May 5, 1959 A. P. LE VAY 2,884,967

MULTI-STATION TABLE FOR CONSTRUCTING BUILDING FRAMES

Filed Oct. 6, 1955 4 Sheets-Sheet 1

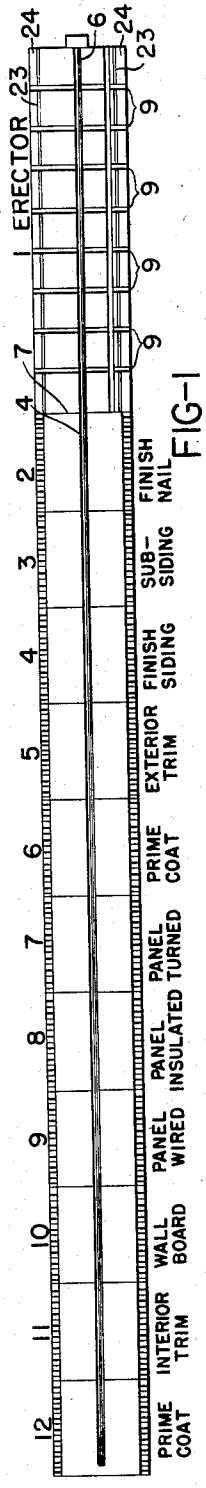


FIG-1

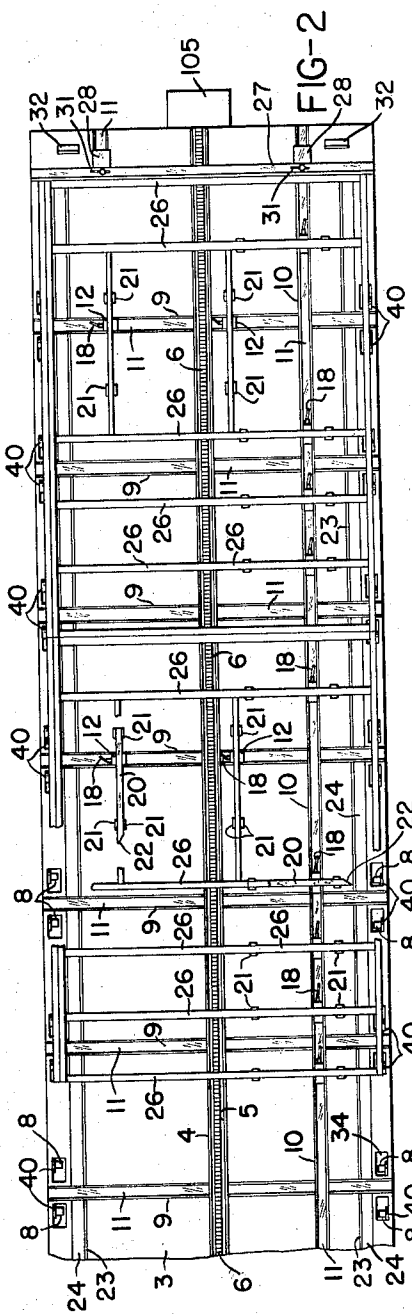


FIG-2

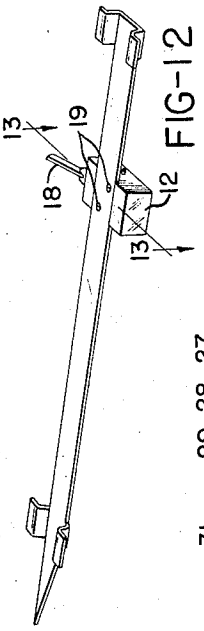


FIG-12

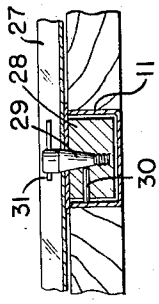


FIG-5

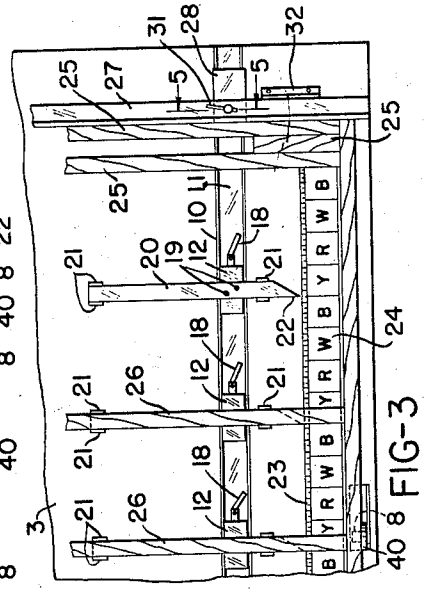


FIG-3

INVENTOR.
ALEX P. LE VAY
BY Toulmin & Toulmin

ATTORNEYS

May 5, 1959 A. P. LE VAY 2,884,967

MULTI-STATION TABLE FOR CONSTRUCTING BUILDING FRAMES

Filed Oct. 6, 1955 4 Sheets-Sheet 2

FIG-9

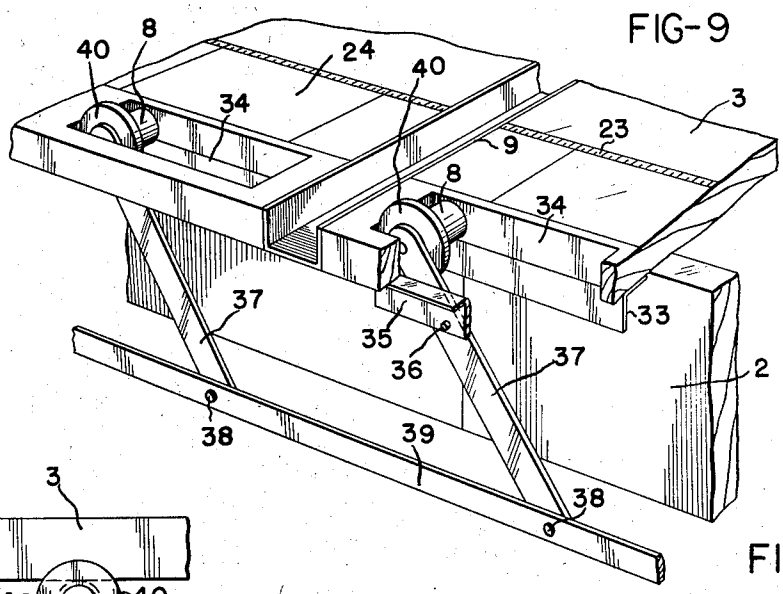


FIG-10

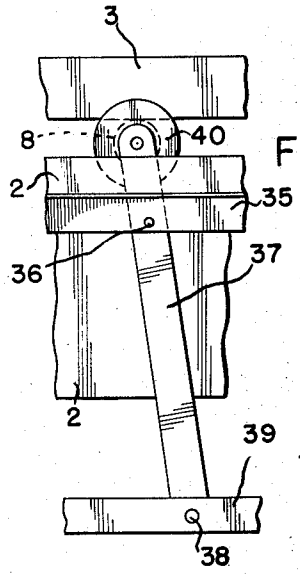


FIG-11

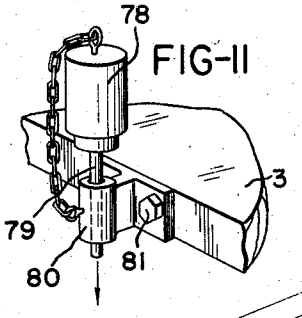


FIG-13

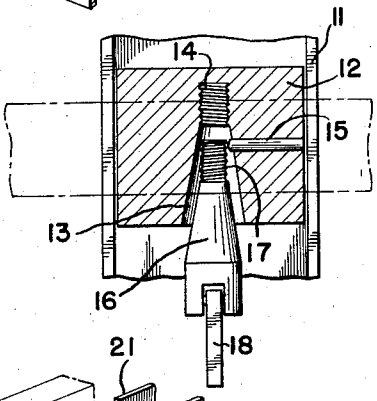
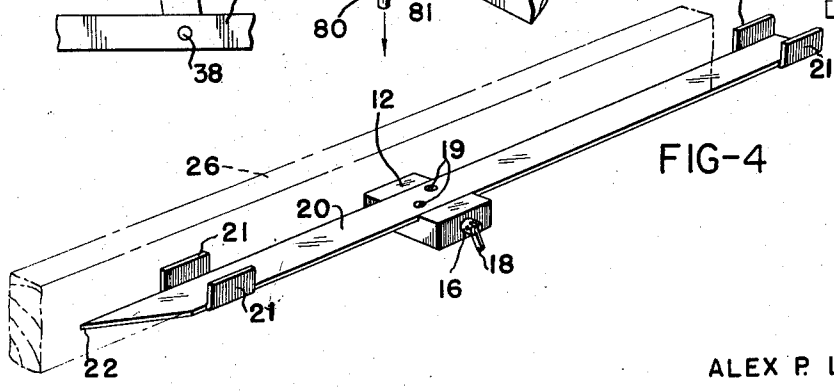


FIG-4



INVENTOR.
ALEX P. LE VAY
BY Toulmin & Toulmin

ATTORNEYS

May 5, 1959 A. P. LE VAY 2,884,967

MULTI-STATION TABLE FOR CONSTRUCTING BUILDING FRAMES

Filed Oct. 6, 1955 4 Sheets-Sheet 3

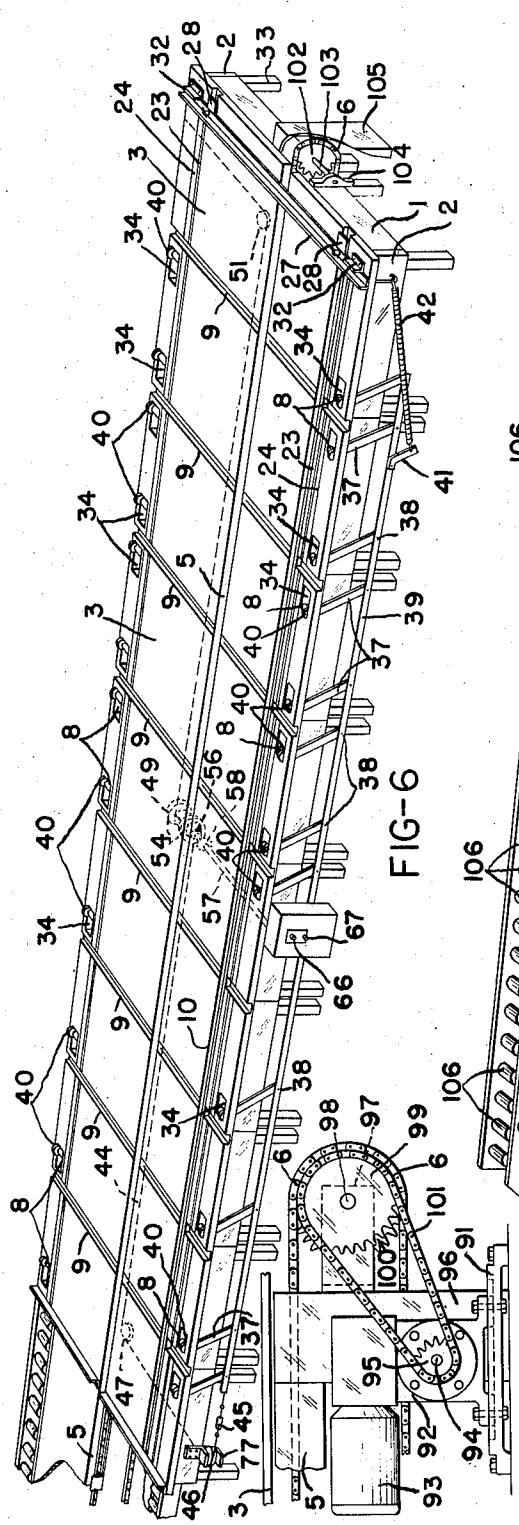


FIG-6

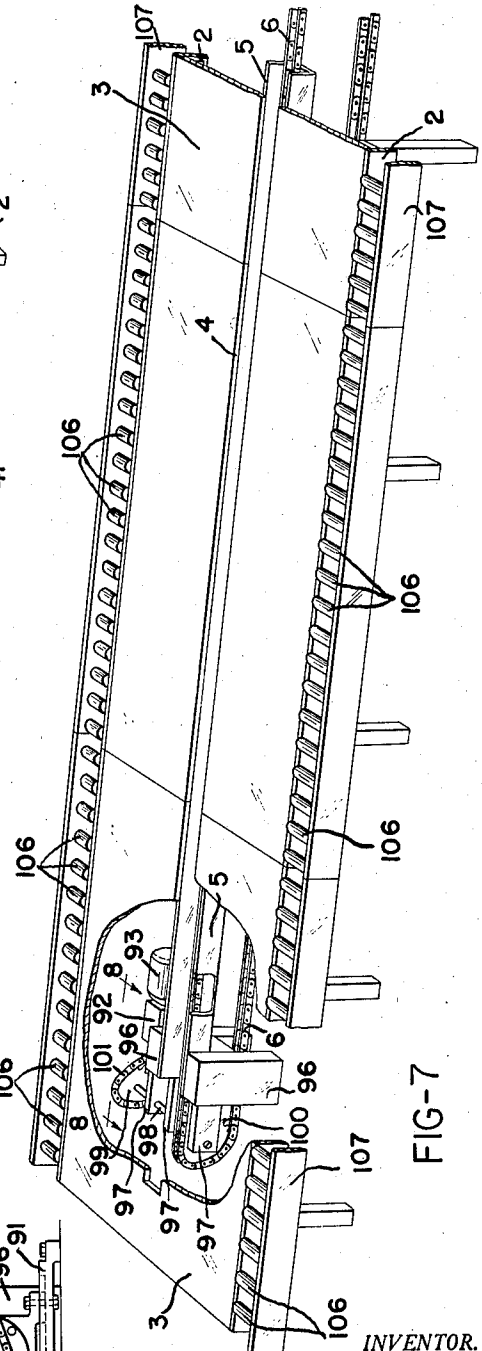


FIG-7

FIG-8

INVENTOR.
ALEX P. LE VAY
BY Toulmin & Toulmin
ATTORNEYS

May 5, 1959 A. P. LE VAY 2,884,967

MULTI-STATION TABLE FOR CONSTRUCTING BUILDING FRAMES

Filed Oct. 6, 1955 4 Sheets-Sheet 4

FIG-14

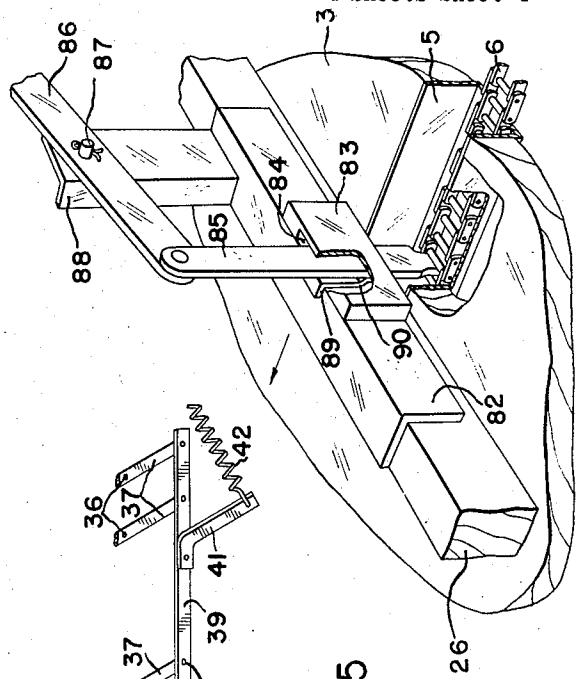
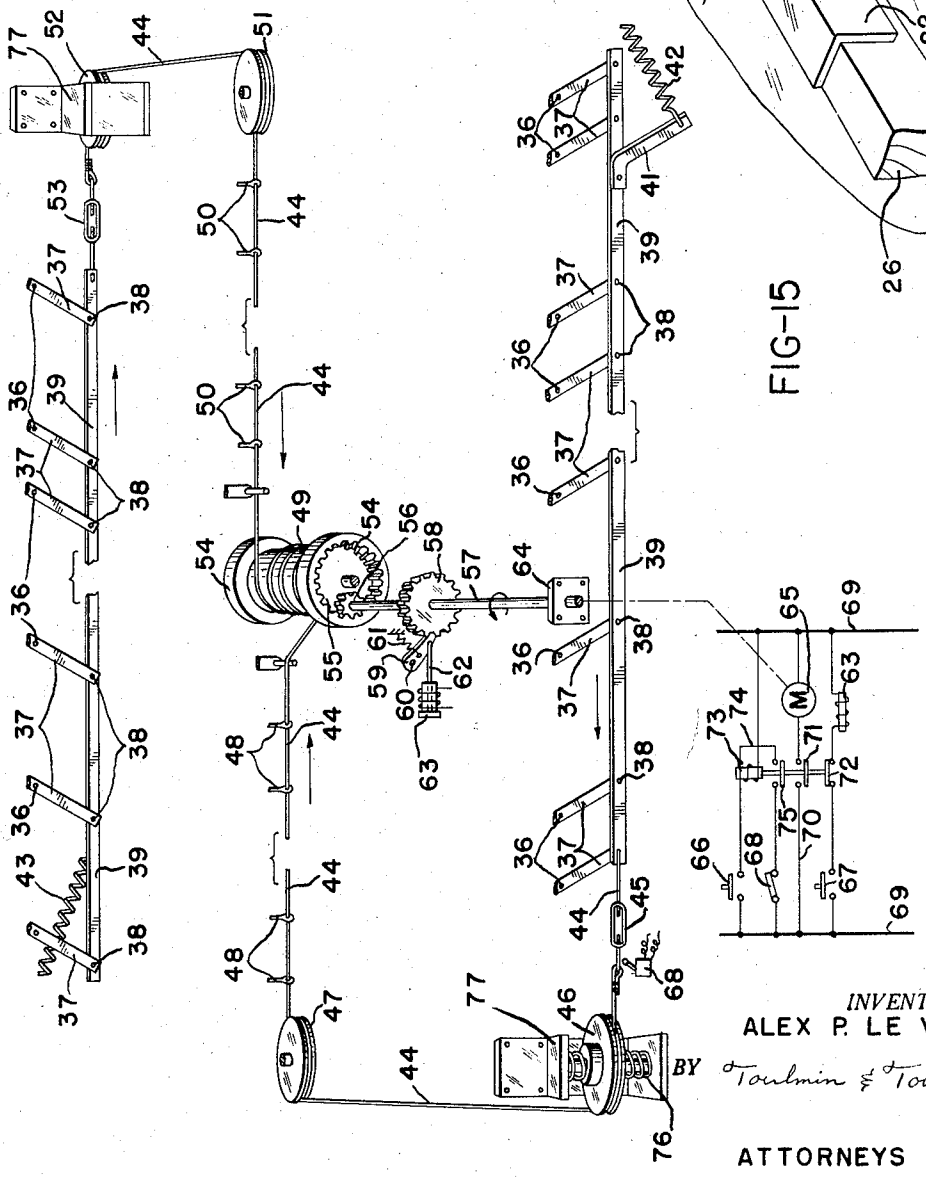


FIG-15



INVENTOR.
ALEX P. LE VAY
BY Toulmin & Toulmin
ATTORNEYS

United States Patent Office

2,884,967

Patented May 5, 1959

2,884,967

MULTI-STATION TABLE FOR CONSTRUCTING BUILDING FRAMES

Alex P. Le Vay, Dayton, Ohio

Application October 6, 1955, Serial No. 538,973

4 Claims. (Cl. 144—288)

The present invention relates to building construction, and more particularly to jigs and lay-out tables for assembling, aligning and, in general facilitating the manufacture of side and end frames, also floors of prefabricated houses.

When frame houses are made on a quantity production basis, the side and end walls, also the floors, are usually fabricated in assembled form at a mill and then erected on a foundation at the building site. Due to the ever increasing sizes of these houses, the job of determining the length of the joists and studs, arranging these various parts, and nailing them together, becomes more and more difficult, not only due to the long lengths of the beams, but also the weight of the completed frames or panels. This weight may reach many hundreds of pounds, particularly in the case of frames of large houses, calling for heavy beams which makes the frame extremely hard to handle.

The present application discloses improvements on the structure shown and claimed in my prior application Serial No. 357,308, filed May 25, 1953, and on which Patent No. 2,662,565 was granted.

The primary object of the invention is to provide a long work-table, extending, in some cases, several hundred feet, and in which house panel sections are first assembled in a jig, secured together, and then moved successively through a number of stations or work positions to the final position at which the panel is completely finished and ready for erection.

Another object is to provide an improved conveyor system formed of a traveling chain with a clutch arrangement so that the panel can be attached and detached at will to the chain, and thus propel the panel from station to station, either intermittently or continuously along the table for successive operations.

Still another object is to provide an improved roller structure by which the panel, in a semi-completed state, is raised from the table, and then moved on the rollers to the next work position.

A further object is to provide an improved roller elevator mechanism, including a power driven drum and cables, for elevating the rollers on which the panels are supported.

A further object is to provide an improved form of locating bar for positioning the parts of the frame which form the panel.

A still further object is to provide an adjustable locating bar extending across the front end of the table in order to accommodate panels of different lengths.

Other objects and features will be apparent as the specification is perused in connection with the accompanying drawings, in which:

Figure 1 represents a plan view of the improved work table showing an improved jig portion at the right-hand end of the table and the various working stations or positions along the table;

Figure 2 is a plan view, somewhat enlarged, of Figure 1, and showing only the jig or erector portion of the table and indicated at the right-hand end of the long table showing of Figure 1;

Figure 3 is another plan view, but still further enlarged, of one corner of the jig portion of the table in order to show some of the details of the table as a whole;

Figure 4 is a perspective view of a slidable positioning fixture or bar for spacing the studs and adapted to move in transverse and longitudinal grooves along the table;

Figure 5 is a fragmentary sectional view of clamping unit taken along line 5—5 in Figure 3;

Figure 6 is a perspective view of the improved right-hand end of the jig portion of the table, showing certain details of structure which could only be indicated in Figure 1 on account of its smallness of size;

Figure 7 represents a perspective view of some of the working stations along the table and showing in particular, at the broken away portion, the conveyor chain operating mechanism;

Figure 8 is an enlarged view of the chain-driving mechanism looking from about the position of the line 8—8 in the direction of the arrows in Figure 7;

Figure 9 is an enlarged fragmentary view of the elevating mechanism including improved forms of elevating and locating rollers for lifting and conveying the building frame from the erecting position to the next operating position along the table. These rollers are located only at the right-hand or jig portion of the table where the studs and the beams are assembled and temporarily nailed together;

Figure 10 is an elevational view of the roller and immediately associated mechanism;

Figure 11 shows a fragmentary perspective view of a modified form of roller, useful in locating sidewise the side edges of the panel frame being built;

Figure 12 is an enlarged view of an improved locating bar for determining the position of the stud or beam at the erector or jig end of the table;

Figure 13 is an enlarged sectional view of the clamping device for the locating bar and taken along the line 13—13 of Figure 12 and looking in the direction of the arrows;

Figure 14 depicts an enlarged view of an improved cable and lever system by which the lifting rollers are raised and lowered; this figure also shows an electrical system including a push-button control for operating the system; and

Figure 15 illustrates, on a large scale, a structure in perspective, by which the built-up panel in its various stages can be propelled along the table by a conveyor chain and stopped at the various operating positions by an engaging and disengaging lever.

The above objects are carried out in brief by providing a multi-station table provided with a conveyor chain extending the length of the table for moving a panel from one station to another. The first station is where the studs, beams, etc. are assembled in proper position and temporarily nailed together. Thereafter, the panel is moved to a second position for further operation, and so on along the entire length of the table throughout the various operating positions.

Improvements have been disclosed to facilitate the positioning of the studs and for moving the assembled panel along the table with minimum friction and effort. The panel as finally finished at the end of the table is complete, wired, insulated, interior trimmed and prime-coated, and ready to be erected at the building site.

GENERAL DESCRIPTION

The improved table, in effect, constitutes a long horizontal support or platform, extending perhaps a hundred feet, or even more, and on which the panel members,

can be assembled and temporarily nailed at one end of the table, thereafter lifted by elevating rollers and pulled by a continuously operating chain along the table to the next position at which a different operation is carried out.

The panel is supported from the second position, and throughout as many positions as may be necessary for the various operations, on rollers having a stationary axis the purpose of which is to reduce friction and thereby assist the traveling chain in moving the panel through each of the successive positions. A connection is made between the partially finished panel and the conveyor chain through an improved form of clutch operated by one of the carpenters or workmen and readily disconnected from the chain when the panel has reached the second or third position, etc.

The frame of the table is formed by rectangular end and side beams **1**, **2** arranged with their edges upward for supporting a heavy table of wood. The width of the table should be somewhat larger than the width of the panel to be built in order to provide space for the elevating rollers at the erector or jig end of the table and for the stationary axis rollers at the various stations beginning with station 2.

The panels to be built may comprise end, side frames, or floors of houses, and even roofs, which are to be erected on prepared foundations. The table proper is indicated at **3** and, as shown particularly in Fig. 1, there is a groove **4** extending the full length of the table from the right to almost the left-hand end, and just below the groove there is a U-beam **5** secured in any suitable manner to the underside of the table.

This U-beam constitutes a channel having a chain conveyor **6**, the details of which will be described under a separate heading, and it is apparent that this chain passes under the lower surface of any panel that is resting on the table **3**. A suitable connection may be made between the panel and the upper length of the conveyor chain **6** by a form of clutch which has been shown in Fig. 15 and which will be described in detail hereinafter.

The right-hand end of the table, as shown in Fig. 1 up to and including the line **7**, is the so-called jig or erector portion where the various studs, beams and plates of wood are assembled at the requisite distances from one another and in proper arrangement according to the architect's specifications. At this position the studs are temporarily nailed together and thereafter they are lifted as a whole panel by means of elevating rollers, indicated generally at **8** in Fig. 6, and carried by the chain **6** to position or station No. 2, indicated in Fig. 1, at which position the studs are completely nailed together by adding additional nails to those previously applied at station No. 1.

The panel is then conveyed by the chain to station No. 3 (Fig. 1) where under-siding is nailed over the panel, then, again, by the chain to station No. 4 where additional nails are applied to the under-siding and cut-outs are made in the under-siding. The panel then travels to station No. 5 where the exterior trim is added, and then to station No. 6 for the prime coat on the outside. At this point a crane (not shown) is provided which picks up the panel, turns it over and deposits the same at the position marked station No. 7 in Fig. 1. From that position the panel, still traveling by the conveyor chain, reaches station No. 8 where insulation is applied, then on to station No. 9 where the panel is wired from the inside.

At station No. 10 the panel is furnished with wall board, then on to station No. 11 where the interior trim is added, and finally to the last station No. 12 where the interior prime coat is applied. The panel, finished on the exterior and the interior, completely insulated, wired and with a prime coat on both sides of the panel, can then be removed from the table and transported to the building site, ready for erection.

The jig or erector end of the table

The portion of the table at which the studs are assembled and temporarily nailed together is located at the extreme right-hand end of the long table shown in Fig. 1 and is marked station No. 1. Detailed views are shown in Figs. 2, 3 and 6. In these figures, the table is illustrated as being provided with transverse grooves **9** and a longitudinal groove **10**. These grooves are lined with a U-shaped metal bar **11** the purpose of which is to receive metal blocks **12** which fit snugly within the grooves of the bars and against which they can be tightened by means of a screw clamp shown more particularly in Fig. 13. Each block **12** has a transversely positioned bore **13**, a portion of which is of conical configuration and which leads into an internal cylindrical portion that is threaded as indicated at **14**.

There is a side opening in the block slidably to receive a pin **15** which projects slightly into the conical portion **13** of the bore. The latter receives a plug **16**, partly conical, having a threaded end **17** for engaging the threads of the bore **14** when the plug is inserted into the opening. A swingable lever **18** is attached to the plug and by screwing the end of the plug into the opening **14**, the conical portion of the plug will engage the pin **15** to press the same outwardly against the inner surface of the U-shaped bar **11**. Thus, the block **12** is tightened within the bar.

As shown in Fig. 4, each block **12** permanently carries, as by screws **19**, a locating bar **20** which is provided at each end with winged extensions **21**. The width of the bar **20** is approximately the width of the studding so that the studs can be held edgewise between the wings of the elements **21**.

Thus, by moving the block **12** in either the longitudinal groove **10** or the transverse groove **9**, the bars **20** and therefore the studs, can be positioned either in the longitudinal or transverse directions to make up a panel with the proper positioning of the window frames and door openings.

In order to position the locating bars **20** at the proper dimensions in the transverse direction, the end of the bars are cut to a point as indicated at **22** (Figs. 3 and 4), and directly opposite these bar points there is a scale **23**, set forth in inches, and located at each side of the table so that measurements can be accurately made and the studs properly spaced from one another.

In order still further to facilitate the proper positioning of the blocks **12** in the longitudinal grooves so as properly to position the transverse studding, I may provide blocks, indicated at **24**, of different coloring, such as blue, white, red, yellow, and provided at each side of the table to furnish a quick reference point for positioning the bars **20**.

In order to take care of a change in the length of the panel, as for example as may be necessary when the right-hand transverse stud (as seen in Fig. 3) in fact constitutes three studs **25** instead of a single stud as in certain other constructions, it may be desirable to provide one of the inch scales displaced to the left by the thickness of two of the studs in order to take into account the extra studding thickness. Thus, the scale **23** at one side of the table can be permanently moved the thickness of the two studs **25** and this scale used in determining the position of the other studs, such as **26**, while the scale at the other side of the table may be set at zero and used as a reference point for the bars having the pointed ends extending to that side of the table and to which only one stud or joist is used at the extreme right-hand end of the panel. The colored blocks **24** at each side of the table can also be prearranged so as to accommodate either a single or a three stud beginning of the panel.

Still further adjustments are required at the right-hand end of the table as shown in Fig. 3, when only a single transverse stud **25** is used in place of the three studs as shown. The starting bar **27** which usually constitutes an angle iron and serves as a stop for the first stud may have

to be moved in changing from a single to a three stud beginning. For this purpose this angle iron is attached to a block 28 (Fig. 5) which fits snugly within the longitudinal U-shaped bar 11, and this block is provided with a clamping block 29 and a transversely extending pin 30 of the type that was explained in connection with Fig. 13.

Thus, by turning the plug at the handle 31, the pin 30 will be caused to move outwardly and to clamp the block 28 within the U-shaped bar 11. The angle iron beam 27 can therefore be moved in the longitudinal direction of the table to make up for any changes in the number of studs 25 that are used at the beginning of the panel. A stop 32 may be bolted or otherwise secured to the table to limit the outward movement of the angle iron member 27.

The advantage of moving the angle iron 27 in order to position the end studs 25, of which three are shown in Fig. 3, is that the total length of the panel can be increased at the right-hand end by simply sliding the angle iron 27 to the right and tightening the block clamp 28 and positioning the end studs 25 against the angle iron as shown in Fig. 3. This change in panel length can be effected without changing the relative positions of the intermediate studs 26 or the stud at the far end (not shown) with respect to the table.

As pointed out hereinbefore, the studs forming the panel are positioned both longitudinally and transversely by the slidable bars 20 placed in position by referring to the longitudinal scales and the colored blocks. Design blueprints are provided to show the proper points on the scales or the colored blocks at which the various bars 20 which carry the studs are to be placed.

Usually the joints between the studs are secured by a single nail per joint at the erector position and, later, at the second position the panel is completely nailed. It is apparent that during the assembly of the studs in their respective positions, it is desirable that the studs rest squarely on the table in order to facilitate the assembly and temporary nailing operations. After completed, the panel is then raised in the manner explained hereinafter and rolled to the second position of the table as shown in Fig. 1, at which the nailing operation is completed.

Panel raising rollers and operating mechanism including the motor and electrical control

Referring to Figs. 6, 9 and 10, the table 3 overhangs the side wall 2 at each side, and directly under the overhanging portion there are lengths of angle iron 33 provided for strengthening purposes. A number of rollers, indicated at 8, are positioned along the side edges of the table, these rollers being preferably arranged in pairs as shown in Fig. 6, and the general purpose is to be caused to swing upwardly under the longitudinal studding or rails of the panel so as to both lift and to serve as a frictionless support for each panel in moving the latter from the first to the second station.

Rectangular openings 34 are provided in the overhanging portion of the table, the inner edges of the openings coinciding with the flat portion of the angle irons 33. There is also a number of angle iron members 35 secured to the underside of the table overhang at the outer edge, these angle iron pieces being provided with a pivot 36 for pivotally mounting a bar 37. The lower end of this bar is pivotally mounted, as indicated at 38, on a long bar 39 which extends the entire length of station No. 1 in order to accommodate a large number of the bars 37.

Thus, as the bar 39 is pulled from right to left, as indicated in Fig. 9, the upper end of the bar 37 is rotated about the pivot 36 in a vertical arcuate path and will tend to raise the roller 8 mounted thereon upwardly, beyond the upper surface of the table. The roller 8 is free to rotate on the bar so that as the roller is moved upwardly out of the openings 34 and the rollers maintain contact with the underside of the panel studding, there is little or no tendency for the panel to move but, instead, it is gently raised vertically upward.

The rollers 8 are provided with flanges 40 which press along the sides of the panel studs and, since there are a corresponding number of these flanged rollers at each side of the table, the flanges maintain the panel in the transverse direction and keep the latter strictly in line in moving down the table.

The panel is caused to move from the first to the second and on to the remaining stations by being temporarily attached to a continuously moving chain 6 which will be explained in detail hereinafter.

An anchor bar 41 (Fig. 14) is riveted to the bar 39 and a tension spring 42 is connected between the anchor bar and a suitable stationary position on the table. There is a similar spring 43 at the other side of the table and connected to the other bar 39, but located at the far end of station 1 of the table. The purpose of these springs is continually to urge one of the bars 39, as seen in Fig. 14, to the right and the other bar 39 to the left. These springs therefore serve to swing the rollers downwardly about the bar pivot 36 to a position as would cause the rollers to rest below the upper surface of the table 3. However, the flanges of the rollers are positioned above the table.

In order to raise the rollers 8 when it becomes time to elevate the panel from the table and move it to the second position, a cable 44 is provided, attached to one end of the bar 39, passing through an adjustable turnbuckle 45, then around a pulley 46 located on the outside of the table, then around a pulley 47 positioned under the table, thence through guide eyelets 48 to a drum 49 which is also located under the table at about the middle position so as to be out of the operator's way.

The cable passes around the drum in three or more convolutions, as indicated, and then extends forwardly of the table, underneath, through guides 50 around a pulley 51 and still another pulley 52 which is secured to the outside of the table, and thence through a turnbuckle 53 to the opposite bar 39. It is apparent that by rotating the drum 49 in a counterclockwise direction, the lower bar 39 is caused to move to the left and the upper bar 39 is caused to move to the right and these movements, in turn, will swing the bars 37 about their pivots 36 to cause the rollers to raise upwardly beyond the upper surface of the table and thus to elevate the panel.

The drum 49 is rotatably mounted on bearings under the table and is provided at each end with flanges 54 to confine the cable to the middle of the drum. One of the flanges is provided with internal gearing, as indicated at 55, the teeth of which mesh with a pinion 56 carried on a shaft 57. A ratchet wheel 58 is mounted on the shaft and there is a cooperating pawl 59 pivotally mounted at 60 for holding the ratchet wheel fixed in position until released. The pawl may be spring-biased as indicated at 61.

There is a rod 62 attached to the pawl 59, this rod forming a part of a movable core of a solenoid 63. The shaft 57 extends through a bearing 64 to a motor 65, as indicated at the lower part of Fig. 14.

Control circuit for the actuating motor

The general purpose of the control circuit is to provide a pair of button switches 66, 67 (Fig. 6) which by pressing switch 66 will cause the motor to operate and to turn the drum 49 in such a direction as to elevate the rollers 8 to a predetermined height above the table 3. This height is determined by the number of revolutions made by the drum and this, in turn, is controlled by a limit switch 68 (Fig. 14) which can be opened when the turn-buckle 45 has moved a predetermined distance to the left and strikes the lever of the switch.

The motor 65 is energized from the mains 69 through conductors 70 and an armature 71. The lower push

button 67 (Fig. 6) forms part of a circuit which passes through the armature 72 and the coil of the pawl solenoid 63. Thus, by pressing the switch 67, and assuming that the armature 72 is in closed position, the solenoid 63 is energized to withdraw the pawl 59 from the ratchet wheel 58 and this, in turn, would permit the springs 42, 43 to exert pressure on the bars 39 and rotate the drum 49 in order to swing the bars 37 upwardly and the rollers to be moved downwardly into their lower position.

The armatures 71, 72 are controlled by the coil 73 of an electromagnet (lower part of Fig. 14), this coil being connected through the switch 66 to the line 69. The other end of the coil is connected to the opposite line 69.

There is a holding circuit indicated at 74 connected at one end to the coil 73 and the other end passes through an armature 75 and the limit switch 68 to the left-hand line 69.

In operation, assuming that a panel has been completed at the erector station No. 1 and it is desired to move the same to station No. 2 for further nailing and additional operations, the upper switch 66 (Fig. 6) is pressed by the workman and this will complete the circuit through the coil 73 to cause the armatures 75, 71 to close circuits through their respective contacts and to open the lowermost circuit at the armature 72. The armature 75 forms part of the holding circuit 74 so that when the switch 66 is released the solenoid 73 will continue to be energized. Thus, the motor 65 is energized to turn the drum 49 in such a direction that the rollers 8 will be caused to move upwardly.

As the lower bar 39 moves to the left under the pull of the cable 44, the turn-buckle 45 will strike the switch 68 to open the same and thus to open the holding circuit 74. This immediately opens the motor circuit at the armature 71 and the motor becomes de-energized. However, the rollers are held in their elevated position on account of the pawl 59 and the ratchet wheel 58. This allows time for the panel to be moved across the rollers by the conveyor chain 6 to the next station.

In order to de-press the rollers ready for the next assembly of panel parts, the workman simply presses the lower button 67 (Fig. 6) and, as shown in the circuit diagram of Fig. 14, this action will cause the energization of the pawl solenoid 63 because the armature 72 will already have made contact through the de-energization of the solenoid 73. The energization of the solenoid 63 will cause the withdrawal of the pawl 59 from the ratchet wheel and then the springs 42, 43 will cause the retraction of the bars 39 which, in turn, causes the lowering of the rollers 8 as explained hereinbefore.

It will be noted that the bars 39 in swinging right or left move, at least to some extent, in the vertical direction so that it may be desirable to mount the pulleys 46, 52 on thrust springs 76 (Fig. 14) so that each pulley is flexibly carried within the center of the bearing plates 77.

It has been explained hereinbefore that the flanges 40 (Fig. 9) serve to prevent the sidewise movement of the panels as they are shifted from station 1 to station 2. If desired, the flanges 40 can be eliminated and separate sidesway rollers 78 (Fig. 11) may be substituted. These rollers are carried on a stationary shaft 79 which is fitted within a bracket 80, bolted as indicated at 81 to the side of the table. These vertical rollers are spaced at positions near the horizontal rollers and extend to a height as to contact with the side edges of the panels when the latter are in their elevated position. Thus the rollers 78 serve the same purpose as the flanges 40 and are placed in position only during the elevating operation.

Conveyor chain mechanism

A suitable and improved mechanism for connecting and disconnecting the panel from the conveyor chain is shown in Fig. 15. This chain, as shown in Fig. 1, extends the full length of the table, past all of the twelve or more stations at which the panel is temporarily stopped. This mechanism comprises a piece of angle iron 82 which can be caused temporarily to rest upon any one of the various studs. A pocket element 83 is secured to the angle iron member 82, this element having a centrally located slot or groove 84 for loosely receiving a bar 85.

The bar is pivoted at the top to a swingable lever 86, pivoted at 87 to the upright angle iron 88 which is secured to the horizontal angle iron 82. Thus, by pressing down on the right-hand end of the lever 86, the bar 85 is caused to be raised so that the lower end of the bar is withdrawn from between the links of the chain 6, in which case the chain then runs free.

On the other hand, if the right-hand end of the lever 86 is pressed upwardly, the bar 85 is caused to enter the spaces between the links of the chain and the latter will therefore exert a pushing effect on the angle iron 82 and the panel stud associated therewith. Inasmuch as the panel remains at each station during the entire completion of the operation, it is desirable that the chain release contact with the panel for an appreciable time. In this event, it is necessary that the bar 85 be held in its upper position against the action of gravity in order to free the bar from the chain.

For this purpose a spring device 89 may be employed, this device being in the form of a spring strip having a ledge 90 and which continuously urges the bar 85 against the pocket member 83. The lower end of the spring member is secured to the bar 85 so that as the latter is moved upwardly to come out of engagement with the links of the chain, the spring plate is carried upwardly and as the ledge 90 reaches the upper surface of the pocket member 83, it will spring outwardly (since it is no longer confined within the pocket) and will rest on the upper surface of the pocket member.

This will hold the bar 85 in its uppermost position until, by applying an upward force on the end of the lever 86, the spring again is caused to enter the pocket member 83 by disengaging the ledge 90 from the upper surface of the pocket member. It will be understood that this engaging and disengaging clutch constitutes an element separate from the table and its accessories and a number of these clutches are made available to the workmen positioned at the various stations and for their use to move the panel on to the next station.

Operating mechanism for the chain conveyor

This mechanism is shown in Figs. 7 and 8. It is preferably located at the far end of the long table, underneath, i.e. at the end where the panels are finished and ready to be transported to the building site. Bolted to the floor there is a base 91 on which is mounted a gear box 92. A motor 93 is supported on the gear box and has extending therefrom a gear (not shown) for actuating a series of gears from which extends a shaft 94 carrying a gear 95.

There is a pair of heavy upright members 96 secured to the floor and spaced apart a distance sufficient to support the sides of the U-shaped member 5. From these upright members 96 there extend three heavy plates 97 which carry a shaft 98. Gears 99, 100 are mounted on the shaft, the gear 99 being connected with the gear 95 by a link chain 101.

The gear 100 carries the conveyor chain 6 so that as the motor 93 is energized, the gear 95 is rotated through the gear train to cause the shaft 98 to turn and thus cause the conveyor chain 6 to move from the front end of the erector station to the end of the table where the finished panels are taken off for transportation. The conveyor chain 6 at the opposite or front end of the table is mounted on a gear 102 carried by a shaft 103 with bearings 104. The latter are constituted of brackets secured to the end piece 1 of the table.

A protective box **105** can be fitted around the gear **102** to protect the workmen as they move from one side of the table to the other. It has been pointed out that the upper length of the chain conveyor is supported by and is movable within a U-shaped channel member **5** in order to eliminate sag, while the lower length of the chain may be permitted to run free of any support and thus to supply a certain amount of tension to the chain.

The multiplicity of stations

As shown in Fig. 1, the erector station of the table constitutes the place where the studs and joists (in the case of flooring) are assembled and temporarily nailed together by using the positioning and spacing bars **20** which are positioned according to the scales or other indicia along the edges of the table. These bars **20** and other positioning and locating devices are used only at station No. 1, since all the operations beyond this particular station concern the further completion of the panel but without changing any of its sizes or positions between studs.

From station 1, the panel is moved by the conveyor chain to station 2 where additional nails are driven into the abutting pieces. Usually separate workmen are stationed at the different stations, highly specialized in their particular duties at that station. When the nailing has been completed at station 2, the workman will then apply the clutch, as shown in Fig. 15, to the panel to send it to station 3 and, upon arriving at that station, the workman will press down on the lever **86** (Fig. 15) of the clutch to disengage the panel from the conveyor chain. At this position the workman will add sub-siding to the panel, placing only a few nails in the siding at this position in order to locate the siding with respect to the panel.

Thereupon, the workman at station No. 3 will provide the clutching mechanism and will press up on the lever **86** to engage the panel with the conveyor chain and the panel will be sent on to station No. 4. The clutch will then be disengaged and perhaps the clutching mechanism will be removed from the panel. Here, the workman may complete the nailing job on the siding and saw portions of the siding at the window and door openings, etc.

The workman will then cause the panel to be transported to station No. 5 and the workmen, after doing their various specialized duties at each of the stations, including the erector station No. 1, will cause the panel to move until it has gone through twelve or more stations from its forming station No. 1, the finished nail station No. 2, the sub-siding station No. 3, the finished siding station No. 4, the exterior trim station No. 5, the prime coat station No. 6, station No. 7 where the panel is turned over to expose the underneath side, and then on to station No. 8 where the panel is insulated on the inside, to station No. 9 where the panel is wired, station No. 10 where the panel is provided with interior wallboard, station No. 11 for the interior trim and, finally to station No. 12 for the interior prime coat.

In order to facilitate the movement of the panel from station No. 2 to station No. 12, and not having the benefit of the elevating rollers at these stations, I may provide a series of transversely extending rollers **106**, carried on bearings which are supported between the sides **2** of the table and a sub-siding member **107** secured in any suitable manner from the sides **2**.

From the foregoing, it is evident that I have disclosed an erector table for panelizing houses, floors and roofs, in which the various operations are carried on at successive stations on a quantity production basis and the heavy panels move from the first to the last station with little or no effort on the part of the workmen, by means of a conveyor chain which can be clutched or declutched at any position on the table.

Except at the first or erector station, the panels are supported on rollers with fixed axes in order to reduce friction, while at the erector station the panel is fabricated in contact with the table and then later raised above the table by elevating rollers to start its journey through the succeeding stations. These elevating rollers are readily controlled by a workman merely pushing a button to elevate and a second button to de-press the rollers after the panel has moved away from the first station.

It will be understood that various modifications and arrangements in structure could be made without departing from the spirit of my invention and, accordingly, I desire to comprehend such modifications and substitutions of equivalents as may be considered to come within the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An erector table for fabricating panels for prefabricated buildings, said table having a plurality of work stations including an erector station, means for moving the panel along the table from the erector station successively to each of the work stations, including the combination of rollers at one of said stations for supporting the panel, and adapted to be elevated so as to pass the panel on to the next station, a plurality of rollers mounted on stationary axes for receiving the panel from the elevated rollers to the next station, said stationary axes being parallel to one another and extending transverse of the table, and the rollers mounted thereon extending along the table at both edges thereof throughout the positions of said stations, said panel-moving means also including a power driven chain extending lengthwise of the table, and a clutch mechanism controllable by the operator for connecting and disconnecting the panel from the chain in order to move the panel from the position of the elevated rollers to the successive positions of the stationary axis rollers.

2. An erector table for fabricating panels of prefabricated buildings, said table having a work platform with a plurality of work stations on which the panel pieces are first assembled, secured together and then additional operations are performed, means for raising the panel at the assembly station preparatory to moving the panel to another work station, said means including a plurality of lifting devices extending along the edges of the table and adapted to receive the outer portions of the panel, each of said devices comprising a roller rotatably mounted on a bar, said bar being pivotally connected to the table, an actuating bar secured to each of the pivoted bars for swinging the latter in unison in order to move the rollers from the rest to the elevated position and means including a motor, drum and cable system for moving the actuating bar in order to raise the panel from the table, each of said rollers having a flanged end which serves as an abutment for the side edges of the panel.

3. An erector table for fabricating panels for prefabricated buildings, said table having a width comparable to one of the dimensions of the panel to be fabricated and a length in a rectilinear direction sufficient to accommodate a plurality of work stations, each station having a length comparable to the other dimension of the panel to be fabricated, the panel pieces being assembled and secured together at the first of said work stations and the additional operations are performed at each of the succeeding work stations, means for raising the assembled panel at the first station preparatory to moving the assembled panel to the second work station for additional operations, said means including a plurality of lifting devices extending along the edges of the table and adapted to receive the outer portions of the assembled panel, each of said devices comprising a roller rotatably mounted on a bar, said bar being pivotally connected to the table, an actuating bar secured to each of the pivoted bars for swinging the latter in unison in order to move the rollers from rest position to the elevated position, and means

including a motor, drum and cable system for moving the actuating bar in order to raise the assembled panel from the table, and rollers for forwarding the panel from the second station to the successive stations, said last mentioned rollers having stationary axes parallel to one another and positioned along both edges of the table.

4. An erector table for fabricating panels for prefabricated buildings, said table having a width comparable to one of the dimensions of the panel to be fabricated and a length in a rectilinear direction sufficient to accommodate a plurality of work stations, each station having a length comparable to the other dimension of the panel to be fabricated, said stations including a first station where the panel pieces are assembled and secured together and then passed on to the second and succeeding stations where additional operations on the panel are performed, means for raising the assembled panel preparatory to moving the panel to the second work station, said means including a plurality of lifting devices extending along the edges of the table and adapted to receive the outer portions of the assembled panel, each of said devices comprising a roller rotatably mounted on a bar, said bar being pivotally connected to the table, an actuating bar secured to each of the pivoted bars for

swinging the latter in unison in order to move the rollers from the rest position to the elevated position, means including a motor, drum and cable system for moving the actuating bar in order to raise the assembled panel from the table preparatory to moving the panel to the second work position, an electrical circuit connected to the motor having push-button control whereby the operator can raise and lower the rollers at will, and rollers for forwarding the panels from one station to another after the first station, said last-mentioned rollers having stationary axes parallel to one another and positioned along both edges of the table.

References Cited in the file of this patent

UNITED STATES PATENTS

816,872	Melvin	Apr. 3, 1906
1,000,106	Morris	Aug. 8, 1911
2,212,421	Henderson	Apr. 20, 1940
2,305,124	Wilson et al.	Dec. 15, 1942
2,317,675	DeBurgh	Apr. 27, 1943
2,619,916	Rainier	Dec. 2, 1952
2,626,643	Kantzler	Jan. 27, 1953
2,662,565	Le Vay	Dec. 15, 1953