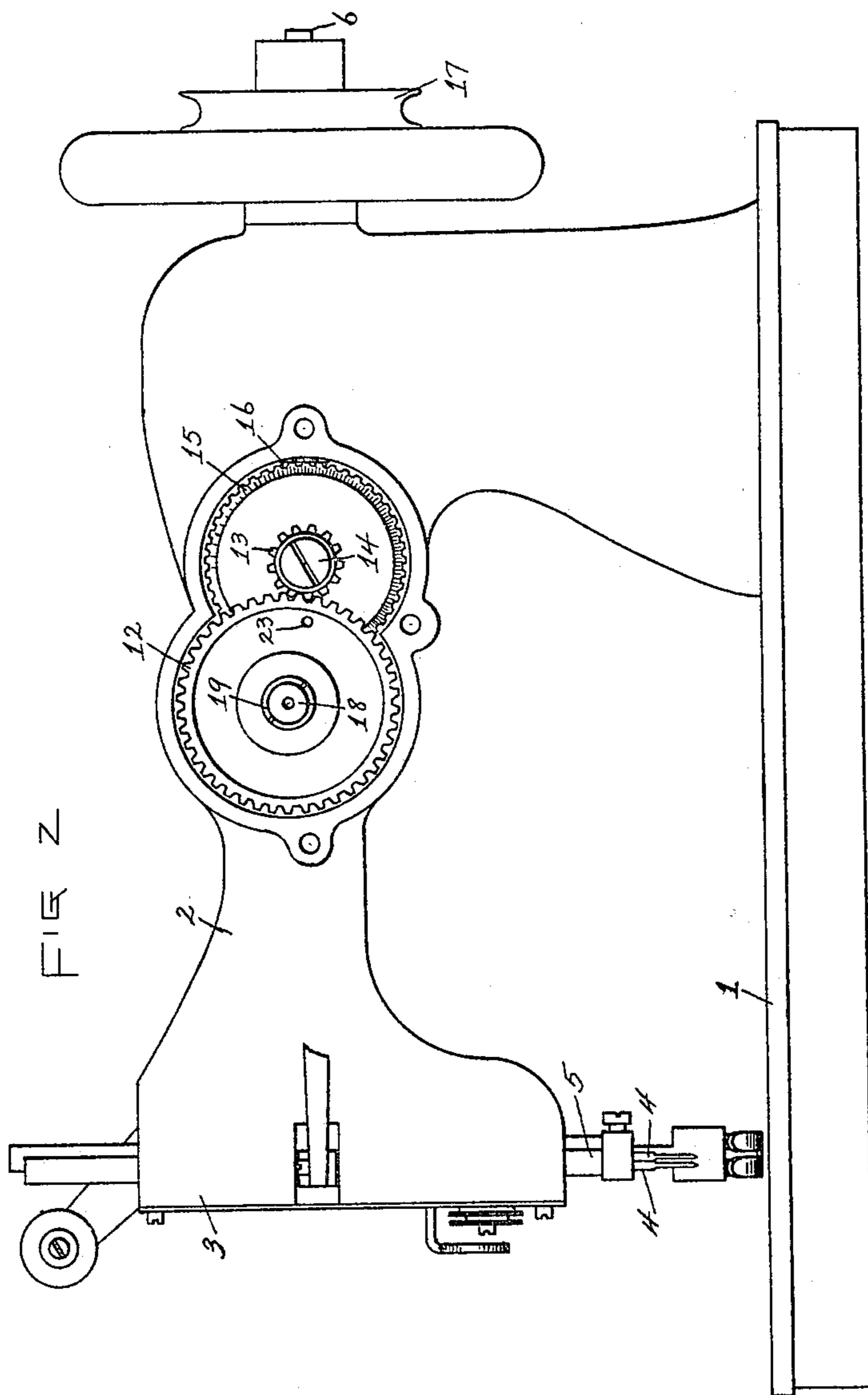
No. 819,811.

PATENTED MAY 8, 1906.

P. E. SCHOEN.
SEWING MACHINE.

APPLICATION FILED SEPT. 15, 1904.

4 SHEETS—SHEET 2.



WITNESSES

S. E. Booth.
E. M. O'Reilly.

INVENTOR

Paul E. Schoen.
By Mosher & Curtis,
attys.

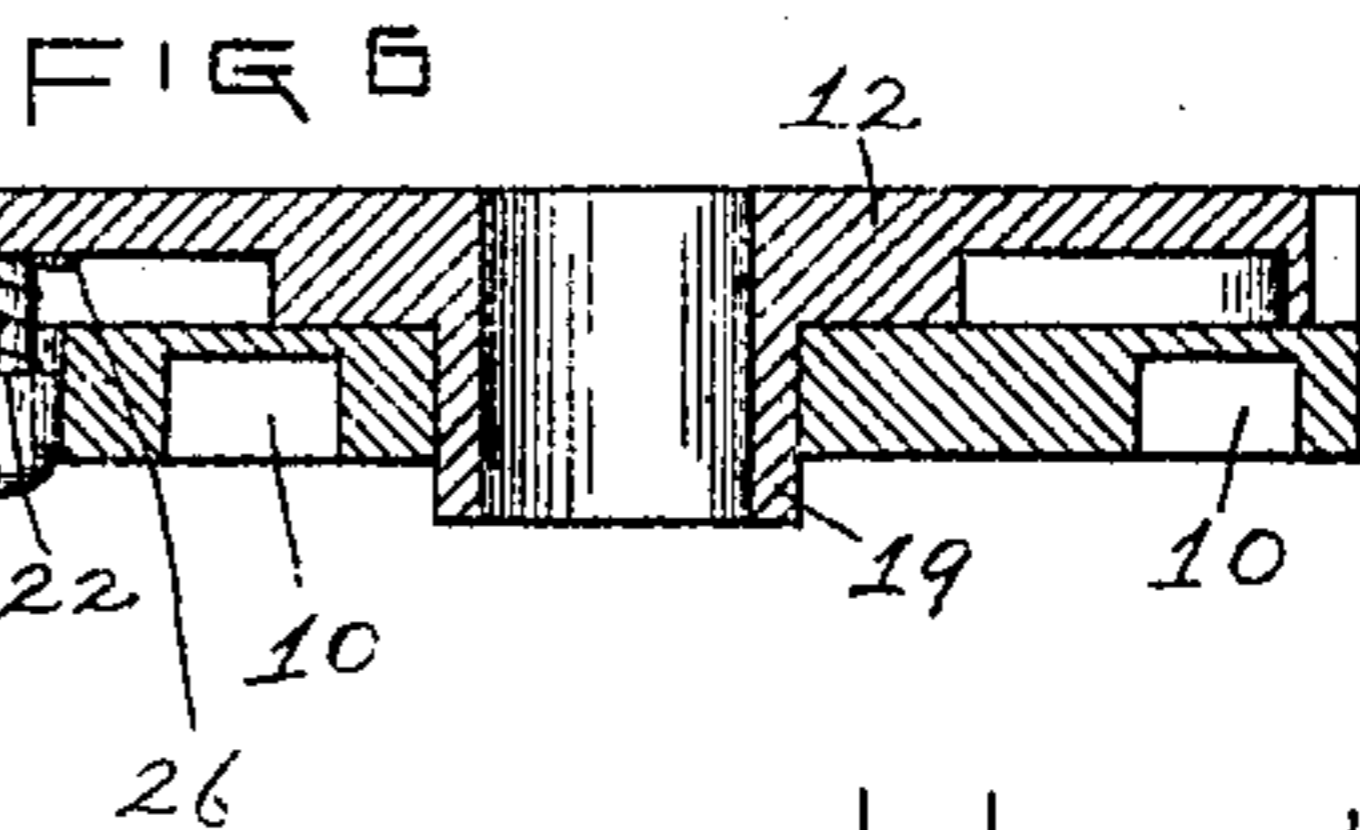
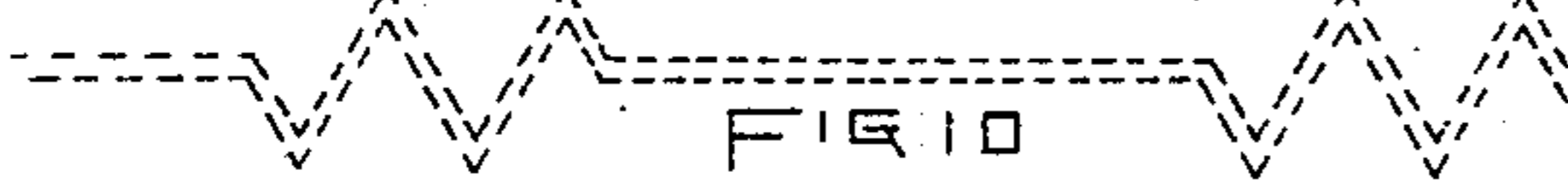
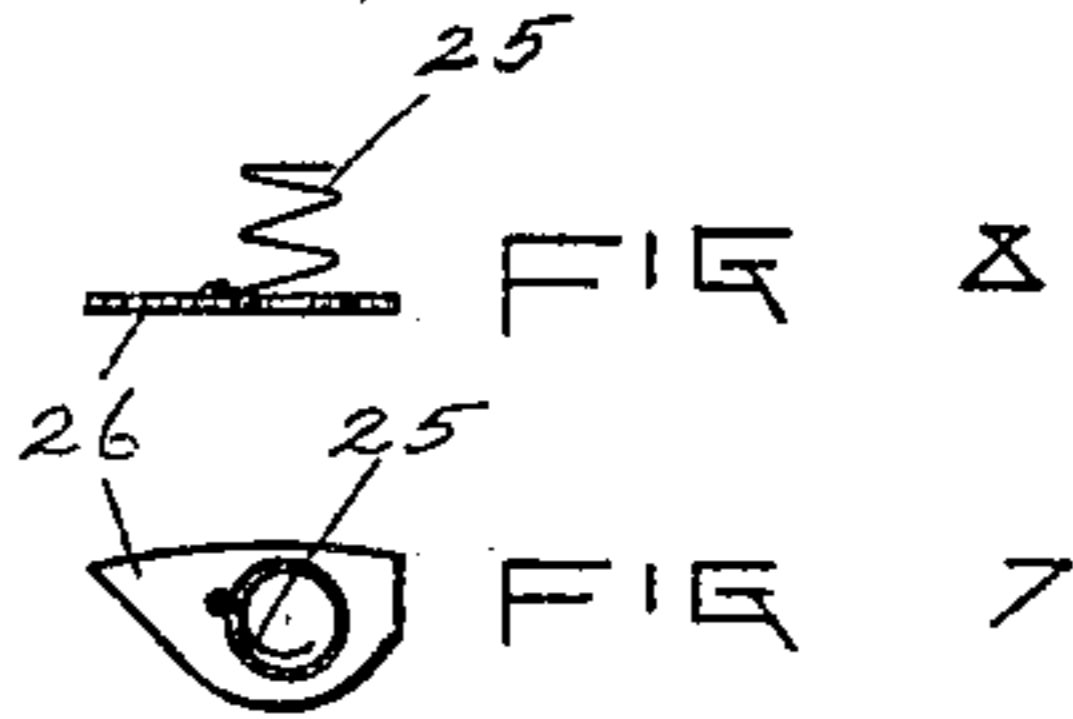
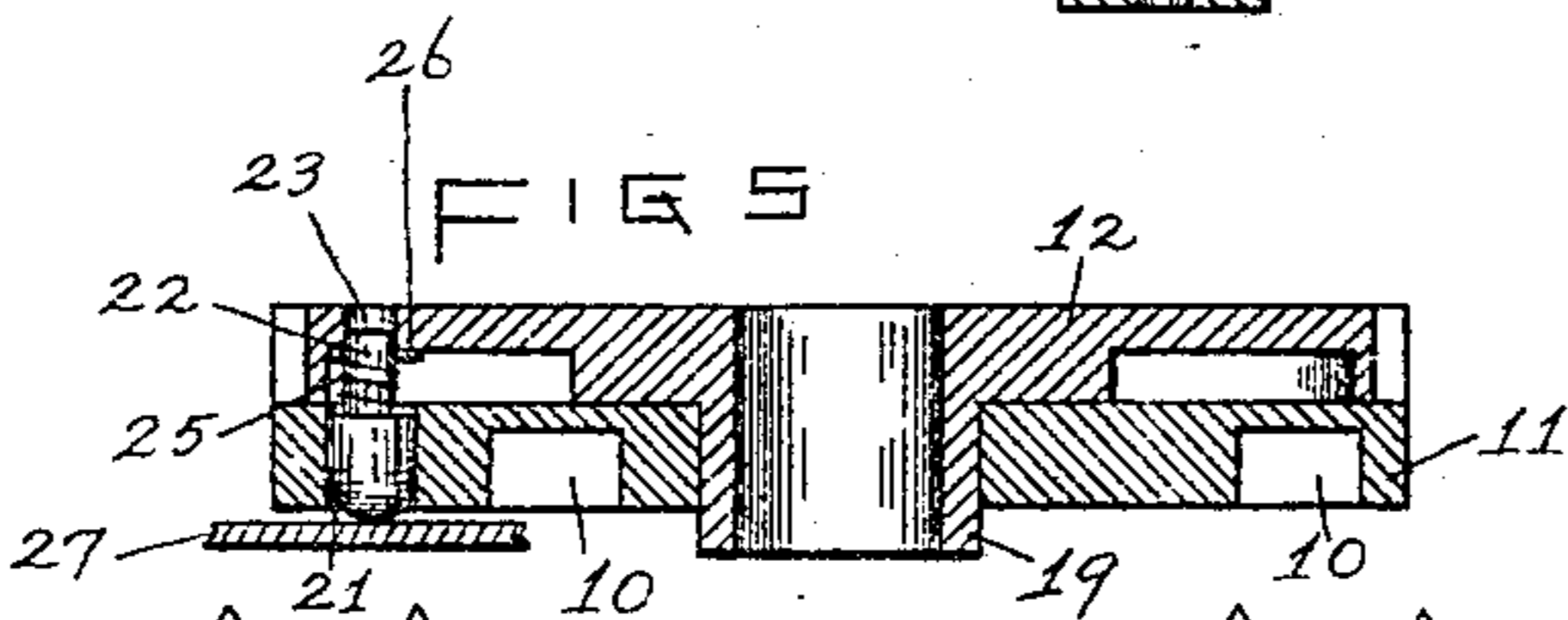
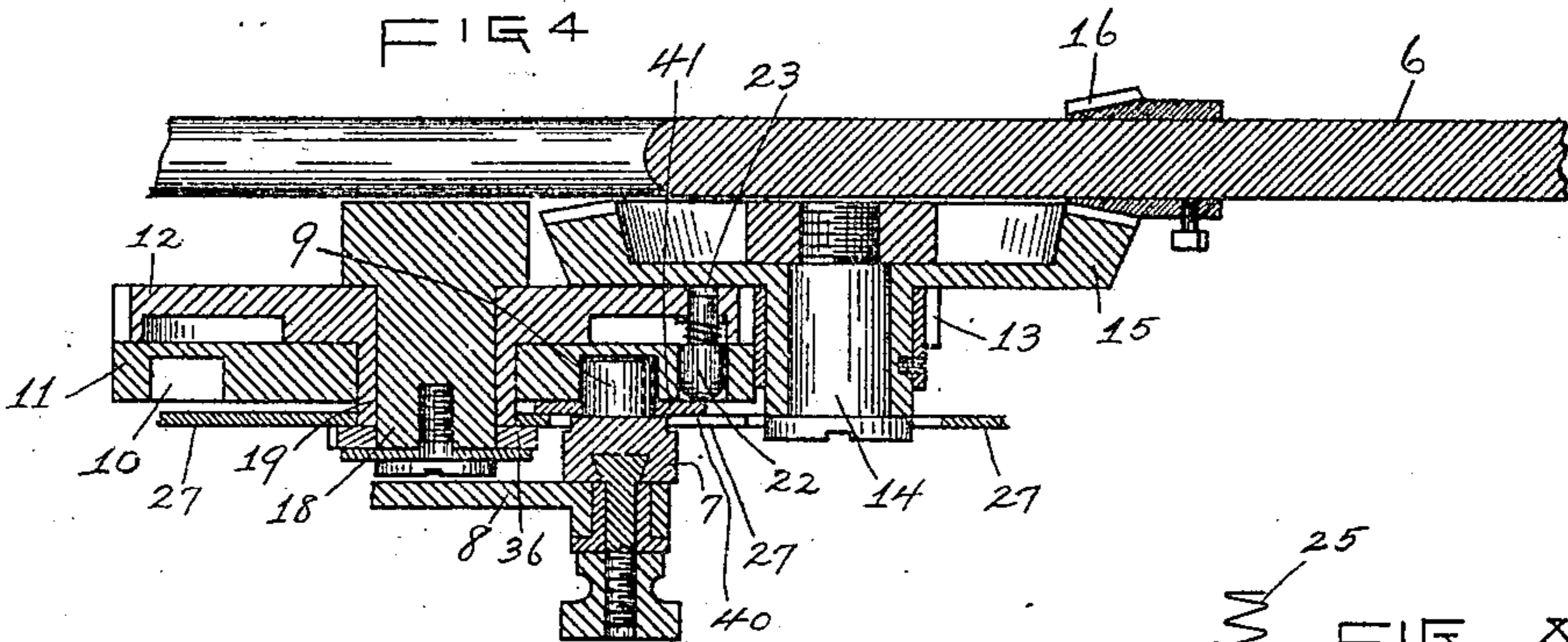
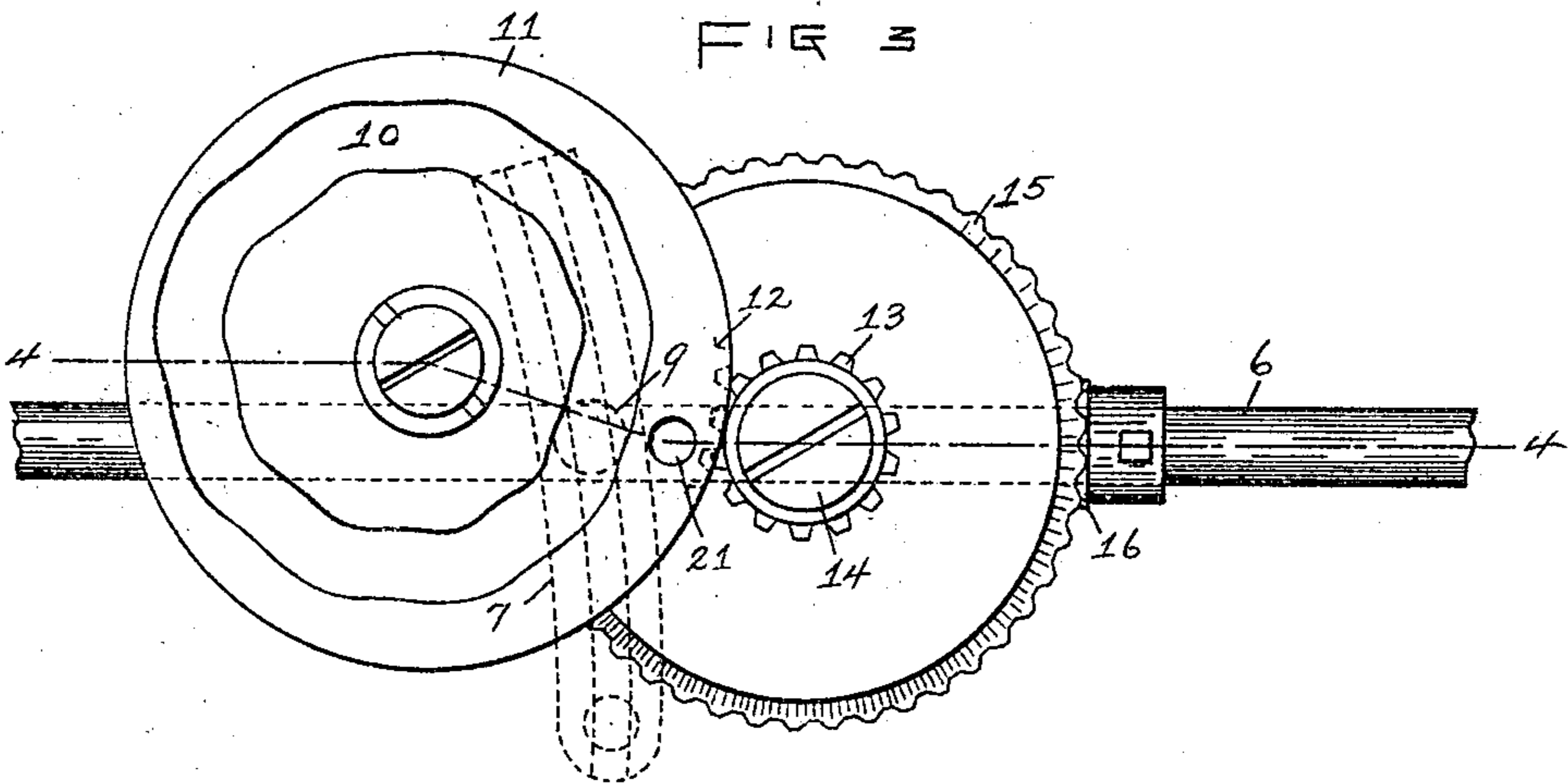
No. 819,811.

PATENTED MAY 8, 1906.

P. E. SCHOEN.
SEWING MACHINE.

APPLICATION FILED SEPT. 15, 1904.

4 SHEETS—SHEET 3.



WITNESSES
St. Paul
E. M. O'Reilly

INVENTOR
Paul E. Schoen
By Mosher & Curtis
Attys.

No. 819,811.

PATENTED MAY 8, 1906.

P. E. SCHOEN.
SEWING MACHINE.

APPLICATION FILED SEPT. 15, 1904.

4 SHEETS—SHEET 4.

FIG 11

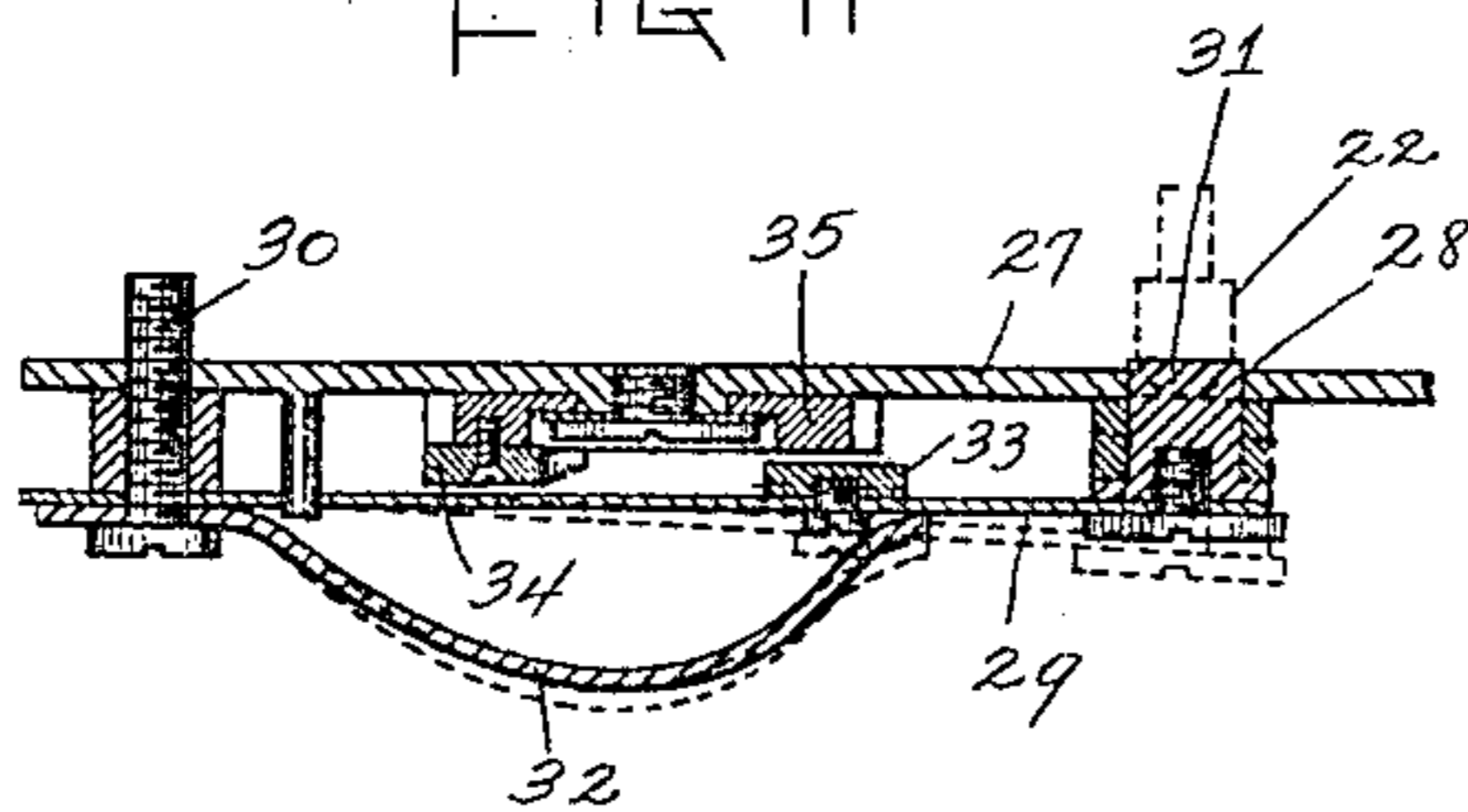


FIG 12

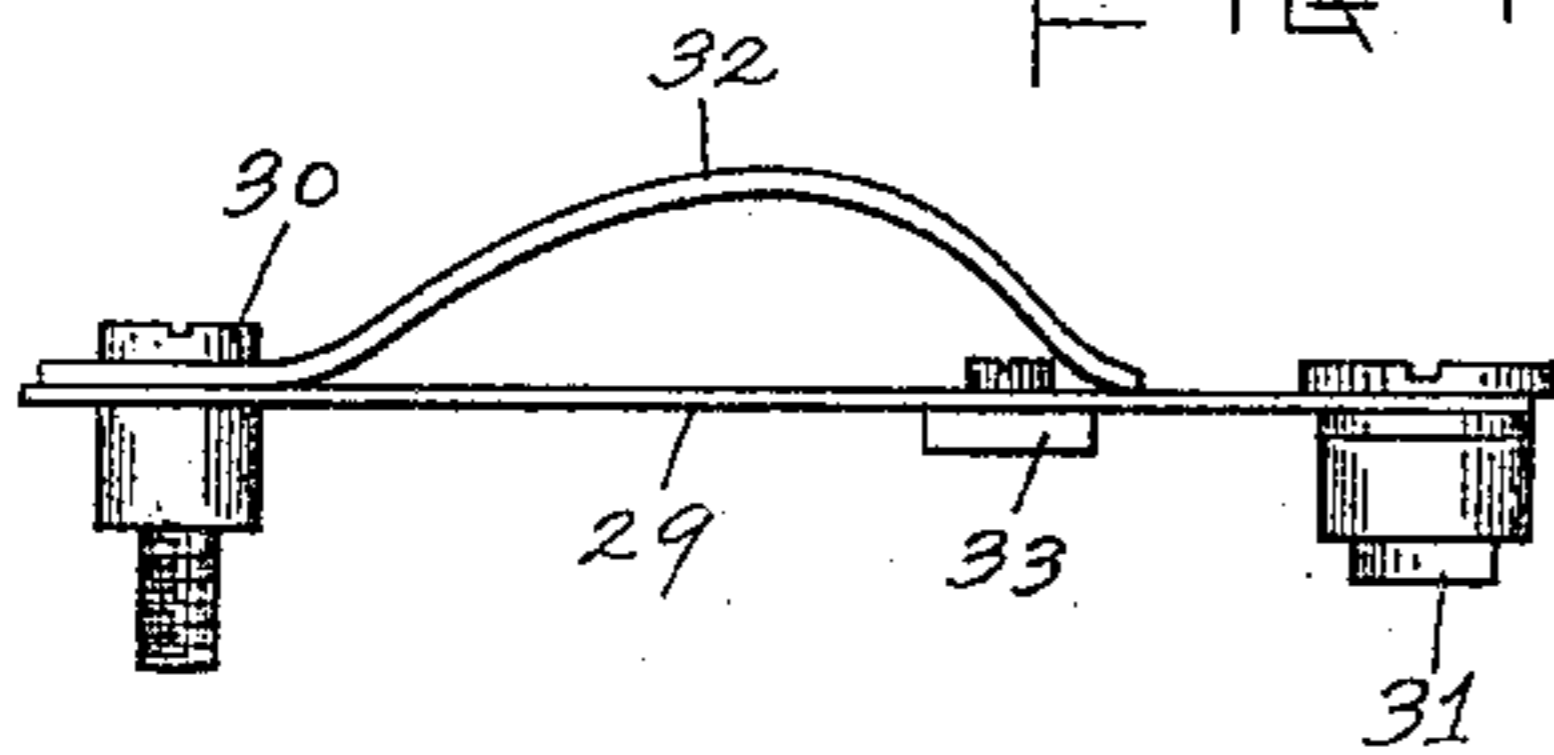


FIG 13

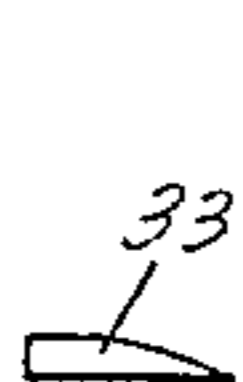
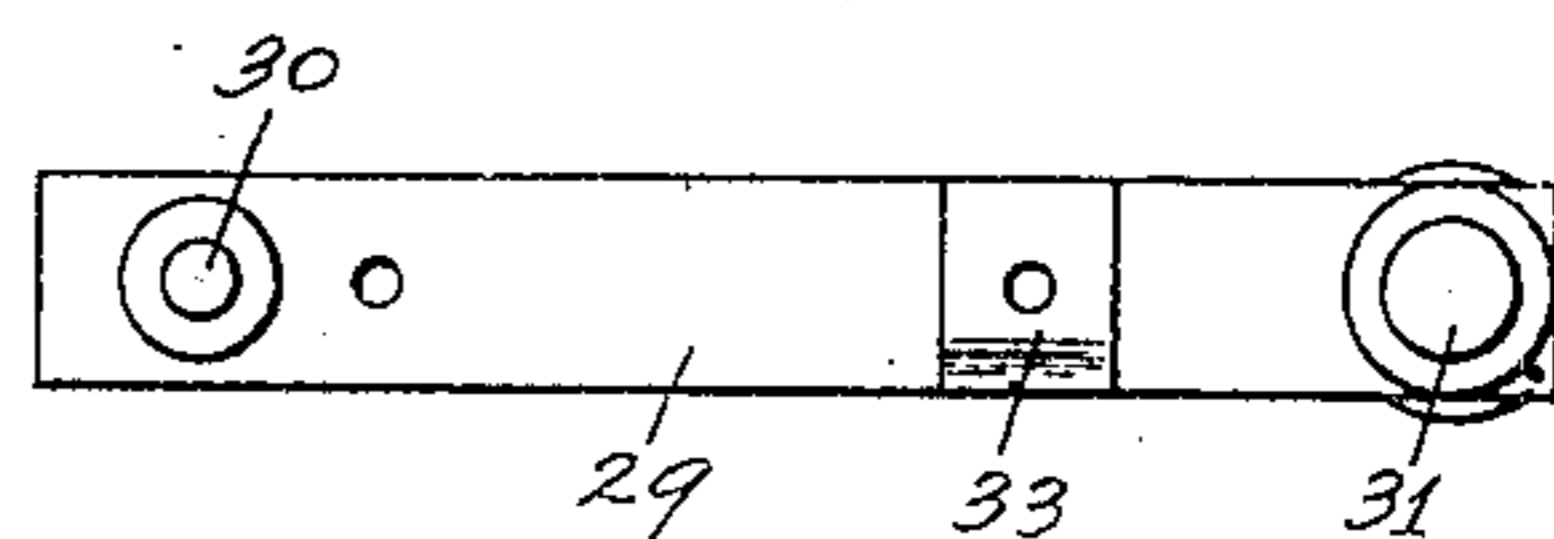


FIG 15

FIG 14

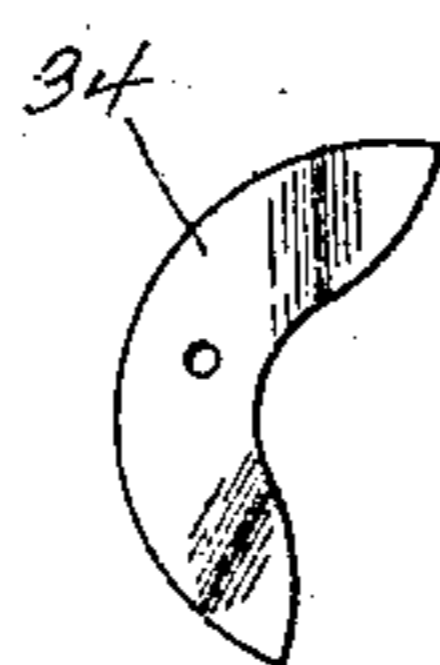


FIG 16

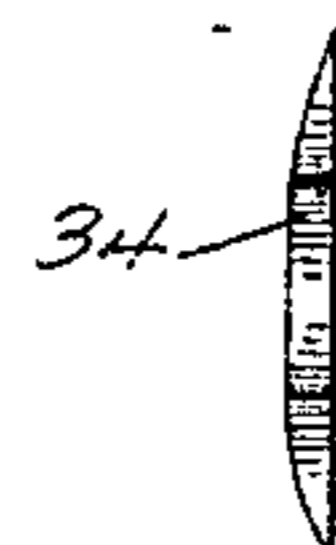


FIG 17

WITNESSES

E. M. O'Reilly

INVENTOR

Paul E. Schoen
By *Mosher & Curtis*
Attys

UNITED STATES PATENT OFFICE.

PAUL E. SCHOEN, OF TROY, NEW YORK, ASSIGNOR TO HALL, HARTWELL & COMPANY, OF TROY, NEW YORK, A FIRM.

SEWING-MACHINE.

No. 819,811.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed September 15, 1904. Serial No. 224,492.

To all whom it may concern:

Be it known that I, PAUL E. SCHOEN, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in side elevation of a sewing-machine provided with my improved pattern-sewing mechanism. Fig. 2 is a similar view with the side plate and external parts removed from the arm of the machine and with the needle-operating pattern-cam removed. Fig. 3 is a side view of the main shaft, needle-operating pattern-cam and intermediate gears on an enlarged scale. Fig. 4 is a horizontal section of the same, taken on the broken line 4 4 in Fig. 3, with exterior parts in position. Fig. 5 is a horizontal cross-section taken through the needle-operating pattern-cam and the gear whereby the same is adapted to be operated at certain times with the connecting-pin located in aligned apertures in said cam and gear, whereby they are connected to rotate in unison. Fig. 6 is a similar view with the connecting-pin freed from the gear, permitting the gear to rotate relatively to the cam. Fig. 7 is a plan view of the pin-controlling spring and the slide-plate upon which the same is mounted. Fig. 8 is a vertical cross-section of the same. Fig. 9 illustrates the pattern adapted to be stitched by the machine without my attachments. Fig. 10 illustrates the pattern adapted to be stitched by said machine provided with my improved attachments. Fig. 11 is a cross-section taken on the broken line 11 11 in Fig. 1. Fig. 12 is a side view of the push-pin and its supporting and controlling mechanism. Fig. 13 is a plan view of the under side of the same, as shown in Fig. 12. Fig. 14 is an edge view of the cam-block detached from the push-pin-supporting arm. Fig. 15 is a plan view of the same. Fig. 16 is a plan view of the cam

for operating the push-pin in opposition to its controlling-spring. Fig. 17 is an edge view of the same.

My invention relates to sewing-machines adapted for stitching ornamental patterns by relative movements between the work-plate and needle transversely of the needle; and the principal object of the invention is to secure variations in the patterns adapted to be produced by such machines. This I accomplish by interrupting during predetermined intervals at certain times the action of the pattern-cam, whereby the relative movements of the work-plate and needle transversely of the needle are produced.

My invention is applicable to various machines of the kind above referred to, and I have shown it in its preferred application to one of said machines wherein the work-plate is stationary and the pattern is produced by transverse movements of the needle.

Referring to the drawings, 1 represents the bed of the machine; 2, the overhanging arm; 3, the head; 4 4, a pair of needles mounted upon the needle-bar 5, to which vertically reciprocating movements are imparted in the usual manner from the shaft 6 and to which transverse reciprocating movements can be imparted from the rocker-arm 7 through the link 8.

The manner in which the needle-bar is mounted to permit transverse movement to be imparted thereto is not shown in detail, as the construction is well understood in the art, it being sufficient for a full understanding of the invention that it be borne in mind that transverse reciprocating movements of the needles are accomplished by rocking movements of the rocker-arm 7.

The bed is adapted at a point below the needles to support the work and to form what is termed a "work-plate," and the machine is provided with the usual feeding mechanism and stitch-forming device coöperative with the needles, which are not shown, as the same are well understood in the art and form no part of the present invention.

Vibratory movements are imparted to the rocker-arm 7 through a cam-follower 9; mounted thereon, adapted to travel in a cam-groove 10 in the cam-disk 11. In rear of the cam-disk 11 is a gear-wheel 12, meshing with a pinion 13, rotatively mounted in fixed connection with a bevel-gear 15 upon a stud 14,

said beveled gear 15 being adapted to mesh with a beveled pinion 16, fixed upon the main shaft 6, which may be operated by the belt-pulley 17, whereby rotary movements can be imparted to the gear-wheel 12. The gear-wheel 12 is rotatively mounted upon a stud 18, and the cam-disk 11 is mounted concentrically therewith upon a sleeve 19, integral with the gear 12.

It will be readily seen that if the cam-disk 11 be connected with the gear-wheel 12 to partake of the rotary movements thereof vibrating movements will be imparted thereby to the needle-bar and needles through the connecting mechanism, including in part the link 8, rocker-arm 7, and cam-follower 9.

The groove 10 in the cam may be made of any desired form in accordance with the pattern desired.

As long as the cam-disk 11 and gear-wheel 12 are maintained in fixed relation to each other the continued operation of the machine will result in producing in the fabric being operated upon repetitions of the pattern for which the cam is adapted. An example of such work is shown in Fig. 9, for the production of which a pattern-cam 11 is employed, having a cam-groove 10 adapted to accomplish a complete to-and-fro sidewise movement of the needles during the interval required for the formation of ten stitches, thereby causing the insertion of the stitches in a zigzag line.

By means of my invention I am able to interrupt during predetermined intervals the movement of the pattern-cam, causing during such periods of interruption the needles to operate in the same vertical lines and the stitches to be inserted in straight lines, the same as in ordinary sewing. In carrying out my invention I eliminate the permanent connection between the cam-disk 11 and its operating gear-wheel 12 and substitute therefor a connecting mechanism adapted to be intermittently operated. This I am able to accomplish by mounting in an aperture 21, extending through the cam-disk, a plunger-pin 22, the inner end of which is adapted at certain times to enter an aperture 23 in the side of the gear-wheel 12, in which position it serves to lock-together said gear-wheel and cam-disk so that they will rotate in unison. A coil-spring 25, interposed between the side of the gear-wheel 12 and a shoulder or enlargement on the plunger-pin, tends to force and retain said plunger-pin out of the aperture in said gear-wheel, so that when said plunger-pin is released to the action of said spring the rotary movement of the gear-wheel is not transmitted to the cam-disk. This coil-spring is mounted upon a small apertured slide-plate 26, adapted to slide upon the side of the gear-wheel as the latter rotates. The side plate 27 on the arm of the machine is provided with an aperture 28,

adapted to receive the outer end of the plunger-pin at certain times when it is intended to release said pin to the action of the spring 25. When the plunger-pin occupies the aperture 28 in said side plate 27, the cam-disk will remain idle, while the gear-wheel 12 continues its rotary movement. Mounted upon the outer side of the side plate 27 is a vibratory arm 29, secured at one end by the screw 30 and having on its vibratory end a push-pin 31, adapted to play through the aperture 28 in said side plate. A leaf-spring 32 exerts an influence upon the arm 29, tending to force the push-pin 31 inwardly through said aperture 28. The arm 29 is adapted to be forced outwardly at certain times in opposition to the force of the spring 32 by the engagement, with an inclined cam-block 33, fixed upon the inner side of said arm, of a cam 34, fixed upon a gear-wheel 35, rotatively mounted upon the outer side of said side plate 27.

The parts are so proportioned and arranged that when the cam 34 is in engagement with the cam-block 33 the push-pin 31 will be held in a position withdrawn from the aperture 28, the side plate leaving said aperture free to receive and be occupied by the plunger-pin 22. When the cam 34 is moved out of engagement with the cam-block 33, the arm 29 is released to the action of the spring 32.

Fixed upon the outer end of the sleeve 19, integral with the gear-wheel 12, is a mutilated gear 36, adapted to mesh with the gear 35, which carries the cam 34.

The operation of the mechanism is as follows: The stitch-forming mechanism and the gear-wheel 12 are continuously operated, causing continuous rotation of the mutilated gear 36, whereby the gear 35 is given a step-by-step rotative movement, causing the cam 34 to intermittently engage the cam-block 33, and thereby operate the arm 29. As soon as the cam 34 engages the cam-block 33 it causes the push-pin 31 to be withdrawn from the side-plate aperture 28, which aperture is then free to receive the plunger-pin 22, when the latter is again brought into line therewith by the rotation of the cam-disk in unison with the gear-wheel 12. As soon as the plunger-pin is thus brought into line with said side-plate aperture 28 it is forced outwardly thereinto by its spring 25, thereby simultaneously freeing the gear 12 from the cam-disk and locking the cam-disk against further rotative movement. While the cam-disk is thus held locked to the side plate 27 the movement of the needles will be confined to the same vertical lines, causing the stitches to be inserted in a straight line in the direction of the feed of the machine. As the operation of the machine continues the cam 34 is after a certain period moved out of engagement with the cam-block 33, whereupon the action of the spring 32 upon the arm 29 forces the push-pin 31 against the plunger-pin 22, which can-

not yield to such pressure, however, until by the operation of the machine the aperture 23 in the gear-wheel 12 is brought into line therewith. As soon as the aperture 23 is brought into line with the plunger the plunger-pin, yielding to the pressure of the push-pin 31, enters said aperture, thereby releasing the cam-disk from the side plate of the machine and connecting it with the gear-wheel 12, so as to rotate in unison therewith. The rotary movement of the cam-disk in unison with the gear-wheel 12 immediately carries the plunger-pin out of line with the side-plate aperture 28; but the outward movement of said plunger-pin is prevented by engagement with the inner surface of the side plate during the remainder of the rotative movement of the cam-disk, except for a brief interval, in passing the slot 40, formed in the side plate to permit the to-and-fro movement of the cam-follower 9, during which interval the plunger-pin is controlled by the washer 41, mounted upon the cam-follower just inside of the side plate 27. When the plunger-pin 22 is again brought opposite the side-plate aperture 28, it will enter said aperture, if the same be unoccupied by the push-pin 31, otherwise it will continue on past said aperture and through another revolution. Whenever the cam-disk is connected with the gear-wheel 12 to rotate in unison therewith, the needles will be operated laterally to produce the pattern for which the cam 11 is adapted, and whenever the cam-disk is locked to the side plate 27 and disconnected from the gear-wheel 12 straight lines of stitching will be formed.

It will be readily seen that by varying the number of teeth on the mutilated gear 36, or by varying the relative sizes of the gears 36 and 35, or by varying the relative lengths of the cam 34 and cam-block 33 the frequency and duration of the intervals of occupation of the side-plate aperture 28 by the push-pin 31 can be varied as desired, making it possible to produce a great many variations of pattern-work.

As shown, the machine is adapted for producing the pattern-stitching shown in Fig. 10, the cam-disk 11 being connected to rotate in unison with the gear-wheel 12 during every alternate interval of twenty stitches.

I have shown the machine provided with twin needles; but one of said needles may be omitted, if desired.

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

1. In a sewing-machine of the class described, the combination with a pattern-cam; and connections whereby said cam is caused to produce relative sidewise movements between the needle and work; of a gear-wheel mounted concentrically with said cam in operative connection with the driving mechanism of the machine; means for automatically connecting said cam and gear to rotate in

unison at certain times and for destroying such connection at certain other times.

2. In a sewing-machine of the class described, the combination with a pattern-cam; and connections whereby said cam is caused to produce relative sidewise movements between the needle and work; of a gear-wheel mounted concentrically with said cam in operative connection with the driving mechanism of the machine, and provided with a pin-receiving aperture; a plunger-pin reciprocatory in an aperture in said cam and adapted in a certain position of said cam relatively to said gear-wheel to enter the pin-aperture in the latter whereby said cam and gear-wheel are connected to rotate in unison; a spring operating to withdraw said plunger-pin from said aperture in the gear-wheel; and intermittently - operating means for inducing movement of the plunger-pin in opposition to said spring.

3. In a sewing-machine of the class described, the combination with a pattern-cam; and connections whereby said cam is caused to produce relative sidewise movements between the needle and work; of a gear-wheel mounted concentrically with said cam in operative connection with the driving mechanism of the machine, and provided with a pin-receiving aperture; a plunger-pin reciprocatory in an aperture in said cam and adapted in a certain position of said cam relatively to said gear-wheel to enter the pin-aperture in the latter whereby said cam and gear-wheel are connected to rotate in unison; a spring operating to withdraw said plunger-pin from said aperture in the gear-wheel; a plate adjacent to the outer side of said cam provided with an aperture adapted to receive said plunger-pin in a certain position of said cam; a push-pin supported on the outer side of said plate adapted to engage said plunger-pin through said plate-aperture, and means for intermittently operating said push-pin.

4. In a sewing-machine of the class described, the combination with a pattern-cam; and connections whereby said cam is caused to produce relative sidewise movements between the needle and work; of a gear-wheel mounted concentrically with said cam in operative connection with the driving mechanism of the machine, and provided with a pin-receiving aperture; a plunger-pin reciprocatory in an aperture in said cam and adapted in a certain position of said cam relatively to said gear-wheel to enter the pin-aperture in the latter whereby said cam and gear-wheel are connected to rotate in unison; a spring operating to withdraw said plunger-pin from said aperture in the gear-wheel; a plate adjacent to the outer side of said cam provided with an aperture adapted to receive said plunger-pin in a certain position of said cam; a push-pin supported on the outer side of said plate adapted to engage said plunger-

pin through said plate-aperture; a movable arm supporting said push-pin; a gear-wheel loosely mounted upon the outer side of said plate; a cam fixed upon said last-mentioned gear-wheel engageable with said arm; and a mutilated gear in operative connection with the driving mechanism of the machine adapted to mesh with said last-mentioned gear.

5. In a sewing-machine of the class described, the combination with a pattern-cam; and connections whereby said cam is caused to induce relative sidewise movements between the needle and work comprising in part a rocker-arm; of a gear-wheel mounted concentrically with said cam in operative connection with the driving mechanism of the machine, and provided with a pin-aperture; a plunger-pin reciprocatory in an aperture in said cam and adapted to enter the pin-aperture in said gear in a certain relative position of the cam thereto; a spring tending to move

said plunger-pin outwardly from the pin-aperture in the gear-wheel; a fixed cover-plate interposed between the face of said cam and said rocker-arm, and provided with a slot adapted to receive and permit side play of said cam-follower on the rocker-arm; and an aperture adapted to receive said plunger-pin in a certain position of said cam; a washer carried by said cam-follower inside the cover-plate adapted to bridge the cam-follower slot in said plate to prevent said plunger-pin from entering said slot; and an intermittently-actuating push-pin engageable with said plunger-pin through said aperture in said plate.

In testimony whereof I have hereunto set my hand this 25th day of August, 1904.

PAUL E. SCHOEN.

Witnesses:

FRANK C. CURTIS,
L. E. BOOTH.