P. MAXWELL-MULLER.

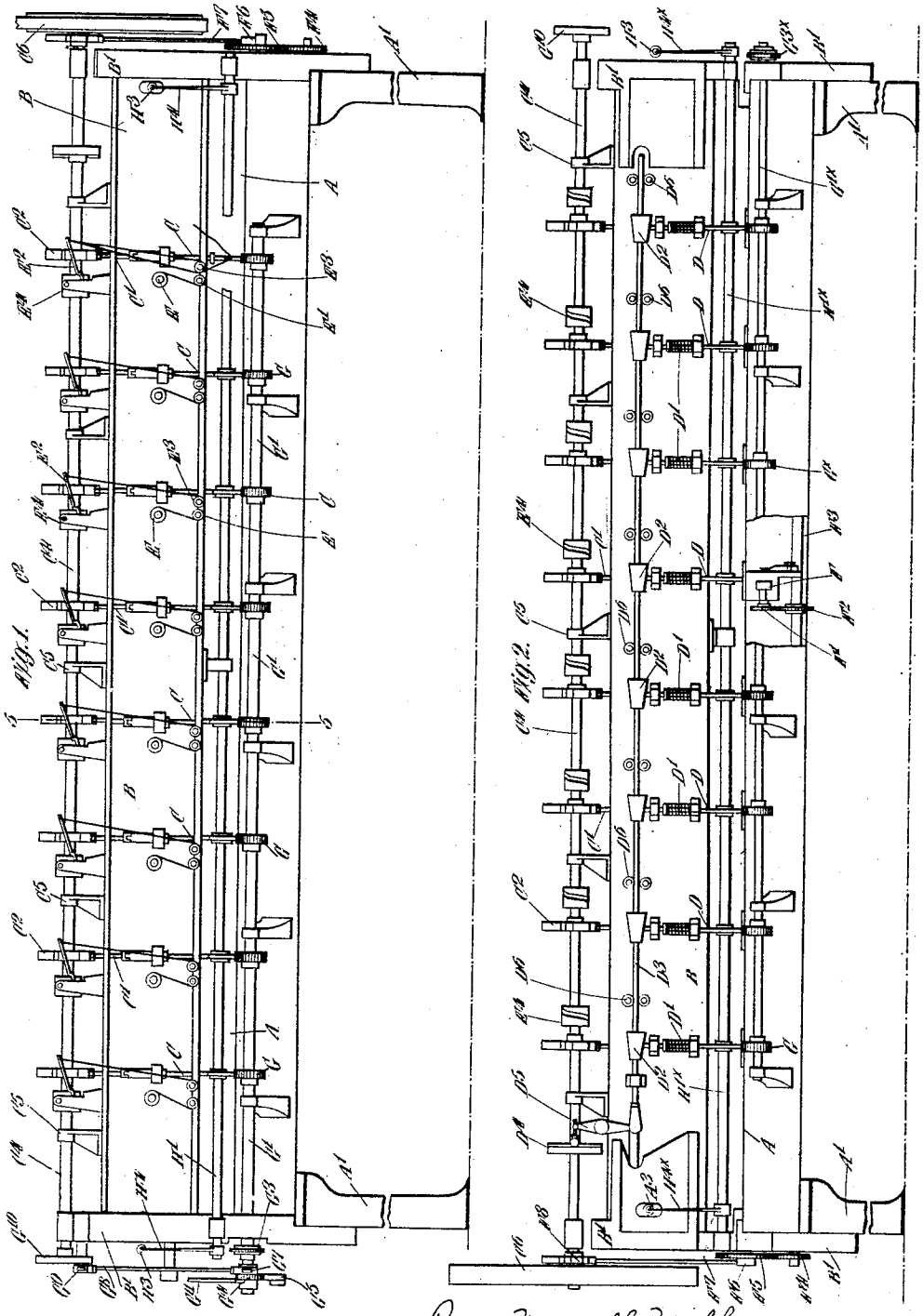
SEWING MACHINE.

APPLICATION FILED MAR. 5, 1920.

1,364,571.

Patented Jan. 4, 1921.

2 SHEETS—SHEET 1.



Percy Maxwell-Muller, Inventor

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2 SHEETS—SHEET 2.

Fig. 3.

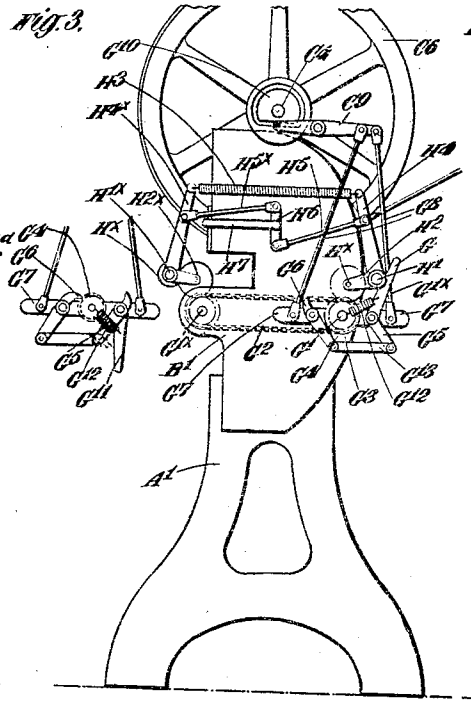


Fig. 3a.

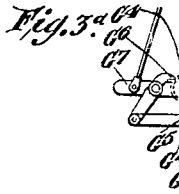


Fig. 5.

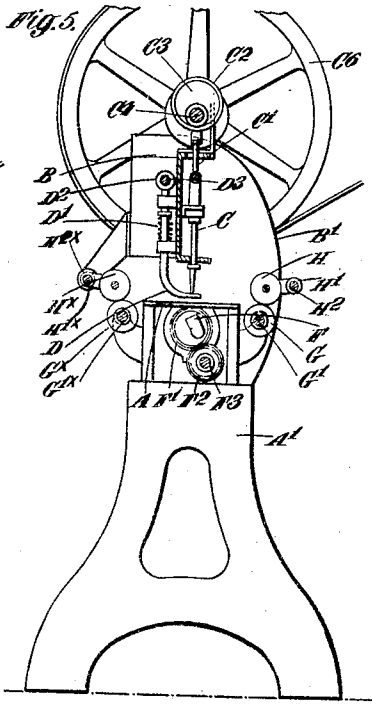


Fig. 4.

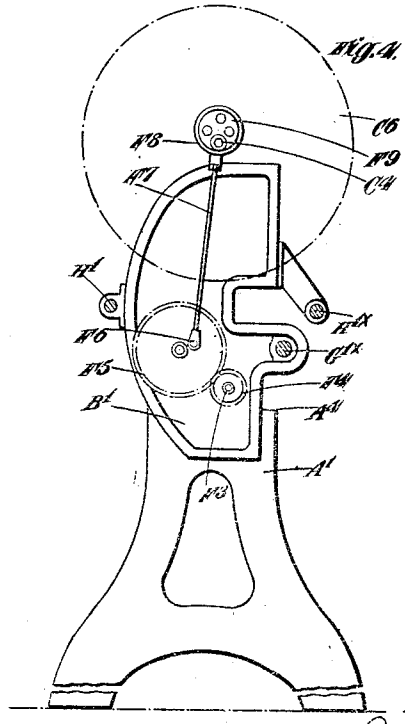
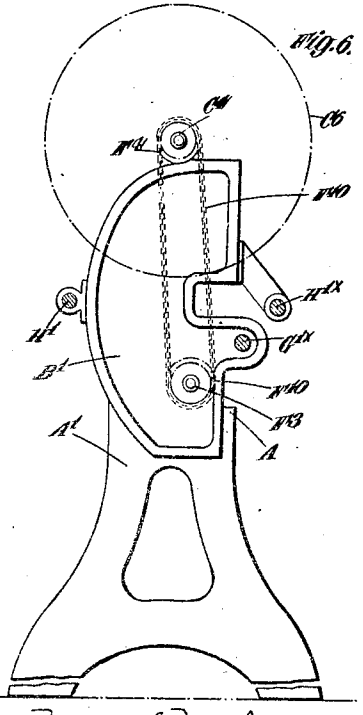


Fig. 6.



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Pennie Davis Marvin & Edmonds, attorneys

UNITED STATES PATENT OFFICE.

PERCY MAXWELL-MULLER, OF WEYBRIDGE, ENGLAND, ASSIGNOR TO VICKERS LIMITED, OF WESTMINSTER, LONDON, ENGLAND.

SEWING-MACHINE.

1,364,571. Specification of Letters Patent. Patented Jan. 4, 1921.

Application filed March 5, 1920. Serial No. 363,598.

To all whom it may concern:

Be it known that I, PERCY MAXWELL-MULLER, a subject of the King of Great Britain, residing at Weybridge, in the county of Surrey, England, have invented certain new and useful Improvements in or Relating to Sewing-Machines, of which the following is a specification.

This invention relates to lockstitch sewing machines and has for its chief object to provide an improved construction of machine for sewing together plies or veneers of wood for use in connection with aircraft, boats, carriages and other structures where multiple-ply wood panels or strips are employed in their constructions.

According to this invention, the improved lockstitch sewing machine comprises several separately actuated needles in conjunction with separately actuated bobbins, or spools corresponding in number to the number of needles employed and coöperating therewith for enabling several rows of lockstitches to be produced. Each needle actuating mechanism may comprise an eccentric suitably connected to the needle and the several eccentrics may be mounted on a common driving shaft. Each bobbin or spool may have its own actuating mechanism and a common driving shaft may be connected to each mechanism. The lower part of the machine constitutes a bed or table in which the aforesaid bobbin or spools are mounted in close proximity to the needles which are independently mounted in an upper part or cross bar extending above the bed or table of the machine, the arrangement and cooperation of each bobbin or spool with its respective needle being similar to the arrangement and coöperation of the bobbin or spool and needle in an ordinary single needle sewing machine. The plies or strips of wood to be sewn together are moved over the bed or table of the machine under the aforesaid cross bar by suitable mechanism which can be adjusted or set to effect the movement of the plies or strips in the forward or the reverse direction. Suitable thread tensioning means may be associated with each needle and various other parts which are usually provided in sewing machines may be employed and multiplied according to the number of needles and bobbins employed.

In order that the said invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings, in which:—

Figures 1 and 2 are respectively a front and rear elevation of one construction of the improved multiple needle lockstitch sewing machine.

Fig. 3 is an elevation of one end of the machine showing more particularly the mechanism for moving the plies or strips through the machine; Fig. 3^a is a detail view showing the same mechanism adjusted to effect the reverse movement.

Fig. 4 is an elevation of the other end of the machine showing more particularly the mechanism for driving the shaft which actuates the mechanism for imparting movement to the bobbins or spools.

Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 1.

Fig. 6 is a similar view to Fig. 4 illustrating a modification hereinafter referred to.

A represents the bed or table of the machine supported at its ends by standards A′, A′. B represents the horizontal transverse bar mounted above the table A in end supports B′, B′ secured to the standards A′ A′. The bar B is of channel or girder section (see Fig. 5) the lower flange of which is perforated at various points along its length to receive the needles C (eight being shown in the example illustrated) which are pivotally connected at their upper ends to rods C′ passing through holes in the upper flange of the girder bar B. The rods C′ are secured to straps C^2 surrounding eccentrics C^3, secured on a transverse rotary shaft C^4 which is mounted at its ends in the supports B′ and which is supported at several points along its length in bearings or supports C^5 on the upper part of the bar B. One end of the shaft C^4 carries a belt-driven pulley C^6 by means of which rotation is imparted to the shaft C^4 and to the eccentrics C^3 thereon which latter impart reciprocation to the needles C through the straps C^2 and the rods C′. At the rear of the transverse bar B are mounted in suitable supports presser-feet D (see Figs. 2 and 5) one for each needle and situated adjacent thereto in the usual manner, the presser-feet D being maintained normally in a raised position by means of springs D′ which retain the upper ends of

the presser feet D against cams D^2 on an endwise movable rod D^3 disposed between rollers D^6 as shown in Fig. 2.

The rod D^3 is adapted to be moved in endwise directions to set the presser feet in the operative or inoperative positions by means of a plate D^4 having a cam of suitable profile which is adapted to rock a centrally pivoted lever to effect the required endwise movement of the cam rod D^3, thereby holding the presser feet firmly against the work during the stitching part of the needle stroke. A small adjustable roller on the upper end of the lever D^5 is in contact with the cam plate D^4, the roller being adjustable to alter the throw of the lever D^5 in one direction so as to adjust the presser feet to suit different thicknesses of plies. Each needle has its own supply of cotton which is supplied from a reel E around a tension disk E′ through the take-up lever E^2 and then around a tension disk E^3 to the needle as shown at the end needle on the right hand side of the machine in Fig. 1. The take-up levers F^2 are simultaneously operated by grooved cams E^4 on the rotary shaft C^4. Loopers and shuttles F (see Fig. 5) of any usual type and supported in the table A adjacent to the needles may be suitably mounted to receive a semi-rotary or oscillatory movement for which purpose each looper or shuttle has a connection including a gear wheel F (see Figs. 2 and 5) and a gear wheel F′ in mesh with a gear wheel F^2 on a rocking shaft F^3, one end of which has a pinion F^4 (see Figs. 1, 2 and 4) in mesh with a gear wheel F^5 having an eccentric or crank pin F^6 which is connected through a rod F^7 and strap F^8 to an eccentric F^9 receiving its rotation from the main driving shaft C^4. The arrangement is such that the eccentric F^9 in rotating imparts a semi-rotary or oscillatory movement to the gear wheel F^5 which transmits this movement to the shaft F^3 and thus to the bobbins or spools B. The coöperation of each needle and its respective bobbin or spool to produce the lockstitch may be effected in any well known manner. Any appropriate or usual bobbin or spool mechanism may be employed, for example, as shown in Fig. 6, rotary loopers or shuttles may be used, the actuating shaft of which is driven by chain gearing F^{10} from the main shaft C^4. The mechanism for moving the wood plies longitudinally in order that they may be sewn together comprises in the example shown two sets of positively driven rollers G and $G^\times$ on transverse shafts G′ and $G'^\times$ disposed at the front and rear of the machine respectively and two sets of upper rollers H and $H^\times$ carried by short arms H^2 $H^{2\times}$ secured to transverse shafts H′ $H'^\times$ so as to be disposed above the rollers G $G^\times$ and to bear on the wood strips while supported on and moved along by the positively driven lower rollers G $G^\times$. The shafts G and $G'^\times$ are operatively connected together by a chain G^2 passing around sprocket wheels G^3 $G^{3\times}$ at one end of the said shafts, the shaft G′ also carrying a gear or ratchet wheel G^4 adapted to be rotated to impart rotation to the shafts G′ $G'^\times$ by a pawl G^5 or a pawl G^6 according to the direction of movement required; the pawls G^5 and G^6 are pivotally mounted on two rocking levers G^7 which levers are pivoted at their inner ends on the shaft G′, the ends of which lever are connected by links G^8 to one end of a centrally pivoted lever G^9 whose other end fits in a cam groove in a plate G^{10} secured on and rotatable with the main driving shaft C^4. By means of this arrangement the levers G^7 can be oscillated to cause say the pawl G^5 to intermittently rotate the ratchet or gear-wheel G^4 and thus impart rotation to the shaft G′ and the rollers G thereon, the rotation of which shaft is imparted to the shaft $G'^\times$ and the rollers $G^\times$ thereon through the chain drive G^2 in order to effect the forward movement of the wood plies to be sewn. After a length of the wood plies has been fed through the machine and sewn together, the sewn plies may be moved laterally and then moved in the reverse direction to enable another row of stitches to be made; in order to drive the shafts G′ and $G'^\times$ and the rollers G $G^\times$ thereon in the opposite or reverse direction the pawl G^5 is provided with a hand lever G^{11} connected to the shaft G by a spring G^{12} and the two pawls are pivotally connected at their lower ends by a link G^{13} so that by angularly moving the lever G^{11} from the position shown in Fig. 3 to the position shown in Fig. 3^a the pawls can be moved to the positions shown to enable the pawl G^5 to assume an inoperative position and the pawl G^6 an operative position whereupon the oscillation of the levers G^7 will cause the pawl G^6 to rotate the ratchet or gear wheel G^5 and therefore the shaft G′ in the reverse direction thus imparting movement to the rollers G and $G^\times$ in the required direction. The spring G^{12} retains the lever G^{11} and the pawls G^5 and G^6 in either of the positions to which they can be set.

The upper rollers H and $H^\times$ which as aforesaid are carried by short arms H^2 $H^{2\times}$ secured to the transverse shafts H′ and $H'^\times$ are normally maintained in a position to bear on the rollers G $G^\times$ by springs H^3 connected to the upper ends of levers H^4 $H^{4\times}$ secured to the shafts H′ and $H'^\times$ at the two ends of the machine, see Figs. 1, 2 and 3. The levers H^4 and $H^{4\times}$ are also connected by links H^5 $H^{5\times}$ to a lever H^6 having a handle H^7 which can be depressed to lower the lever H^8 and cause the links H^5 $H^{5\times}$ to move the levers H^4 $H^{4\times}$ outwardly against the action

of the springs H^3 so as to rock the transverse shafts H' H'^{x} and thus raise the rollers H H^{x} to permit of the insertion of the wood plies to be sewn and also to allow for lateral displacement of the same if required. Any width of plies up to the limit determined by the distance between the supports B' B' can be passed through the machine. If narrow plies be employed so that all the needles would not be required to effect the stitching, those needles not required would not be threaded and the corresponding bobbins or spools would be removed.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A multiple needle sewing machine for sewing wood plies comprising two side supports, a bed plate extending between and connected to said supports, loopers disposed under said bed plate, a vertical bar extending between and connected to said supports above the bed plate, a plurality of needles on one side of said vertical bar with cotton supplying means for said needles carried on said bar, presser feet associated with said needles and disposed on the other side of the bar, a main operating shaft disposed above said bar and a longitudinally movable rod coöperating with the presser feet and actuated by mechanism connected to said main operating shaft.

2. A multiple needle sewing machine for sewing wood plies comprising two side supports, a bed plate connected to same, loopers under said bed plate, needles coöperating with the loopers disposed above said bed plate, a main shaft for operating said needles, a common shaft actuating said loopers, mechanism at one end of the said main shaft which operates said common shaft, and mechanism at the other end of said main shaft for operating feed rollers which move the wood plies over said bed plate.

3. A multiple needle sewing machine for sewing wood plies comprising side supports, a bed plate extending between said supports, a vertical bar above said bed plate, needles with cotton supplying means on one side of said bar, presser feet on the other side of said bar, an operating shaft above the needles and connected thereto by eccentrics, a longitudinally movable rod having cams for engaging with said presser feet against the action of springs around said presser feet and a connection between said operating shaft and rod converting the rotary movement of the shaft into reciprocating motion for longitudinally moving said rod.

4. A multiple needle sewing machine for sewing wood plies, comprising two side supports, a bed plate between same, a plurality of loopers under said bed plate and coöperating with a plurality of needles supported in a frame extending between and connected to said side supports, a common operating shaft for said loopers, a main driving shaft connected by eccentrics to said needles, driving means operatively connecting the looper operating shaft and the needle operating shaft, spring controlled presser feet carried by said frame and means operated by said driving shaft for enabling the presser feet to be raised or lowered.

5. A multiple needle sewing machine for sewing wood plies comprising two side supports connected by a bed plate and a vertical bar, loopers under said bed plate and needles carried by said bar, a main driving shaft for actuating the needles and operatively connected to a shaft driving said loopers, feed rollers at the front and rear of said bed plate and means connected to said main driving shaft for operating the rollers in reverse directions for causing the wood plies to travel in either direction across said bed plate.

6. A multiple needle sewing machine for sewing wood plies comprising two side supports connected by a bed plate and a vertical bar, loopers under said bed plate and needles carried by said bar, a main driving shaft for actuating the needles operatively connected to a shaft driving said loopers, feed rollers disposed at the front and rear of said bed plate, oscillating levers on one of said roller shafts carrying pawls for engaging and driving a gear wheel on said roller shaft and links connected to said oscillating levers and to a cam actuated oscillatory lever.

7. A multiple needle sewing machine for sewing wood plies comprising two side supports connected by a bed plate and a vertical bar, loopers under said bed plate and needles carried by said bar, a main driving shaft for actuating the needles and operatively connected to a shaft driving said loopers, a feed roller at the front of said bed plate, the operating shaft of which carries oscillatory arms connected by links to a lever adapted to be oscillated by a cam on said main driving shaft, pawls carried by said arms, means for placing one or other of said pawls into engagement with a ratchet wheel on said roller shaft, a pressure roller coöperating with said feed roller, feed and pressure rollers at the rear of the bed plate, said latter feed rollers being operatively connected to the feed rollers at the front of the bed plate, and means for enabling the said pressure rollers to be raised or lowered simultaneously.

8. A multiple needle sewing machine for sewing wood plies comprising two side supports connected by a bed plate and a vertical bar, loopers under said bed plate and needles carried by said bar, a main driving shaft for actuating said needles and operatively connected to a shaft driving said loopers, a pressure roller and a feed roller adjacent to each needle, a shaft co-extensive with the

said bed plate carrying the pressure rollers by means of levers, a similar set of rollers at the rear of said bed plate, mounted on another shaft by means of levers, which levers are connected at each end of the bed plate by springs and are also connected to link mechanism for raising said rollers, feed rollers coöperating with said pressure rollers and means for rotating said feed rollers in opposite directions.

9. In a multiple needle sewing machine for sewing wood plies, having a main shaft and needles actuated by said shaft, presser feet for holding the wood plies in position, said presser feet being normally maintained by a spring in an inoperative position, and means for positively bringing said presser feet into operative position comprising a longitudinally movable rod carrying cams for engaging the presser feet, a rocker arm connected to said rod, and a disk mounted on said shaft and having a cam projection adapted to engage said rocker arm and thereby produce reciprocation of the rod.

10. In a multiple needle sewing machine for sewing wood plies, having a main shaft and needles actuated by said shaft, presser feet for holding the wood plies in position, said presser feet being normally maintained by a spring in an inoperative position, and means for positively bringing said presser feet into an operative position comprising a longitudinally movable rod carrying cams for engaging the presser feet, a rocker arm connected to said rod, and a disk mounted on said shaft and having a cam projection adapted to engage said rocker arm once during every revolution of the main shaft, and thereby causing said cams to periodically engage said presser feet.

11. In a multiple needle sewing machine for sewing wood plies, having a main shaft and needles actuated by said shaft, presser feet for holding the wood plies in position during the stitching action of the needles, said presser feet being normally maintained by the spring in an inoperative position, and means for positively bringing said presser feet into an operative position comprising a longitudinally movable rod carrying cams for engaging the presser feet, a rocker arm connected by said rod, and a disk having a cam projection and so mounted on said shaft as to cause said cams to depress the presser feet during each insertion and withdrawal of the needle.

In testimony whereof, I affix my signature.

PERCY MAXWELL-MULLER.

Correction in Letters Patent No. 1,364,571.

It is hereby certified that in Letters Patent No. 1,364,571, granted January 4, 1921, upon the application of Percy Maxwell-Muller, of Weybridge, England, for an improvement in "Sewing-Machines," an error appears in the printed specification requiring correction as follows: Page 3, lines 12–13, for the words "bobbins or spools" read *loopers and shuttles;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of April, A. D., 1921.

[SEAL.]

M. H. COULSTON,

Commissioner of Patents.

Cl. 112—2.