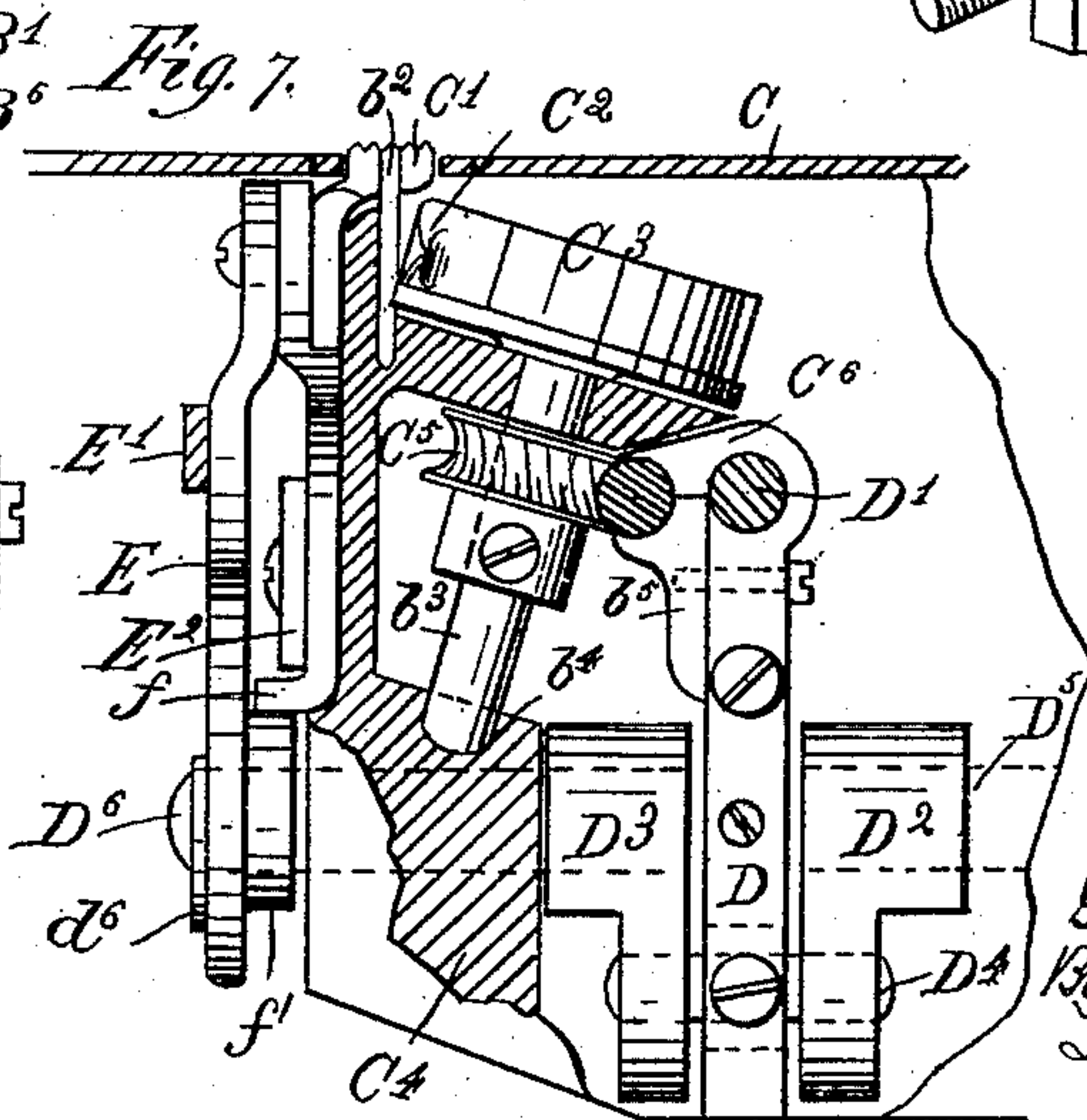
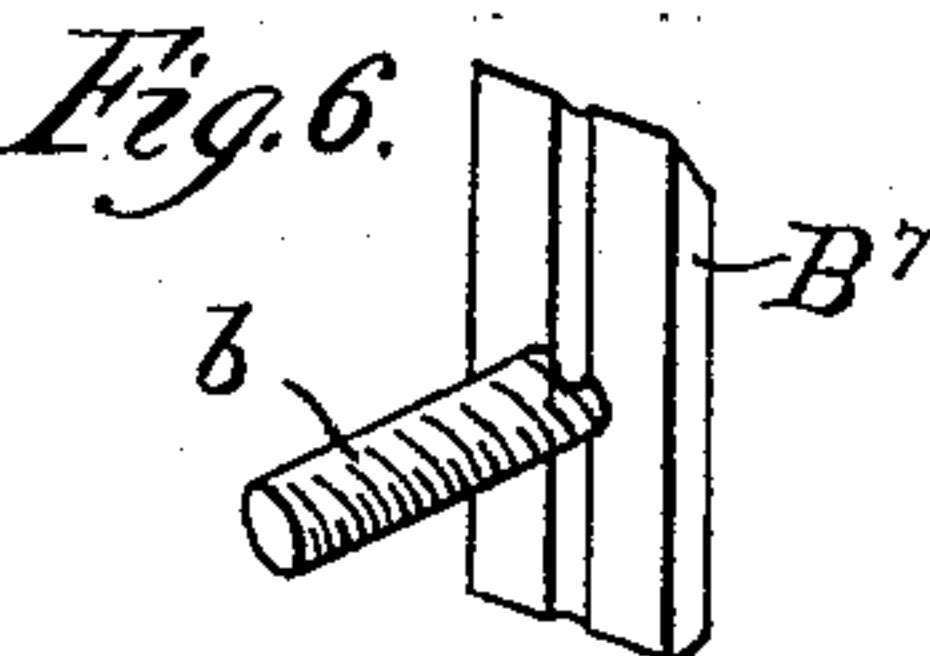
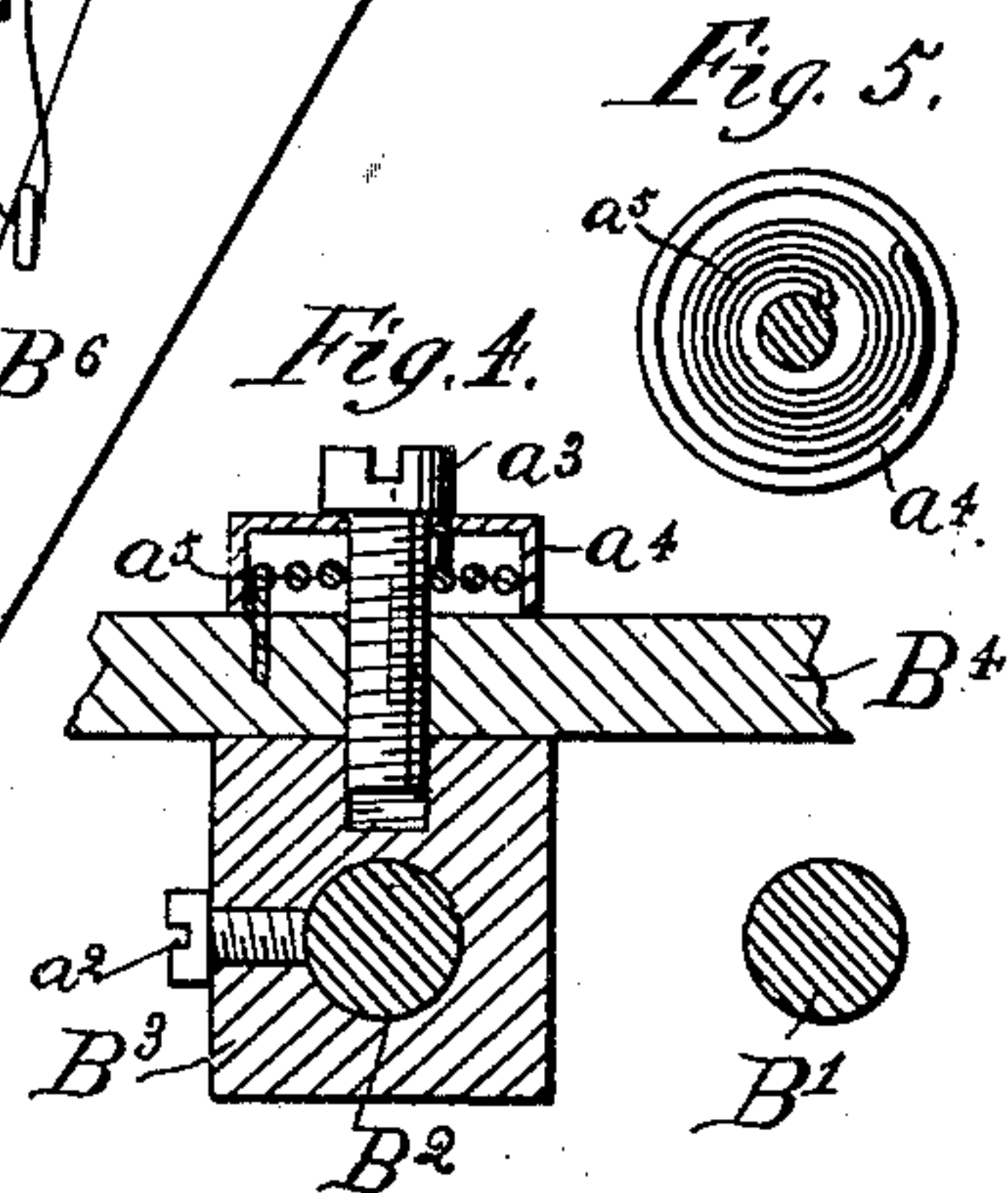
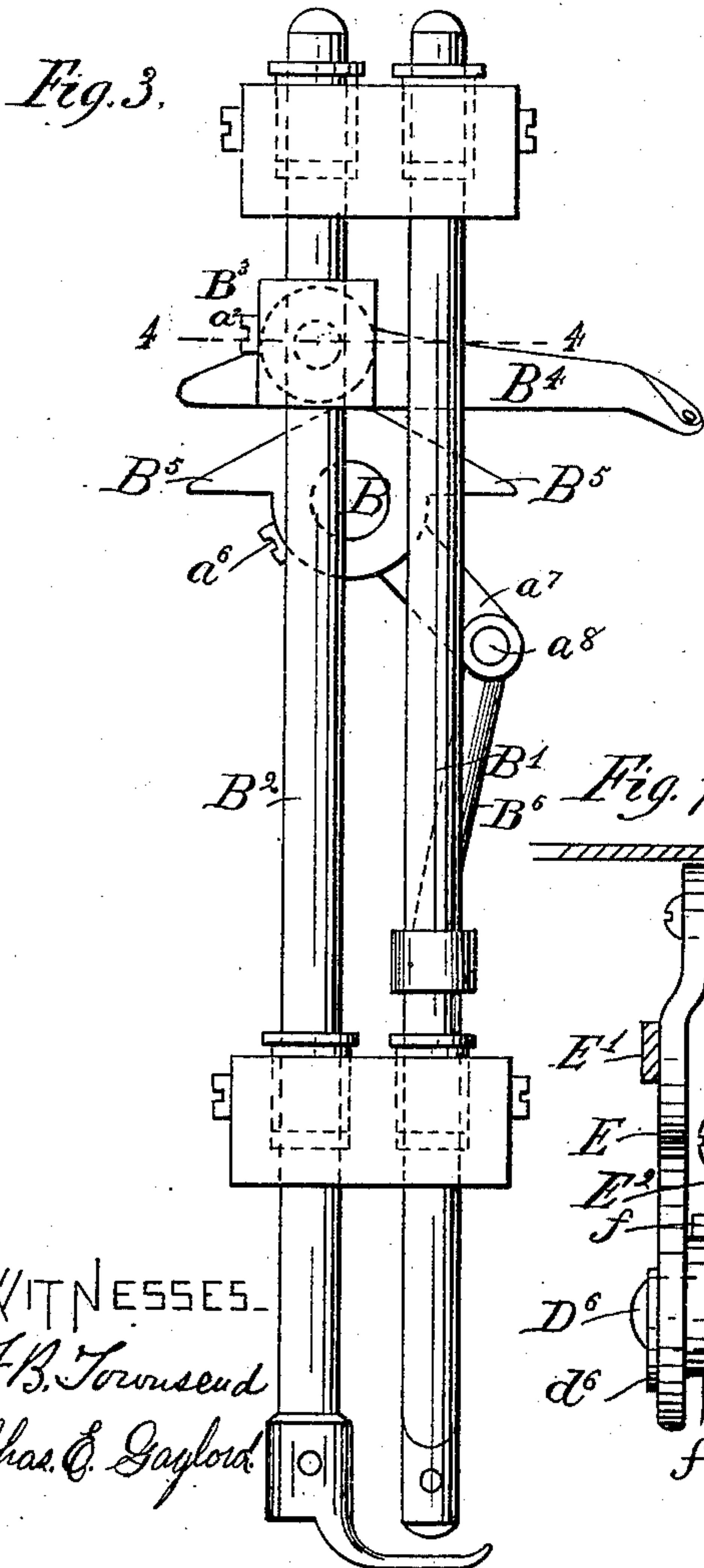
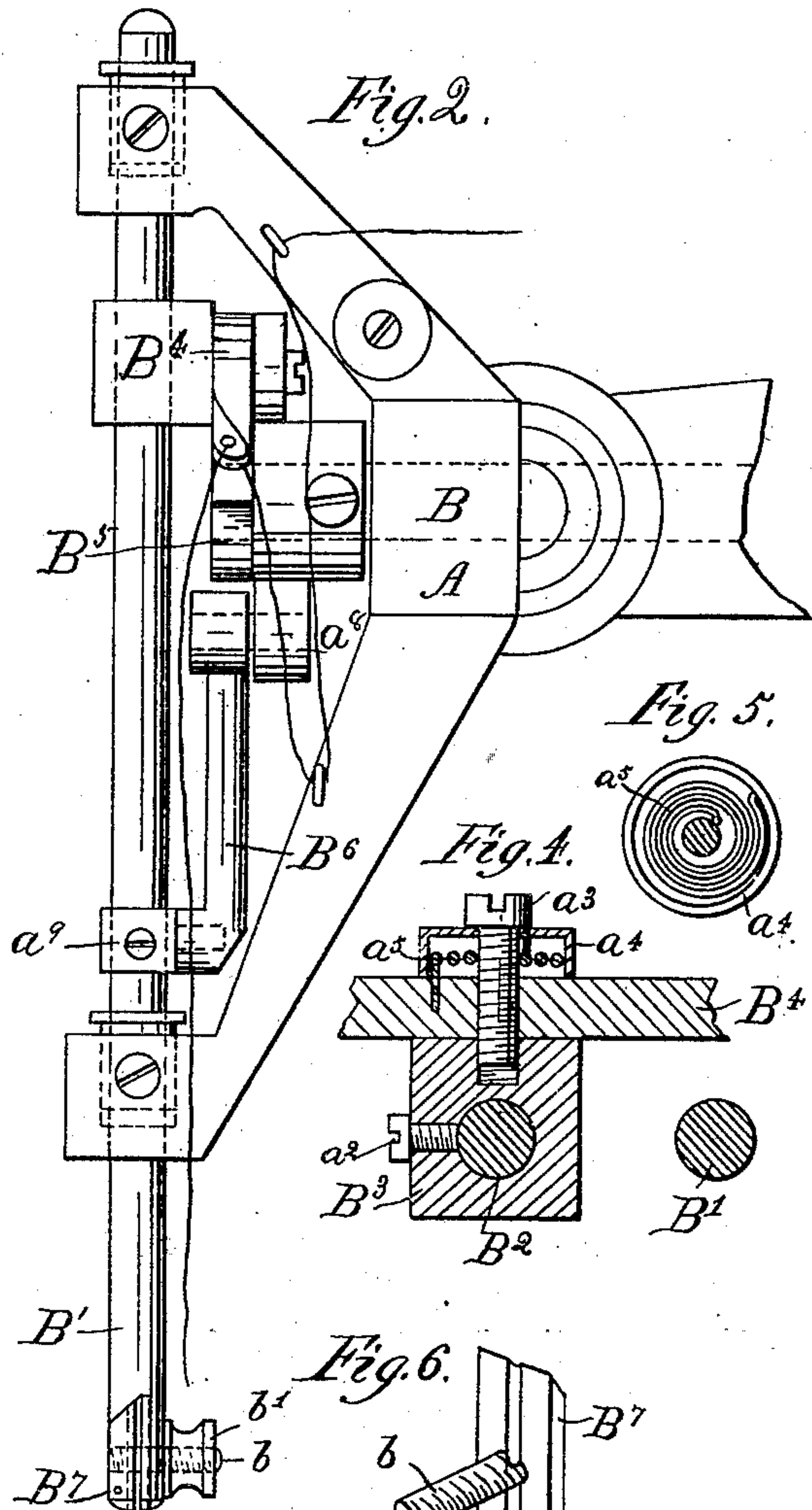
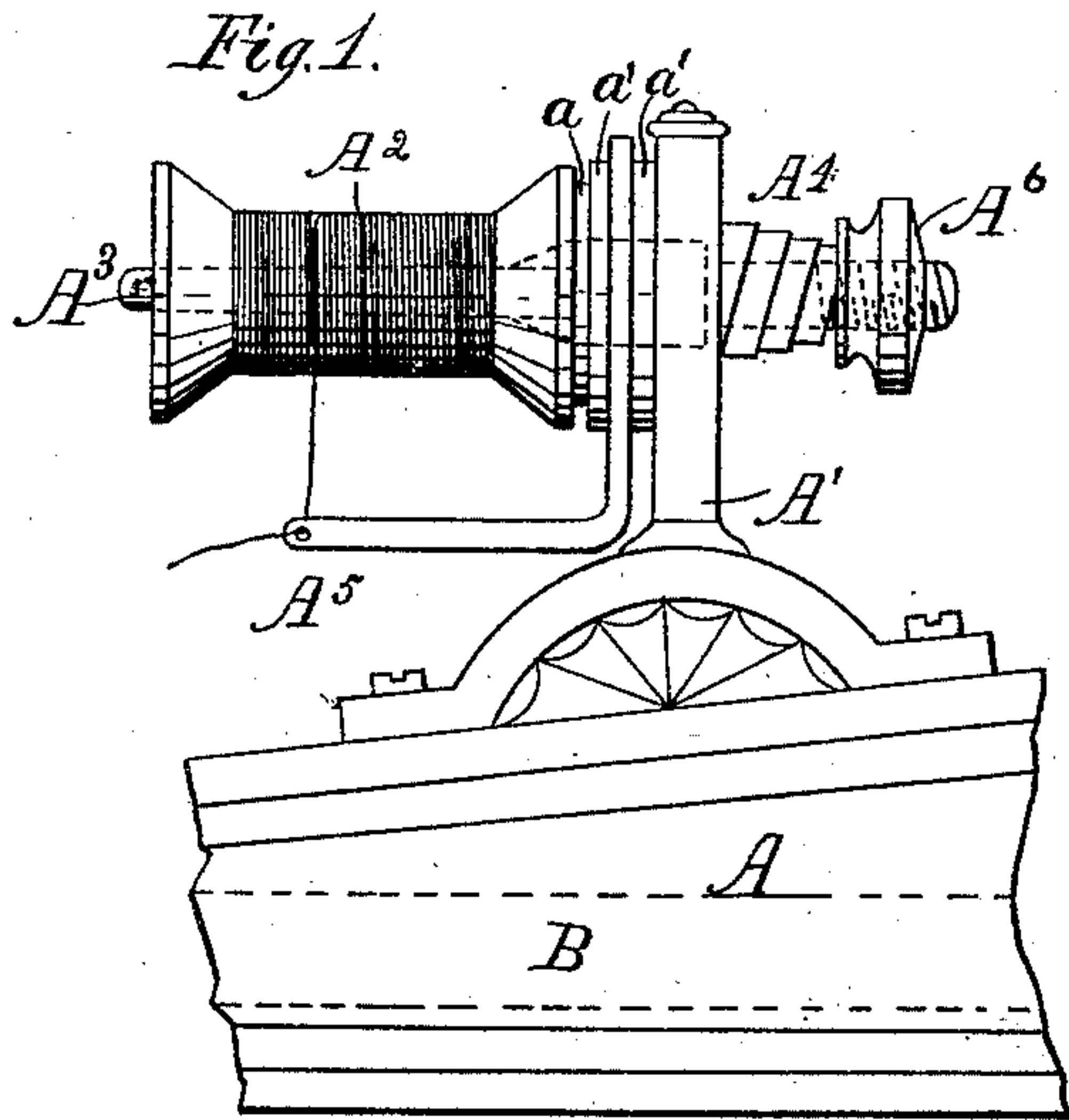


G. S. DARLING.
SEWING MACHINE.

No. 266,977.

Patented Nov. 7, 1882.



WITNESSES.
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(No Model.)

3 Sheets—Sheet 2.

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Fig. 8.

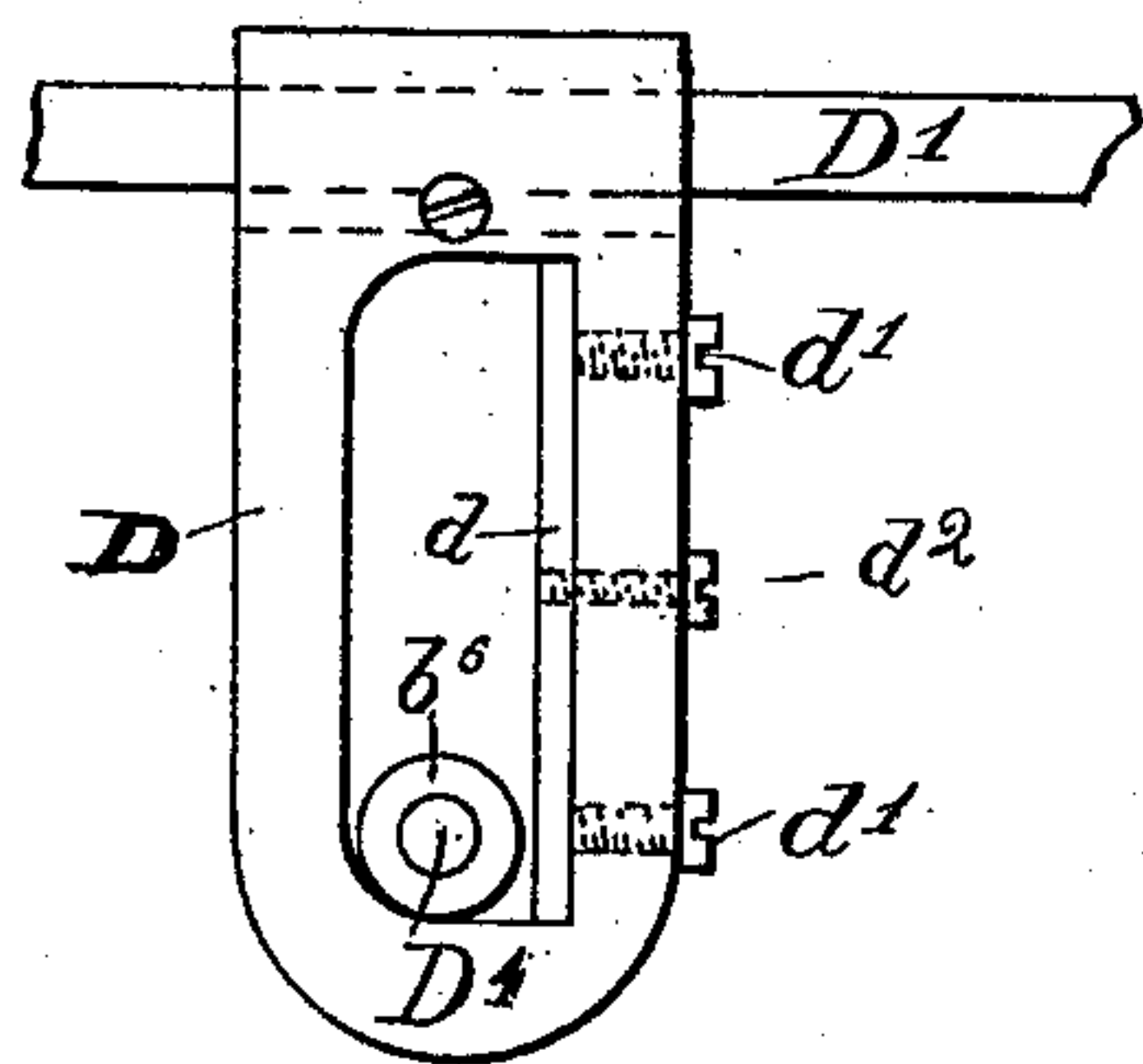


Fig. 9.

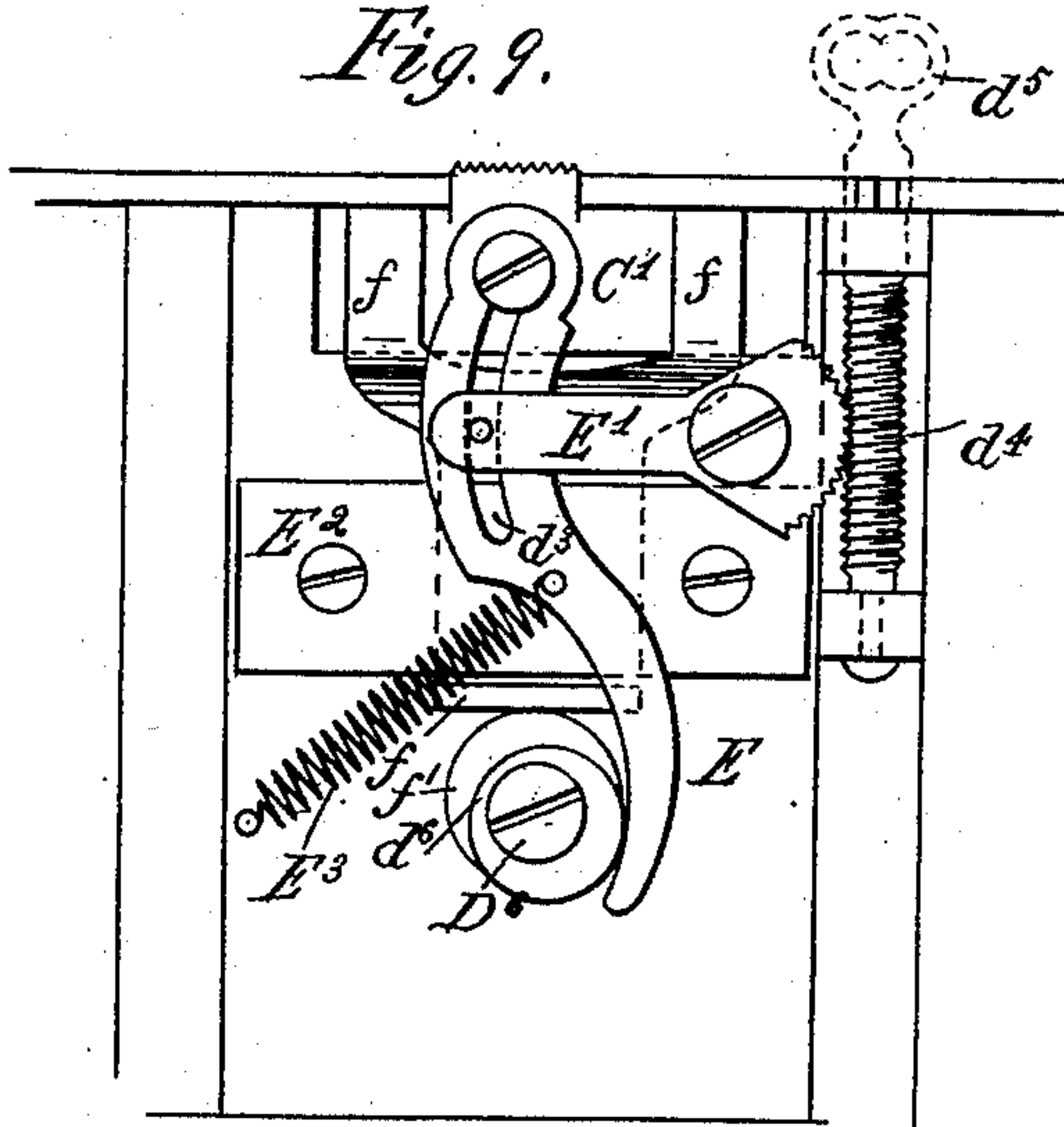


Fig. 11.

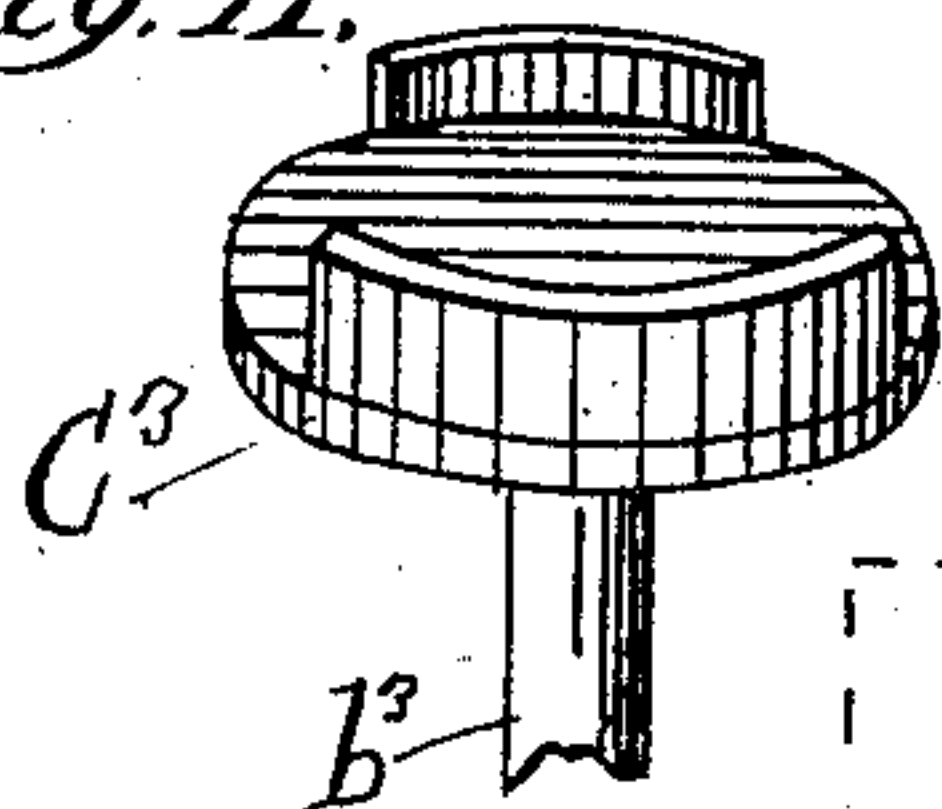


Fig. 10.

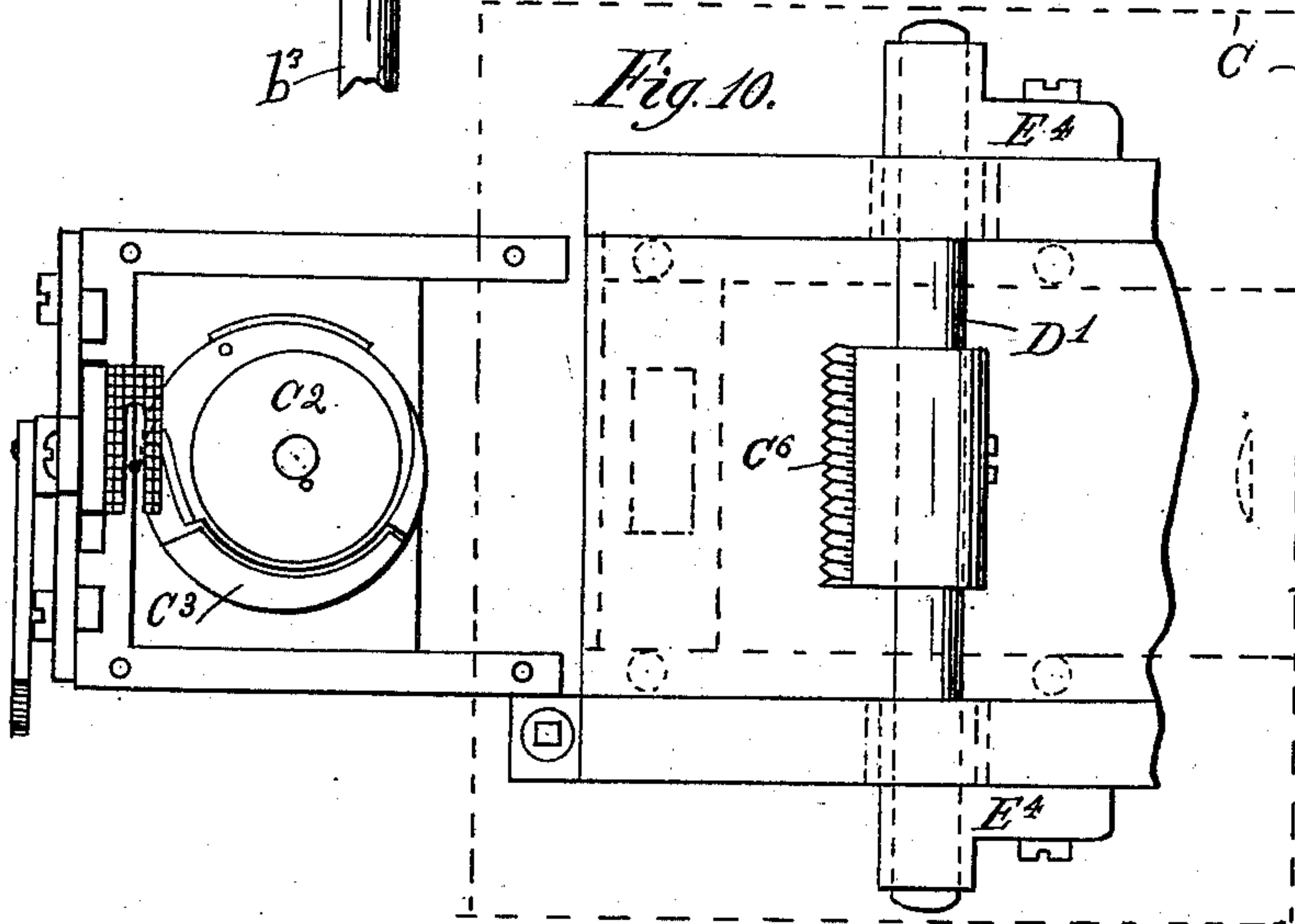
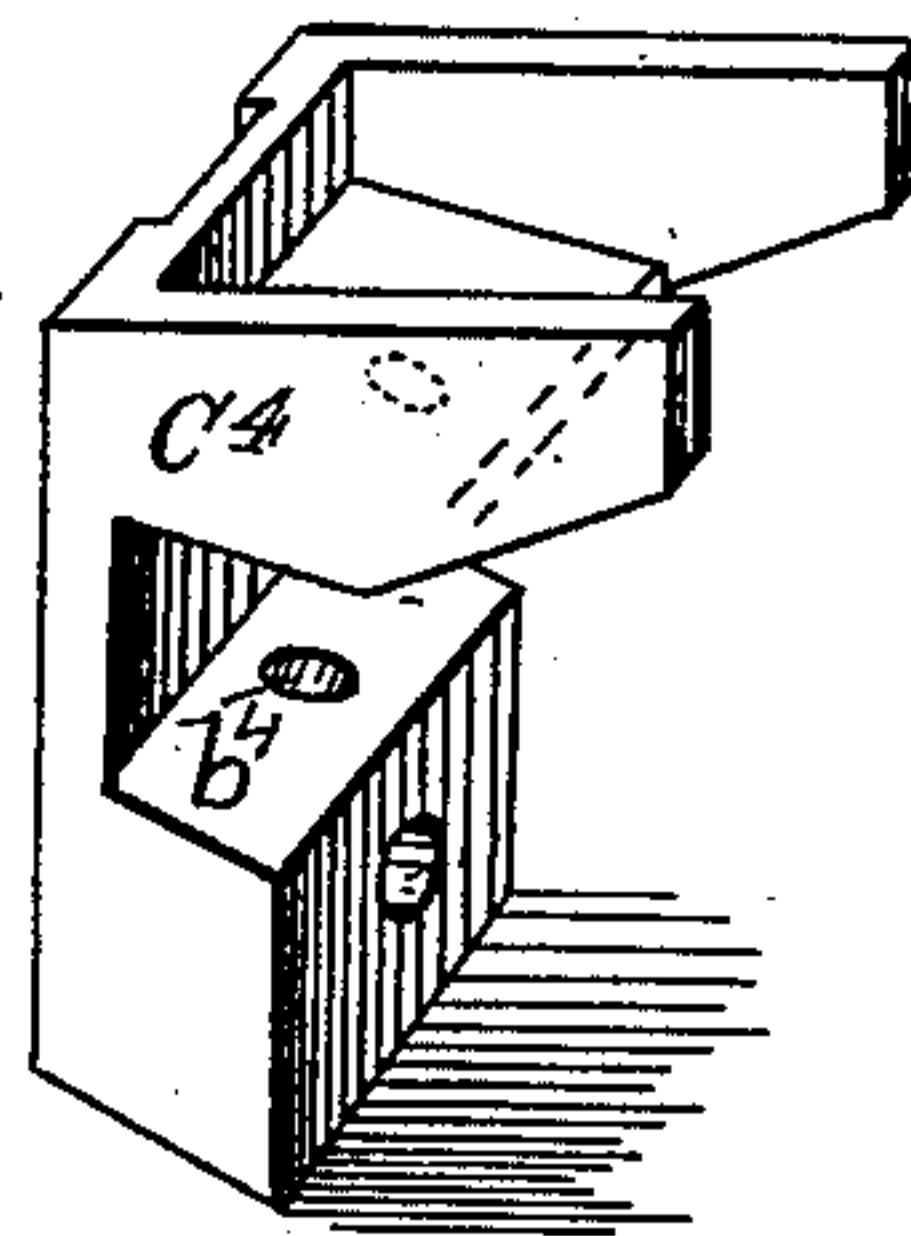


Fig. 12.



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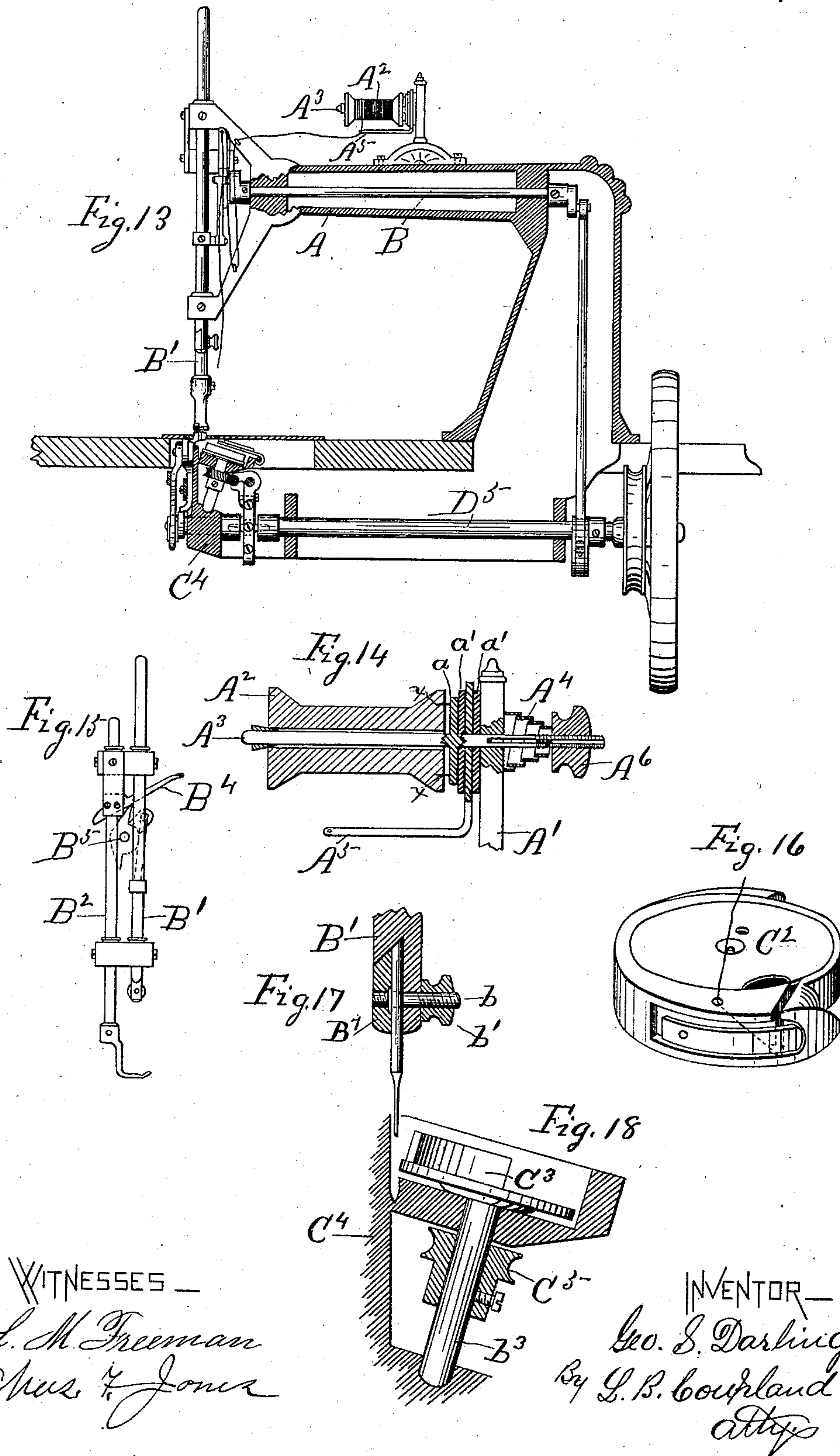
(No Model.)

3 Sheets—Sheet 3.

G. S. DARLING.
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No. 266,977.

Patented Nov. 7, 1882.



N. PETERS; Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE S. DARLING, OF CHICAGO, ILLINOIS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 266,977, dated November 7, 1882.

Application filed September 1, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. DARLING, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, that will enable others to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, forming a part of this specification.

This invention relates to an improvement in sewing-machines; and it consists of certain novel features, as will be hereinafter more fully set forth in detail, and pointed out in the claims.

Figure 1 shows a broken-away portion of the bracket-arm of a sewing-machine carrying the tension mechanism; Fig. 2, a side elevation of a portion of a sewing-machine embodying my improvements; Fig. 3, a front elevation of Fig. 2; Fig. 4, a horizontal section in the plane 4 4, Fig. 3. Fig. 5 is a face view of the spring and inclosing-cap shown in Fig. 4. Fig. 6 is a detached detail of construction from the lower end of the needle-bar. Fig. 7 is an elevation showing a broken-away portion of the main shaft, the position of the shuttle and carrier, and the actuating mechanism. Fig. 8 is a detached side view of the slide-yoke embracing the crank-pin. Fig. 9 is a face view of the feed-regulating mechanism. Fig. 10 is a top view of a portion of the machine, the outside dotted lines representing the cloth-table, the shuttle and adjacent parts being removed from their working position to show the shuttle-driving rack. Fig. 11 is a perspective of the shuttle-carrier. Fig. 12 is a perspective of a bracket supporting the shuttle-carrier shaft, the position and a vertical section of which is shown in Fig. 7. Fig. 13 is a vertical longitudinal section of a sewing-machine embodying my improvements. Fig. 14 is a longitudinal section of the spool and tension device. Fig. 15 is a front elevation of the presser-bar and needle-bar; Fig. 16, a perspective of the shuttle. Fig. 17 is an enlarged vertical section of the lower broken-away end of the needle-bar, showing the needle-clamping device; and Fig. 18 is a vertical section of the part supporting the shuttle-carrier, showing the same in place and the relative position of these parts with the needle.

Referring to Figs. 1 and 14 of the drawings, A represents a bracket-arm, A' the stand supporting the tension mechanism, and A² a threaded spool. The collar *a* is formed integral with the spool-pin A³. The vertical part of the stand A' forms an abutting shoulder for the inner end of the volute tension-spring A⁴. The side of the collar *a* next to the inner end of the spool is provided with the sharp projecting spurs *xx*, (shown in Fig. 14 of the drawings,) which are adapted to penetrate the end of and hold the spool in a stationary position. The spool and spindle remain stationary while the flier or tension arm A⁵ revolves around the same. The inner end of the flier-arm has a bearing on the spool-pin between the elastic or cloth washers *a' a'*, the outer end being perforated for the passage of the thread. A continuation of the thread broken away is shown in Fig. 2 of the drawings, the thread passing through the upper and lower guides on the bifurcated end of the bracket-arm A before it reaches the take-up device. The tension is regulated by the hand or tension nut A⁶, having a threaded connection with the spool-pin and bearing against the end of the spring A⁴. When the tension-nut is tightened it has the effect of causing a slight longitudinal movement of the spool-pin in the direction of the stand A', drawing the collar *a* against the cloth washers and giving these parts a closer frictional bearing on the flier-arm. By this arrangement the spool is held in a stationary position while the flier-arm revolves around the same, thereby unwinding uniformly just the quantity of thread required and preventing the same from becoming twisted or tangled.

Referring to Figs. 2 and 3 of the drawings, B represents a rock-shaft, which actuates the needle-bar and take-up mechanism. This rock-shaft passes longitudinally through the bracket-arm A, and has the usual connection at the back end with the main rotating shaft D⁵, as shown in Fig. 13 of the drawings. The needle-bar B' and the presser-bar B² have bearings in the bifurcated end of the bracket-arm A, and are adapted to have vertical movements therein. Secured to the presser-bar by means of the set-screw *a*² is the bracket B³, which supports the oscillating take-up arm B⁴. The take-up arm is secured to the bracket B³ by the ad-

justing-screw a^3 , which passes through the cap a^4 , inclosing the spring a^5 . A horizontal section of these parts is shown in Fig. 4 of the drawings. The coiled spring a^5 is confined in the cap a^4 , one end being connected to the upper part of the cap and the opposite end to the take-up arm B^4 , the tension being regulated by rotating the cap a^4 , which is adjustably secured by the screw a^3 . Placed upon the rock-shaft B and bearing against the under side of the take-up arm B^4 is the double rocker-arm B^5 . This arm is secured to the shaft B by the set-screw a^6 , and is provided with the projecting crank-arm a^7 , having a pin, a^8 , as shown in Figs. 3 and 13 of the drawings, and by dotted lines in Fig. 2. The pin a^8 connects the crank-arm with the upper end of the pitman-rod B^6 . The lower end of this rod has a bearing on a stud forming an integral part of the collar a^9 , attached to the needle-bar. This stud is shown by dotted lines and fits into a recess in the lower end of the pitman-rod B^6 , which is adapted to have a slight oscillating movement thereon.

The construction and operation of the rocker-arm B^5 is such that it may properly be termed a "double arm," which serves to impart a corresponding action or movement of the take-up arm, causing both a positive and elastic movement, forcing the take-up arm to slack the needle-thread at the proper time, and also forcing the same upward to set the stitch and draw off the required thread, while between the two positive movements the take-up is free to obey the action of the coiled spring a^5 or yield to the requirements of the shuttle. This arrangement prevents any jar in these parts. The double rocker-arm, having a continuous bearing or contact with the take-up arm, renders the operation of these parts smooth and noiseless, and at the same time these parts are strong, simple, and durable. The extended outer end of the take-up arm is beveled off, as shown, and perforated for the passage of the thread.

Referring to Fig. 6 of the drawings, B^7 represents a detachable part of the lower end of the needle-bar. This piece is semicircular in form, corresponding to the adjacent part of the needle-bar illustrated in Fig. 17 of the drawings. The upper end of this detachable piece is cut away at an oblique angle, the bevel ranging downward and outward. The joining part of the needle-bar is cut away to correspond to the bevel end on the part B^7 . These parts are grooved for the reception of the needle, the upper end of which is beveled off, as shown in Fig. 17 of the drawings, to correspond with and fit into the bottom of the needle-passage, thereby making it impossible to get the needle in the wrong way or set it too high, and always bringing the eye of the needle to the right position relative to the shuttle. The needle is clamped in position by means of the screw-stud b and nut b' .

Referring to Fig. 7 of the drawings, C represents the line of the cloth-table; C' , the feed-

plate; b^2 , the needle-passage to shuttle; C^2 , the shuttle; C^3 , the shuttle-carrier, and C^4 a bracket supporting the shuttle mechanism. Fig. 12 is a perspective of the bracket C^4 .

The shuttle is circular in form, and is adapted to have a rotary reciprocating movement, traveling about three-fourths of its circle. The shuttle-carrier is of the form shown in Fig. 11 of the drawings, and is provided with the arbor b^3 , the lower end of which has a recessed bearing, b^4 , in the lower ledge of the bracket C^4 , the opposite end passing through and having a bearing in the upper ledge. The shuttle and carrier are set on an inclined angle at about the degree of inclination shown in the drawings, which arrangement has the effect of presenting a free line to the needle-thread, and no square corners to be turned.

C^5 represents a screw-wheel, placed upon the shuttle-carrier arbor and actuated by engagement with the screw rack or worm C^6 , a top view of which is shown in Fig. 10. The binding-piece b^5 is attached to the yoke D, and assists to support and retain in proper place the screw-rack C^6 . Passing through the upper end of the yoke D is the supporting-rod D' . The yoke D, a side view of which is shown in Fig. 8 of the drawings, is placed between the cranks D^2 and D^3 and embraces the crank-pin D^4 . One end of said crank-pin is connected with the crank D^2 , which is on the main rotating shaft D^5 , the opposite end being connected with the crank D^3 on the shaft D^6 , which actuates the feed mechanism. That part of the crank-pin D^4 having a bearing in the yoke D is inclosed by the bushing b^6 , which is held to a close bearing in the yoke by the strap or backing-gib d and the set-screws d' . The strap d is secured in place and prevented from rattling by means of the tap-bolt d^2 .

A side view of the feed-regulating mechanism is shown in Fig. 7 and a face view in Fig. 9 of the drawings. The feed mechanism consists of the curved feed-lever E, provided with the segmental slot d^3 , which permits of the proper adjustment of the arm E' , having geared connection with the hand regulating-screw d^4 , controlled by the key d^5 . The serrated end of the arm E' , engaging with the screw d^4 , is in the line of a circle, compelling a corresponding movement of the opposite end of the arm in the segmental slot d^3 . The lower curved end of the feed-lever E bears against the eccentric d^6 , placed on the shaft D^6 . The lift-bar f is of the form shown in Fig. 9, the lower end resting on the eccentric d^6 and the upper bifurcated end inclosing the downwardly-projecting end of the feed-bar C' . The strap E^2 secures the lift-bar f in place. The spiral spring E^3 retains the lower end of the feed-lever in contact with the eccentric d^6 .

Fig. 10 is a top view of the machine, showing the feed and shuttle mechanism drawn out, and showing the supporting-rod D' and the screw-rack C^6 , which engages with the screw-wheel C^5 . The bearings E^4 are provided with elon-

gated openings on the sides, through which pass the attaching-screws, thereby permitting these bearings to have a horizontal adjustment.

5 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

10 1. The combination, with the flier or tension arm A⁵, of the stationary spool A² and the spool-pin A³, having the collar *a* formed integral therewith, which is provided with spurs adapted to penetrate the end of the spool and secure the same in a locked position, substantially as described.

15 2. The combination, with the flier or tension arm A⁵, of the spool-pin A³, having the collar *a*, the elastic washers *a'* *a'*, the tension-spring A⁴, and the adjusting-nut A⁶, substantially as described.

3. The combination, with the rocking shaft 20 B, of the double rocker-arm B⁵ and the take-up arm or lever B⁴, substantially as described.

4. In a sewing-machine, the needle-bar B', provided with the detachable part B⁷, cut away at an oblique angle and adapted to receive a 25 needle having a beveled upper end corresponding thereto, substantially as and for the purpose described.

5. The combination, with the main shaft D⁵, of the crank D², the crank-pin D⁴, the yoke D, 30 the screw-rack C⁶, the screw-wheel C⁵, the arbor *d*³, the shuttle-carrier C³, and the bracket C⁴, substantially as herein shown and described.

GEO. S. DARLING.

Witnesses:

W. A. SCHONFELD,
A. STEPHENS.