May 27, 1958 R. S. GAMBLE ET AL 2,836,133

RAILWAY TYPE SEWING MACHINE

Filed Dec. 20, 1954

4 Sheets-Sheet 1

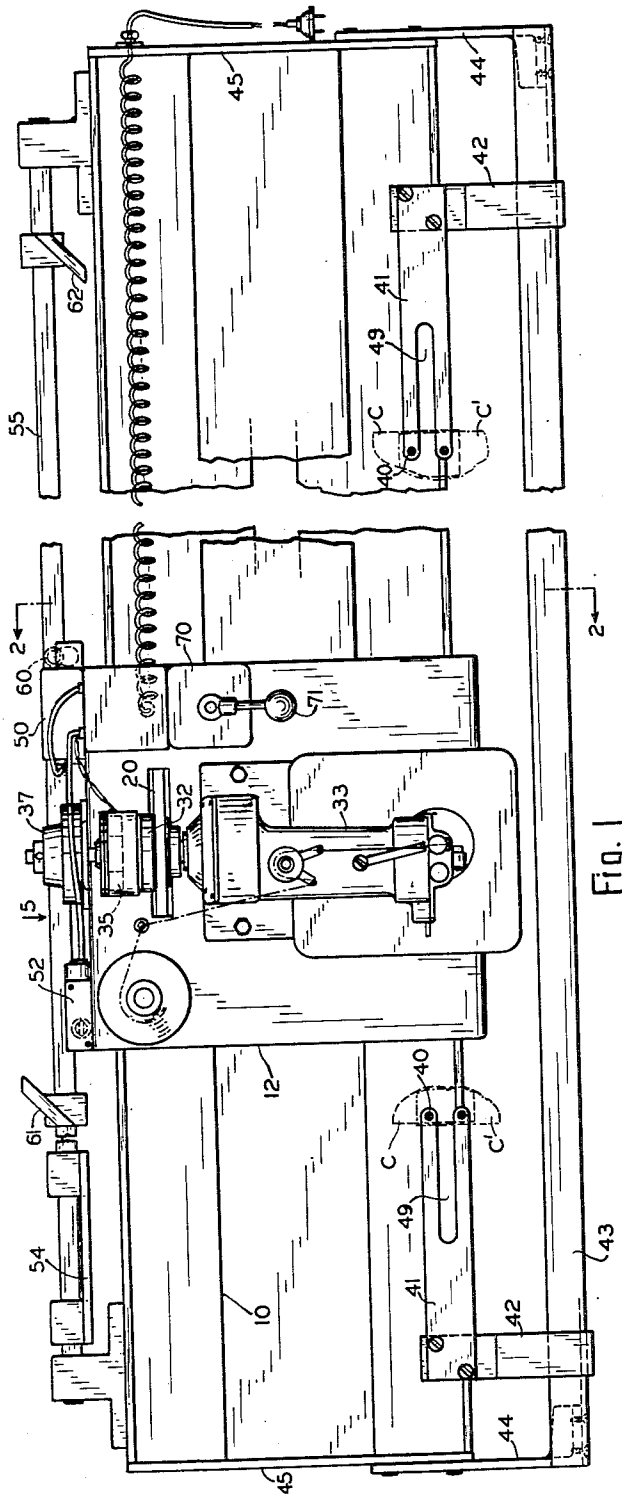


Fig. 1

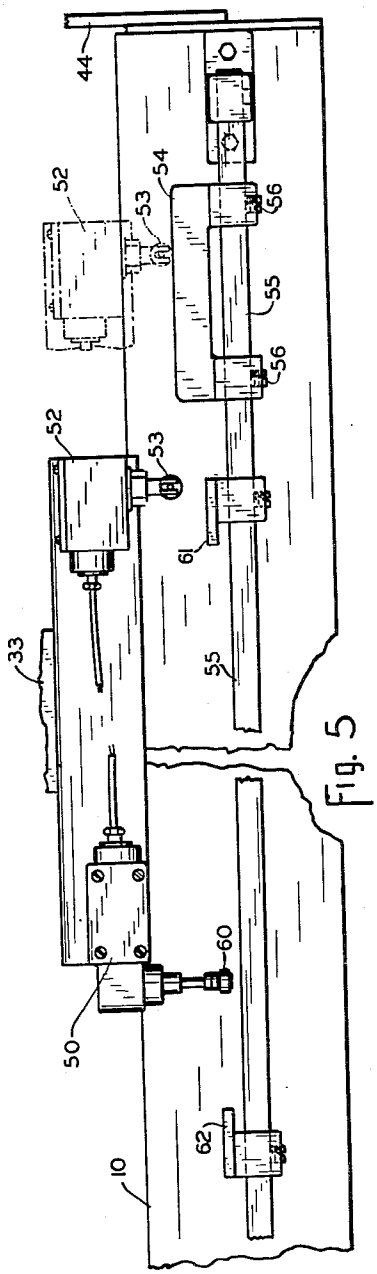


Fig. 5

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RAILWAY TYPE SEWING MACHINE

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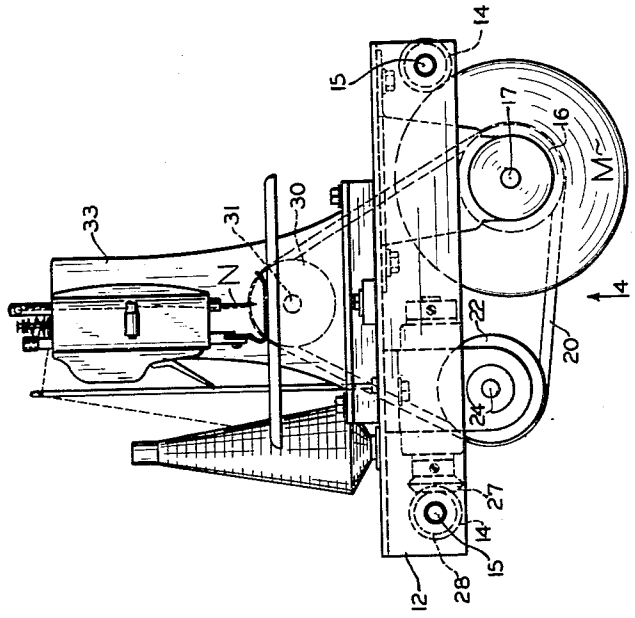


Fig. 3

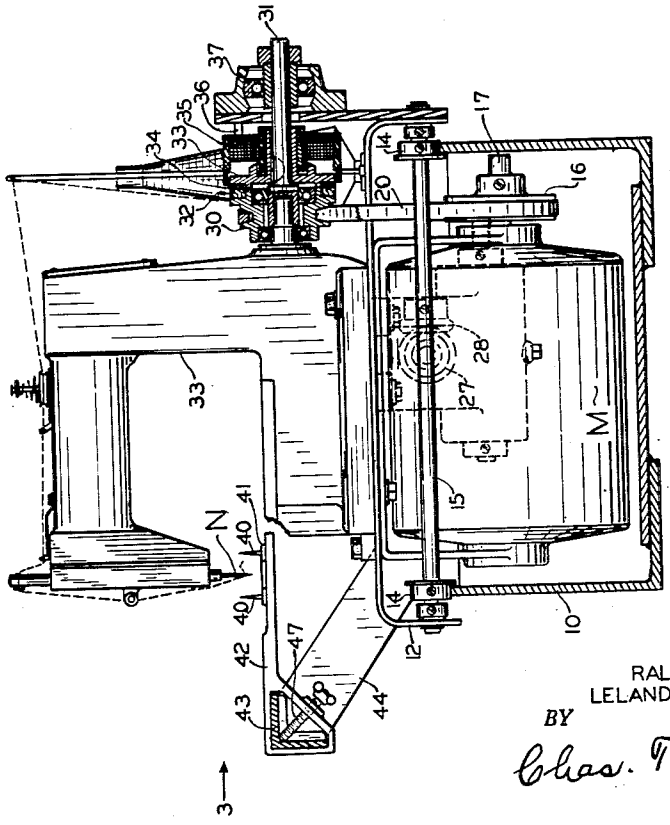


Fig. 2

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RAILWAY TYPE SEWING MACHINE

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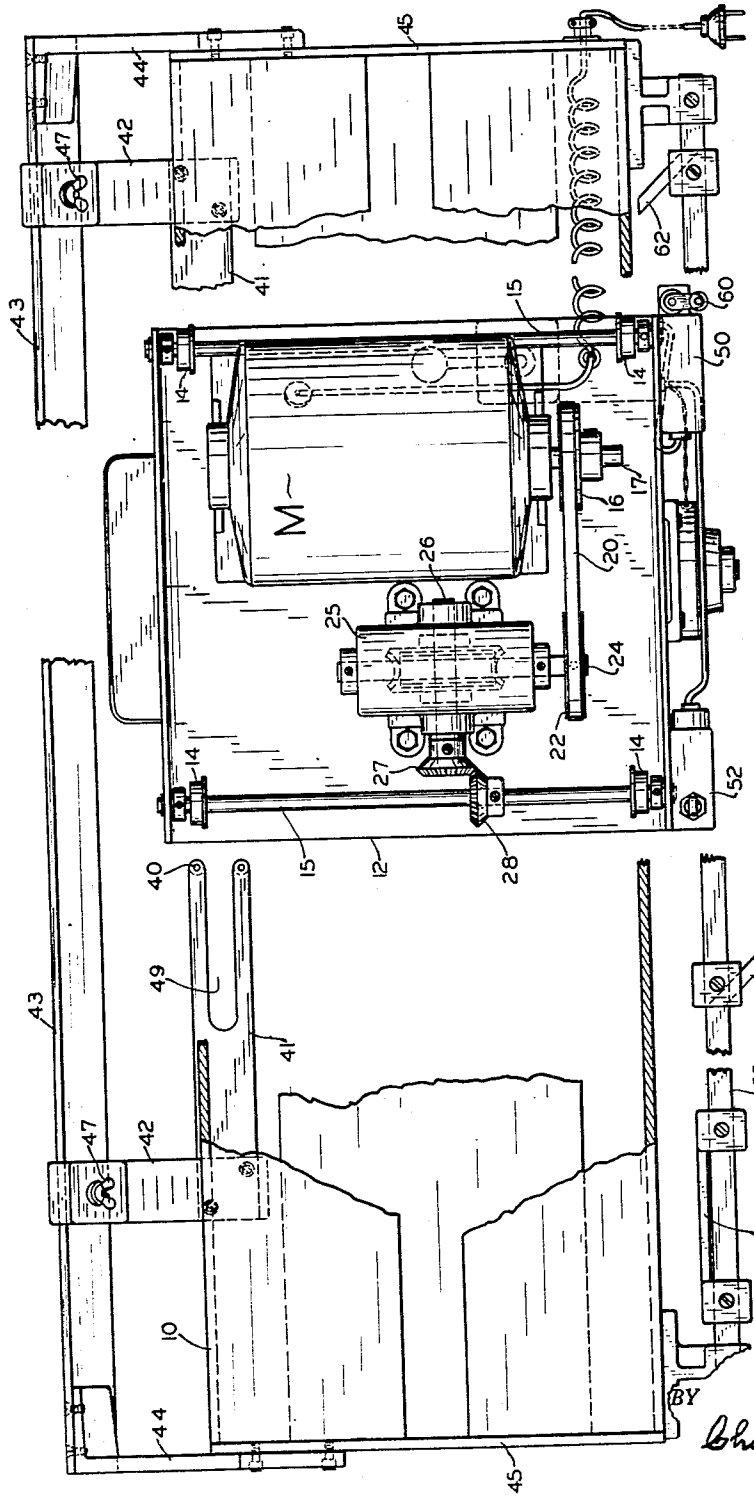


Fig. 4

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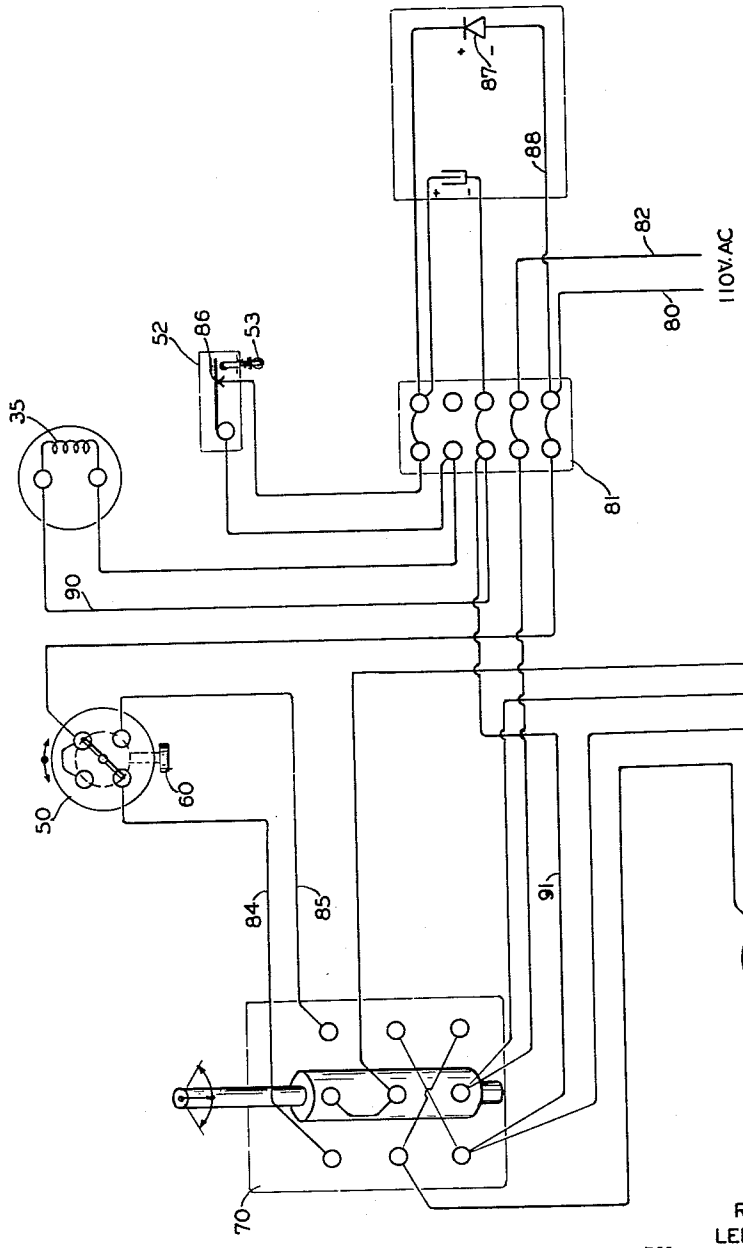


Fig. 6

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United States Patent Office

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RAILWAY TYPE SEWING MACHINE

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Application December 20, 1954, Serial No. 476,144

2 Claims. (Cl. 112—2)

This invention relates to a sewing machine of the so-called "railway" type in which the work is held stationary and the sewing head has straight-line travel relative to the work.

It is the general object of our invention to improve the design and construction of such railway sewing machines, to the intent that the machine may be made more reliable and satisfactory in use and that it may be found more economical in operation.

To the attainment of these general objects, an important feature of our invention relates to the provision of means to cause a sewing carriage to travel between predetermined limits only, and also to cause the sewing head to stitch the fabric between separately predetermined limits and during travel of the carriage in one direction only.

Another object is to provide means for automatically starting the sewing operation at a selected point in the continued travel of the carriage.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown on the drawings, in which

Fig. 1 is a plan view of our improved machine;

Fig. 2 is a sectional end elevation, taken along the line 2—2 in Fig. 1;

Fig. 3 is a front view of the sewing carriage, with the supporting frame omitted and looking in the direction of the arrow 3 in Fig. 2;

Fig. 4 is a bottom view of the machine on a somewhat enlarged scale and looking in the direction of the arrow 4 in Fig. 3;

Fig. 5 is a rear view of certain parts, looking in the direction of the arrow 5 in Fig. 1; and

Fig. 6 is a diagrammatic view of the electrical wiring and controls.

Referring to the drawings, our improved railway sewing machine comprises a base or frame 10 on which a sewing carriage 12 is supported by flanged guide-rolls 14, secured to cross shafts 15 (Fig. 2).

The power for moving the carriage is supplied by a motor M mounted on the carriage 12 and having a driving pulley 16 on its armature shaft 17. A belt 20 connects the driving pulley 16 to a pulley 22 (Fig. 4) which is secured to the worm shaft 24 of a speed-reduction unit 25. This shaft 24 has a worm-and-gear connection to a cross shaft 26, which in turn is connected by bevel gears 27 and 28 to one of the cross shafts 15 previously described.

The motor M is of reversible type and may be caused to rotate the shaft 15 and rolls 14 to move the carriage 12 in either desired direction.

The belt 20 (Figs. 2 and 3) also drives a pulley 30 loosely mounted on the drive shaft 31 of a stitching head 33, which head is of commercial type and forms no part of our present invention.

The pulley 30 has a friction member or plate 32 associated therewith and rotated thereby. A non-magnetic disc 33 is keyed to the shaft 31 and is slidable thereon. A friction ring or pad 34 is secured to the face of the disc 33 in position to engage the friction plate 32.

A magnetic ring 35 is loosely mounted on a hub portion of the member 33 and is held from rotation by a fixed pin 36. One end of the hub portion also engages the disc 32, and the outer end of the drive shaft 31 is supported in a bearing 37.

When the magnet ring 35 is energized, the plate 32 and magnet ring are drawn toward each other, and the magnet ring forces the friction pad 34 against the plate 32, thus causing the drive shaft 31 to be rotated. This friction clutch is commercial and illustrative only.

The pieces of cloth C and C' which are to be stitched together are mounted on pairs of holding pins 40 (Figs. 1 and 2), which pins are fixed in plates 41 carried by brackets 42. These brackets are slidable on an angle iron or rail 43 supported on stands 44 secured to an end plate 45 (Fig. 1) of the fixed frame or base 10.

The brackets 42 may be adjusted as desired along the rail 43 to accommodate pieces of cloth of different widths, and may be secured in adjusted position by wing screws 47 (Fig. 2) engaging the angle iron 43.

The pin-holding plates 41 (Fig. 1) are slotted as indicated at 49 to permit the starting run and over-run of the stitching needle N.

A limit switch 50 (Figs. 1 and 5) controls the travel of the carriage 12, and a micro-switch 52 controls the magnetic clutch which starts and stops the stitching mechanism.

The micro-switch 52 is normally closed but is opened when a roll 53 (Fig. 5) is engaged and lifted by a cam plate 54 which is supported on a fixed rod 55. The cam plate 54 may be adjustably secured on the rod 55 by screws 56. The limit switch 50 has a roller 60 which is engaged by stop plates or dogs 61 and 62 which are also adjustably mounted on the fixed rod 55.

The over-all operation of the machine is controlled by a hand-operated drum switch 70 (Fig. 1) having a handle 71. This drum switch acts as a reversing switch for the motor M and the handle 71 has forward, reverse and neutral positions.

Illustrative electrical connections are shown in Fig. 6, in which a power wire 80 is connected through a terminal plate 81 to double contacts in the limit switch 50. A second power wire 82 is connected through the plate 81 to the drum switch 70. The motor M has a forward connection to the drum switch 70. Wires 84 and 85 connect reverse terminals in the drum switch 70 to the limit switch 50, so that the power wires 80 and 82 will be reversely connected to the motor M according to the angular position of the limit switch 50 as determined by the dogs 61 and 62.

One end of the magnetic clutch coil or ring 35 is connected to the micro-switch 52 and through normally closed contacts 86, a rectifier 87 and a wire 88 to the power wire 80. The other end of the coil 35 is connected through wires 90 and 91 to one of the motor terminals in the drum switch 70 when the motor is running forward but is not connected through the motor when the motor operates in a reverse direction.

When the stitching operation is to be started, the carriage 12 will be at the left in Fig. 1 and the micro-switch 52 which controls the stitching mechanism will be opened by the cam plate 54. The operator then throws the handle 71 to the right in Fig. 1, thus setting the drum switch 70 to drive the motor M forward and to cause the carriage 12 to travel to the right in Fig. 1. As the stitching needle N approaches the edge of the cloth, the micro-switch roll 53 drops off of the cam plate 54 and the con-

tacts **86** (Fig. 6) close. The magnetic clutch circuit is then closed, starting the stitching.

The carriage travel and the stitching then continue until the roll **60** on the limit switch **50** engages the dog or stop **62** and is thereby reversed, thus breaking the operating motor circuit and stopping the machine.

After the stitched fabric has been removed, the drum switch is manually reversed, thus connecting the motor for reverse rotation and moving the carriage **12** to the left in Fig. 1 until the dog **61** is engaged and again reverses the limit switch **50**.

During the return movement, the contacts **86** in the micro-switch **52** will be closed but there will be no power connections through the drum switch, so that the stitching mechanism cannot operate during the return travel of the carriage.

From the foregoing description, it will be clear that the dogs **61** and **62** determine the limits of travel of the carriage **12** in both directions and stop the motor M whenever either dog is engaged. Furthermore, the cam plate **54** automatically determines the start of the stitching operation, and the described connections are such that the micro-switch **52** and clutch coil **35** are out of circuit during the return travel of the carriage.

Our improved machine thus requires an absolute minimum of attention by the operator, and the stitching operation may also be performed at higher speed, as the start and stop of the stitching is entirely controlled automatically.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:

1. In a railway sewing machine, a base frame, a stitching carriage mounted to be moved along said frame, a head provided with stitching mechanism and mounted on said carriage, means to move said carriage between predetermined limits on said frame, separate clutch-controlled driving mechanism for said stitching mechanism, and automatic means to render the clutch of said stitching driving mechanism operative to drive said stitching mechanism at a predetermined intermediate point between the ends of the operative run only of said carriage and during the continued travel of the stitching carriage.

2. In a railway sewing machine, a base frame, a stitching carriage, a head provided with stitching mechanism and mounted on said carriage, a reversible motor connected to move said carriage and to separately drive said stitching mechanism and including a clutch between the motor and the stitching mechanism, and automatic means to shift said clutch to operative condition at a predetermined intermediate point between the ends of the operative travel of the carriage and during the continued travel of the carriage to effect stitching during a selected portion of the operative run only of the carriage, and said automatic means being also effective to shift the clutch to inoperative position before the return movement of the carriage begins.

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