

G. BENSON.
Sewing Machine.

No. 238,556.

Patented March 8, 1881.

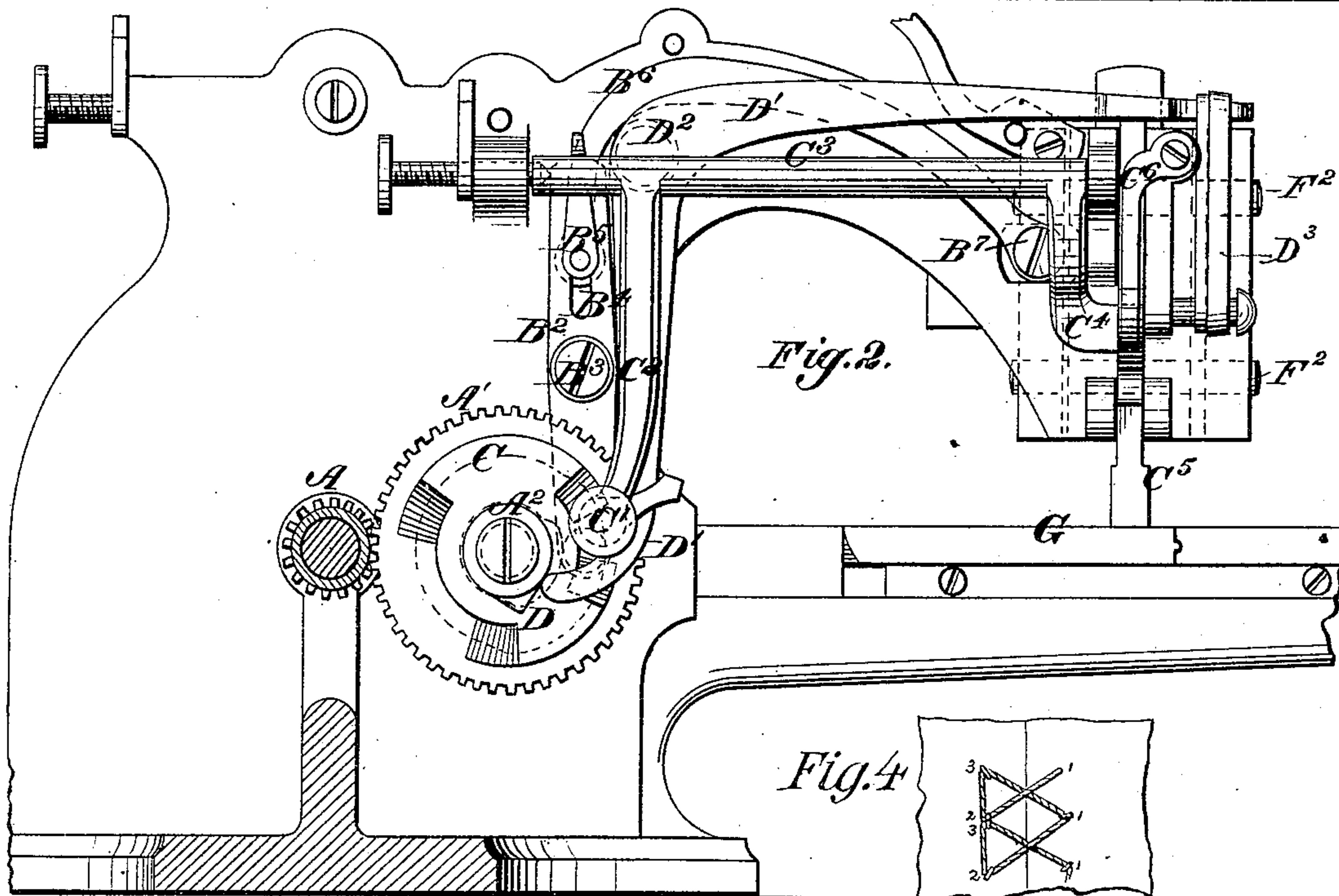
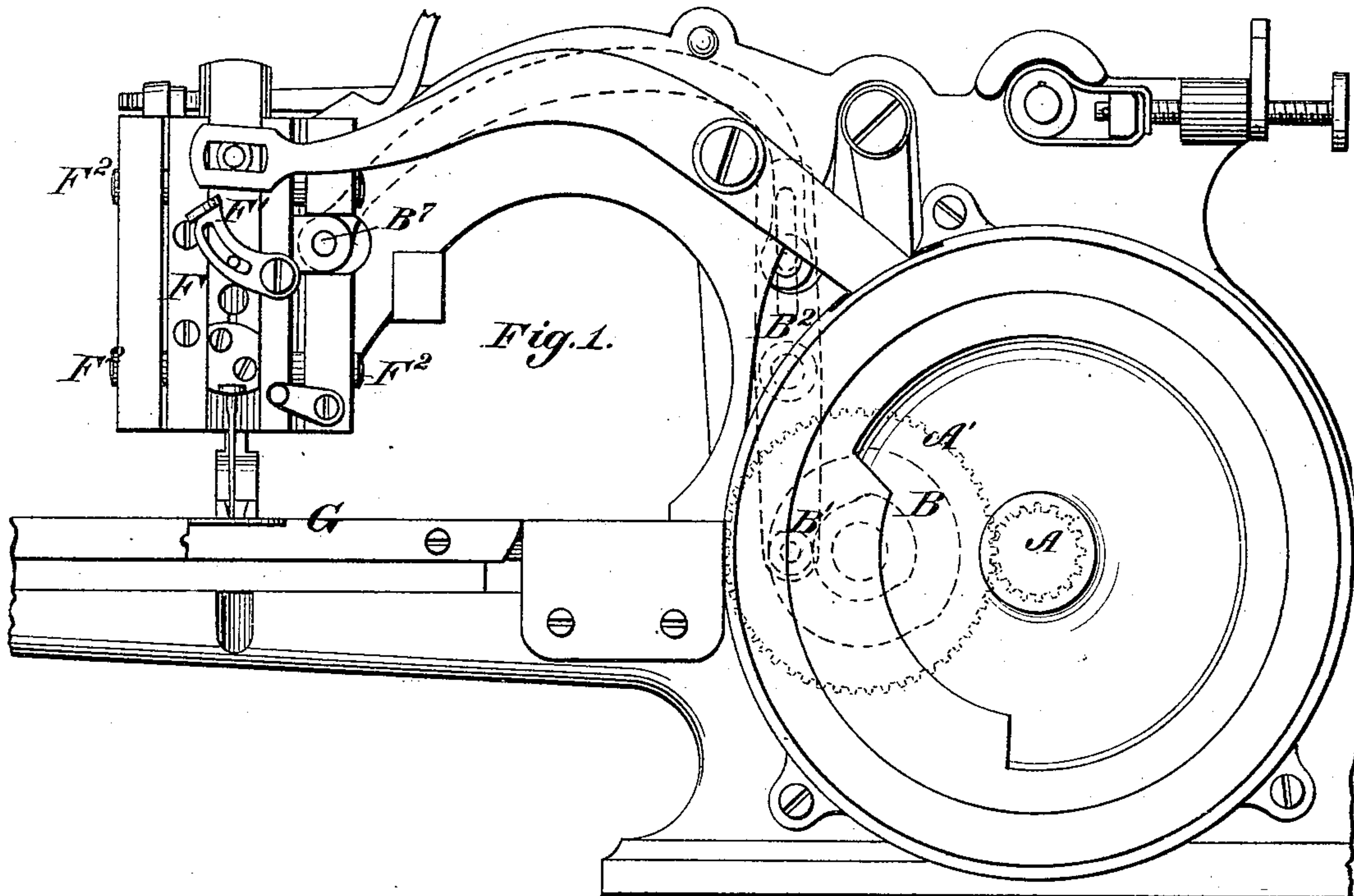
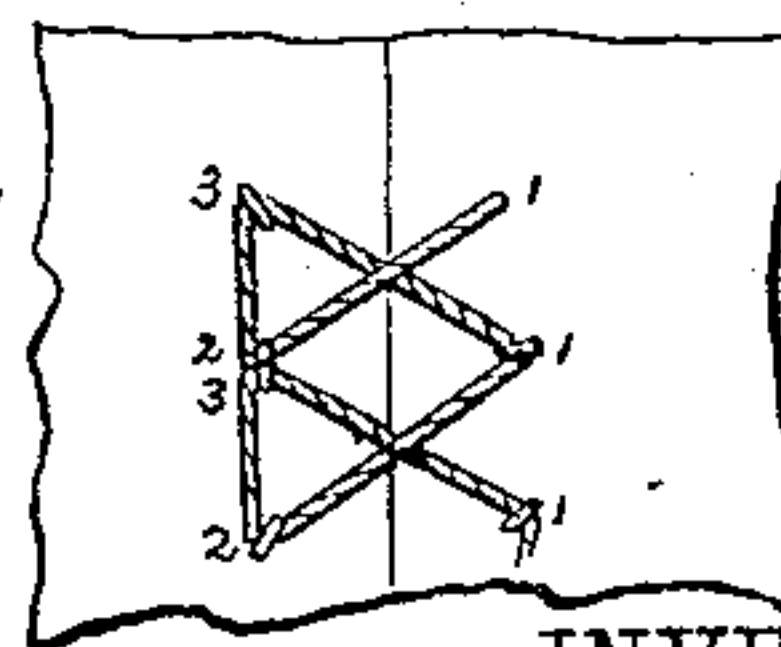
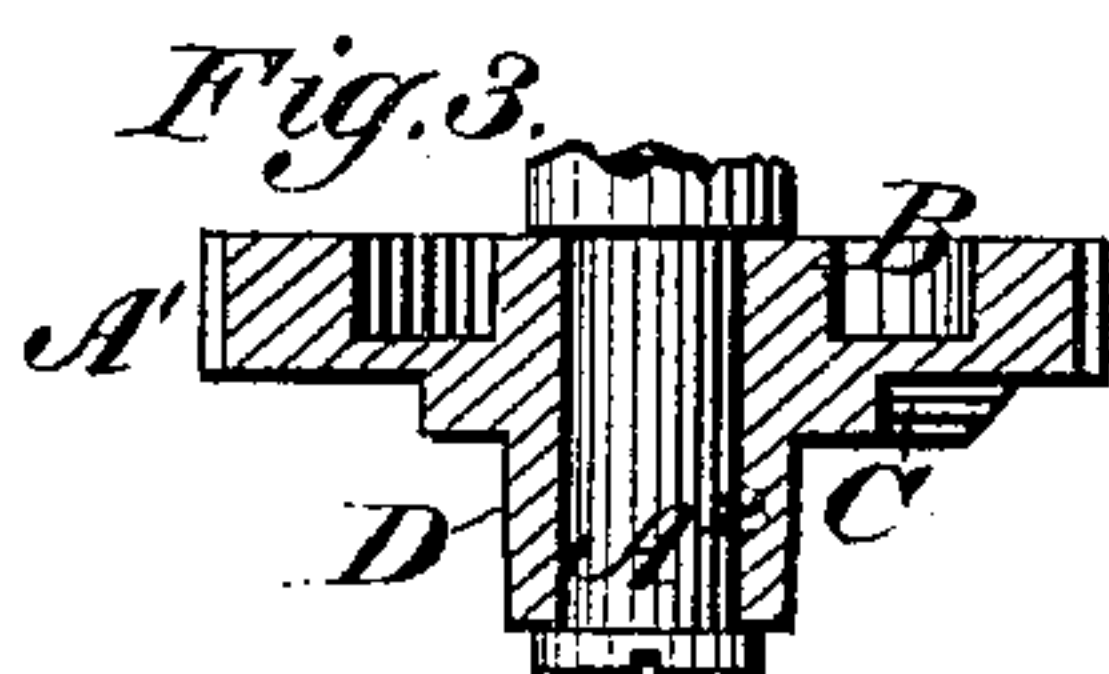


Fig. 4



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Fig. 5

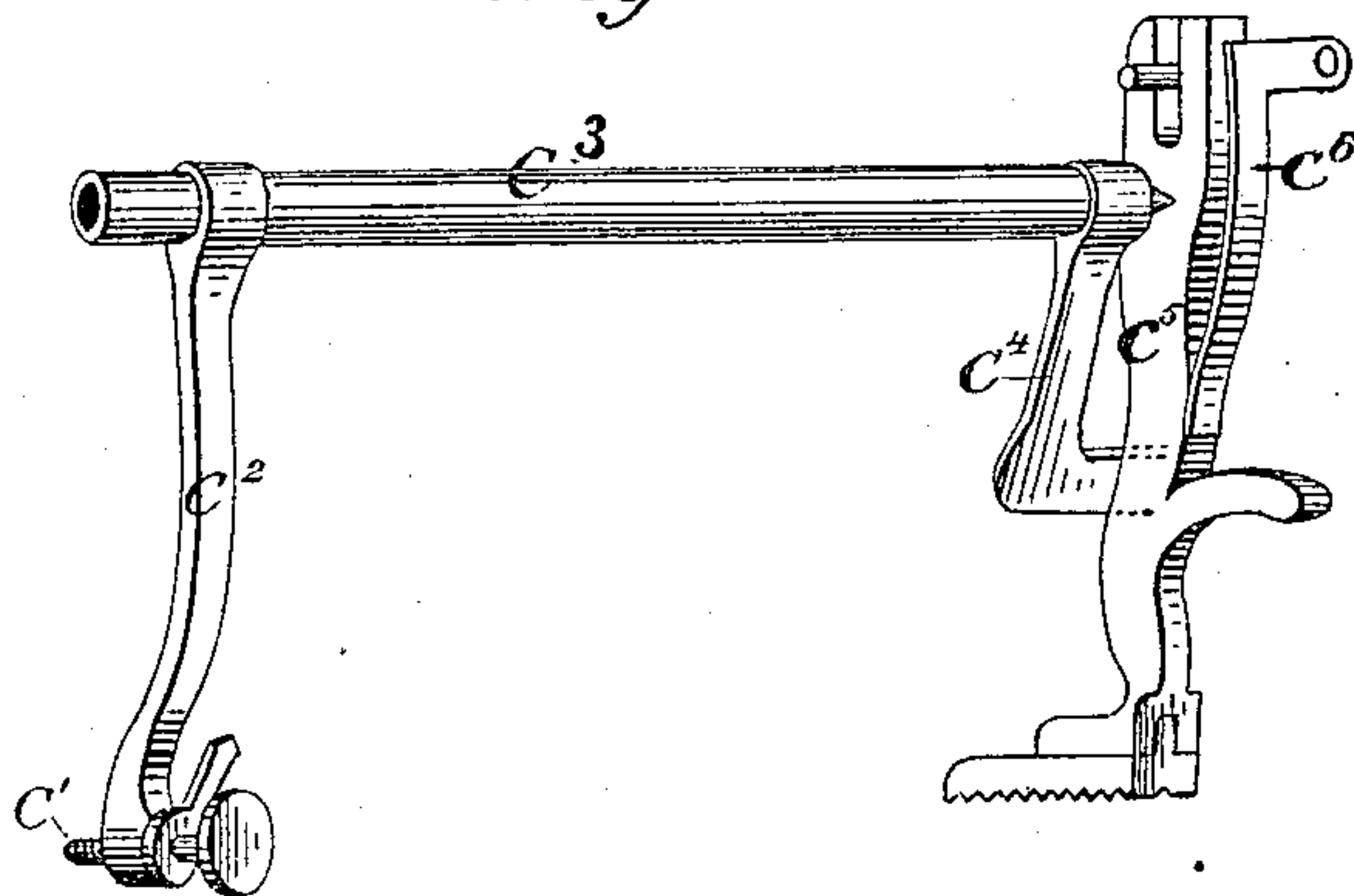
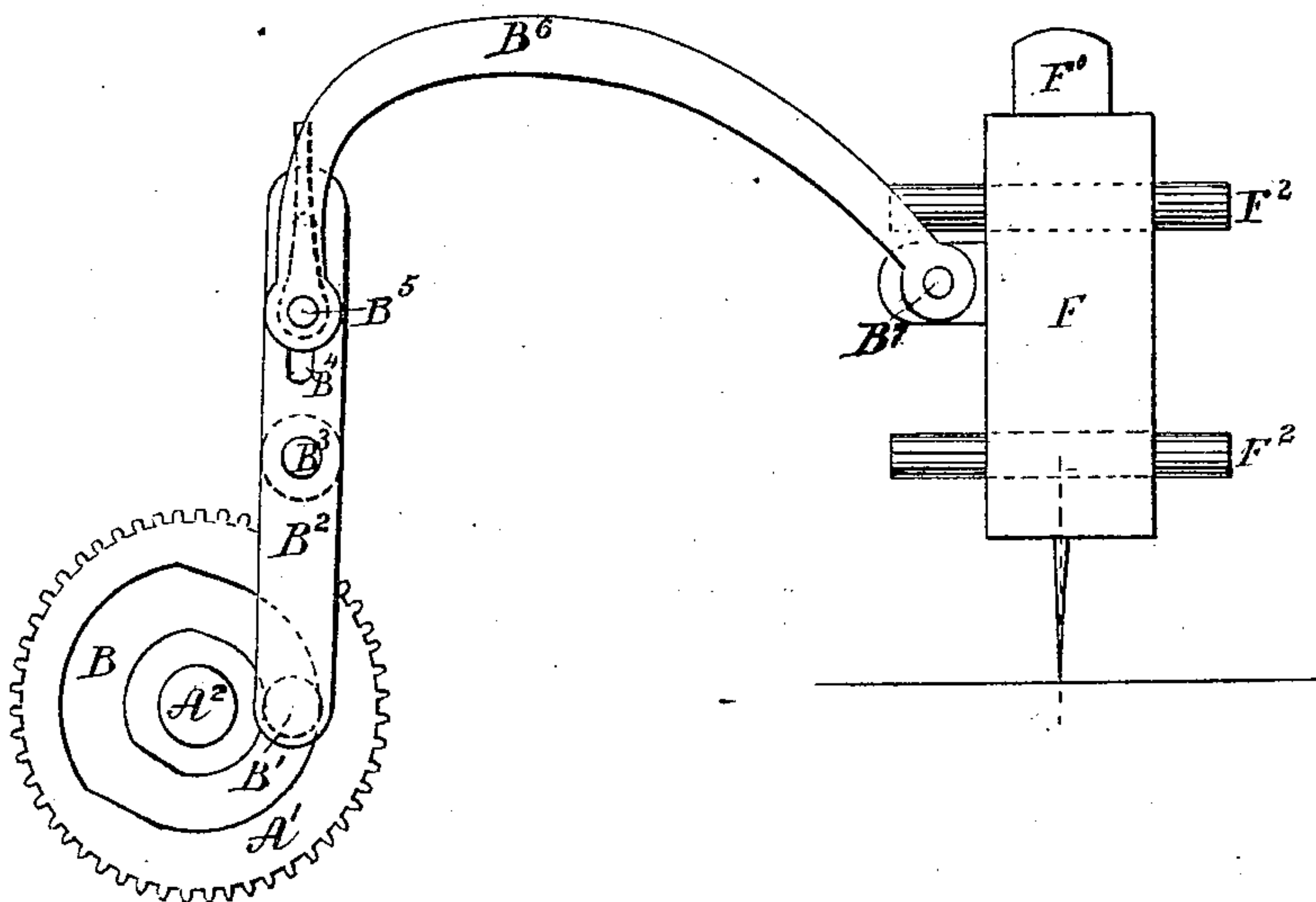


Fig. 6



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE BENSON, OF BELFAST, COUNTY OF ANTRIM, IRELAND.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 238,556, dated March 8, 1881.

Application filed February 18, 1880. Patented in England November 22, 1879.

To all whom it may concern:

Be it known that I, GEORGE BENSON, of Belfast, in the county of Antrim, Ireland, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My improvements relate to that class of sewing-machines which are employed for making the "French vein" or hemstitch; and the invention consists in certain improved means and arrangements for operating the needle and feed mechanism, as will be hereinafter more fully described in the specification, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front side elevation of a machine embodying my invention; Fig. 2, a rear side elevation thereof, partially in section, showing my improvements as applied to a sewing-machine; Fig. 3, a sectional detail of the same, the view being taken through the spur-wheel and cams for operating the feed and needle-shifting devices; Fig. 4, a plan view of a section of work, showing the peculiar form of stitch made by the machine; Fig. 5, a detail, in perspective, of the presser-foot and lever mechanism for operating it; and Fig. 6 a side elevation, in detail, of the needle-bar guide and the adjustable lever and cam for operating it, in which figures like parts are indicated by the same letters of reference.

A is a spur-pinion on the driving shaft or spindle of the sewing-machine, meshing with and driving the spur-wheel A', which is in a piece integral with all the cams required to give the feed motions and lateral movements of the needle necessary to produce the hemstitch, and revolves on a stud, A², fixed in the frame of the machine.

B is a cam-groove cut in back face of the wheel A', (see detail Figs. 3 and 6,) in which works a small roller, B', that is on the end of a lever, B², which rocks on a stud, B³, fixed in the frame of the machine.

B⁴ is a slot cut in the end of rocking lever B², through which passes the screw-pin B⁵, provided with a finger-nut for adjustment into the connecting-arm B⁶; and B⁷ is a screw-pin passing through the opposite end of arm B⁶, and through a hole in the frame into a lug on the needle-bar guide F.

C is a face-cam on front of the spur-wheel A', which acts against a screw-pin, C', which passes through the end of an arm, C², that is formed with or attached to the rock-shaft C³, that is fitted in bearings on the frame. From the opposite end of shaft C³ projects an arm, C⁴, which passes between the feed-bar C⁵ and the frame, and is kept in close contact with the inner side of the feed-bar by means of the flat spring C⁶.

D is a cam on wheel A', which presses against and raises the bell-crank lever D', which rocks on the stud D², and extends at its opposite end over the feed-bar C⁵, and is held with a sufficient pressure upon the upper end of the feed-bar C⁵ by a tension-spring, D³, secured at one end to a fixed pin on the frame, and secured at its other end to the end of the arm or lever D', by which means pressure is exerted and released at proper intervals upon the feed-bar C⁵.

The needle-bar guide or block F carries the needle-bar F', and is fitted in a recess at the end of the machine-arm or goose-neck on pins F², that pass horizontally through the said recess, and form a solid support for the guides F, on which such guide may move in a direction in line with the shuttle-box G. This movement is imparted to the guide F, by the arm B⁶ and connections before described, from the cam-groove B, and it will be seen that in either position of guide F the needle-bar F' is sustained vertically, and the needle will pass vertically through the work.

The necessary forward and backward movements are given to the feed-bar C⁵ by the joint action of cam C, arm C², rock-shaft C³, arm C⁴, and flat spring C⁶, while the lever D' and tension-spring D³ give the required pressure to the feed-bar at the proper time.

The operation of the machine will be understood by reference to Fig. 4, in which the numerals to the right will represent the first stitches of a series and the numerals to the left will represent the remaining or second and third stitches of a series.

In forming the French vein or hemstitch it is well known that three stitches are employed, one upon one side and two upon the other side of the seam, to secure a positive progressive movement of the fabric. Assuming the needle to be in the vertical plane shown in Fig. 6, the needle will first pass through

the fabric at the point 1 of the diagram shown in Fig. 4, and be held in this position until it is caused to descend through the fabric a sufficient distance to allow the shuttle to pass between the needle and its thread, the said vertical movement and throw of the shuttle being caused to take place while the needle-guide is held in a fixed point upon one side of the seam. When the needle is raised by its actuating mechanism to clear the fabric the cam-face C of the spur-wheel A' will press against the pin C', and through the medium of arm C², rock-shaft C³, and arm C⁴ actuate the feed-bar to draw the fabric forward the full length of the feed. In the meantime the cam B will have turned sufficiently to draw the needle-bar guide over the other side of the seam and hold it at rest until the needle shall have passed through the fabric at 2, Fig. 4, and be caught by the lower or shuttle thread. The needle-bar guide is held in the last-named position until the third and last stitch of the series is made, which is done by the action of the cam C through the arms C² C⁴ and rock-shaft C³ upon the presser-foot C⁵, in conjunction with the spring D³, to withdraw the fabric toward the first position described, and hold it there until the needle again descends at 3, Fig. 4, and passes through the fabric to form the last stitch of the series. In order to make the next series of stitches and cause a fixed progressive movement of the fabric, the cam D upon the face of the spur-wheel is caused to act against the end of lever D', which will release the pressure upon the upper end of the presser-foot, so that by means of the arms C⁴ and D', together with their operating connections, the presser-foot will be caused to slip freely over the fabric to the full length of its throw, and when the lever D' is released and the cam C, with its arms and rock-shaft, again acts upon the presser-foot, the tension-spring D³ of the presser-foot will cause it to hold the fabric and feed it forward a full movement to be in position to receive the next series of stitches, in the manner above described, by shifting the needle to its new position upon the opposite side of the seam.

It will be readily understood that the parts not described may be constructed and operated in any well-known manner.

The end of the lever for operating the needle-bar F is slotted to admit of the movement of the needle-bar from one position to the other.

The advantages of making the arm B⁶ adjustable upon the lever B² will be readily seen, as the needle may thereby be readily adapted to form a stitch of any desired width.

The needle-bar guide is firmly held in its place within the recess and against the end of the machine by the guide-pins, so that there is no back motion or liability of the parts to get out of order or be broken.

As the spur-wheel A is made of a solid piece of metal with the cams, the latter cannot become separated or change their relative position one with the other when the machine is taken apart by unskilled persons for cleaning; and the levers and arms for shifting the needle-bar guide and for operating the presser-foot are all compactly arranged and operated from one point with a single instrumentality.

What I claim is—

1. In a sewing-machine wherein the needle-bar is carried by a guide that is fitted for lateral movement, the revolving spur-wheel A', formed with a cam-groove, B, and cams C and D upon its faces, in combination with the rocking lever D', stud D², spring D³, rock-shaft C³, having arms C² C⁴, presser-foot C⁵, spring C⁶, lever B², arm B⁶, and needle-bar and guide F', all arranged and operating as described and shown.

2. In a sewing-machine, the combination of the goose-neck, formed with a recess in its end, the guide-pins F² across said recess, the needle-bar guide F arranged within the said recess and fitted upon the guide-rods to slide upon them, the needle-bar F', the lever B², arm B⁶, and the revolving cam-wheel A', to move the needle-bar guide upon the rods from one position to the other, substantially as described.

The above specification signed by me this 28th day of October, 1879.

GEO. BENSON. [L. S.]

Witnesses:

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