

No. 620,134.

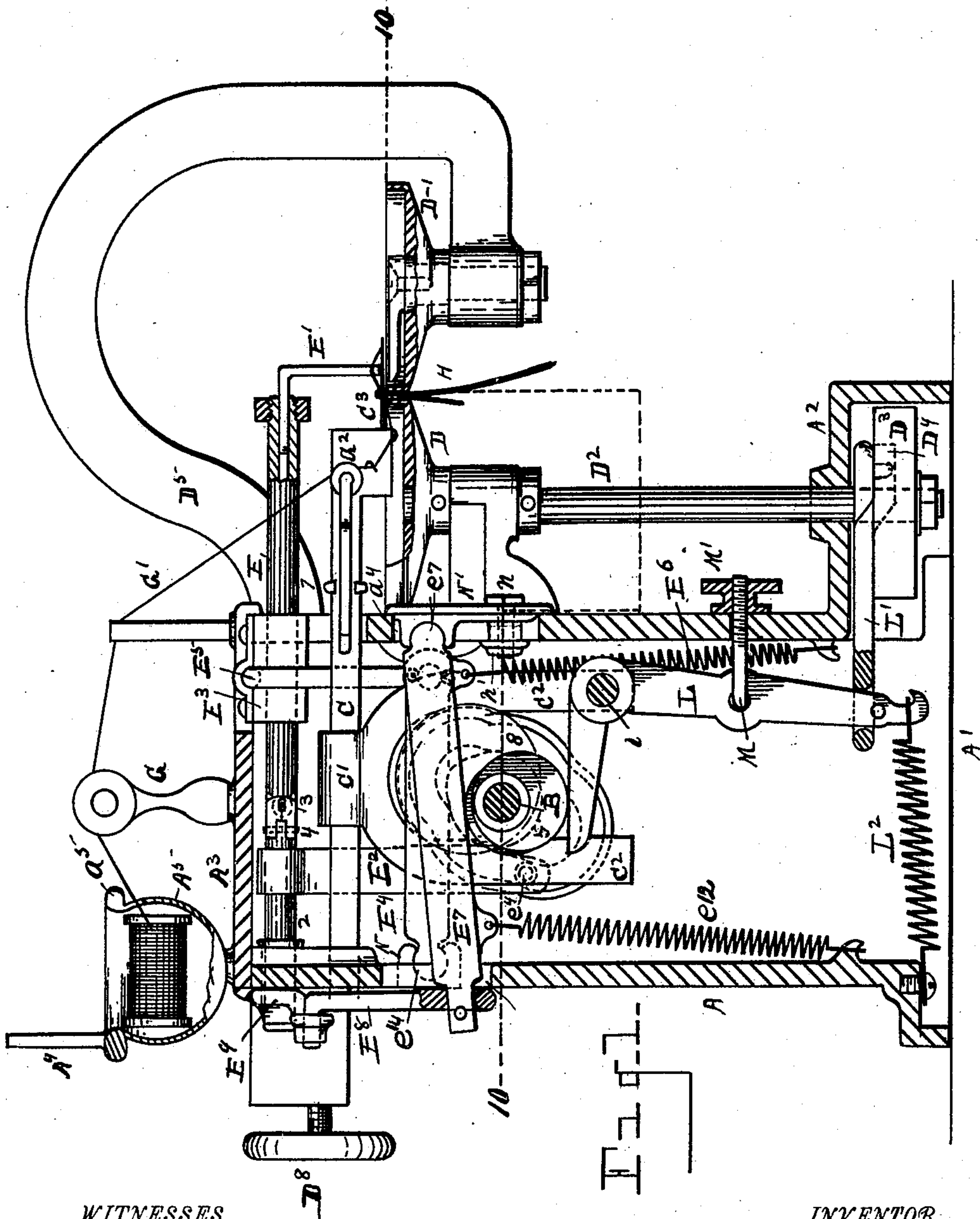
Patented Feb. 28, 1899.

S. G. HOWE.
SEWING MACHINE.

(Application filed Sept. 10, 1897.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES

O. B. Parzinger.
Mary Lickey.

INVENTOR

Solon G. Howe

By his Attorney

Mcwill Wright

No. 620,134.

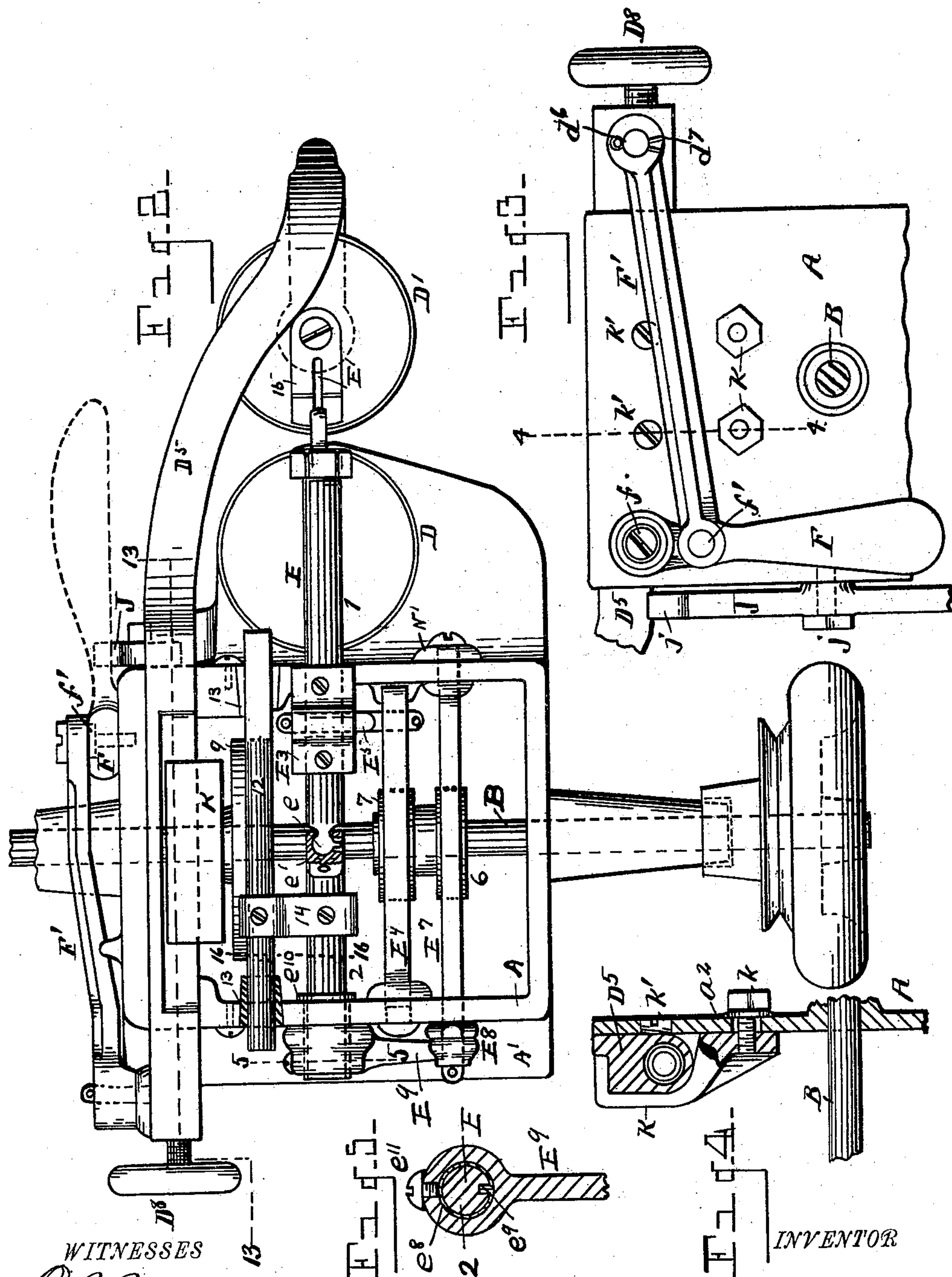
Patented Feb. 28, 1899.

S. G. HOWE.
SEWING MACHINE.

(Application filed Sept. 10, 1897.)

(No Model.)

5 Sheets—Sheet 2.



WITNESSES

O. J. Baenziger.
Mary Lichey

Solon G. Howe
By his Attorney
Newell S. Wright

INVENTOR

No. 620,134.

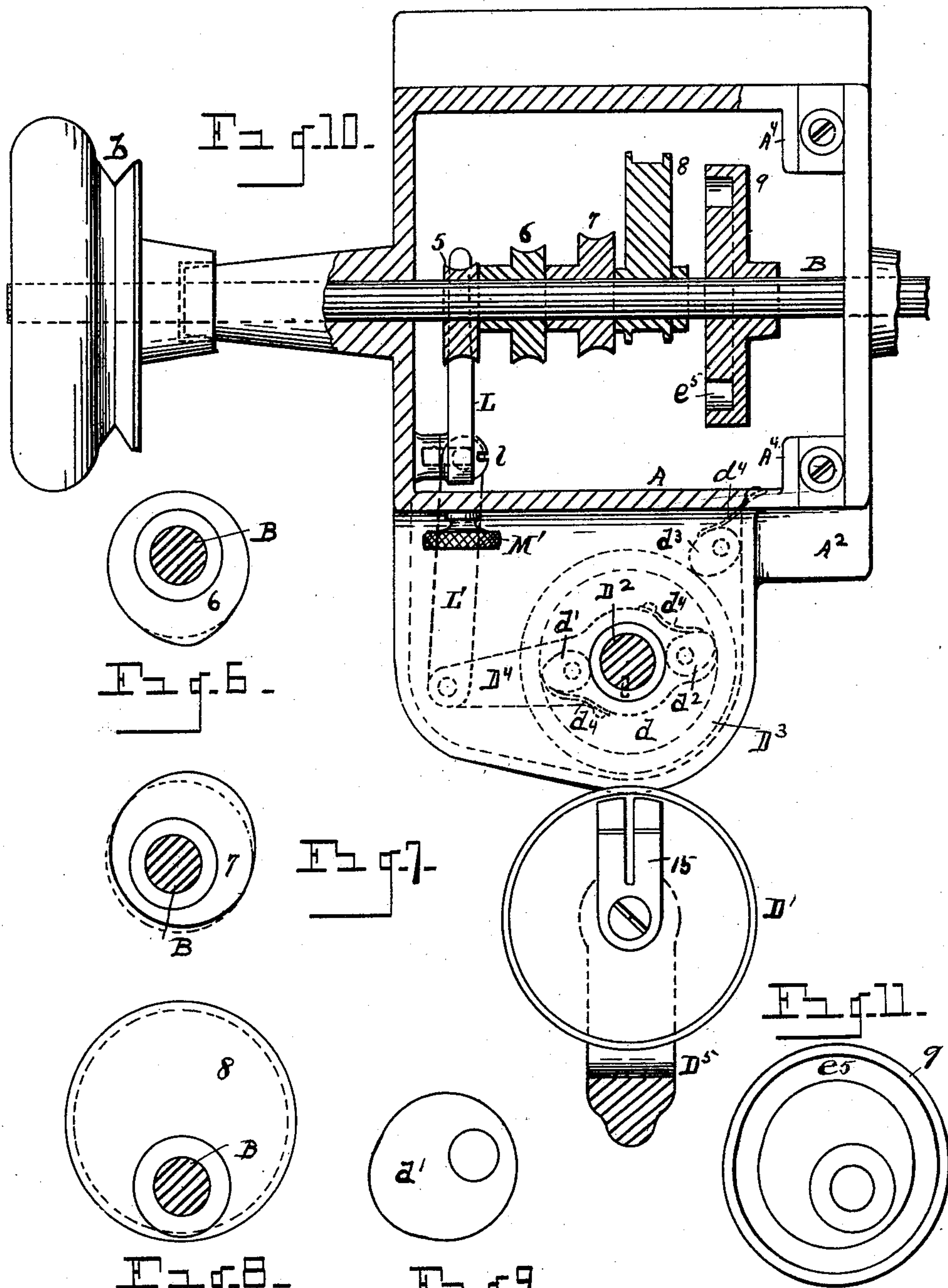
Patented Feb. 28, 1899.

S. G. HOWE.
SEWING MACHINE.

(Application filed Sept. 10, 1897.)

(No Model.)

5 Sheets—Sheet 3.



WITNESSES

O. B. Baerzger.
Mary Lickey.

INVENTOR

Solou G. Howe
By *his* Attorney
Newell S. Wright

No. 620,134.

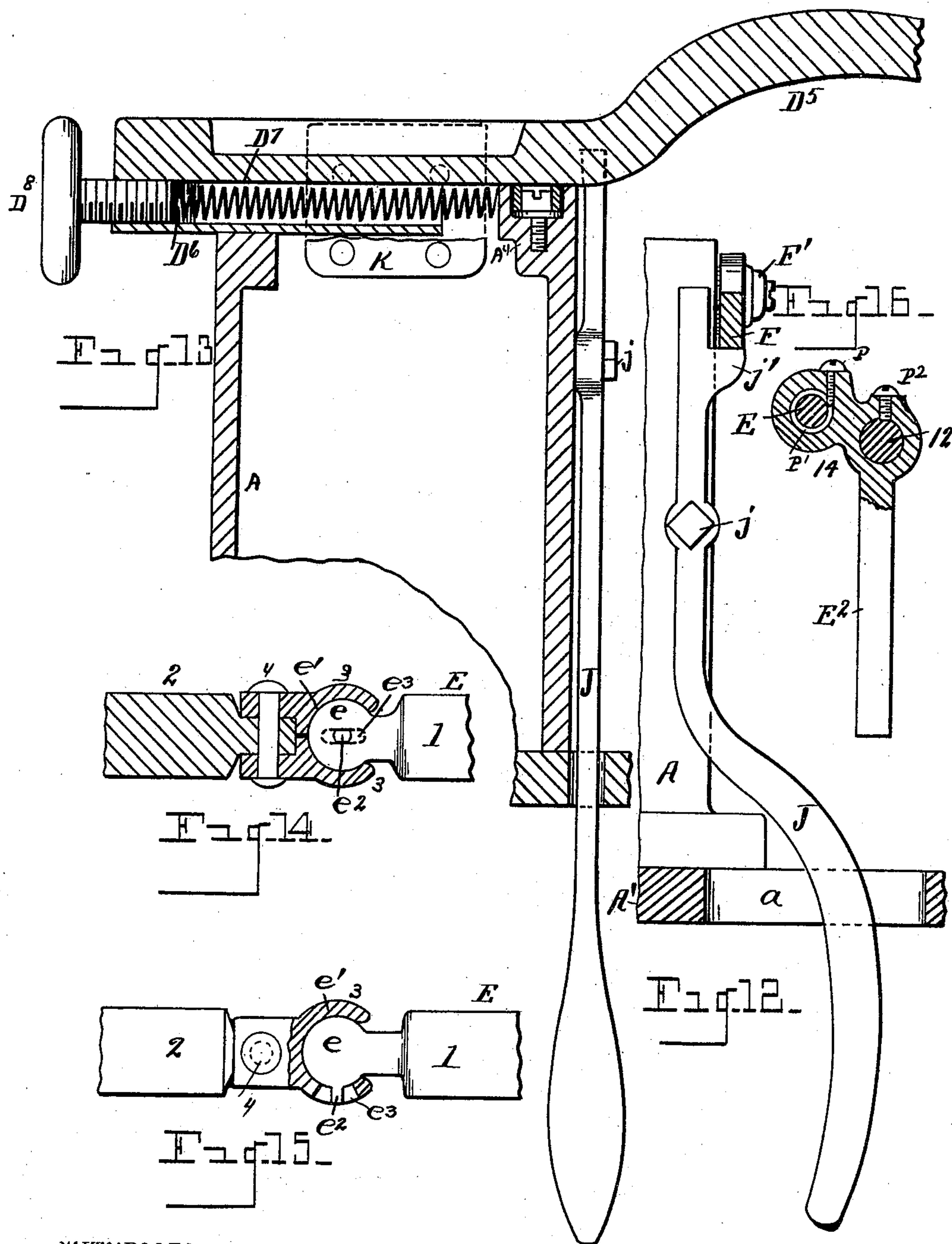
Patented Feb. 28, 1899.

S. G. HOWE.
SEWING MACHINE.

(Application filed Sept. 10, 1897.)

(No Model.)

5 Sheets—Sheet 4.



WITNESSES

O. J. Barmyger
Mary Lickney

INVENTOR

Solon G. Howe

By his Attorney

Newell S. Wright

No. 620,134.

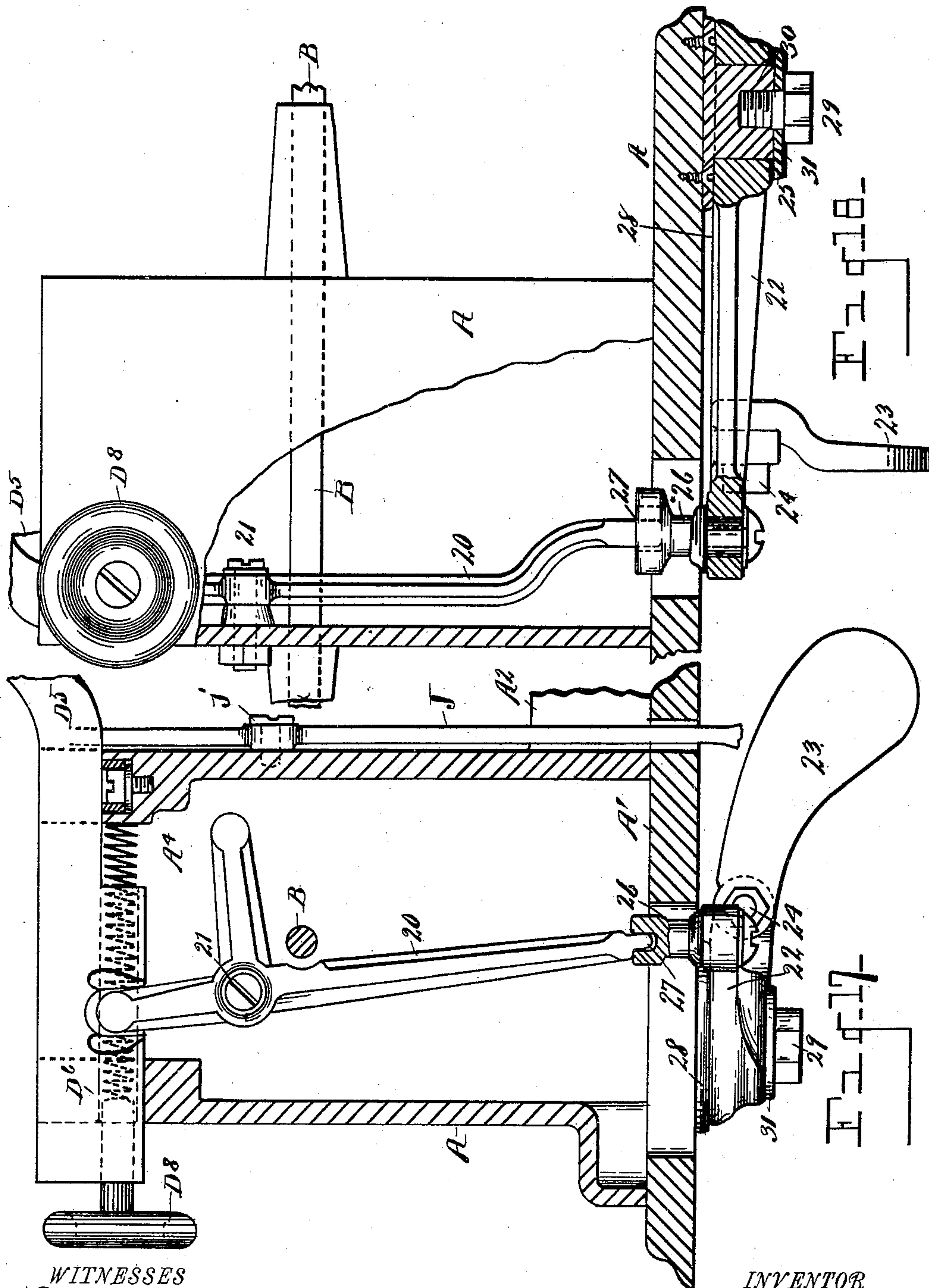
Patented Feb. 28, 1899.

S. G. HOWE.
SEWING MACHINE.

(Application filed Sept. 10, 1897.)

(No Model.)

5 Sheets—Sheet 5.



WITNESSES

O. H. Amey,
Mary Lickay.

INVENTOR

Solon G. Howe

By *his* Attorney

Howell Wright

UNITED STATES PATENT OFFICE.

SOLON G. HOWE, OF DETROIT, MICHIGAN, ASSIGNOR TO JEROME W. HYDE,
OF SPRINGFIELD, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,134, dated February 28, 1899.

Application filed September 10, 1897. Serial No. 651,240. (No model.)

To all whom it may concern:

Be it known that I, SOLON G. HOWE, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Sewing-Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain new and useful improvements in sewing-machines, and has reference more particularly to that class of machines used in overseaming furs, gloves, and for analogous uses.

To this end my invention consists of the construction and arrangement of devices and appliances herein described, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section showing parts in elevation. Fig. 2 is a plan view showing a feature in horizontal section. Fig. 3 is a partial side elevation showing the mechanism for operating the outer feed-disk. Fig. 4 is a view in section on the line 4 4, Fig. 3. Fig. 5 is a view in section on the line 5 5, Fig. 2. Fig. 6 is a detail view of the eccentric 6. Fig. 7 is a detail view of the eccentric 7. Fig. 8 is a detail view of the eccentric 8. Fig. 9 is an enlarged view of one of the eccentrics for operating the friction-disk controlling the rotation of the inner feed-disk. Fig. 10 is a horizontal section showing parts in plan. Fig. 11 is a detail view of the cam 9 on the driving-shaft. Fig. 12 is a partial front elevation showing the trip-lever for operating the outer feed-disk. Fig. 13 is a view in section on the line 13 13, Fig. 2. Fig. 14 is a detail view showing the ball-and-socket joint in the looper-bar, parts being shown in section. Fig. 15 is a view of said joint at right angles to Fig. 14. Fig. 16 is a vertical section on the line 16 16, Fig. 2. Fig. 17 is a view, partly in vertical section and partly in elevation, showing features of my invention. Fig. 18 is a view, partly in section and partly in elevation, at right angles to Fig. 17.

I carry out my invention as follows:

A represents any suitable case, which may

be supported upon any suitable table A', said case being provided with a base A² and top A³.

B denotes the driving-shaft, driven in any suitable manner, as by a pulley b.

C is the needle-bar, provided with a yoke C', having arms C² embracing an eccentric 8 upon the driving-shaft.

C³ is the needle engaged with the needle-bar.

D and D' represent the inner and outer feeding-disks, the inner feeding-disk being carried by the rotatable feed-shaft D², supported upon a friction-disk D³, said disk being constructed with a groove d, in which project eccentrics d' d², journaled upon a lever D⁴. An additional eccentric d³ bears upon the periphery of the friction-disk D³ to prevent backward movement of the same. The springs d⁴ hold the corresponding eccentrics d', d², and d³ to their work.

A⁴ is a spool-spindle, preferably supported upon a receptacle A⁵, provided with an orifice a⁵, through which the thread passes.

G is any suitable tension device.

G' is the thread.

H is the work.

D⁵ is the arm or bar carrying the outer feed-disk.

E indicates the looper-bar, and E' the looper-arm. The looper-bar E is preferably formed of two parts, (indicated by the numerals 1 and 2,) having a ball-and-socket-joint connection one with another at their adjacent ends in any suitable manner. As shown, the part 1 may be provided with a ball e, the part 2 being provided with a corresponding socket, (indicated at e'.) This socket may conveniently be constructed of two socketed plates (indicated by the numeral 3) held in place by a rivet 4, passed through the part 2 of the looper-bar. By this construction the ball end of the portion 1 of said bar may readily be engaged in place.

It will be understood that, as in the other application referred to, the looper-arm E', being in the position indicated in Fig. 1, is first given a forward rocking movement toward the thread to pick up the loop. It is then to be given an upward movement, then a backward movement toward the disk D, and then a downward movement into position for the

needle to pass through the loop. By means of the ball-and-socket joint, above described, in the looper-bar E it will be perceived that provision is made for these various movements of the looper-bar and looper-arm.

The mechanism for rocking the bar E, I prefer to connect with the portion 2 of said bar, for which reason the ball-and-socket joint needs to be rigid when a laterally-rocking movement is given to the looper-bar. Provision for this rigidity for said rocking movement is made by providing the ball e with a spur e^2 , projecting into a corresponding opening e^3 in the adjacent plate 3.

Horizontal reciprocatory movement is given to the looper-bar by means of an arm E^2 , provided with a cam-roll e^4 , projecting into a cam-groove e^5 in the cam-disk 9 upon the driving-shaft. To this end the machine is provided with a slide 12, made horizontally reciprocatory in the case of the machine, the case preferably being provided with bushings 13 to take the wear, the arm E^2 being engaged with the slide 12, said bar E^2 being preferably constructed with a yoke 14, engaged upon the slide 12, and with the part 2 of the looper-bar, as shown more particularly in Fig. 16. The arm E^2 is preferably made integral with the yoke 14 and depends from said yoke.

While the needle is being moved forward through the loop and while the needle is being drawn back to form the loop the looper-arm is required to be motionless longitudinally. Provision is made for this motionless attitude of the looper-arm at required points by the shape of the cam-groove e^5 .

To give an upward-and-downward movement to the looper-bar, the same is provided with a bearing E^3 , having a vertical reciprocation in a portion of the case, through which bearing the looper-bar is horizontally reciprocatory. To vertically reciprocate said bearing, the machine is provided with a lever E^4 , fulcrumed in any suitable manner at one extremity thereof, as at e^{14} , said lever being connected at its opposite end with the bearing E^3 , as by means of a connecting-rod E^5 . The bar E^4 rides upon the periphery of an eccentric 7 upon the driving-shaft. The arm E^4 is retracted by means of a retracting-spring E^6 .

A rocking movement is given to the looper-bar by means of a lever-arm E^7 , fulcrumed at one extremity, as indicated at e^7 , said arm riding upon the periphery of an eccentric 6. The arm E^7 is retracted by a spring e^{12} . The lever-arm E^7 is connected with a vertical arm E^8 , connected with a horizontal arm E^9 , keyed upon the portion 2 of the looper-arm E. This may readily be effected by providing a sleeve e^8 , having adjacent edges turned inward to form a key e^9 , projecting into a corresponding keyway in the looper-bar, as indicated more particularly in Fig. 5. The portion 2 of the looper-bar, it will be understood, must play longitudinally through the sleeve e^8 . The sleeve e^8 is preferably constructed with a collar e^{10} at its inner end and a set-screw e^{11} , that

holds the arm E^9 as well as the sleeve in place, at the opposite end of the sleeve.

The arm carrying the outer feed-disk is provided with a needle-guide 15 and the needle-bar with a tension device G^2 .

To reciprocate the arm D^5 to open the feed-disks and to compress the outer feed-disk against the inner disk, I provide a lever F, fulcrumed to the case, as indicated at f , said lever being connected with the arm D^5 by a connecting-rod F' , jointedly connected to the lever F, as indicated at f' . The rear end of the arm D^5 is constructed to form a spring housing or case, (indicated at D^6), in which is located a retracting-spring D^7 . The inner end of the spring-case is open, permitting the spring to project therethrough, as indicated in Fig. 13, and abut against a bracket A^4 , forming a part of the case A and supporting the arm D^5 . The spring-case terminates a sufficient distance from the bracket A^4 to permit the arm D^5 to move a required distance in a direction toward the bracket, such movement compressing the spring.

The spring-case or rear end of the arm D^5 is constructed with a boss and pin, (indicated at d^6), upon which the adjacent end of the connecting-rod F' is engaged and held in place in any suitable manner, as by a key d^7 . The tension of the spring may be regulated by an adjusting-screw D^8 .

To lock the outer disk in open position, I provide a locking-lever J, fulcrumed, as at j , and provided with a shoulder j' to engage under the lever F when the disk is in open position and prevent said disk closing until the locking-lever J is removed from locked position. This locking-lever preferably projects downward through the supporting-table A' , as through an opening a , in which position the locking-lever may readily be thrown out of engagement with the lever F by the knee of the operator. I prefer also to provide a cap K, secured at its lower side to the inside face of the case A, as by screws k , said cap extending underneath the arm D^5 and embracing its outer vertical surface opposite the case and having engagement upon the upper face of the arm D^5 and by means of which the arm D^5 is securely held in position. Said cap preferably has an adjustable engagement with the case A, which may be provided for by constructing the case with elongated orifices a^2 , through which the screws k pass. Adjusting-screws k' are also provided to bear against the adjacent face of the arm D^5 .

To actuate the feeding mechanism already described, a bell-crank lever L is provided, fulcrumed as at l , one arm of which rides against an eccentric 5 upon the driving-shaft. The other arm of the lever L is connected with a lever D^4 , hereinbefore mentioned, by means of a connecting-arm L' .

L^2 is a retracting-spring connected with the lever L.

To adjust the length of the stitch, I provide an adjusting-screw M, connected with the le-

ver L and passed through the adjacent portion of the case A, said screw provided with an adjusting-nut M', by means of which the lever L may be adjusted to give more or less throw to the lever D⁴ as may be required to regulate the length of the stitches.

The arms E⁴ and E⁷ are preferably fulcrumed in position by providing the case A with caps N and N', of similar construction, formed to receive a rounded end of the corresponding lever-arm and permit the oscillation of the corresponding arm, said caps each projecting through the corresponding opening α^4 in the case A of the machine, the adjacent edges of the case preventing said lever-arms from lateral disengagement from the socket in its cap, while the form of socket in the cap will obviously prevent the vertical disengagement of said lever-arms upon said caps. To compensate for any possible wear upon the eccentrics or the wearing side of said lever-arms, said caps may be made vertically adjustable in the openings α^4 . The caps preferably project over the outer face of the case A, as shown in Fig. 1, and are adjustably held in place by means of a bolt n and a cap-nut n', the nut bearing upon the inner face of the case.

By reference to Figs. 1 and 2 particularly it will be seen that the arm D⁵ is bent upward at its forward end and then laterally downward and forward beyond the outer feeding-disk and then inward, as shown, horizontally toward the outer disk, the horizontal portion of said arm projecting inward beneath the outer feeding-disk to support said disk. This upward and lateral bending of said arm provides freedom of movement upon the part of the operator in handling the work, inserting and adjusting the work, giving ample room for the hands of the operator about the disks.

The sleeve e⁸ is obviously held from backward movement by the collar e¹⁰, which has bearing against the inside of the case A. Said sleeve is also held from contrary movement by means of the shoulder of the horizontal arm E⁹ bearing against the outer face of the case, as indicated in Figs. 1 and 2, for example.

By providing the arm D⁵ with a spring-housing, which is preferably formed integral with said arm, and providing the outer end of said case with an adjusting-screw tapped thereinto I provide a very small economical means of effecting the required adjustment of the screw and the retraction of said arm, while also the parts are out of any possible contact with the work in the operation of the machine.

The operator actuating the outer or pressure feed-disk D' may use a knee-lever on the under side of the table, if desired, my invention contemplating a lever (indicated by the numeral 20) fulcrumed to the case of the machine, the upper end of said lever being engaged with the reciprocatory arm D⁵, the lower end of said lever 20 being suitably connected

with a swinging lever 22, provided with an adjustable knee-rest 23, said rest being adjustable by means of a screw 24. The knee-rest is located about the center of the machine, and so will operate the arm D⁵ on either side of the machine-case. Being adjustable, the knee-rest may be set up close to the table or lowered, as circumstances may require.

The lever 22 may be fulcrumed in any suitable manner, as indicated at 25, and at its opposite end it is preferably provided with a swivel-bearing (indicated at 26) engaging the lower end of the lever 20, which bearing allows for oscillations of the levers 20 and 22, both said last-named levers having an oscillatory motion about their fulcrums. The swivel-bearing 26 is preferably provided with an opening (indicated at 27) in its upper end to engage the lower end of the lever 20, the opening being constructed to provide for a desired amount of play of the parts adjacent, as indicated more particularly in Fig. 18.

In Figs. 17 and 18 I further provide a fulcrum-plate (indicated at 28) upon the under side of the table in order to give greater rigidity to the lever 22 at its fulcrumed end, a screw 29 engaging in a shoulder 30 of said plate, with an intervening washer 31 holding the lever 22 in place.

The means shown in Figs. 17 and 18 for operating the outer feed-disk are preferred, the means shown in Figs. 2, 3, 4, and 13 illustrating modifications of my invention.

What I claim as my invention is—

1. In a sewing-machine, the combination of a pair of feeding-disks, an arm carrying the outer feed-disk extending to the rear of the case and constructed with a spring housing or case toward its rear end, a lever to actuate said arm, a retracting-spring within said housing projecting forward therefrom and contacting at one end against an adjacent portion of the case, and an adjusting-screw engaged in the rear end of said housing outside said case, substantially as described.

2. In a sewing-machine, the combination of a pair of feeding-disks, an arm carrying the outer feed-disk extending to the rear of the case and constructed with a spring-housing toward its rear end open at its inner end, a lever to actuate said arm, a retracting-spring having one end located in the spring-housing and its opposite end projecting therebeyond and contacting with the case of the machine, and an adjusting-screw engaged in the rear end of said housing to regulate the tension of the spring, said housing terminating a sufficient distance from the case of the machine at its forward end to permit the forward movement of the arm and compress the spring, substantially as set forth.

3. In a sewing-machine, the combination of a looper-bar constructed of two parts jointly connected at their adjacent ends, means to give to both parts of said bar a horizontally-reciprocatory movement, means to give to both parts of said bar a rocking move-

ment, and means to give to the forward part of said bar an upward-and-downward movement independently of the rearward part of said bar, for the purposes described.

5 4. In a sewing-machine, the combination of a looper-bar constructed of two parts jointly connected, means to give to both parts of said bar a rocking movement, means to hold the jointed parts of said bar together, 10 whereby they may both be given a rocking movement simultaneously, mechanism to give to both parts of said bar a reciprocatory movement, and means to give to the forward of said parts an upward-and-downward move- 15 ment independently of the other of said parts, substantially as set forth.

5. In a sewing-machine, the combination of a looper-bar constructed of two parts connected with a ball-and-socket joint, one of 20 said parts provided with a ball end, and the other of said parts provided with socketed plates engaged therewith over said ball end, mechanism to give to both parts of said bar a reciprocatory movement, and means to give to 25 the forward of said parts an upward-and-downward movement independently of the other of said parts, substantially as set forth.

6. In a sewing-machine, the combination of a looper-bar constructed of two parts con- 30 nected with a ball-and-socket joint, one of said parts provided with a ball end and the other of said parts provided with socketed plates engaged therewith and over said ball end, said plates provided with an opening 35 therein, and the ball end provided with a spur projecting into said opening, means to give to said looper-bar a rocking movement, mechanism to give to both parts of said bar a reciprocatory movement, and means to give to 40 the forward of said parts an upward-and-downward movement independently of the other of said parts, substantially as set forth.

7. In a sewing-machine, the combination of a looper-bar, a slide, an arm provided with a 45 yoke engaging both said bar and slide, a driving-shaft, and a cam upon said shaft to actuate said arm to give a horizontal reciprocation to said looper-bar, said looper-bar having a rocking movement within said yoke, sub- 50 stantially as set forth.

8. In a sewing-machine, the combination of a looper-bar, a driving-shaft, an eccentric upon said shaft, a lever-arm fulcrumed to the case actuated by said eccentric, a vertical arm 55 connected with said lever-arm, a horizontal arm connecting the vertical arm with said looper-bar to rock the looper-bar, said bar provided with a sleeve between the end of said arm and the horizontal arm, said sleeve 60 keyed to said bar, and means to hold said horizontal arm in place upon said sleeve and looper-bar, substantially as set forth.

9. In a sewing-machine, the combination of a looper-arm, a driving-shaft, an eccentric 65 upon said shaft, a lever-arm fulcrumed to the case actuated by said eccentric, a vertical arm

connected with said lever-arm, a horizontal arm connected with the vertical arm and with the looper-bar to give a rocking movement to said bar, said bar provided with a sleeve be- 70 tween the adjacent end of the horizontal arm and the looper-bar and keyed to said bar, and means to hold the horizontal arm in place upon said sleeve and looper-bar, said sleeve provided with a collar engaged against the 75 inner face of the case of the machine, the adjacent end of the horizontal arm engaging against the outer face of said case, for the purposes described.

10. In a sewing-machine, the combination 80 of a looper-bar, a driving-shaft, a slide, an arm constructed with a yoke sleeved upon both said bar and slide, means to hold the bar and slide longitudinally immovable in said yoke, a cam upon said shaft to actuate 85 said arm to give a horizontal reciprocation to said looper-bar, a bearing upon said looper-bar, a lever-arm connected with said bearing to give an upward-and-downward movement to said bar, an eccentric upon the driving- 90 shaft to actuate said arm, a spring to retract said arm, a lever-arm connected with the looper-bar to give to said bar a rocking movement, an eccentric upon said shaft to actu- 95 ate the last-named lever-arm, and a spring to retract said latter arm, said looper-bar having a rocking movement in said yoke, substantially as set forth.

11. In a sewing-machine, the combination of a looper-bar, a lever-arm connected with 100 said bar to give to said bar an upward-and-downward movement, a lever-arm connected with said looper-bar to give to said bar a rocking movement, a driving-shaft, eccentrics 105 upon the driving-shaft to actuate each of said lever-arms, and caps adjustably connected with the case of the machine, in which said lever-arms, respectively, are fulcrumed, sub- stantially as set forth.

12. In a sewing-machine, the combination 110 of a pair of feeding-disks, a reciprocatory arm carrying one of said disks, a lever to actuate said arm, a swinging lever fulcrumed to the case, a swivel-bearing connecting the two le- 115 vers, and a knee-rest connected with the swinging lever, substantially as set forth.

13. In a sewing-machine, the combination of a pair of feeding-disks, a reciprocatory arm carrying one of said disks, a lever engaged 120 at its upper end with said arm, a swinging lever fulcrumed to the case, a swivel-bearing connecting the two levers, and a knee-rest adjustably connected with the swinging lever, substantially as set forth.

14. In a sewing-machine, the combination 125 of two feeding-disks, a reciprocatory arm carrying one of said disks, a lever engaged at its upper end with said arm, a bearing-plate engaged with the case of the machine, a swing- 130 ing lever fulcrumed upon said bearing-plate, and swivel-bearing connecting said swinging lever with the lower end of the first-named

lever to allow for oscillations of said levers, substantially as set forth.

15. In a sewing-machine, the combination of two feeding-disks, a reciprocatory arm carrying one of said disks, a lever engaged at its upper end with said arm, and centrally-located knee-lever mechanism connected with the lower end of said first-named lever, whereby said arm may be actuated from either side

of the case of the machine, substantially as is set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

SOLON G. HOWE.

Witnesses:

N. S. WRIGHT,
MARY HICKEY.