July 20, 1943. D. WARREN 2,325,016

PAPER MACHINE SLICE ASSEMBLY

Filed Nov. 16, 1938 5 Sheets-Sheet 1

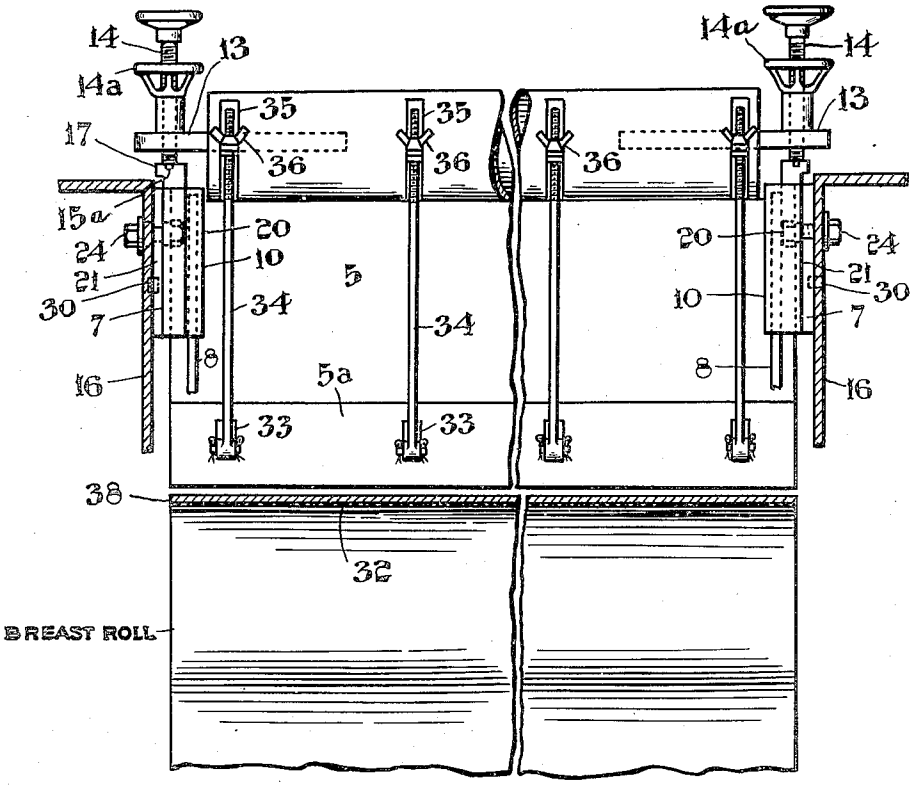


FIG. 1

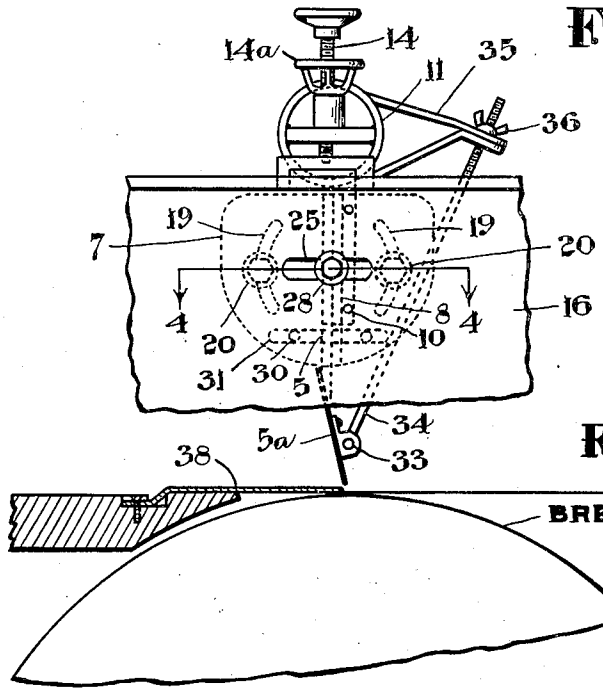


FIG. 2

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PAPER MACHINE SLICE ASSEMBLY

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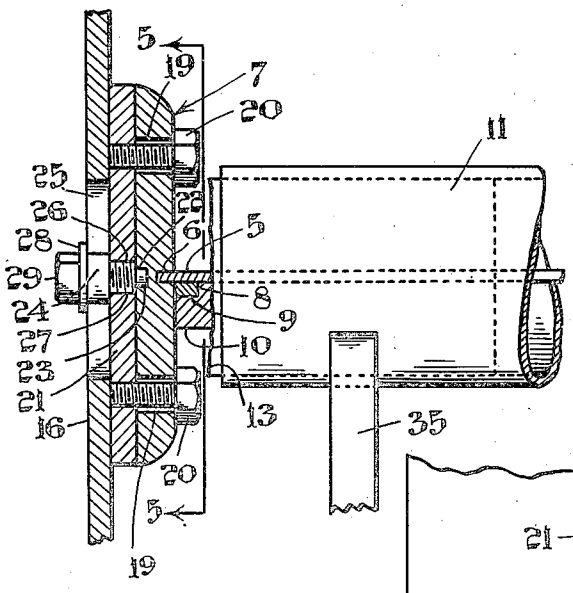


FIG. 4

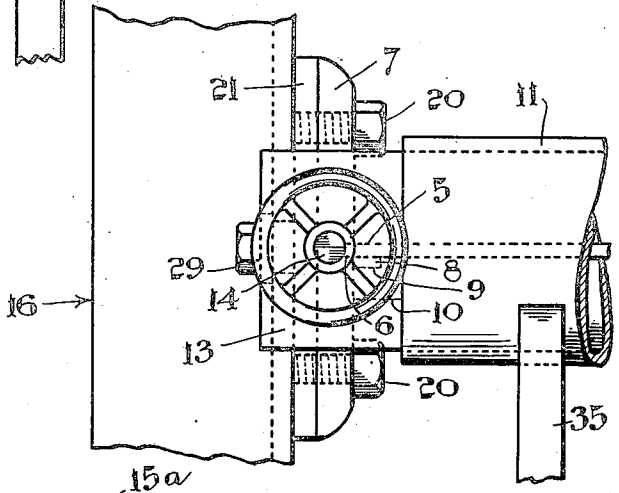


FIG. 3

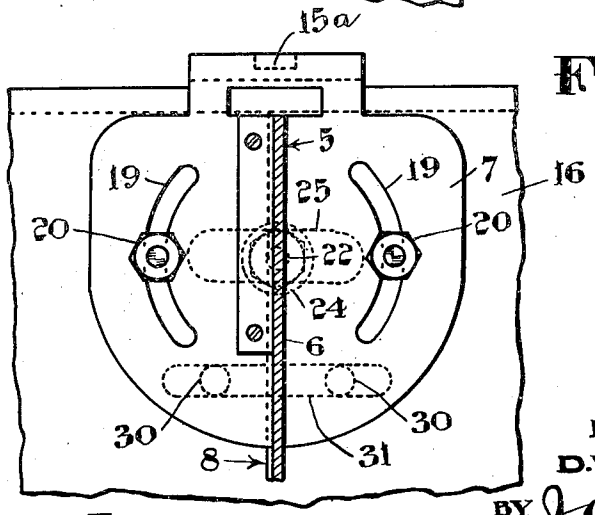


FIG. 5

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PAPER MACHINE SLICE ASSEMBLY

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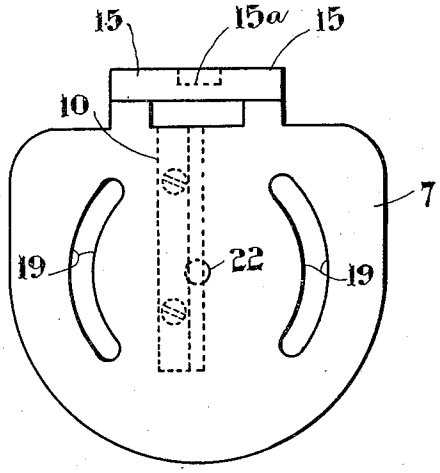


FIG.6

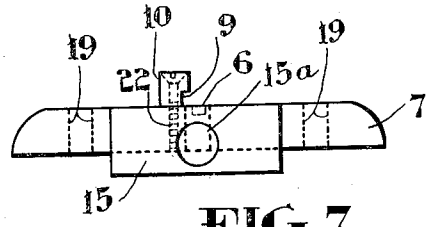


FIG.7

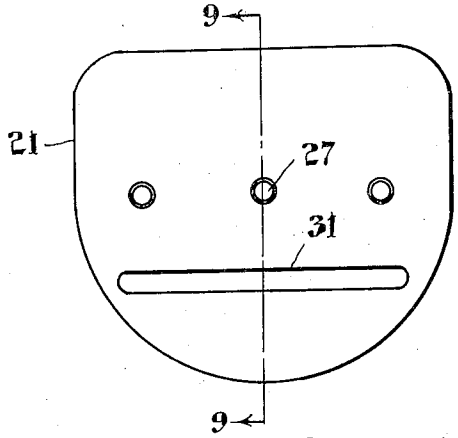


FIG.8

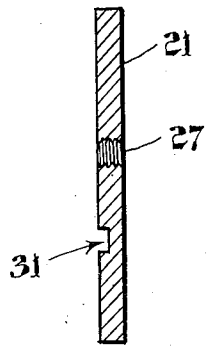


FIG.9

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PAPER MACHINE SLICE ASSEMBLY

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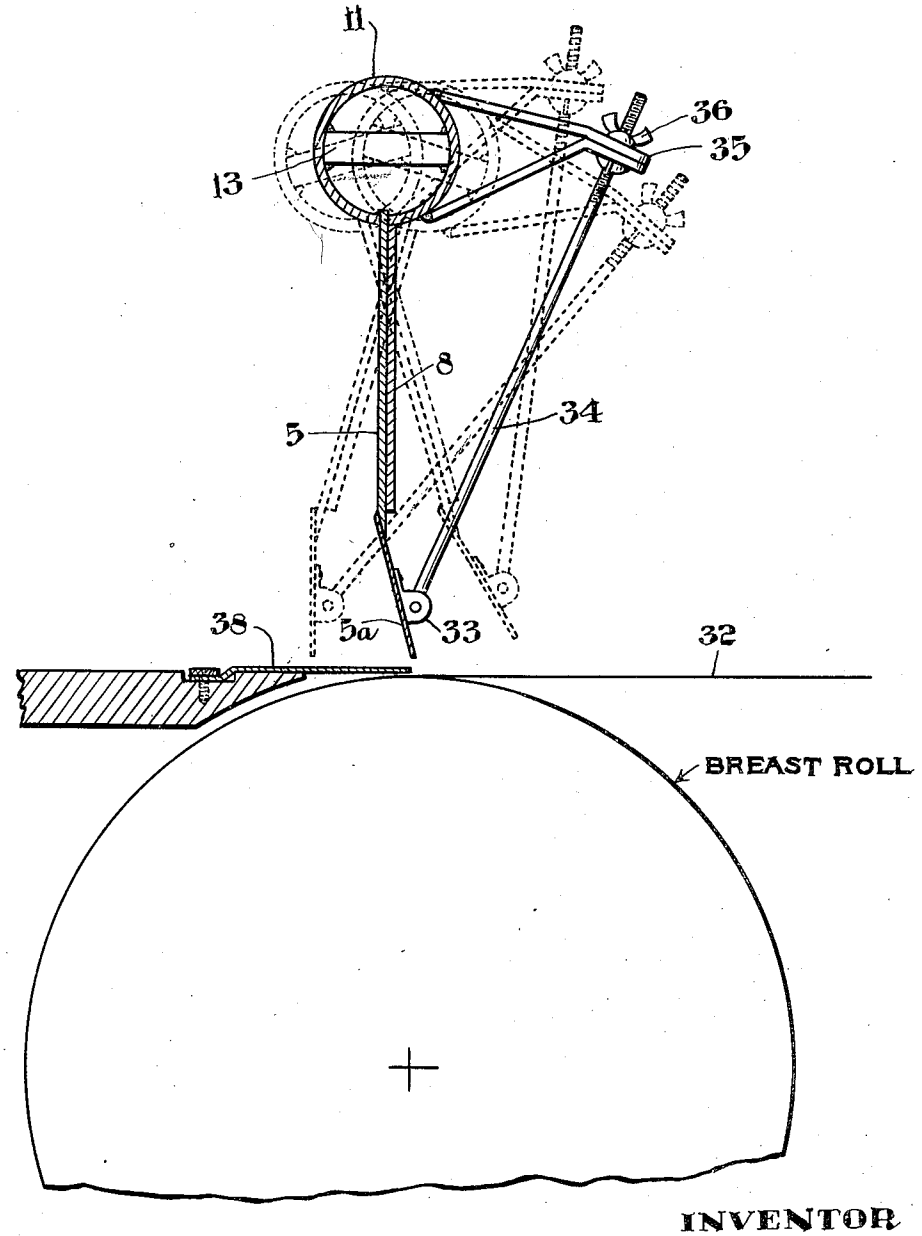


FIG. 10

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PAPER MACHINE SLICE ASSEMBLY

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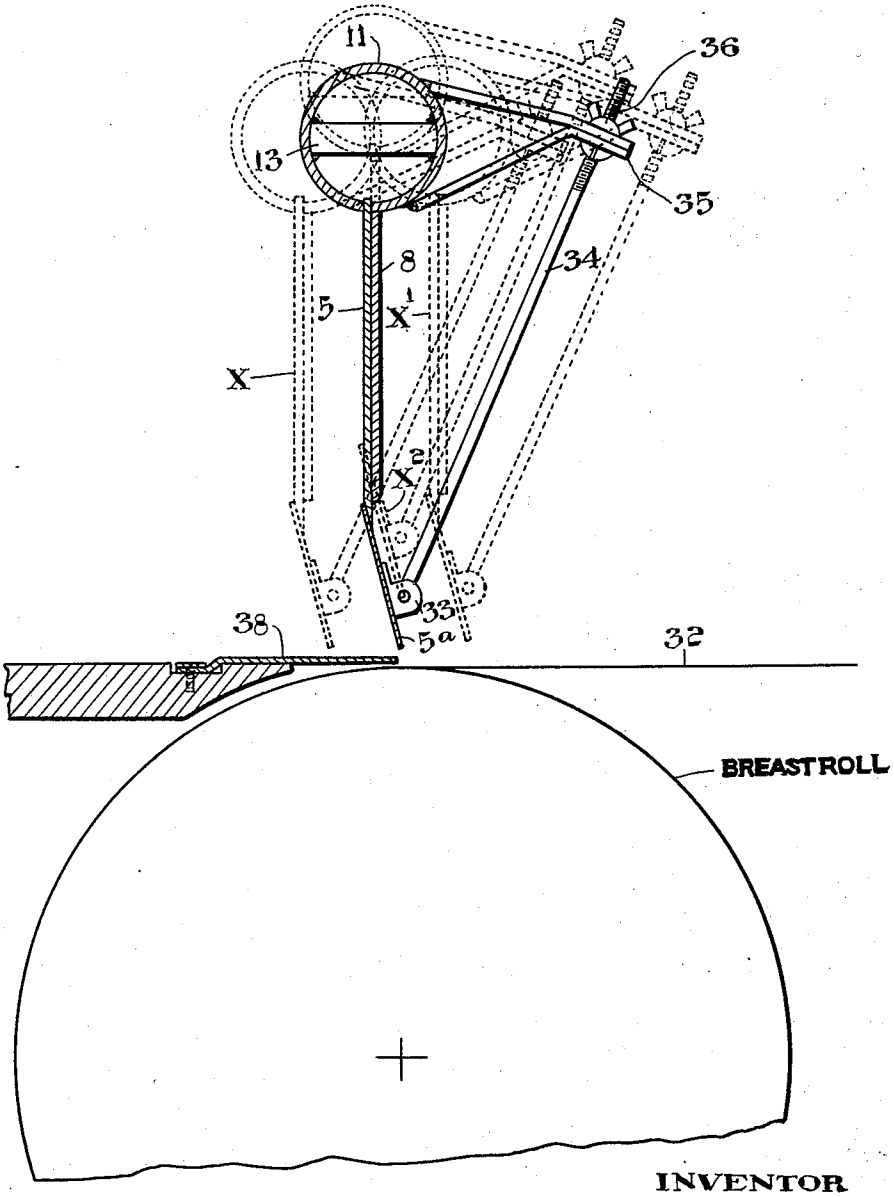


FIG. 11

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Patented July 20, 1943 2,325,016

UNITED STATES PATENT OFFICE

2,325,016

PAPER MACHINE SLICE ASSEMBLY

David Warren, Madawaska, Maine, assignor to Fraser Companies Limited, Edmundston, New Brunswick, Canada

Application November 16, 1938, Serial No. 240,785

4 Claims. (Cl. 92—44)

This invention relates to paper making machines; and it comprises a slice assembly in which an exceptionally wide range of adjustment is obtained by mounting the slice plate so that it may be raised or lowered with reference to the web forming element or swung to different angular positions about an axis that is shiftable to different positions along the path of travel of the web forming element.

According to the preferred embodiment of this invention the ends of the slice plate are fitted in guideways afforded by a pair of swivel plates mounted to swing the plate to different angular positions about a horizontally shiftable axis extending across the path of travel of the sheet forming element. The slice plate is suspended from a supporting beam equipped with adjusting screws for raising and lowering the plate in the guideways. The adjusting screws are threaded through end members of the supporting beam and are arranged with their lower ends resting on suitable portions of the swivel plates. A characteristic feature of this assembly is that the lip of the slice plate, in addition to being raised and lowered with reference to the sheet forming element may be shifted to different positions along the path of travel of said element by (*a*) swinging the slice plate about its horizontal axis or (*b*) shifting said axis in a horizontal plane along said path of travel. Means are also provided for effecting local adjustment of the slice lip at different points along its length.

Proceeding now to a more detailed description reference will be had to the accompanying drawings, wherein—

Fig. 1 is a front elevation of the slice assembly applied to a Fourdrinier paper making machine.

Fig. 2 is a side view of the assembly appearing in Fig. 1.

Fig. 3 is a top plan view of a portion of said assembly.

Fig. 4 is a horizontal section taken substantially along the line 4—4 of Fig. 2.

Fig. 5 is a vertical section taken substantially along the line 5—5 of Fig. 4.

Fig. 6 is an inside elevation of one of the swivel plates.

Fig. 7 is a top plan view of the plate appearing in Fig. 6.

Fig. 8 is an inside elevation of one of the slides on which the swivel plates are mounted.

Fig. 9 is a vertical section along the line 9—9 of Fig. 8.

Figs. 10 and 11 are diagrams showing the different positions of the slice plate and lip in relation to the wire or web forming element.

As shown in these drawings the ends of slice plate 5 are slidably fitted in guideways or grooves 6 formed in the opposing surfaces of a pair of swivel plates 7. Plate 5 is also provided with guide strips 8 working in supplementary guideways 9 afforded by suitably recessed cleats 10 attached to the swivel plates 7.

The upper edge of plate 5 is welded to a supporting beam 11. This beam is shown as a hollow metal tube equipped with separately formed terminal extensions 13. Adjusting screws 14 are threaded through vertical openings provided in the extensions 13 so that the lower ends of the screws rest on supports 15 carried by the swivel plates 7. The screws 14 are provided with reduced ends 17 which are seated in recesses 15*a* formed in the supports 15. Each swivel plate 7 (Figures 4 and 6) is provided with diametrically opposed arcuate slots 19 for the passage of bolts 20 which serve to releasably clamp the swivel plate to a supporting slide 21. The slots 19 of each plate 7 are curved about a centre coinciding with the axis of a centrally located socket 22 formed in the outer surface of said plate. This socket receives a trunnion 23 which, in conjunction with the trunnion 23 journaled in companion plate 7, affords a horizontal axis about which the swivel plate 7 may be turned to swing the slice plate 5 to different angular positions as indicated by the full and dotted lines in Fig. 10. The trunnions 23 are formed by the reduced inner ends of suitable clamping bolts 24 which serve to releasably clamp the slides 21 to the frame members 16. As here shown, each bolt passes through an elongated horizontal slot 25 formed in the frame members 16 and is provided with an inner threaded portion 26 engaging in a threaded opening 27 provided in one of the slides 21. Washers 28 are interposed between the outer sides of the frame members 16 and the heads 29 of the bolts 24. Obviously, when the bolts 24 are tightened against the washers 28 the slides 21 are drawn against the inner sides of the frame members 16 and held against movement relative thereto. The slots 25 formed in the frame members 16 permit the slides 21 and the bolts 24 to be adjusted in a horizontal plane when said bolts are sufficiently loosened by turning them in a counterclockwise direction. The slides 21 are guided, during their horizontal movement, by dowels 30 which are secured to the frame members 16 and project into elongated horizontal grooves 31 formed in the outer sides of the slides.

It will thus be seen that, by adjusting the slides 21 in a horizontal direction, the horizontal axis about which the slice plate 5 is swingable may be shifted in either direction to different points along the path of travel of the Fourdrinier wire 32. This adjustment of the slice plate is indicated diagrammatically in Fig. 11 by dotted lines X and X'. In addition to the previously mentioned adjustments, the slice plate 5, as indicated by dotted lines X^2 in Fig. 11, may be raised and lowered in the guideways 6 and 8 by appropriate adjustment of the height regulating screws 14. These screws, after being turned to give the desired adjustment, may be locked in place by suitable lock nuts 14a.

The slice plate 5 is provided with the usual flexible lip 5a. This lip is fastened by brackets 33 to the lower ends of a plurality of adjusting screws 34 which constitute the means for effecting local adjustment of the lip at different points along its length. The upper portions of the screws 34 pass through brackets 35 projecting from supporting beam 11 and are equipped with adjusting nuts 36.

In some instances it is desirable to have the lip of the slice plate positioned just beyond the delivery end of the rubber apron cloth 38 over which the stock flows onto the forming wire 32. In such cases the component parts of the slice assembly are arranged as illustrated by full lines in Figs. 10 and 11. With the parts in this position, the slice lip 5a may be raised to the dotted line position X^2 (Fig. 11) or to any other elevation by appropriate adjustment of the raising and lowering screws 14. If it is desired to swing the lip of the slice plate from the full line position to either of the dotted line positions shown in Fig. 10, this is accomplished by loosening the nuts 20 and turning the swivel plates 7 in the proper direction about the axis afforded by the trunnions 23. For any angular position of the slice plate 5 with reference to the forming wire 32, the pivotal axis of the plate may be shifted longitudinally of the forming wire 32 by loosening the nut 24 and moving the slides 21 in the lengthwise direction of the slots 25. This gives the plate adjustment represented by dotted lines X and X' (Fig. 11).

Having thus described my invention, what I claim is:

1. A paper making machine including a travelling carrier on which the pulp stock is deposited to form a sheet, frame members projecting upwardly above the carrier at opposite sides of said machine, a pair of plates slidably secured to the inner sides of said frame members for sliding movement in a horizontal direction of the frame members, a pair of swivel plates mounted for turning movement about horizontal supporting pivots carried by and movable with said first mentioned plates, a slice plate extending between said swivel plates and having its end portions slidably fitted in grooves formed in the opposing surfaces of said swivel plates, a vertically adjustable beam mounted on said swivel plates, said slice plate being secured to and supported by said beam.

2. A Fourdrinier paper making machine including a forming wire, frame members extending above the forming wire at opposite sides thereof, a slide plate slidably secured to the inner side of each frame member by a supporting bolt secured to the slide plate and working in a horizontal slot provided in the frame member, dowels extending inwardly from each frame member into a horizontal groove provided in the outer surface of each slide plate, a swivel plate carried by each slide plate at the inner side thereof, a slice plate supporting beam extending between said swivel plates and supported thereby for adjustment toward and away from the underlying surface of the forming wire, and a slice plate depending from and supported by said slice plate supporting beam, the ends of the slice plate being slidably fitted in grooves provided in said swivel plates.

3. A paper machine as set forth in claim 2 including means for securing the swivel plates in various adjusted positions with reference to the slide plates.

4. A Fourdrinier paper making machine including a forming wire, frame members projecting above the forming wire at opposite sides thereof, each frame member being provided with a horizontally extending slot and with a pair of dowels projecting inwardly therefrom, a slide plate arranged against the inner side of each frame member over the slot therein, said slide plate being provided with a horizontal groove in its outer surface to accommodate the dowels projecting inwardly from said frame member, a threaded bolt passing inwardly through the slot in each frame member and having a threaded portion engaged in a threaded opening of the slide plate, and extending beyond the inner surface of the slide plate to provide a projecting pivot, a swivel plate arranged against the inner side of each slide plate and provided with an opening receiving the pivot end of the bolt extending through said slide plate, said swivel plate being also provided with arcuate slots through which extend clamping bolts having threaded engagement with the associated slide plate, a slice plate supporting member adjustably supported by said swivel plates and a slice plate carried by said slice plate supporting member and having its ends slidably fitted in grooves formed in the opposing surfaces of said swivel plates.

DAVID WARREN.