

No. 790,067.

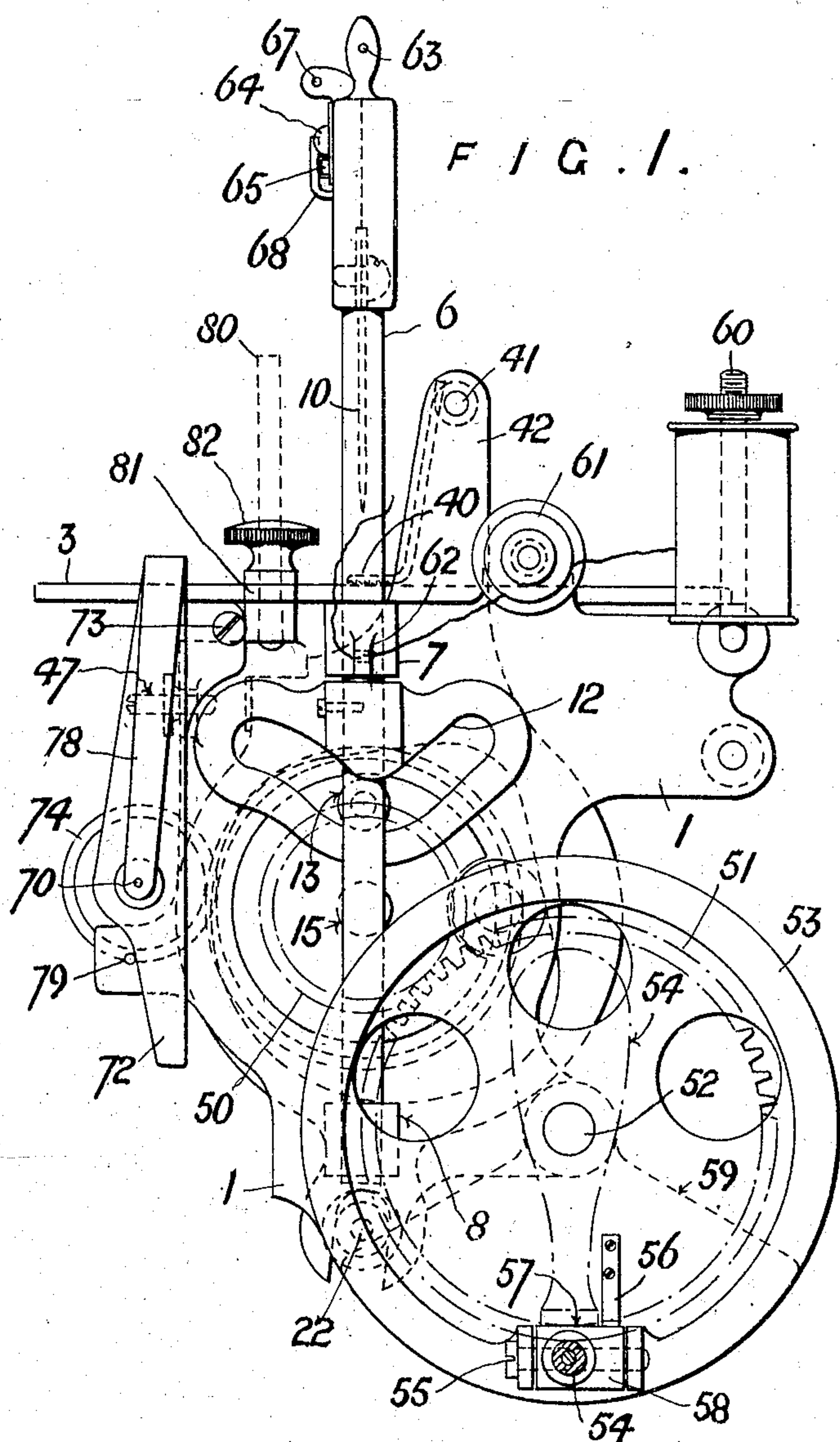
PATENTED MAY 16, 1905.

H. MANNING.

FEEDING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED JULY 15, 1903.

3 SHEETS—SHEET 1.



WITNESSES:

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A. H. Davis

INVENTOR

Henry Manning

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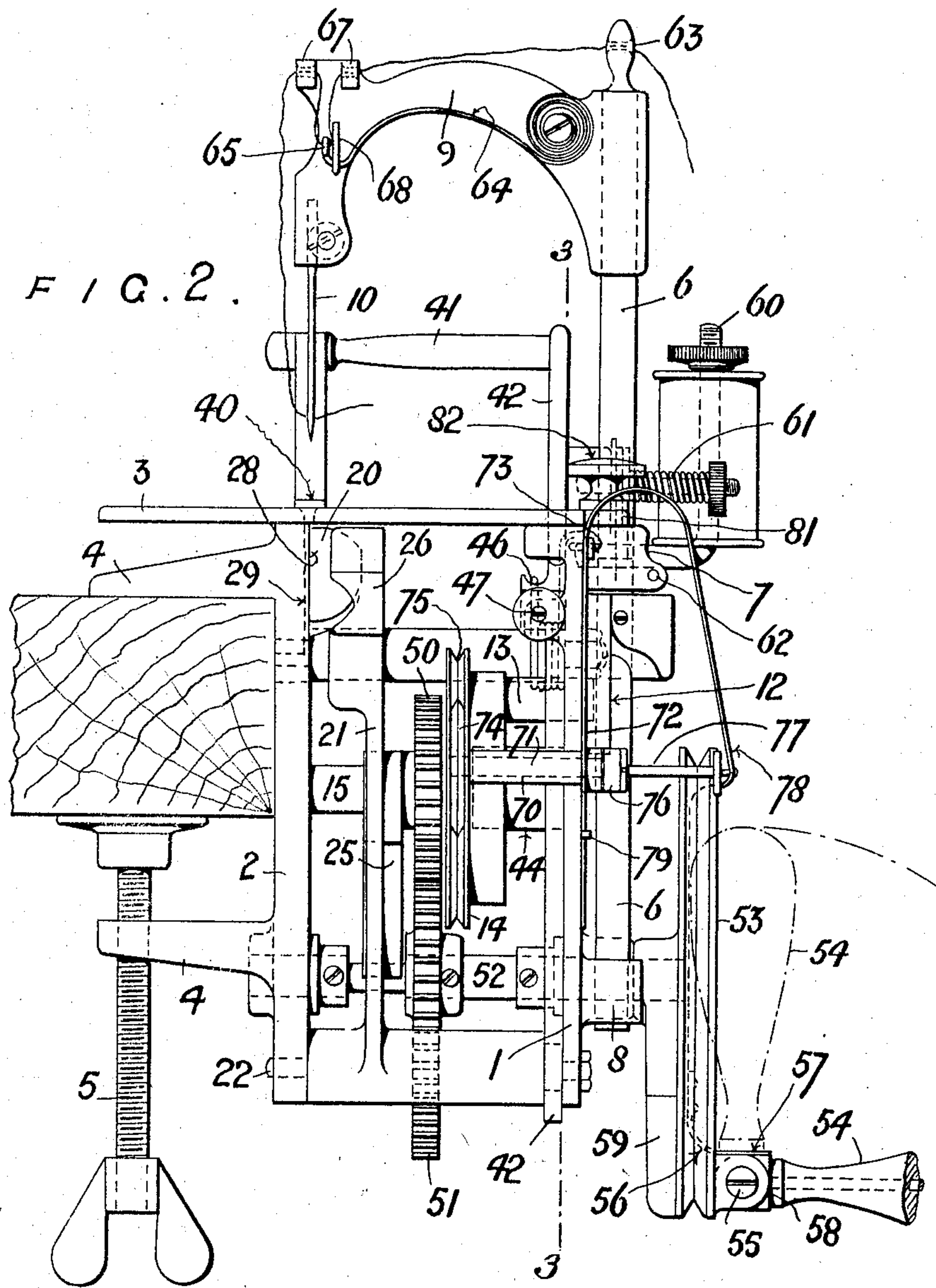
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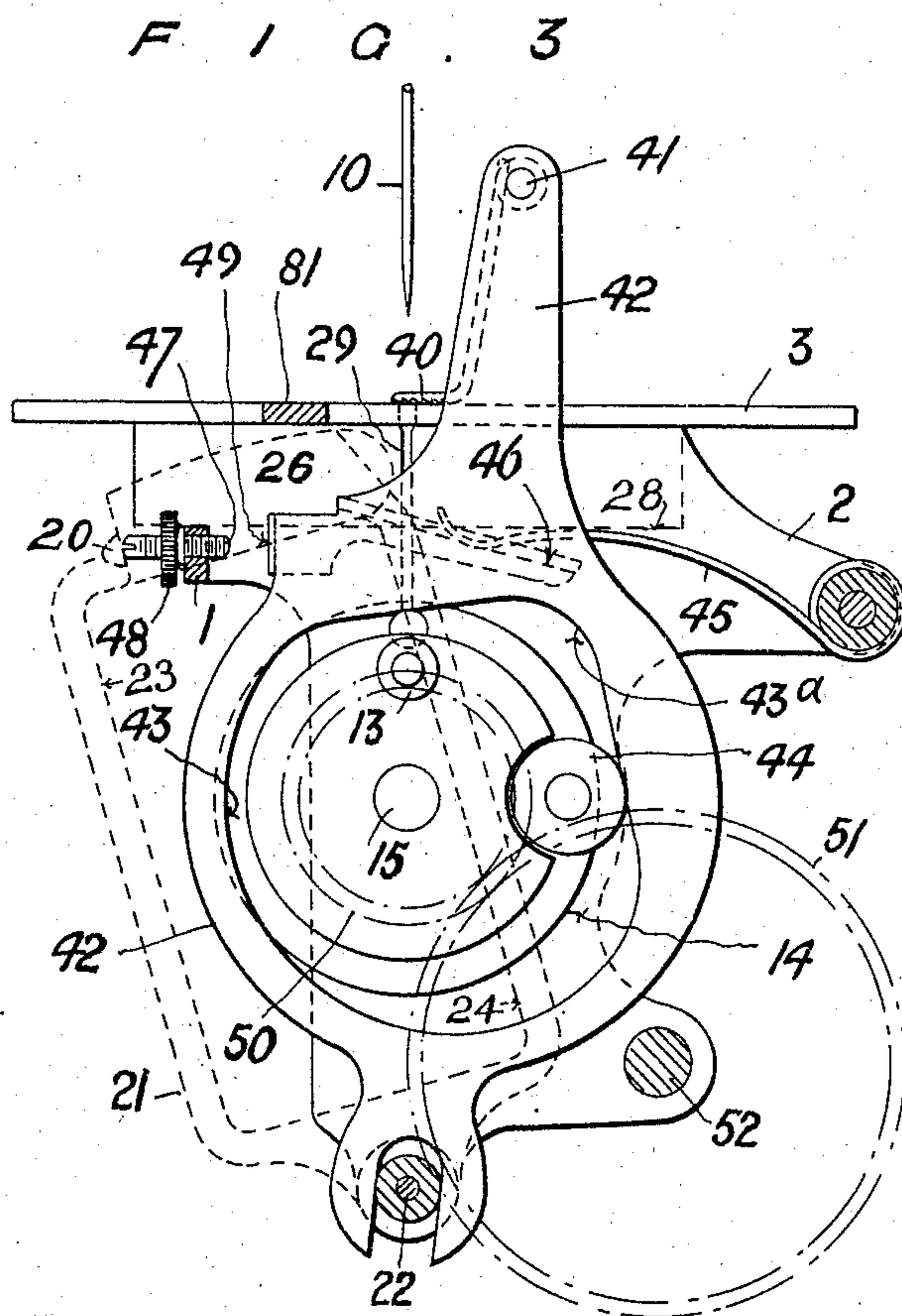
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UNITED STATES PATENT OFFICE.

HENRY MANNING, OF LONDON, ENGLAND, ASSIGNOR TO JOSEPH LEO ROSENSCHEIN, OF NOTTINGHAM, ENGLAND.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 790,067, dated May 16, 1905.

Application filed July 15, 1903. Serial No. 165,573.

To all whom it may concern:

Be it known that I, HENRY MANNING, engineer, a subject of the King of Great Britain, residing at 46 Grays Inn road, London, England, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a specification.

This invention relates to a feeding mechanism for lock-stitch sewing-machines; and it consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claim.

Reference is to be had to the accompanying drawings, wherein—

Figures 1 and 2 are respectively front and end elevations of the sewing mechanism proper of the machine. Fig. 3 is a section on line 3 3, Fig. 2, showing the presser-foot lever.

The sewing mechanism proper comprises a light frame consisting of front and back members 1 2, held apart by stay-bolts and distance-collars and supporting above them the work-plate 3, the back member 2 being provided with clamping-jaws 4, through the lower one of which works a thumb-screw 5 for fixing the machine to the edge of a table or similar support, the work-plate 3 thus extending over the table-top at a convenient level relatively thereto.

The needle-bar consists of a rod 6, mounted to slide longitudinally in vertical guides 7 8 on the front member 1 of the frame below and clear of the outer edge of the work-plate. The needle-arm 9 extends from the upper end of the needle-bar 6 over the work-plate 3 and carries at its extremity the vertical needle 10, the length of the arm 9 being made sufficient to admit work of any ordinary width between the needle and needle-bar and the usual heavy stationary arm for carrying and guiding the needle-bar being entirely dispensed with. Fixed to the needle-bar 6, below the level of the work-plate, is a cam 12, through which motion is communicated to the needle-bar, the cam having a groove or slot which is engaged by a cam-stud and roller 13, carried by

a disk 14, mounted on and turning with a horizontal shaft 15, journaled in bearings in the members 1 2 of the frame, the profile of the cam-slot 12 being such that at each revolution of the shaft 15 the needle-bar 6 receives one complete up-and-down movement.

The shuttle 20 is carried by a rocking lever-arm 21, mounted to vibrate in a vertical plane about a transverse axis 22 at the lower part of the machine-frame, this arm 21 being formed, preferably, as an open frame having at opposite sides of a central gap surfaces 23 24, engaged by a cam 25, carried by and turning with the shaft 15, the cam 25 being of a form, as shown, adapted to produce the requisite to-and-fro movement of the shuttle in time with the reciprocations of the needle.

The shuttle 20 rests in a cradle 26 at the upper end of the arm 21, the lower side of the cradle being of such form that the shuttle constantly tends under gravitation to remain with its flat side bearing against the shuttle-race 28, which is formed by a portion of the front face of the back member 2 of the machine-frame, the needle 10 working in a groove 29 in that face. The shuttle 20 is removably retained in its cradle by any suitable means.

Step-by-step feed movement, adjustable in extent, is imparted to the work by means of the serrated presser-foot 40, which is carried by and projects downward from an arm 41, extending over the work-plate from a lever 42, mounted to vibrate clear of the outer edge of the work-plate about the transverse axis 22, before mentioned, this lever being slotted or forked, as shown, to engage with the axis 22, so that the lever is free to receive also slight movement transversely of said axis. The lever 42 is preferably formed (somewhat like the shuttle-carrier) as an open frame, having a central gap bounded by a cam-surface 43 43^a, engaged during a portion of their revolution by a cam-stud and roller 44, carried by the disk 14, before mentioned, so that for each revolution of the shaft 15 the presser-foot will be caused to perform the cycle of movements necessary for effecting the feed—that is to say, after the completion of a stitch the

presser-foot 40, being then in contact with the work, will be caused to receive a movement parallel to the surface of the work-plate 3, the cam-surface 43 43^a being of such configuration as to feed the work in the required direction, and will then, during the next descent of the needle, (whereby the work will be held steady independently of the presser-foot,) be raised clear of the work, moved backward, and again caused to descend so as to press upon and grip the work in readiness for the next feed movement. The lever 42 is forced downward (so as normally to cause the presser-foot to hold the work upon the work-plate) and also rearward by means of a spring-arm 45, fixed at one end to the machine-frame and bearing by its other end upon an inclined ledge 46 on the lever 42, this ledge being of a length corresponding to the amplitude of vibratory movement of the lever 42, whose upward movement to clear the work is permitted by the fact of the lever engaging with the axis 22 by a fork or slot, as already described. For the purpose of regulating the length of stitch the amplitude of the angular vibration of the lever 42 in the rearward direction (this part of its movement being effected suddenly by the pressure of spring 45 while the roller 44 is out of contact with the portion 43^a of the cam-surface of said lever) is determined by means of an adjustable stop consisting of a set-pin 47, screwing through a lug on the frame and provided with a lock-nut 48, the stop 47 being struck by a padded projection 49 on the lever 42 at each return vibration of the latter.

The cam-studs 13 and 44 are both mounted upon the same side of the disk 14, and the feed-cam lever 42 being placed between the disk 14 and the needle-bar cam 12 the cam-stud 13, which engages the latter, is made long enough to pass through the gap in the lever 42.

The shaft 15, which carries the cam-studs 13 and 44 and the shuttle-cam 25, has fast upon it a pinion 50, in gear with a spur-wheel 51, fast on a shaft 52, mounted in bearings in the machine-frame and having at its outer end a peripherally-grooved hand-wheel 53, carrying a crank-handle 54, hinged to the wheel, so as to be adapted when not in use to be folded out of the way, as indicated in dotted lines in Fig. 2. The crank-handle 54 is retained in the operative and inoperative positions by a spring 56, fixed to the hand-wheel and bearing against flats 57 58 on the boss which carries the handle, and turns about the hinge-pin 55, the boss having a knuckle or stop to prevent the handle being forced outward beyond the operative position. The angular position of the handle 54 on the circumference of the hand-wheel 53 is such that when free the handle will act as a counterpoise to retain the needle-bar 6 in its highest position, wherein the needle 10 is most conveniently situated for being threaded, the hand-wheel being, if necessary,

further counterweighted, as at 59, to assist in producing this effect.

The needle-thread reel is mounted to turn about a pin 60, outstanding from the machine-frame clear of the work-plate, the thread being led from the spool through a spring-tension device 61 of ordinary construction and thence through guide-eyes 62 and 63 in the frame and at the top of the needle-bar, respectively, to the eye of the needle 10 by way of a take-up device, whereby the slack of the thread is drawn tight after each stitch. This take-up device consists of a light flexible spring-arm 64, spirally coiled at one end, whereby it is attached to the needle-arm 9, and having at its free end a loop 65 for the passage of the thread-bight formed between a pair of guide-eyes 67 on the needle-arm (preferably directly over the needle, as shown) and through which the thread is rove, the spring 64 tending to stretch the bight of the thread, but being capable of yielding in the opposite direction, so that when the needle-bar in rising draws the thread through the work the spring 64 will yield and (by permitting the shortening of the thread-bight) prevent an excess of slack being formed, whereas on the tension of the thread being released by the descent of the needle-bar the spring 64 will recover its previous position and in so doing will take up the remaining slack of the thread. 68 is a combined guide and stop for the spring-arm 64.

The take-up device herein shown and described is not claimed in the present application, but forms the subject-matter of a separate application, filed January 25, 1904, Serial No. 190,501.

The shuttle-spool-winding device comprises a rotary spindle 70, journaled in a sleeve-bearing 71, carried by one limb, 72, of a U-shaped spring-frame pivoted at 73 to the front of the frame beneath the level of the work-plate 3, the spindle 70 having at its inner end a V-edged pulley 74 of relatively small diameter, adapted to gear frictionally with a V-shaped peripheral groove 75 on the disk 14. At its outer end the spindle 70 has the usual spool-driving carrier 76, the spool 77 to be filled being mounted between pivot-centers provided, respectively, on the carrier 76 and on the other limb, 78, of the U-shaped frame, which is so formed out of a single strip of flat spring-steel that its limbs 72 78 tend to spring together, and so hold the spool between them. When the spool winding device is in use, the periphery of the friction-pulley 74 is held in gear with the groove 75 of disk 14 by the arm 72 being sprung over a projection 79 on the machine-frame. In order to hold the reel from which the shuttle-spool 77 is to be filled, there is provided a stud-pin, (indicated by the dotted lines at 80,) which is screwed for the time being into a tapped hole in a lateral extension 81 of the work-plate, the same hole serving to receive the clamping-

screw 82, whereby the work-guide, hemmer, and other such adjuncts are secured in position when required.

5 Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

10 In a lock-stitch sewing-machine, a presser-foot for feeding the work, a lever comprising an open frame having cam-surfaces and provided at its upper end with an arm carrying the presser-foot, a shaft extending through the opening in the lever and carrying a cam-stud adapted to engage the cam-surfaces of
15 the lever during a part of the revolution of

the shaft to move the lever in one direction to feed the work, a spring secured at one end to the machine-frame and bearing at its other end on the said lever to move the same in the opposite direction when the cam-stud is out 20 of operative engagement with the lever, and an adjustable stop consisting of a set-screw screwing through a lug on the frame of the machine and provided with a lock-nut, the said lever having a padded projection for en- 25 gaging the said stop-screw, as set forth.

HENRY MANNING.

Witnesses:

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