

No. 711,909.

Patented Oct. 21, 1902.

H. C. PETERS.
SEWING MACHINE.

(Application filed Apr. 1, 1897. Renewed Jan. 17, 1900.)

(No Model.)

4 Sheets—Sheet 1.

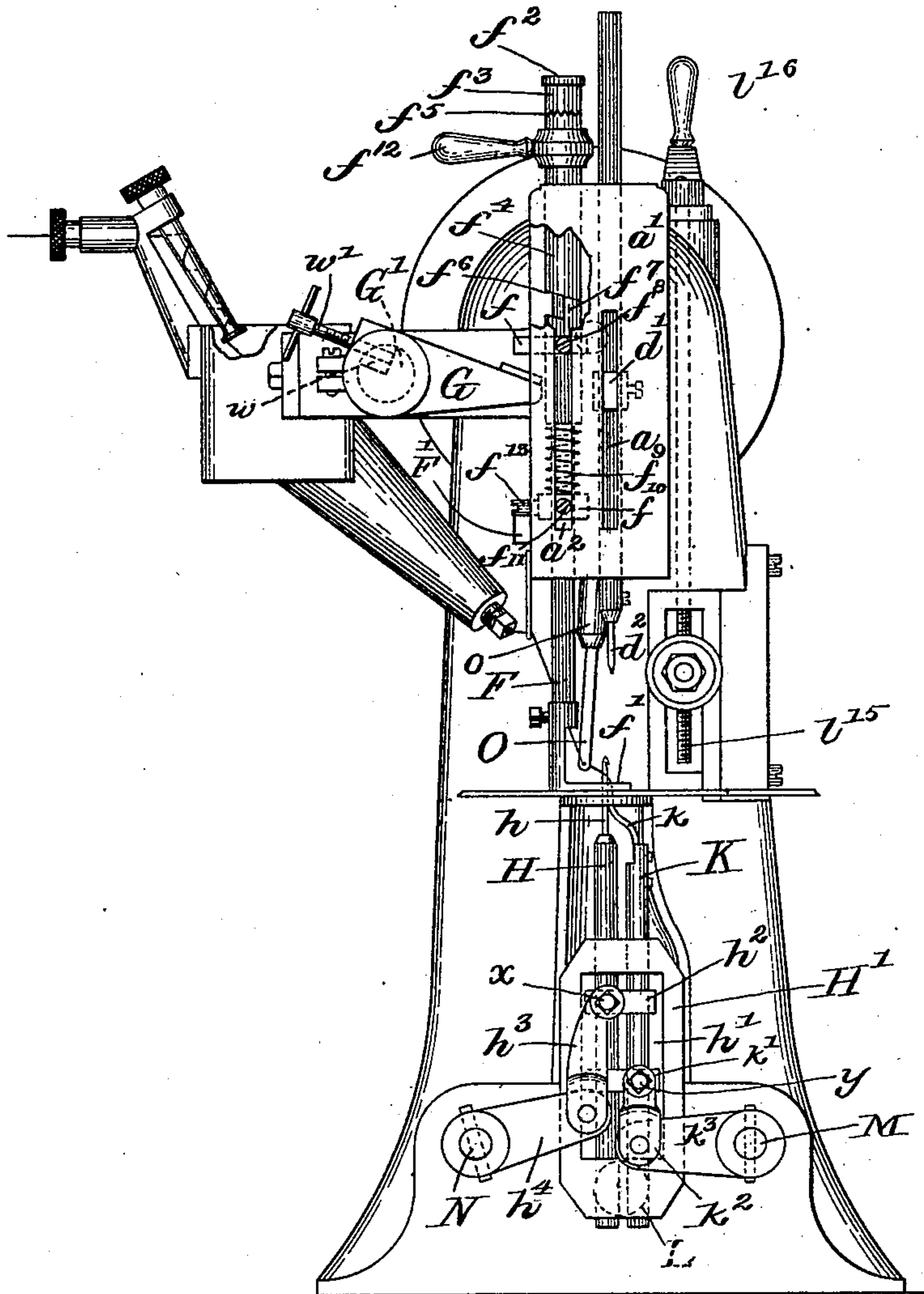


FIG. 1.

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No. 711,909.

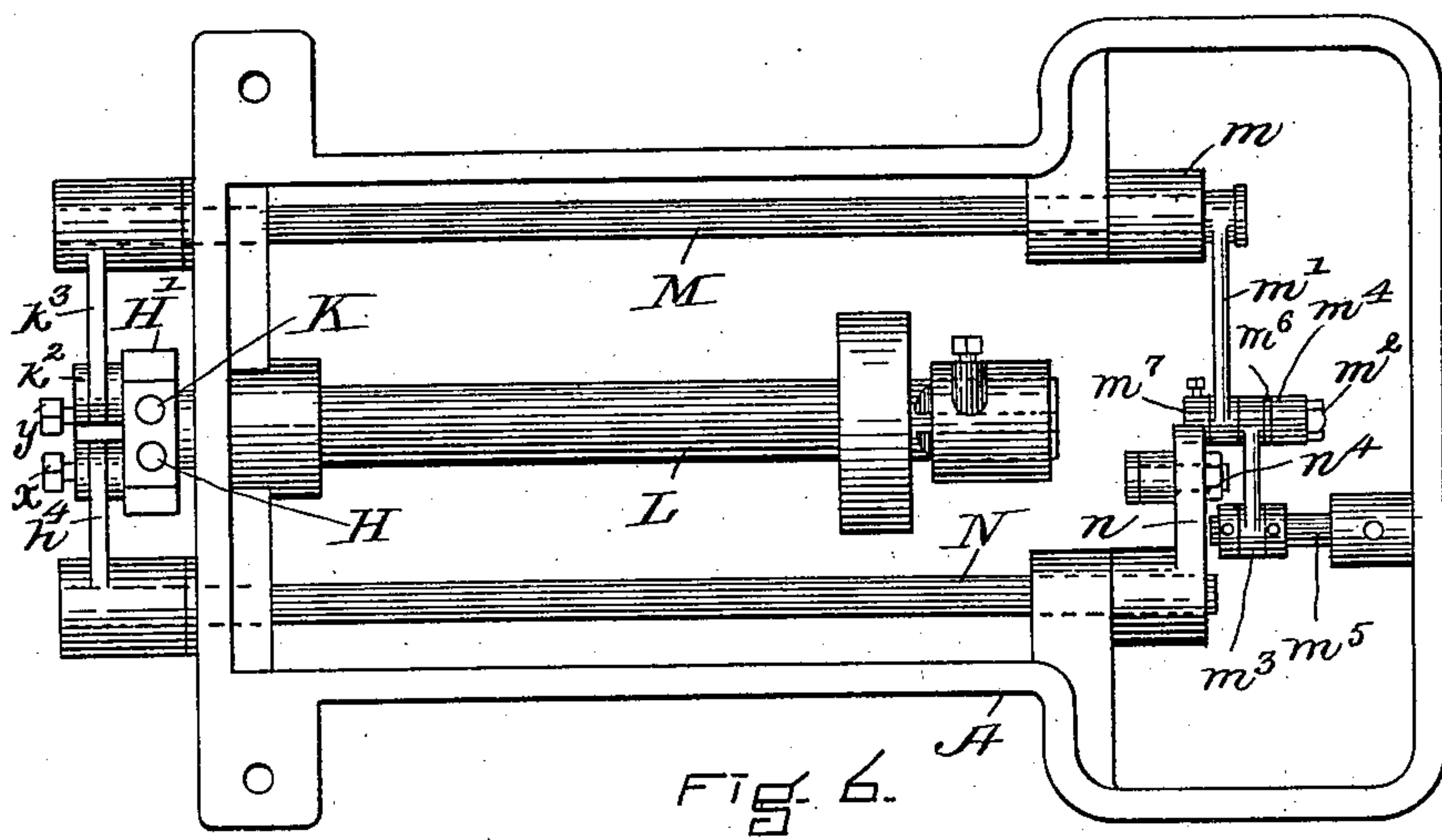
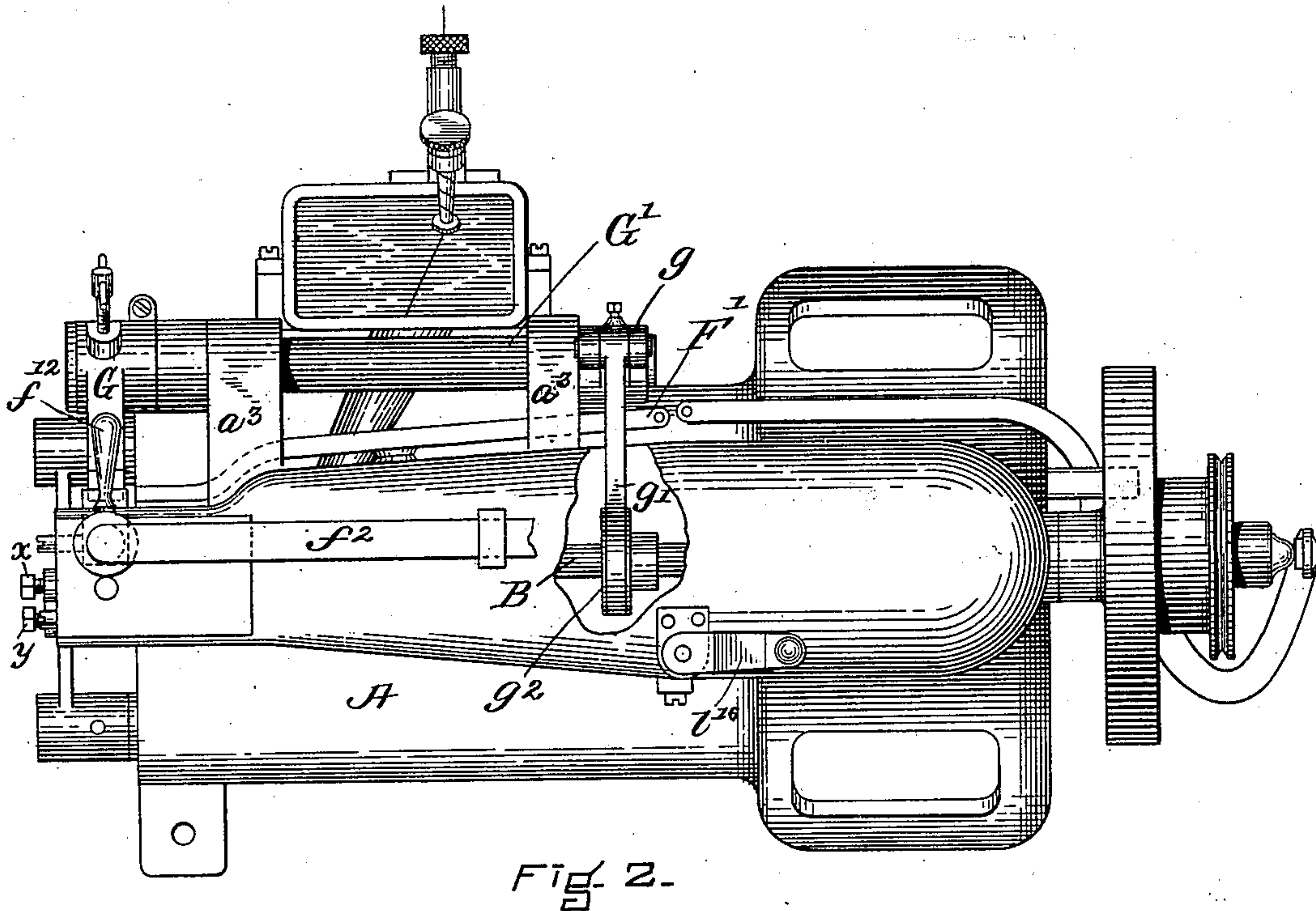
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4 Sheets—Sheet 2.



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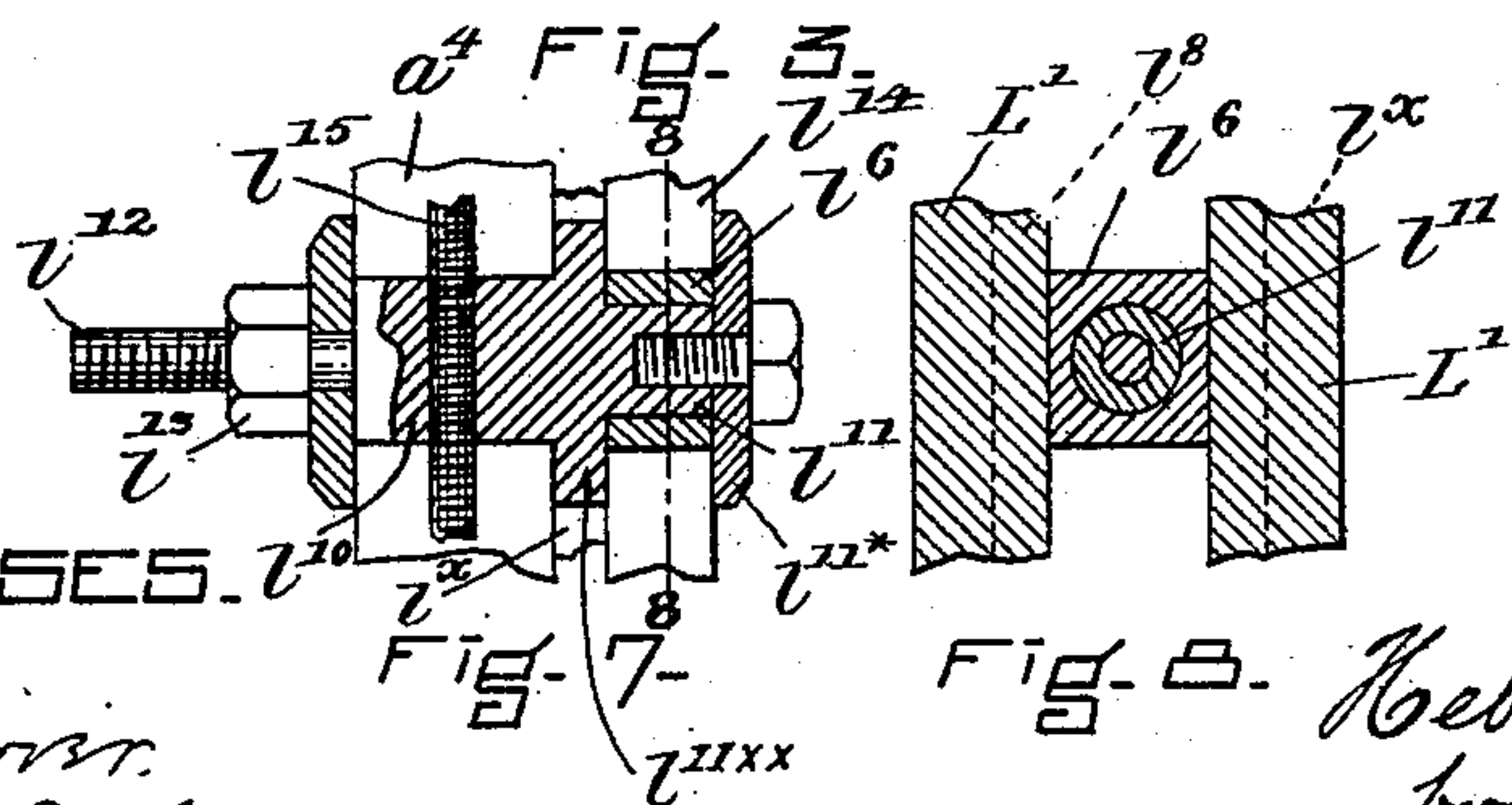
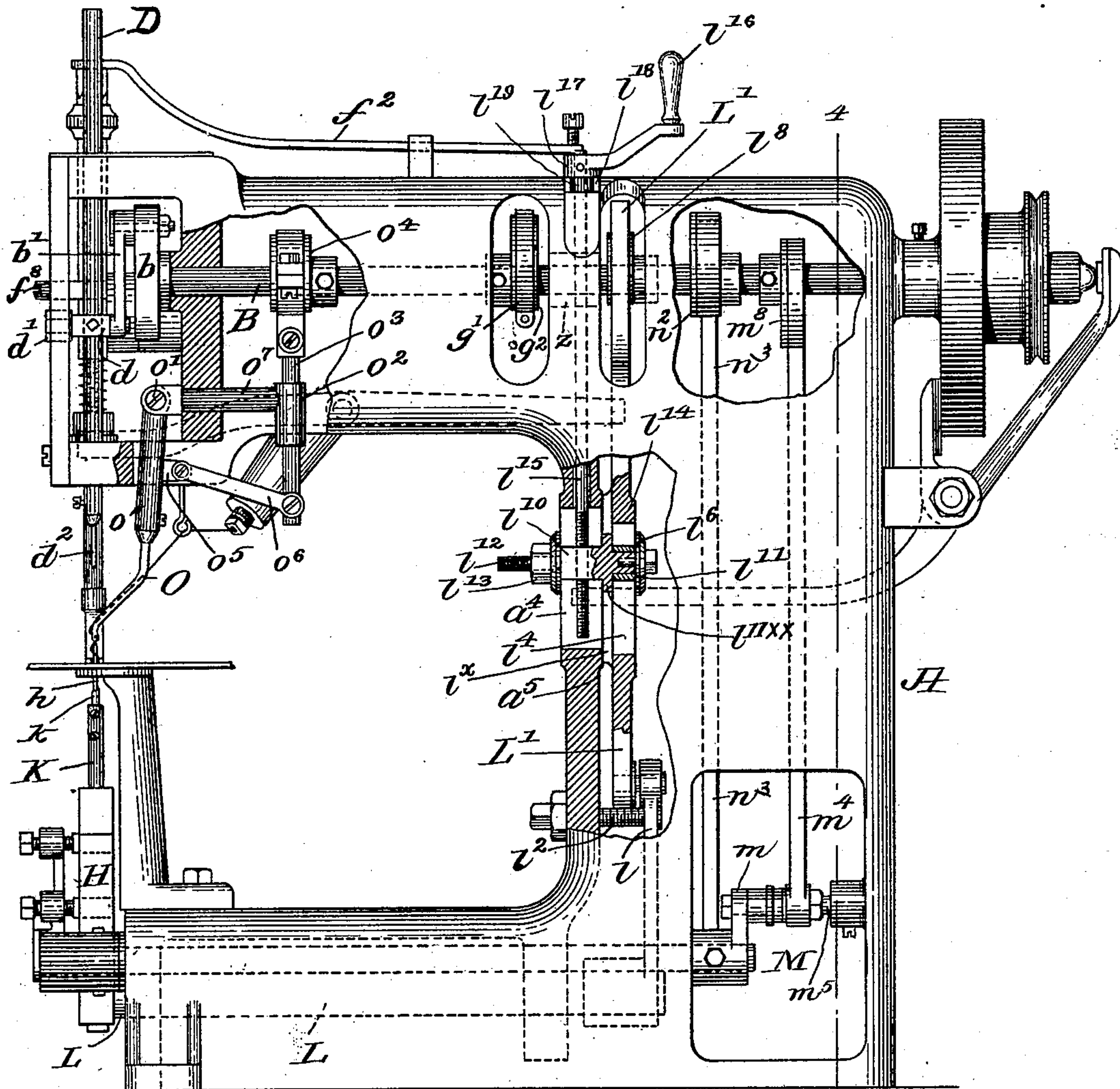
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4 Sheets—Sheet 3.



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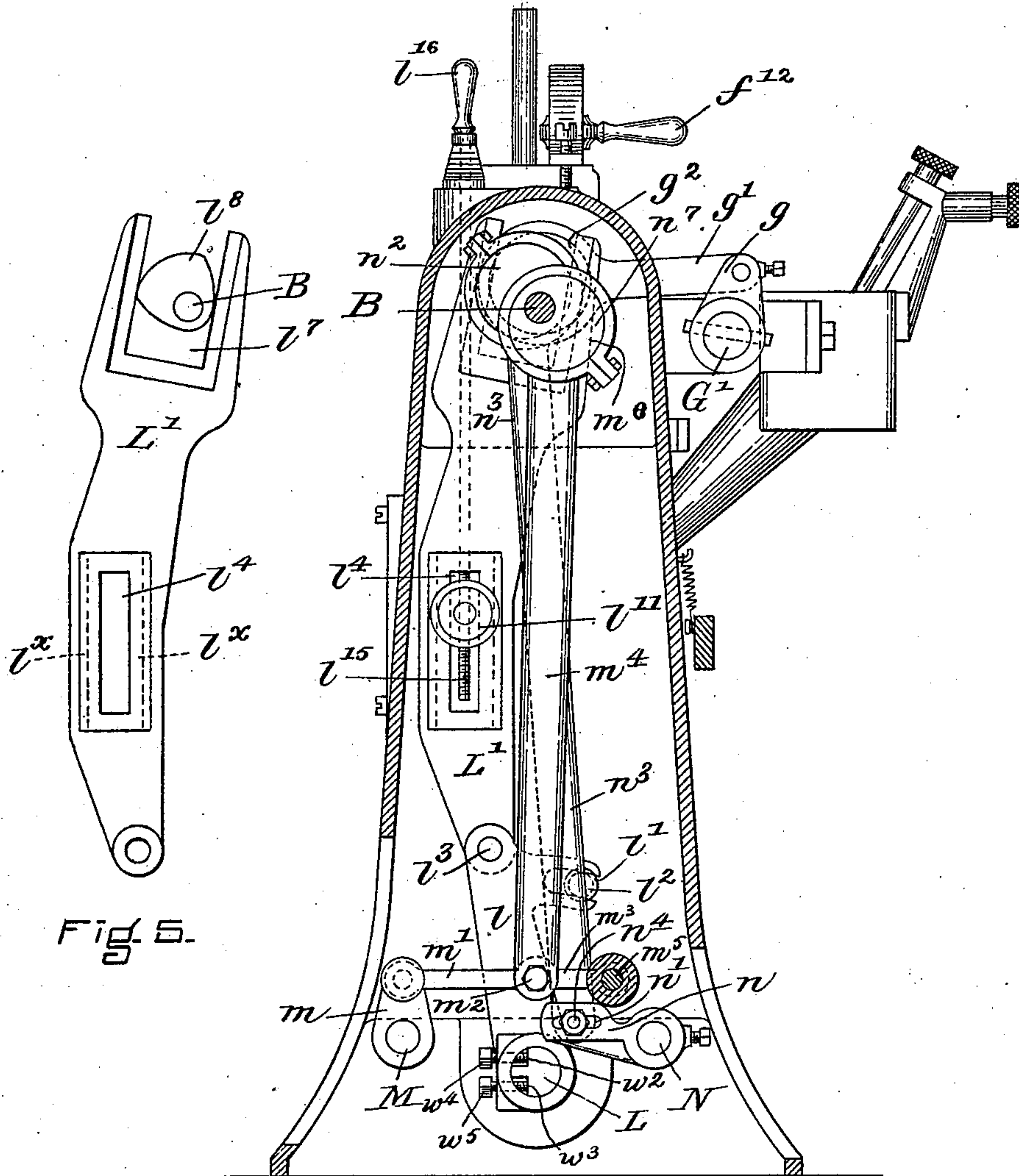


FIG. 5.

FIG. 4.

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UNITED STATES PATENT OFFICE.

HEBER C. PETERS, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,909, dated October 21, 1902.

Application filed April 1, 1897. Renewed January 17, 1900. Serial No. 1,759. (No model.)

To all whom it may concern:

Be it known that I, HEBER C. PETERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following is a specification.

Referring to the accompanying drawings, Figure 1 is a front elevation, Fig. 2 a top plan view, Fig. 3 a side elevation, Fig. 4 a cross-section on line 4 4 of Fig. 2, and Fig. 5 a side elevation, of a feed-lever forming part of the mechanism for vibrating a carrier in which needle and cast-off devices are mounted. Fig. 6 is a bottom plan view of the machine. Figs. 7 and 8 show details of the adjustable fulcrum of the feed-lever.

My invention pertains to barbed or hooked needle machines, and the machine wherein I show the features of my invention embodied is a wax-thread machine.

The object of my invention is to produce an improved high-speed sewing-machine, especially of the wax-thread variety; and my invention consists in various features of construction and combinations hereinafter pointed out, whereby I obtain a high-speed wax-thread sewing-machine which runs with greater steadiness—that is, with less vibrations of parts—than any comparable machine heretofore produced, and which consequently produces a better grade and quality of work.

In the drawings illustrating the principle of my invention and the best form in which I have contemplated applying that principle, A is the frame, and B the driving-shaft, suitably journaled in the frame and connected with the awl-bar D in any suitable manner—as, for example, by the crank *b* and link *b'*, one end portion of which is loosely jointed to the crank and the other end portion of which is loosely jointed to the collar *d* on the awl-bar. Collar *d* is formed with a lug *d'*, which projects into the vertical slot *a* in the face *a'* of the frame. The awl-bar is reciprocated when the driving-shaft is rotated. Awl-bar D is shown with but one awl *d²*; but a plurality of awls may be used in the usual manner.

The presser-foot bar F is mounted in suitable bearings in the front of the frame and is provided with a lateral projection *f*, with which the rocker-arm or toe-piece G on rocker-shaft G' engages to lift the presser-bar and

its foot *f'*. Presser-foot bar F is held down by the spring *f²* in the usual way and is provided at its top with a fixed collar *f³*, the under edge of which is serrated. A sleeve *f⁴* surrounds the upper portion of the presser-foot bar F, which is loose within the sleeve *f⁴*. The upper end of sleeve *f⁴* is serrated at *f⁵*, and the serrations or teeth of sleeve *f⁴* mesh with the spaces between the serrations or teeth of collar *f³*. The lower end of sleeve *f⁴* is cut off on a bevel and rests upon the reversely-beveled face of sleeve *f⁷*, which is fast to the projection *f*, with which the rocker-arm G engages, as before explained. This sleeve *f⁷*, with its attached projection *f*, is loosely mounted on the presser-foot bar, and the screw *f⁸*, which projects from projection *f*, plays in a vertical slot *a²* in the face *a'* of the frame. The lower or under end of the sleeve *f⁷* below projection *f* rests upon a spring *f⁹*, which preferably is helical in form and surrounds the presser-foot bar and rests upon a collar *f¹⁰*, which is fast on the presser-foot bar and is provided with a projection *f¹¹*, which plays in said slot *a²*. The sleeve *f⁴* is preferably provided with a handle *f¹²*, by which the sleeve is conveniently rocked to change the position of the opposed contacting beveled or cam-acting ends of the sleeve *f⁴* and sleeve *f⁷*. This adjustment of handle *f¹²* changes the position of the projection *f*, so that the position of rest of projection *f* in relation to rocker-arm G is readily varied as required by the operator. As handle *f¹²* is fast to sleeve *f⁴*, movement of the handle changes the position of the beveled end of the sleeve *f⁴* and so forces its beveled end *f⁶* against the beveled end of the sleeve *f⁷* and moves sleeve *f⁷* downwardly against the force of spring *f⁹* or permits the spring to move the sleeve *f⁷* upwardly. Consequently, as before stated, adjustment of handle *f¹²* or of sleeve *f⁴* (for of course handle *f¹²* may be dispensed with, if desired) varies the position of rest of projection *f* in relation to rocker-arm G.

Rocker-shaft G' is mounted in suitable bearings *a³*, forming part of the frame A, and is provided toward its rear end with a rocker-arm *g*, from which an eccentric-strap *g'* extends to an eccentric *g²* on driving-shaft B. The presser-foot bar F is lifted by means of the usual lever F', pivoted to the side of frame

A with its forward end in position to engage the projection f^{13} from collar f^{10} . This lever F' may be operated by either hand or foot power, as desired, and is customarily attached to the rod of a treadle, as will be readily understood by all skilled in the art.

Needle-bar H, carrying in this instance a single needle h , but which may be provided with a plurality of needles, if so desired, as will be readily understood by all skilled in the art, is adapted to reciprocate vertically in the oscillating carrier or "needle-post" forming part of the end of the needle-post rocker-shaft H' . This carrier has an opening h' , and within the opening there is a block h^2 , through which the needle-bar H passes. Block h^2 is rigidly attached to the needle-bar H and is loosely jointed to a link h^3 , an end portion of which is jointed to the rocker-arm h^4 .

K is a cast-off bar provided with one or more cast-offs k , according to the number of needles and awls with which the machine is equipped. This cast-off bar passes through and is rigidly connected with a block k' , mounted within the opening h' of the oscillating carrier H' . Block k' is loosely jointed to a link k^2 , which is loosely jointed to the rocker-arm k^3 . Block h^2 , rigidly affixed to the needle-bar H, has a forked lateral projection toward the cast-off K and the fork has a sliding contact with the cast-off bar K, so as to assist in steadying the needle-bar during its endwise reciprocation. The block k' , rigidly affixed to the cast-off bar K, has a forked lateral extension toward the needle-bar H and the forks have a sliding contact with the needle-bar H, so as to assist in steadying the cast-off bar during its endwise reciprocation. The upper end of the carrier H' is provided with bearings, through which the needle-bar H and the cast-off bar K play when they are moved endwise. The carrier H' is fast on the needle-post shaft L, journaled in frame A.

This rocker-shaft L is provided toward its rear end with a crank-arm l , which has a lateral projection, in the edge of which there is a reentrant recess l' , this recess receiving between its side walls an alining-screw l^2 , projecting from frame A. The upper end of rocker-arm l is loosely jointed at l^3 to a swinging lever L' , this lever having a lengthwise-extending slot l^4 to receive its adjustable fulcrum l^6 . The upper end of lever L' has a recess l^7 , the opposed side walls of which are engaged by a cam l^8 on the driving-shaft B.

To secure adjustment of the fulcrum l^6 , frame A is provided with a vertical slot a^4 , which is approximately coincident with the slot l^4 in the rocking feed-lever L' , as best seen in Fig. 3. The fulcrum l^6 is a centrally-bored block (see Fig. 8) and is on a lateral extension l^{11} of fulcrum-post l^{10} , which has flat side walls making a sliding fit with the vertical side walls of the slot a^4 . The lateral extension l^{11} of this fulcrum-post, forming the bearing of fulcrum l^6 , is made round and receives

a rocking fulcrum l^6 , having flat side walls which contact with and slide between the opposed parallel side walls of the slot l^4 . The fulcrum end of the fulcrum-post l^{10} is provided with the cap-piece l^{11} , which lies over the slot l^4 and overlaps the marginal portions thereof. The forward end of fulcrum-post l^{10} is provided with a projecting threaded stud l^{12} , on which a nut l^{13} is screwed. This nut lies over slot a^4 and overlaps the marginal portions thereof. The fulcrum-post l^{10} is formed with a shoulder l^{11**} , which lies between feed-lever L' and opposed walls of frame A, in which the slot a^4 is made. Lever L' is formed with laterally-projecting and parallel ribs l^x on that side which faces toward slot a^4 . These ribs are parallel with the longer side walls of slot l^4 and the shoulder l^{11**} rests between these ribs, the shoulder l^{11**} having a width equal to the height of projection of the ribs l^x . By this arrangement the needle-feed lever L' is held snugly against the opposed wall of the frame-piece or lateral stationary support a^5 , in which the slot a^4 is made. This gives to the needle-feed a steadiness of action that is very desirable and highly advantageous.

The side margins of the slot a^4 and of the slot l^4 are made smooth, so that the fulcrum-post l^{10} and its fulcrum l^6 may readily be adjusted between the upper and lower ends of the slots a^4 and l^4 , as desired, and to secure this adjustment a threaded spindle l^{15} is passed vertically through a threaded hole in fulcrum-post l^{10} and provided, preferably, with a suitable handle l^{16} . The spindle is provided at its upper end with a fixed collar l^{17} (an extension of which in this instance forms the handle l^{16}) above a bearing l^{18} and is also provided on the other side of that bearing with a fixed collar l^{19} . These collars bear against the bearing l^{18} , so that whichever way the spindle is rotated it keeps its position and compels fulcrum-post l^{10} to slide in the direction desired. By rotating the threaded spindle l^{15} fulcrum-post l^{10} is raised or lowered in the vertical slot a^4 , and consequently the fulcrum l^6 of the needle-feed lever L' is adjusted, thereby varying the throw of the lower end of the needle-feed lever L' and the carrier H' .

The rocker-arm h^4 , which is connected with the needle-bar H, is carried by a rocker-shaft N, which is parallel with the rocker-shaft L and is suitably journaled in the frame A. Toward the rear end of the rocker-shaft N said shaft is provided with the rocker-arm n , having a slot n' struck from the center of the eccentric n^2 . Eccentric-strap n^3 extends upwardly from the rocker-arm n to eccentric n^2 on driving-shaft B. The lower end of the eccentric-strap n^3 is made adjustable at its point of connection with the rocker-arm n by means of the screw and nut connection indicated by the reference-letter n^4 . (See Fig. 4.) By varying the point of connection between the eccentric-rod n^3 and the rocker-arm N an increased or diminished throw is given to the

latter, and consequently the stroke of the needle is regulated, as will be plain to all skilled in the art. The cast-off, as before stated, is dependent on the movement of the rocker-arm k^3 . This rocker-arm k^3 is fast on the rocker-shaft M, which is provided toward its rear end with a rocker-arm m , and this rocker-arm is connected by a link m' with a stud m^2 , which projects loosely through the link m^3 from the eccentric-strap m^4 , in the lower end of which the stud m^2 is made fast. The link m^3 is journaled on a stud m^5 from frame A. Eccentric-strap m^4 is formed with a collar m^6 , which bears against the opposed side walls of link m^3 , so that when the stud m^2 is pushed into place and held by the collar m^7 the eccentric-strap m^4 , link m^3 , and connecting-link m' are held firmly in contact and produce suitable running bearings. The eccentric-strap m^4 extends to the eccentric m^8 on driving-shaft B.

The thread-carrier mechanism herein shown is made up of the thread-guide O, which may carry one or more threads, as desired, depending upon the number of awls and needles, and which is loosely jointed at o' to a rocking shaft o^7 , mounted in frame A. The hinge or joint o' between the guide O and the rocking shaft o^7 is at right angles to the lengthwise axis of the rocking shaft o^7 . The rearward end portion of the rocker-shaft o^7 is provided with a sleeve o^2 , through which plays the eccentric-strap o^3 from an eccentric o^4 on driving-shaft B. Guide O is provided with an ear o^5 , and the link o^6 is loosely jointed to this ear and to the lower portion of eccentric-strap o^3 . While this thread-carrier or actuating mechanism forms part of my present machine as now organized and is wholly new with me, I do not herein claim it, because it is claimed in my copending application, upon which United States Letters Patent No. 656,585 were granted August 2, 1900; nor do I claim herein the presser-foot-adjusting devices before referred to.

The rocker-arm or toe-piece G is adjustable on rocker-shaft G' to regulate the throw of the toe-piece in relation to the projection f of the presser-foot bar. This adjustment is secured by forming the rocker-shaft with an angular recess w in its side, against a flat wall of which a set-screw or other adjustable device w' impinges to change the relative position of the toe-piece and its rocker-shaft. A similar adjustment of the crank-arm l on its rocker-shaft L is obtained by forming the shaft with angular notches w^2 and w^3 , one at one side and the other at the other side of the lengthwise axis of the shaft L and engaging flat walls of the recesses with the screws w^4 and w^5 , as will be readily understood by all skilled in the art.

While the feed-lever is shown as a needle-feed lever, it may be used as an awl-feed lever, as will be plain to all skilled in the art, and in the claims wherein a "feed-lever" is specified I intend to include by that term

either a needle-feed lever or an awl-feed lever.

Referring now to cam l^8 and the needle-feed lever L', it is to be noted that the cam is fast on the driving-shaft B and is a cam of constant diameter. This is an important factor in the production of my present high-speed machine, which is adapted to carry a plurality of needles and awls and to do wax-thread work, as above stated. The use of eccentrics in combination with the thread guiding or carrying mechanism and in connection with the mechanisms which give endwise reciprocation to the needles and cast-offs is highly advantageous and practically necessary to the production of a high-speed wax-thread sewing-machine. The awl-bar in my present machine is given a quicker return by its connection with the driving-shaft at one side of the center thereof.

The rocker-shaft L, with the attached oscillating carrier H', is generally and conveniently termed the "needle-post rocker-shaft." By moving the screw or equivalent adjusting-stud l^2 endwise the needle-post rocker-shaft is readily moved endwise to aline the needles with the awls, and as the carrier H' is then moved laterally away from or toward the frame of the machine the studs x and y , which support the blocks h^2 and k' , play through the holes in the links h^3 and k^2 .

While I have thus described the construction in detail of the present form of machine in which the several features of my invention are embodied, I do not intend to limit my invention to matters of detail, and the constructional features described may be varied, if desired, without departure from my invention.

What I claim is—

1. In a sewing-machine, the combination of a driving-shaft and actuating device thereon, of the cast-off rocker-shaft M and rocker-arm m on said rocker-shaft; a connecting-rod m^4 on said actuating device, said rod carrying a stud m^2 and link m' connecting said rocker-arm and stud; a stationary stud m^5 and a link connecting said stationary stud with the stud m^2 carried by the connecting-rod.

2. In a sewing-machine, a driving-shaft; an awl-bar connected therewith at one side of the longitudinal axis of the driving-shaft; an eccentric on the driving-shaft for the thread-carrying mechanism; an eccentric on the driving-shaft for the presser-foot-lifting mechanism; a bearing for the driving-shaft, contiguous to the last-mentioned eccentric; a triangular cam for the feed mechanism, on the driving-shaft, and contiguous to said bearing; an eccentric on the driving-shaft for the needle-reciprocating mechanism; and an eccentric on the driving-shaft for the cast-off mechanism; in combination with a thread-carrying mechanism; presser-foot-lifting mechanism; needle-feeding mechanism including a feed-lever; needle-reciprocating mechanism; a cast-off-actuating mechanism, and a

stationary lateral support carrying an adjustable fulcrum for said feed-lever.

3. In a sewing-machine, a driving-shaft; an awl-bar connected therewith at one side of the longitudinal axis of the driving-shaft; an eccentric thereon for the thread-carrying mechanism; an eccentric on the driving-shaft for the presser-foot-lifting-mechanism; a triangular cam on the driving-shaft, for the feed-lever; an eccentric on the driving-shaft for the needle-reciprocating mechanism; and an eccentric on the driving-shaft for the cast-off mechanism; in combination with thread-carrying, foot-lifting, needle-feeding, needle-reciprocating and cast-off-reciprocating mechanism; and a stationary lateral support formed by a vertical portion of the main frame and carrying an adjustable fulcrum for said feed-lever.

4. In a sewing-machine, the combination of

a driving-shaft; a rocker-shaft for the needle-reciprocating mechanism; a rocker-shaft for the cast-off-reciprocating mechanism; eccentrics on the driving-shaft, and eccentric-straps from each of said eccentrics to each of said mechanisms; a triangular cam on the driving-shaft for a feed-lever; a feed mechanism including a feed-lever; a needle-reciprocating mechanism, a cast-off-reciprocating mechanism; and a stationary support for said feed-lever.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 30th day of March, A. D. 1897.

HEBER C. PETERS.

Witnesses:

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