United States Patent [19]

Davis

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[54] **BUILDING FRAME FABRICATING MACHINE**

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[73] Assignee: **Davis Building Systems, Ltd.,** Bristol, Tenn.

[22] Filed: **Mar. 21, 1973**

[21] Appl. No.: **343,485**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 215,824, Jan. 6, 1972, Pat. No. 3,765,587, which is a continuation-in-part of Ser. No. 110,196, Jan. 27, 1971, abandoned.

[52] **U.S. Cl.** **227/7,** 227/40, 227/100, 227/153

[51] **Int. Cl.** **B27f 7/02**

[58] **Field of Search** 227/3, 7, 39, 40, 41, 44, 227/45, 50, 99, 100, 101, 103, 151, 152, 153; 198/126, 140, 204

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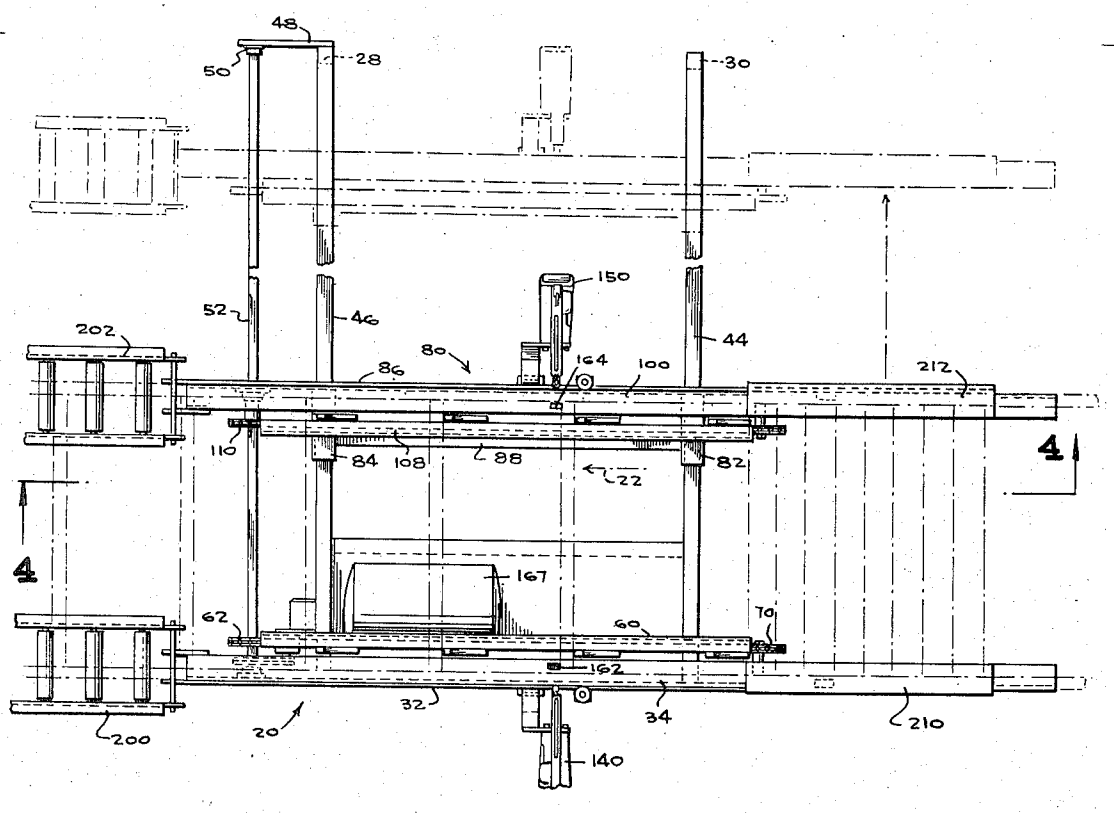
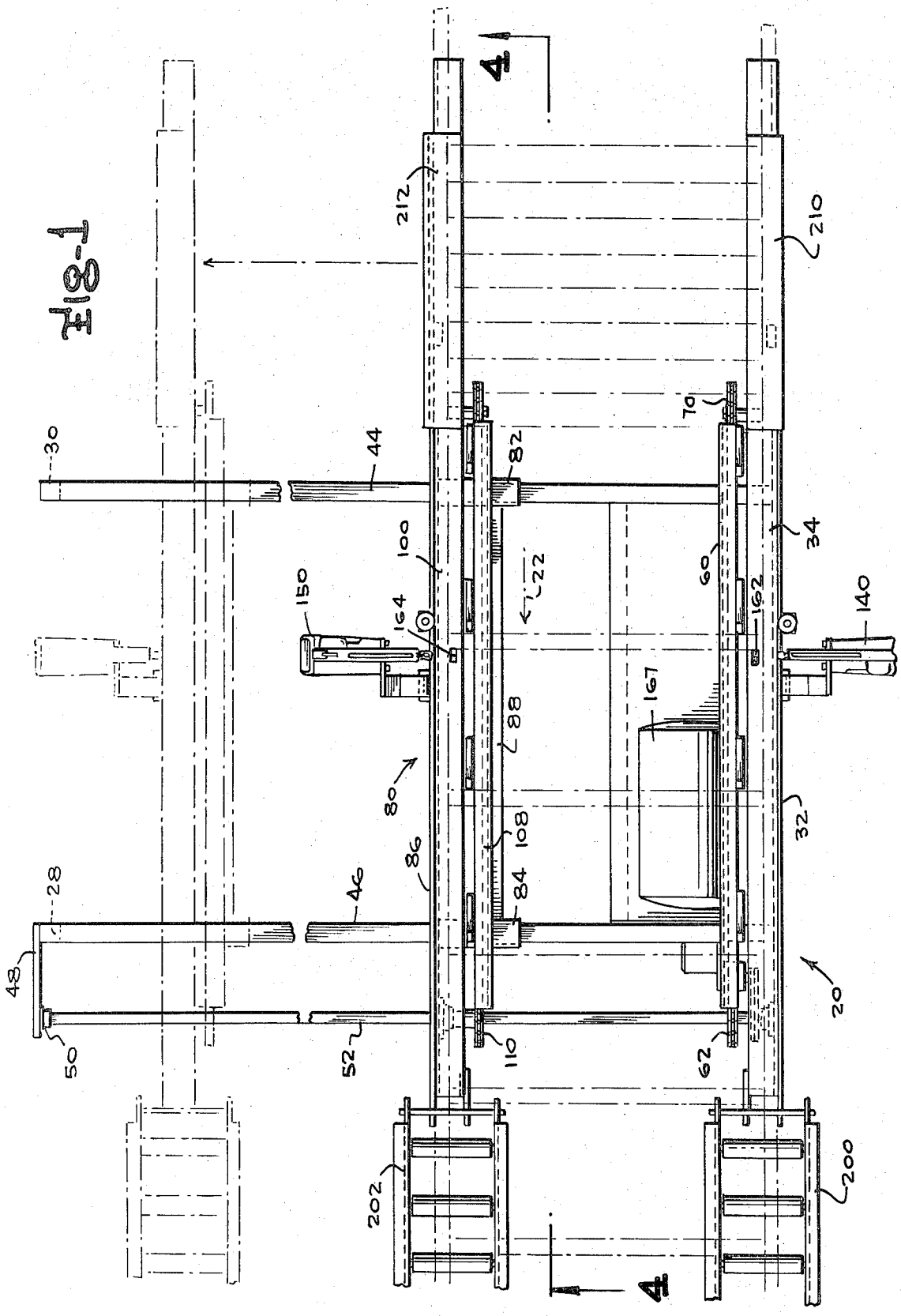
Attorney, Agent, or Firm—Nathaniel A. Humphries, Esq.

[57] **ABSTRACT**

A frame fabricating machine is disclosed including a fixed frame having transverse support beams on which a carriage is transversely adjustable. Stationary guide rails on a fixed portion of the frame and adjustable guide rails on the carriage support longitudinal frame members for axial movement through the machine with two conveyor chains having pivotal lugs on upper horizontal flights engaging transverse spreaders perpendicularly oriented between the longitudinal frame members to move the spreaders and longitudinal members past nailing means on opposite sides of the frame which are actuated by two air valve sensors to detect a properly positioned spreader aligned with the nailing means. The pivot lugs on the chains pivot downwardly out of engagement with the frame members under cam control as they reach a position near the end of the upper flight of each chain. Transverse adjustment of the carriage adjusts one guide rail and one conveyor chain for accommodating different width frame constructions. Outfeed conveyors are provided for removing the completed frame.

19 Claims, 8 Drawing Figures

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164
162
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20
50
52
110
62
202
200
4

Fig-1

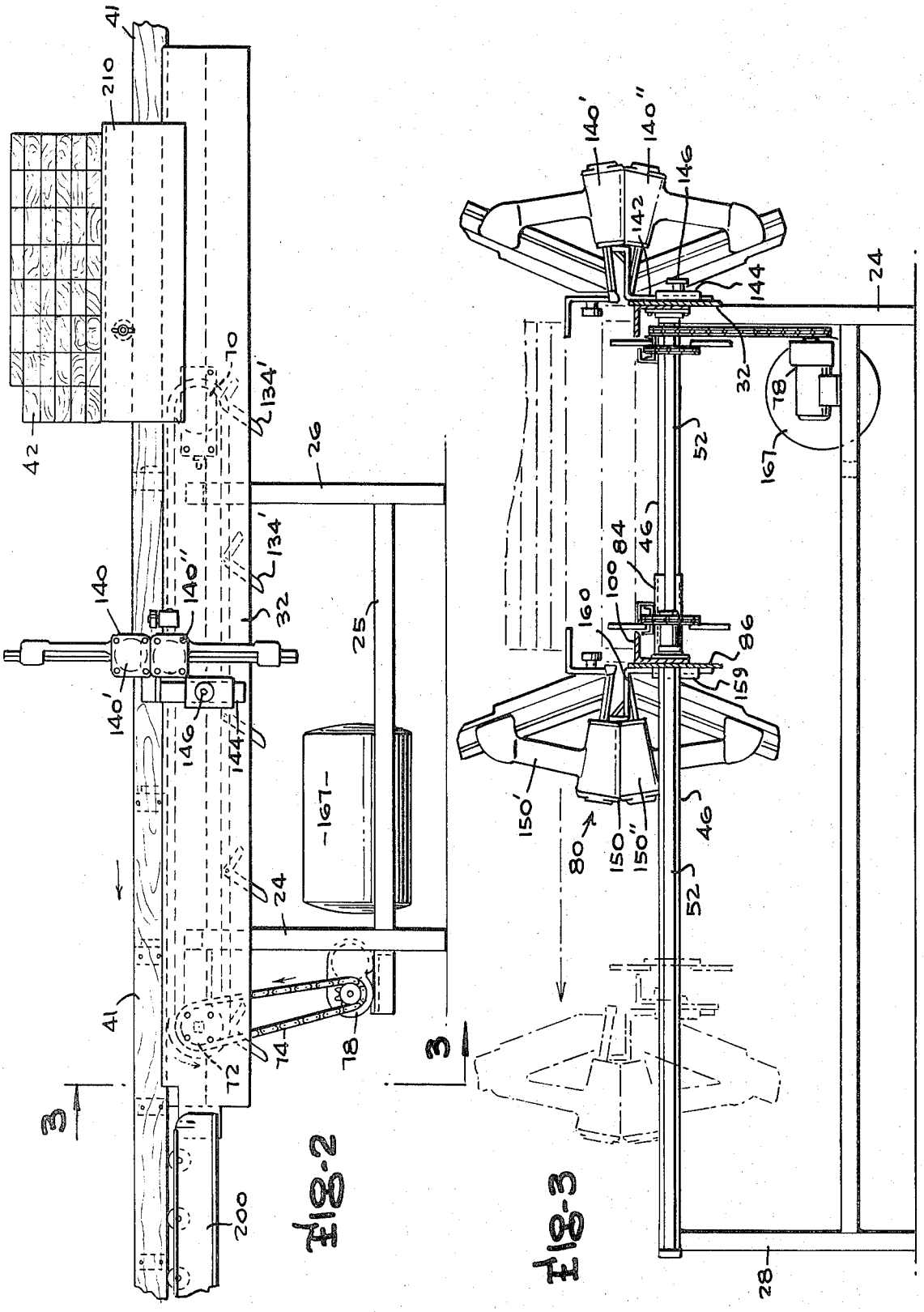
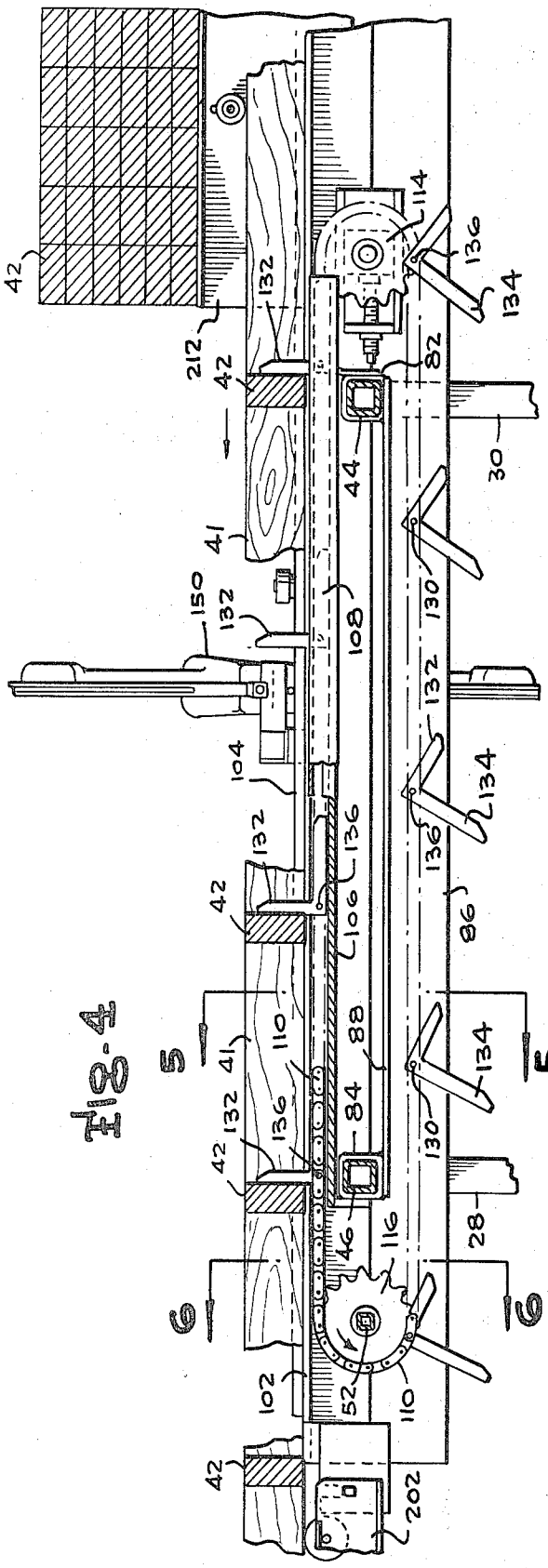

41
210
42
70
134'
26
140
140''
32
25
140'
146
144
167
24
72
74
78
3
3
200
140'
140''
146
142
144
24
32
78
52
167
46
84
100
160
86
159
150'
150''
80
46
52
28

FIG. 2

FIG. 3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132
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42
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136
106
86
42
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134
84
132
136
130
42
46
116
28
102
52
110
42
202

FIG-4

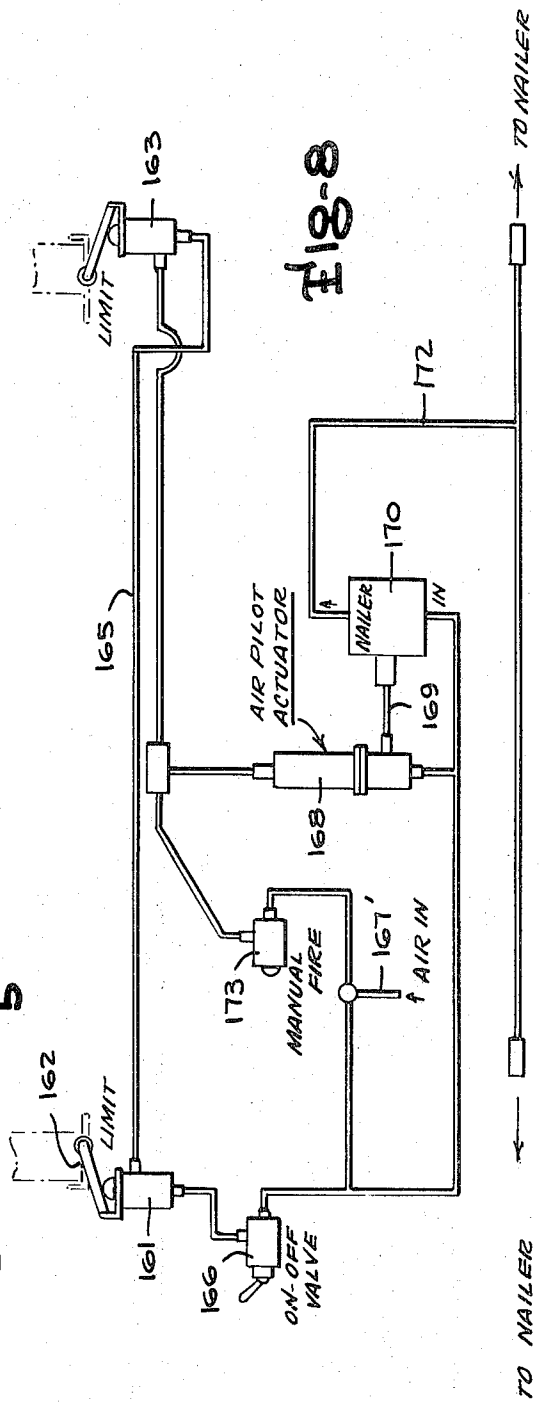
LIMIT
163
165
AIR PILOT ACTUATOR
NAILER
170
IN
169
172
168
TO NAILER
173
MANUAL FIRE
167'
AIR IN
LIMIT
162
161
166
ON-OFF VALVE
TO NAILER

FIG-8

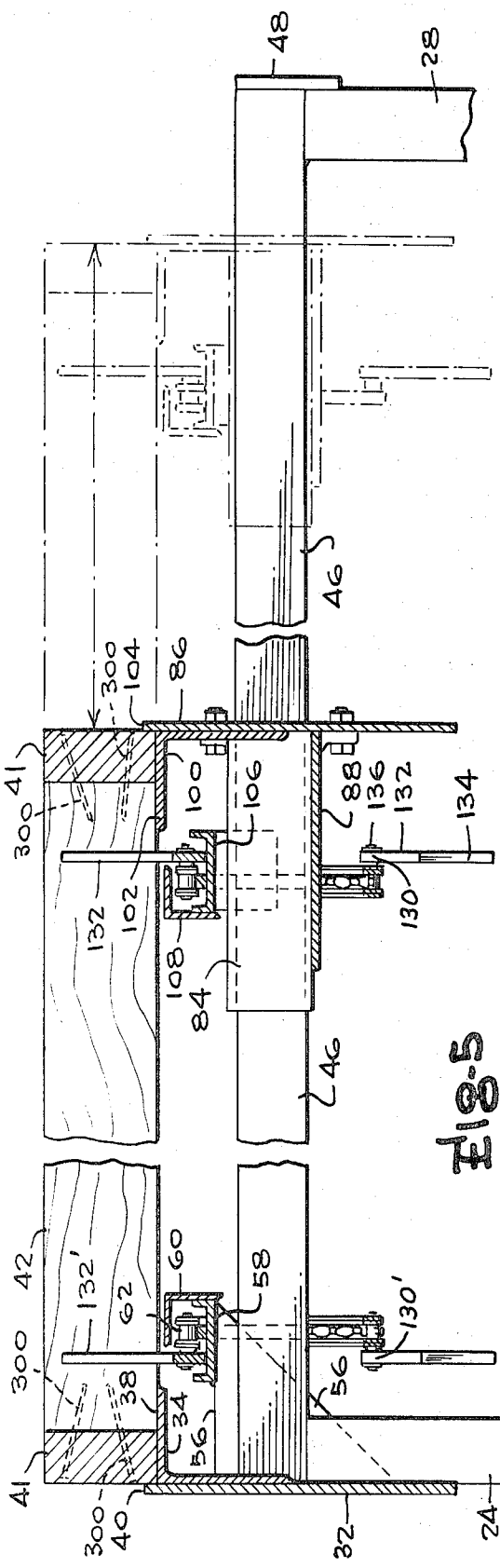

FIG. 5

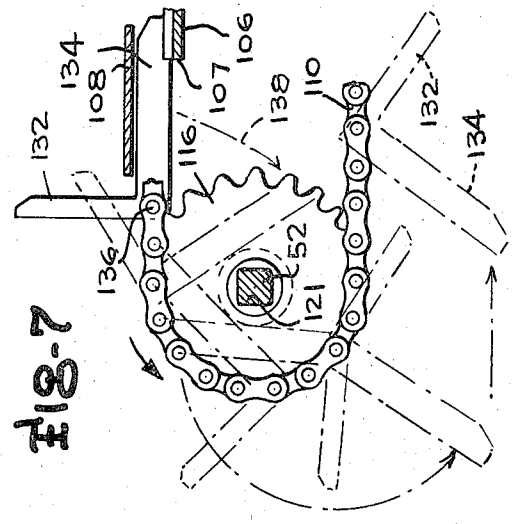

FIG. 7

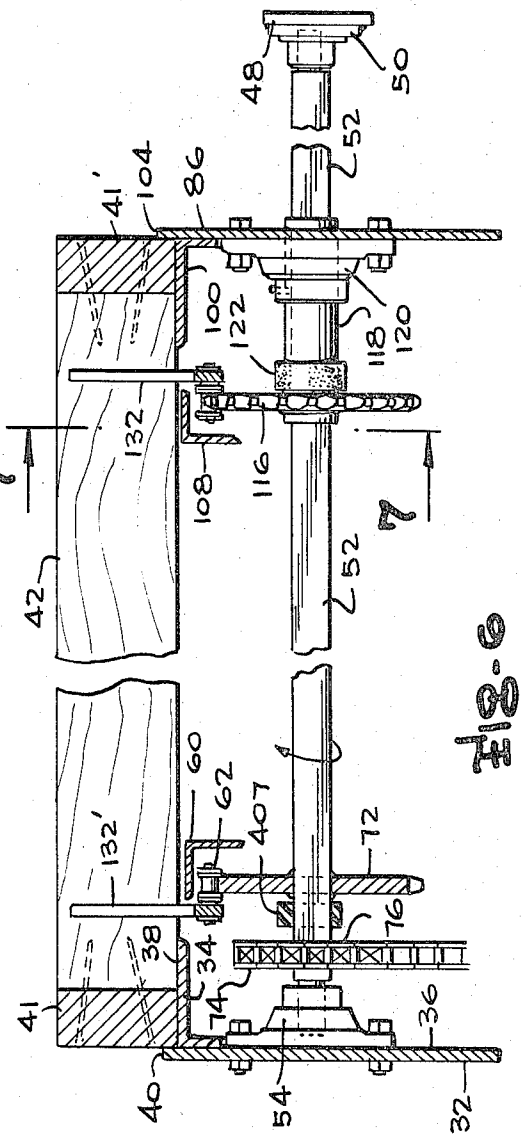

FIG. 6

BUILDING FRAME FABRICATING MACHINE

This application is a continuation-in-part of prior application Ser. No. 215,824, entitled BUILDING CONSTRUCTION MACHINE, filed Jan. 6, 1972, now Pat. No. 3,765,587 issued Oct. 16, 1973 and which is a continuation-in-part of prior application Ser. No. 110,196, entitled BUILDING CONSTRUCTION MACHINE, filed Jan. 27, 1971, now abandoned.

This machine relates to devices and apparatus for constructing building component elements, such as walls, floors, roofs and the like frame elements and other non-structural elements such as pallets, boxing and crating components. More particularly, this invention is directed to an apparatus employing automatic means for positioning and connecting the parts being used to provide a frame component.

Many forms of jigs and the like have been proposed in the past for the purpose of facilitating the assembly of precut building materials into finished panel frame components comprising stud frames frequently provided with a cover sheet affixed to the frame components. Prior known frames or jigs have been provided in a fixed predetermined arrangement to receive and hold parts of the panel frame components while they are being connected to each other. While such jigs are relatively simple, they must be reconstructed or reset for any variation in the panel arrangement being provided and each panel must be fully completed before it is removed from the jig.

Additionally, prior known jig constructions have been of such nature as to require that the operator move about the jigs securing the various parts together with a consequent substantial expenditure of time and labor being involved. After the frame or panel is completed, it is removed from the jig and the components for the next frame to be assembled are then manually positioned in the various required positions in accordance with the frame construction being formed.

More recently, efforts have been made to mechanize jig constructions; however, these efforts have resulted in little more than the use of a movable conveyor for removing the completed frame panel from the jig area in which it is fabricated. Assembly of completed panels at a given area remains the rule with removal of the completed panel being accomplished after the assembly has been completed.

Other devices have developed in recent years for moving frame components to and through an assembly station. Unfortunately, such devices have uniformly been of substantial complexity and have consequently been expensive to fabricate, use and maintain. Additionally, prior known devices have suffered from an inadequate capability of forming different sized frame panels and the like without substantial structural overhaul of the entire device.

Another substantial problem with prior known devices in this field is that they frequently occupy a substantial amount of floor space and consequently result in an inefficient space utilization in the fabrication facility.

SUMMARY OF THE INVENTION

It is the primary object of this invention to provide a new and improved apparatus for automatically positioning and fabricating the components of a panel frame element.

Achievement of the object of this invention is enabled through the provision of a frame fabricating apparatus comprising a fixed main frame member on which is supported a fixed guide rail and a first conveyor chain with feed lugs extending along one edge of the main frame. The main frame includes a pair of transversely extending parallel support beams on which a movable carriage is mounted for movement toward and away from the fixed rail member. A second guide rail is provided on the movable carriage and a second driven conveyor chain having feed lugs is supported on the carriage with a horizontal flight extending adjacent the guide rail on the carriage.

The feed lugs on each of the conveyor chains are each of an L-shaped plate construction having first and second mutually perpendicular arms intersecting at an apex with the L-shaped plates being pivotally connected to the conveyor chains at the apex of each plate. One of the arms of the feed plates is longer and consequently heavier than the other arm so as to consequently provide a gravitational positioning of the feed plate with both arms normally extending below the portion of the chain to which they are attached. However, a first feed lug plate control cam track channel member is mounted on the fixed frame member adjacent and beneath the upper flight of the first conveyor chain for engaging the heavier arm of the L-shaped feed lug plates to position the plate so that the other arm extends perpendicularly upward with respect to the upper chain flight. Consequently, the movement of the upper flight and the upwardly extending arm enables engagement of frame components for feeding them through the machine. A similar feed lug cam track channel member is provided on the adjustable carriage for actuating the L-shaped feed lug plates carried by the second conveyor chain upper flight in an identical manner.

A first nailer means comprising two nailer devices of conventional construction operable by compressed air is mounted on the fixed portion of the main frame member alongside the first guide rail and a second identical compressed air nailer means comprising two conventional nailer devices is mounted on the carriage adjacent the second guide rail. First and second air valve sensors are positioned below the feed path of the frame component parts being assembled in alignment between the two compressed air nailer means. The first and second sensor valves are mounted in series in an air pressure line extending from a source of compressed air to a pilot valve. Upon opening of the first and second air valve sensor devices by a spreader being conveyed past the nailers, compressed air is supplied to the pilot valve which, in turn, opens a main power valve to provide compressed air to both nailer means simultaneously.

In operation, longitudinal frame members are fed axially along the guide rails and transverse spreaders are manually positioned on the guide rails between the longitudinal frame members. The spreaders are positioned to be engaged by one arm of the L-shaped feed lug plates on the conveyor chains extending upwardly from the upper chain flight to move the spreaders in an upstream to downstream direction into direction in alignment between the two nailer means. Detection of the movement of a spreader into alignment between the two nailer means by the first and second valve sensors simultaneously actuates the nailer devices to drive nails or other metal fasteners through the parallel longitudi-

nal frame members into the ends of the spreader positioned between the longitudinal frame members. Continued conveyor chain movement moves the spreaders and the longitudinal frame members connected thereto through the machine past the nailer devices with the spreaders being positioned at desired increments along the length of the longitudinal frame members as determined by the distance between adjacent feed lug plates on the upper flights of the conveyor chains.

A better understanding of the manner in which the preferred embodiment of the invention achieves the objects of the invention will be enabled when the following detailed description is read in conjunction with the appended drawings in which:

FIG. 1 is a plan view of the preferred embodiment;

FIG. 2 is a side elevation view of the preferred embodiment;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2;

FIG. 4 is a sectional view taken along lines 4—4 of FIG. 1;

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 4;

FIG. 6 is a sectional view taken along lines 6—6 of FIG. 4;

FIG. 7 is a sectional view taken along lines 7—7 of FIG. 6; and

FIG. 8 is a schematic pneumatic diagram of the pneumatic control circuit for the nailer means.

Attention is initially invited to FIG. 1 of the drawings which illustrates the preferred embodiment of the invention, generally designated **20**, in which frame components and the completed frame formed by the preferred embodiment are fed from right to left in an upstream to downstream direction indicated by arrow **22**.

The preferred embodiment includes a support frame having vertical post members **24** and **26** joined by a lower brace **25** on the operator's side of the apparatus as shown in FIG. 2 and beam end supporting post members **28** and **30** on the other side of the apparatus. The aforementioned post members constitute a part of the main frame of the apparatus which also includes a fixed stop guide bridge plate **32** welded to the vertical posts **24** and **26** with a first or fixed guide rail **34** being welded to the inside face **36** of the stop guide bridge plate **32**. It should be noted that the first guide rail **34** comprises an angle member having an upper surface **38** positioned below the upper edge **40** of the fixed stop guide bridge plate **32** as best illustrated in FIG. **5**. Upper surface **38** is of sufficient width to provide edgewise support for an elongated longitudinal frame member **41** and the end of a spreader member **42**.

A first horizontal support beam **44** extends transversely from the upper end of vertical post **26** and has its outer end supported on the vertical beam end support post **30**. Similarly, a second horizontal support beam **46** has one end supported by the vertical post **24** with its other end being supported by the vertical beam end support post **28**.

A bearing support plate **48** (FIG. 1) is welded to the vertical post **28** and provides support for a rotary bearing **50** supporting a rounded end of a square drive shaft **52**. The other end of drive shaft **52** is also rounded and is supported in a bearing **54** connected to the inner face of the fixed stop guide bridge plate **32** as best shown in FIG. **6**. Shaft **52** is of square cross-sectional configuration except for its rounded end portions received in the respective bearings **50** and **54** for a purpose to become apparent.

Triangular brace plates **56** are welded to the inner face **36** of the fixed guide bridge plate **32** for providing support of each end of a first horizontally extending cam track channel member **58** having a protective angle member **60** welded along one edge (FIG. **5**). Cam track channel member **58** provides a guiding support for the upper flight of a first conveyor chain **62** which is supported by an upstream sprocket **70** mounted in an adjustable bearing support welded to the lower surface of the upstream end of the channel member **58** and a driving or downstream sprocket **72** fixedly attached to the drive shaft **52** as shown in FIG. **6**. Rotative power for the drive shaft **52** is provided by means of a chain **74** extending over a power input sprocket **76** fixed to drive shaft **52** which receives power from an electric motor **78** through a conventional step-down drive transmission.

Transverse support beams **44** and **46** provide support for a movable carriage generally designated **80** (FIG. **1**). Carriage **80** includes first and second tubular slide sleeves **82** and **84** matingly fitted over the beams **44** and **46** for axial movement along the length thereof. Slide sleeves **82** and **84** are connected by a carriage bridge plate **86** welded to their outer end and by a base bridge plate **88** welded to their lower surfaces.

A second guide rail **100** is connected to the inner face of the carriage bridge plate **86** with its upper surface **102** being positioned beneath the upper edge **104** of the carriage bridge plate **86**. Similarly, a second cam track channel member **106** is supported by the sleeves **82** and **84** and is associated with a protective angle member **108** as shown in FIG. **5**.

A second conveyor chain **110** is supported on the carriage **80** by means of an adjustable upstream idler sprocket **114** and a downstream drive sprocket **116**. Sprocket **116** is coaxially connected to a hollow tubular stub shaft **118** (FIG. **6**) mounted for rotation in a rotary bearing **120** fixedly connected to the carriage bridge plate **86**. Sprocket **116** has a square central opening **121** (FIG. **7**) slightly larger than the square portion of shaft **52** which permits shaft **52** to drivingly rotate the sprocket while permitting the sprocket to be axially positioned along the length of shaft **52** in accordance with the position of carriage **80**. A rubber bumper ring member **122** is fitted over the outer surface of the tubular shaft **118** for purposes to be described.

A plurality of L-shaped lug plates **130** consisting of a feed lug arm **132** and a cam follower arm **134** joined at an apex are pivotally connected to the chain **110** for pivotal movement about pivot pins **136**. Cam follower arm **134** is of larger size and greater weight than the feed lug arm **132** and the L-shaped lug plates consequently pivot about the pivot connection **136** to assume the position illustrated by the lowermost lug in FIG. **7**. However, it is desirable for the feed lug **132** to extend upwardly in vertical orientation during traversal of the upper flight of the feed chain and this result is effected by means of engagement of cam follower arm **134** with the cam track channel member **106**. It is to be noted that as the L-shaped lugs **130** move upwardly about the sprocket **114** in FIG. **4**, the cam follower arm **134** will come to rest on the surface of the cam track channel member **106** and will ride along the length of the chan-

nel member while holding the feed lug arm **132** in a vertical position for engaging spreader members **42** supported by the tracks **34** and **100.**

However, it should be noted that the cam track channel member **106** has an end termination **107** upstream of the drive sprocket **116** as shown in FIG. **7** and that the cam follower arm **134** consequently pivots downwardly in a clockwise direction as shown by arrow **138** so that the feed lug arm **132** is moved out of its driving position into its downwardly inclined position under the influence of gravity. Consequently, feeding cooperation between the feed lug arm **132** and any members being fed thereby is immediately terminated. By permitting the feed lug arm **132** to be disengaged in the foregoing manner, the completed frame members are disengaged from feeding contact with the conveyor means at a point further upstream than would be the case with other lug arrangements. Bumper rings **122** and **407** absorb the noise and shock of the L-shaped lug plates as they are released from the cam track channel members.

While the foregoing discussion has been related to the feed lug members **132** mounted on the adjustable carriage, it should be understood that the first conveyor chain **62** is provided with identical L-shaped lug members **130'** having cam follower arms **134'** and feed lug arms **132'** pivotally connected to chain **62.** Feed lug members **130'** cooperate with the cam track channel member **58** in the exact same manner as the L-shaped lugs **130** mounted on chain **110** cooperate with the cam channel member **106** etc.

First conventional pneumatically operated nailer means **140** consisting of two pneumatic nailers **140'** and **140''** is mounted on a vertically adjustable support bracket **142** carried in an apertured fitting **144** and held in an adjusted position of adjustment by knob **146.** Similarly, second conventional penumatic nailer means **150** consisting of two pneumatic nailers **150'** and **150''** is supported on a vertically adjustable support member **160** adjustably secured to the carriage bridge plate **86** by an apertured fitting **159.**

Control means are provided for actuating the first and second nailer means upon the detection of a spacer member **42** extending in alignment with the nailers **140', 140''** and **150', 150''** across the width of the apparatus with the control means comprising a first sensor valve **161** having an actuator arm **162** extending upwardly through an opening in the first guide rail **34** for detecting the presence of a spreader member and a second valve sensor member **163** mounted on the carriage **80** and having a valve actuator arm **164** extending upwardly through an opening in the second track **100** for detecting a spreader moving across the opening through which the arm **164** extends. Sensor valves **161** and **163** are normally in a closed condition and are mounted in series in a signal pressure line **165** extending from a valve **166** connected to a pressure source line **167'** from pressure tank **167** (FIG. **2**). Opening of valves **161** and **163** permits control pressure in line **165** to be applied to a pilot valve **168** which, in turn, provides a momentary pulse through a line **169** to a main power valve **170** connected to the nailers **140', 140'', 150'** and **150''** by an output line **172** in an obvious manner. It should also be noted that the control circuitry illustrated in FIG. **8** additionally includes a manual actuator valve **173** which, when manually actuated, provides a signal to the pilot valve **168** to consequently fire the nailers.

First and second outfeed conveyors **200** and **202** of the idler roller type are respectively pivotally connected to the downstream ends of the guide tracks **34** and **100** as shown in FIG. **1** for removing a completed frame component.

A convenient means for holding a plurality of the spreader members **42** is provided in the form of first and second angle support brackets **210** and **212** mounted on the upstream ends of the guide tracks **34** and **100** as shown in FIG. **1.**

In use, the carriage **80** can be adjusted between the solid line position illustrated in FIG. **1** and the dotted line position illustrated in the same FIGURE and similarly illustrated in FIGS. **3** and **5.** Consequently, the device can be adjusted for forming frames of varying widths with the carriage being held in an adjusted position either by pins extending through the support beams, **44, 46,** or by the employment of a threaded screw clamp type means extending through a threaded aperture in the wall of the support sleeves **82** and **84.** In operation, a supply of spreader members **42** is positioned on the support brackets **210** and **212** as shown in FIG. **2** and the motor **78** is actuated with a supply of compressed air being provided in the tank **167** by any convenient source. The longitudinal frame members **41** are initially positioned with their forward ends in alignment with the nailer means **140, 150** and the operator initiates the positioning of spreaders **42** on the guide rails **34** and **100** to be engaged by the feed lug arms **132.** The first spreader member positioned on the guide rails is engaged by the next feed lug arms **132, 132'** moving up and around the idlers **70** and **114** and is moved downstream until the actuator arms **162** and **164** are engaged to cause all of the nailers to be simultaneously fired. The first spreader member is then connected to the longitudinal frame members by metal fasteners **300** from the nailers and continued forward movement of the spreader member results in forward movement of the longitudinal frame members with the next spreader member arriving at the nailing station to actuate the nailers and to cause the next spreader member to be connected by fasteners **300** to the longitudinal frame members a distance from the first spreader member equal the distance between the feed lug arms **132.** The process is repeated until the completed frame has been finished and the frame is then moved onto the outfeed conveyors **200** and **202** to be carried away from the assembly apparatus. Additionally, in some instances, it might be desirable to provide a panel such as a sheet of plywood or the like to be fixed to the upper surface of the completed frame and, in which case, connection of such a panel could be effected by the use of a bridge supporting a plurality of pneumatic nailers above the path of travel of the panel frame to be actuated by sensor switches operable in the same manner as switches **161** and **163.** Alternatively, the panel sheeting could be manually applied with hand nailers or staplers if desired.

Numerous other modifications of the preferred embodiment will undoubtedly occur to those of skill in the art and it should be understood that the spirit and scope of the invention is to be limited solely in light of the appended claims.

I claim:

1. A frame fabricating machine for fabricating a frame formed of first and second parallel longitudinal side frame members and a plurality of parallel spreaders transversely extending and connected between the parallel longitudinal side frame members, said machine comprising a main support frame, first and second parallel spaced guide rails supported by said main support frame for supporting said parallel longitudinal frame members for axial movement through said machine in an upstream to downstream direction and for supporting the ends of said spreaders for movement through said machine, conveyor means extending parallel to said guide rails and having plural feed lug members engageable with said spreaders, first and second power operated nailer means positioned outwardly of said guide rails operable upon actuation to drive fastener means through said longitudinal frame members into adjacent spreaders for effecting connection of said longitudinal frame members to said adjacent spreaders, first and second sensors positioned in alignment with said nailer devices for detecting the presence of a spreader in alignment with said nailer device and actuator means responsive to the simultaneous detection of a spreader by said first and second sensors to actuate said nailer devices.

2. The invention of claim 1 wherein said first and second sensors each comprise normally closed sensor valve members each having an actuator arm engageable by said spreaders to open said valve members.

3. The invention of claim 1 wherein said first and second sensors each comprise normally closed sensor valve members each having an actuator arm normally extending into the path of movement of said spreaders so that engagement of said spreaders with said actuator arms serves to open said valve members and wherein said nailer means are pneumatically actuated by compressed air from a power air line extending from said actuator means, said actuator means comprising pilot valve means operable by an input signal line extending from a source of air pressure, said first and second sensor valve members being connected in series in said input signal line.

4. The invention of claim 1 wherein said conveyor means comprises first and second conveyor chains each having an upper horizontal flight extending respectively adjacent and parallel one of said guide rails between an upstream sprocket and a downstream sprocket and said first and second sensors comprise normally closed sensor valve members each having an actuator arm extending into the path of movement of said spreaders so that engagement of said spreaders with said actuator arms serves to open said valve members and wherein said nailer means are pneumatically actuated by compressed air from an air pressure power line extending from said actuator means, said actuator means comprising pilot valve means operable by an input pressure signal line extending from said source of air pressure, said first and second sensor valve members being connected in series in said input pressure signal line.

5. The invention of claim 4 wherein said plural feed members comprise L-shaped feed lug plates formed of first and second arms intersecting at an apex, said L-shaped plates being pivotally connected to said chains at an apex of each L-shaped plate and cam means positioned adjacent the upper flight of each of said conveyor chains to engage one of said arms to pivot said L-shaped plate into a position in which the other arm extends upwardly from said upper flight as it moves into and along the length of the upper flight for engaging spreaders on said guide rails to feed the spreaders along the guide rails in an upstream to downstream direction and wherein said cam means terminates upstream of the downstream sprocket to permit said L-shaped plates to pivot under the influence of gravity about their pivotal connection to said chains so that said second arm moves below the level of said guide rails out of driving engagement with said spreaders before the L-shaped plates reach the downstream sprocket.

6. The invention of claim 5 additionally including first and second transverse support beams forming part of said main support frame, transversely adjustable carriage means mounted on said first and second transverse support beams for adjustable movement on said transverse support beams, said adjustable carriage supporting said upstream and downstream sprockets of said second conveyor chain, said second guide rails, said second power operated nailer means and the camming means associated with said second conveyor chain for unitary adjustment in a direction perpendicular to the axes of the guide rails to enable the fabrication of frames of various widths.

7. The invention of claim 6 additionally including a vertically adjustable bracket supporting said second nailer means on said adjustable carriage for adjusted vertical positioning.

8. The invention of claim 7 additionally including vertically adjustable bracket means supporting said nailer means on said main frame for adjusting the height of said first nailer means.

9. The invention of claim 8 wherein said carriage includes first and second tubular sleeves respectively mounted in mating relationship on said first and second support beams, an elongated bridge plate oriented perpendicularly to said support beams and secured to said tubular sleeves and said second guide rail comprising an angle member attached to an inwardly facing surface of said bridge plate below an upper horizontal edge of said bridge plate.

10. The invention of claim 9 additionally including a fixed stop guide bridge plate comprising a portion of said main frame and oriented perpendicularly to said support beams, wherein said first guide rail comprises an angle member fixedly connected to said fixed stop guide bridge plate on an inwardly facing surface thereof and having an upper horizontal surface spaced a small distance below an upper horizontal edge of said fixed stop guide bridge plate.

11. The invention of claim 10 additionally including outfeed conveyor means respectively connected to the downstream ends of said first and second guide rails.

12. The invention of claim 1 wherein said conveyor means comprises first and second conveyor chains each having an upper horizontal flight extending respectively adjacent and parallel one of said guide rails between an upstream sprocket and a downstream sprocket.

13. The invention of claim 12 wherein said plural feed members comprises L-shaped feed lug plates formed of first and second arms intersecting at an apex, said L-shaped plates being pivotally connected to said chains at an apex of each L-shaped plate and cam means positioned adjacent the upper flight of each of

said conveyor chains to engage one of said arms to pivot said L-shaped plate into a position in which the other arm extends upwardly from said upper flight as it moves into and along the length of the upper flight for engaging spreaders on said guide rails to feed the spreaders along the guide rails in an upstream to downstream direction and wherein said cam means terminates upstream of the downstream sprocket to permit said L-shaped plates to pivot under the influence of gravity about their pivotal connection to said chains so that said second arm moves below the level of said guide rails out of driving engagement with said spreaders before the L-shaped plates reach the downstream sprocket.

14. The invention of claim **13** additionally including first and second transverse support beams forming part of said main support frame, transversely adjustable carriage means mounted on said first and second transverse support beams for adjustable movement on said transverse support beams, said adjustable carriage supporting said upstream and downstream sprockets of said second conveyor chain, said second guide rails, said second power operated nailer means and the camming means associated with said second conveyor chain for unitary adjustment in a direction perpendicular to the axes of the guide rails to enable the fabrication of frames of various widths.

15. The invention of claim **14** additionally including a vertically adjustable bracket supporting said second nailer means on said adjustable carriage for adjusted vertical positioning.

16. The invention of claim **15** additionally including vertically adjustable bracket means supporting said nailer means on said main frame for adjusting the height of said first nailer means.

17. The invention of claim **16** wherein said carriage includes first and second tubular sleeves respectively mounted in mating relationship on said first and second support beams, an elongated bridge plate oriented perpendicularly to said support beams and secured to said tubular sleeves and said second guide rail comprising an angle member attached to an inwardly facing surface of said bridge plate below an upper horizontal edge of said bridge plate.

18. The invention of claim **17** additionally including a fixed stop guide bridge plate comprising a portion of said main frame and oriented perpendicularly to said support beams, wherein said first guide rail comprises an angle member fixedly connected to said fixed stop guide bridge plate on an inwardly facing surface thereof and having an upper horizontal surface spaced a small distance below an upper horizontal edge of said fixed stop guide bridge plate.

19. The invention of claim **18** additionally including outfeed conveyor means respectively connected to the downstream ends of said first and second guide rails.

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