May 25, 1926. 1,586,204

G. LAMOUREUX

PAPER MAKING MACHINE

Filed April 15, 1922 3 Sheets-Sheet 1

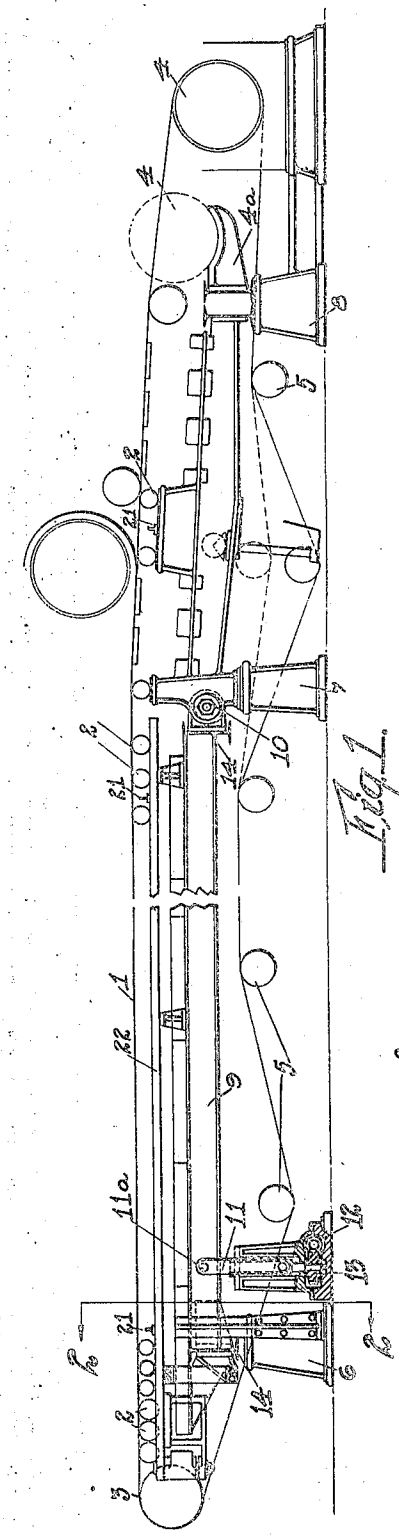


Fig. 1.

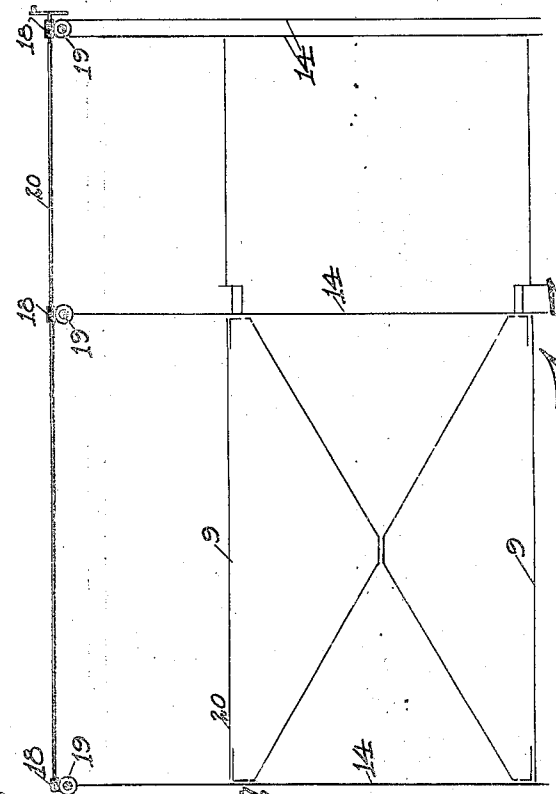


Fig. 3.

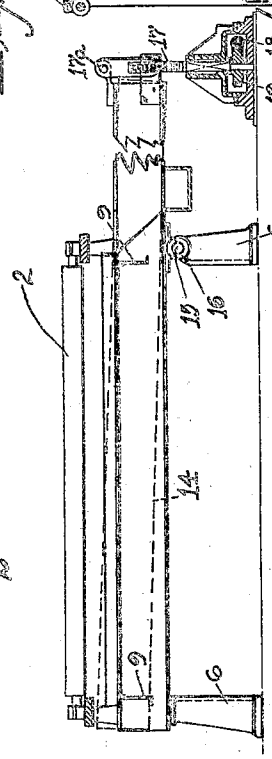


Fig. 2.

Inventor:
George Lamoureux.
By attorney
Owen W. Kennedy

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G. LAMOUREUX

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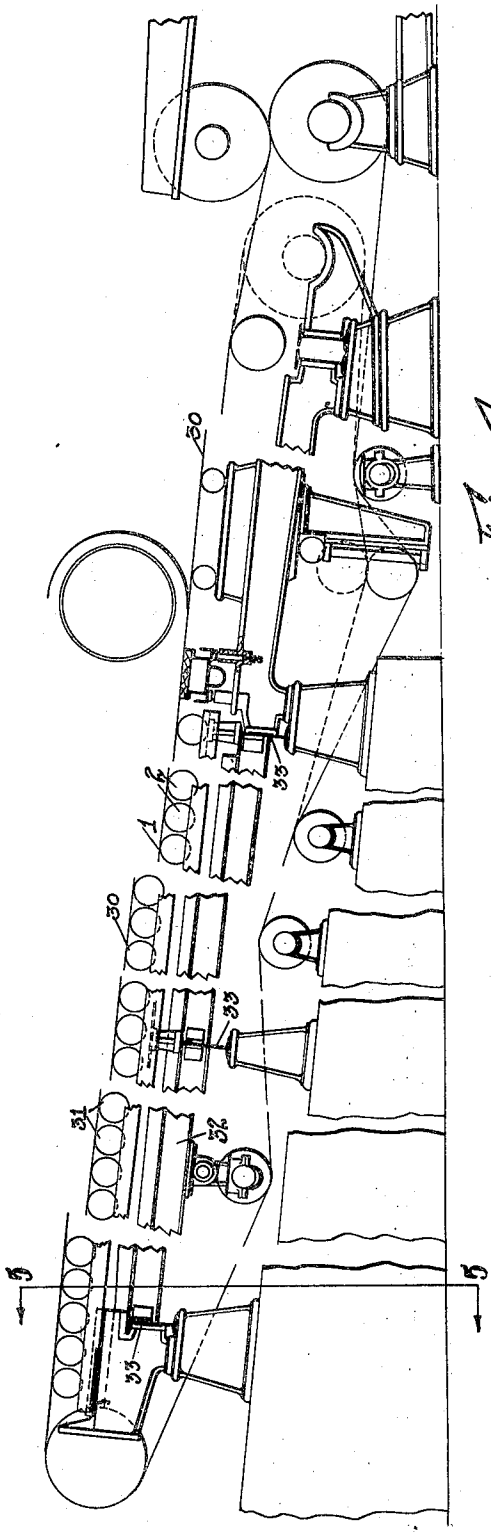


Fig. 4.

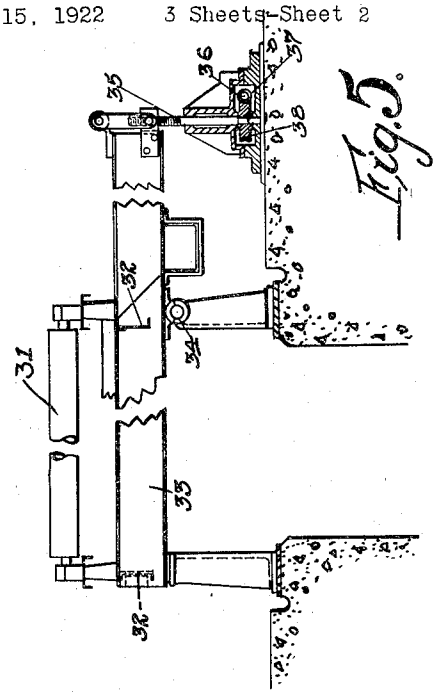


Fig. 5.

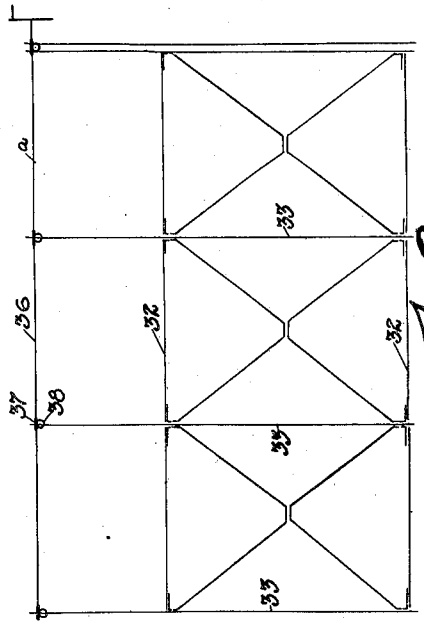


Fig. 6.

Inventor:
George Lamoureux,
By attorney
Owen U. Kennedy

May 25, 1926.

1,586,204

G. LAMOUREUX

PAPER MAKING MACHINE

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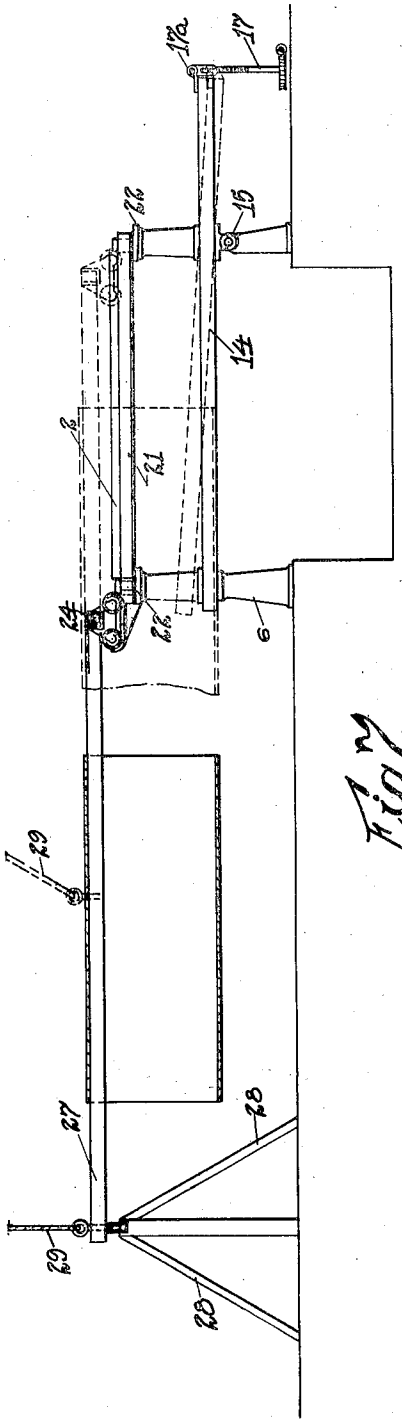


Fig. 7.

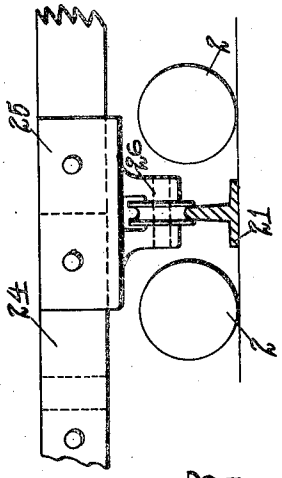


Fig. 9.

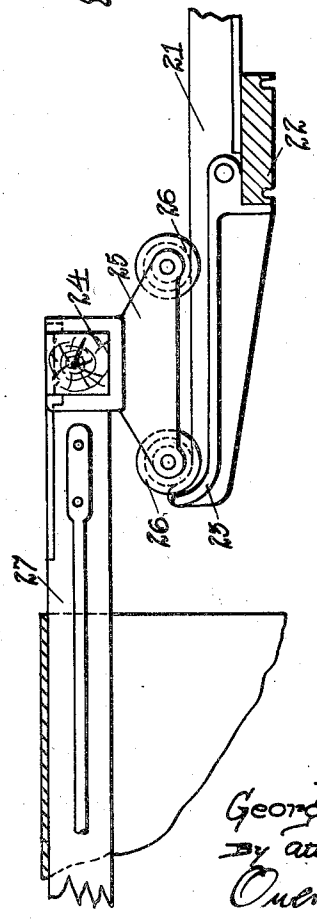


Fig. 8.

Inventor:
George Lamoureux.
By attorney
Owen W. Kennedy

Patented May 25, 1926. 1,586,204

UNITED STATES PATENT OFFICE.

GEORGE LAMOUREUX, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO SCOTT PAPER COMPANY, A CORPORATION OF PENNSYLVANIA.

PAPER-MAKING MACHINE.

Application filed April 15, 1922. Serial No. 553,046.

My invention relates to paper making machines of the so-called Fourdrinier type, in which an endless woven wire of fine mesh is employed for forming the fibres of wet pulp into a sheet.

The object of my invention is to provide an improved arrangement of the parts of a Fourdrinier machine, whereby a wire may be readily renewed with a minimum expenditure of time, during which the machine must be shut down and remain nonproductive. The above and other advantageous features of my invention will hereinafter more fully appear, reference being had to the accompanying drawings in which,

Fig. 1 is a view in side elevation of a Fourdrinier machine embodying my invention.

Fig. 2 is a partial sectional view along the line 2—2 of Fig. 1, looking in the direction of the arrows.

Fig. 3 is a diagrammatic view, showing in plan my improved tilting frame.

Fig. 4 is a view in side elevation, showing a Fourdrinier machine of a type different from that shown in Fig. 1 and also embodying my invention.

Fig. 5 is a partial sectional view along the line 5—5, Fig. 4, looking in the direction of the arrows.

Fig. 6 is a diagrammatic view, illustrating in plan the arrangement of my improved tilting frame for the machine shown in Fig. 4.

Fig. 7 is a diagrammatic view, showing the manner of applying a new wire to either of the machines shown in Figs. 1 and 4.

Fig. 8 is a fragmentary view, showing, on an enlarged scale, a portion of the parts shown in Fig. 7.

Fig. 9 is a view in end elevation of the parts shown in Fig. 8.

Like reference characters refer to like parts in the different figures.

Referring to Fig. 1, my invention is shown, for the purposes of illustration, in connection with a Fourdrinier machine of a well known type, in which an endless woven wire 1, of relatively fine mesh, is supported upon a plurality of table rolls 2, so as to present a plane surface for the reception of a mixture of fibre and water, commonly called the "stock." One end of the wire 1 passes around a breast roll 3 near the flow box, not shown, and the other end of the wire passes around a couch roll 4, the wire 1 passing over or under guide rolls 5 disposed beneath the table rolls 2.

The table rolls 2 are mounted in parallel relation upon a suitable frame, which is supported above the floor on spaced pairs of pedestals 6, 7 and 8. That portion of the frame between the pedestals 6 and 7 is pivotally mounted with respect to that portion of the frame extending between the pedestals 7 and 8, whereby the breast roll 3 may be raised or lowered with respect to the remainder of the frame to give the desired inclination to the wire 1. To this end, the longitudinal members 9 of the frame are pivoted at 10 on the pedestals 7, and each member 9 is connected to the lifting member 11 of a suitable jack which is adapted to be operated by means of a worm 12 and a worm wheel 13.

The above described arrangement of the wire 1 and the mechanism for supporting the same is usual in Fourdrinier machines, and in such machines, as heretofore constructed, considerable difficulty has been encountered when it is desired to replace a worn-out wire with a new one. This is due, to the fact that all of the table rolls 2, the breast roll 3, the couch roll 4, the suction boxes and everything else inside the wire, must be removed separately in order to permit a new wire to be put in place, after which all the above mentioned parts must be replaced. This procedure naturally requires the expenditure of a considerable amount of time and labor, during which time the machine is non-productive, and furthermore, often results in injury to the parts which must be removed and also to the new wire.

As stated before, it is the object of the present invention to provide an arrangement of the parts of a Fourdrinier machine whereby a worn-out wire 1 may be replaced with the expenditure of a minimum amount of time, and to this end I have devised means whereby the entire frame of the machine, carrying the rolls and various auxiliary devices, may be tilted, so as to permit the ready replacement of the wire, and without necessitating the removal of any of the table rolls 2 and other apparatus coacting with the wire 1.

As best shown in Figs. 2 and 3, the cross members 14 of the frame of the machine are extended beyond the side members 9 at one

side of the machine, and are pivotally supported on trunnions 15 received in sockets 16 provided on the pedestals 6, 7 and 8. The projecting end of each cross member 14 is adapted to be connected to the operating member 17 of a suitable lifting device, such as a jack, by means of a pin 17ª. The member 17 is adapted to be raised or lowered, by means of a worm 18 in mesh with a worm wheel 19. The several worms 18 may be mounted on a common shaft 20, extending at right angles to the cross members 14, whereby all of the operating members 17 may be moved in unison. The other ends of the cross members 14 are adapted to rest on the pedestals 6, 7 and 8 when the frame of the machine is placed in a horizontal position, preparatory to the replacement of a worn-out wire, as will now be described.

When it is desired to replace a wire 1 on the machine, the lifting members 11 are first lowered to bring the forward cross frame member 14 to rest on the pedestals 6, as best shown in Fig. 2, after which the lifting members 11 are disconnected from the longitudinal frame members 9 by removing the pins 11ª, and the members 14 are connected to the lifting members 17 by the pins 17ª. The shaft 20 is then driven to cause rotation of all of the worm wheels 19 in unison, thereby causing the members 17 to draw down the projecting end portions of the cross members 14. In this way the whole frame of the machine carrying the table rolls 2, the breast roll 3, the couch roll 4, and everything else inside the wire, is tilted about the trunnions 15 to cause the cross members 14 to be lifted off of the pedestals 6, 7 and 8, as indicated in dotted lines in Fig. 2. The old wire is then removed and the couch roll 4 is moved on to the bracket 4ª, as indicated in dotted lines. The machine is now ready to receive a new wire, and in order to expedite the installation of the same, I have shown in Figs. 7, 8 and 9, an arrangement whereby the wire may be first laid out and then placed on the machine with a minimum expenditure of time.

Referring first to Fig. 7, there is shown diagrammatically one of the cross members 14 provided with means for tilting the same about its trunnion 15. A track member 21 is supported between shake rails 22 extending longitudinally of the machine, and is located between a pair of adjacent table rolls 2, as best shown in Fig. 9. A number of these track members 21 are arranged between the table rolls 2, as indicated in Fig. 1, the top of each track member 21 being below the peripheries of the table rolls 2. Each track member 21 is extended at one end beyond the rail 22 and terminates in a bent up portion 23, as best shown in Fig. 8.

A temporary wire frame is adapted to be supported upon the projecting track portions 23 and comprises a beam 24 extending the length of the machine and provided at intervals with shoes 25 having grooved wheels 26 running upon the track members 21. The beam 24 serves to support at one end, a number of wire carrying members 27, the other ends of which are supported by means of tripods 28. Each member 27 is connected by means of a cable 29 to a suitable lifting device, not shown, by means of which the wire frame may be moved bodily on the track members 21 when it is desired to place a new wire 1 on the machine, as will now be described.

When it is desired to replace a worn out wire with a new one, the frame work constituted by the beam 24 and wire supporting members 27, is first set up along side of the machine, as shown in Fig. 7, without interrupting the operation of same. The new wire is then laid out across the frame members 27, the machine is shut down and the worn out wire is removed. The cross members 14 of the machine frame are then tilted about the trunnions 15 by means of the lifting members 17 into the position shown in dotted lines in Fig. 7, thereby leaving a space between the top of the pedestals 6, 7 and 8, and the cross members 14. In this position, the entire wire supporting mechanism moves with the frame and is not disturbed. The temporary wire frame is then moved bodily in the direction of the machine by means of the cables 29, the wheels 26 riding upon the track members 21. As the wire approaches the frame, its lower edge passes between the pedestals 6, 7 and 8 and the cross members 14, thereby allowing the complete wire to be supported on the machine, although not in contact with the rolls 2. The frame is then withdrawn from beneath the wire 1 by moving the frame members 27 away from the machine, which allows the wire to rest upon the table rolls 2. The wire is then stretched around the rolls, as desired, after which the machine is ready for operation, as before. The cross members 14 are then lowered to bring them to rest again on the pedestals 6, 7 and 8, after which the operating members 17 are disconnected therefrom and the operating members 11 re-connected to the longitudinal members 9 of the machine frame. The breast roll 3 is then elevated to give the desired inclination to the wire.

The above described operation in installing a new wire may be carried out very quickly, so that it is only necessary to shut down the machine just before it is desired to tilt the frame, preparatory to receiving the wire which has already been laid out on the temporary frame. The frame can be set up and the wire arranged thereon while the machine is still running, as will be apparent from an inspection of Fig. 7, so that the

only time that the machine remains nonproductive is the very short period required for slipping the laid-out wire over the up-tilted end of the frame and adjusting it to the rolls.

Referring now to Figs. 4, 5 and 6, my invention is shown as applied to a Fourdrinier machine in which the wire 30 has a fixed inclination as it passes over the table rolls 31. This type of machine is commonly employed for making news print paper, and is similar in all respects to the machine shown in Fig. 1, with the exception that the longitudinal frame members 32 are supported at a fixed angle and the cross members 33 are therefore at different heights above the floor. As best shown in Fig. 5, each cross member 33 is pivotally mounted on a trunnion 34 and projects beyond the edge of the machine. The projecting end of each cross member 33 is connected to the operating member 35 of a lifting jack, which is adapted to be driven from a suitable shaft 36 through a worm 37 and a worm wheel 38. The diagrammatic arrangement of the frame is shown in Fig. 6. The cross members 33 are adapted to be moved in unison to tilt the frame of the whole machine in substantially the same manner as described with reference to Fig. 2, whereby a new wire may be placed on the machine.

From the foregoing then, it is apparent that I have provided an improved arrangement of the parts of a Fourdrinier machine, whereby a worn out wire may be readily replaced with a new wire with a minimum expenditure of time, during which the machine must be shut down and remain nonproductive. The fact that a wire may be changed without necessitating the removal of any of the table rolls, or mechanism associated therewith, greatly reduces the amount of labor involved in changing the wire, and also reduces the wear and tear on the parts of the machine, resulting from their removal each time a wire is changed. The time during which the machine must be shut down is reduced to an absolute minimum, owing to the fact that a new wire may be set up and be made ready to be placed upon a machine while the latter is still operating, a result which has been impossible of attainment with prior machines.

A further advantageous feature of my invention lies in the fact that a wire can be changed at any time without seriously interrupting the operation of the machine, whereas in Fourdrinier machines, as heretofore constructed, it has often been the practice to change the wire only on those days when the entire plant is shut down. This practice arose from the fact that in order to change a wire it was necessary to shut the machine down for a considerable length of time, and obviously such a shut-down would seriously reduce the earning capacity of the machine. For this reason, Sundays and holidays were usually chosen to change the wire, with the result that a wire which was not completely worn out was often replaced with a new one in order to avoid shutting the machine down on a working day.

With a machine constructed in accordance with my invention it is possible to change a wire within one-half hour after the machine is shut down, thereby making it profitable to use a wire until it is worn out.

I claim:

1. In a Fourdrinier machine, a fixed supporting means or frame structure, combined with an upper frame carrying a plurality of rolls for supporting an endless wire apron, said upper frame pivotally supported at one side upon the fixed supporting means and having the opposite side vertically movable with respect to the fixed supporting means and provided at its pivotal side with lateral extensions, and power applying means operating upon the said extensions for depressing them to raise the movable side of the upper frame upwardly relatively to the fixed supporting means.

2. The invention according to claim 1, wherein the means for depressing the extensions of the upper frame consists of screws each having a connection at one end with the extensions and journaled at the other end in a bearing arranged in a frame fixed to the floor or permanent support.

3. The invention according to claim 1, wherein the means for depressing the extensions of the upper frame consists of screws each having a connection at one end with the extensions and journaled at the other end in a bearing arranged in a frame fixed to the floor or permanent support, the said screws provided with worm wheels and rotated by means of a longitudinal shaft having a plurality of worms respectively meshing with the worm wheels.

4. The invention according to claim 1, wherein further, there is provided means for simultaneously causing all of the power applying means to operate simultaneously.

5. In a Fourdrinier machine, the main frame having tube rolls, wire apron, breast roll, couch roll, deckle bands, and shafts and pulleys for the deckle bands, wherein a portion of the machine is supported to swing upon supports at the back side of the machine and having one or more backwardly extending parts to provide leverage, combined with power devices for forcibly moving the ends of the extending parts downward to raise the front portions of the machine for permitting the wire apron to be introduced sidewise into working position.

6. The invention according to claim 5, wherein further, the power devices comprise fixed supports, movable tension rods and

screw and collar devices connecting the rods and supports whereby the turning of the collar raises or lowers the movable tension rods and the extending parts.

7. The invention according to claim 5, wherein further, the supporting means for the portion of the machine which is to be swung upward at the front side comprise jointed parts constituting hinges and are arranged to the rear of the tube rolls and wire apron.

8. In a Fourdrinier machine, the combination of a roller carrying frame and supporting stands or main frame therefor, said roller carrying frame being pivotally connected at one side of the machine to the said stands or main frame so as to be held thereby against transverse movement, said roller carrying frame having lateral extensions beyond the pivotal connection, and power devices connecting with the said extensions for moving them downwardly whereby said roller carrying frame may be raised from the supporting stands or main frame at the opposite side of the machine to receive the wire.

9. In a Fourdrinier machine, the combination of a roller carrying frame over which the wire apron travels and supporting stands or main frame therefor, said roller carrying frame having rear extensions and supported along its length intermediate of its roll carrying portion and the rear extensions permanently upon the stands or main frame, combined with power devices connecting with said extensions for applying a depressing effort thereon for removing the pressure of that portion of said roller carrying frame, most distant from the extensions, from the stands or main frame.

10. The invention according to claim 1, wherein further, the upper roll carrying frame is provided with a plurality of track members, and a temporary wire supporting frame consisting of transverse members having trucks at one of their ends guided upon the track members and having their other ends movable toward the upper roll carrying frame for shifting the wire apron into position over the rolls thereof.

GEORGE LAMOUREUX.