

(No Model.)

7 Sheets—Sheet 1.

D. H. COLES.
SEWING MACHINE.

No. 420,333.

Patented Jan. 28, 1890.

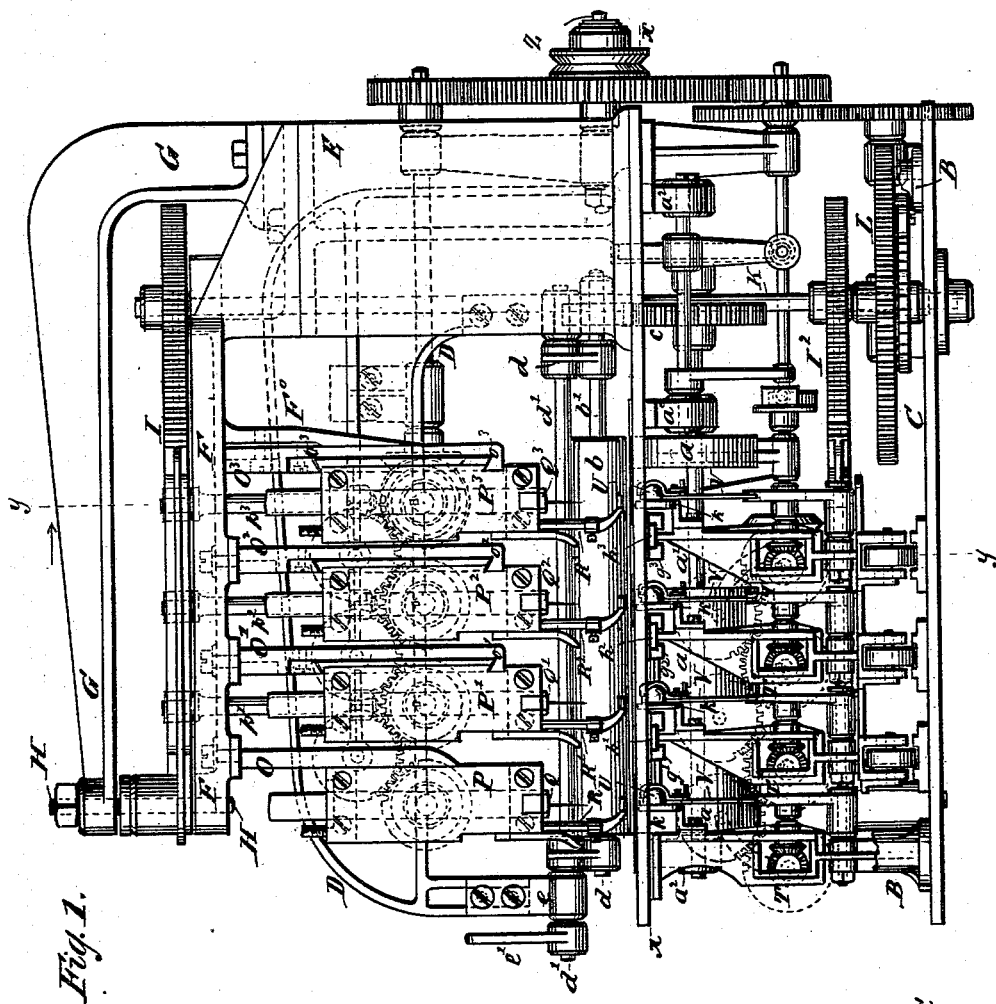
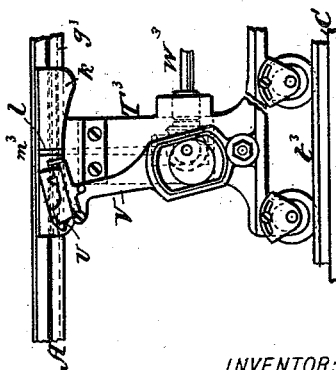


Fig. 2.



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INVENTOR:

David H. Coles.

BY *Van Bentwood & Haugh*

ATTORNEYS

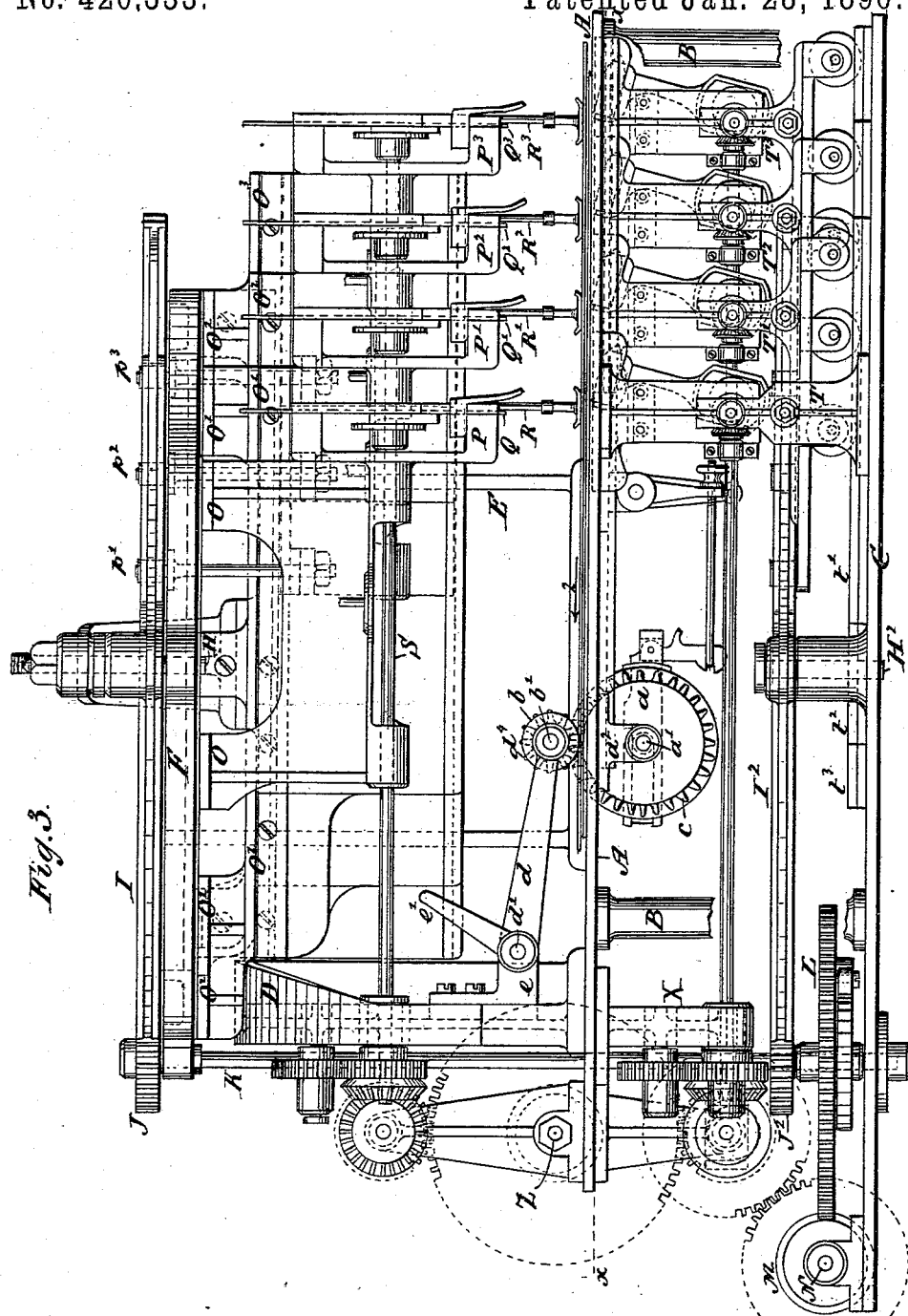
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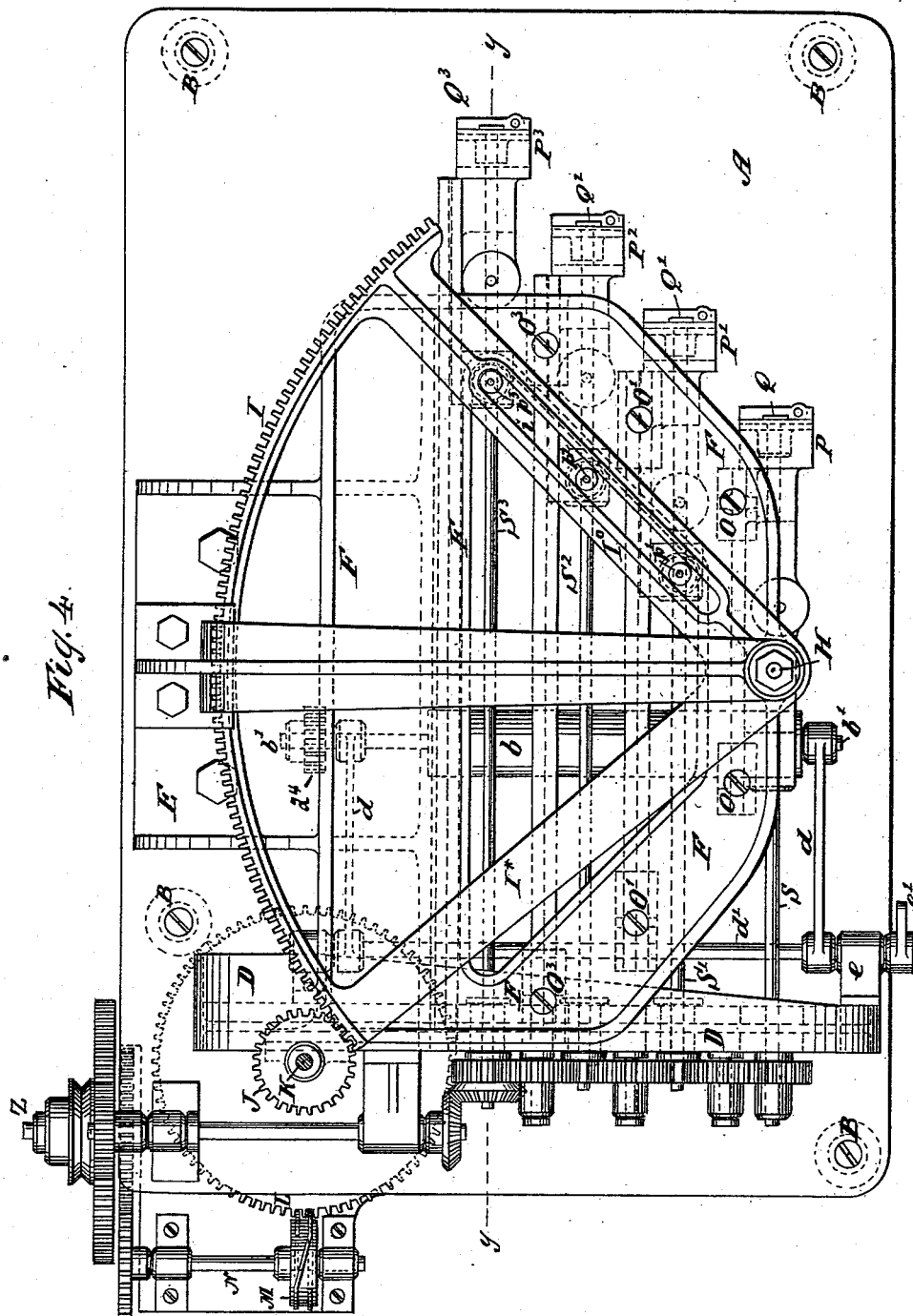


Fig. 4.

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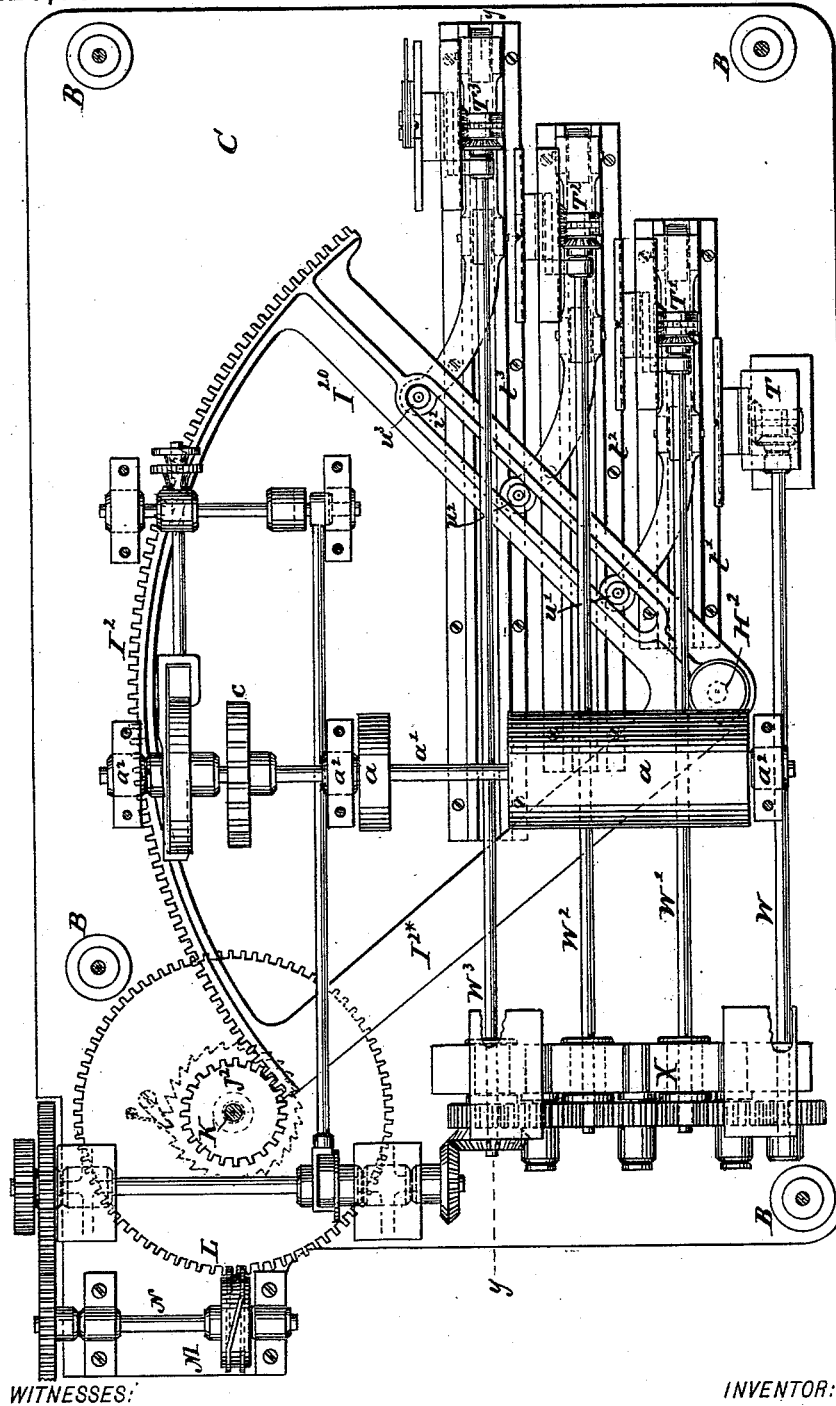
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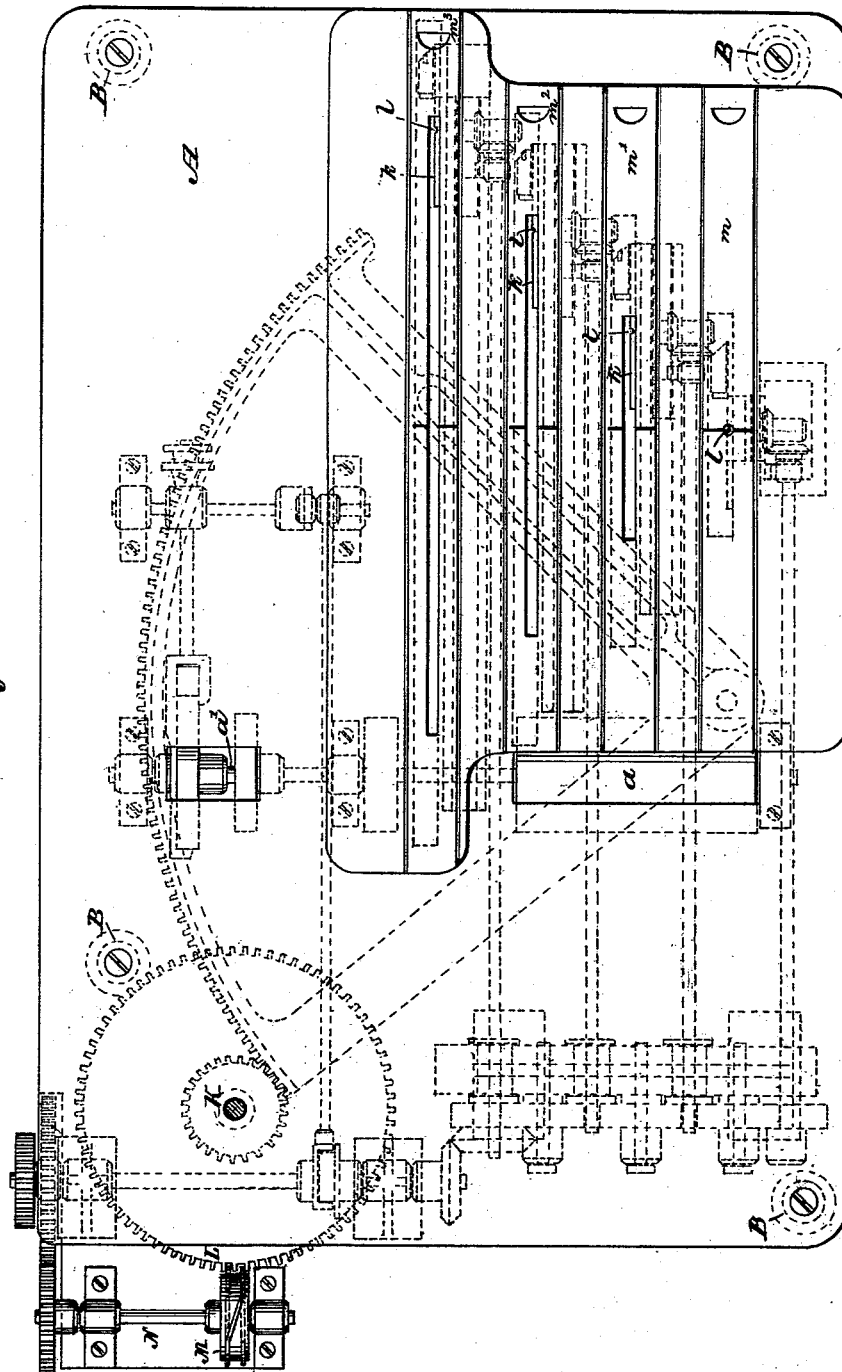
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Fig. 6.



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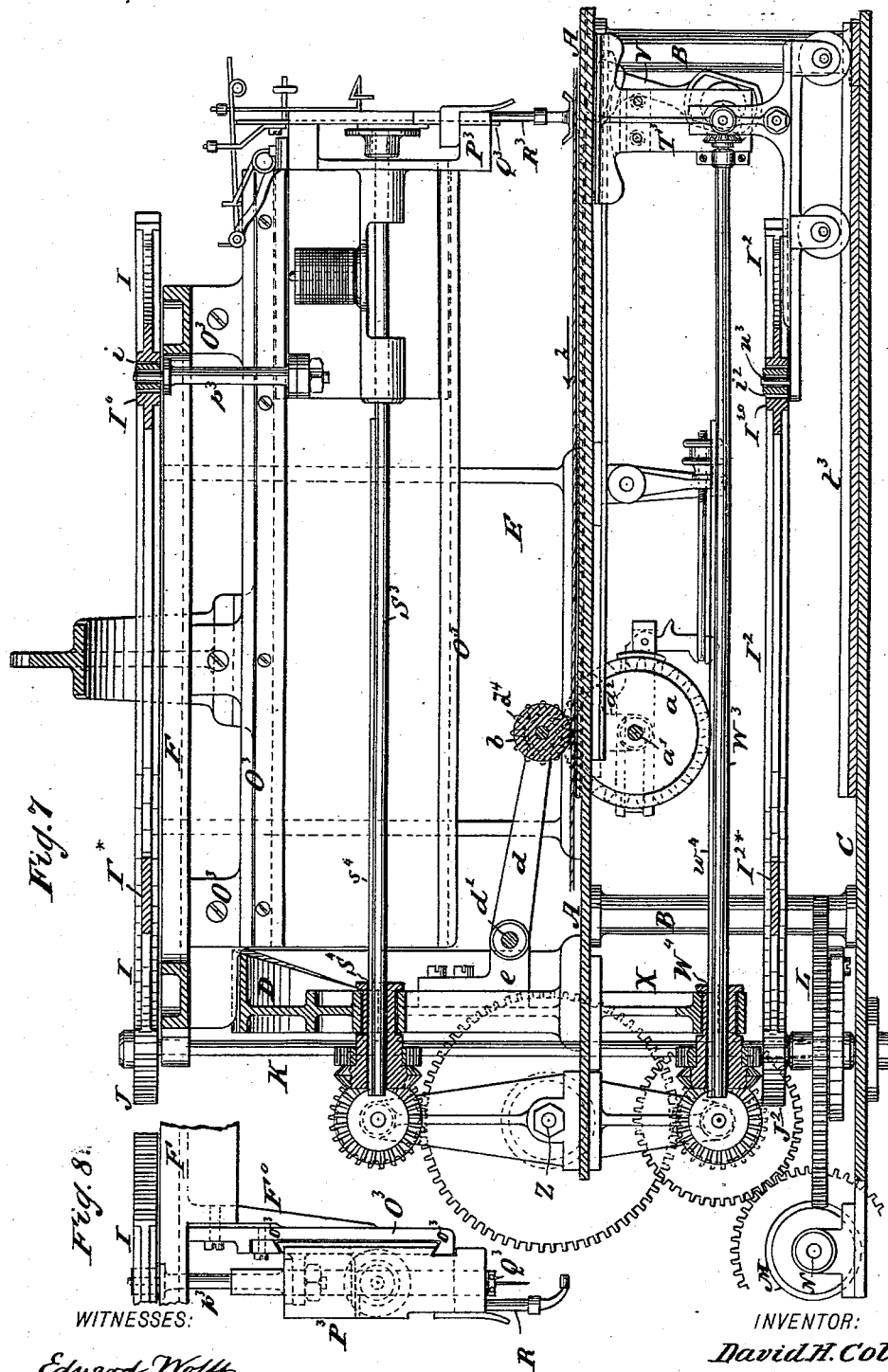


Fig. 7

Fig. 8

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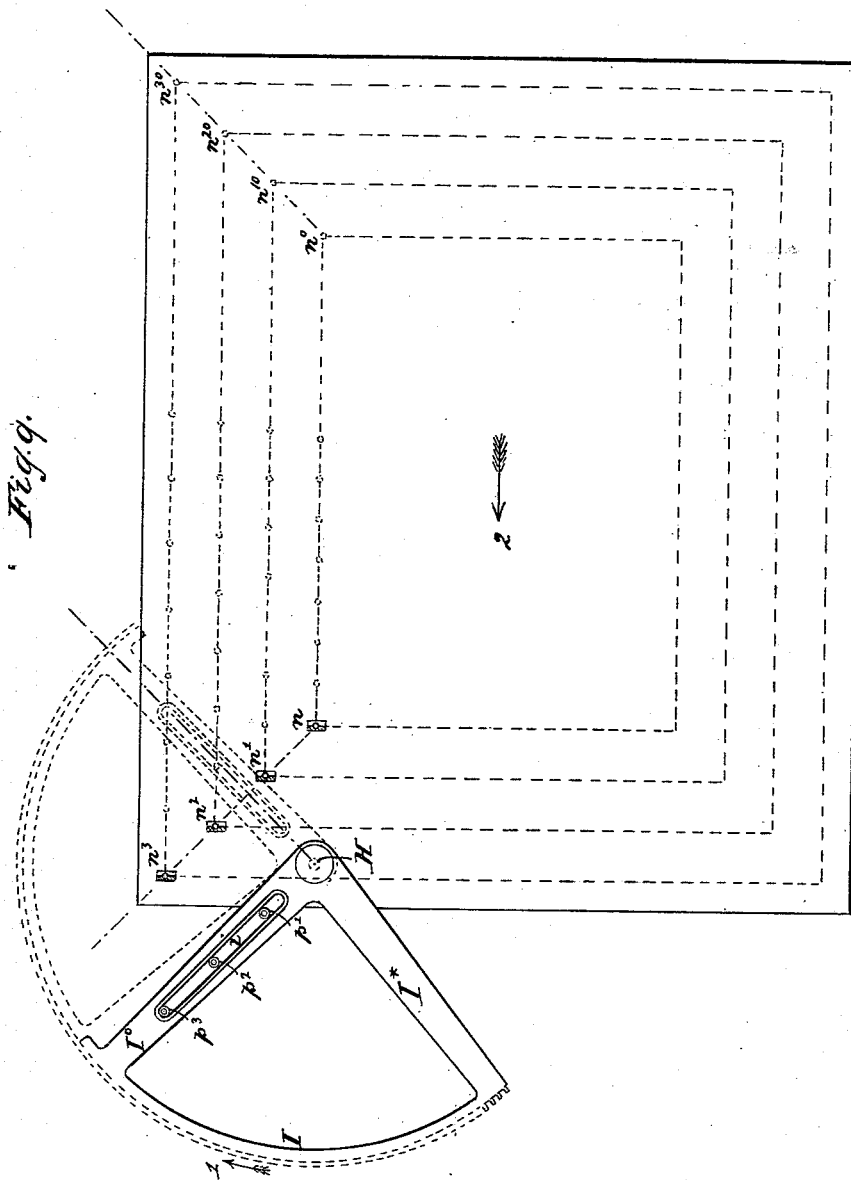
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UNITED STATES PATENT OFFICE.

DAVID H. COLES, OF BROOKLYN, NEW YORK.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 420,333, dated January 28, 1890.

Application filed September 26, 1889. Serial No. 325,227. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. COLES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to a sewing-machine which is capable of forming miter-shaped seams, as illustrated in Figure 9 of the drawings.

The peculiar and novel construction of my sewing-machine is pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Fig. 1 represents a front view of the machine. Fig. 2 is a side view of one of the shuttle-carriages detached. Fig. 3 is a side view of the entire machine. Fig. 4 is a plan or top view of the same. Fig. 5 is a horizontal section in the plane $x x$, Figs. 1 and 3. Fig. 6 is a plan of the work-plate and of some parts below the same. Fig. 7 is a longitudinal vertical section in the plane $y y$, Figs. 1, 4, and 5. Fig. 8 is a front view of one of the needle-arms detached. Fig. 9 is a diagram illustrating the lines of stitches produced by my machine.

Similar letters indicate corresponding parts. In the drawings, the letter A designates the work-plate, which is connected by standards B B, Figs. 5 and 7, with the base-plate C. On the work-plate is firmly secured the goose-neck D and the standard E, from which extends the platform F, and on which is firmly secured the bent arm G.

H is a vertical arbor, which has its bearing below in the platform F and above in the outer end of the arm G, and on this arbor is mounted the toothed segment I. This segment has two arms $I^* I^0$, and it meshes into a cog-wheel J, which is mounted on a vertical arbor K. This arbor has its bearing above in the platform F and below in the base-plate C, and on the same, near its bottom end, is firmly mounted a cog-wheel L, which engages a cam M, mounted on a horizontal arbor N. This cam is so formed that it turns the cog-wheel L for one tooth during about one-fifth of each revolution of the arbor N, while during the remaining four-fifths the cog-wheel L remains stationary, and consequently by the

action of the cam M a step-by-step movement is imparted to the segment I. On the lower portion of the arbor K is mounted a cog-wheel J^2 , which engages a toothed segment I^2 , which turns on a vertical arbor H^2 , mounted in the base-plate C and provided with two arms $I^{2*} I^{20}$. (Best seen in Figs. 3 and 5.) This arbor is directly beneath and in line with the arbor H of the segment I, and the segment I^2 is intended to control the positions of the various shuttle-carriages, while the segment I controls the position of the needle-carriages, as will be hereinafter more fully explained.

On the under side of the platform F are firmly secured a series of brackets $O O' O^2 O^3$, which carry the needle-carriages $P P' P^2 P^3$. By referring to Figs. 1 and 8 it will be seen that the brackets $O O' O^3$ are secured to the under surface of the platform, while the bracket O^3 is secured to a hanger F^0 , which extends from the under surface of the platform F. The needle-carriage P is firmly secured to the bracket O, and it contains the needle-slide Q and the presser-bar R, and motion is imparted to the needle-slide by means of a shaft S. (Best seen in Figs. 3 and 4.)

The needle-carriages $P' P^2 P^3$ are fitted into guideways $o' o^2 o^3$, formed in the brackets $O' O^2 O^3$ and they carry the needle-slides $Q' Q^2 Q^3$, and the presser-bars $R' R^2 R^3$, motion being imparted to these needle-slides by means of shafts $S' S^2 S^3$. From the needle-carriages $P' P^2 P^3$ extend rods $p' p^2 p^3$, which engage a slot i in the arm I^0 of the segment I, (best seen in Fig 4,) so that when this segment is turned on its arbor H the needle-carriages $P' P^2 P^3$ are moved in the guideways of the brackets $O' O^2 O^3$. In order to permit the needle-carriages to follow the action of the segment I, the shafts $S' S^2 S^3$ must be mounted so that they can follow the motion of the needle-carriages. To effect this purpose said shafts have their bearings at one end in a bushing S^4 , Fig. 7, which turns loosely in the goose-neck D and is geared together with the driving-shaft Z, and each shaft is provided with a feather-key s^4 , which engages a groove in the bushing, so that it can slide in the direction of its length without getting out of engagement with the bushing.

T T' T² T³ are four shuttle-carriages, which

rest upon the base-plate C. The carriage T is stationary and firmly secured to the base-plate; but the carriages T' T² T³ are mounted on wheels, Figs. 1, 2, and 3, which run in tracks t' t² t³, formed on or secured to the base-plate. (Best seen in Fig. 5.) From each of the carriages rises a stud u' u² u³, respectively, (roller-studs being shown in the drawings, Figs. 5 and 7,) which engage a slot i² in the arm I²⁰ of the toothed segment I², and when this segment is moved by the action of the cam M the shuttle-carriages T' T² T³ are caused to move in their respective tracks, so that the shuttles carried by the same preserve their proper relations to the needles carried by the needle-carriages P' P² P³. The shuttles U are carried by cradles V, Fig. 2, to which an oscillating motion is imparted by an eccentric or any other means usually employed for this purpose. The shafts W W' W² W³, which serve to impart motion to the shuttle-levers, have their bearings in a hanger X, which is secured to the under surface of the cloth-plate, and in order to permit shafts W' W² W³ of the movable shuttle-carriages to accommodate themselves to the movements of their respective carriages each of them is made to extend loosely through a bushing W⁴, with which it is kept in engagement by a feather-key w⁴, said bushing being geared together with the driving-shaft Z.

The material to be sewed is fed through the machine in the direction of arrow 2, Figs. 3 and 7, by two rollers a b. The lower roller a is mounted on a shaft a', which is journaled in hangers a², secured to the under side of the work-plate A, and it receives an intermittent rotary movement by any suitable means, such as a friction-clutch, as shown in Fig. 5. On the shaft a' is mounted a cog-wheel c, which gears into a cog-wheel d⁴, mounted on the shaft b' of the upper roller b. This shaft has its bearings in arms d d', which are firmly secured on a rock-shaft d', that has its bearings in lugs e e, extending from the inner side of the goose-neck D, Fig. 4. On this rock-shaft is firmly mounted a hand-lever e', by means of which the upper roller b can be raised or depressed.

In the example shown in the drawings the cog-wheel L is mounted loosely on the shaft K and connected to the same by a ratchet-wheel and pawl, so that the segment I I² can only be turned in one direction by means of said shaft. The manner in which the various shafts are geared together with the driving-shaft can be readily understood from the drawings and requires no further explanation.

In order to sew the miter-seams indicated in Fig. 9, the segments I and I² are brought into the position occupied by the segment I in said figure, and thereby the needles are brought into the position indicated by the letters n n' n² n³. As the work is fed in the direction of arrow 2 and the segments are turned after each stitch in the direction of

arrow 1 the needles are successively brought in the positions indicated in Fig. 9, and by the time the segment reaches the position shown in dotted lines in said figure the needles occupy the position indicated by the letters n⁰ n¹⁰ n²⁰ n³⁰, and four parallel seams of unequal length have been finished. If it is now desired to produce the same number of seams on another side of the work, the work is turned in the proper position, the segments are turned back to the position shown in full lines in Fig. 9, and the operation above described is repeated. If this second side of the work is shorter than the first, the feed motion has to be reduced to correspond.

It will be seen from this description that the needle-carriage P and the shuttle-carriage T are fixed or stationary, and consequently the needle mounted in the carriage P and the shuttle mounted in the carriage T receive a concerted movement in fixed paths, while the paths in which the remaining needles and shuttles travel are changed by each rotation of the cam M.

By referring to Fig. 6 it will be seen that the work-plate A is provided with four oblong slots, which are covered by the slides m m' m² m³, and each of the shuttle-carriages is provided with a plate k, Fig. 2, which extends into one of these slots and has a semicircular groove l, which forms the guide for the descending needle. The movable shuttle-carriages T' T² T³ are provided with T-shaped heads h' h² h³, Fig. 1, which engage guides g' g² g³ and serve to keep the carriages steady.

If desired, the step-by-step movement of the segments may be stopped at any time by throwing the pawl which holds the cog-wheel L in gear with the shaft K out of gear with its ratchet-wheel, and then the sewing can be continued, while all the needle-carriages and the shuttle-carriages remain stationary.

From the foregoing description it will be seen that the feed movement imparted to the work is in the direction of arrow 2, Fig. 9, while the carriages P' P² P³ T' T² T³ receive a step-by-step movement in the opposite direction, and while the length of the stitches produced by the needle n in the stationary carriage P depends solely upon the length of the feed motion, the lengths of the stitches produced by the needles n' n² n³ are equal to the length of the feed motion plus the movements of the carriages P' P² P³, respectively, and a series of parallel seams of different length are produced and miter-shaped borders can be sewed.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the work-plate A and the feed mechanism, of the fixed needle-carriage P and the movable needle-carriage P' above the work-plate, the fixed shuttle-carriage T and the movable shuttle-carriage T' beneath the work-plate, and mechanism for imparting to the carriages P' T' a concerted step-by-step

movement in the direction opposite to the feed motion, substantially as described.

2. In a sewing-machine, the combination, with the work-plate and the feed mechanism, of two movable needle-carriages P' P^2 above the work-plate, two movable shuttle-carriages T' T^2 beneath the work-plate, and mechanism for imparting to the carriages P' T' and to the carriages P^2 T^2 concerted movements of different magnitude, the movement of the carriages P^2 T^2 being greater than the movements of the carriages P' T' , substantially as described.

3. In a sewing-machine, the combination, with the work-plate A and the feed mechanism, of two needle-carriages P' P^2 , fitted into guideways o' o^2 above the work-plate, two shuttle-carriages T' T^2 , constructed to move on tracks t' t^2 beneath the work-plate, the oscillating arm I^0 , engaging both needle-carriages P' P^2 , the oscillating arm I^{20} , engaging both shuttle-carriages T' T^2 , and means, substantially as described, for imparting to the arms I^0 I^{20} concerted movements.

4. In a sewing-machine, the combination, with the work-plate A and the feed mechanism, of the platform F above the work-plate, the needle-carriage P, firmly secured to this platform, the bracket O' , fixed to the platform, the guideways o' , formed in this bracket, the needle-carriage P' , fitted into the guide-

ways o' , the base-plate C beneath the work-plate, the shuttle-carriage T, firmly secured to this work-plate, the track t' on the base-plate, the shuttle-carriage T' , movably fitted on this track, the toothed segment I, engaging the needle-carriage P' , the toothed segment I^2 , engaging the shuttle-carriage T' , and the cam M, for imparting to said segments a step-by-step movement, substantially as described.

5. In a sewing-machine, the combination, with the work-plate A and the feed mechanism, of the platform F above the work-plate, the guideways o' o^2 , firmly connected to this work-plate, the needle-carriages P' P^2 , fitting these guideways, the base-plate C beneath the work-plate, the tracks t' t^2 on this base-plate, the shuttle-carriages T' T^2 , movably fitted on these tracks, the toothed segment I, engaging the needle-carriages P' P^2 , the toothed segment I^2 , engaging the shuttle-carriages T' T^2 , and the cam M, for imparting to said segments a step-by-step movement, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID H. COLES.

Witnesses:

W. HAUFF,

J. VAN SANTVOORD.