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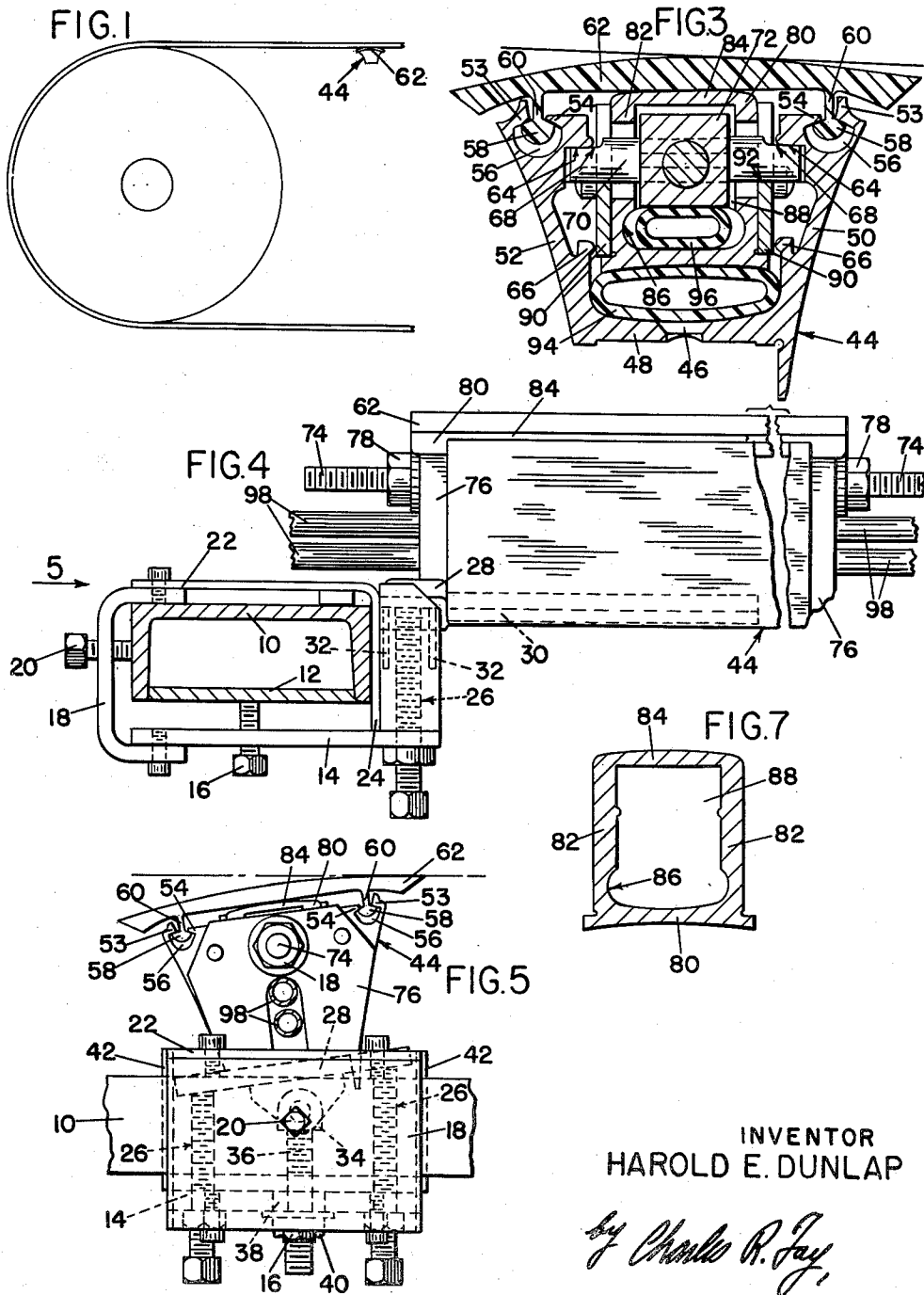
H. E. DUNLAP

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ADJUSTABLE SUPPORTS FOR FOURDRINIER SCREEN WIRES

Filed June 24, 1959

2 Sheets-Sheet 1



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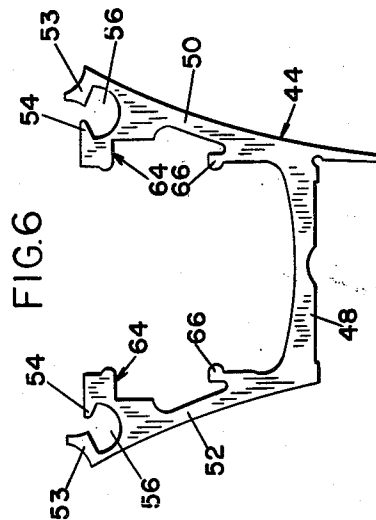
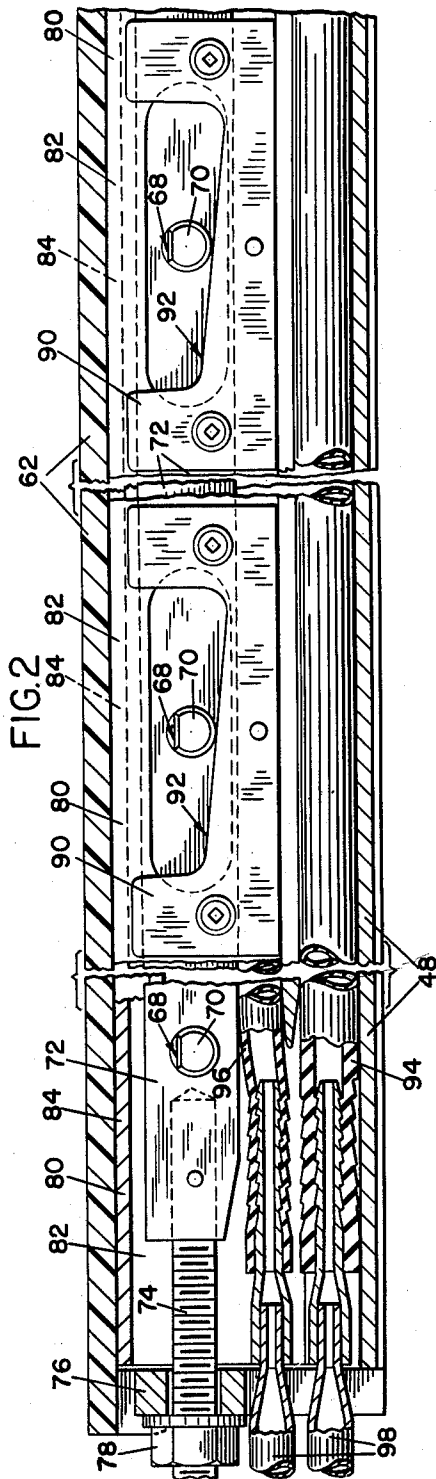
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ADJUSTABLE SUPPORTS FOR FOURDRINIER SCREEN WIRES

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10 Claims. (Cl. 162-352)

This application is a continuation-in-part of application Serial No. 784,133, filed December 31, 1959.

This invention relates to a new and improved adjustable supporting means for the wires or screens of Fourdrinier machines in the paper-making industry, and the principal object of the present invention resides in the provision of a novel support in the nature of a deflector board which not only supports the wire or screen more efficiently than either wedges or rolls of the prior art, but also greatly enhances the water-removing ability of such supports and is an improvement in this respect over roller or wedge-type deflectors of the prior art.

A further object of the invention resides in the provision of a deflector of the class described which is very easily adjustable with respect to the degree of flexure of the support or deflection member or board which is also bodily adjustable, the adjustment mechanism including control means at the ends of the device, i.e., at the sides of the framework of the Fourdrinier machine or other machine in which the device may be used.

Other objects of the invention include the provision of quick and easy adjustment by means of air or fluid pressure; the provision of a device of the class described which is easily and relatively inexpensively manufactured as for instance by the use of aluminum extrusions which extend completely across the machine from side-to-side thereof and adequately and continuously support the deflector member at all times and in varying degrees of flexing adjustment thereof, with respect to the wire of the Fourdrinier machine.

A further object of the invention resides in the provision of a special new and improved elongated extruded member which is in the general form of a channel, with the arms thereof extending in an upward direction, said channel receiving therein another elongated extruded member in the form of a box, said members being substantially longitudinally co-extensive and said box imparting pressure upwardly to the under side of the deflector board by means of pressure applied thereto in a certain new and novel manner as will be hereinafter more fully described; and the provision of a device as aforesaid including pressure means for releasing the box-like extrusion member from its pressure position against the lower surface of the deflector board, whereupon the device may be easily adjusted from the ends of the machine for increasing or decreasing the position of the box-like extruded member with relation to the deflector board in order to re-position the same and thus varying the degree of flexure of the board.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly set forth in the appended claims.

Reference is to be had to the accompanying drawings, in which:

FIG. 1 is a diagrammatic view illustrating a Fourdrinier wire with the new deflector applied thereto;

FIG. 2 is a longitudinal section through the new deflector;

FIG. 3 is a section on line 3-3 of FIG. 2;

FIG. 4 is a section illustrating the supporting means for the new device;

FIG. 5 is a view in elevation, looking in the direction of arrow 5 in FIG. 4;

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FIG. 6 is a view on an enlarged scale illustrating the main extruded member; and

FIG. 7 is a view on an enlarged scale illustrating the interior extruded member.

The horizontal screen wire of the Fourdrinier machine travels at a relatively high rate of speed from the breast roll to the couch roll, and the water tends to drip down through the screen so that the paper pulp on the wire gradually condenses. The screen wire requires supports, and the prior art has used so-called small table rolls, or deflectors in the nature of wedges provided with flat tops and beveled edges facing the direction of travel of the wire. These wedges tend to scrape off the bottom of the wire and the rolls being rotated by the wire, develop a slight vacuum at the rear portion thereof with respect to the passage of the wire thereover, and this helps to suck the water from the wire. There are well known objections to both of these devices. The rollers must be dynamically balanced, and are apt to deflect, being supported at their ends only. This allows the wire to sag across the face of the machine. Also, water temporarily adhering to the rolls is often flung back to the under sides of the wire in advance of the rolls, and the rollers may tend to clog the wire. The wedges are not provided with any natural suction means such as occurs with the use of the rollers and if the wire sags between supports, the sharp front edge of the wedge may abrade the wire. The present invention presents a great improvement over the rolls or wedges in many respects.

In carrying out the present invention, the main support for the device is provided by an extruded channel member preferably made of aluminum and best shown in FIG. 3. This extrusion contains the operative parts and is mounted at its ends in an adjustable bracket arrangement which is capable of being applied more or less where desired in any kind of machine where it may be appropriate. Referring now to FIGS. 4 and 5, it will be seen that the reference character 10 indicates an inverted channel member which is closed by a member 12, and this represents a rail or section of a machine framework upon which the device is adapted to be mounted. In order to make the same adjustable, there is provided a base plate 14 which is provided with an adjustable set-screw or the like 16 and connected to this base plate there is an outer member of C-form 18, also having an adjustment as by a set-screw or the like 20 at right angles to the one at 16. This C-shaped member may be secured in any way to a top plate member 22 which in this instance extends at 24 and is secured as by welding or otherwise to base plate 14. The base plate 14 mounts a pair of set-screws or the like generally indicated at 26, 26 and these in turn support a T-shaped bracket or the like having a head 28 and a leg 30, the leg 30 being provided with mounting holes for securing the same to the extruded piece above referred to and to be later described. These brackets support the entire deflector mechanism.

The set-screws 26 may of course be adjusted to provide any tilt desired with relation to the head 28 of the T-shaped bracket, and this in turn will cause tilting to the degree desired of the extrusion and consequently of the entire device.

The head of the T-shaped bracket 28 is provided with a pair of spaced brackets 32 between which there is mounted a clevis 34 having a threaded end 36 extending through an enlarged hole 38 and secured by a nut 40 or the like so as to allow a slight adjustment of the entire apparatus relative to the mounting bracket 14 when nut 40 is loosened. It is desired that one end of the head 28 of the T-shaped bracket should contact a wall of the box 42, regardless of the angular adjustment of the apparatus, and this is accomplished by reason of the loose-

ness of the fit of the shank 36 of the clevis 34 in the hole 38.

Referring now to FIG. 3, the channel member is generally indicated at 44 and in this view there is shown one of the mounting holes 46 for cooperation with the leg member 30 in the T-shaped bracket support whereby the extrusion is supported as above described across the machine and under the Fourdrinier wire.

The channel-shaped extrusion itself is best shown in FIG. 6 and comprises essentially a base or web member at the bottom and this is indicated at 48. At either edge thereof it is provided with an upstanding arm as at 50 and 52, these being inclined outwardly as shown. These arms terminate in longitudinal inwardly-directed members 53, 53 which cooperate with oppositely-directed fingers 54, 54 outlining the top of longitudinal top-opening restricted recesses 56, 56. These recesses 56, 56 provide reception means for the downwardly-depending heads 58, 58 of a pair of spaced ribs 60, 60 made integral with the adjustable deflector board 62 which in effect forms the adjustable flow water drainage inducer member and wire support as will become more apparent hereinafter.

The member 62 is assembled with relation to the extruded member by sliding it endwise in a manner which will be apparent to those skilled in the art and the member 62 will be held in fixed relation relative to the channel member 44.

The channel member 44 is also provided with opposite elongated downwardly-directed flat shoulders 64, 64 located at the inside of each arm 50, 52; and there are upstanding longitudinal projections 66 also at the interior surfaces of these arms. The flat shoulders 64, 64 serve to locate and hold corresponding flat shoulders 68 of cross-pins 70, see FIG. 3; and these shoulders hold and locate the pins against any further upward motion. The pins hold in position and in turn are held by a longitudinal stop pin bar indicated at 72. At the ends of this bar there are provided a pair of axially extending pins 74 which extend out beyond the end plates 76. Pins 74 are threaded and are provided with corresponding nuts 78 for the longitudinal adjusted positioning of the stop pin bar 72 as will be made more apparent hereinafter.

There is another elongated extruded member in the shape of a box, indicated by the reference numeral 80, see FIG. 7, and this is provided with a bottom wall connecting opposite side walls 82, 82, and having a top wall indicated at 84. The top wall has a top exterior curved surface. This box-like member is referred to as the pressure bar section and is provided with through cross holes in which the pins 70 extend from side-to-side and beyond. In the lower portion thereof, the pressure bar section is provided with a generally oval-shaped space indicated at 86 for a purpose to be described. The stop pin bar 72 fits in the upper portion of the pressure bar section in the space which is herein indicated at 88. The pins 70 extend laterally of bar 72 and considerably out at the side edges thereof, where the flat surfaces 68 of the pins may be in a position to contact the elongated shoulder members 64 of the channel member. The pressure bar section 80 is not fixed but is capable of vertical motion, and when it moves upwardly it causes a deflection of the board member 62 as is clearly shown in FIG. 3. When the pressure bar section is depressed, it will allow member 62 to become flattened out by releasing the upward pressure thereon.

Fastened to the side walls of the pressure bar section 80 there are a series of stop plates generally indicated at 90 and each of these stop plates is provided with an inclined top edge portion 92 which engages the under sides of the pins 70 opposite the flat shoulders 68. Any longitudinal motion of the stop plates 90 clearly will result in a re-positioning of the same in a vertical direction and also of the pressure bar section due to the fact

that the pins 68 are fixed against vertical motion upwardly by the shoulders 64. Therefore the vertical position of the pressure bar section 80 is dependent upon the longitudinal adjustment of the stop pin bar 72 because this longitudinal adjustment will result in moving the stop plates 90 and the inclined edges 92. Therefore the pressure bar section 80 is variably vertically adjustable.

The bottom surface of the pressure bar section 80 is slightly concave in order to receive a hose 94 and another but smaller hose 96 is received in the oval portion or space 86 of pressure bar section 80. These hoses are connected to sources of pressure as for instance by pipes 98 and any kind of convenient valve control may be provided for inflating or applying interior pressure to either one of the two hoses 94 or 96 alternately as may be desired.

It is pointed out that if hose 94 is inflated, the pressure bar section 80 will rise to the extent limited by the adjustment of plates 90 and thus pressure bar section 80 at its topmost surface will engage the under surface of the deflector board 62, deflecting the same substantially centrally thereof as best shown in FIG. 3. This action is made adjustable by reason of the nuts 78 and threaded rods 74 on the stop pin bar 72. This causes different degrees of upward motion of the pressure bar section 80 relative to the deflector board 62.

If now the pressure on the hose 94 be reduced and the pressure in hose 96 increased, this pressure will thereby be exerted upwardly against the stop pin bar 72 at the lowest edge thereof. However, this bar cannot rise because of the engagement of pins 70 with shoulders 64 and therefore the pressure bar section 80 must be lowered out of pressure contact with relation to the deflector board 62. It is when this condition is obtained by proper control of the respective pressure pipes that the adjustment of screw-threaded rods 74 may be made in order to shift the position of the stop bar 72 relative to the pressure bar section 80 and plates 90 which are fixed in position with respect to the pressure bar section.

The deflector board 62 may be slid longitudinally sufficiently to disengage it from the pockets holding the heads 58, and therefore if the deflector board should become worn, it may be quickly and easily replaced.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A deflector for a paper-making machine having a traveling web comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the web, an elongated flexible deflector board on the support, said support including a bottom member and a pair of arms extending upwardly from said bottom member, means releasably securing said deflector board to the arms said deflector board extending directly transversely across the support from one edge to the other of the support, and a bar located in said support between the arms for applying an upward pressure to the deflector board, said bar extending generally longitudinally of and for substantially the length of the deflector board.

2. A deflector for a paper-making machine having a traveling web comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the web, a flexible deflector board on the support, said support including a bottom member and a pair of arms extending upwardly from said bottom member, said deflector board being releasably secured to the arms at and extending transversely of the support from one side edge to the other, a bar located in said support between the arms for applying an upward pressure to the deflector board, said bar extending generally longitudinally of and for substantially the length of the deflector board, and means for moving said bar upwardly and holding the

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same in pressure-applying position with respect to the deflector board.

3. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms having upper ends, said deflector board being releasably secured to the arms at their upper ends and extending transversely of the support, a pressure member located in said support between the arms for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, and means mounting the support for tilting adjustment on an axis below and parallel to the support.

4. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms having upper ends, said deflector board being releasably secured to the arms at their upper ends and extending transversely of the support, a pressure member located in said support between the arms, said pressure member having an upward motion for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, and means adjustably positioning said pressure member and limiting its upward motion and thereby the pressure on the deflector board.

5. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms, said deflector board being releasably secured to the arms and extending transversely of the support, a vertically movable pressure member located in said support between the arms for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, means adjustably positioning said pressure member and limiting its upward motion and thereby the pressure on the deflector board, and means to move said pressure member downwardly to relieve the pressure from the deflector board.

6. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced generally upright arms having upper ends, said deflector board being releasably secured to the arms at their upper ends, an elongated vertically movable pressure member located in said support between the arms for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally substantially of and for the length of the deflector board, a movable bar extending longitudinally of and in conjunction with said pressure member, a series of lateral projections on the bar, stop means on the arms of the support abutting said projections and limiting its upward motion, and pressure means bearing directly on said bar to move it relatively upwardly.

7. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms, said deflector board being releasably secured to the arms and extending in general conformance with the support an elongated vertically movable pressure member located in said support between the arms under the deflector board for applying an upward pressure to the deflector board, said pressure member extending generally longi-

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tudinally of and for substantially the length of the deflector board, a movable bar extending longitudinally of and in conjunction with said pressure member, a series of lateral projection on the bar, stop means on the arms of the support abutting said projections and limiting the upward motion of the bar, pressure means bearing directly on said bar to move the same relatively upwardly, and pressure means associated with the bar for moving it downwardly.

8. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms, said deflector board being releasably secured to the arms, a pressure member located in said support between the arms for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, shoulders on the arms, a stop pin bar associated with said pressure member, pins on said stop pin bar adapted to engage the shoulders on the arms, means engaging said bar to move it relatively upwardly and the pressure member downwardly, the pressure member being moved downwardly by reason of the limitation of upward motion of the stop pin bar due to said shoulders.

9. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms, said deflector board being releasably secured to the arms and extending generally along the support, a vertically movable pressure member located in said support between the arms for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, shoulders on the arms, a stop pin bar associated with said pressure member, pins on said stop pin bar adapted to engage the shoulders on the arms, means engaging said bar to move it relatively upwardly and the pressure member downwardly, the pressure member being moved downwardly by reason of the limitation of upward motion of the stop pin bar due to said shoulders, stop plates on the pressure member, said stop plates being adjustable, inclined edges on the stop plates engaging the extended pins, and means to move said stop pin bar longitudinally to vary the relative position of said pressure member relative to the stop plates.

10. A deflector for a paper-making machine having a traveling wire comprising an elongated support adapted to extend across the machine transversely to the direction of travel of the wire, a flexible deflector board on the support, said support including a pair of spaced arms, said deflector board being releasably secured to the arms and extending along the support, a vertically movable pressure member located in said support between the arms under the deflector board for applying an upward pressure to the deflector board, said pressure member extending generally longitudinally of and for substantially the length of the deflector board, shoulders on the arms, a stop pin bar associated with said pressure member, pins on said stop pin bar adapted to engage the shoulders on the arms, means engaging said bar to move it relatively upwardly and the pressure member downwardly, the pressure member being moved downwardly by reason of the limitation of upward motion of the stop pin bar due to said shoulders, stop plates on the pressure member, said stop plates being adjustable, inclined edges on the stop plates engaging the extended pins, means to move said stop pin bar longitudinally to vary the relative position of said pressure member relative to the stop plates, and means for adjusting the stop plates including means at its ends for longitudinally mov-

ing the stop pin bar to re-position the pins relative to
the inclined edges on said stop plates.

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