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DOOR SECTION ASSEMBLY APPARATUS

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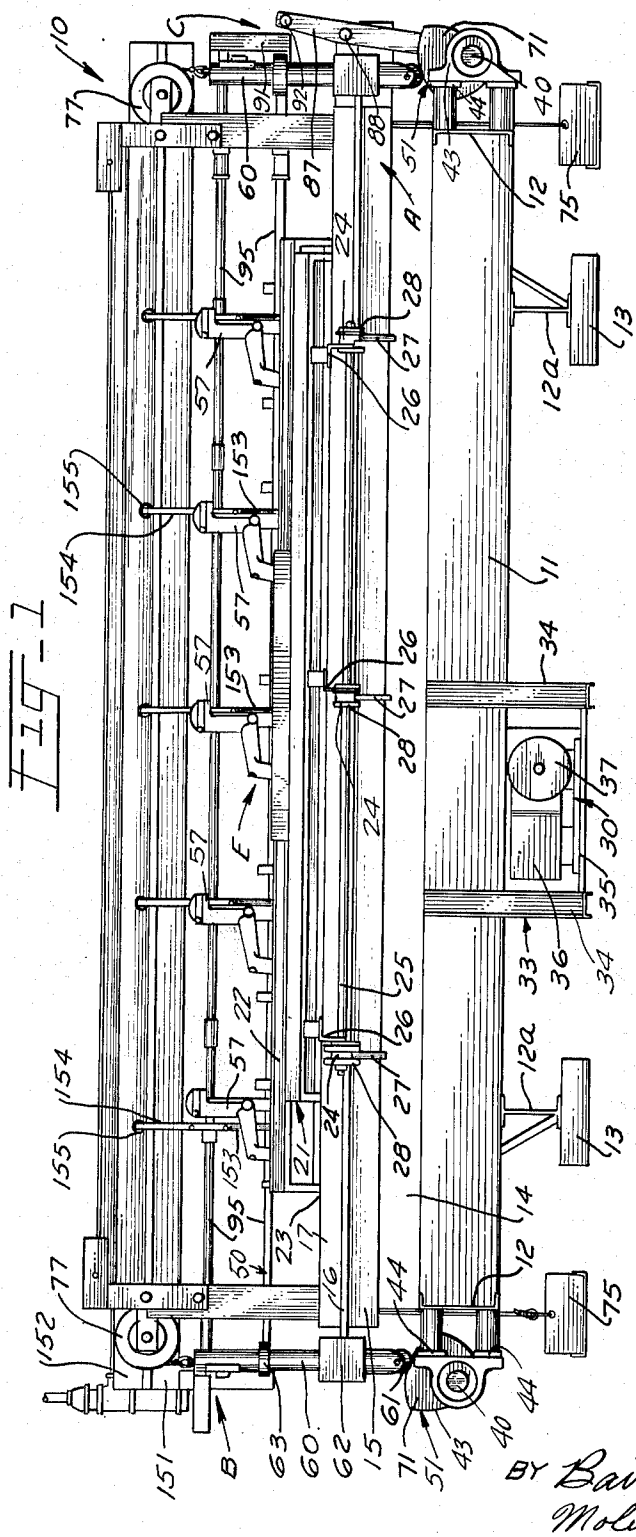


FIG. 1

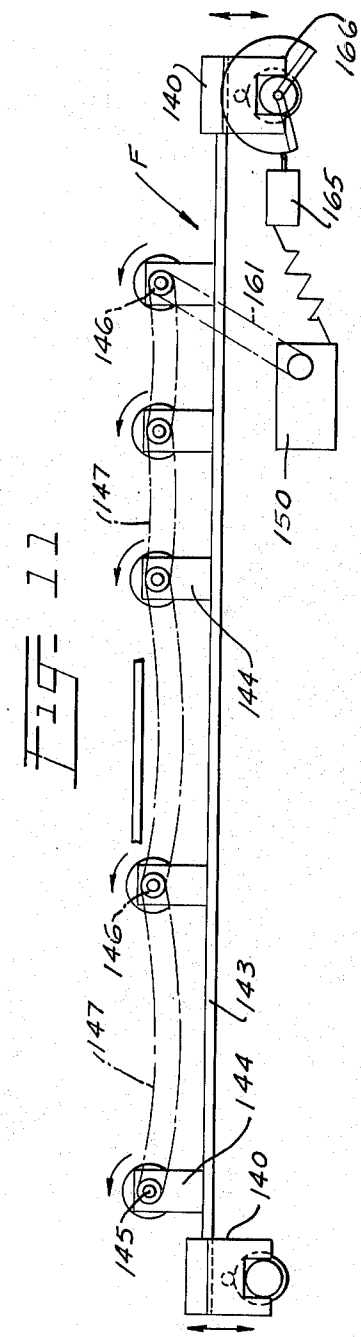


FIG. 11

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DOOR SECTION ASSEMBLY APPARATUS

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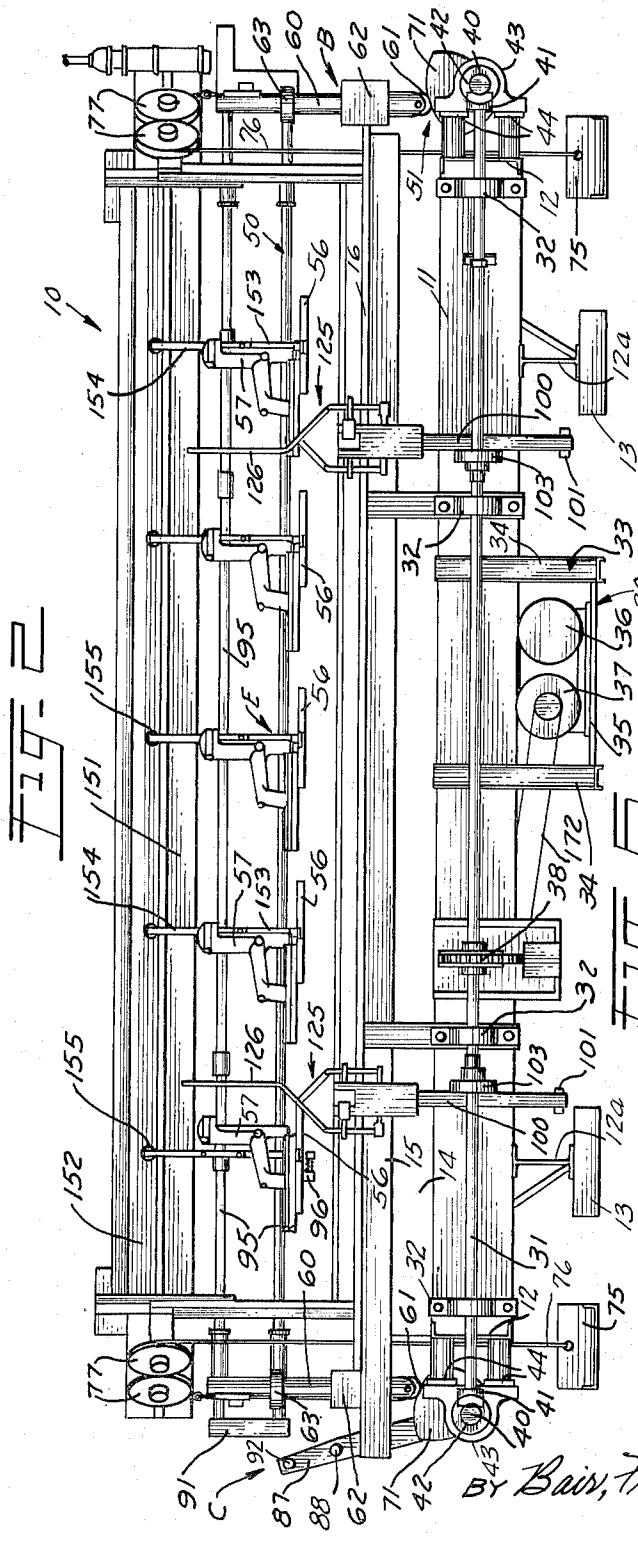


FIG. 2

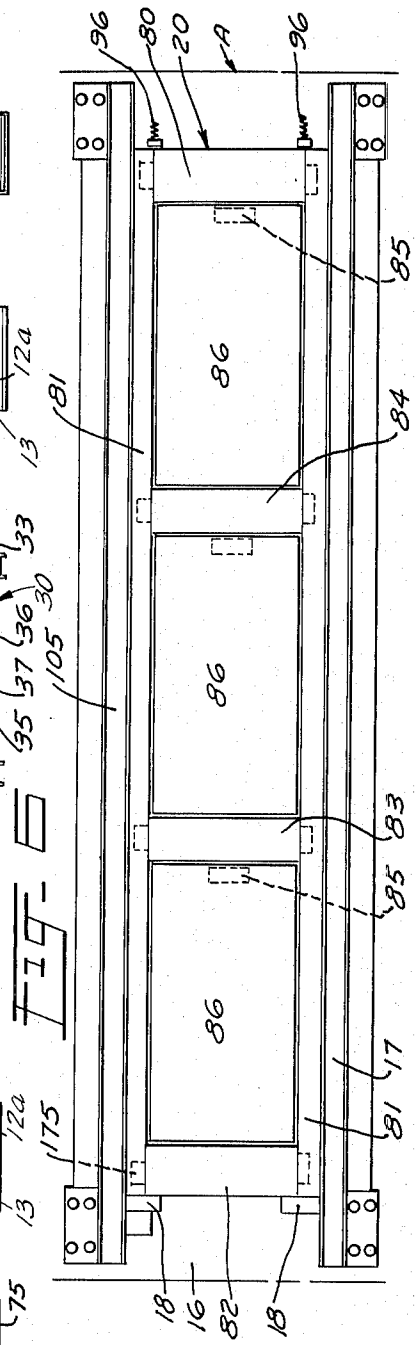


FIG. 5

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DOOR SECTION ASSEMBLY APPARATUS

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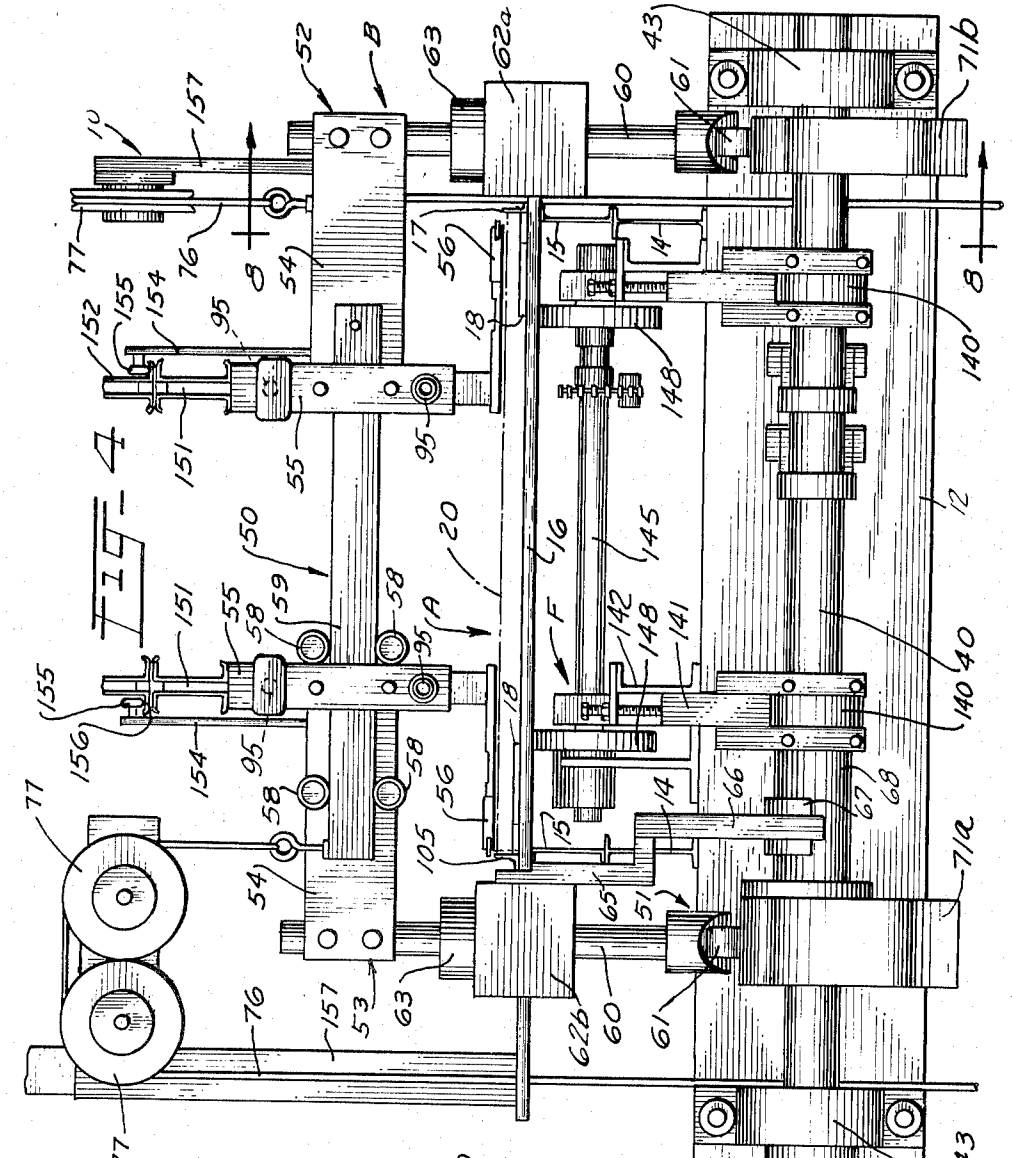


FIG. 4

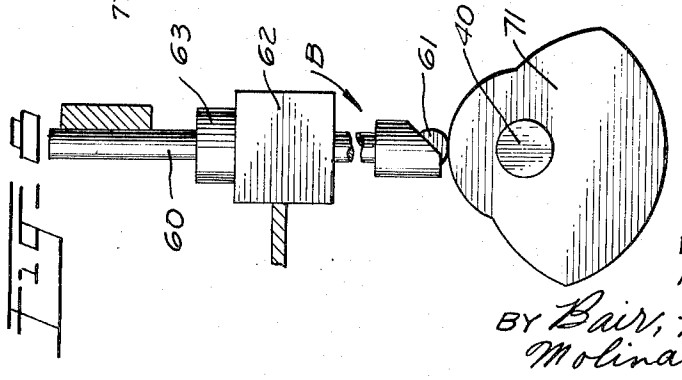


FIG. 5

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FIG. 5

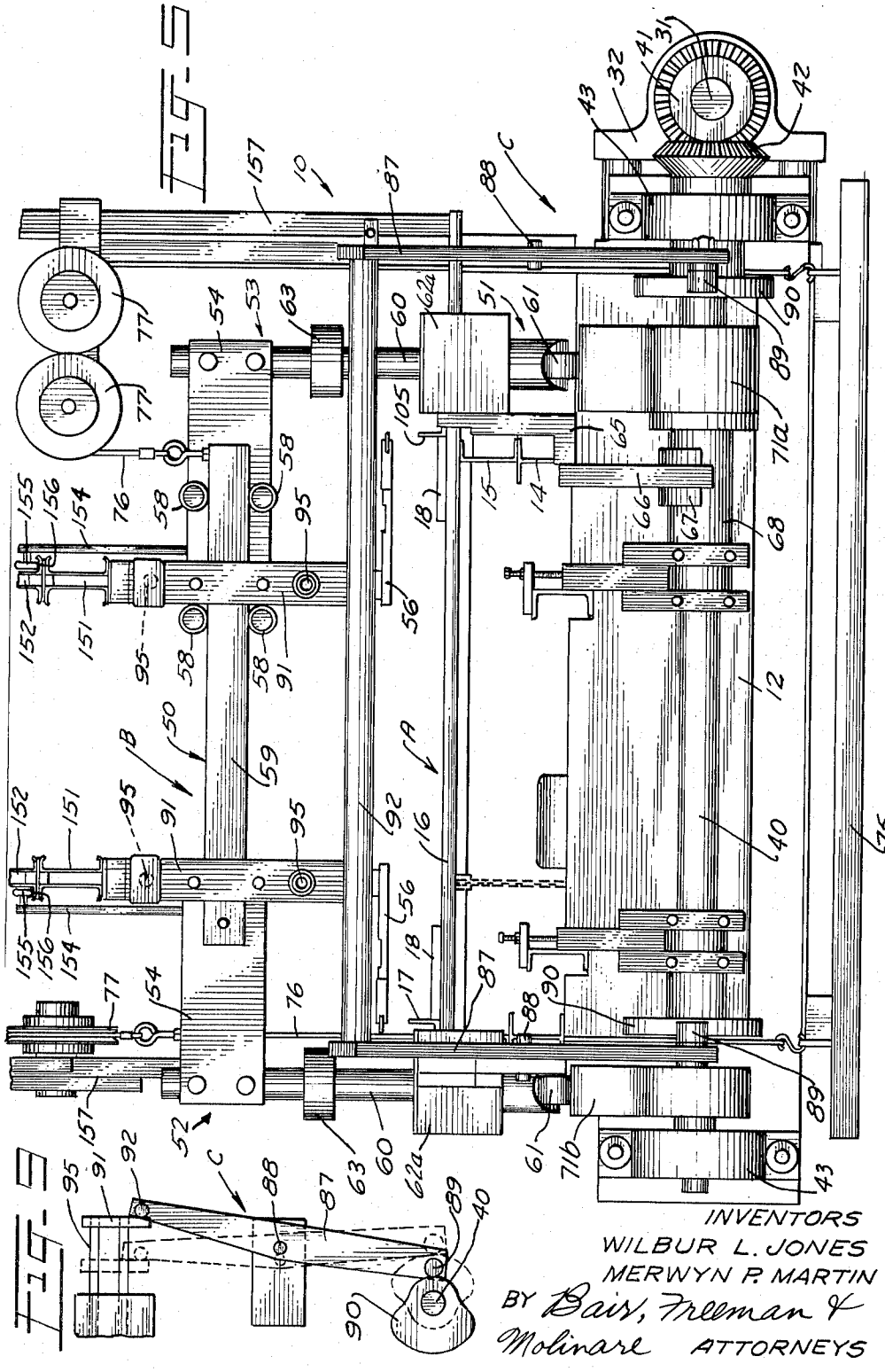


FIG. 5

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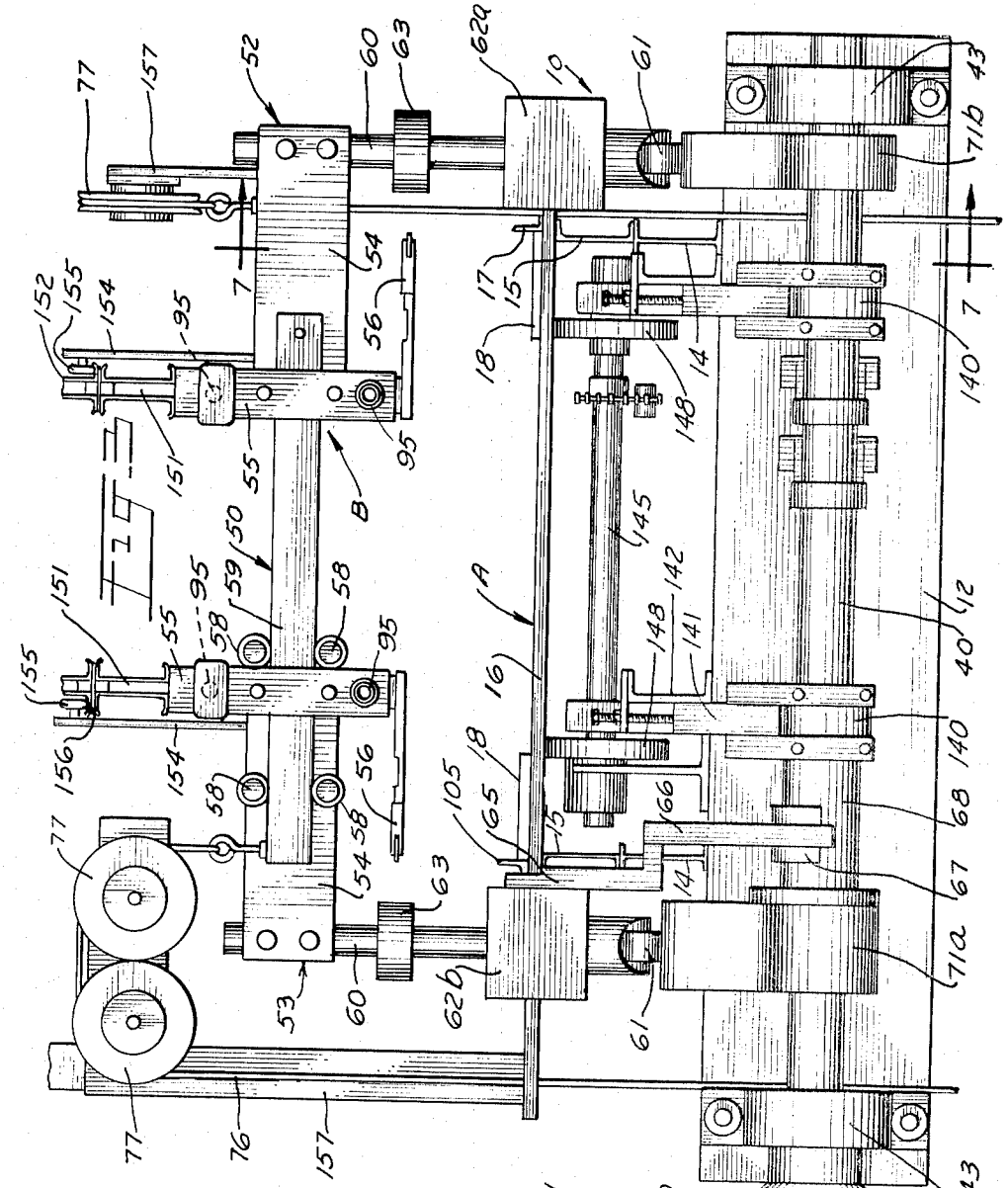
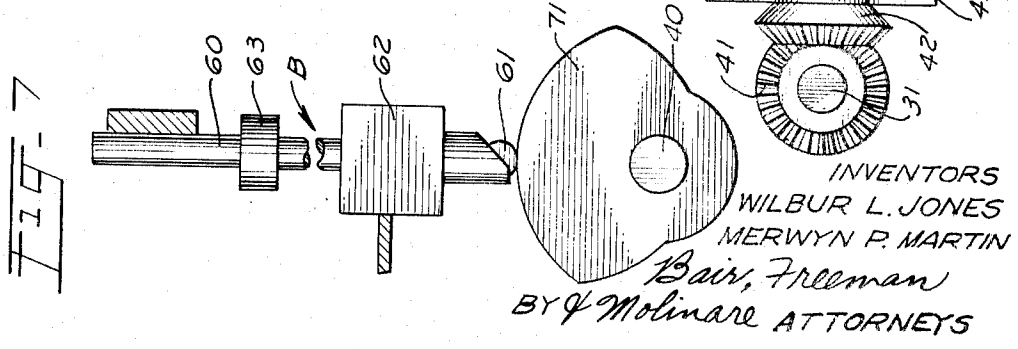


FIG. 7



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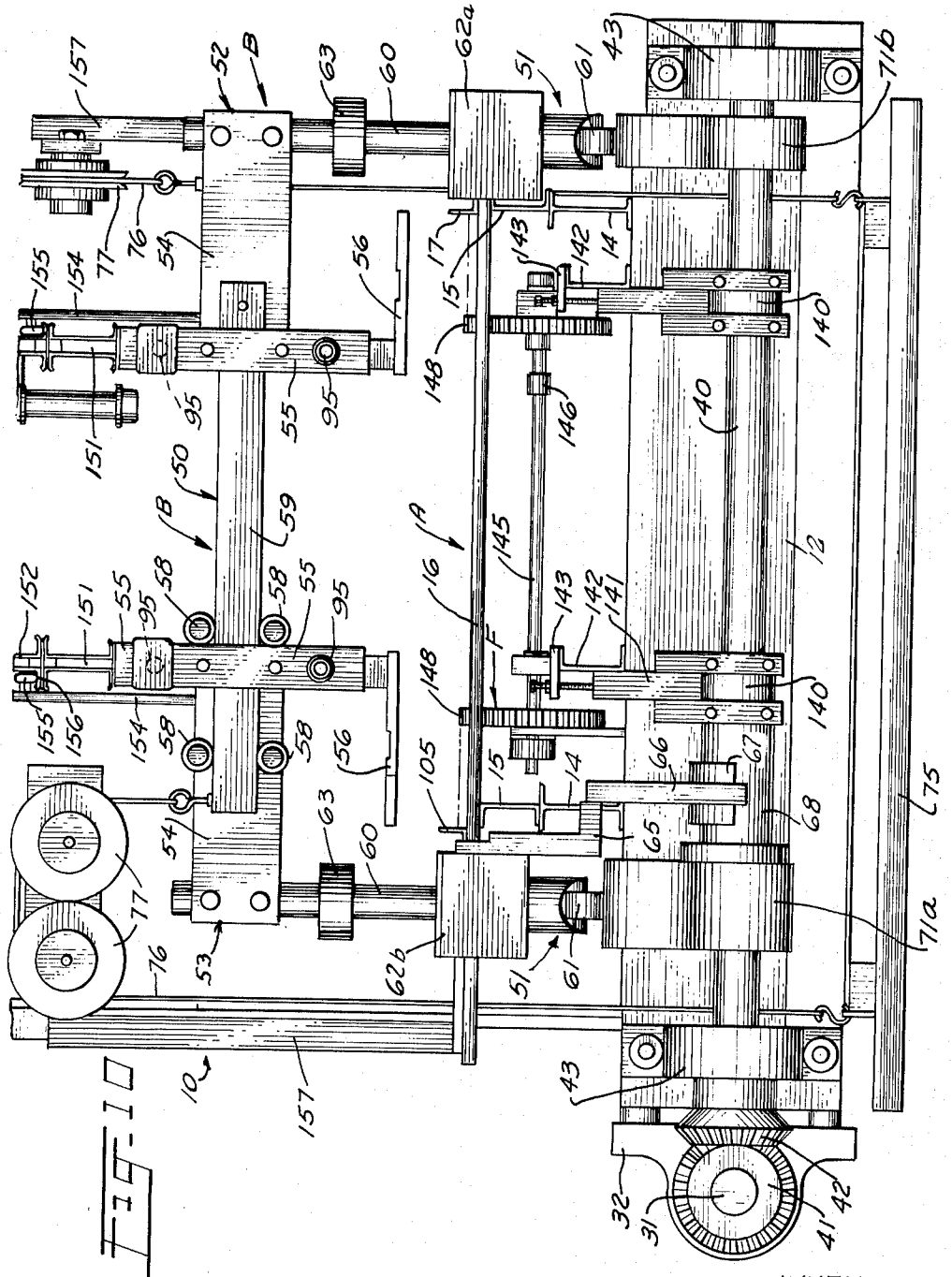


FIG-10

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Fig. 12

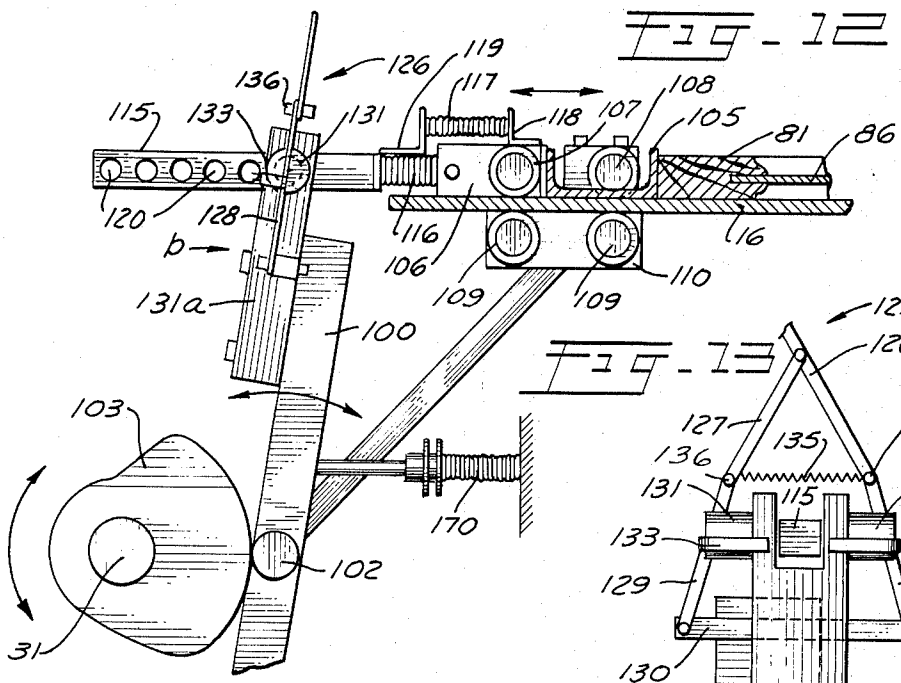


Fig. 13

Fig. 14

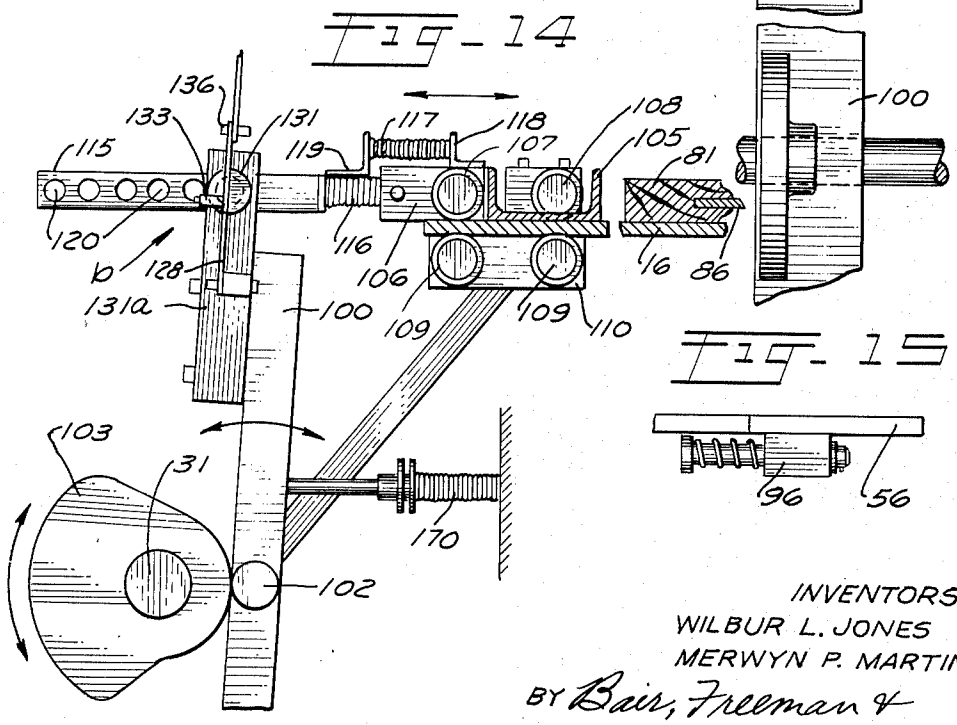


Fig. 15

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United States Patent Office 3,235,156 Patented Feb. 15, 1966

3,235,156

DOOR SECTION ASSEMBLY APPARATUS

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Filed Apr. 11, 1963, Ser. No. 272,475
12 Claims. (Cl. 227—153)

This invention relates to apparatus for quickly aligning and rigidly assemblying a door or door section and it particularly relates to apparatus for aligning and securing side rails to the center stiles of a garage door section so as to provide uniformly and rigidly assembled garage door sections.

In assembling the parts of any door or door section, it is always important, from the standpoint of both appearance and function, to properly align and secure all parts of the door section. More specifically, it is important to provide that the side rails of the door section be at substantially right angles to the cross supports or center stiles which are positioned between the side rails, that the side rails be substantially parallel to each other, that the center stiles also be substantially parallel to each other, and that the center stiles and side rails be uniformly spaced. From the standpoint of appearance, by constructing a door section according to the above provisions, the center stiles and side rails will not be askew and will be uniformly spaced, so as to provide an attractive appearing door section. Functionally, a door or door section which is so constructed will properly fit its matching door frame or other mating part.

The importance of the above provisions is greatly increased when assembling a plurality of door sections for use on an overhead garage door when the sections are contiguous and hingedly secured together along their side rails. For example, if the side rails of a series of door sections are even fractionally misaligned, the error will be increased by the number of sections being hinged together, thereby resulting in a poorly constructed and unattractive garage door. Furthermore, by having all the stiles parallel and uniformly spaced, and by having the side rails parallel and uniformly spaced, there will be a uniform appearance among all door sections of the garage door, which is important from the standpoint of appearance.

Therefore, it is a primary object of this invention to provide apparatus useful for rigidly and uniformly assembling door sections.

It is another object of this invention to provide apparatus for aligning and rigidly fastening the side rails and center stiles of a door section.

It is also an object of this invention to provide apparatus for assembling all the side rails substantially parallel to each other and the center stiles substantially parallel to each other, while maintaining the rails and stiles at substantially right angles to each other.

It is a further object of this invention to provide a door section assembly apparatus which rigidly secures the door section while all parts of the door section are being maintained in substantially the same plane and as endwise and crosswise pressure are being applied to the door section.

Further purposes and objects of this invention will appear as the specification proceeds.

The present invention, which accomplishes all the afore-mentioned objects and which is useful for quickly and conveniently aligning and rigidly assembling a door section having side rails and cross supports positioned between the side rails, includes a frame for supporting the door section, means mounted on the frame for maintaining parts of the door section in substantially the same

vertical plane, means mounted on the frame for applying crosswise and endwise pressure to the door section so as to rigidly hold the cross supports and side rails together, and means for fastening the cross supports to the side rails while the door section parts are being maintained in substantially the same plane and while the door section is under crosswise and endwise pressure whereby the door section is quickly and rigidly assembled.

One embodiment of the present invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a side elevational view of the door section assembly apparatus;

FIG. 2 is a rear elevational view of the apparatus of FIG. 1;

FIG. 3 is an enlarged elevational view of one end of the embodiment of FIGS. 1 and 2;

FIG. 4 is an end elevational view, similar to FIG. 3, except that the overhead hold-down apparatus is shown in the lowered position;

FIG. 5 is an enlarged, end elevational view of the other end of the embodiment of FIGS. 1 and 2;

FIG. 6 is a top plan view of a door section in position on the support frame;

FIG. 7 is a partially broken, sectional view taken along line 7—7 of FIG. 3;

FIG. 8 is a partially broken, sectional view taken along line 8—8 of FIG. 4;

FIG. 9 is a partially broken, side elevational view of means for applying endwise pressure to a door section;

FIG. 10 is an end elevational view, similar to FIG. 3, except that the means for ejecting an assembled door section from the apparatus is shown in the raised position;

FIG. 11 is a detailed, side elevational view of the means for ejecting a door section from the apparatus;

FIG. 12 is a partially sectioned, detail view of means for applying crosswise pressure to the door section;

FIG. 13 is an end, elevational view of the embodiment of FIG. 12;

FIG. 14 is a view, similar to FIG. 12, except that the crosswise pressure applying means is shown out of its operating position; and

FIG. 15 is a detail view of the contact member which applies endwise pressure to a door section.

In describing the door section assembly apparatus **10**, the frame for supporting the door section is generally referred to by the letter A, the means for maintaining parts of the door section in substantially the same plane is generally designated by the letter B, the means for applying crosswise pressure to the door section is generally referred to by the letter C, the means for applying endwise pressure to the door section is generally designated by the letter D, the means for fastening the cross supports to the side rails is generally designated by the letter E, and the means for rejecting the assembled door section is generally designated by the letter F.

Referring particularly to FIGS. 1, 2 and 3, the frame A of the apparatus **10** includes a pair of longitudinal channel beams **11** which rest upon transverse I-beams **12***a*, which in turn are positioned on support blocks **13**. The beams **11** are secured together at both ends by channel members **12**. The channel members **12** support a pair of elongated I-beams **14** and channel members **15**, which carry the door section base plate **16**. The upper surface of the plate **16** fixedly carries a longitudinal angle member **17** and fixed transverse bars **18**, against which parts of a door section **20** may be buttressed for receiving crosswise pressure and endwise pressure.

Referring to FIG. 1, the frame A includes a roller table which is used in the loose manual assembly of a door section **20**. The top of the roller table **21** is tapered downwardly from the upper front portion **22** to the lower

rear portion 23, which is positioned above the door stop member 17 so that a door section 20 may be readily pushed on the support plate 16. The table 21 is rollably and movably positioned by means of roller members 24 which are fixedly carried by the shaft 25. Shaft 25 is rotatably mounted in the supports 26 which are carried by the underside of the table 21. The rollers 24 are adapted to ride on tracks 27 which extend from and are affixed to beams 14 and channel members 15. The rollers 24 include integral sides 28 which guide the movement of the roller table 21 on the tracks 27. Suitable stops (not shown) are provided to prevent overtravel of the roller table, both in moving towards and away from the working area of the machine.

Positioned under the frame A is the drive means 30 which, through suitable means, rotates the rear drive shaft 31. The shaft 31 is rotatably carried in the pillow blocks 32, which in turn are fixed to the frame A. The drive means 30 is positioned within a framework 33, which has both vertical support members 34 and horizontal support members 35.

Referring to FIG. 2, the drive means 30 includes a motor 36 and a gear reduction unit 37 which, through suitable operating connections, rotates shaft 31. Specifically, the gear reducer 37 drives a pulley 172 which rotates a worm (not shown) and thereby the worm gear 38 and the shaft 31.

The rear drive shaft 31 is adapted to rotate the end shafts 40 through the bevel gears 41, mounted on both ends of the shaft 31, and the bevel gears 42, mounted on both end shafts 40. The shafts 40 are rotatably carried by the pillow blocks 43, which are fixed to the channel members 12 through spacers 44.

Referring particularly to FIGS. 1–3, the means B for maintaining substantially all parts of the door section 20 in substantially the same vertical plane, generally includes an overhead hold-down frame 50 and a lowering mechanism generally 51.

The overhead hold-down frame 50, which is vertically movable, includes a laterally immobile side 52 and a laterally mobile side 53. Each side is provided with horizontal support arms 54, which are secured to the vertical guide rods 60 positioned near the four corners of the frame A.

Two vertical bar supports 55 are fixedly mounted on the extremities of the elongated overhead members 151 and 152. The supports 55 slidably carry elongated guide rods 95 which in turn fixedly carry pad support arms 153. The extensions 154 of the pad support arms 153 are provided with rollers 155 which are adapted to ride on the tracks 156 which are provided on the overhead members 152.

The pad support arms 153 securely maintain the hold-down pads 56. The pads 56 serve a twofold function in that they are positioned in close proximity to the upper side of a door section 20 so as to maintain all parts thereof in substantially the same plane and also they provide a support for the air guns 57 which drive dowels or other fastening means into the door section 20 (air guns 57 not shown in FIGS. 3–5 and 10).

The side 53 is laterally movable toward the stationary side 52 by means of rollers 58, which are rotatably mounted to the horizontal support 54 of the mobile side 53 and are adapted to be guided during lateral movement by the guide bar 59 which is securely fastened to the support 54 of the immobile side 52.

As previously mentioned, the sides 52 and 53 are both movable in a vertical direction and are fixed to vertical guide rods 60 which rotatably carry a circular cam follower 61 at their lower end. The rods 60 are slidably mounted within the guide blocks 62. Also, the four rods 60 are each provided with fixed collars 63 which are adapted to abut against the blocks 62 so as to support the frame 50 in its lowered position. The block 62*a* on the immobile side 52 is affixed to the frame A whereas the block 62*b* on the mobile side 53 is laterally movable and is secured to the crosswise pressure applying means D, which will described in greater detail in a subsequent portion of this specification.

The mobile block 62*b* is attached to supports 65 and 66. The support 66 is provided with a saddle member 67 which rides on a sleeve 68, mounted around the end shaft 40. The saddle 67 is adapted to slidably move along the sleeve 68 as the mobile side 53 is moved towards or away from the stationary side 52. Also the cam 71*a* on the laterally mobile side 53 has a wider working surface than the cam 71*b* on the laterally immobile side 52 so that the follower 61 is always positioned over the cam 71*a*.

The lowering mechanism 51 includes four cam members 71 which are fixed to the end shaft 40. As the drive means 30 operates the back drive shaft 31 and rotates both end shafts 40, the cams 71 are also rotated. Since the cams 71 are aligned with the followers 61, the corner guide rods 60 and the entire frame 50 are lowered as the followers 61 enter the recessed area of the cams 71*a* and 71*b*. Referring to FIG. 7, one cam 71 is shown in the raised position where the overhead frame 50 is ready to receive a door section 20. In FIG. 8, the cam 71 is shown in the lowered position, where the collar 63 abuts a block 62 whereby the overhead frame 50 is supported in the desired vertical position, relative to the door section 20. In FIG. 4, there is an end view of a door section 20 on the base 16 showing the hold-down pads 56 in position above the door section 20.

Further, much of the weight of the overhead frame 50 against the cams 71 and the cam followers 61 is relieved by counterweights 75, which are carried by the cables 76 which pass over ball bearing pulleys 77 and are attached either to the horizontal support 54 of side 52 or to the horizontal guide member 59. The pulleys 76 and 77 are rotatably mounted on support arms 157 which are fixedly mounted on the base 16.

The description of the endwise pressure applying means C may be more clearly understood by referring particularly to FIGS. 5, 6 and 9. After the frame 50 has been lowered so as to maintain the door section parts in place against the support plate 16, the endwise pressure means C applies pressure against the end cross support or stile 80 as shown in FIG. 6, whereby pressure is applied to the door section 20, since the opposite end stile 82 abuts the end blocks 18. Also, the side rails 81 of the door 20 receive endwise pressure so that the ends of the rails 81 are aligned with the end stiles 80 and 82. Furthermore, the intermediate stiles 83 and 84 are adapted to abut the stile stops 85, which are detachably mounted on the support plate 16 and fit beneath the door panels 86.

Endwise pressure is applied through the operation of the rockable members 87 which are pivotally mounted at one end of the frame A, as at 88. The lower ends of the rockable members 87 are provided with cam roller followers 89 which are operably aligned against the cams 90. The cams 90 are fixed to the end shaft 40. Referring particularly to FIG. 9, as the cams 90 are rotated by the shaft 40 to the dotted line position shown in FIG. 9, the rockable member 87 is forced to the vertical position, also shown in dotted view. During movement to the vertical position, a pressure bar 92, attached to and passing between the rockable members 87, contacts and forces the end blocks 91 toward the opposite end of the machine 10. Since the guide rods 95 are fixed to the end blocks 91, the movement of the blocks 91 also imparts linear movement to the rods 95. Also, since the guide rods 95 fixedly carry the hold-down pads 56 and air guns 57, as the rods 95 are moved, the hold-down plates 56 and air guns 57 are moved into their appropriate positions for doweling or fastening the stiles 80, 82, 83 and 84 to the side rails 81.

As shown best by FIGS. 6 and 15, endwise pressure is directly applied to a door section 20 by means of resiliently mounted pusher members 96 which are positioned on the

underside of the two hold-down pads 56 nearest the endwise pressure applying means C, whereby force is applied to both the side rails 81 and the end stile 80. As pressure is being applied by the pusher members 96, the stile 82 and opposite ends of the side rails 81 abut the block members 18 and the stiles 80, 83 and 84 abut the block members 85. The guide rods 95 are returned to the operating position by compression springs (not shown) which are mounted integral with the rods 95 at the end of the machine 10 which is opposite to the endwise pressure applying means C.

The description of the crosswise pressure applying means D may be most clearly understood by referring to FIGS. 2, 12, 13 and 14. Crosswise pressure is applied to a door section 20 by means of lever arms 100 which are fulcrumed at 101 near the bottom of the machine 10. The fulcrumed levers 100 are provided with cam follower rollers 102 which are aligned with cams 103. The cams 103 are fixedly secured to the rear drive shaft 25. In FIG. 14, the cams 103 and levers 100 are shown before pressure is applied to a side rail 81 and in FIG. 12, the cams 103 have rotated the lever 100 inwardly, whereby crosswise pressure is being applied to the door section 20.

The pressure is directly applied to the rail 81 by the channel member 105 which is slidably mounted on the support plate 16 and is secured to the roller block 106, which is also slidably mounted on the plate 16. The sliding movement of the channel member 105 and block 106 is assisted by the upper rollers 107 and 108, which are rotatably mounted within the roller block 106 and the channel member 105 respectively. Furthermore, lower rollers 109 are provided on the under side of the support plate 16. The rollers 109 are rotatably carried by the block 110 which is secured to the channel 105. The rollers 109 are adapted to avoid tipping or rotation of the channel member 105 as pressure is being applied.

The member 105 is resiliently mounted to the adjusting bar 115 by the cushion springs 116 and 117. Cushion spring 116 is a heavy spring positioned between the roller block 106 and the adjusting bar 115 and the cushion spring 117, lighter than spring 116, is positioned between the angle member 118 of the block 106 and the angle member 119 of the adjusting bar 115.

The adjusting member 115 is provided with a plurality of openings 120 so that the channel member 105 may be moved to various places on the support plate 16 whereby door sections of different widths may be accommodated. Referring particularly to FIG. 13, the adjustment for accommodating varying widths of door sections 20 is accomplished by means of the apparatus, generally 125. The adjusting apparatus includes a lever arm 126 and linkage 127, which are pivotally carried by legs 128 and 129. The legs 128 and 129 are pivotally mounted on the base leg 130 which is carried by the yoke member 131*a*. The legs 128 and 129 are positioned within slots provided in the slotted pin members 131 and 132 and are maintained in place in the slots of pin members 131 and 132 by the L-shaped retaining members 133 which block the slot openings. A tension spring 135 is positioned between the pivots 136 of linkage 127 and leg 129 and of arm 126 and leg 128 whereby the leading portions of the pin members 131 and 132 are maintained in place in the openings 120 of the adjusting member 115.

The pin members 131 and 132 are readily movable to different openings 120, so as to accommodate different width door sections 20 by a simple manual operation. The operator simply rotates the lever arm 125 downwardly and against the tension of spring 135. This movement causes the legs 128 and 129 to pivot outwardly and abut the blocking arm of retaining members 133 so that the pins 131 and 132 are removed from one opening 120 and movable to another. When the pins 131 and 132 are aligned with the desired aperture 120, the lever 126 is rotated upwardly and the spring 135 retains the legs 128 and 129 in place.

As the door section is being held in proper vertical position, and while crosswise and endwise pressure are being applied, the fastening means E, and specifically, the air guns 57 drive rivets or dowels into the rails or stiles so as to rigidly assemble the door section 20. The particular guns 57 which are used are well known devices and a detailed description is believed to be unnecessary. However, briefly, the guns are provided with a magazine for carrying a plurality of dowels, and upon the appropriate signal indicating the endwise pressure and crosswise pressure are being applied and that the door section 20 is being maintained in proper vertical alignment, compressed air simultaneously drives all the dowels. The dowels are driven at precisely the desired position on given door sections having a certain length and width and having a certain number of stiles since all door sections are held in a uniform crosswise position and endwise position on the base 16.

After a door section 20 has been assembled the ejection means F removes the section from the machine. The overhead frame 50 is raised by the raised portion of the cams 71 and end pressure is also be released. At this time, referring to FIG. 10, the cams 140, which are fixed to the end shafts 40, raise the cam follower members 141. The members 141, through channel members 142, carry elongated plate supports 143. Referring particularly to FIG. 11, the plate 143 carries a plurality of upright supports 144 which rotatably carry a plurality of shafts 145. The shafts 145 carry sprockets 146 which mesh with chains 147 that transfer the rotation of one 145 to the next shaft 145. Mounted on the ends of the shafts 145 are serrated wheels 148 which are adapted to pass through suitable openings provided in the plate 16 as the cams 140 raise the cam follower members 141 and thereby the shaft 145 and wheels 148. One of the shafts 145 is operably connected to a drive means 160, by a chain 161 whereby rotational movement is imparted to all the wheels 148. As the wheels 148 are rotated in the raised position and in the direction illustrated by the arrows in FIG. 11, the wheels 148 contact the underside of the rails 81 of an assembled door section 20 and eject the section from the machine 10. The motor 150 is started by a limit switch 165 which is actuated by a cam 166 which is adapted to start and stop the motor 150 at the appropriate time.

Although the operation of the door section assembly apparatus 10 should be apparent from the foregoing description, a brief description of the operation will be operated in order that the invention will be thoroughly understood.

A door section 20 is first loosely assembled by manual operation on the roller table 21. After the ejection means F has ejected a door section 20, the table 21 may be rolled forward to the operating portion of the machine 10, and the loosely assembled section is easily placed on the support plate 16. When the door section 20 is in position, a switch is manually actuated and the operating cycle starts.

Upon actuating the drive circuit, the drive means 30 rotates the back drive shaft 31, and, through bevel gears 41 and 42, the end shafts 40 are also rotated. This causes the cams 71 to rotate thereby lowering the overhead hold-down assembly 50, until the collars 63 abut the blocks 62. The overhead assembly 50 is completely lowered after about a 40° rotation of the back shaft 31. The hold-down pads 56 are then within approximately 1/64" of the upperside of the door section 20. It is important that the hold-down pads 56 be in place before substantial endwise pressure or crosswise pressure is applied, since otherwise the door section 20 would be likely to buckle from the pressure.

After the overhead hold-down assembly 50 is in place, the back shaft 31 and end shafts 40 continue rotating and the rotation of the cams 90 of the endwise pressure applying means C force the rockable members 87 to the vertical position. During this movement, the pressure rod 92

applies pressure against the end plates 91, thereby pushing the guide rods 95 and applying endwise pressure to the door section 20. The movement is directly applied to the ends of the side rails 81 and to the stile 80 by the resiliently mounted pressure applying means 96, which are mounted on the underside of the hold-down pads 56 closest to the endwise pressure applying means C. The endwise pressure is gradually applied during approximately a 90° rotation of the end shafts 40.

Approximately 65° after the overhead hold-down assembly has been lowered, and while endwise pressure is being applied to the door section 20, the back rail 105 is being pushed towards the angle member 17 so as to apply crosswise pressure to the door section 20 as the cam 103 pivots the lever 100 into the position shown in FIG. 12.

When the crosswise and endwise pressure are being applied to the door section 20 and when the door section 20 is being maintained in approximate vertical alignment by the hold-down pads 56, the air guns 57 receive a signal that conditions for securing all parts of the door section 20 are proper, and compressed air drives the dowels in the guns 57 into the door section, whereby the stiles are securely fastened to the side rails. Specifically, the dowels are driven into mortise and tenon joints 175 so as to rigidly connect both ends of each of the center stiles to the side rails 81, as shown in FIG. 6. Further, as shown best in FIGS. 12 and 14, the panels 86 are securely maintained in place in the grooves provided in the side rails 81 and also in the center stiles. The doweling operation takes place during approximately a 20° rotation of the back drive shaft 31.

When the doweling operation is completed, the rail 105 is moved back approximately ½" by means of the compressed spring 170, and the endwise pressure is released as the cam 90 is rotated to allow the rocking member 87 to move towards the starting position by action of springs (not shown) which are integrally mounted with the guide rods 95, whereby the rods 95 are returned to the starting position. Further, the cams 71 begin to lift the overhead frame 50 upwardly.

Approximately after an additional 40° rotation of the back shaft 31, the cams 140 move the cam followers 141 and thereby the eject wheels 148 upwardly until the wheels 148 contact the underside of the door section 20. The rotation of the wheels 148 quickly removes the assembled door section from the bed 16. The ejecting operation is completed during appromixately a 100° rotation of the back shaft 31. After the door section 20 is removed, the operation is stopped during approximately a 30° rotation of the back shaft 31.

The complete cycle of operations described takes place in a single 360° revolution of the back shaft 31 and is completed in less than fifteen seconds.

It should be readily apparent from the above description that all of the objects previously set forth have been accomplished. It is seen that a door section is quickly and efficiently aligned and secured, the side rails being substantially parallel to each other and substantially perpendicular to the center stiles, which in turn are substantially parallel to each other. Furthermore, the machine is adapted to assemble a plurality of door sections, all of which are uniformly assembled. Further, the apparatus 10 is not only a great labor saving device, but it also makes a greatly improved door section which is both properly aligned and securely fastened.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

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

1. Apparatus for rigidly assembling a door section having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, an overhead assembly mounted on said frame, said assembly having laterally stationary and laterally movable sides and hold-down plates mounted on each of said sides, both of said sides being movable in a vertical direction whereby said hold-down plates maintain said door section in position against said frame, support members slidably carried by said overhead assembly and fixedly carrying said hold-down plates, contact members mounted on the under side of said hold-down plates and being adapted to transmit endwise pressure to said door section, means for sliding said support members whereby endwise pressure is applied to said door section by said contact members for rigidly aligning said cross supports with said side rails, means mounted on said frame for applying crosswise pressure to said door section so as to align said rails with said cross supports whereby said cross supports and said rails are rigidly held in place, and means mounted on said frame for fastening said cross supports and said side rails together as parts of said door section are being maintained in substantially the same plane and as said door section is under crosswise and endwise pressure so as to rigidly assemble said door section.

2. The apparatus of claim 1 wherein said means for sliding said support members includes a rockable member having a bar for applying pressure to said support members and cam means for pivoting said rockable member whereby said support members are moved and pressure is applied to said door section.

3. Apparatus for rigidly assembling a door section having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, an overhead assembly mounted on said frame, said assembly having laterally stationary and laterally movable sides and hold-down plates mounted on each of said sides, both of said sides being movable in a vertical direction whereby said hold-down plates maintain said door section in position against said frame, rods slidably carried by said overhead assembly and fixedly carrying said hold-down plates, contact members mounted on the under sides of said hold-down plates, said contact members being adapted to transmit endwise pressure to said door section, means mounted on said frame for sliding said rods whereby endwise pressure is applied for rigidly aligning said cross supports with said side rails, a stationary bar mounted on said frame for aligning one of said side rails, a back support movably mounted on said frame for aligning a second side rail, cam means mounted on said frame for moving said movable back support toward said stationary bar whereby crosswise pressure is applied to said door section so as to rigidly hold said cross supports and said side rails in place, and means mounted on said hold-down plates for fastening said cross supports and said side rails together as parts of said door section are being maintained in substantially the same plane and as said door section is under crosswise and endwise pressure so as to rigidly assemble said door section.

4. Apparatus for rigidly assembling a door section having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, an overhead assembly mounted on said frame, said assembly having laterally stationary and laterally movable sides and hold-down plates mounted on each of said sides, both of said sides being movable in a vertical direction so that said hold-down plates maintain said door section in position against said frame, rods slidably carried by said overhead assembly and fixedly carrying said hold-down plates, contact members mounted on the under side of said hold-down plates, said contact members being adapted to transmit endwise pressure to said door section, means mounted on said frame for sliding said rods whereby endwise pressure is

applied for rigidly aligning said cross supports with said side rails, a stationary bar mounted on said frame for aligning one of said side rails, back support movably mounted on said frame for aligning a second side rail, cam means mounted on said frame for moving said movable back support toward said stationary bar whereby said door section in under crosswise pressure, means mounted on said hold-down plates for fastening said cross supports and said side rails together as parts of said door section are under crosswise and endwise pressure in order to rigidly assemble said door section, a plurality of rollers mounted on said frame, said rollers being movable in an upward direction and being adapted to raise said door section from said frame, and means mounted on said frame for rotating said rollers for ejecting said door section from said frame.

5. Apparatus for rigidly assembling a door section having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, said frame having a table for supporting said door section during the initial loose assembly of the door section, vertically movable means mounted on said frame for holding said door section against said frame whereby parts of said door section are maintained in substantially the same plane, said holding means including plates for maintaining said door seution against said frame, means mounted on said frame for applying endwise pressure to said door section so as to align said cross supports with said side rails, means mounted on said frame for applying crosswise pressure to said side rails so as to align said side rails with said cross supports whereby parts of said door section are rigidly held together, said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, drive means mounted on said frame for moving and maintaining said holding means, said endwise pressure applying means and said crosswise pressure applying means against said door section, means for fastening said cross supports and said side rails together as said drive means maintains said holding means and said pressure applying means against said door section, said fastening means being carried by said plates, and means mounted on said frame for ejecting the door section from said frame after the fastening of said cross supports and side rails together.

6. Apparatus for rigidly assembly a door section having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, an overhead assembly mounted on said frame, said assembly having laterally immovable and laterally movable sides and hold-down plates mounted on each of said sides, both of said sides being movable in a vertical direction whereby said hold-down plates maintain said door section in position against said frame, means mounted on said frame for applying crosswise pressure to said door section, means mounted on said frame for applying endwise pressure to said door section while crosswise pressure is being applied to said door section supports and said side rails are rigidly held together, both of said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, and means for fastening said cross supports and said side rails together as parts of said door section are being maintained in substantially the same plane and as said door section is under both crosswise and endwise pressure so as to rigidly assemble said door section, said fastening means being carried by said hold-down plates.

7. Apparatus for rigidly and uniformly assembling door sections having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, movable means mounted on said frame for maintaining parts of said door section in substantially the same vertical plane and on said frame, means mounted on said frame for applying crosswise pressure to said door section, means mounted on said frame for applying endwise pressure to said door section while crosswise pressure is being applied to said door section whereby said cross supports and said side rails are held together, both of said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, means mounted on said frame for fastening said cross supports and said side rails together as parts of said door section are being maintained in proper vertical alignment and as said door section is undergoing both crosswise and endwise pressure so as to rigidly and uniformly assemble said door section, a plurality of rollers mounted on said frame means for moving said rollers in an upward direction so as to raise said door section from said frame, and means mounted on said frame for rotating said rollers for ejecting the door section from said frame as said drive means maintains said holding means and said pressure applying means against said door section.

8. Apparatus for rigidly and uniformly assembling door sections having side rails and cross supports positioned between the side rails, comprising a first frame for supporting said door section, a vertically movable frame having hold-down plates mounted thereon, said hold-down plates being mounted over said first frame for maintaining parts of said door section in substantially the same vertical plane and against said first frame, means mounted on said first frame for applying crosswise pressure to said door section, means mounted on said first frame for applying endwise pressure to said door section while crosswise pressure is being applied to said door section whereby said cross supports and said side rails of said door section are rigidly held together, both of said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, and means mounted on said hold-down plates for fastening said cross supports and side rails together as said parts of said door section are being maintained in proper vertical alignment against said first frame and as said door section is undergoing both crosswise and endwise pressure so as to rigidly and uniformly assemble said door section.

9. Apparatus for rigidly and uniformly assembling door sections having side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, vertically movable means including hold-down plates mounted over said frame for maintaining parts of said door section in substantially the same vertical plane and against said frame, means mounted on said frame for applying crosswise pressure to said door section, means mounted on said frame for applying endwise pressure to said door section while crosswise pressure is being applied to said door section whereby said cross supports and said side rails of said door section are held together, both of said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, means mounted on said hold-down plates for fastening said cross supports and said side rails together as parts of said door section are being maintained in proper vertical alignment against said frame and as said door section is undergoing both crosswise and endwise pressure so as to rigidly and uniformly assemble said door section, and means mounted on said frame for ejecting the door section from said frame after the fastening of said cross supports and side rails together.

10. Apparatus for rigidly and uniformly assembling a door section having side rails and cross supports positioned between the side rails, comprising a first frame for supporting said door section, a vertically movable frame having hold-down plates mounted thereon, said hold-down plates being mounted over said first frame for holding said door section against said first frame whereby substantially all parts of said door section are maintained in substantially the same plane, means

mounted on said first frame for applying endwise pressure to said door section in order to properly align said cross supports with said side rails, means mounted on said first frame for applying crosswise pressure to said side rails in order to align said side rails with said cross supports whereby parts of said door section are rigidly held together, said pressure applying means causing the parts of said door section to be properly held in position prior to being fastened together, drive means mounted on said first frame for moving and maintaining said holding means, said endwise pressure applying means, and said crosswise pressure applying means against said door section, and means mounted on said hold-down plates for fastening said cross support and said side rails together as said drive means maintains said holding means and said pressure applying means against said door section.

11. The apparatus of claim 10 wherein means are mounted on said frame for ejecting the door section from said frame after the fastening of the said cross supports and side rails together.

12. Apparatus for rigidly assemblying a door section having first and second side rails and cross supports positioned between the side rails, comprising a frame for supporting said door section, vertically movable means including hold-down plates mounted over said frame for maintaining parts of said door section in substantially the same plane and against said frame, means mounted on said frame for applying endwise pressure to said door section while in position on said frame so as to rigidly align said cross supports with said side rails, a stationary bar mounted on said frame for aligning said first side rail, a back support movably mounted on said frame for aligning said second side rail, cam means mounted on said frame for moving said movable back support toward said stationary bar with said door section therebetween whereby crosswise pressure is applied to said door section so as to rigidly hold said cross supports and side rails in place, and means mounted on said hold-down plates for fastening said cross supports and said side rails together as parts of said door section are being maintained in substantially the same plane against said frame and as said door section is under crosswise and endwise pressure so as to rigidly assemble said door section.

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