April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

Filed Sept. 9, 1950 6 Sheets-Sheet 1

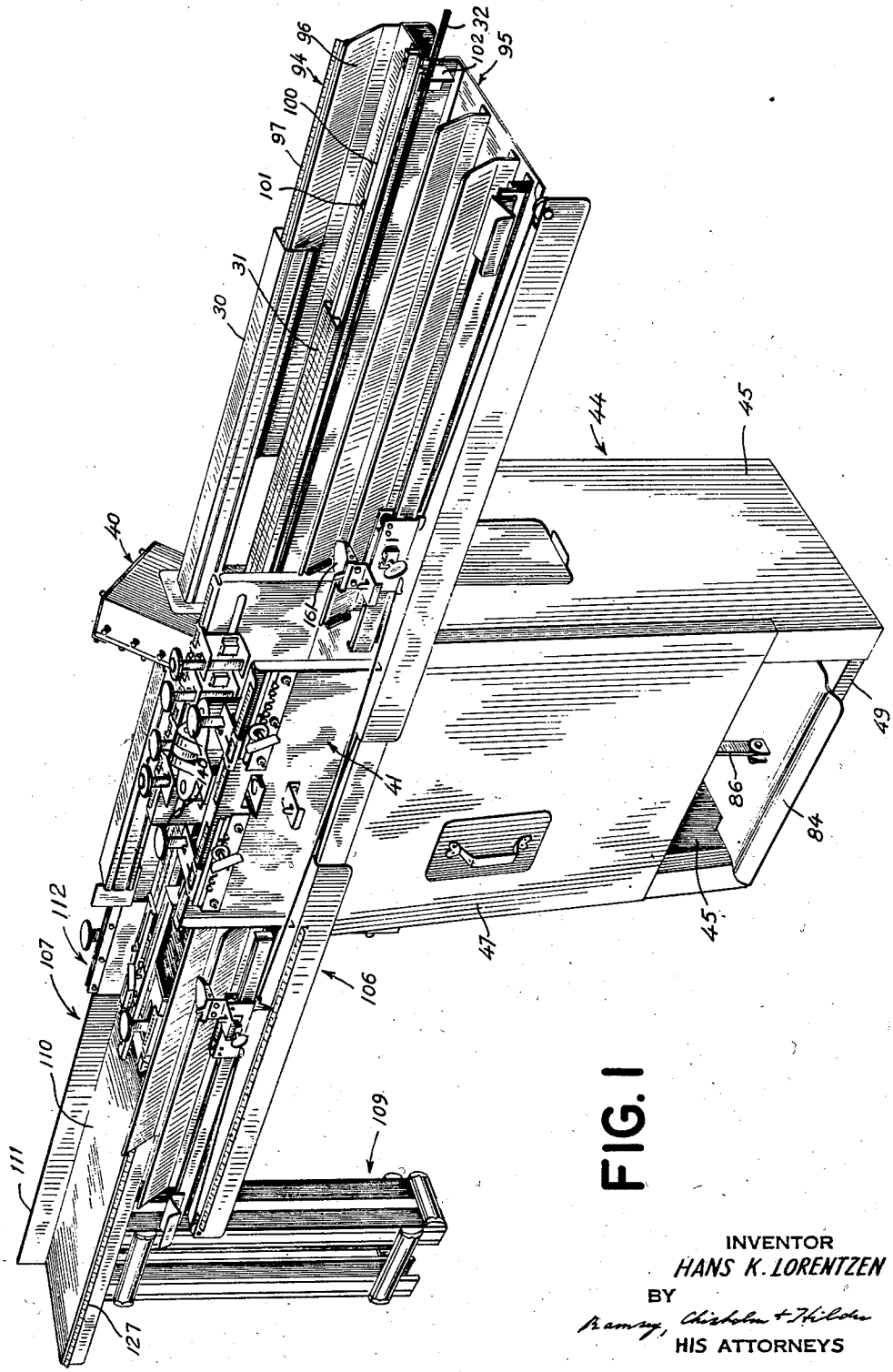


FIG. I

INVENTOR
HANS K. LORENTZEN
BY
Ramsey, Chisholm & Hilden
HIS ATTORNEYS

April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

Filed Sept. 9, 1950 6 Sheets-Sheet 2

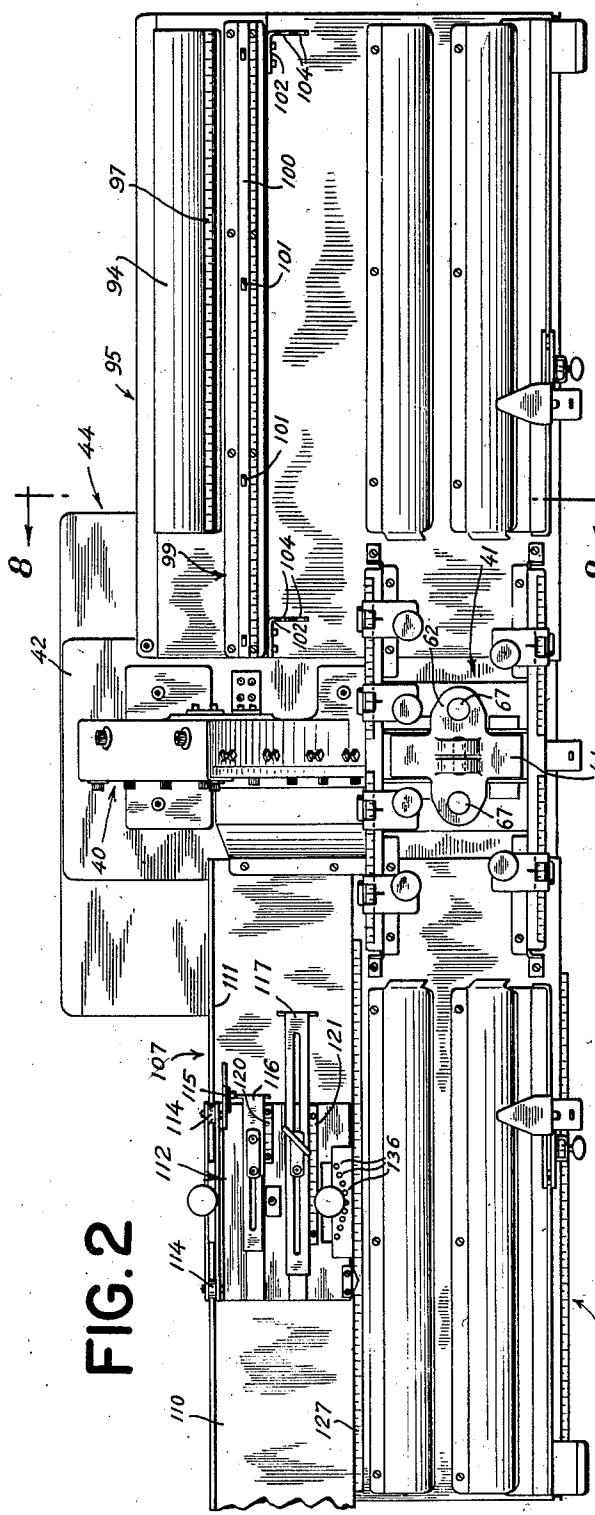


FIG. 2

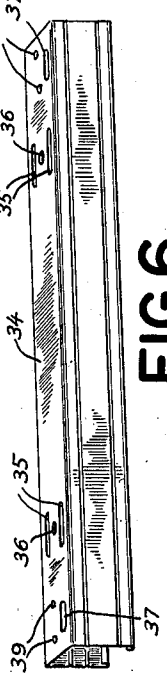


FIG. 6

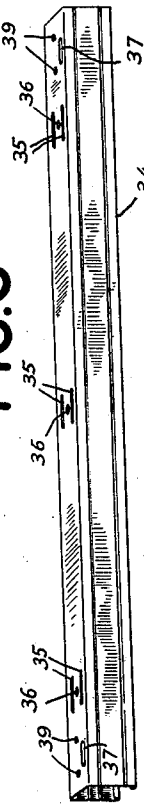


FIG. 7

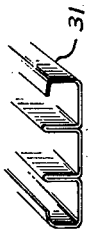


FIG. 4



FIG. 5

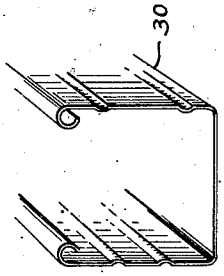


FIG. 3

INVENTOR
HANS K. LORENTZEN
BY
Ramsey, Chisholm & Hilder
HIS ATTORNEYS

April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

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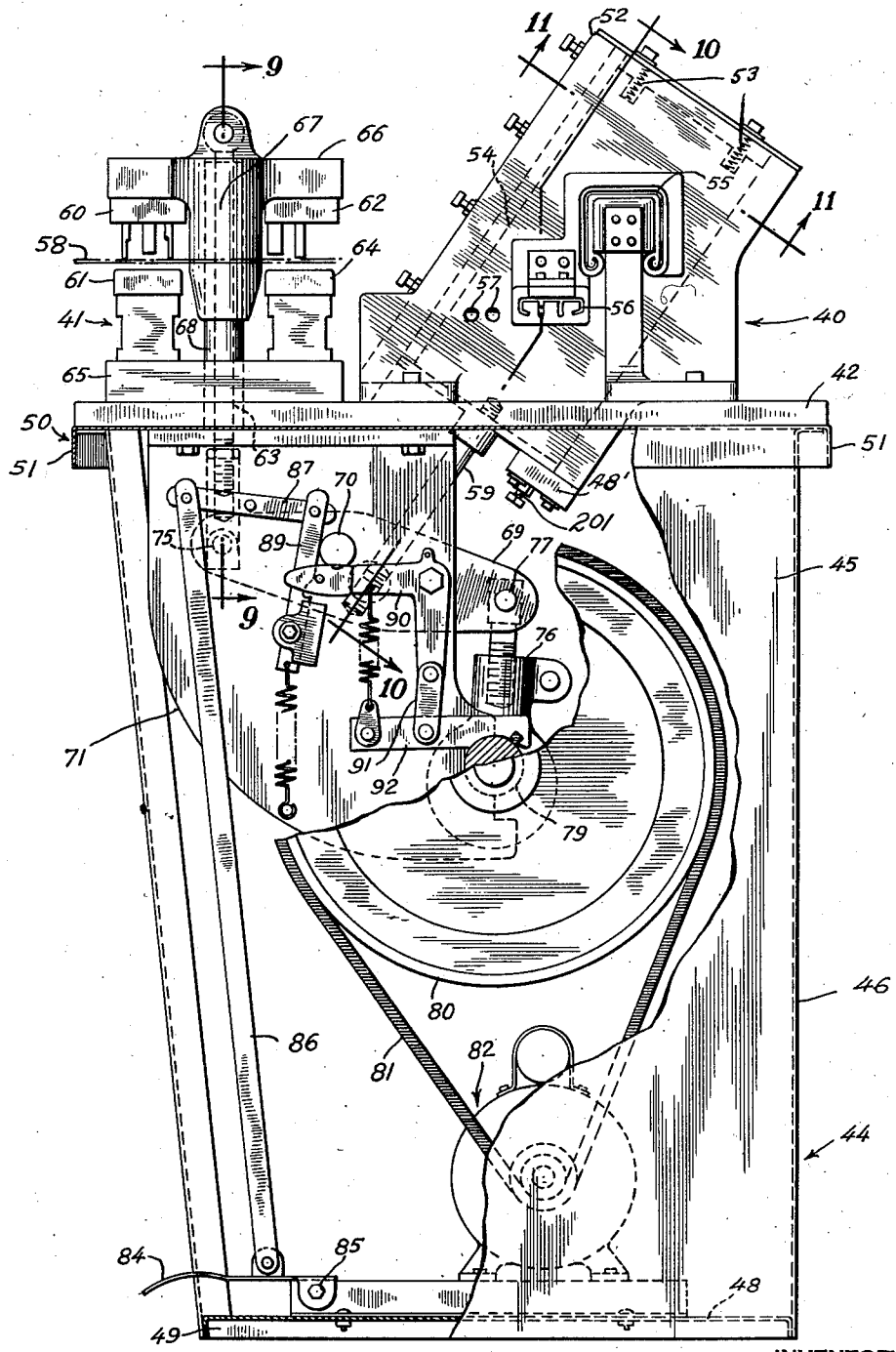


FIG.8

INVENTOR
HANS K. LORENTZEN
BY
Ramsey, Chisholm & Hilder
HIS ATTORNEYS

April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

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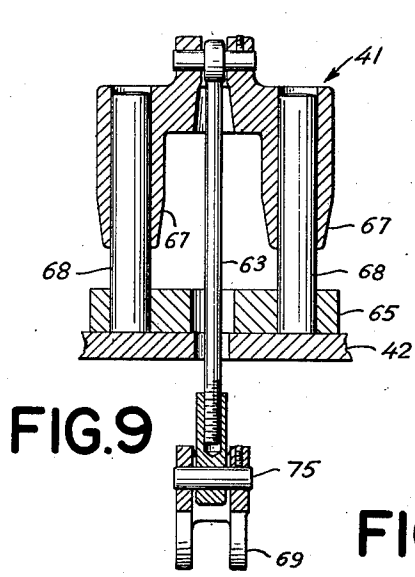


FIG.9

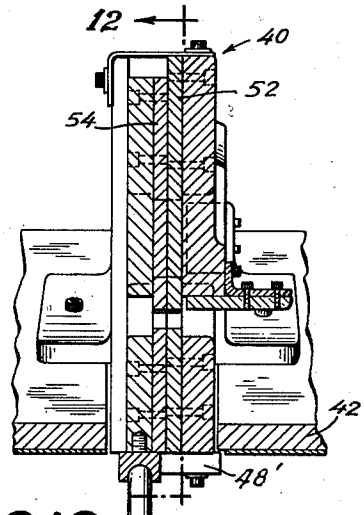


FIG.10

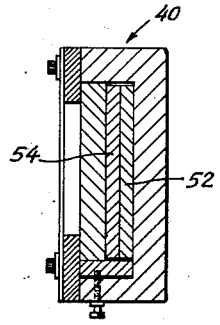


FIG.11

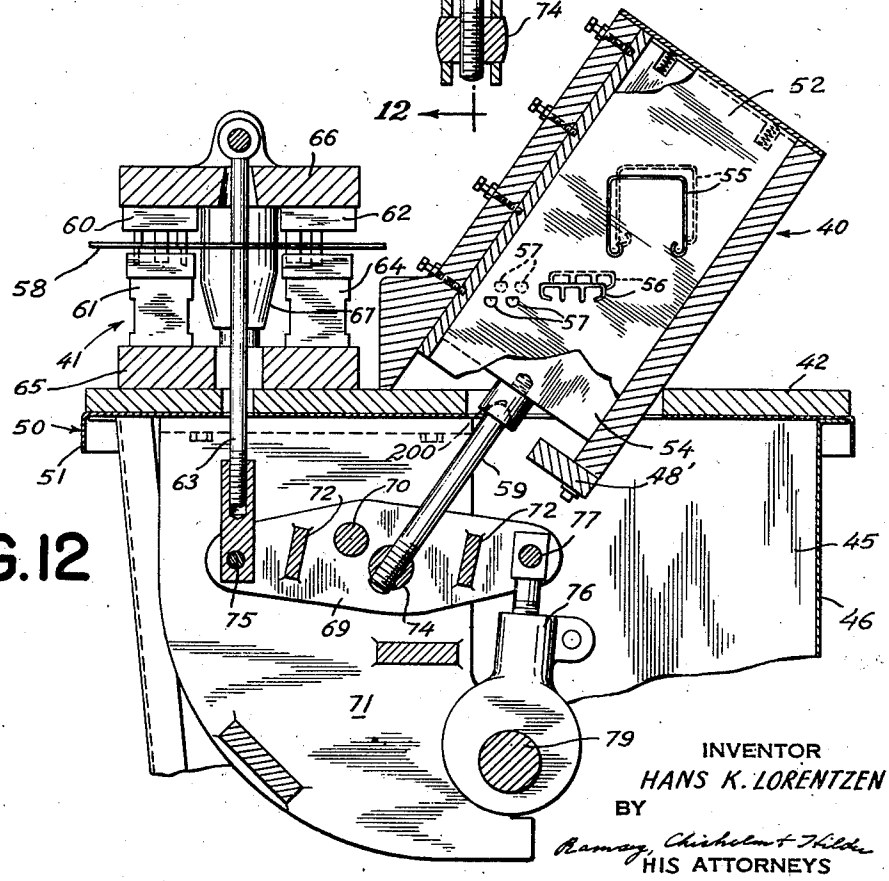


FIG.12

INVENTOR
HANS K. LORENTZEN
BY
Ramsay, Chisholm & Hilde
HIS ATTORNEYS

April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

Filed Sept. 9, 1950 6 Sheets-Sheet 5

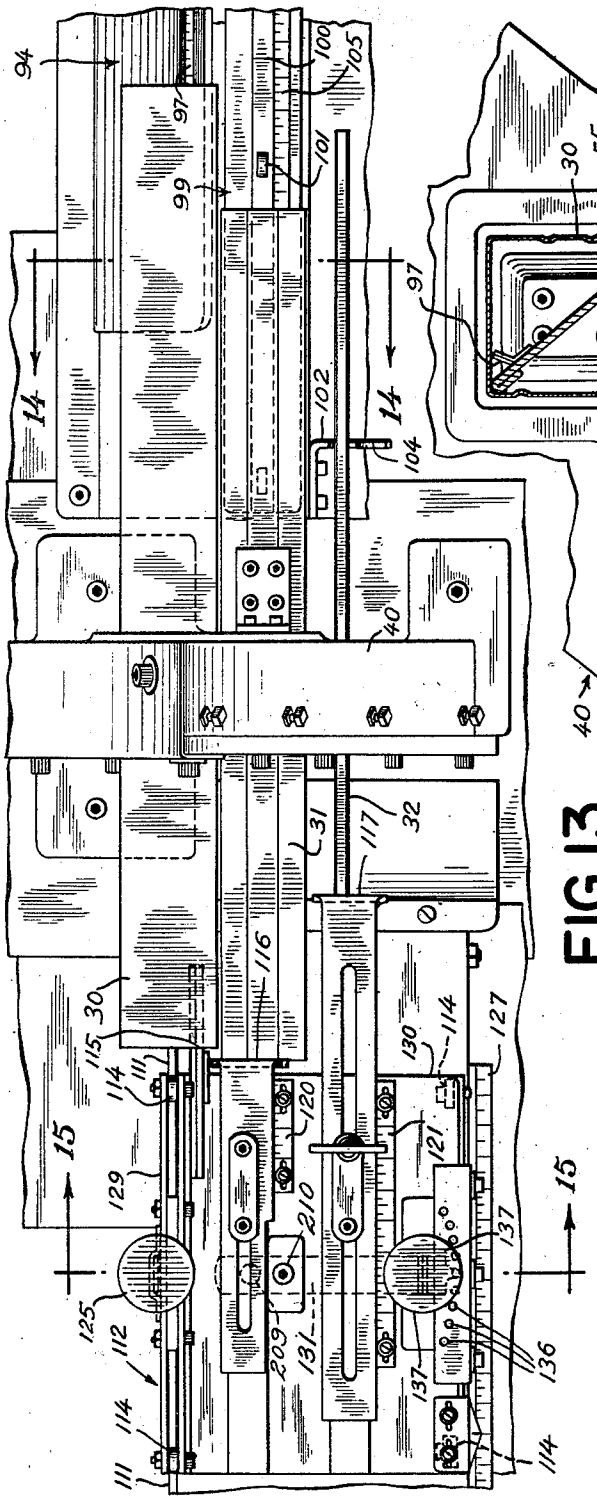


FIG. 13

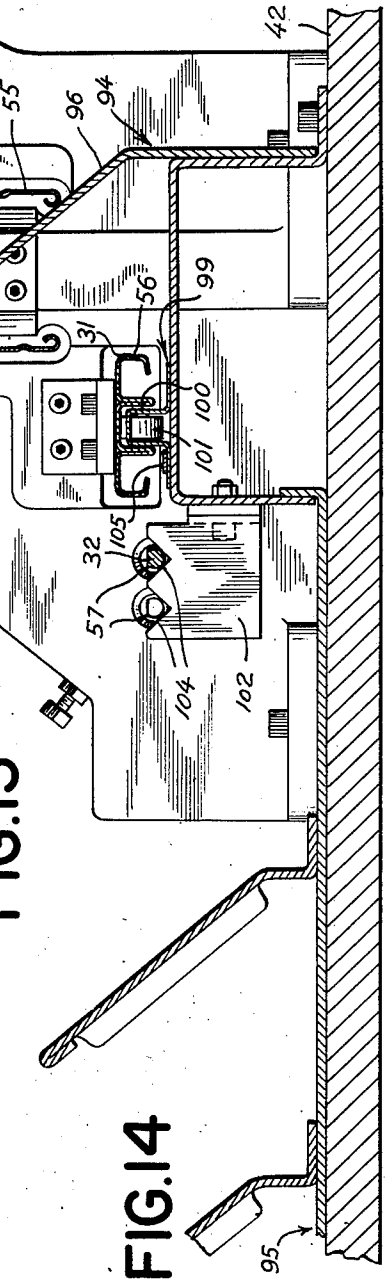


FIG. 14

INVENTOR
HANS K. LORENTZEN
BY
Ramsey, Christoffers & Hilden
HIS ATTORNEYS

April 23, 1957 H. K. LORENTZEN 2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

Filed Sept. 9, 1950 6 Sheets-Sheet 6

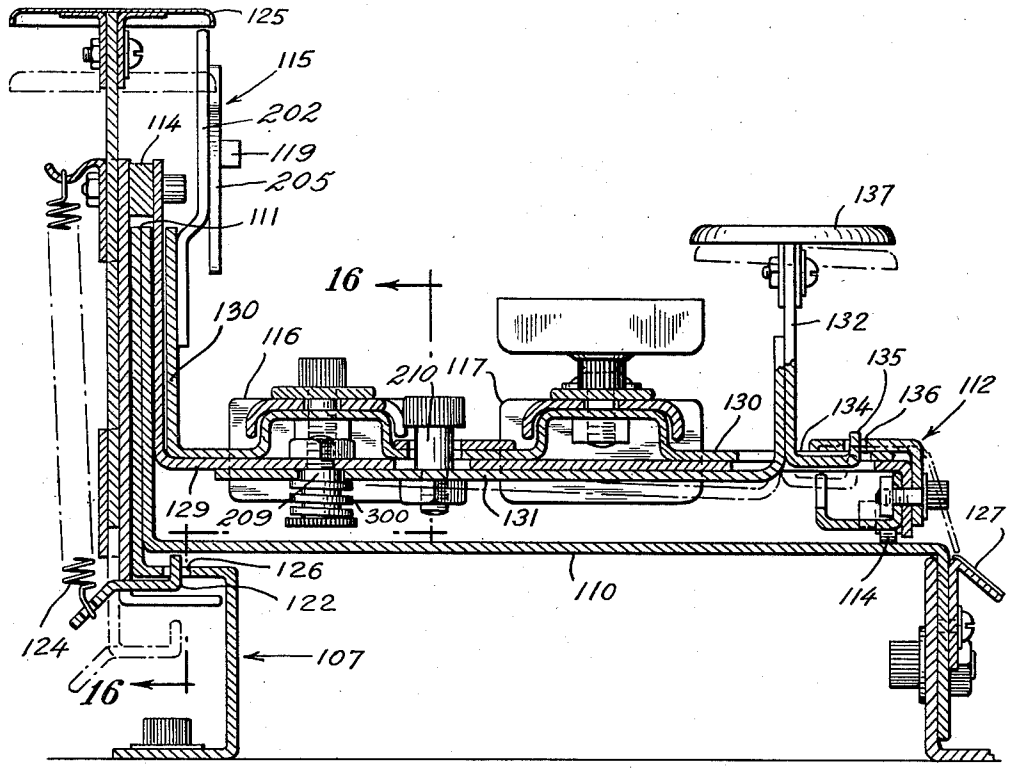


FIG.15

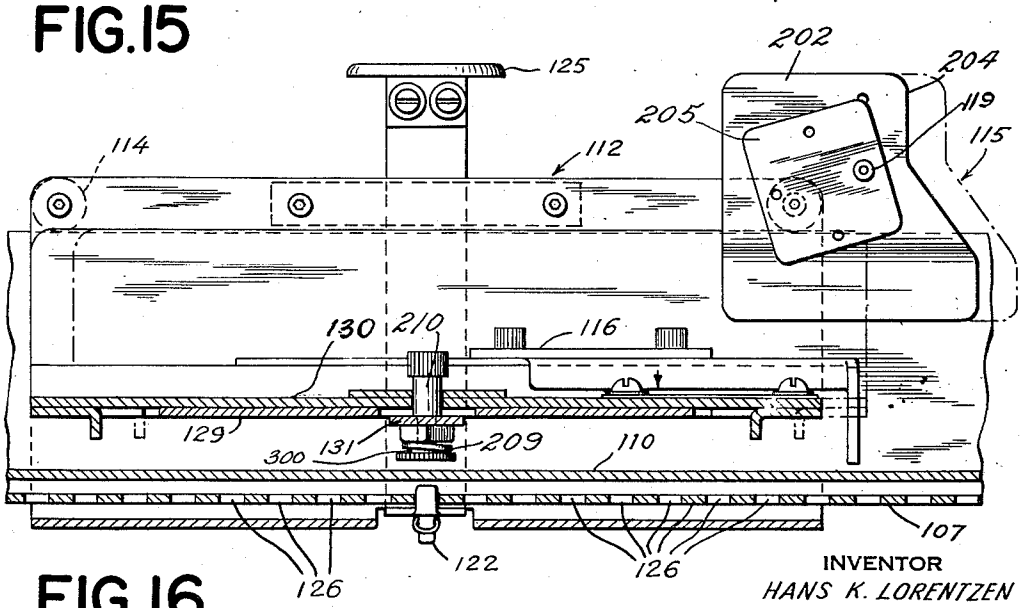


FIG.16

INVENTOR
HANS K. LORENTZEN
BY
Ramsey, Chisholm & Holden
HIS ATTORNEYS

United States Patent Office 2,789,639 Patented Apr. 23, 1957

2,789,639

METHOD USEFUL IN THE MANUFACTURE OF VENETIAN BLINDS

Hans K. Lorentzen, Montclair, N. J., assignor to Lorentzen Hardware Mfg. Corp., New York, N. Y., a corporation of New York

Application September 9, 1950, Serial No. 184,055

3 Claims. (Cl. 164—17)

This invention relates to a method for the cutting of Venetian blind head bars, bottom bars and tilt rods.

In the so-called "enclosed metal head" type of Venetian blind, the articulated, superimposed slats of the blind are supported by ladder tapes suspended from a sheet metal channel head bar assembly mounted at the top of the window. Lift cords for raising the blind are reeved through the head bar, and the entire operating mechanism of the blind, including a tilt rod running longitudinally of the head bar and mounting tape rockers to which the upper ends of the ladder tapes are attached, is contained within the head bar. Such a head bar is shown in Nelson United States Patent 2,455,135 and in Nelson copending United States application S. N. 778,002, filed October 4, 1947, now Patent No. 2,629,434.

It is customary in Venetian blinds to provide a bottom bar to which the lower ends of the lift cords and ladder tapes are attached, the bottom bar being heavier and more rigid than the slats. Bottom bars may be formed from a sheet metal channel section, such a bottom bar being shown in Nelson copending application S. N. 780,653, filed October 18, 1947, now Patent No. 2,618,329. In manufacturing such a blind, the head bar channel, the tilt rod, and the bottom bar channel are severed to proper length from stock of indeterminate length, the length of these parts varying according to the width of the blind and also, to a limited extent, according to local shop practice. The method of the present invention may be carried out with the aid of the machine herein disclosed. This machine is adapted for the cutting of head bar, bottom bar, and tilt rod stock to proper length and punching the bottom wall of the head bar for passage of the lift cords, tilt cord, and ladder tapes.

In many Venetian blinds designed for an "inside" mounting (in which the blind is mounted between the window jambs rather than on the face of the wall or window frame), the head bar is slightly shorter than the slats in order to provide the necessary clearance for the installation brackets supporting the blind. The bottom bar is usually made slightly longer than the head bar, unless hold-down brackets are being used in conjunction with the bottom bar. It is general shop practice to maintain a constant differential in length between the head bar, the slats, and the bottom bar. It is also common practice to maintain a uniform rout distance (distance from the lift cords to the adjacent ends of the slats) throughout a wide range of blind widths, changing the rout distance only for very narrow or very wide blinds. The length of the tilt rod is determined in part by the rout distance, which can be considered as constant throughout a large range of blind widths.

In computing the required length of a head bar channel, bottom bar channel, and tilt rod, it is necessary to subtract the proper constant differential in order to provide for proper clearance and fit of the blind. This problem is not great when manufacturing large numbers of blinds of stock sizes, but becomes much more acute

when manufacturing "custom blinds," which are "tailor-made" to individual window measurements.

In the machine shown, a carriage, upon which individual stops for the head bar channel stock, the bottom bar channel stocks, and the tilt rod stock are adjustably mounted, is positioned varying distances from the shearing die in accordance with either window width or slat length. Accordingly, by adjusting the individual stops to the proper clearance constant, the carriage may be set directly for producing a blind of any window width or slat length, thus automatically and simultaneously correctly setting all three individual stops.

The stock to be severed is then fed through the die and against the respective stop, after which the die is actuated to sever the proper length. This arrangement provides for a rapid, single, simultaneous setting of all the stops and automatically applies the proper clearance constants to the settings so as to decrease chance of error and aid in quickly and accurately cutting the stock to proper length for manufacture of a particular blind.

This machine is also adapted for the piercing and lancing of the bottom wall of the head bar channel for the passage of the lift and tilt cords and ladder tapes, and to provide upstruck tabs for mounting the fittings in the head bar channel. Since these features are not directly related to the method claimed herein, they will be disclosed only incidentally and in a sketchy manner.

An object of the present invention is to provide an improved method of quickly and accurately cutting Venetian blind head bar channels, bottom bar channels and tilt rods.

Another object is to provide such a method usable in conjunction with a machine, in which by a single adjustment of the machine for window width or slat length, the machine will cut the head and bottom bars and tilt rod to the proper individual lengths.

Another object is to provide an improved method of severing Venetian blind head bars, bottom bars, and tilt rods to the proper length.

My invention is clearly defined in the appended claims. In the claims, as well as in the description, parts of the machine in conjunction with which the method is disclosed are at times identified by specific names for clarity and convenience, but such nomenclature is to be understood as having the broadest meaning consistent with the context and with the concept of my invention. The best form in which I have contemplated applying my invention is disclosed in connection with the accompanying drawings forming part of this specification, in which:

Fig. 1 is a more or less diagrammatic front perspective of a machine in conjunction with which the present method may be carried out. Head bar, bottom bar, and tilt rod stock are shown positioned within the dies for cutting.

Fig. 2 is a top plan view of the machine, a portion of the machine having been broken away.

Fig. 3 is an isometric view of a section of head bar channel which the machine is adapted to cut and punch.

Fig. 4 is a view similar to Fig. 3 of a bottom bar channel which the machine is adapted to cut.

Fig. 5 is a view similar to Fig. 3 of a tilt rod the machine is adapted to cut.

Fig. 6 is an isometric view of an inverted head bar channel that has been cut to length and punched for a two-ladder-tape blind.

Fig. 7 is a view similar to Fig. 6 of a head bar channel for a three-ladder-tape blind.

Fig. 8 is a vertical section of the machine taken generally on the line 8—8 of Fig. 2. Portions of the machine have been broken away for convenience of illustration.

Fig. 9 is an enlarged vertical section of the punching-

and-lancing-die operating mechanism, taken on the line 9—9 of Fig. 8.

Fig. 10 is a section of the cutting dies, taken on the line 10—10 of Fig. 8.

Fig. 11 is a transverse section of the cutting dies, taken on the line 11—11 of Fig. 8.

Fig. 12 is a somewhat diagrammatic section taken on the line 12—12 of Fig. 10 of the cutting dies, the punching dies, and the associated operating mechanism.

Fig. 13 is an enlarged, fragmentary top plan view of the head bar, bottom bar, and tilt rod severing portion of the machine. Head bar, bottom bar, and tilt rod stock are shown positioned within the dies for cutting.

Fig. 14 is an enlarged transverse section of this portion of the machine, taken on the line 14—14 of Fig. 13.

Fig. 15 is an enlarged transverse section of the carriage, stops, and associated parts, taken on the line 15—15 of Fig. 13.

Fig. 16 is a longitudinal section of the carriage, stops, and associated parts, taken on the line 16—16 of Fig. 15.

The head bar, bottom bar, and tilt rod sections which the present machine is adapted to cut, and as regards the head and bottom bars also punch, are shown in Figs. 3 to 5, respectively. The head bar stock 30 of Fig. 3 is formed of a sheet steel channel of the cross section indicated and is ordinarily supplied in 20 ft. lengths. The metal from which the head bar stock 30 is formed is of sufficiently heavy gauge to possess the required strength for a head bar. A generally similar head bar section and complete head bar assembly are shown and described in detail in Nelson Patent No. 2,629,434.

The bottom bar stock 31 of Fig. 4 is formed of a sheet steel channel of the section indicated. This section likewise is ordinarily supplied in 20 ft. lengths and is severed by the machine of the present invention to form the channel for a bottom bar assembly, the open side and ends of the channel being closed in the assembly by an arched metal Venetian blind slat and end caps. The bottom bar stock 31 is severed to desired length and no punching or other forming operation of the channel is required. A bottom bar assembly of this general type is shown and described in detail in Nelson Patent No. 2,618,329.

The tilt rod stock 32, shown in Fig. 5, for incorporation in the head bar assembly is a mild steel rod about ¼" in diameter. It has the D-shaped cross section indicated and is usually provided in 20 ft. lengths. The machine of the present invention severs this rod to desired length, and no further forming operations on the rod are required.

A head bar 34 for a two-ladder-tape blind is shown in inverted position in Fig. 6. This head bar has been cut to proper length from the head bar stock 30 and then punched to receive the lift and tilt cords, ladder tapes, and hardware of the blind. The punching of the bottom wall of the head bar includes the forming of a pair of slots 35, 35 for passage of the ladder tapes, a hole 36 centered between each pair of slots 35, 35 for passage of the lift cords, and a slot 37 adjacent each end of the head bar, one slot 37 receiving the depending looped end of the lift cords and the other slot 37 receiving the tilt cord.

The metal displaced from the wall of the head bar 34 in forming the slots 35, 35 is formed into upstruck tabs which are clenched about the bases of tilt rod cradles to attach the cradles to the head bar. Similar pairs of tabs 39, 39 are struck up from the head bar and subsequently clenched about the bases of the tilter and cord lock to hold these parts in position on the head bar. The machine of the present invention is adapted for the rapid punching of the head bar as described. However, since these features of the present machine are not directly related to the method herein claimed, they are not disclosed in any great detail.

Fig. 7 shows the head bar of a three-ladder-tape blind. This head bar is similar to the head bar of Fig. 6 except that it is usually somewhat longer than the head bar of a two-ladder-tape blind and is provided with a third pair of ladder tape slots 35, 35 usually located substantially midway between the end ladder tape slots. A hole 36 is provided midway between the slots 35, 35 to receive a third lift cord, if desired. The machine of the present invention also facilitates the stamping of a head bar of this type.

Referring now to Figs. 1, 2, and 8, the machine of the present invention comprises a cutting die 40 for severing head bar stock 30, bottom bar stock 31, and tilt rod stock 32, and piercing and lancing dies 41 for punching the head bars shown in Figs. 6 and 7.

The dies 40 and 41 are mounted on a heavy horizontal plate 42 forming a frame for the machine. The plate 42 is supported at a height convenient for the operator of the machine by a metal stand 44. The metal stand 44 is a boxlike sheet metal stand having full sides and rear walls 45 and 46 and a somewhat shorter front wall 47 to leave an opening between the front wall and the base 49 of the stand. A rectangular sheet metal plate 50, which may be provided with a depending marginal flange 51, forms the top of the stand 44 and receives the plate 42 of the machine. A rectangular sheet metal bottom plate 48 connects the lower ends of the side and rear walls 45, 45 and 46.

The cutting die 40 is of the general type shown in Nelson copending application S. N. 132,139, filed December 9, 1949, now Patent No. 2,644,520. This die consists of a fixed die member 52 secured to the plate 42 and forming a guide for a movable die member 54 (see Figs. 10 and 12). Each of these die members is provided with an opening 55 corresponding with the cross section of the head bar stock 30, an opening 56 corresponding with the cross section of the bottom bar stock 31, and a pair of openings 57, 57 corresponding with the cross section of the tilt rod stock 32, each of these openings being adapted to receive the corresponding stock. Since the tilt rod stock 32 is heavier than the head bar and bottom bar stock and dulls the dies more rapidly, two openings 57 are provided in the cutting die 40 although only one tilt rod is cut for each blind.

The corresponding openings in the die members are in alignment when the movable die member 54 is in its normal or low position and are out of alignment when the member is raised in the cutting stroke as indicated in Fig. 12. The movable die member 54 is biased downwardly toward abutment 48' by springs 53 and is driven upwardly for the cutting stroke by a downwardly projecting operating rod 59. The rounded upper end 200 of rod 59 is received in a socket at the bottom of the movable die member 54 and clearance is provided between such end 200 of the operating rod 59 and the socket on the movable die member, with the die member in contact with the upper end of adjustable stop stud 201 on abutment 48' (Fig. 8) and the push rod retracted downwardly in its rest position, to assure that the movable die member returns to its normal position to assure alignment of the openings of the fixed and movable die members, as will be explained more fully in connection with the description of the actuating mechanism for the dies.

The piercing and lancing dies 41 (see Figs. 9 and 12) include a cooperating punch 60 and die block 61 for forming the ladder tape slots 35, 35 and lift cord hole 36 and a cooperating punch 62 and die block 64 for forming the tabs 39, 39 and the slot 37 to receive the tilter or cord lock and the tilt or lift cords. The die blocks 61 and 64 are mounted on a common die shoe 65 secured to the plate 42 and the punches 60 and 62 are mounted on a common punch plate 66.

The punch plate 66 is provided with a pair of bushings 67, 67 which receive a pair of guide posts 68, 68 located on the die shoe 65 to hold the punches and die blocks in alignment. The punch plate 66 is lowered for the cutting stroke and restored to raised position by a connecting rod

63 connected to the punch plate 66 and projecting downwardly through aligned holes in the punch plate, die shoe 65, the plate 42, and the plate 50 of the stand. A common stripper 58 extends over die blocks 61 and 64 to extract the head bar from the punches 60 and 62 during the return strokes of the punches in the punching operations. This stripper comprises a horizontal plate supported above the die blocks and apertured for passage of the punches.

A rocking lever 69 is mounted on a horizontal pivot 70 supported in a bracket 71 depending from the underside of the plate 50 and secured to the plate 42. Preferably both the rocking lever 69 and the bracket 71 are formed of spaced parallel plates connected at intervals by webs to avoid unbalanced bending moments on the pins and bearings. Webs 72, 72 on the rocking lever 69 are indicated in Fig. 12.

The operating rod 59 of the cutting dies 40 and the connecting rod 63 of the piercing and lancing dies 41 are pivotally connected to the rocking lever 69 by pins 74 and 75, respectively. Preferably, pin 74 is located somewhat closer to the rocking arm pivot 70 than the pin 75, since the travel of the movable die member 54 is much less than the travel of the punches 60 and 62.

When a cutting or punching operation is to be performed, the rocking lever 69 is rocked in counterclockwise direction and then returned by a crankshaft connecting rod 76 connected to the end of the rocking lever 69 by a pin 77. The crankshaft connecting rod 76 is pivotally mounted on the crank throw of a crankshaft journaled in the lower portion of the bracket 71.

The crankshaft 79 is rotated, under control of the operator, by a flywheel 80 mounted for rotation on one end of the crankshaft and constantly driven through a V belt drive 81 by an electric motor 82 which may be of one-third horsepower. The motor, flywheel, crankshaft, rocking lever 69, and associated parts may all be contained within the metal stand 44.

The crankshaft 79 and flywheel 80 are connected by a single-rotation clutch and brake so arranged that, upon actuating of the clutch, the crank shaft is turned through a single revolution and then stopped. The single-rotation clutch is of conventional type used for light presses and will not be described in detail.

The actuating mechanism for the clutch is indicated in Fig. 8. A treadle 84 projects forwardly from the metal stand 44 beneath the front wall 47 and is mounted on a horizontal pivot 85. A link 86, pivotally connected to the treadle in front of the pivot 85, extends upwardly on the outside of the bracket 71 and is pivotally connected to an end of a lever 87 pivotally mounted on the outside of the bracket. A link 89, pivotally connected to the other end of the lever 87, extends downwardly to engage one end of a bell crank lever 90 pivotally mounted on the bracket 71. The opposite end of the bell crank lever 90 is connected by a toggle link 91 to a clutch-actuating lever 92 pivotally mounted on the bracket 71.

The operation of the treadle 84 and connecting linkage is such that, upon depressing the treadle, the clutch-actuating lever is rotated counterclockwise, as viewed in Fig. 8, so as to actuate the clutch and link the crankshaft 79 with the flywheel 80 for a single rotation of the crankshaft. The crankshaft will be turned for only a single revolution for each depression of the treadle 84, regardless of how long the treadle is held depressed, and the treadle must be returned to fully raised position and depressed a second time after the first revolution of the crankshaft 79 is completed before the clutch will again be actuated to produce a second rotation of the crankshaft.

Upon each rotation of the crankshaft 79, the rocking lever 69 is oscillated first counterclockwise and then clockwise, as viewed in Fig. 12, by the crankshaft connecting rod 76. The counterclockwise movement of the rocking lever (as viewed in Fig. 12) acts through the rod 59 to operate the cutting dies 40 in their cutting stroke and also simultaneously acts through the rod 63 to operate the piercing and lancing dies 41 in their cutting stroke. Clockwise return oscillation of the rocking lever 69 by the connecting rod 76 restores the cutting dies and the piercing and lancing dies to initial position. Since there is a clearance between the movable die member 54 and the operating rod 59, the die member 54 will return to initial or normal position, in contact with stop stud 201, even though the single rotation clutch and brake does not arrest the crankshaft 79 with the rocking lever 69 completely at the end of its clockwise return oscillation.

The head bar stock 30, bottom bar stock 31, and tilt rod stock 32 are received for cutting on guides located on a right-hand extension 95 of the metal stand 44 (see Figs. 1, 2, and 14). The head bar stock guide 94 is located at the rear of the extension 95 of the metal stand and serves to support head bar stock in alignment with the opening 55 in the cutting die 40.

The present machine is particularly adapted for the cutting and punching of painted Venetian blind head bars and bottom bars, and to this end the extension 95 is arranged to contact only the interior surface of the head bar stock 30 so as to avoid marring the paint on any visible portion of the head bar. This stock guide comprises a relatively rigid, upwardly inclined fin or flange 96, which may have its upper edge bent back upon itself to form a smoothly rounded upper edge portion adapted to be received within the corner of the head bar stock formed by the intersection of the front and bottom wall (see Fig. 14). The angle and extent of the flange 96 is such that when the upper edge of the rear wall of the head bar is resting against the surface of the flange, the bottom of the head bar will be horizontal and in alignment with the opening 55 in the dies. The head bar stock 30 will tend to take this position when placed on the guide 94 due to the fact that the preponderance of the weight of the stock is behind the upper edge portion of the guide and tends to rotate the head bar clockwise as viewed in Fig. 14, so as to hold the upper edge of the guide into the corner of the stock and hold the top rear edge of the stock against the guide. If desired, a linear scale 97, graduated in inches, may be attached adjacent the upper edge of the guide 94 to indicate inches from the cutting plane of the cutting dies 40 so as to show the available length of stock remaining after a cut has been completed.

The guide 99 for the bottom bar stock 31 comprises a U-shaped channel 100 mounted on the right-hand extension 95 and provided with rollers 101 projecting upwardly from the channel at intervals, the upper portion of the channel 100 and the rollers 101 being adapted to receive the central portion of the inside of the bottom bar stock and support it in alignment with the opening 56 in the cutting dies 40.

The tilt rod guide is comprised of flanges 102 secured at intervals on the right-hand extension 95 and provided with a pair of V-shaped notches 104, 104 at their upper edges for supporting the tilt rod stock 32 in alignment with either of the openings 57, 57 in the cutting die 40. A linear scale 105 (Fig. 13) adjacent the bottom bar stock guide 99 and tilt rod guide 102 serves, similarly to scale 97, to indicate available length of the bottom bar channel and tilt rod stock left after completing a cut.

A left-hand extension 106 of the metal stand 44 is secured to the plate 42 and extends to the left of the machine, as viewed in Figs. 1 and 2. The left-hand extension is provided at its rear with a track 107 extending from the cutting dies 40 out along the rear edge of the extension. The outer end of the track may project substantially beyond the end of the extension and be supported by a supplemental support 109.

The track 107 is comprised of a horizontal portion 110 and a vertical, upwardly projecting, rear flange 111. A carriage 112 is adapted to run along the track 107 on rollers 114 (see also Fig. 13) supported on the horizontal

portion 110 and the top edge of the flange 111 of the track.

The carriage 112 is provided with a head bar stop generally designated 115, a bottom bar stop 116, and a tilt rod stop 117, these stops being aligned with the openings 55, 56, and 57, 57, respectively, in the cutting dies 40. Each of these stops is adapted to engage the end of stock passed through the corresponding opening in the cutting dies 40 so as to limit the movement of the stock through the cutting dies. Each of the stops 115, 116, and 117 is adjustable relative to the carriage 112 to vary the distance of the stock-engaging portion of the stop from the carriage. The head bar stop is shown in detail in Figs. 15 and 16. This stop is made up of a vertical plate 202 affixed to the plate portion 130 of the carriage 112, the plate 202 having an upper vertical edge surface 204 designed to function directly as a head-bar measuring abutment when the parts are positioned as in Fig. 16. Supplementing the plate 202 to form an additional, optionally usable stop, is the four-sided plate 205, which in Fig. 16 is shown swung to inoperative position about a bolt 119 which attaches it to the plate 202. Plate 205 may be adjusted by loosening the bolt 119 and rotating the plate to present a selected side for engagement with the head bar stock, each side being a different distance from the bolt. Linear scales 120 and 121 are secured to the carriage 112 beside the stops 116 and 117, respectively, and each coacts with an index point on the adjacent stop to indicate the setting of the stop.

The carriage 112 is provided with a latch 122 which is biased upwardly into latching position by a tension spring 124 and may be depressed by pressing downwardly on the plunger portion 125 of the latch (Fig. 15). The latch is received within any one of a series of holes 126 (Fig. 16) in the track 107 along the path of the carriage, these holes being located at intervals of ½ inch between centers. Accordingly, the carriage 112 may be adjusted rapidly to any desired distance (in ½ inch increments) from the cutting dies 40. A linear scale 127 (Fig. 13) may be located along the forward edge of the track 107 to indicate distance from the cutting plane of the dies 40.

The carriage 112 comprises a body portion 129 which is generally L-shaped in section as seen in Fig. 15 and from which the latch 122 is supported. The carriage 112 also comprises a plate portion 130 which is generally L-shaped in section as seen in Fig. 15 and upon which the stops 115, 116, and 117 are mounted. The plate portion 130 is relatively movable on the body portion 129 along the direction of the track 107. The plate portion 130 of the carriage 112 is connected to the body portion 129 of the carriage by a vernier adjustment comprising a lever 131 pivotally mounted by stud 209 on the body portion, lever 131 having an upstanding stud 210 affixed thereto and extending through a slot in the body portion of the carriage and received within a hole in the plate portion 130, as shown in Figs. 15 and 16. The free end of lever 131 has a post 132 received in a transverse slot 134 of the plate portion 130. A latch 135 at the forward end of the lever 131 is received within any one of nine holes 136 (Fig. 13) spaced along an arcuate path in a member affixed to the forward part of the body portion 129 (see Fig. 15). The spacing of the holes 136 is such that movement of the latch 135 to the next adjacent hole moves the plate portion 130 of the carriage on the body portion 129 for a distance of 1/16 of an inch. A plunger portion 137 of the latch 135 serves to depress the latch from latched position and to move the latch and lever 131 to registry with any of the holes 136. The coiled compression spring 300 interposed between the head of stud 209 and the lever 131 allows the lever generally to pivot downwardly about its left-hand end (Fig. 15) when the plunger portion 137 is depressed. The length of the shank of stud 210 projecting above the plate portion 130 and the sizes of the slot in member 129 and the hole in member 130 through which stud 210 projects are such that the lever may be depressed without causing the stud 210 to bind on the body portion 129 or the plate portion 130.

The combination of the carriage adjustment to ½ inch increments and the vernier adjustment to 1/16 inch increments enables the plate portion 130 of the carriage, upon which the stops 115, 116, and 117 are mounted, to be adjusted rapidly and precisely to any distance in 1/16 of an inch increments from the cutting surface of the dies 40. The use of the carriage in the cutting of head bar, bottom bar, and tilt rod stock will be explained hereinafter.

The machine of the present invention is adapted for the manufacture of both custom blinds and stock blinds. The head bar stop 115 is adjustable on the carriage 112 so that the scale 127 of the carriage will indicate directly in inches the actual channel length severed. However, if desired, the stop 115 may be adjusted so that the carriage may be set in accordance with the length of a slat for which the head bar is to be made, and the head bar will be severed to correct length in accordance with local shop practice. In "inside" installations, the head bar is usually up to ¼ inch shorter than the slats; while in "outside" installations, the head bar may be somewhat longer than the slats.

Custom-made blinds are those blinds which are tailor made to specific window dimensions. Accordingly, in the manufacture of custom blinds, it is particularly advantageous to adjust the head bar stop 115 so that the carriage 112 may be set to the width of the window opening relative to the scale 127, adjustment of the stop serving to compensate for the differential in length between the window opening and the head bar. Accordingly, the head bar stop once having been set in accordance with local shop practice, it is unnecessary to thereafter take into consideration the differential between head bar length and the width of window opening. The carriage may be set directly to window opening width to produce head bars and bottom bars of the proper length. This construction eliminates a likely source of error in the cutting to length of Venetian blind head bars and bottom bars and makes unnecessary any calculations on the part of the machine operator, thus resulting in a greatly lessened number of bars cut to improper length.

The bottom bar stop 116 and tilt rod stop 117 are also adjusted in accordance with local shop practice so as to automatically produce the proper length differential between the head bar and the bottom bar and tilt rod. However, if desired, both of these stops may be adjusted so that the carriage will indicate directly in inches the length of bottom bar and tilt rod severed.

In the manufacture of a head bar for a custom blind, the stops 115, 116, and 117 may be set as above described and the head bar stock 30, bottom bar stock 31, and tilt rod stock 32 positioned on their respective guides 94, 99, and 102. The carriage 112 is then set to the width of window opening and the head bar stock passed through the opening 55 in the cutting dies 40 and the treadle 84 depressed to actuate the dies and sever the head bar. In turn, the bottom bar and tilt rod are similarly passed through their respective openings 55 and 56 in the dies 40 and severed to proper length. The bottom bar and tilt rod are then ready for incorporation in the blind, but it is necessary to punch the severed head bar 34. Punching of the head bar, however, is not part of the invention claimed herein.

I claim:

1. The method of severing a Venetian blind bar to proper length for any predetermined window width, comprising adjusting a stop relative to its carriage in accordance with the constant difference between the window width and the length of the bar, then setting the carriage at a distance from a shearing die in accord-

ance with the window width, then passing the Venetian blind bar stock through the die and against the stop, and then actuating the die to sever the bar.

2. The method of severing a Venetian blind bar to proper length for any predetermined window width, comprising adjusting a stop relative to its carriage to represent the constant difference between the window width and the length of the bar, then setting the carriage at a distance in accordance with the window width from a cutting means operating in a fixed path, then passing the Venetian blind bar stock past the path of the cutting means and against the stop, and then actuating the cutting means to sever the bar.

3. The method of severing a Venetian blind bar to proper length for any predetermined slat length, comprising adjusting a stop relative to its carriage to represent the constant difference between the slat length and the length of the bar, then setting the carriage at a distance from a shearing die determined in accordance with the slat length from a cutting means operating in a fixed path, then passing the Venetian blind bar stock through the die and against the stop, and then actuating the die to sever the bar.

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