

No. 656,440.

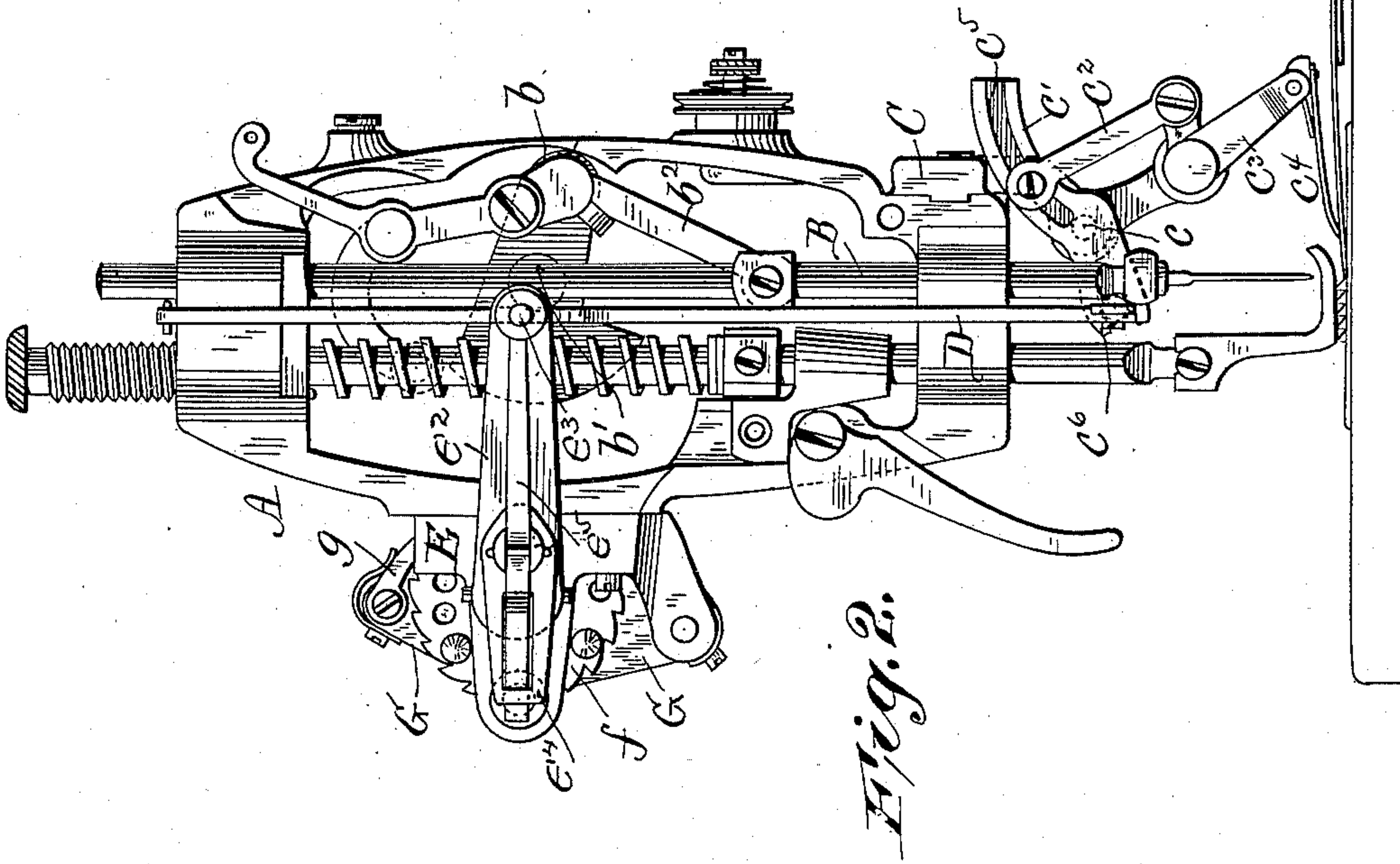
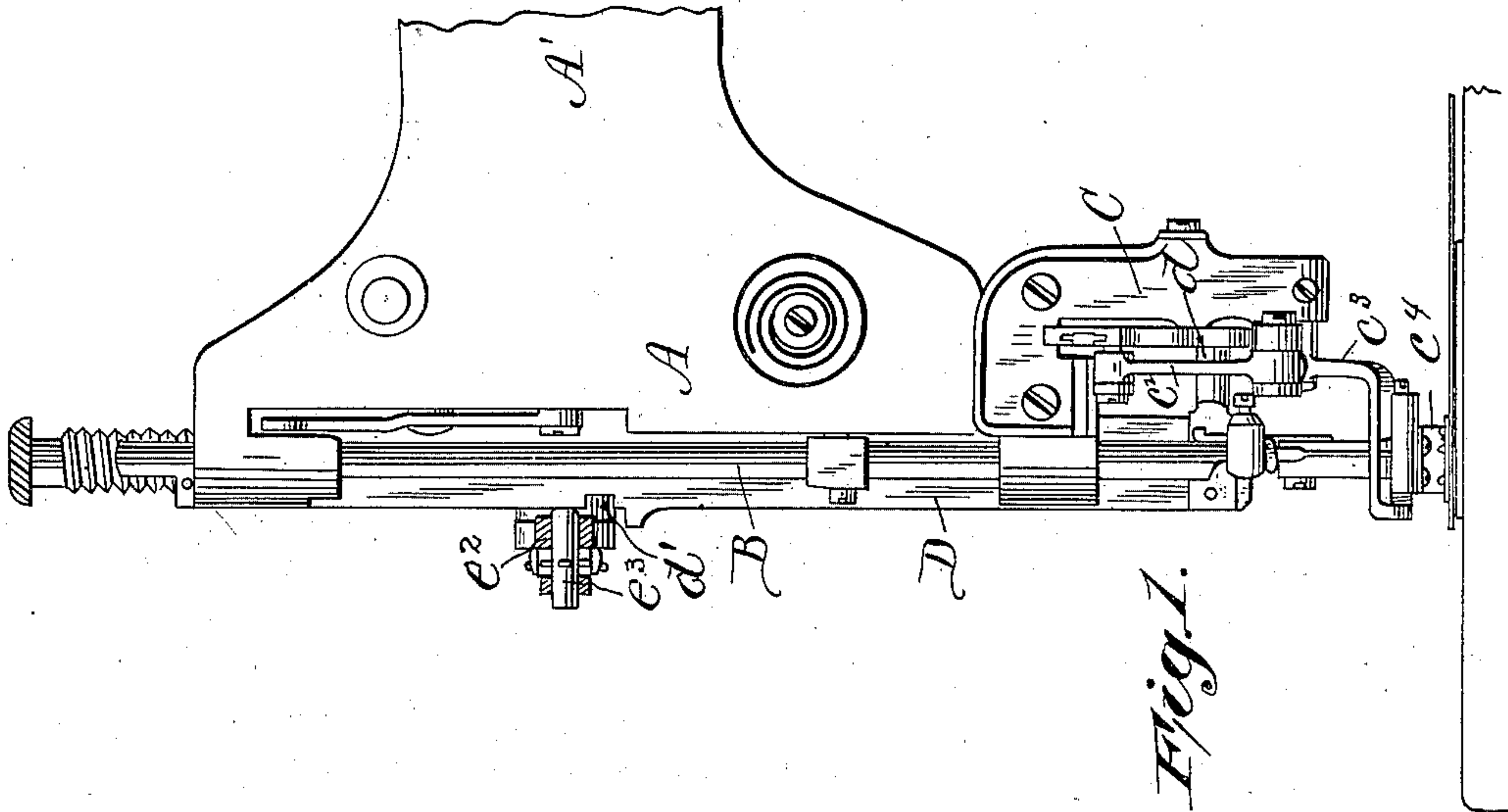
Patented Aug. 21, 1900.

P. DIEHL & M. HEMLEB.  
RUFFLING SEWING MACHINE.

(Application filed June 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses;  
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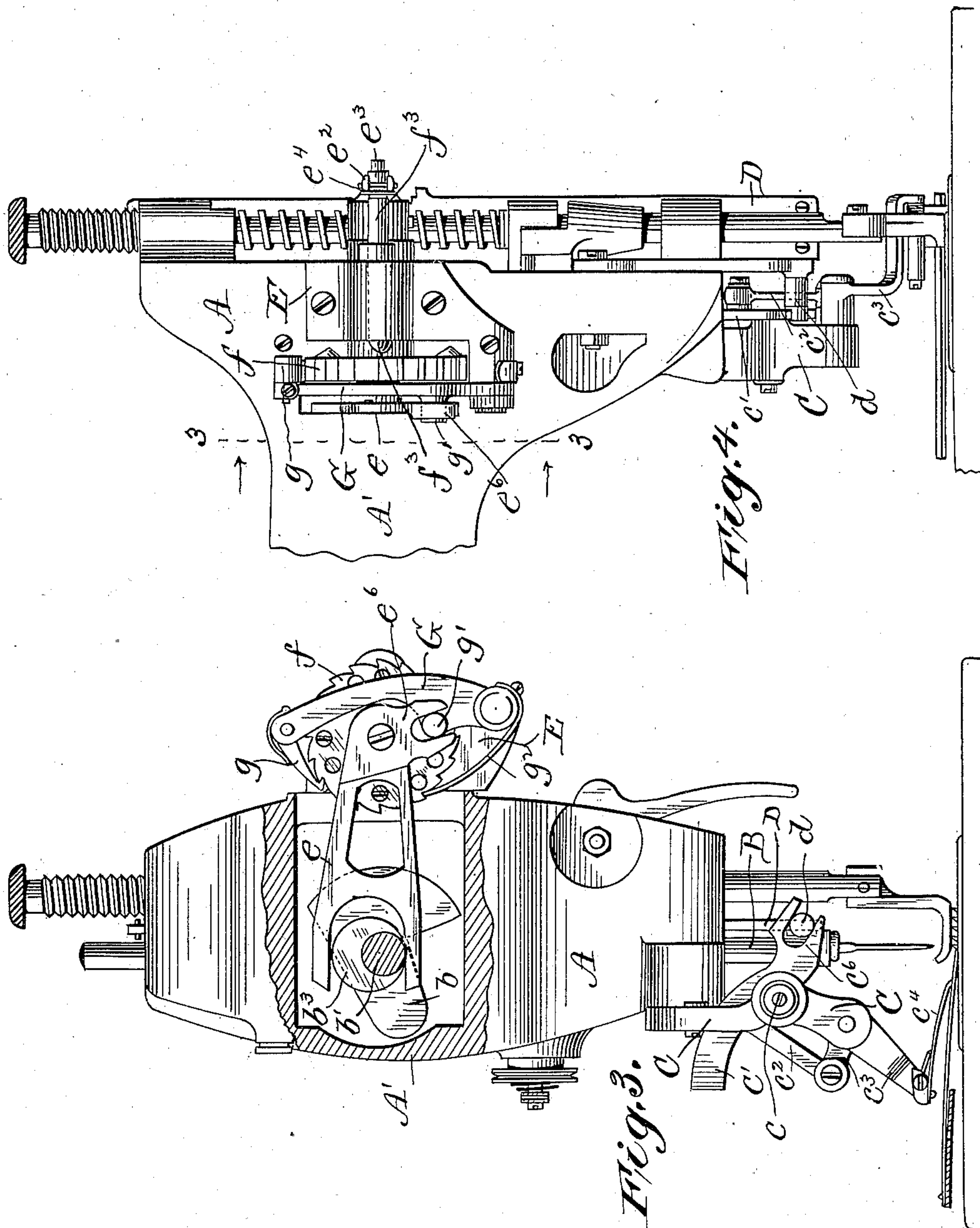
Patented Aug. 21, 1900.

P. DIEHL & M. HEMLEB.  
RUFFLING SEWING MACHINE.

(Application filed June 28, 1899.)

(No Model.)

3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 5.

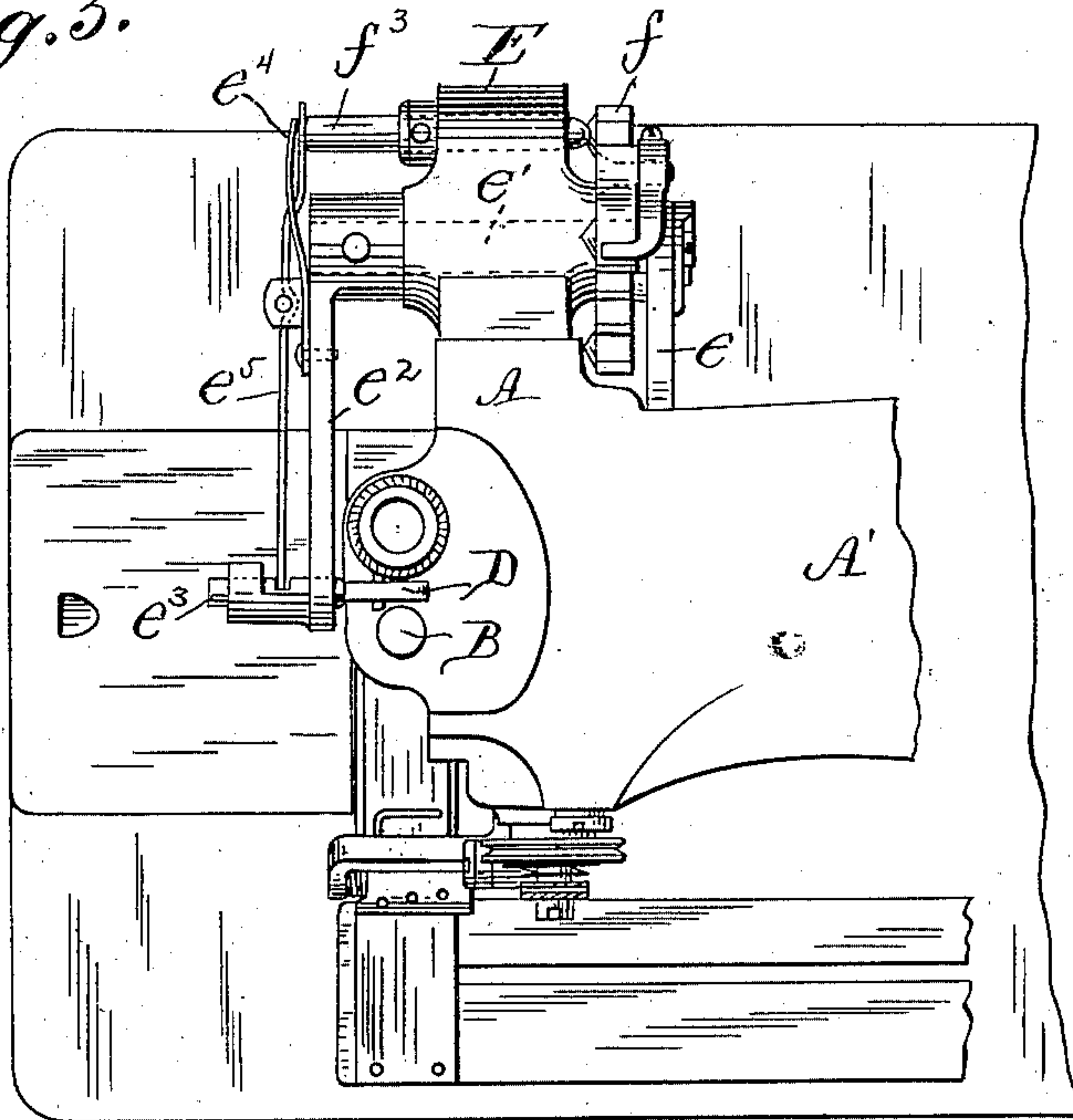


Fig. 6.

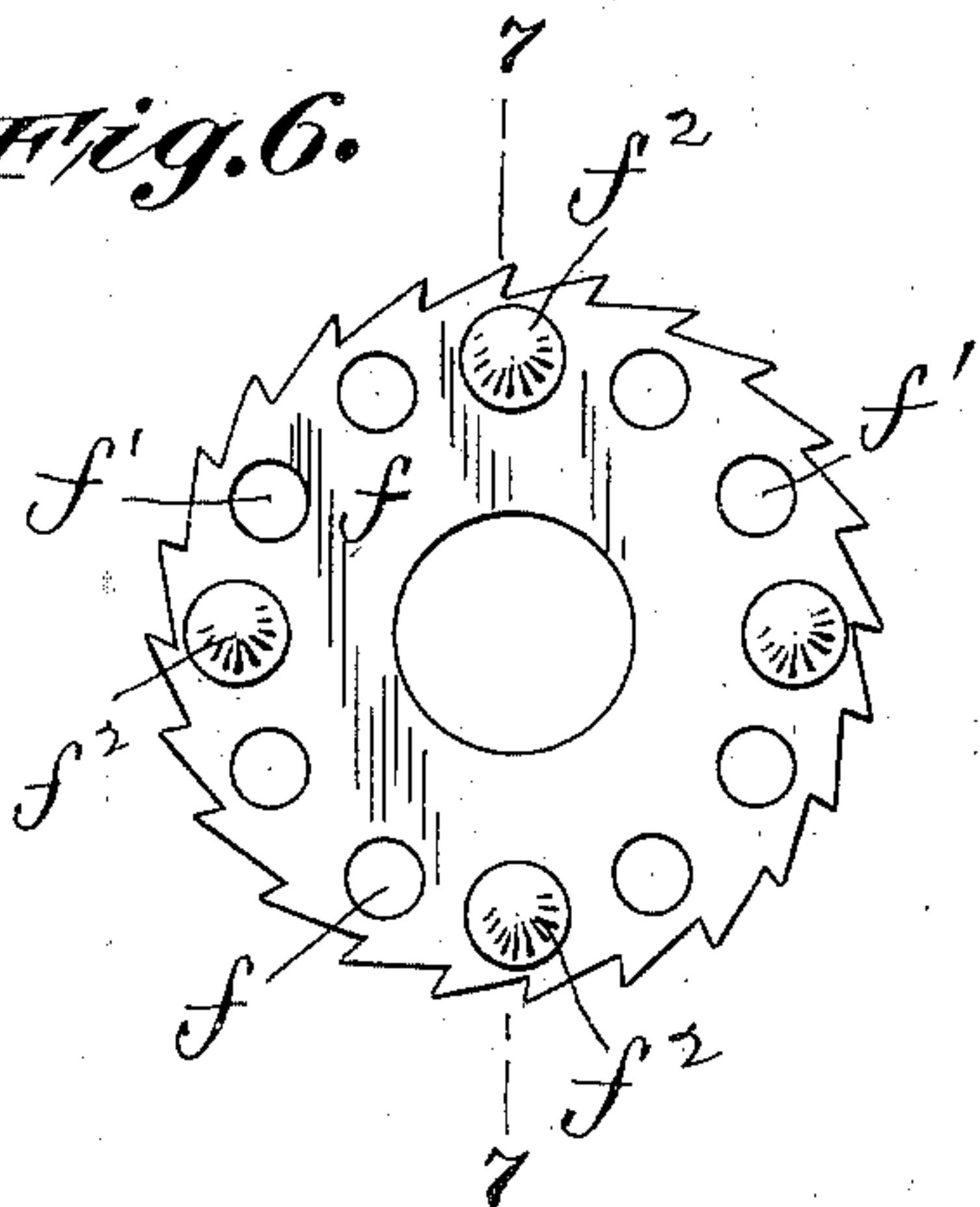
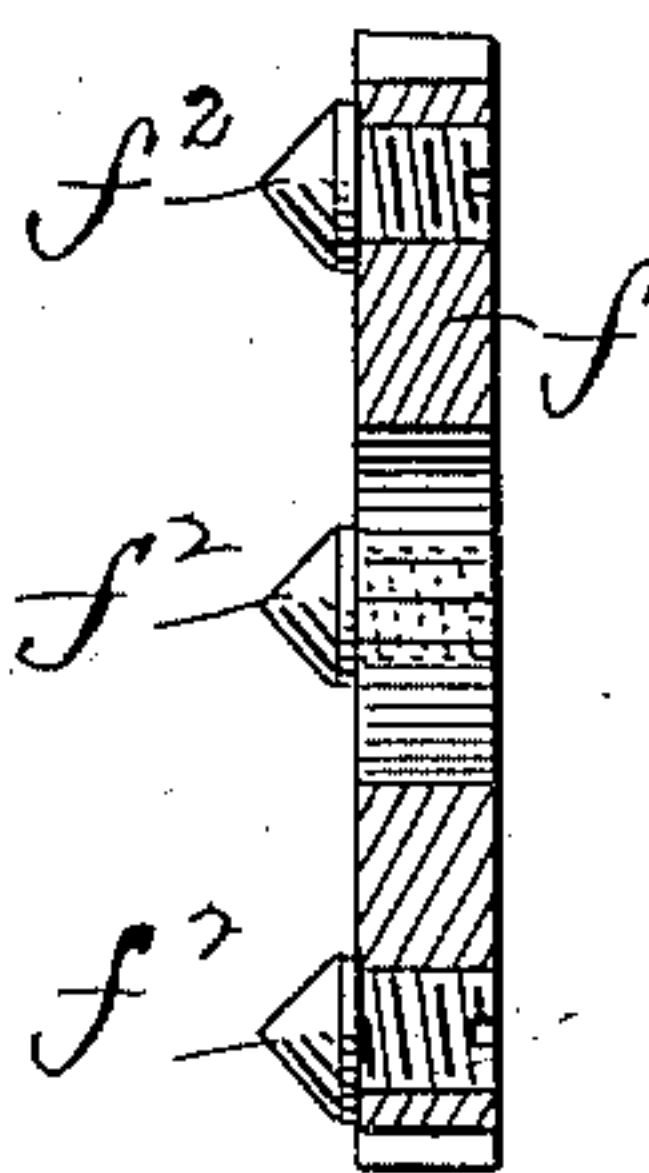


Fig. 7.



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# UNITED STATES PATENT OFFICE.

PHILIP DIEHL AND MARTIN HEMLEB, OF ELIZABETH, NEW JERSEY, AS-  
SIGNORS TO THE SINGER MANUFACTURING COMPANY, OF NEW JERSEY.

## RUFFLING SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 656,440, dated August 21, 1900.

Application filed June 26, 1899. Serial No. 721,918. (No model.)

*To all whom it may concern:*

Be it known that we, PHILIP DIEHL and MARTIN HEMLEB, citizens of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machine Rufflers or Plaiters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to provide a sewing-machine ruffling or plaiting device in which the ruffling or plaiting blade preferably has but one reciprocation for several stitches and which comprises a rotating pattern-wheel capable of variation by means of changeable pins, so that one plait may be formed for a greater or lesser number of stitches. In this improved ruffling or plaiting device the ruffer or plaiter is preferably actuated independently of the needle-bar by an operating-bar receiving its movements from a constantly-moving vibrating arm which is automatically connected or coupled at intervals of several stitches (and preferably for a single stitch at a time only) with the said vibrating arm, so that the ruffling or plaiting blade is operated to form one or more ruffles or plaits, and the operating-bar is then automatically disconnected or uncoupled from said vibrating arm, so that the said blade may remain at rest for any desired interval.

In the accompanying drawings, Figure 1 is a front side view of the head of a sewing-machine with the face-plate removed equipped with the invention. Fig. 2 is a front end view, Fig. 3 a rear end view, Fig. 4 a rear side view, and Fig. 5 a plan view, of the same. Figs. 6 and 7 are detail views of the pattern ratchet-wheel.

A denotes the head at the forward end of the machine bracket-arm A'.

B is the needle-bar, operated in a well-known manner from a crank *b* on the driving-shaft *b'* through a pitman *b<sup>2</sup>*.

C is a bracket attached to the head A and to which bracket is pivoted at *c* an operating-lever *c'*, connected by a link *c<sup>2</sup>* with an elbow-lever *c<sup>3</sup>*, carrying the ruffling or plaiting blade *c<sup>4</sup>*. The link *c<sup>2</sup>* has an adjustable connection at its upper end with the operating-lever *c'* by means of the curved groove *c<sup>5</sup>* in one arm

of said lever, the latter being forked at *c<sup>6</sup>* at its other end for engagement with a stud *d* on a vertically-reciprocating operating-bar D, which imparts movements to the said lever *c'*.

The driving-shaft *b'* is provided at the rear of the crank *b* with an eccentric *b<sup>3</sup>*, embraced by a forked arm *e* on a rock-shaft *e'*, having its bearing in a bracket E, attached to the rear side of the head A, said shaft having a second arm *e<sup>2</sup>*, carrying at its forward end a sliding coupling-pin *e<sup>3</sup>*, adapted to engage a notch *d'* in the operating-bar D.

Mounted on the shaft *e'*, to rotate loosely thereon, is a pattern ratchet-wheel *f*, provided with holes *f'*, in any desired number of which may be fixed pins *f<sup>2</sup>*, having projecting pointed ends to engage a slide-rod *f<sup>3</sup>*, mounted loosely in the bracket E, so as to have a free endwise movement, said rod being pressed toward the ratchet-wheel *f* by a spring *e<sup>4</sup>* on the arm *e<sup>2</sup>* of the shaft *e'*. A spring-lever *e<sup>5</sup>*, pivotally attached to said arm *e<sup>2</sup>* and engaging the coupling-pin *e<sup>3</sup>*, is so placed that its rear end is pressed against the slide-rod *f<sup>3</sup>* by the spring *e<sup>4</sup>*, so that when the said slide-rod is forced outward by any one of the pointed pins *f<sup>2</sup>* the forward end of the said spring-lever will press the pin *e<sup>3</sup>* against the operating-bar D, and thus when said pin by the vibration of the constantly-moving arm *e<sup>2</sup>* comes into register with the notch *d'* of said operating-bar said pin will be forced into said notch and thus couple the said operating-bar D to the constantly-vibrating arm *e<sup>2</sup>* to operate the ruffer to cause the blade thereof to form a plait between the time of formation of two stitches, the coupling-pin *e<sup>3</sup>* being withdrawn from the bar D as soon as the point of the pin *f<sup>2</sup>* passes the slide-rod *f<sup>3</sup>*. The arc of vertical movement of the rear end of the spring-lever *e<sup>5</sup>* is so short that said lever does not move out of contact with the outer end of the rod *f<sup>3</sup>*.

The pattern ratchet-wheel *f* is intermittently rotated by a spring-pressed pull-pawl *g*, carried by a lever G, pivoted at its lower end to the bracket E and provided above its pivot with a pin or roller-stud *g'*, engaged by a depending fork *e<sup>6</sup>*, attached to the arm *e* of the rock-shaft *e'*, a detent-spring *g<sup>2</sup>* preventing backward rotation of said ratchet-wheel.



In the operation of the machine the pattern ratchet-wheel  $f$  is intermittingly rotated and the rock-shaft  $e'$  is in constant operation, so that the arm  $e^2$ , carrying the pin  $e$ , is moved up and down at each rotation of the driving-shaft or at each stitch being formed by the machine. When one of the pins  $f^2$  carried by the said ratchet-wheel comes opposite the slide-rod  $f^3$ , said rod will be forced outward to cause the spring-lever  $e^5$  to press the coupling-pin  $e^3$  against the operating-bar D, so that when in the operation of the vibrating arm  $e^2$  the said pin comes opposite the notch  $d'$  in the said bar D said pin will be forced into said notch to couple said bar with the arm  $e^2$ , and thus cause said bar to be reciprocated vertically to operate the ruffling-blade and cause the latter to form one or more ruffles or plaits, after which by the disconnection of the coupling-pin  $e^3$  from the bar D the further movement of the said bar will be suspended until another of the pins  $f^2$  comes into register with the slide-rod  $f^3$ . Thus the number of stitches to be formed between each plait will be determined by the distance apart of the pins  $f^2$  in the pattern ratchet-wheel  $f$ , said ratchet-wheel being moved forward one tooth at each rotation of the driving-shaft or during the time each stitch is formed by the machine. Any desired number of pins can be inserted in the holes of the ratchet-wheel  $f$ , and by changing the number, positions, or forms of said pins the pattern of the plaiting may be varied without changing the pattern-wheel, as will be understood.

By operating the ruffler or plaiter from an independent bar instead of from the needle-bar of the machine, as heretofore, the needle-bar is relieved from this extra duty, while the independent operating-bar adapts the construction to an automatic connection and disconnection of the ruffler or plaiter operating device with and from its actuating mechanism, so that the machine is adapted to form one plait for any desired number of stitches, or if the projections on the ratchet-wheel be of proper form the machine is adapted to make any desired number of consecutive plaits, one at each stitch.

We do not wish to be understood as limiting our invention to the details herein shown and described, as these may be varied widely without departing from the spirit of our invention.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. The combination with a sewing-machine ruffling or plaiting attachment provided with an actuating-lever, of an operating device, independent of said attachment, for said lever, an actuating mechanism for said operating device, and automatic mechanism for connecting and disconnecting said actuating mechanism and operating device.

2. The combination with a sewing-machine ruffling or plaiting attachment provided with an operating-lever, of an independent oper-

ating-bar for said lever, an actuating mechanism for said operating-bar, and automatic means for connecting and disconnecting said actuating mechanism and operating-bar.

3. The combination with a sewing-machine ruffling or plaiting attachment provided with an operating-lever, of an operating-bar connected with said lever, a rotating pattern-wheel for controlling the movements of the ruffling or plaiting blade of said attachment, a vibrating arm for actuating said bar, and a coupling device, controlled by said pattern-wheel for connecting and disconnecting said arm and bar.

4. The combination with a sewing-machine ruffling or plaiting attachment provided with an operating-lever, of a vertically-reciprocating bar in the head of the machine and independent of the needle-bar, and connected with and serving to operate said lever.

5. The combination with a sewing-machine ruffling or plaiting attachment provided with an actuating-lever, as  $c'$ , of the independent operating-bar D connected with said lever, a vibrating arm for operating said bar, and automatic means for connecting and disconnecting said arm and bar.

6. The combination with a ruffling or plaiting attachment, of an operating-bar therefor, a rock-shaft having an arm connectible with said bar, means for operating said rock-shaft, and automatic means for connecting and disconnecting said arm and bar.

7. The combination with a sewing-machine ruffling or plaiting attachment, of an operating-bar therefor, a rock-shaft having an arm connectible with said bar, means for operating said rock-shaft, a rotating pattern-wheel, and means, controlled by said pattern-wheel, for connecting and disconnecting said arm and bar.

8. The combination with a sewing-machine ruffling or plaiting attachment, of the notched operating-bar D therefor, the rock-shaft  $e'$  having the arm  $e^2$ , the sliding coupling-pin  $e^3$  carried by said arm and adapted to enter the notch of said bar, means for operating said rock-shaft, the rotating pattern-wheel, and means, controlled by said pattern-wheel, for coupling and uncoupling said pin and bar.

9. The combination with a sewing-machine ruffling or plaiting attachment, of the notched operating-bar D, the rock-shaft  $e'$  having the arm  $e^2$  provided with the sliding coupling-pin  $e^3$ , means for operating said rock-shaft, the rotating pattern ratchet-wheel having projecting pins, the slide-rod  $f^3$  to be engaged by said pins, the spring  $e^4$  and the lever  $e^5$  mounted on said arm, said lever engaging said coupling-pin  $e^3$ .

In testimony whereof we affix our signatures in the presence of two witnesses.

PHILIP DIEHL.

MARTIN HEMLEB.

Witnesses:

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HAROLD W. BROWN.