

No. 705,569.

Patented July 29, 1902.

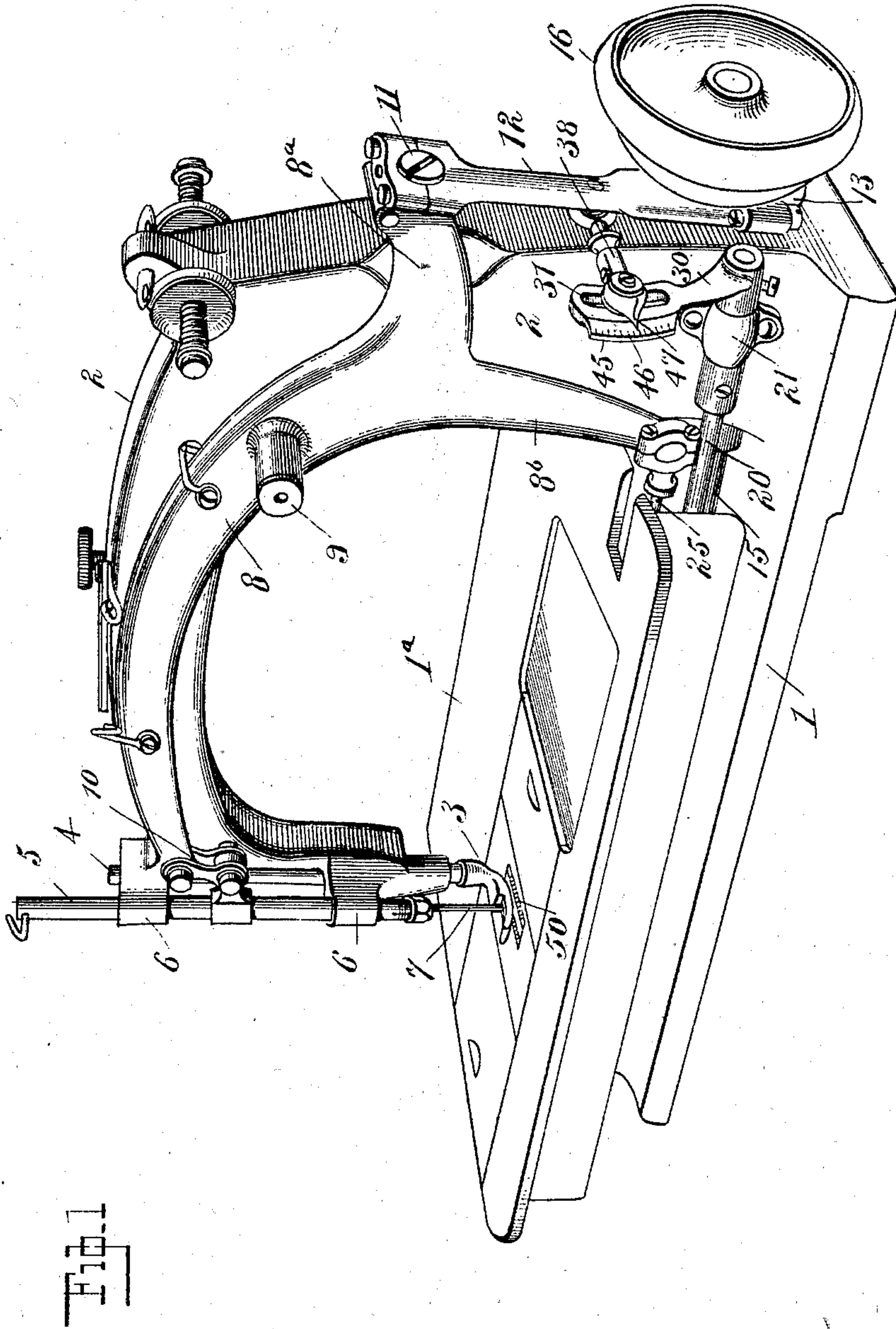
H. H. FEFEL.

STITCH FORMING MECHANISM FOR SEWING MACHINES.

(Application filed Aug. 28, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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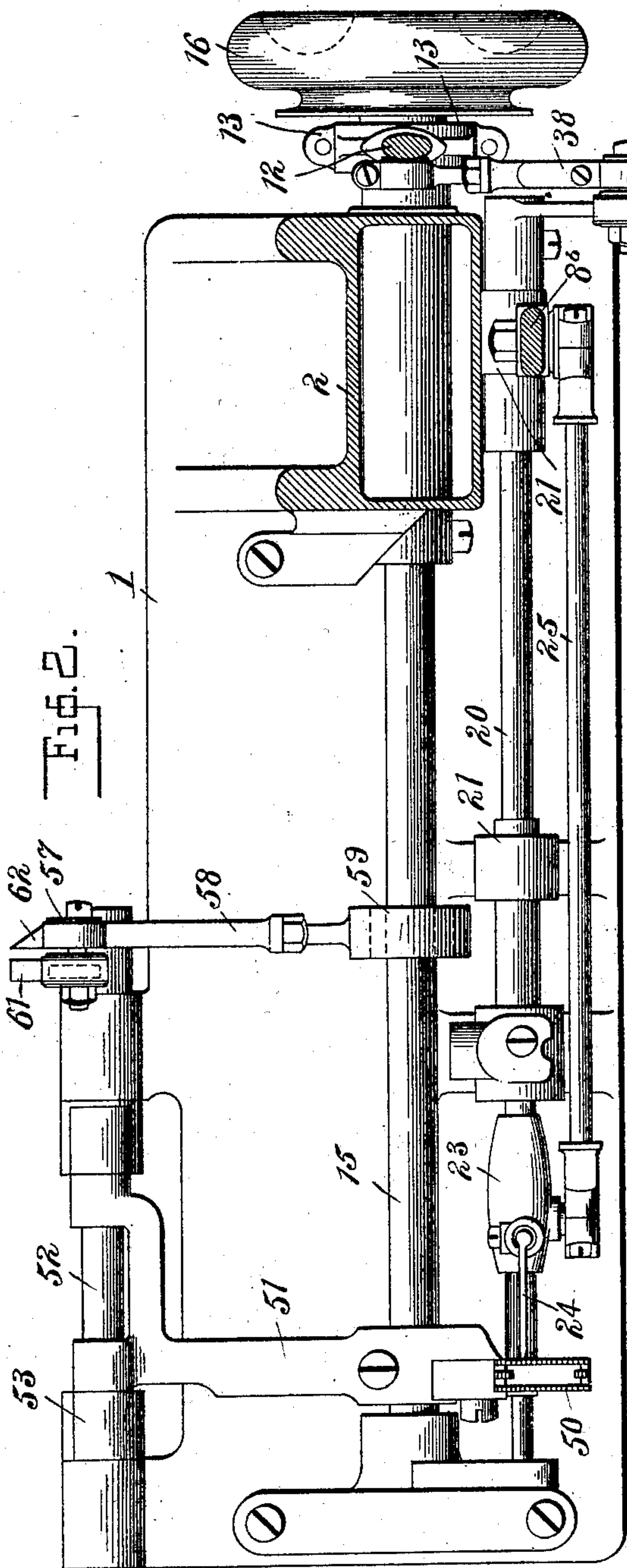
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Witnesses.
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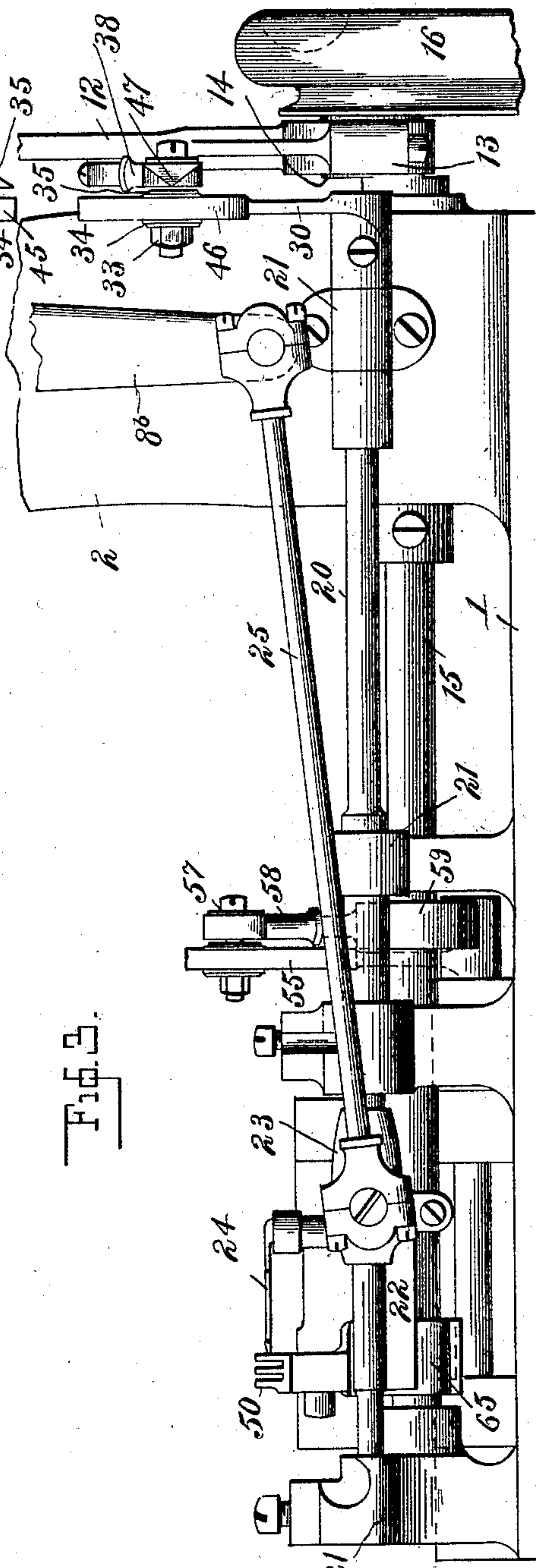


Fig. 3.

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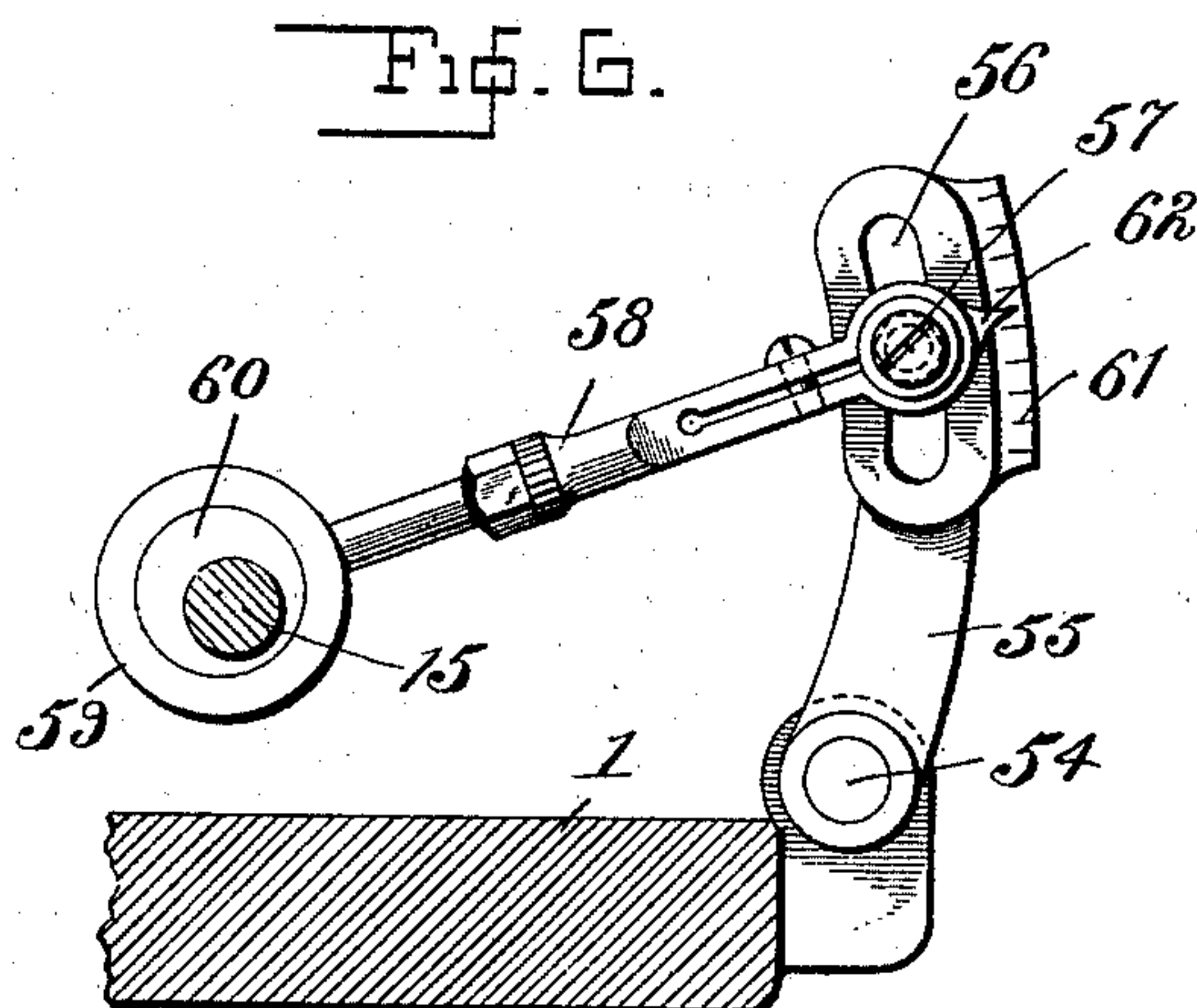
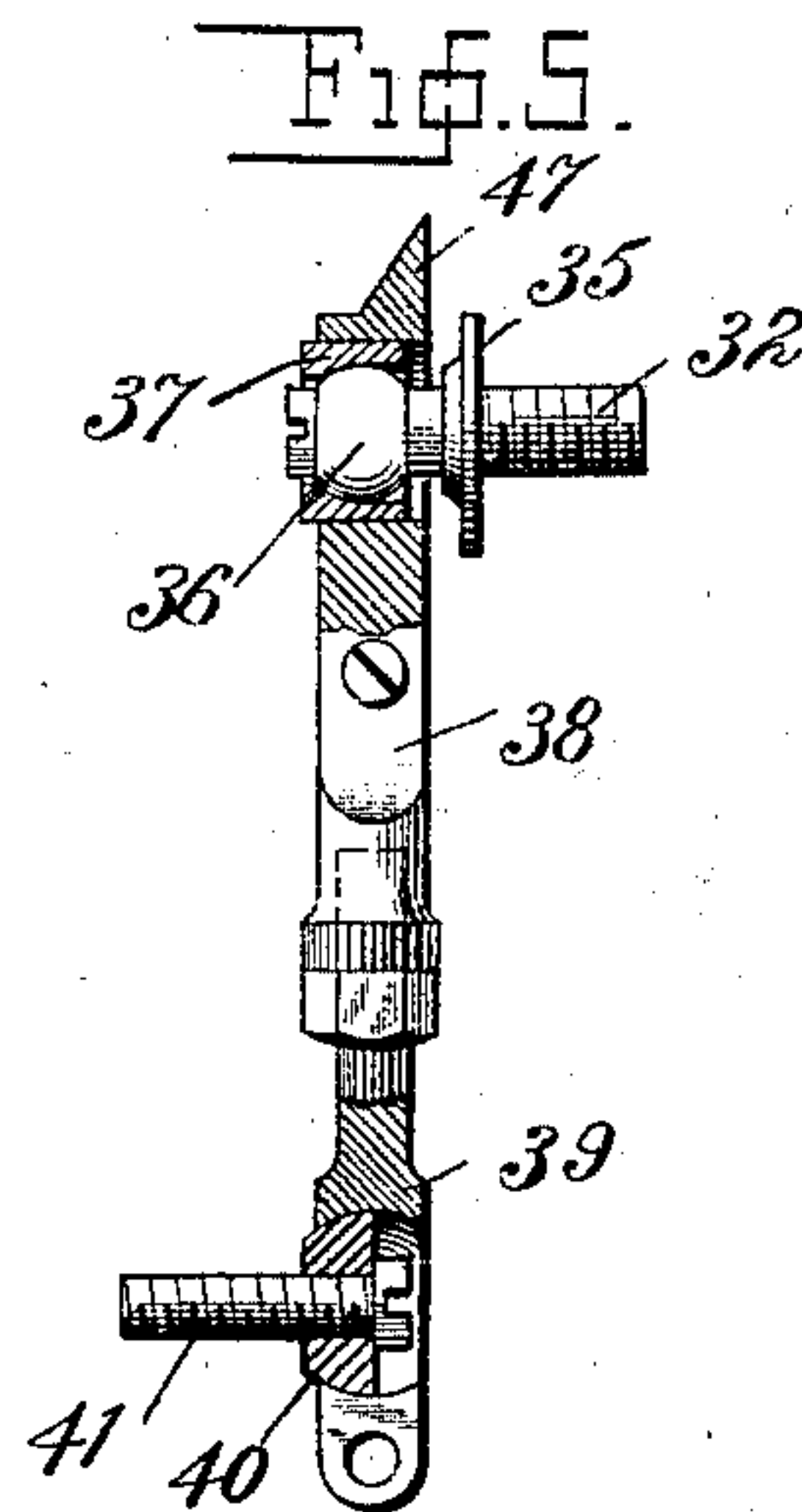
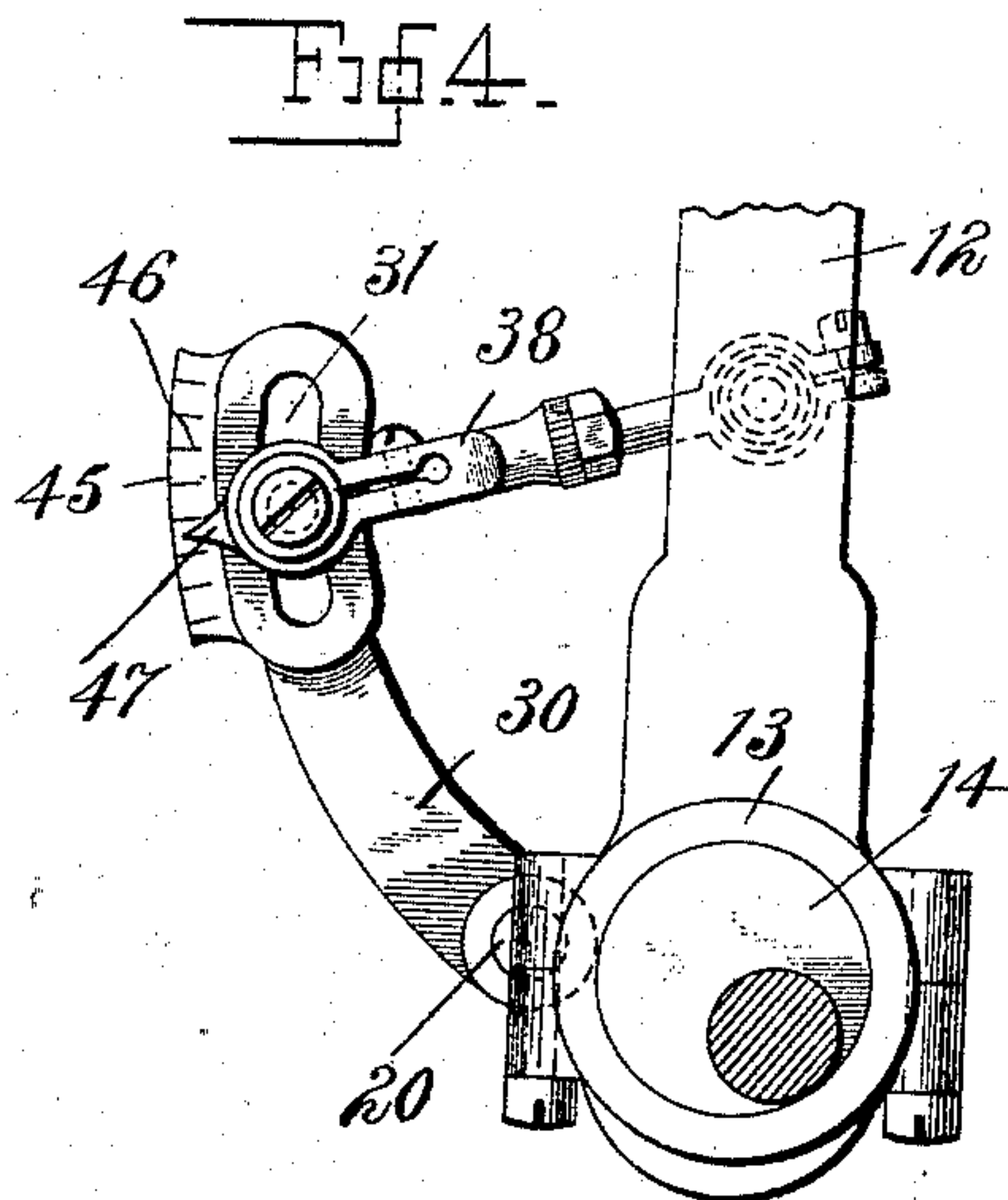
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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STITCH-FORMING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 705,569, dated July 29, 1902.

Application filed August 28, 1901. Serial No. 73,581. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. FEFEL, a citizen of the United States, residing at New York, in the county and State of New York,
5 have invented certain new and useful Improvements in Stitch-Forming Mechanism for Sewing-Machines, of which the following is a specification.

My invention relates to improvements in
10 the operating mechanism of sewing-machines of the lock-stitch type employing the ordinary reciprocating needle and thread-carrying looper; and the object of my invention is to simplify and improve the structure of the
15 operating mechanism of the stitch-forming mechanism and at the same time to provide for the convenient and accurate adjustment of the parts to suit the movements of the looper to needles of various sizes.

20 The main feature of novelty in my present invention is the structure and arrangement of the operating mechanism of the stitch-forming mechanism. This construction and arrangement is such that both the needle and
25 the thread-carrying looper are operated from a single cam or eccentric mounted upon the driving-shaft of the machine. In producing this result the needle is operated by the ordinary rocker-arm receiving motion from the
30 cam or eccentric on the driving-shaft. The rocking motion of the thread-carrying looper is produced through the medium of a rock-arm mounted upon the looper rock-shaft and a pitman connecting said rock-arm with the
35 needle-operating link, and the longitudinal reciprocation of the looper upon its rock-shaft is effected by a connection between the needle rocker-arm and the looper-carrier.

A second very important feature in my
40 present invention is the provision of means for adjusting the throw of the thread-carrying looper to suit the size of the particular needle being used. In effecting this result I form the rock-arm on the looper-carrying
45 rock-shaft with an elongated slot in which is adjustably mounted a pin which connects said rock-arm with a rod or link extending from the needle-operating link. By adjusting this rod connection up and down in the

slot of the rock-arm the rocking throw of the
50 looper can be slightly decreased or increased to cause the looper to pass upon the opposite sides of the needle as close as necessary to produce the desired result.

A further feature of my invention is the
55 provision of adjustable mechanism for regulating the stroke of the feed. This adjustable mechanism is similar to the adjustable mechanism for rocking the looper, it consisting of a slotted rock-arm upon the rock-shaft
60 of the feed-carrier frame, a link adjustably engaging the slotted end of said rock-arm, and a cam upon the main shaft operating said link.

I prefer to provide a scale upon each of the
65 slotted rock-arms of the looper and feed and an index or pointer upon the adjustable connecting-rods, whereby the adjusted position of the parts may be accurately determined
70 after the desired relation of the operative parts of the machine have once been ascertained.

In order that my invention may be fully understood, I will first describe the same
75 with reference to the accompanying drawings and afterward point out the novelty with more particularity in the annexed claims.

In said drawings, Figure 1 is a perspective
view of a sewing-machine having my improvements applied thereto. Fig. 2 is a horizontal
80 sectional plan view of the same, the cloth-plate of the machine being removed. Fig. 3 is a detail front elevation of the parts of the machine shown in Fig. 2. Fig. 4 is a
85 detail edge view of the adjustable mechanism for rocking the looper. Fig. 5 is a detail view, on an enlarged scale, partly broken away, of the adjustable connecting-rod of
90 the looper-operating mechanism. Fig. 6 is a detail edge view of the adjustable operating mechanism of the feed.

1 is the base of the sewing-machine, and 1^a is the cloth-plate.

2 is the sewing-machine head, projecting
95 up from the base.

3 is the presser-foot, mounted upon the lower end of the presser-foot bar 4, which is journaled in the sewing-machine head 2.

5 is the vertically-reciprocating needle-bar, journaled in bearings 6 of the head 2 and carrying at its lower end a needle 7.

8 is the needle-operating rocker-arm, journaled to the head 2 and 9 and connected through link 10 with the vertically-reciprocating needle-bar 5. The rocker-arm 8 has an integral arm 8^a, which curves around the sewing-machine head 2 and carries a journal pin or screw 11, formed with a spherical head, with which engages the concave recess of the upper yoke end of operating-link 12. The lower end of the link 12 is formed with a concaved yoke or strap 13, which embraces the convex eccentric 14, mounted upon the main driving-shaft 15 of the machine.

16 is the combined belt-pulley and fly-wheel.

The shaft 15 is suitably journaled in the base of the machine.

20 is the looper rock-shaft, suitably journaled in bearings 21 and provided with a spline or feather 22.

23 is the looper-carrier, mounted to slide upon the feathered or splined portion of the rock-shaft 20.

24 is the looper-needle, adjustably mounted upon the looper-carrier 23.

For imparting a longitudinally-reciprocating motion to the looper-carrier 23 a connecting-rod 25 is journaled at one end to the looper-carrier and at its other end to an arm 8^b, formed integral with the needle-operating rocker-arm 8. The journal connections between the ends of the rod 25 and the looper-carrier 23 and arm 8^b are arranged to allow relative lateral movement of these parts.

The looper rock-shaft 20 has usually been operated by means of an independent cam upon the driving-shaft of the machine and suitable connections between said independent cam and the rock-shaft. In my improved structure I omit this independent cam and its connections and provide means for rocking the shaft 20 from the eccentric or cam 14, which operates the needle and imparts the longitudinally-reciprocating motion to the looper. For this purpose I provide at one end of the rock-shaft 20 a curved rock-arm 30, formed with an elongated slot 31, in which is adjustably mounted a journal pin or screw 32. The pin 32 is clamped in the desired adjusted position in slot 31 by means of nut 33 and washers 34 and 35, the washer 35 being rigidly mounted upon the screw 32. Secured to the outer end of the adjustably-mounted screw 32 is a convex journal nut or block 36, journaled in the concave collar 37, mounted in the forward yoked end of the adjustable link 38. The opposite end of the adjustable link 38 is formed with a concave yoke 39, which embraces the convex bearing nut or block 40, which is in turn mounted upon a screw 41, threaded into the link 12, which is oscillated and reciprocated by the cam or eccentric 14. The slotted end of the rock-arm 30 is formed with an integral pin or flange 45,

upon which is marked a scale 46. An indicator or pointer 47 is attached to or formed integral with the end of the link 38 and rests in close proximity to the scale 46 of the rock-arm 30, so as to indicate the adjusted position of the adjustable connections.

Just beneath the presser-foot 3 is mounted the feed-foot 50. This feed-foot 50 is mounted upon the end of the rock-arm 51, keyed to the short rock-shaft 52, which is in turn journaled in the upper end of a vertical rocker-frame 53. The rocker-frame 53 is keyed at its lower end to a rock-shaft 54, journaled in the base of the machine-frame. A curved rock-arm 55 is keyed to the rock-shaft 54 and is formed with an elongated slot 56, in which is adjustably mounted a journal-pin 57, to which is journaled the end of a link 58, formed at its opposite end with a strap or yoke 59, embracing an eccentric 60, keyed to the main operating-shaft 15 of the machine.

61 is a scale formed on an integral part of the rock-arm 55, and 62 is a pointer mounted upon the adjustable end of the link 58.

The construction of the rock-arm 55 and the adjustably-connected link 50 is substantially the same as the rock-arm 30 and as the adjustably-connected link 38, above described.

Keyed to the driving-shaft 15 directly beneath the feed-supporting rock-arm 51 is a cam or eccentric 65, which serves the purpose of raising and lowering the feed-foot to cause it to engage and disengage the cloth beneath the presser-foot in a manner well understood in the art.

The main advantage of my improved mechanism is its simplicity of construction. I operate the needle and thread-carrying looper from a single cam upon the main driving-shaft, the looper having both its reciprocating and oscillating movements imparted to it through suitable connections with said cam.

When it is desired to perform a piece of work with my improved machine, the needle, of suitable size for the work, is first mounted in the needle-bar, and then the adjustable connections between the looper rock-arm and needle-operating link are adjusted to give the looper-needle the desired throw with relation to the sewing-needle. The adjustment of the feed-operating mechanism is also important, as it affords a simple device for regulating the length of the stitch. By use of the scales and indexes on the adjustable parts the proper positions can be determined with accuracy, and the operator will be able to quickly adjust his machine for any work that he may desire to perform.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a sewing-machine, the combination of suitable stitch-forming mechanism including a needle and a looper, a driving-shaft, a cam or eccentric on said shaft, and suitable operating connections between said cam or

eccentric and the needle and looper, whereby the needle will be reciprocated and the looper will be oscillated and reciprocated by said cam, substantially as set forth.

5 2. In a sewing-machine, the combination of suitable stitch-forming mechanism including a needle and a looper, a rock-shaft upon which the looper is mounted, a needle-operating rocker-arm, and connection between
10 said needle-operating rocker-arm and the looper for causing the looper to reciprocate upon its rock-shaft, a driving-shaft, a cam or eccentric mounted upon said driving-shaft, a link connected with said needle-operating
15 rocker-arm and engaged and operated by said cam or eccentric, and suitable connections between said link and the looper rock-shaft, substantially as set forth.

20 3. In a sewing-machine, the combination of suitable stitch-forming mechanism including a needle and a looper, a needle-operating rocker-arm, a driving-shaft carrying a cam or eccentric, a link operated by said cam or eccentric and suitably connected with the needle-operating rocker-arm, a rock-shaft upon
25 which the looper is mounted and by which it is oscillated, a rock-arm mounted upon said

rock-shaft, suitable adjustable means connecting said rock-arm to said link, and an independent connection between the needle-operating rocker-arm and the looper for causing the looper to reciprocate upon its rock-shaft, substantially as set forth. 30

4. In a sewing-machine, the combination of suitable stitch-forming mechanism including a needle and a looper, a driving-shaft carrying a cam or eccentric, a link operated by said cam or eccentric and suitably connected with the needle for operating it, a rock-shaft upon which the looper is mounted
40 and by which it is oscillated, means for reciprocating the looper upon its rock-shaft, a slotted rock-arm mounted upon said rock-shaft, and a rod connected with said link at one end and carrying at its other end a pin
45 which is adjustably mounted in the slot of said rock-arm, and means for clamping the pin of said rod in the desired adjusted position upon the rock-arm, substantially as set forth.

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Witnesses:

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