

(No Model.)

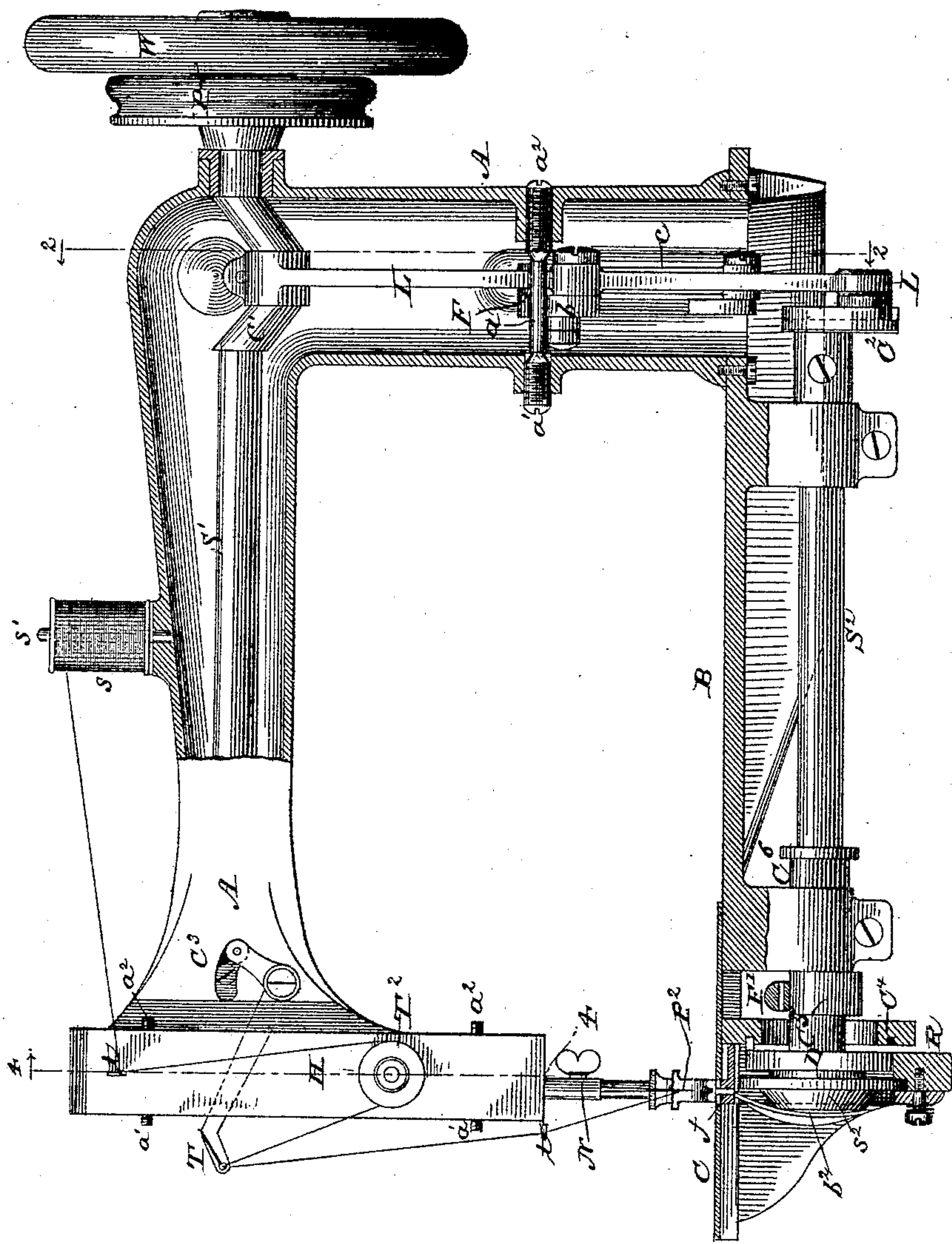
2 Sheets—Sheet 1.

A. M. LESLIE.
SEWING MACHINE.

No. 444,758.

Patented Jan. 13, 1891.

Fig. 1.



Witnesses

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By his Attorney.

[Signature]

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

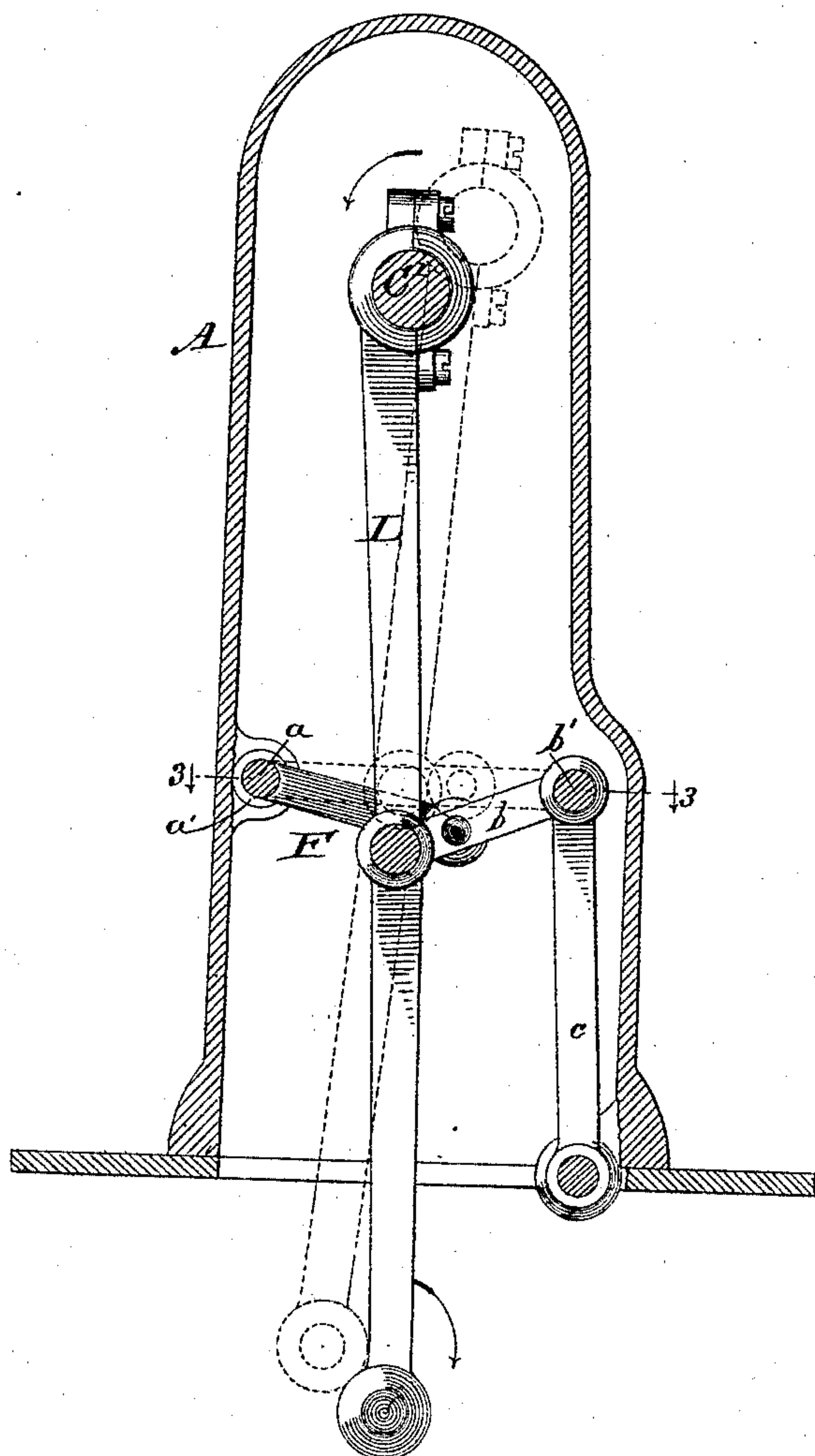


Fig. 4.

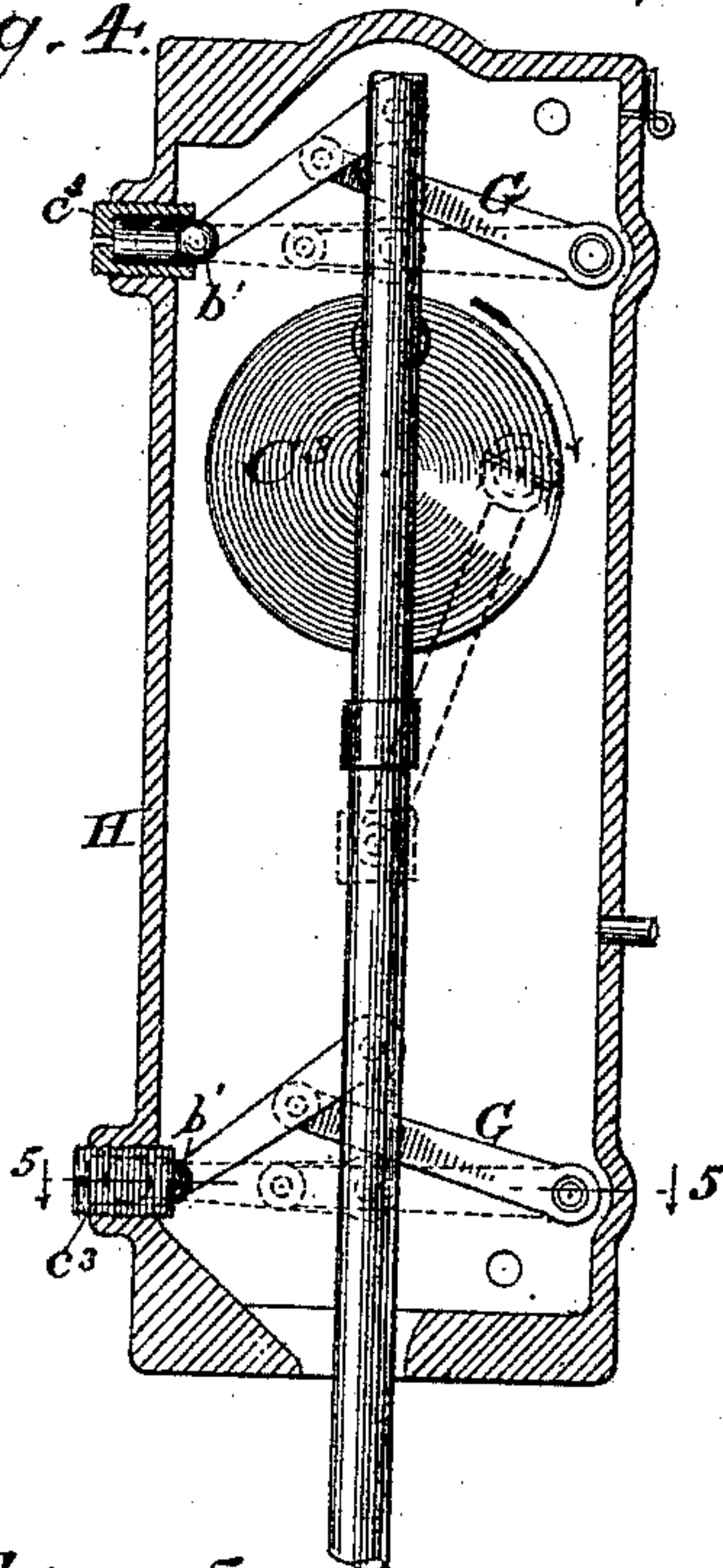


Fig. 5.

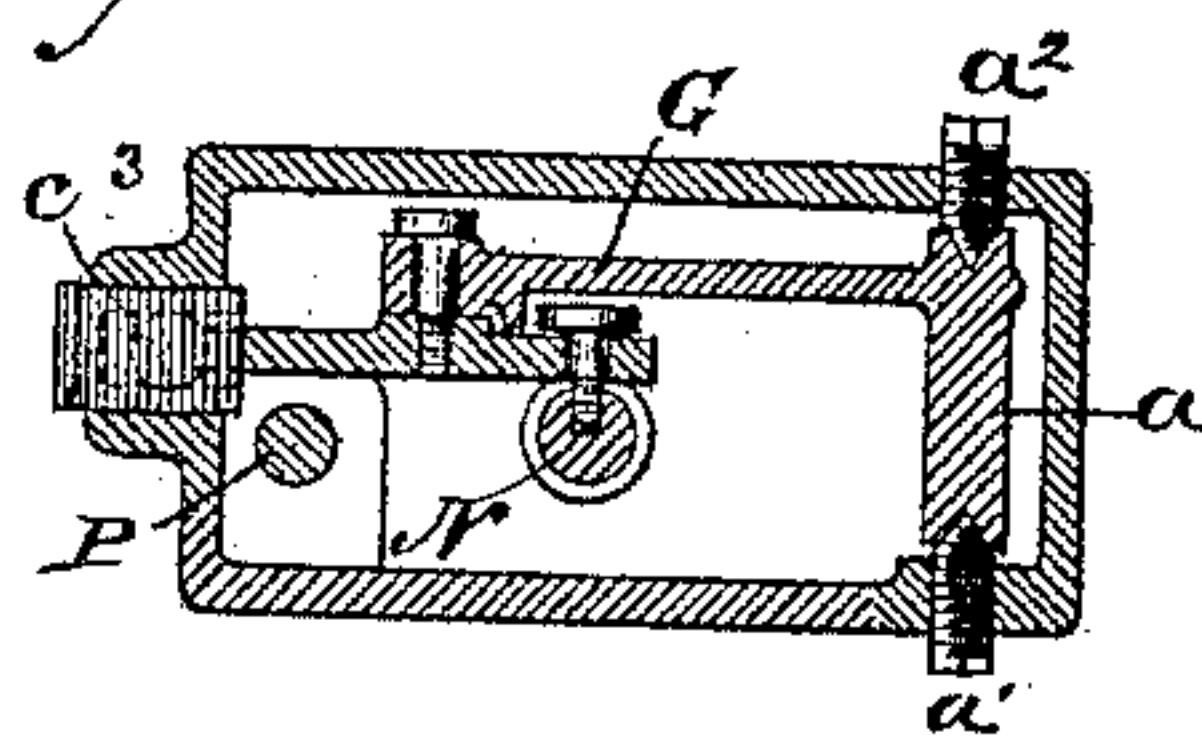


Fig. 2x.

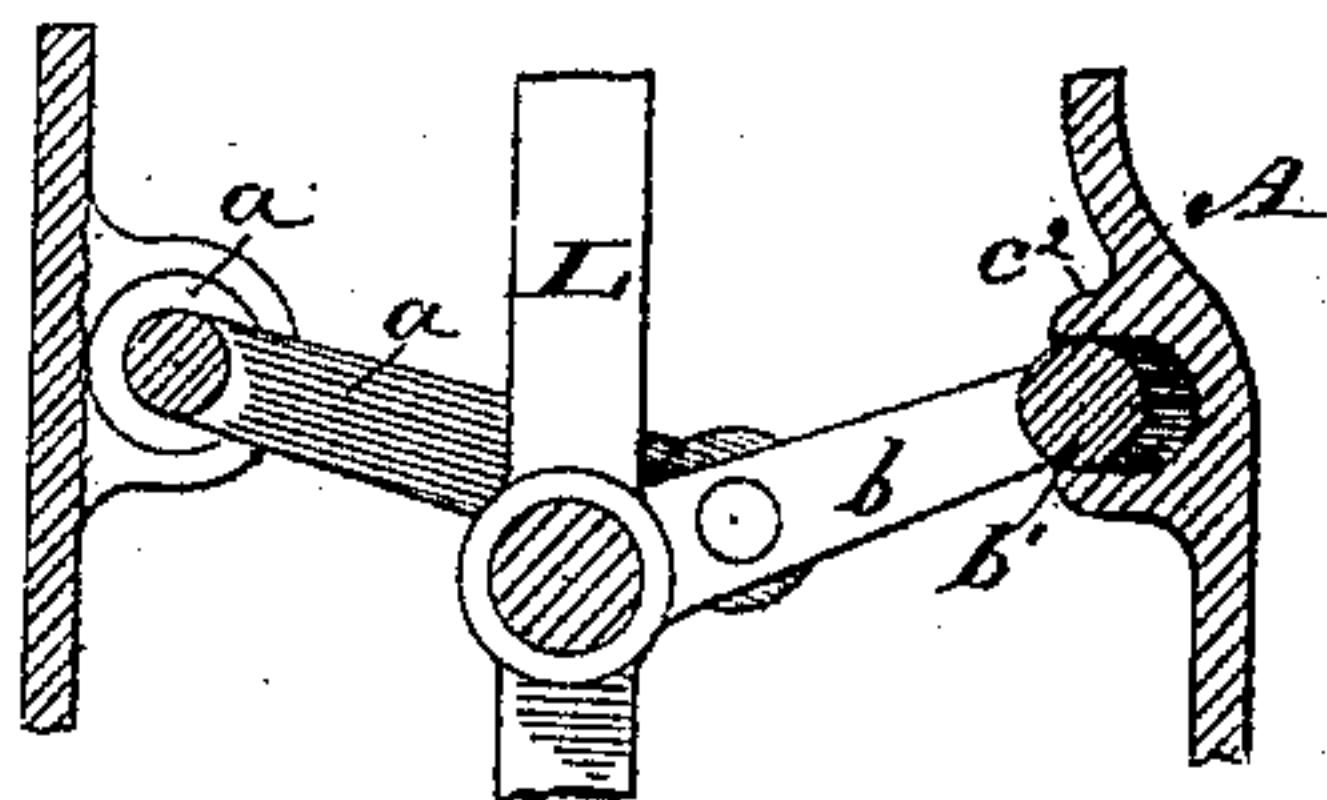
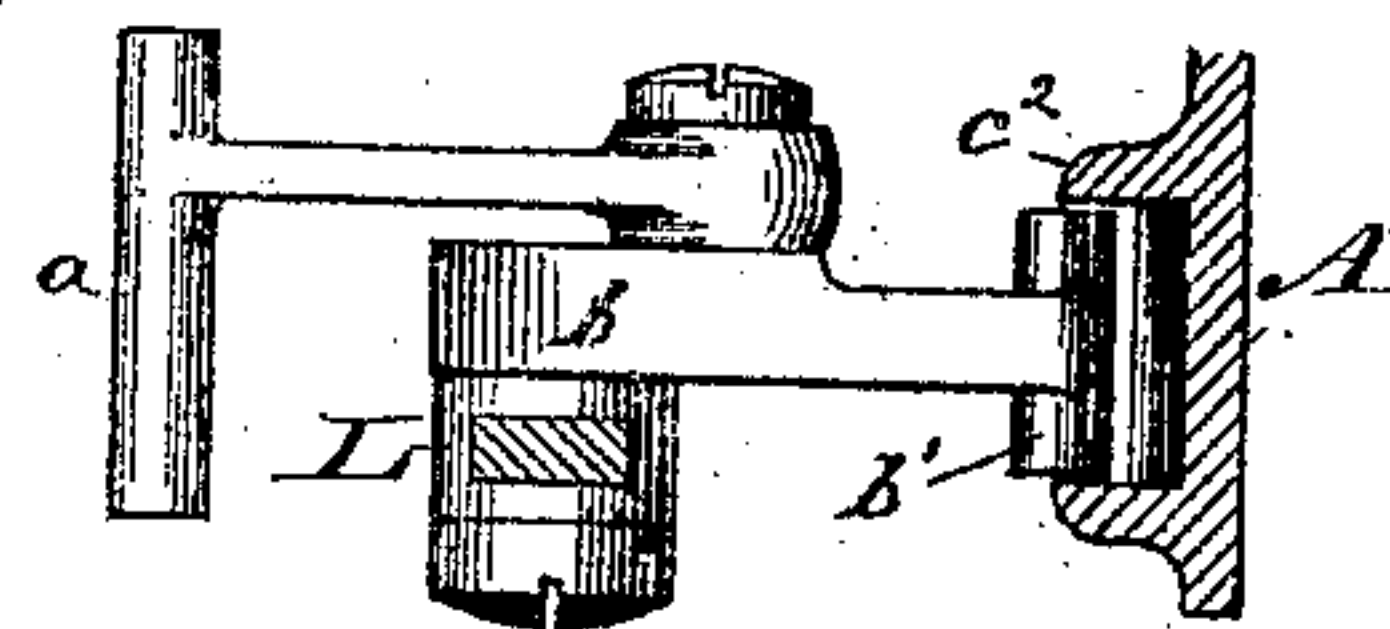


Fig. 3x.



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UNITED STATES PATENT OFFICE.

ARTHUR M. LESLIE, OF EVANSTON, ILLINOIS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 444,758, dated January 13, 1891.

Original application filed November 14, 1887, Serial No. 255,153. Divided and this application filed July 30, 1889. Renewed July 11, 1890. Serial No. 358,417. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR M. LESLIE, a citizen of the United States, and a resident of Evanston, in the State of Illinois, having my place of business at Chicago, in said State, have invented a new and useful Improvement in Mechanical Movements for Sewing-Machines, of which the following is a specification.

The primary object of this invention is to increase the adaptation of rotary-shuttle sewing-machines to work noiselessly and with as little friction as possible at the high speeds which their continuous rotary motion renders otherwise practicable. The invention is applicable, however, wholly or in part to other sewing-machines.

The present invention consists, first, in a novel and peculiarly frictionless and compact link-motion structure employed in common to guide a vertically-moving fulcrum for a lever-pitman transmitting rotary motion from a shaft in the overhanging arm to the shuttle-driving shaft below the bed-plate and to guide a vertically-moving needle-bar, and, secondly, in a peculiar combination of such link-motion guides for a reciprocating needle-bar, whereby lubricating the latter to the usual troublesome extent is obviated.

Two sheets of drawings accompany this specification as part thereof.

Figure 1 of these drawings represents an elevation of a sewing-machine "head," or machine proper, partly in longitudinal section, illustrating the present invention. Fig. 2 represents a vertical section on the line 2 2, Fig. 1, showing the said lever-pitman with its fulcrum in elevation. Fig. 3 represents a sectional plan of the latter viewed from the line 3 3, Fig. 2. Figs. 2^x and 3^x are fragmentary sectional views corresponding, respectively, with Figs. 2 and 3 as to plane and illustrating a modification. Fig. 4 represents a vertical section on the line 4 4, Fig. 1; and Fig. 5 represents a horizontal section on the line 5 5, Fig. 4.

Like letters of reference indicate corresponding parts in the several figures.

The machine may have an arm A, bed-plate B, and cloth-plate C, of any approved design, suitably united with each other. Preferably

the arm is hollow, as shown, so as to inclose a rotary upper shaft S' and the mechanism which transmits motion therefrom to a parallel rotary shaft S² below the bed-plate, said upper shaft being provided at its right-hand end with a pulley P and hand-wheel W, Fig. 1, as the driving-shaft. Said transmitting mechanism consists of a crank C', integral with the shaft S', in line with the upright portion or "standard" of the arm, a lever-pitman L within said standard coupled to said crank, a peculiar link-motion fulcrum F for said pitman, and a suitable crank C² on the right-hand end of said under shaft S², to which the lower end of the pitman is coupled. As shown by Figs. 2 and 3 in connection with Fig. 1, said fulcrum F consists of an L-shaped primary link a, supported at the extremities of one member by axial pivot-screws a' a², Fig. 1, a substantially horizontal link b, pivoted at one end to the pitman and to the extremity of the swinging member of said link a behind the pitman, and having a horizontally-yielding pivot b' at its rear end, and in one arrangement a vertical link c, supporting said yielding pivot at its upper end and pivoted at its lower end at the bottom of the standard. All the pivots are parallel with the wrists of the cranks C' C², and, excepting said pivots a' a², all may be formed by shouldered screws, as shown in Fig. 3. As illustrated by Figs. 2^x and 3^x, said yielding pivot b' may, in an alternative form, be integral with said link b and supported by a fixed projection c² within the arm-standard, having a suitable horizontal recess. The operation of the "fulcrum" is illustrated by full and dotted lines in Fig. 2, showing the parts in two positions, and by arrows indicating the rotation of the respective shafts. It will be seen that the pivotal center of the pitman moves straight up and down, thus relieving the motion from the varying effect produced by the shifting of the pitman center back and forth when a single radius-link is used, and at the same time the friction is materially reduced, as compared with a sliding connection. At its left-hand end said arm A is rigidly united with the customary head H, and said upper shaft S' carries a combined take-up cam and needle-driving crank C³, which, together with

ordinary connections, oscillates a take-up lever T, that projects through the face-plate of the head and reciprocates a needle-bar N, that carries at its lower end a straight-eye pointed
 5 needle. The needle-bar is guided by peculiar means forming part of the present invention as illustrated by Figs. 4 and 5 in connection with Fig. 1—that is to say, a pair of link-motion guides G, Figs. 4 and 5,
 10 substantially similar to said link-motion fulcrum F, coacting with each other, form a parallel-motion device which supports and guides the needle-bar, so that the customary drilled guides, with their glands and other
 15 accessories, are dispensed with and lubricating the needle-bar is reduced to a minimum. The shifting pivots b' of these guides are preferably spherical, and work in thimbles c^3 , which are screwed into the rear edge of the
 20 head. Otherwise the guides G, as shown, are identical with said fulcrum F, except as to size, and need not therefore be more particularly described.

T², Fig. 1, represents the upper tension device of the machine; t , the upper thread-guides; s , the spool of upper thread; s' , its spindle; P², the presser; D, the shuttle-driver disk; C⁴, a fixed cam auxiliary to the shuttle-driver; R, the shuttle-race; s^2 , a disk shuttle
 30 within the latter; b^2 , the bobbin-case; F', the feed-bar; f , its dog, and C⁵ C⁶ its cams. These parts, together with the remainder of the sewing mechanism proper, form no part of my present invention.

35 The peculiar shuttle-cam, shuttle-driver, and shuttle-race represented in Fig. 1 constitute the subject-matter of my specification forming part of an application for patent,

Serial No. 255,153, patented July 30, 1889, No. 408,019, of which this is a division. 40

Details and accessories which are not above specified may be of any approved description, and I do not limit my respective claims to specified details, except as therein stated.

Having thus described the said mechanical 45 movements and a machine embodying the same, I claim as my invention and desire to patent under this specification—

1. In combination with a moving part, a link-motion structure to support and guide 50 the same, composed of a link substantially of L shape, axial pivots at the extremities of one member thereof, a link pivoted to the said moving part at one end and having a laterally-yielding pivot at its other extrem- 55 ity and pivoted at an intermediate point to the other member of the link first named, and supports for said axial pivots and said laterally-yielding pivot, substantially as hereinbefore specified. 60

2. In combination with the needle-bar of a sewing-machine, a pair of link-motion guides, each composed of a link substantially of L shape, axial pivots at the extremities of one member thereof, a link pivoted to the needle- 65 bar at one end and having a laterally-yielding pivot at its other extremity and pivoted at an intermediate point to the other member of the link first named, and supports for said axial pivots and said laterally-yielding 70 pivot, substantially as hereinbefore specified.

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Witnesses:

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CHAS. W. CHANDLER.