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Witness
 Lloyd R. Cornwall

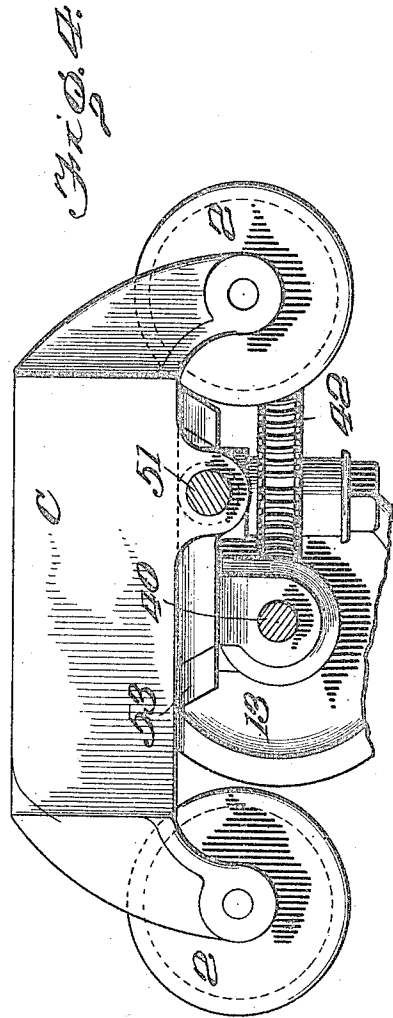
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4 SHEETS—SHEET 2.



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A. E. YATES.
SEWING MACHINE.
APPLICATION FILED MAY 9, 1916.

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Patented Nov. 27, 1917.
4 SHEETS—SHEET 3.

Fig. 3.

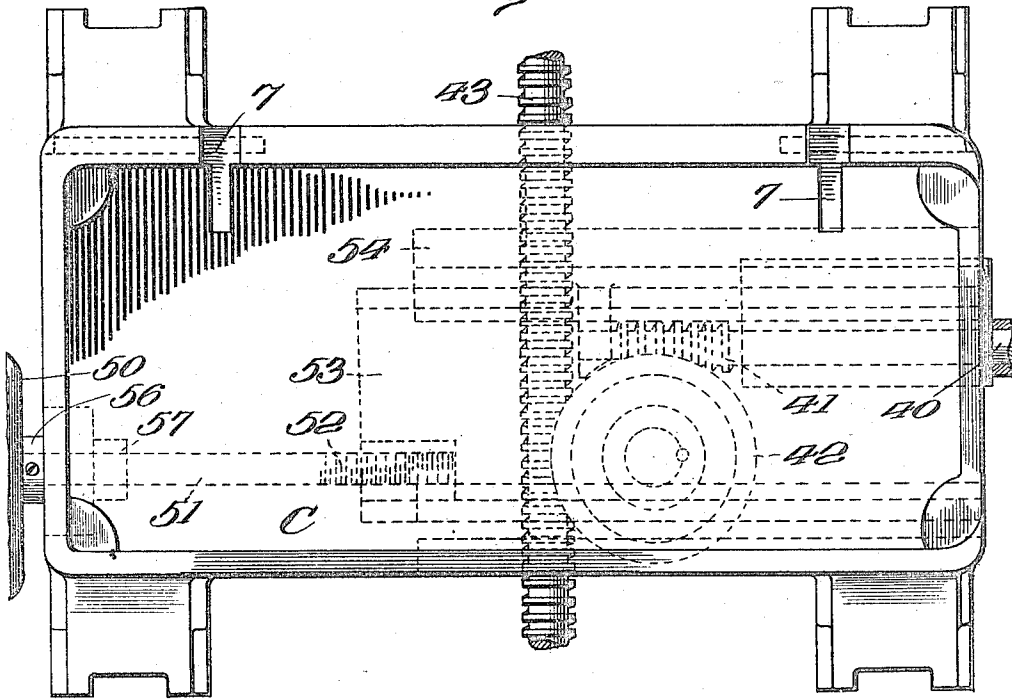
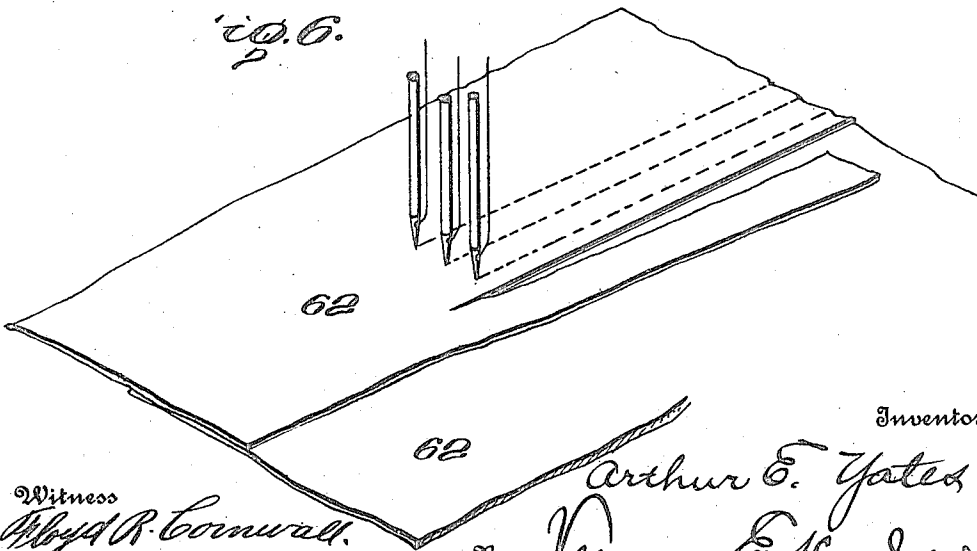


Fig. 6.



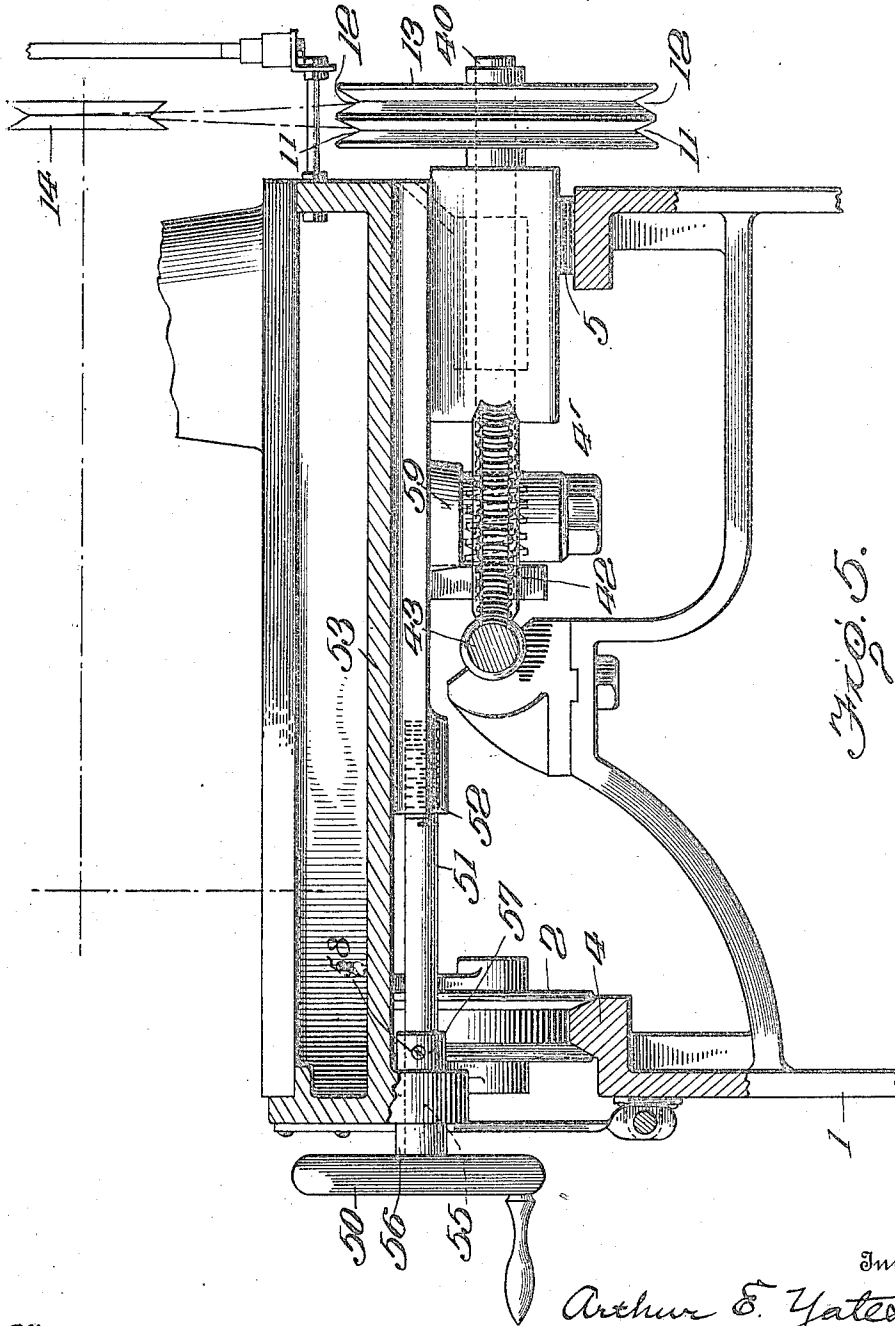
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4 SHEETS—SHEET 4.



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334

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UNITED STATES PATENT OFFICE.

ARTHUR EDWARD YATES, OF CHICKAMAUGA, GEORGIA, ASSIGNOR TO CRYSTAL SPRINGS BLEACHERY CO., OF CHICKAMAUGA, GEORGIA, A CORPORATION OF GEORGIA.

SEWING-MACHINE.

1,248,236.

Specification of Letters Patent.

Patented Nov. 27, 1917.

Application filed May 9, 1916. Serial No. 96,387.

To all whom it may concern:

Be it known that I, ARTHUR E. YATES, a citizen of the United States, residing at Chickamauga, in the county of Walker and State of Georgia, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to an improvement in sewing-machines adapted to do heavy work, such as sewing the ends of bolts together, stitching flour-sacks, harness, or canvas, and it is adapted to operate automatically, and intended to carry a plurality of needles, thereby stitching several rows simultaneously as the needles are located side by side.

My invention comprises a carriage adapted to carry any form of sewing-machine, said carriage mounted on a bed, upon which the carriage travels with the stitching of the fabric, means being provided for holding and stretching taut the articles to be stitched and in the path of the needles, means being provided for automatically stopping the machine when it shall have traversed the length of the material to be sewed, preparatory to being returned to the starting point.

My present invention also includes a carriage mounted on rollers, two at least of which are grooved on the periphery to accurately fit a planed way on the bed, thus insuring a straight seam being sewed and facilitating the return of the carriage to its starting point.

It also comprises an improved method of drive in the form of an endless belt, which is crossed between the machine sheave and two sheaves on the machine carriage and carried around a drive and idle-sheave on the bed, thereby affording a good contact on the several sheaves and insuring a positive forward travel of the machine carriage and drive of the needles of the machine.

The invention also includes mechanism for quickly connecting and disconnecting the carriage feed mechanism, whereby the forward feed of the carriage is insured, but also a quick release is provided to admit of the carriage being quickly returned to the starting point.

My invention also consists in novel means of fastening and stretching the material to be stitched; means for automatically stop-

ping and starting the machine; as well as in other novel features of construction and combinations of parts, which will be hereinafter described and pointed out in the claims.

In the accompanying drawings:

Figure 1 is a view in side elevation of the entire machine;

Fig. 2 is a top plan;

Fig. 3 is an enlarged plan view of the carriage;

Fig. 4 is an end view of the same;

Fig. 5 is an enlarged section through the carriage; and

Fig. 6 is a detail showing the stitching.

A, is the bed of the machine supported a suitable elevation from the floor on the legs 1, 1. A carriage C is provided with rollers 2, 2, having grooved peripheries to receive, and whereby they are mounted on, the planed way 4, the flat faced rollers 3, 3, resting on the flat way 5, both of which are shown in Fig. 2. This construction insures a straight seam being sewed, and also facilitates the return of the machine to its original position. The carriage C is adapted to travel back and forth on these ways from one end of the machine to the other in forming the seam. Spring-bumpers 6, 6, are provided at opposite ends of the machine, (as shown in Fig. 1) to receive the impact of the carriage at the ends of its travel.

The sewing-machine S, which may be of any commercial type desired, is removably mounted on the carriage C, its lugs being inserted through slots 7, 7, shown in Fig. 3.

The sewing-machine is primarily driven and the carriage moved from one end of the machine to the other by a single endless belt 8, which travels over the grooved sheaves 9 and 10 located at opposite ends of the machine, as shown in Figs. 1 and 2, the belt 8 passing from opposite directions into the two grooves 11 and 12 of the double-grooved pulley 13, shown in Figs. 1 and 2, above which it is crossed, as shown in Fig. 1, and extended over the drive-pulley 14, which operates the needles of the sewing-machine.

The double-grooved sheave 13 is keyed on a shaft 40, see Figs. 2 and 5. A worm 41 is secured on the inner end of shaft 40, its teeth meshing with the teeth of worm-wheel 42, and worm-wheel 42 in turn meshes with the stationary feed screw 43, which runs the full length of the machine, by means of

which construction the travel of the carriage is slow and in unison with the movement of the sewing-machine.

The belt 8 is driven by the sheave 9 keyed on the drive-shaft 15, and on this shaft 15 there are the tight and loose pulleys 16 and 17 respectively, as shown in Fig. 2. The belt 18 is automatically shifted from the tight to the loose pulley by the belt shifter 19 slidably mounted in the boxes 20, 20, on the left hand end of the machine, as shown in Fig. 2. This belt-shifter has a loose pivotal connection at 21 with the fulcrumed lever 22, the latter being fulcrumed at 23, and pivotally connected at 24 with the left hand end of the shifter shaft 25, which is slidably connected through the boxes 26, 26, with the side of the bed, as clearly shown in Figs. 1 and 2.

An arm 27 depending from the carriage is in position to strike the spring-cushioned collar 28, adjustably secured on the shifter-shaft 25 when the carriage shall have traveled the width of the material to be stitched. Of course this spring-cushion collar is capable of being adjusted to different positions on the shifter-shaft, according to the width of the material or the length of the seam to be stitched.

The tension of the endless belt 8 is regulated by a belt-tightener 30 adjustably secured on the bracket 31 at the right-hand end of the machine.

While the carriage and the sewing-machine stop automatically by reason of the collar 27 striking the arm 28, and the automatic shifting of the belt 18 from the tight to the loose pulley through shifter 19, fulcrumed lever 22, and shifter-shaft 25, some means must be provided for releasing the worm-wheel 42 from the stationary feed-screw 43 preparatory to returning the carriage to its starting position. This is accomplished by a hand-wheel 50 on the outer end of the screw 51, the screw passing through a hole 55 at the forward side of the carriage where the screw is held against end-wise movement by the collar 56 fixed on the screw on one side, and the collar 57 removably held thereon by set-screw 58 on the other side of the hole 55. The threads of this screw 51 turn in the threaded hole 52 of the slide bolt 53, the edges of which latter are undercut to fit the corresponding edges 54 on the lower side of the carriage C, as shown in Fig. 3.

The slide 53 carries a bearing-stud 59, shown in Fig. 5, upon which the worm-wheel 42 is rotatably supported. By turning the hand-wheel 50, it moves the slide 53 with its stud 59, carrying the worm-wheel 42 as well as the shaft 40 and worm 41 outward, disengaging the worm-wheel from the stationary feed-screw.

It may be stated that the worm 41 and

the stationary feed-screw 43 have exactly the same kind and size of thread.

When the worm 42 is thus disengaged from the stationary feed-screw 43, the operator rolls the carriage back to the left to the starting-point. Now by reversing the hand-wheel 50, the slide 53 is drawn inwardly, carrying with it the sheave 40, worm 41, double-grooved shaft 13, and the worm-wheel 42 until the latter is brought into operative contact with the spirals of the stationary feed screw 43, when, by shifting the belt to the tight pulley, the carriage is carried forward, and the stitching proceeds.

The fabric or other material to be stitched is held over the cloth hooks 32, 32, one of which extends inwardly from the plate 33 secured at the right-hand end of the machine, and the other from the plate 34 slidably connected with the bracket 35 at the left hand end of the machine. A hand-lever 36, pivoted to the bed at 37, and having a slidable pivotal connection at 38 with the plate 34, is employed to give the required tautness or tension to the materials to be stitched, it being pushed to the left and held by a catch 36'.

While, as previously stated, any type of sewing-machine proper may be mounted on the carriage for the particular work for which this is intended, we find it is best to employ three needles, thus forming three parallel stitches, and the threads are carried from the spools through holes in a rack 60 at the rear of the machine.

While the operation has been quite generally described, by way of brief recapitulation it may be stated that the operator first takes the two pieces of material 62, 62, and hooks one end or edge of each piece over the two cloth hooks, so that they overlap each other. He now pushes the lever 36 to the left, stretching the material and making it taut. The carriage is at the left end of the machine, ready to start. The operator now pushes the shifter-shaft 25 to the left, thereby shifting the drive belt of the machine from the loose to the tight pulley, thus starting the machine in operation, the sewing-machine immediately commencing to sew and travel across the goods from the left hand side of the bed to the right, until the arm 27 on the carriage strikes the adjustable collar 28 on the shifter-shaft, shifting the latter to the right, and with it the belt from the tight to the loose pulley. The hand-wheel 50 is now given a few turns which disengages the worm-wheel 42 from the stationary feed-screw 43, whereupon the operator rolls the carriage back to its original position at the left hand end of the bed, after which the cloth or other material stitched is removed, and the machine is ready for a repetition of the operation.

I claim:

1. The combination with a bed having ways extending lengthwise thereof, of a carriage having rollers to travel on said ways, and adapted to carry a sewing machine, a stationary feed-screw running the length of the bed, transmission mechanism carried by and adjustably connected with the carriage for engaging said stationary feed screw, means supported by the bed for actuating said transmission mechanism for moving the carriage on the bed, a main drive shaft for said actuating mechanism, an automatic shift for throwing the drive shaft out of motion, said automatic shift comprising a slidable shifter shaft having means thereon adapted to be engaged by the carriage when it reaches a predetermined position, a fulcrumed lever, and a belt shifter and rod loosely pivoted to said fulcrumed lever.

2. The combination with a bed having ways extending lengthwise thereof, of a carriage having rollers mounted on said ways, transmission mechanism adjustably supported on the carriage, a grooved pulley carried by the adjustable transmission mechanism, a stationary feed screw running the full length of the bed adapted to be engaged by the adjustable transmission mechanism, whereby to move the carriage lengthwise of the machine, sheaves, an endless belt extending around the latter as well as the grooved pulley, a drive shaft on which one of said sheaves is keyed, and means actuated by the carriage at a predetermined point for stopping the drive shaft.

3. The combination with a bed having ways extending lengthwise thereof, of a carriage having rollers mounted on said ways, transmission mechanism adjustably supported on the carriage, a double-grooved pulley carried by the adjustable transmission mechanism, a stationary feed-screw running the full length of the bed adapted to be engaged by the adjustable transmission mechanism, whereby to move the carriage lengthwise of the machine, sheaves, an endless belt extending around the latter as well as the double-grooved pulley, a drive-shaft on which one of said sheaves is keyed, and means actuated by the carriage at a predetermined point for stopping the drive-shaft.

4. The combination with a bed having ways extending lengthwise thereof, of a carriage having rollers mounted on said ways, transmission mechanism adjustably supported on the carriage, a grooved pulley carried by the adjustable transmission mechanism, a sewing-machine pulley located above the double-grooved pulley for actuating the needles of the sewing-machine, a stationary feed-screw running the full length of the bed adapted to be engaged by the adjustable transmission mechanism, whereby to move

the carriage lengthwise of the machine, sheaves, an endless belt extending around the latter as well as the double-grooved pulley and the sewing-machine pulley, a drive-shaft on which one of said sheaves is keyed, and means actuated by the carriage at a predetermined point for stopping the drive shaft.

5. The combination with a bed having ways thereon, of a carriage having wheels fitted to and traveling on said ways, a stationary feed-screw running the full length of the machine, a plate slidably connected with the carriage, means for adjusting said plate in and out, a shaft rotatably supported by said plate and carrying a worm at one end and a double grooved pulley at the other, a worm-wheel in mesh with the worm and rotatably supported by the slidable plate, a drive-shaft located at one end of the machine, a sheave thereon, an idle-shaft at the opposite end of the machine carrying a sheave, and an endless belt extending around said sheaves, the double-grooved pulley on the shaft carried by the slide plate adjustably connected with the carriage.

6. The combination with a bed having ways thereon, of a carriage having wheels fitted to and traveling on said ways, said carriage adapted to carry a sewing-machine, the sewing-machine having a grooved drive pulley, a stationary feed-screw running the full length of the machine, a plate slidably connected with the carriage, means for adjusting said plate in and out, a shaft rotatably supported by said plate and carrying a worm at one end and a double-grooved pulley at the other, a worm-wheel in mesh with the worm and rotatably supported by the slidable plate, a drive-shaft located at one end of the machine, a sheave thereon, an idle-shaft at the opposite end of the machine carrying a sheave and an endless belt extending around the said sheaves, the double-grooved pulley on the shaft carried by the slide plate adjustably connected with the carriage, and around the sewing-machine drive-pulley.

7. The combination with a bed having ways thereon, of a carriage having wheels fitted to and traveling on said ways, said carriage adapted to carry a sewing-machine, the sewing-machine having a grooved drive-pulley, a stationary feed-screw running the full length of the machine, a plate slidably connected with the carriage, means for adjusting said plate in and out, a shaft rotatably supported by said plate and carrying a worm at one end and a double-grooved pulley at the other, a worm-wheel in mesh with the worm and rotatably supported by the slidable plate, a drive-shaft located at one end of the machine, a sheave thereon, an idle-shaft at the opposite end of the machine carrying a sheave, and an endless belt extend-

ing around said sheaves, the double-grooved pulley on the shaft carried by the slide plate adjustably connected with the carriage, and around the sewing-machine drive pulley, and
5 an automatic shift for throwing the drive shaft in and out of motion.

8. The combination with a bed having ways thereon, of a carriage having wheels fitted to and traveling on said ways, said
10 carriage adapted to carry a sewing-machine, the sewing-machine having a grooved drive-pulley, a stationary feed-screw running the full length of the machine, a plate slidably connected with the carriage, means for ad-
15 justing said plate in and out, a shaft rotatably supported by said plate and carrying a worm at one end and a double-grooved pulley at the other, a worm-wheel in mesh with the worm and rotatably supported by

the slidable plate, a drive-shaft located at 20 one end of the machine, a sheave thereon, an idle-shaft at the opposite end of the machine carrying a sheave, and an endless belt extending around said sheaves, the double-
25 grooved pulley on the shaft carried by the slide plate adjustably connected with the carriage, and around the sewing-machine drive pulley, an automatic shift for throwing the drive-shaft in and out of motion, said automatic shift comprising a slidable
30 shifter shaft, having means thereon adapted to be engaged by the carriage when it reaches a predetermined position, a fulcrumed lever, and a belt shifter and rod loosely pivoted to
35 said fulcrumed lever.

In testimony whereof I affix my signature.

ARTHUR EDWARD YATES.

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