

(No Model.)

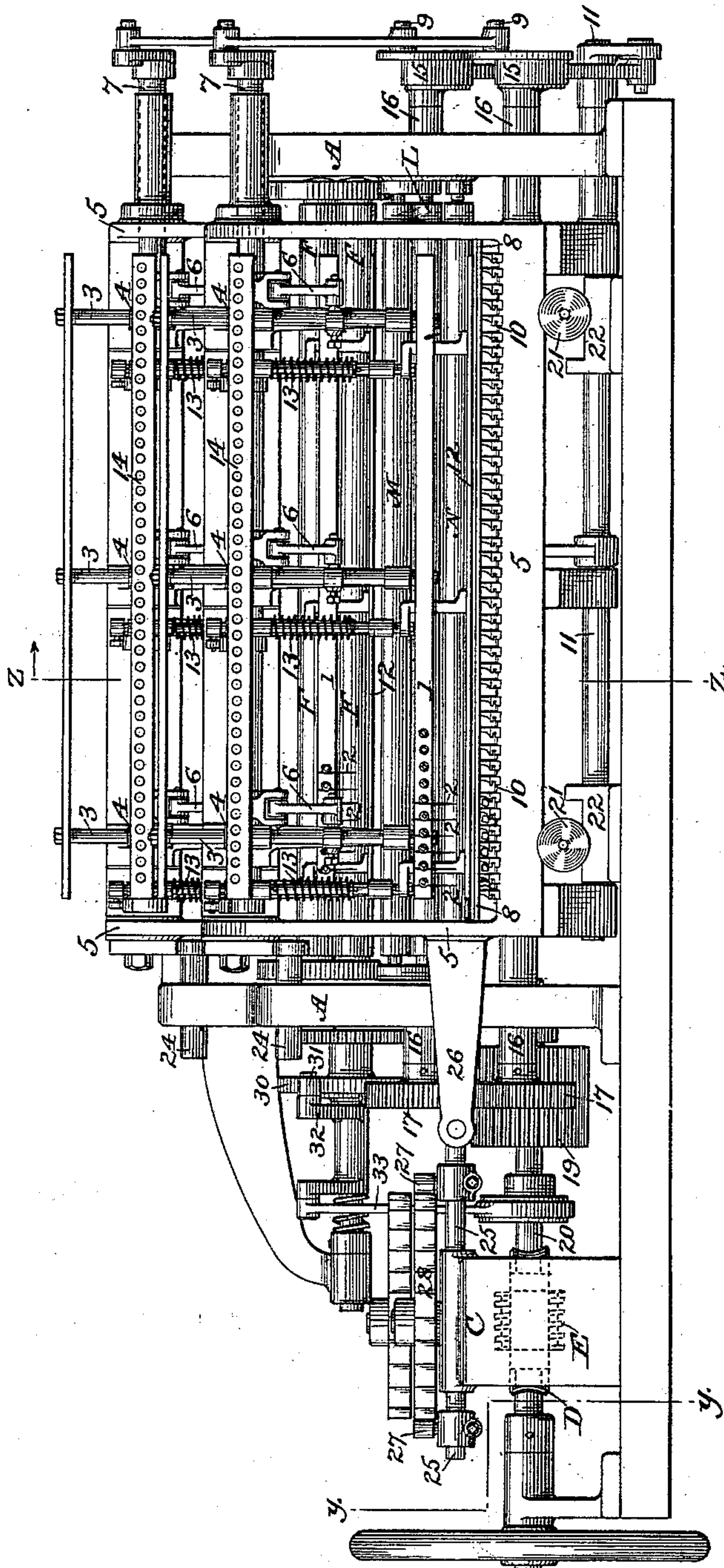
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W. KOCH.  
QUILTING MACHINE.

No. 379,478.

Patented Mar. 13, 1888.

Fig. 1.



Attest:

A. H. Jespersen.  
A. D. Vinton.

Inventor:

William Koch.  
By David A. Burr.  
Atty.

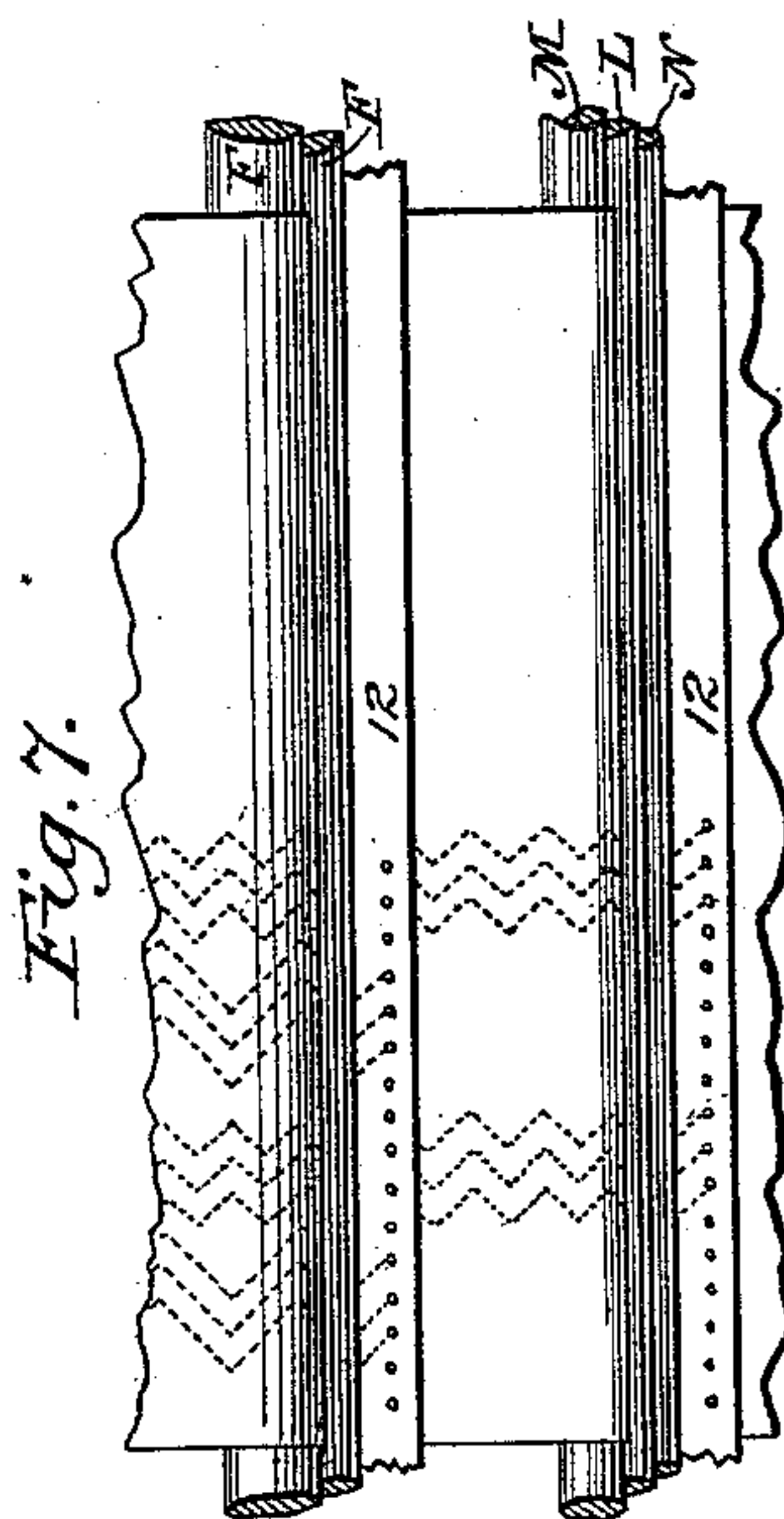
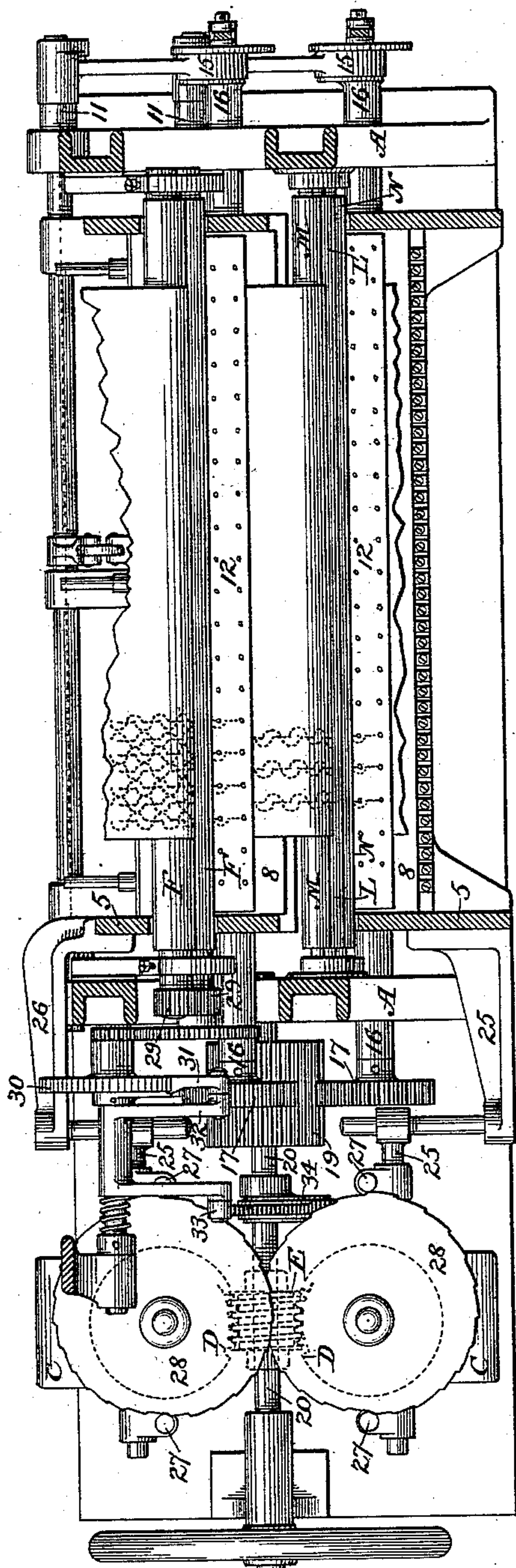
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*Attest:*

A. N. Jesbera  
A. D. Vinton.

*Inventor:*

William Koch.

By David A. Burr.

*Atty.*



(No Model.)

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Fig. 4.

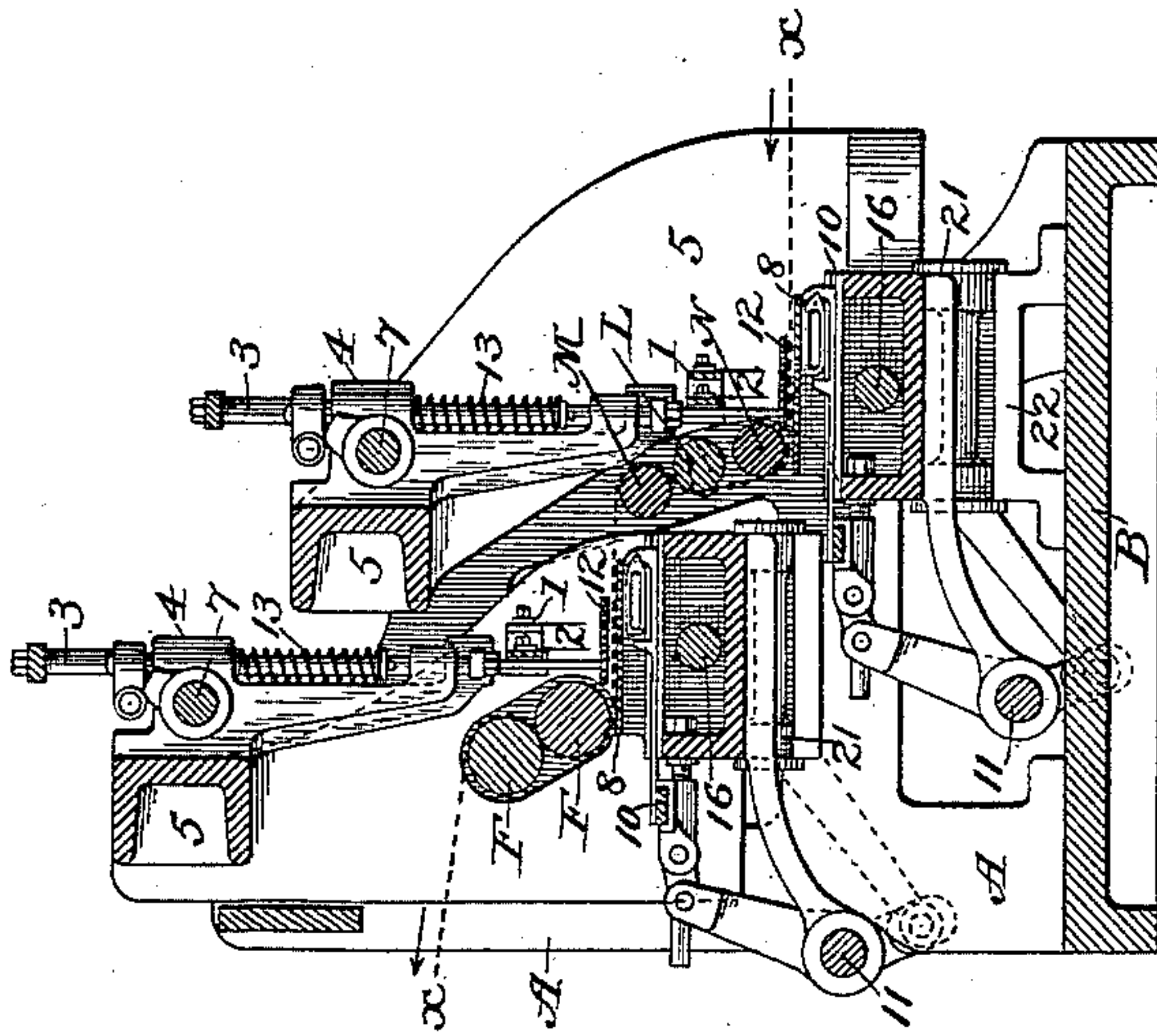


Fig. 6.

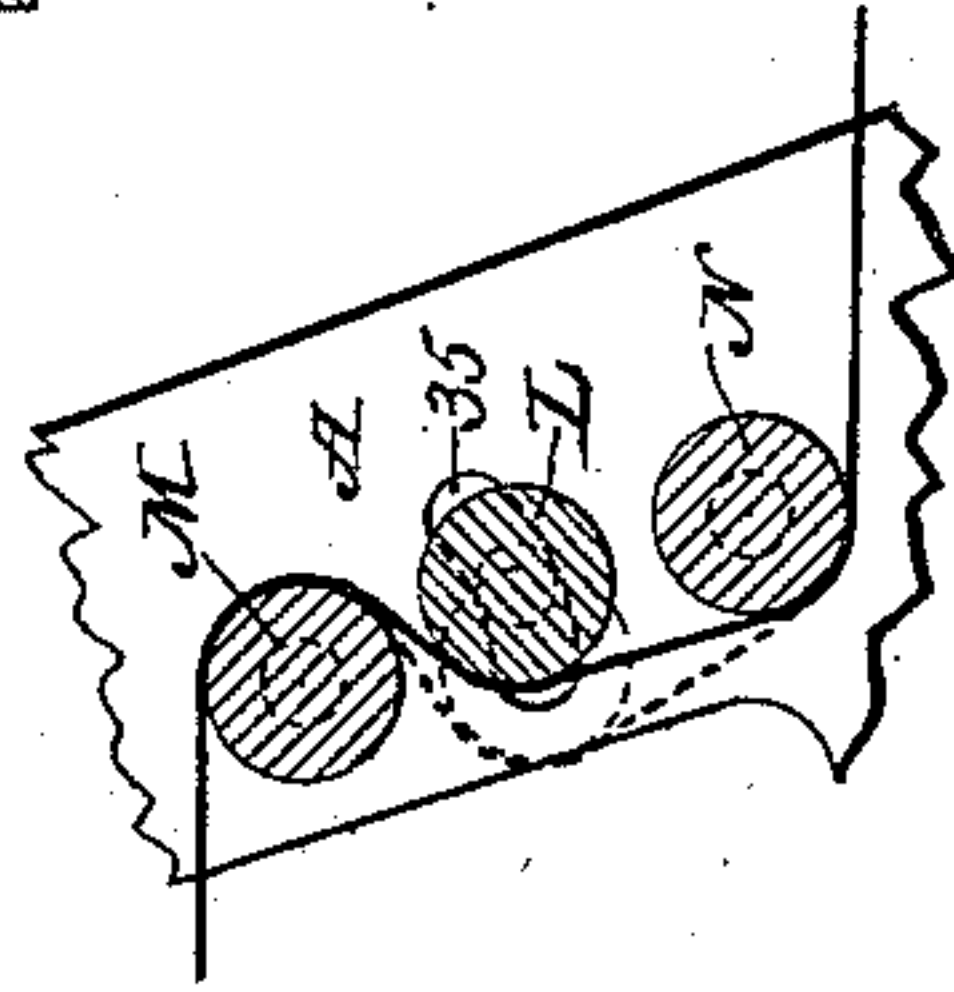
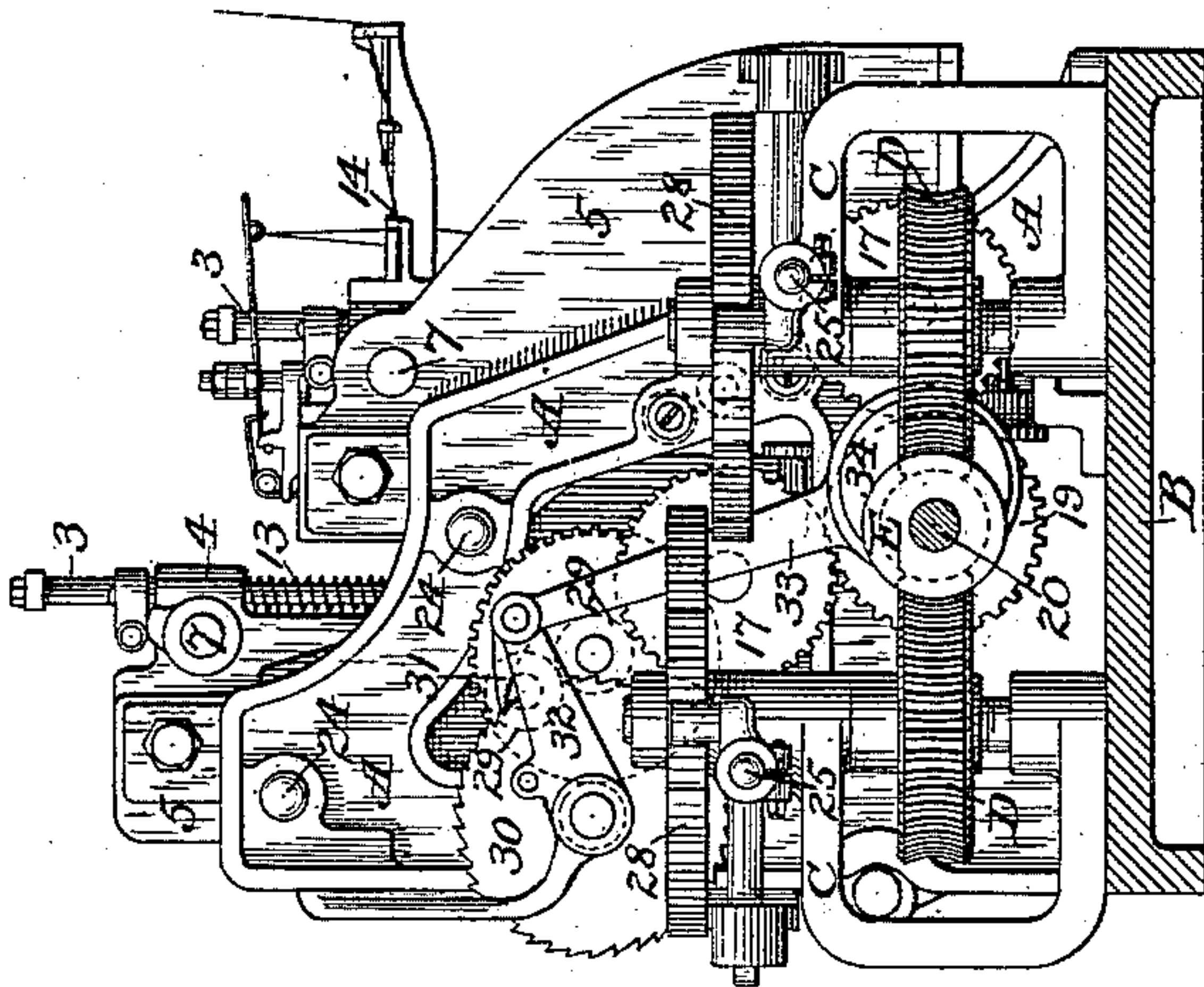


Fig. 3.



Attest:

*A. N. Jesberger.*  
*A. D. Vinton.*

Inventor:

*William Koch.*  
*By David A. Burr.*  
*Atty.*

(No Model.)

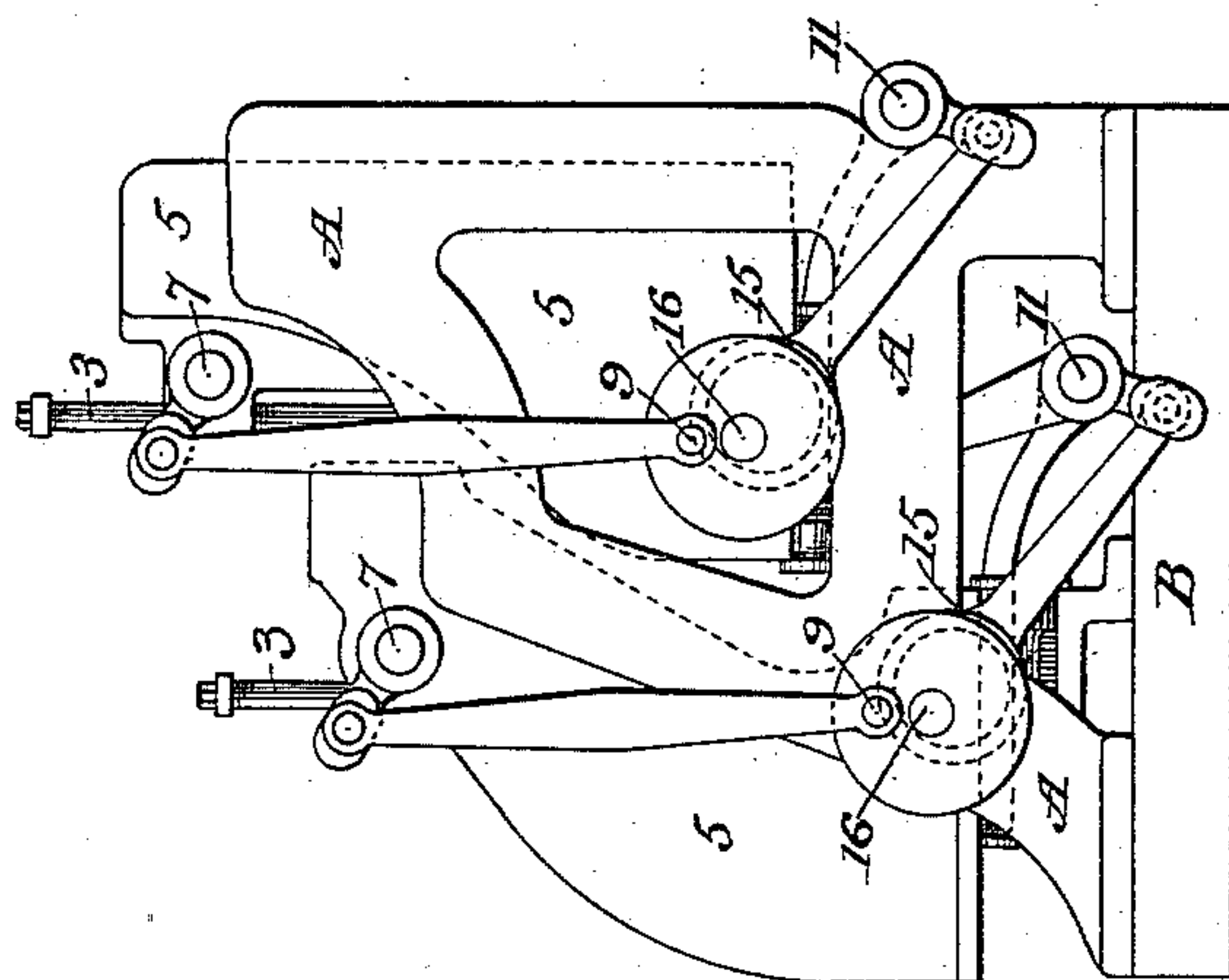
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Fig. 5.



Attest:

A. N. Jesbera.  
A. D. Vinton.

Inventor:

William Koch.  
By David A. Burr.  
Atty.



# UNITED STATES PATENT OFFICE.

WILLIAM KOCH, OF NEW YORK, N. Y.

## QUILTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,478, dated March 13, 1888.

Application filed February 16, 1887. Serial No. 227,785. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM KOCH, of the city, county, and State of New York, have invented certain new and useful Improvements in Quilting-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a front elevation of my improved duplex quilting-machine. Fig. 2 is a sectional plan view of the same, with the feed and tension rollers in elevation, (the section following the line of the fabric led through the machine, as shown in dotted lines *xx* of Fig. 4.) Fig. 3 is an elevation of the left end of the machine, partly in section, in line *yy* of Fig. 1. Fig. 4 is a vertical transverse section in line *zz* of Fig. 1, looking to the right. Fig. 5 is an elevation of the right end of the machine; Fig. 6, a detached sectional view, on an enlarged scale, of the tension-rollers; Fig. 7, a detached plan view similar to that of Fig. 2, illustrating a modification in the character of the work produced on the machine.

Similar numerals and letters indicate like parts in all of the figures.

My invention relates to compound or duplex sewing-machines in which two separate needle-bars are employed, and which are specially adapted for quilting.

It has for its object to so organize the complete machine as that all or any of the shuttles may be readily removed or replaced without disturbing the fabric to be sewed, and, furthermore, to provide means for obtaining variations in the patterns produced by the intersecting lines of stitches without changing the distance between the rows of needles by which they are produced, and for changing the positions of the needles in the separate rows with reference to each other without affecting the movements of said needles, whereby the efficiency of the machine and the range and variety of work which may be accomplished therewith is greatly increased without increasing the complication of its mechanism.

My invention consists, primarily, in the organization in a single complete quilting-ma-

chine, as hereinafter fully described, of two compound sewing-machines, each driven from one common driving-shaft and fed from the same set of feed-rollers, the one machine, with its shuttle mechanism, being mounted in a horizontal plane above and independently of the other, whereby, without any interference in their respective shuttle mechanisms, the two needle-bars are made to approximate an intermediate vertical plane and all the shuttles for both machines are brought into position for ready access thereto.

It consists, secondly, in the combination, with the carriages upon which the two machines are severally mounted to permit of a lateral movement thereof each independently of the other, and with the mechanism for imparting said lateral movement thereto, of adjustable devices, as hereinafter described, whereby the position of the two needle-bars and of the needles carried thereby, relatively to each other and to the feed of the fabric carried under the needles, may be varied at will, and also of an improved worm-gear, as hereinafter described, for imparting a synchronous movement to both carriages by the rotation of the main shaft; and it consists, thirdly, in the combination, with the two needle-bars and the feed mechanism in a quilting-machine, of an adjustable guide-roller interposed between the needle-bars, and over which the fabric is carried intermediate the two, whereby the distance to be traversed by the fabric in passing from the one set of needles to the other may be increased or diminished at will without any variation in the interval separating the needle-bars.

The two compound sewing-machines combined in my improved quilting-machine are similarly organized and constructed in the customary manner. Each of them contains a long vertically-reciprocating horizontal needle-bar, 1, carrying a gang of vertical needles, 2 2 2, (see Figs. 1 and 4,) secured at equal distances apart in straight rows. Each needle-bar is carried by two or more vertical rods, 3 3, playing in suitable bearings, 4, in a frame, 5, and these rods are coupled by links 6 6 to a horizontal rock-shaft, 7, mounted in bearings in the frame 5. The needles work through apertures in a horizontal cloth-plate, 8, fitted



under the needle-bar, and beneath which the shuttle bar or box 10, embracing the shuttle-carriers or seats for the shuttles, (see Figs. 1 and 4,) is mounted to reciprocate in suitable ways formed in the lower part of the frame 5 transversely to the length of the needle-bars. The shuttle-bar 10 is actuated in the customary manner by a rock-shaft, 11, mounted in suitable bearings in the frame 5. A presser-plate, 12, is mounted upon spring-actuated rods 13 13, to close down upon the cloth-plate, and the customary threaded guiding-plates, 14 14, and take up devices are fitted in an upper part of the frame. The rock-shafts 7 and 11, which actuate, respectively, the needle bar and shuttle-bar in each machine, are driven, the one by an eccentric, 15, and the other by a crank-pin, 9, upon the outer end of a driving-shaft, 16, mounted in the frame 5 parallel with said rock-shafts. The inner end of each shaft 16 is fitted with a pinion, 17, engaging the teeth of an elongated spur-wheel, 19, upon the main shaft 20. (See Figs. 1, 2, and 3.) The frames 5 and 5, upon which the compound sewing-machines are thus mounted, and which I shall hereinafter designate as "carriages," are each supported upon friction-rollers 21 21, Figs. 1 and 4, which rest and roll upon horizontal ways 22 22 in an outer frame, A, supporting the entire machine. These ways 22 permit a limited horizontal movement of each carriage 5 and of its sewing-machine in a direction coincident with the length of the needle-bar 1 and parallel with the axis of the driving-shaft 16 and the main shaft 20, while the teeth upon the spur-wheel 19 (see Figs. 1 and 2) are of such width as to permit the pinion 17 to move to and fro with the carriage 5 without becoming disengaged from said teeth. The movement of each carriage is steadied by means of horizontal pins 24 24, (see Fig. 1,) projecting from the carriage through apertures in the outer frame, A.

The two compound sewing-machines are severally mounted in the outer frame, A, the one at a slight distance behind the other (see Fig. 4) and in different horizontal planes, so as to bring the shuttle-carriers for the one far enough above the shuttle-carriers of the other to permit of ready access to them both from the rear, as illustrated in Fig. 4.

The spur-wheel 19 is so located that it will engage the pinions 17 17 upon the driving-shafts 16 in each carriage, so as to actuate them both simultaneously and produce an exact synchronism in the movements of the needle-bars in both machines.

The carriages 5 are made to reciprocate horizontally upon the rollers 21 21 in a line coincident with the length of their needle-bars and of the rows of needles carried thereby by means of rods 25 25, (see Figs. 1, 2, and 3,) mounted severally in horizontal bearings in pedestals C C upon the bed-plate B of the outer frame, A, said rods being coupled by an arm, 26, to one of the carriages 5 5. Each rod 25 is fitted with

two friction-rollers, 27 27, pivoted upon studs projecting from said rod to embrace between them the periphery of a cam or pattern wheel, 28, whose curves are made to determine the time and extent of the reciprocating movements of the carriage controlled thereby. Each carriage 5 and 5 is thus actuated by a separate cam or pattern wheel, and each pattern-wheel is mounted upon a separate shaft; but the two shafts are geared by worm-wheels D D to a single worm, E, upon the main shaft 20.

A single pair of feed-rollers, F F, (see Figs. 2, 4, and 7,) are provided for the duplex machine. These rollers are mounted in fixed bearings in the outer frame, A, parallel with the upper needle-bar, at the rear thereof, immediately above the cloth-plate 8 under said needle-bar, as illustrated in Fig. 4. They are geared together by means of pinions 29 29 (see Fig. 2 and dotted lines in Fig. 3) on the outer ends thereof, and are driven intermittently and synchronically with the movements of the needle-bar by means of a ratchet-wheel, 30, (see Figs. 1, 2, and 3,) geared thereto, and which is actuated by a swinging pawl, 31, upon the end of a rock arm or lever, 32, made to vibrate by means of a coupling-rod, 33, extending from a strap encircling an eccentric-wheel, 34, upon the main shaft 20, as shown in Figs. 2 and 3.

A set of idle guide-rollers, L M N, are mounted between the two sewing-machines, just above the level of the cloth-plate of the first or lower machine, as shown in Fig. 4. The two outer rollers, M N, are supported at each end in fixed bearings in the outer frame, A, of the machine, while the intermediate central roller, L, is mounted in bearings which are fitted in transverse slots 35 35 (see Fig. 6) in the frame A, whereby said roller may be adjusted to and from a line drawn through the axes of the two outer rollers, as shown in Fig. 6 and dotted lines, Fig. 4. By this means the fabric led under the lower roller, N, and over the upper roller, M, may be made to pass over a greater or less distance in traveling from the needles in the one machine to the needles in the other, the adjustment being effected by moving the central adjustable idle-roller, L, from between the other two out more or less toward the fabric.

In the operation of my improved duplex quilting-machine constructed substantially as described the fabric to be quilted is passed over the cloth-plate 8 of the first or lower compound sewing-machine, thence under the lower guide-roller, N, and between the tension-roller L and upper roller, M, (see Fig. 6,) forward over said roller to the cloth-plate of the upper or second compound sewing-machine, and thence out between the feed-rollers F F, by which it is fed forward with a regular intermittent movement at each stroke of the needles in the sewing-machines. The needles are all made to move simultaneously by the connection of the rock-shafts 7 7 (which actu-



ate the two needle bars through the intermediate rotating shafts, 16, and crank-pins 9 9) to the one spur-wheel 19 on the main shaft 20, as shown in Figs. 1 and 5.

5 While a synchronous vertical movement of all the needles is thus obtained, the rows of needles in each compound sewing-machine are carried back and forth over the fabric transversely to the direction of its feed by the bodily transverse reciprocating movement of each  
10 of said sewing-machines upon the rollers 21 21, produced by means of the cam-wheels 28 28, in manner as described, said cam-wheels being both geared mediately to the main shaft  
15 20, so as to revolve in unison with the movements of the needles actuated from the same shaft.

By the use of similar cam or pattern wheels 28 28 the transverse movements of the needles  
20 may be made to correspond exactly. By varying the form or adjustment of the wheels the rows of needles in the one machine may be caused to reciprocate transversely to the line of feed once while the needles of the other  
25 machine are making two such reciprocating movements, producing the pattern shown in Fig. 7, or others similar thereto; or the needles in the one may be made to move constantly in a contrary direction to those in the  
30 other, so as to produce an intersection of the lines of stitches produced by the one with those produced by the other; or they may be made to move in unison in the same direction, whereby the several lines of stitches will remain constantly parallel; or these relations  
35 may be diversified, so that there shall be a parallelism and a divergence of the two lines of stitching in regular order to form symmetrical designs. So, also, the cam or pattern  
40 wheels may be so formed as to obtain differential transverse movements of the two sets of needle bars and needles to produce thereby curved lines of stitching of various patterns, or a combination of straight or curved lines,  
45 as illustrated in Fig. 2, it being evident that with a constant uniform forward feed of the fabric, if the two needle-bars remain stationary, the lines of stitches formed by the two sets of needles will be straight and parallel with  
50 each other and with the edge of the fabric; or, if the needle-bars be moved transversely at the same rate of speed as that of the forward movement of the cloth, diagonal lines of stitches will be formed at an angle of forty-five degrees,  
55 the angle being varied in accordance as the relative speed of the transverse movement of the needles is increased or diminished; or, if the speed of transverse movement be continually increased or diminished, the lines of  
60 stitches will assume curves whose lines will be determined by the variations in said transverse movements.

The rapidity of the forward feed, and consequently the length of the stitches, may also  
65 be varied at pleasure by varying in any customary manner either the stroke of the pawl

31, engaging the ratchet-wheel 30, or the pitch and arrangement of the teeth on said ratchet-wheel, and the point of intersection of the curved or diagonal lines of stitching produced  
70 by the one set of needles with those produced by the other is determined and varied by adjusting the distance of the travel of the fabric between the two sets of needles through a change in the position of the intermediate tension-roller, L, as hereinbefore described. 75

I claim as my invention—

1. The combination, in a compound sewing or quilting machine, with its driving and feed mechanism and the shuttle mechanism appropriate to each row of needles therein, of the two separate needle-bars severally carrying one or more rows of needles and each mounted in a different horizontal plane one above the other, whereby all the shuttles are severally  
80 brought into position for easy access thereto, substantially in the manner and for the purpose herein set forth. 85

2. The combination, in a sewing or quilting machine, with two independent rows of needles and the shuttle and feed mechanism co-acting therewith, of an adjustable idle-roller interposed between said rows of needles, and over which the fabric to be sewed is led in passing from the one to the other, substantially  
90 in the manner and for the purpose herein set forth. 95

3. The combination, in a quilting-machine, of two independent compound sewing-machines organized and actuated substantially as  
100 herein described, independent carriages moving in different horizontal planes one above the other and in parallel lines one in front of the other, and upon which said machines are mounted, a set of parallel feed-rollers apart  
105 therefrom, mechanism, substantially as described, for actuating synchronously the two machines, the parallel reciprocating carriages and the feed-rollers, and one or more adjustable idle-rollers interposed between the two  
110 machines, substantially in the manner and for the purpose herein set forth.

4. The combination, in a quilting-machine, with its master-shaft, two independent compound sewing-machines organized and actuated from said shaft, substantially as herein  
115 described, separate carriages upon which said machines are severally mounted to traverse the one in front of the other in parallel lines, and cam or pattern wheels geared mediately  
120 to said master-shaft, of adjustable coupling devices connecting each carriage with one of said pattern-wheels, whereby the relative position and movements of the two carriages may be varied at will, substantially in the manner and  
125 for the purpose herein set forth.

5. The combination, in a quilting-machine, of two independent compound sewing-machines organized and actuated substantially as  
130 herein described, separate carriages upon which said machines are severally mounted to traverse in parallel lines one in front of the



other, a cam or pattern wheel for each carriage, a connecting rod interposed between each pattern-wheel and its carriage, a worm-wheel upon the shaft of each cam or pattern wheel, a driving shaft, and a worm upon said driving shaft gearing simultaneously with both worm-wheels, whereby the rotation of the shaft is made to actuate both carriages, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM KOCH.

Witnesses:

A. N. JESBERA,  
S. A. STAVERS.