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G. M. EAMES & J. S. FINCH.
OVERSEAMING SEWING MACHINE.
APPLICATION FILED MAY 21, 1914.

1,155,052.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

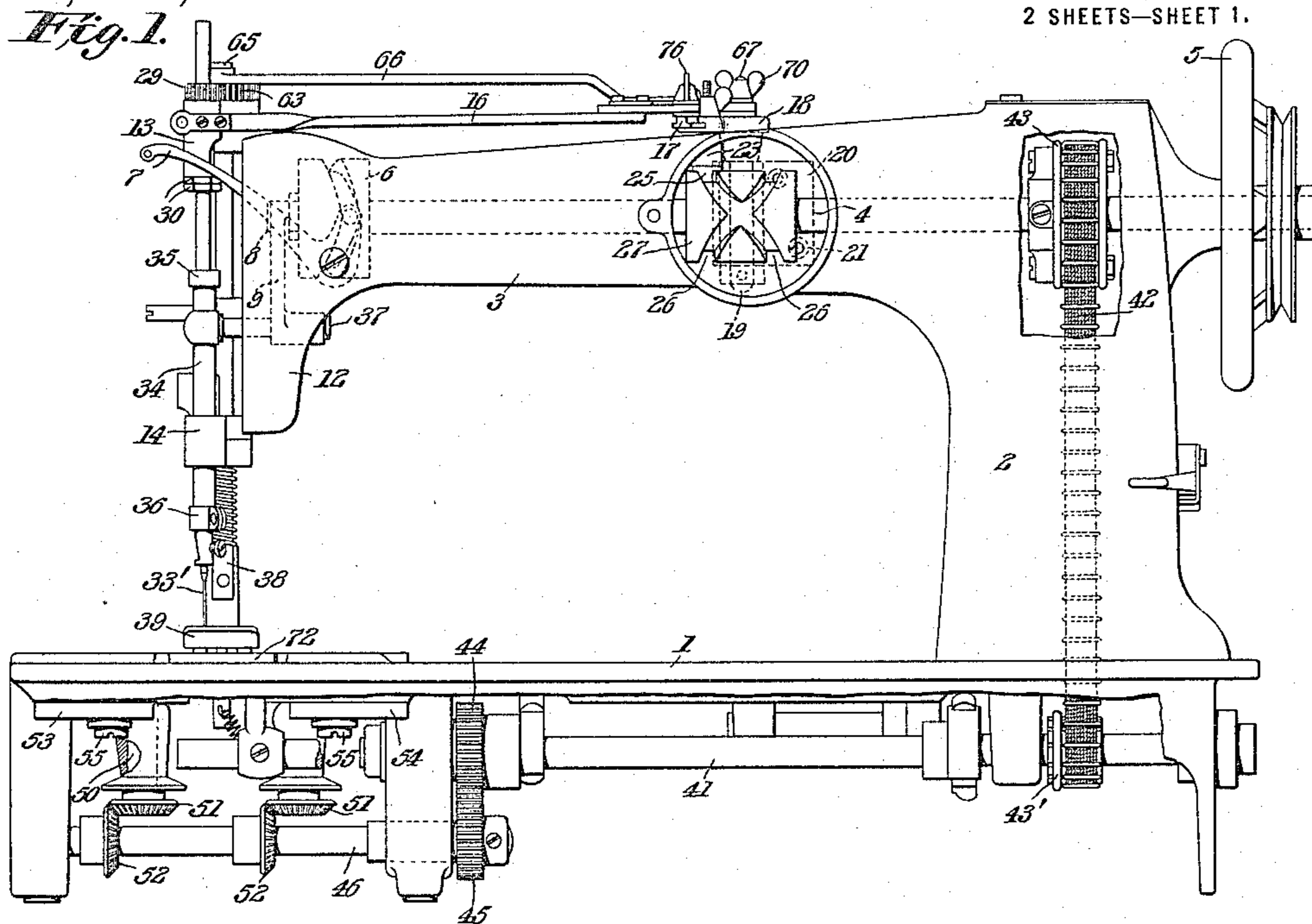


Fig. 4.

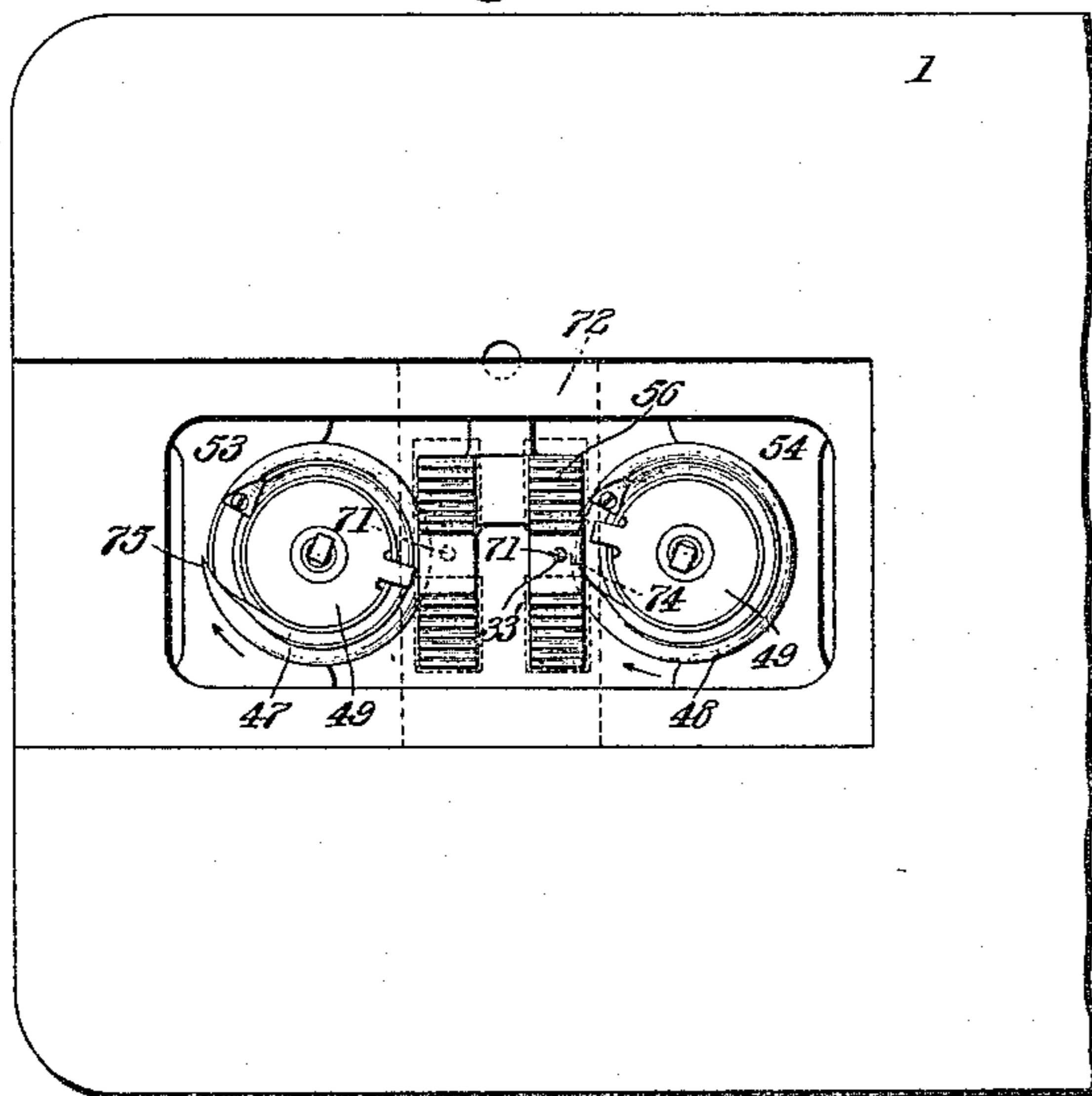
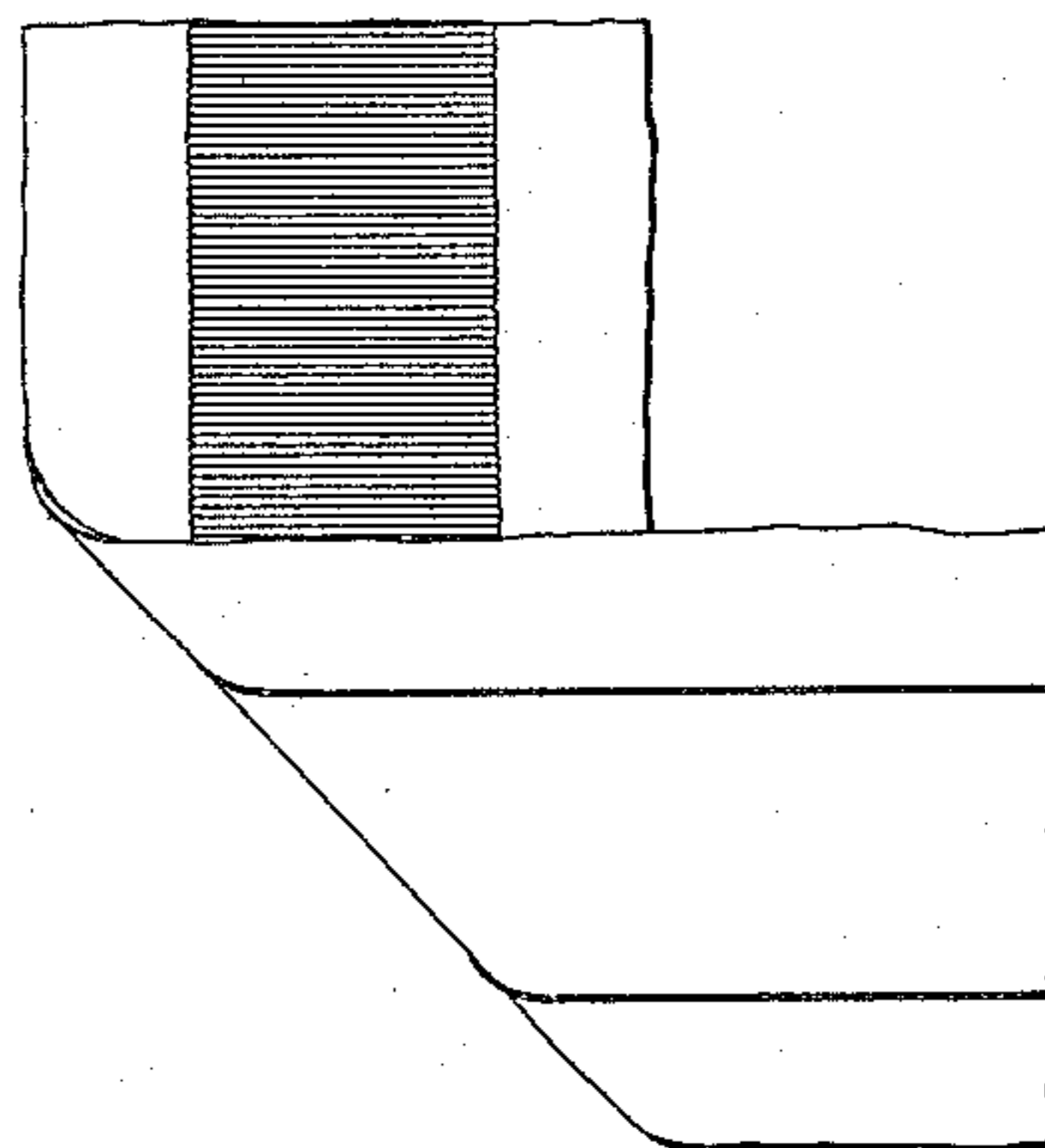


Fig. 6.



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Fig. 2.

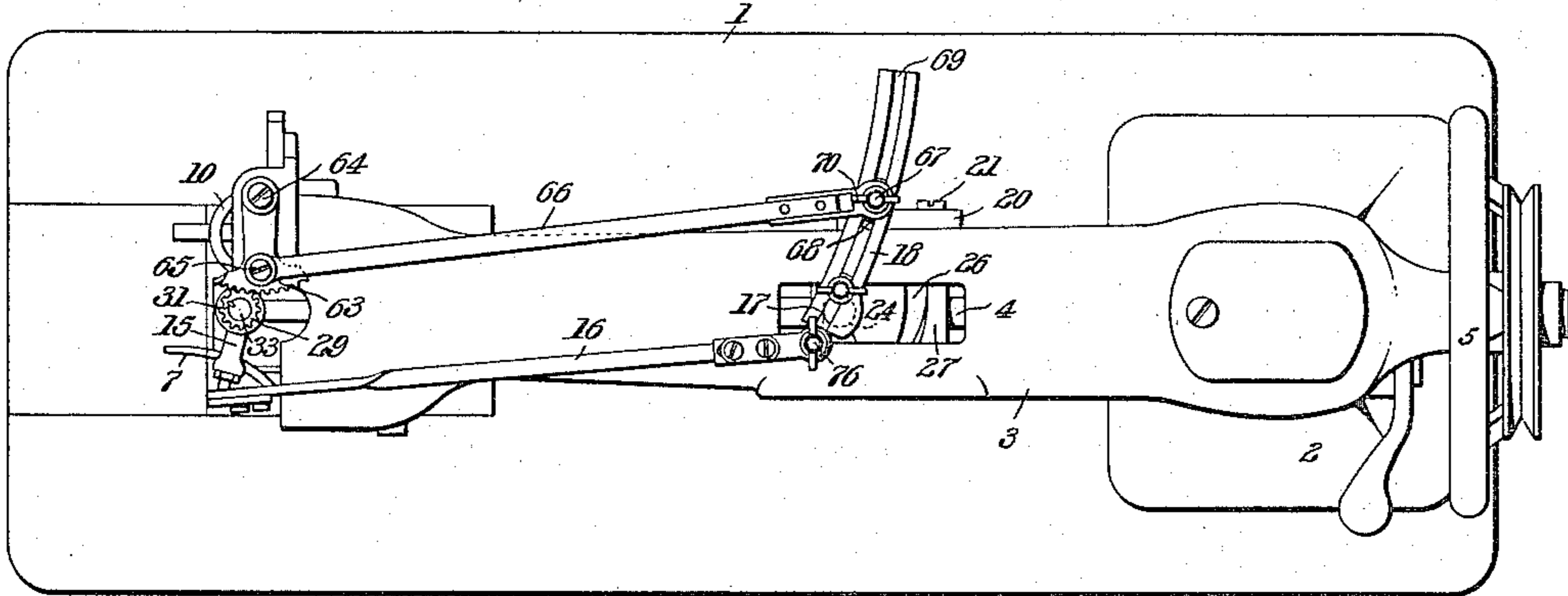


Fig. 3.

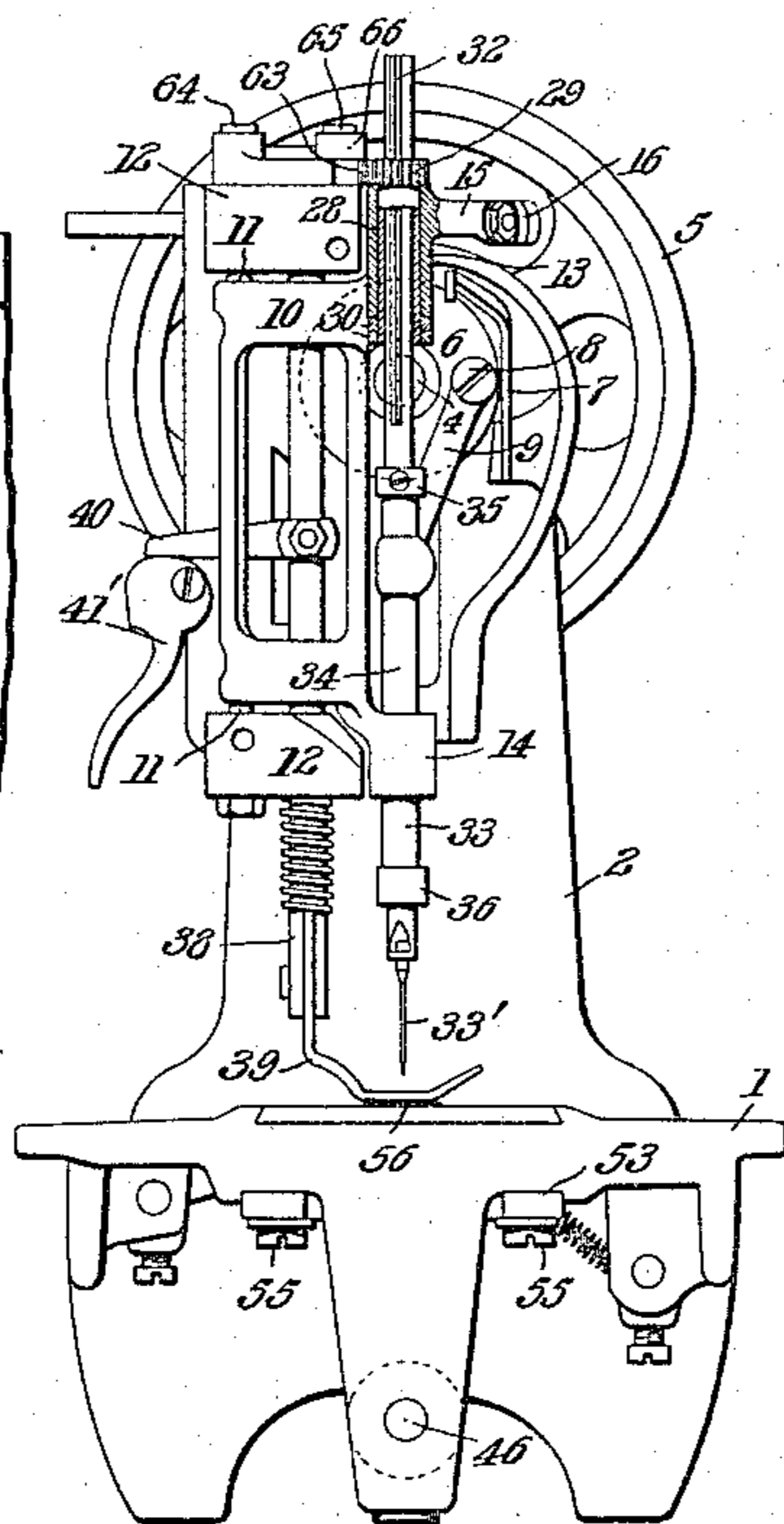


Fig. 5.

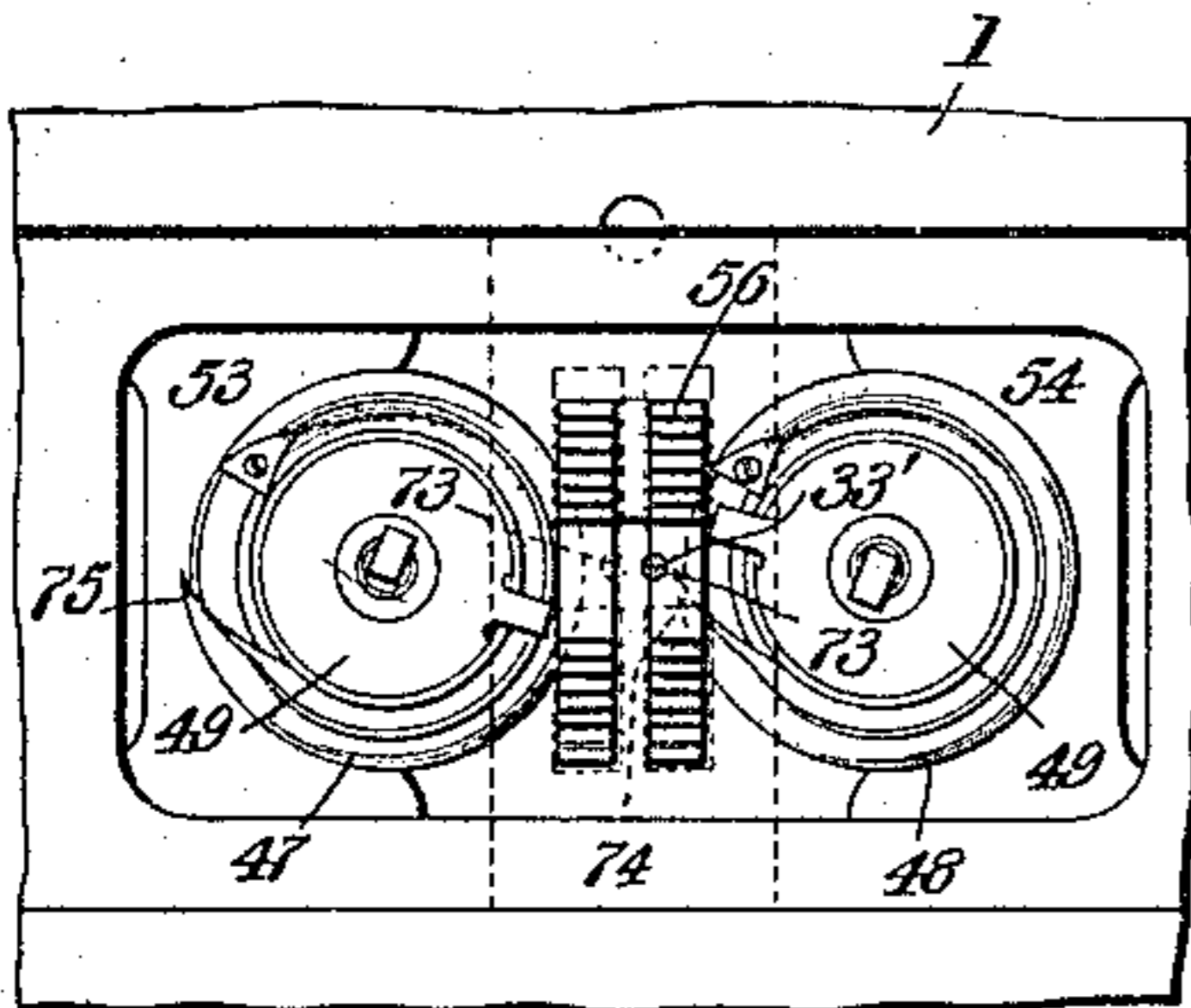
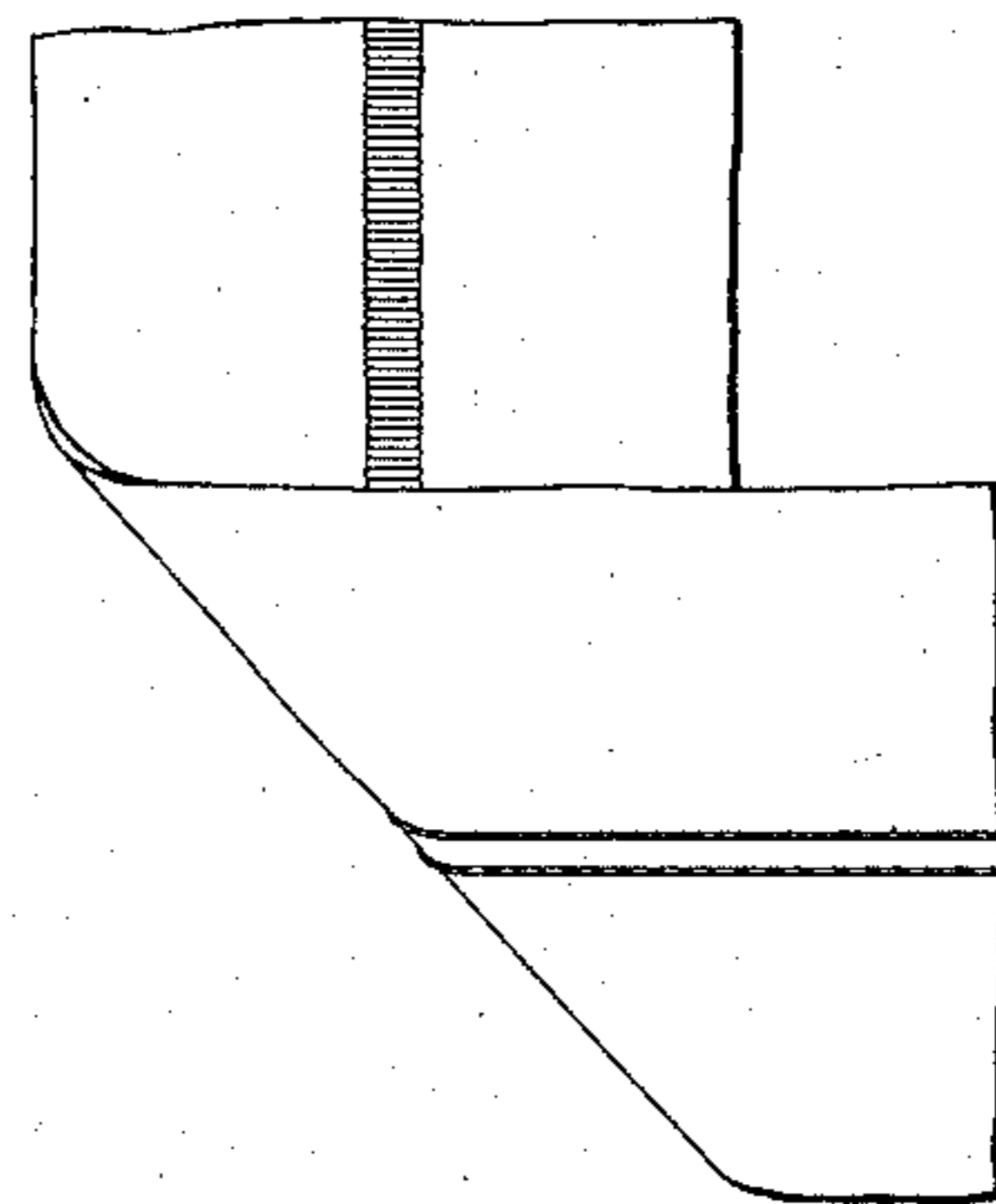


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE M. EAMES AND JOHN S. FINCH, OF BRIDGEPORT, CONNECTICUT, ASSIGNORS TO
THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

OVERSEAMING SEWING-MACHINE.

1,155,052.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed May 21, 1914. Serial No. 839,928.

To all whom it may concern:

Be it known that we, GEORGE M. EAMES and JOHN S. FINCH, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have
5 invented certain new and useful Improvements in Overseaming Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying
10 drawings.

This invention relates to improvements in overseaming sewing machines employing two loop-takers in connection with a single needle having reciprocating, oscillating and
15 lateral movements, and has for its object to provide a stitch-forming mechanism capable of effecting extremely narrow gage, even to the extent of producing a seam having its successive stitches arranged in a straight or
20 given line without the liability of one of the loop-takers interfering with the loop-seizing action of the other of said loop-takers, and to this end there is provided a stitch-forming mechanism employing loop-takers hav-
25 ing one or more rotations and a fractional rotation for each complete actuation of the needle.

Prior to the present invention it has been impractical to effect stitching of an extremely narrow gage as in the earlier constructions each of the loop-seizing points of the loop-takers are timed to enter the thread-loop at the same point in their rotations, which makes liable the picking up of
35 the needle-thread by the loop-seizing point arranged at the side of the needle opposite the loop-seizing point effecting the loop-seizing operation, and especially is this true when using a wiry or hard twisted sewing
40 thread which often throws out a loop at both sides of the needle in the formation of a given stitch.

Referring to the drawings, Figure 1 is a view in front side elevation of an overseaming sewing machine equipped with the present invention; Fig. 2 a plan of Fig. 1; Fig. 3 a front side elevation of Fig. 1. Figs. 4 and 5 are plan views of the loop-takers, feed-dog and a portion of the bed-plate, together with dotted line views of the throat
45 or needle-plate, the former figure illustrating the loop-takers arranged for effecting a medium width of gage and the other of said figures for a comparatively narrow gage. Figs. 6 and 7 reverse sides of a fabric illus-

trating wide and comparatively narrow gage seams respectively.

1 represents the bed-plate of the sewing machine upon which is mounted the bracket-arm comprising the arm standard 2 and arm bracket 3, 4 the main or needle-bar-driving shaft carrying at its rear end the hand or band-wheel 5 and at its opposite end the usual take-up cam 6 for actuating the take-up lever 7, the front face of said cam being
60 provided with a stud bearing 8 upon which is pivoted one end of a needle-bar-actuating link 9.

10 represents the needle-bar gate mounted to oscillate on pintle screws, as 11, threaded into the head 12 of the arm bracket 3, and at its front edge provided with bearing hubs 13 and 14 and extension 15, the latter operatively connected through the needle-bar gate connection 16 with the adjustable slide 17
70 carried by the oscillating lever 18 provided with a downwardly extended bearing shaft 19, which latter is mounted to oscillate in a suitable bearing formed in the bracket 20 secured by screws, as 21, to the rear side of
80 the arm bracket 3, the forward end of said oscillating lever being provided with a hollow downwardly extended portion 23 in which is pivotally mounted the stem 24 (shown in dotted lines only, Fig. 2) of the
85 cam follower 25, which latter tracks cam grooves, as 26, of the switch cam 27 carried by the main-shaft 4, whereby lateral movements are transmitted from the main-shaft to the gate 10.

In the bearing hub 13 is journaled a needle-bar bearing 28 provided at its upper end with a pinion 29, its opposite end being threaded to accommodate adjusting nuts, as 30, which latter, in connection with said pin-
95 ion, act to hold the bearing against endwise movement in the hub 13, said bearing being provided with a keyway 31 which coacts with a key 32 carried by the needle-bar 33 to hold the latter against axial movement
100 independently of the movements of the bearing 28.

34 represents a tubular bearing member which is mounted to move vertically in a suitable bearing formed in the hub 14, and
105 in which is mounted to move axially the needle-bar 33 provided with the needle 33', collars 35 and 36 suitably secured on said needle-bar acting to transmit to the latter vertical movements corresponding to the
110

vertical movements of the tubular bearing, which latter is provided with a stud 37 upon which is fulcrumed the lower end of the link 9, thus vertical movements are transmitted from said main-shaft to said needle-bar.

38 represents a spring-depressed cloth-presser-carrying bar provided at its lower end with a cloth-presser 39 and carrying a presser-lifting lug 40 for coacting with a manually operated presser-lifting lever 41', as in earlier constructions.

41 represents a rotating crank-shaft mounted in suitable bearings depending from the bed-plate and operatively connected with the main-shaft through a belt 42 and pulleys 43 and 43', later to be referred to, said crank-shaft being provided with a gear 44 which meshes with a gear 45, later to be referred to, carried by the loop-taker-actuating shaft 46.

47 represents the left hand and 48 the right hand loop-taker, each provided with a suitable thread-holding case, as 49, and a loop-taker shaft, as 50 (one only of which is shown), and to the lower end of each is suitably secured a bevel gear, as 51, which meshes with a like gear 52 carried by the loop-taker-actuating shaft 46, the shafts 50 being journaled in suitable bearings formed in the left and right hand saddles 53 and 54, respectively, adjustably secured to the underside of the bed-plate by suitable screws, as 55.

The means employed for giving to the feed-dog 56 its feed movements and controlling the amplitude of said movements may be of any suitable construction, one form of which is shown in the drawings, but it is not deemed necessary to specifically describe such mechanism, since it is well understood.

63 represents a segment gear pivoted on a bearing stud 64 threaded into the head 12 of the arm bracket, and having pivoted to it, by stud-screw 65, one end of a link 66 whose opposite end is pivotally mounted on a stud 67 carried by the adjustable slide-block 68 which tracks the under-cut groove 69 formed in the oscillating lever 18, a wing-nut 70 acting to hold said slide-block in the desired adjustment with respect to the axis of the bearing shaft 19, and said segment gear meshing with the pinion 29.

When employing a single needle in connection with two loop-takers for effecting stitches first at one and then at the opposite side of the median line of vertical movement of the needle, the needle must be given a half turn so that in the formation of each stitch the loop of needle-thread will be properly presented to the loop-taker.

In the present construction, assuming that the needle-openings, as 71, in the throat or needle-plate 72, Fig. 4, represent the limit

of lateral movement of the needle, that the present adjustment of the slide-block 17 in the groove 69 of the lever 18 represents the adjustment of the connection 16 to effect lateral movements of the needle corresponding to the distance between said needle-openings, and that the axis of the stud 67 connecting the link 66 with the segment gear 63 coincides with the axis of the bearing stud 19, the operation of the machine would cause the needle to be alined first with one and then with the other of said needle-openings, and the now stationary segment gear would act on the pinion 29 to give the needle a half turn, thus effecting a like coöperation of needle and loop-takers, whether at one or the opposite side of the median line of vertical movement of the needle.

When it is desired to lessen the amplitude of the lateral movements of the needle as represented by the needle-openings, as 73, Fig. 5, the attendant adjusts the slide-block 17 in the direction of the axis of the bearing stud 19, which of itself would negative the means for giving to the needle its half turn, and to overcome this the slide-block is adjusted from the axis of the bearing stud 19 a distance sufficient to give to the segment gear such movement as is necessary to compensate for the shortening of the lateral movements of the needle, which form of needle control makes practical the employment of a needle secured concentric with the axis of the needle-bar, and provides adjusting means for changing the amplitude of the lateral movements of said needle.

Referring now to the inventive features new to the present construction, the ratio of the pulleys 43 and 43' are as two to one, thus giving to the shaft 41 two rotations to one of the shaft 4, and the ratio of the gears 44 and 45 are as one and one quarter to one, thus giving to the shaft 46 one and one quarter rotations to one rotation of the shaft 41 or two and one half rotations to one rotation of the shaft 4 which, as will be readily understood, makes practical the timing of the loop-takers so that at the time the loop-seizing point 74 is about to enter the thread-loop the like points 75 is farthest from their loop-seizing positions, which avoids any possibility of one of the loop-takers interfering with the loop-seizing action of its coacting loop-taker, as has been the difficulty in connection with the earlier constructions when stitching extremely narrow gaged seams.

Should any variety of product being acted upon by the present construction require the stitching of a straightaway seam the operator would adjust the pivot-stud 76 of the slide 17 to coincide with the axis of the shaft 19, thus eliminating the lateral movements of the needle, and adjust the slide 68 rearward a distance sufficient to cause the gear

segment 63 to transmit to the pinion 29 and needle-bar a half turn, followed by substituting a throat or needle-plate having a single central needle-opening and giving to the loop-takers adjustments toward each other a distance sufficient to insure that their loop-seizing points will properly enter the needle-thread loop.

While the present embodiment of the invention is in connection with loop-takers having two and one half rotations to one complete actuation of the needle-carrying bar, it is evident that other complete and fractional rotations of the loop-takers to one complete actuation of the needle-carrying bar could be employed.

Having thus set forth the nature of the invention, what we claim herein is:—

1. In an overseaming sewing machine, the combination with a stitch-forming mechanism including multiple loop-takers, and a needle-carrying bar and needle cooperating with each of said loop-takers to form stitches, of means for giving to said loop-takers complete and fractional stitch-forming movements for each complete stitch-forming movement of said needle.

2. In an overseaming sewing machine, the combination with a stitch-forming mechanism

including multiple loop-takers, a needle-carrying bar and needle cooperating with each of said loop-takers to form stitches, and means for giving to said needle reciprocating and oscillatory movements in a given path only, of means for giving to said loop-takers complete and fractional stitch-forming movements for each complete stitch-forming movement of said needle.

3. In an overseaming sewing machine, the combination with a stitch-forming mechanism including multiple loop-takers, a needle-carrying bar and needle cooperating with each of said loop-takers to form stitches and means including coacting gear members for giving to said needle reciprocating and oscillatory movements, of means for giving to said loop-takers complete and fractional stitch-forming movements for each complete stitch-forming movement of said needle.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

GEORGE M. EAMES.
JOHN S. FINCH.

Witnesses:

WM. A. SAUTTER,
FRANK M. WOOTTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."