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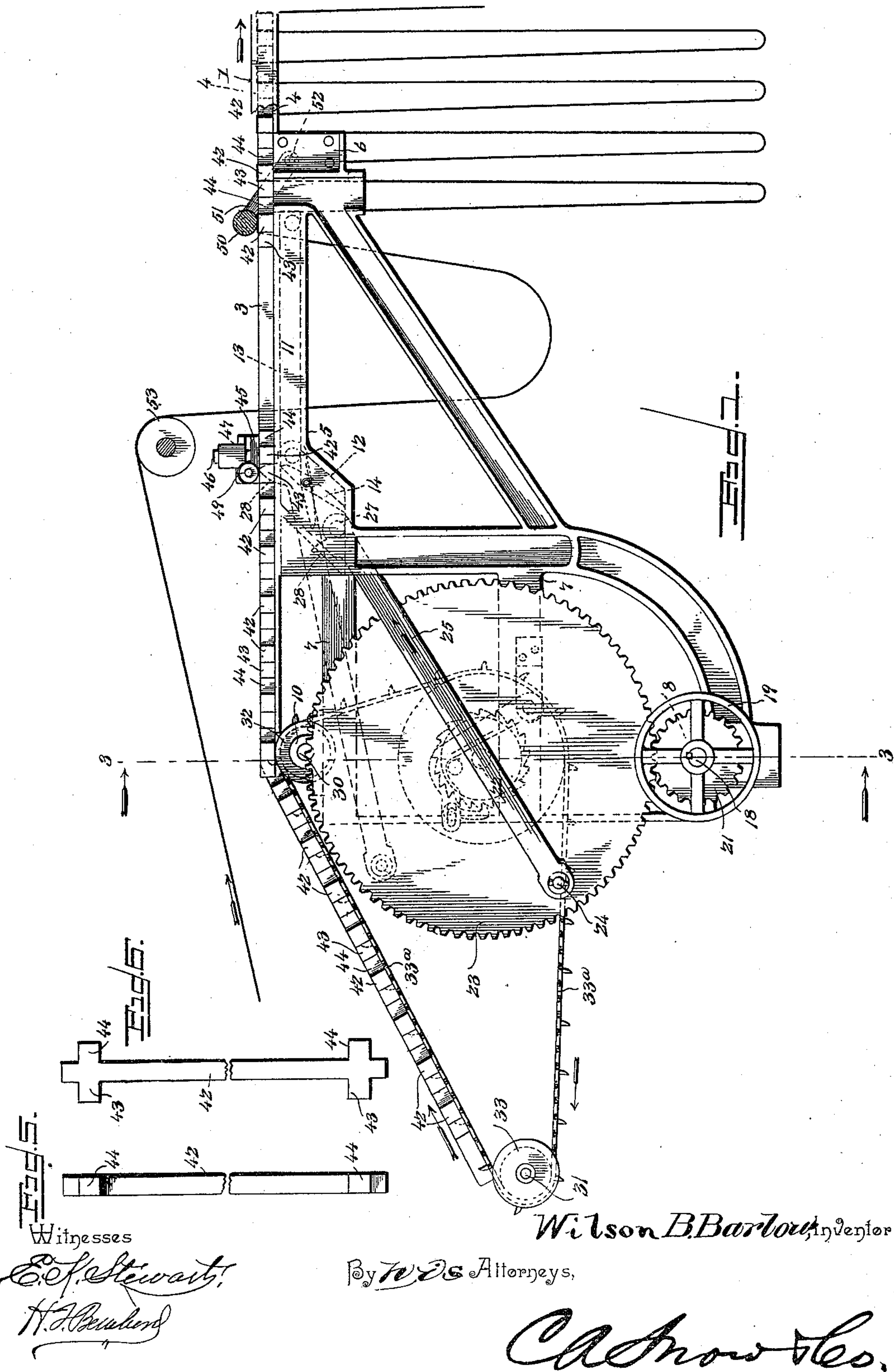
Patented Jan. 2, 1900.

W. B. BARLOW.
WEB DRYING MACHINE.

(Application filed Aug. 13, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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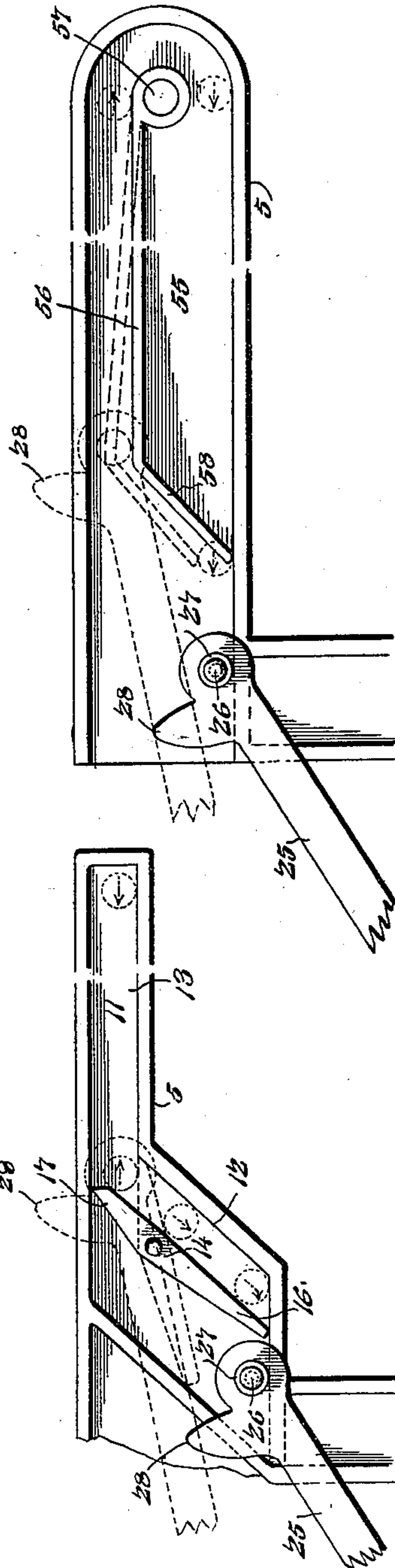
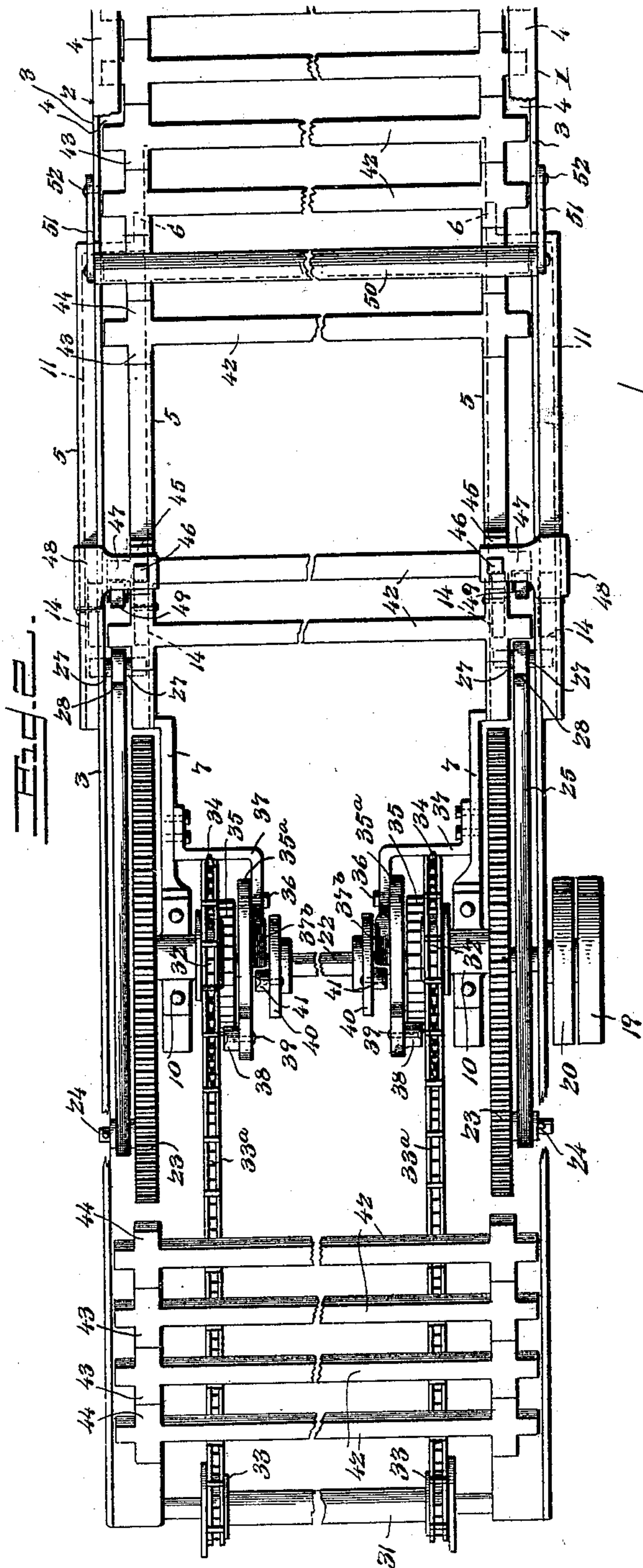
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3 Sheets—Sheet 2.



Witnesses

E. F. Stewart

H. F. Cramb

By *W. B. Barlow* Attorneys,

Wilson B. Barlow, Inventor

C. A. Snow & Co.

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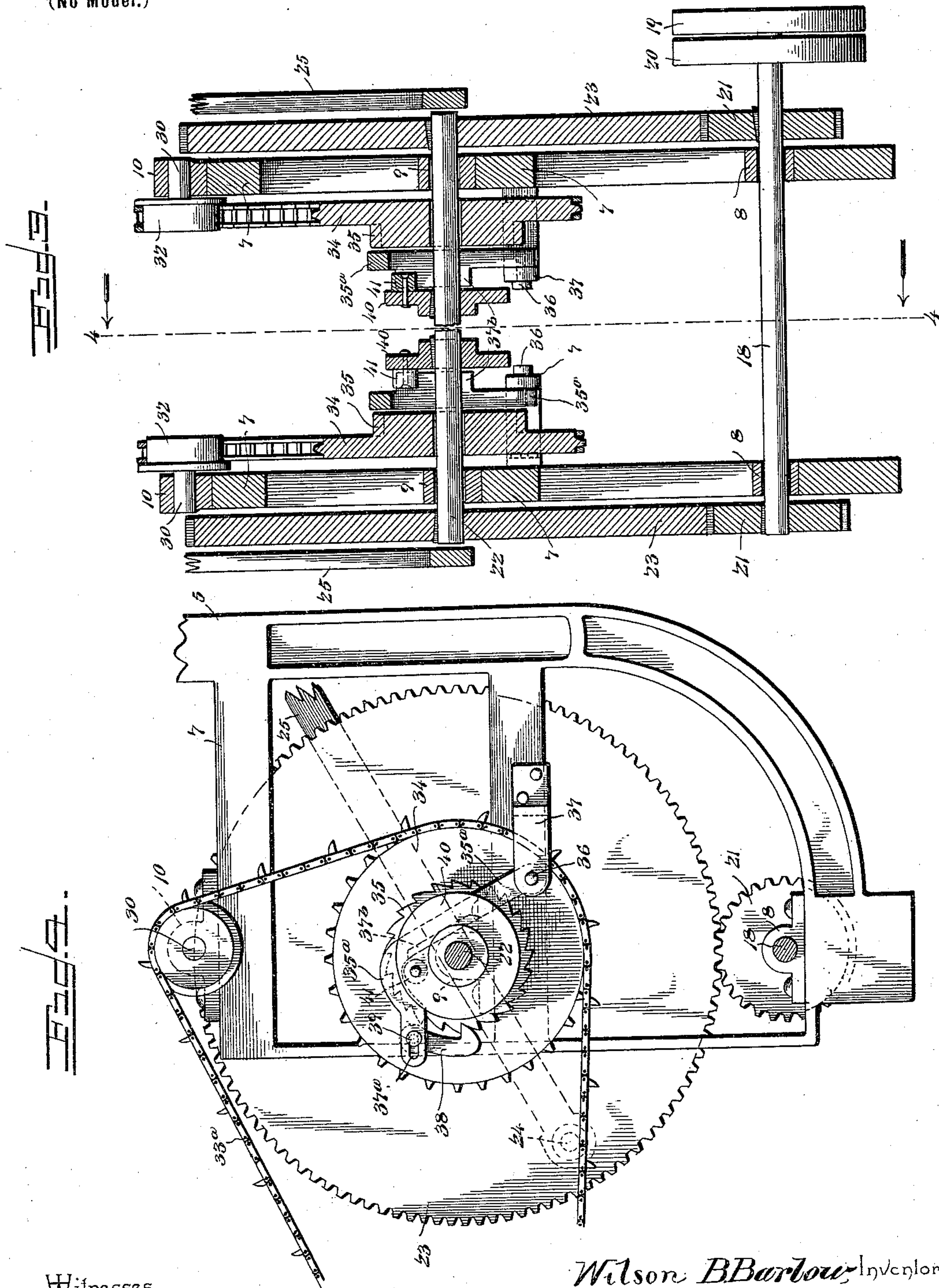
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3 Sheets—Sheet 3.



Witnesses

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H. J. Barlow

Wilson B. Barlow Inventor

By *W. B. Barlow* Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

WILSON B. BARLOW, OF CANTON, NEW YORK.

WEB-DRYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 640,170, dated January 2, 1900.

Application filed August 13, 1898. Serial No. 688,506. (No model.)

To all whom it may concern:

Be it known that I, WILSON B. BARLOW, a citizen of the United States, residing at Canton, in the county of St. Lawrence and State of New York, have invented a new and useful Web-Drying Machine, of which the following is a specification.

My invention relates to improvements in web-drying machines in which an endless web of paper pulp or fabric may be carried through a drying-oven; and one object that I have in view is to provide means for carrying the endless web in folds or loops through the drying-oven without permitting the individual web-loops to come in contact, and thus hold the folds in a separated condition for the circulation between them of the hot air within the oven, and so insure thorough drying of the pulp or fabric in its transit through the oven.

A further object of the invention is to provide an improved feed mechanism by which the individual carrier-bars are supplied or presented successively at suitable intervals to the endless web to engage with the loop or fold therein as said loop is in the process of formation, and the feed mechanism serves not only to present the carrier-bars successively to the web, but it also serves to push or force the entire series of carrier-bars and the web-loops thereon through the oven by imparting impulse or movement to the carrier-bars at regular intervals.

A further object of the invention is to provide means by which the pusher devices that form a part of the feed mechanism may be retracted from the path of or engagement with the carrier-bars without disturbing or turning said carrier-bars and also permitting the return of said pushers to their normal positions to engage with the carrier-bars successively.

A further object of the invention is to provide means by which the carrier-bars are directed positively into certain engagement with the track-rails and also to insure proper engagement of the looped web with the carrier-bar around which said web is looped.

With these ends in view the invention consists in a series of carrier-bars adapted to travel on suitable track-rails and having spacing devices by which the web-loops are held out of contact and a feed and pusher mechanism

for forcing the carrier-bars along the track-rails at regular intervals; also, in the combination of a driving-shaft, crank-disks operating the pushers, intermittent feed mechanism actuated by the shaft, a feed apron or link, belts driven at intervals by said feed mechanism, and guide-trips in the pushers; also, in a presser bar or roll to position the carrier-bars on the track-rails, and also in a web-presser roller to force the web into engagement with the carrier-bars.

The invention also consists in the novel combination of elements and in the construction and arrangement of parts hereinafter more fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a sectional elevation of so much of a web-drying machine as is necessary to an understanding of my invention. Fig. 2 is a plan view of the parts represented by Fig. 1. Fig. 3 is a vertical transverse section on a plane through the driving and feed mechanism and indicated by the dotted line 3 3 of Fig. 1. Fig. 4 is an enlarged detail sectional elevation on the plane indicated by the dotted line 4 4 of Fig. 3 looking in the direction indicated by the arrow. Figs. 5 and 6 are views in plan and edge elevation of one of the carrier-bars, and Fig. 7 is a detail view of another form of the trip-guide for the pusher-pitman. Fig. 8 is an enlarged detail view of the preferred form of the pusher-guide and trip shown partly by dotted lines in Fig. 1.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

In carrying my invention into practice I employ a pair of parallel track-rails 1 and 2, which are arranged in horizontal positions at suitable intervals from each other and extend practically from one end of the machine through the drying-oven, the offset ends of said track-rails extending at or through the distant end of said oven. As no novelty is claimed herein for the oven, which it may be remarked may be of any suitable type preferred by those skilled in the art to

which the invention relates, I have not deemed it necessary to illustrate the oven by the accompanying drawings.

My machine may be used for drying an endless web of fabric, but it is especially designed for the reception and drying of an endless web of paper-pulp.

In the construction of the track-rails 1 and 2 I prefer to provide the same with vertical webs 3 and overhanging flanges 4, and the carrier-bars, hereinafter described, are adapted to rest upon the track-rails, so that they may slip along said rails under the impulse imparted to said carrier-bars at the intervals when the successive bars are presented to the endless web for engagement therewith. The vertical webs 3 restrain the carrier-bars from endwise displacement on the track-rails, and the overhanging flanges 4 hold the carrier-bars against vertical displacement and in proper position on the track-rails.

At the receiving end of the track-rails forming the supports for the carrier-bars I provide the supporting-frames 5, which are parallel to each other and are situated within and between said track-rails, the supporting-frames 5 being in the same vertical plane with the track-rails. At one end the supporting-frames 5 are provided with end plates 6, to which are attached certain parts of the track-rails before they enter the drying-oven, and at the other ends of said frames 5 they are provided with the brackets 7, which are fashioned to carry the series of shaft-bearings, which are arranged in pairs for the support of the power, driving, and idler shafts hereinafter referred to. Said brackets 7 are provided with a pair of lower bearings or boxes 8, with another pair of alined middle bearings or boxings 9, and also with a third pair of alined upper bearings or boxings 10, all of these bearings being in substantially the same vertical plane and supported in fixed relation to each other on the brackets. The supporting-frames 5 between the brackets 7 and the end plates 6 are constructed to form the pusher-guides 11, and the guides of the two frames 5 are coincident and parallel with each other to properly receive and direct the pushers that serve to present the carrier-bars into engagement with the loop of the endless web and also to impart the impulse to the series of carrier-bars, by which the latter and the web-loops suspended therefrom are forced along the track-rails and through the oven. Each pusher-guide 11 is constructed to form the inclined length 12 and the horizontal length 13, and within said guide is a tiltable trip 14. In the preferred embodiment of the invention as represented by Fig. 1 this tiltable trip in each pusher-guide consists of a bar which is arranged in an inclined position in the inclined length 12 of the guide, and said tiltable trip is pivoted at a point intermediate of its length to form the long arm 16 and the short arm 17. The vertically-inclined trip 14 has its short arm 17 normally across the path of the hori-

zontal length 13 of the pusher-guide, while the long arm 16 of said trip is in the path of the pusher-pitman to form a track therefor, by which the pusher-pitman is raised from its lower position up and in engagement with the carrier-bar on the track-rail, and as the pusher continues to advance in making its forward stroke it rides upon the arms 16 of the trip until it enters the horizontal length 13 of the guide, the trip yielding to the forward thrust of the pusher for the latter to pass from the said trip into the guide-length 13, along which it travels to engage with the carrier-bar, present the latter to the web-loop, and move the carrier-bar into engagement with a similar carrier-bar, which was previously placed in position on the track-rail. As the pushers make their return strokes they travel in the horizontal lengths of the guides 11 and strike the short arms 17 of the trips 14, thus causing the pushers to descend in the inclined lengths 12 of the pusher-guide during a part of their return movement, and as the pushers complete their return movement they ride against the long arm 16 of the trips, which yield to permit the return of the pushers to their normal positions, ready to begin the next forward movement.

In the lower boxings or bearings 8 of the frame-brackets is journaled a power-shaft 18, which at one end is equipped with the fast and loose pulleys 19 20, and said power-shaft is furthermore provided with a pair of gear-

pinions 21. In the boxes or bearings 9, immediately above the power-shaft, is journaled the driving-shaft 22, which is in parallel relation to the power-shaft, and to this driving-shaft is rigidly secured in any suitable way a pair of master gears or disks 23, which are in the vertical plane of the gear-pinions 21 and mesh directly therewith, so that the driving-shaft 22 is rotated by direct gear connections with the power-shaft 18. These master-gears 23 are provided with wrist-pins 24, that occupy the same relation on each gear, and with these wrist-pins are loosely connected the rear ends of the pusher-pitmen 25. These pusher-pitmen lie alongside of the master-gears, to which they are connected in a way to give to the pitmen simultaneous movement on the rotation of the gears 23, and these pusher-pitmen extend from the wrist-pins to the pusher-guides 11 on the supporting-frames 5. At the free ends of the pusher-pitmen they are provided with pins or studs 26, on which are loosely fitted the idler supporting-rollers 27, that are adapted to travel on the tiltable trips 14 and in the pusher-guides 11, and said free ends of the pusher-pitmen are constructed with pusher arms or lugs 28, which extend upwardly from the said pitmen for suitable distances, so as to engage with one of the carrier-bars on the track-rails. The pusher-arms 28 at the free ends of the pusher-pitmen are preferably made integral therewith, and said pusher

arms or lugs are adapted, when the rollers 27 ride upwardly on the tiltable trips 14, to engage with the carrier-bars, and they return to such engagement in the interval of the forward travel of said pushers in the horizontal lengths of the pusher-guides 11; but when the pusher-pitmen complete their forward movement to present the carrier-bar in engagement with the preceding carrier-bar the pusher-arms 28 are retracted from engagement with said carrier-bar on the return stroke of the pushers to their normal positions. In connection with this pusher mechanism for presenting the carrier-bars successively into engagement with the endless web I employ a feed mechanism by which the carrier-bars are presented successively to positions for engagement by the pushers. To this end an idler-shaft 30 is journaled in the boxings or bearings 10 directly over the drive-shaft 22, and said shaft 30 is provided with flanged pulleys 32. Another shaft 31 is journaled in suitable boxes at a proper distance from the power and driving shafts, and said shaft 31 has pulleys 33, which are in the same plane with the pulleys 32 on the shaft 30. Around the aligned pulleys 32 and 33 on each side of the machine pass the endless chains or belts 33^a, which constitute the endless conveyer by which the carrier-bars are supplied to the track-rails 1 2 in the path of the pushers, and the overhead shaft 30, forming the support and guide for the endless conveyer, is arranged immediately below the receiving-terminals of the fixed rails 1 2, as shown by the drawings. This traveling conveyer is not driven continuously, because the carrier-bars would be presented too fast to the pushers and sufficient time would not elapse for the pushers to make the forward and back movement to present the carrier-bars into engagement with the web and with the preceding carrier-bars, and I therefore have devised an intermittent feed mechanism, which is driven by the shaft 22 and operates the endless conveyer at suitable regular intervals to present the carrier-bars in the path of the pushers. The preferred embodiment of the intermittent feed mechanism contemplates the employment of sprocket-wheels 34, which are mounted loosely on the driving-shaft 22 in the vertical and longitudinal planes of the pulleys 32 and 33 on the shafts 30 31, respectively, and these sprocket-wheels are engaged by the linked plates or chains 33^a, which form the endless conveyer and are actuated from said sprocket-wheels. The sprocket-wheels are adjacent to the master-gears 23 of the driving-shaft, and on their inner opposing faces said sprocket-wheels are provided with ratchet-wheels 35, which are integral with or rigidly secured to said driving-sprockets 34. It will be understood that the driving-sprockets and their ratchets for the endless conveyer are loose on the driving-shaft, and to impart the intermittent motion to the sprocket-wheels I employ the feed-levers 35^a, the feed-pawls 38,

and the driving-disks 40. Each feed-lever 35^a is arranged alongside of one of the sprocket-wheels, and at one end said feed-lever is hung or pivoted, as at 36, to the inner end of an irregular-shaped arm 37, which at its other end is fixed to one of the frame-brackets 7 of the machine-frame. The loosely-hung feed-lever is arranged to overhang the ratchet 35, with which its feed-pawl 38 is adapted to engage, and the free end of said feed-lever is provided with a transversely-slotted angular arm 37^a, to which is adjustably connected a loose feed-pawl 38. The feed-pawl 38 is connected by a pivotal bolt 39 to the angular slotted arm 37^a of the feed-lever for the purpose of adjustment on said feed-lever toward or from its fulcrum 36, thus moving the feed-pawl to vary the movement of the feed-lever and ratchet. Each feed-lever is provided at a point intermediate between its fulcrum and feed-pawl with a laterally-extending web or rib 37^b, which is adapted to be engaged by a crank-pin 41 on the drive-disk 40. The drive-disk for each feed-lever and ratchet is keyed or otherwise fixed to the driving-shaft 22 to rotate therewith and occupy close relation to the ratchet 35, and said drive-disk is provided with a suitable eccentric stud or pin 41, that extends from one face thereof and is adapted to impinge against the web or plate 37^b of the lever. The driving-sprockets and the endless conveyer remain at rest during the interval of rotation of the crank pins or studs on the driving-disks when they are free from the webs or plates 37^b of the feed-pawls; but for a certain portion of the orbit of rotation of said eccentric or crank studs on the drive-disks they ride against the webs or plates of the feed-pawls to impart to the latter an angular movement equivalent to the interval between two adjoining carrier-bars. This movement of the feed-levers under the action of the crank-pins 41 on their webs or plates is communicated to the feed-pawls 38, which engage with the ratchets 35 and move said ratchets and sprocket-wheels a distance corresponding to the movement of the feed-levers, and the conveyer belts or chains are correspondingly actuated because they engage with the sprocket-wheels, whereby the endless conveyer is moved at intervals and the distance of movement is sufficient to present one carrier-bar into the path of the pusher. As the crank-pins 41 clear the feed-levers the latter and their pawls drop back to their normal positions over the ratchets in position to take fresh hold on said ratchets, and as the eccentric studs 41 again reach the point of contact therefor with the feed-levers the latter are again actuated to move the ratchets and sprockets for imparting the movement to the endless conveyer.

In my improved machine I employ a series of carrier-bars which are independent one from the other and are adapted to separately sustain the individual loops of the endless web, and these carrier-bars are constructed

to slide along the track-rails 1 2 and to space themselves apart at proper intervals to sustain the web-loops without permitting said loops to contact or press one against the other. Each carrier-bar 42 is provided near its ends with the spacing lugs or arms 43 and 44, the lugs or arms 43 projecting from one side of the carrier-bar and the other lugs or arms 44 extending from the opposite side of the carrier-bar. The carrier-bars are laid or placed on the chain belts of the endless conveyor one after the other, so as to occupy parallel relation to each other, and said carrier-bars are conveyed by the conveyor to the track-rails 1 and 2, on which they are oppositely moved or fed by the advancement or movement of the conveyor until the carrier-bars are engaged successively by the reciprocating pushers. As shown by Fig. 1 of the drawings, a series of these carrier-bars are provided on the receiving end of the track-rails and the endless conveyor, and the pushers and conveyor are so timed in their movements that when the pushers make their forward stroke and are elevated to engage with the first of the series of carrier-bars the conveyor is actuated by its feed mechanism to force the entire series of carrier-bars along the receiving ends of the track-rails, thus positioning the second carrier-bar in the position occupied by the first carrier-bar, so as to be engaged by the pushers on their next forward movement.

To prevent the carrier-bars from being displaced vertically when the pushers are elevated at the beginning of their forward stroke, I provide a presser device, which is situated immediately over the point where the pushers have initial engagement with the carrier-bars, and this presser device may be embodied either in the form of a bar or a roll. As shown by the drawings, I prefer to employ a presser-bar 45 of substantially rectangular form in cross-section and of a width exceeding the width of the carrier-bar, and this presser-bar is provided with vertical stems 46, that extend upwardly and play idly in vertical guides 47, which overhang the track-rails and are equipped with plates 48, adapted to be secured rigidly to said track-rails or the frames 5 of the machine, whereby the fixed guides 47 serve to slidably confine the presser device in proper relation to the track-rails, so as to make the presser device hold the slats down to the track-rails when the pusher is advanced to engage with said slats. The guides 47 are sustained in fixed relation to the track-rails and the carrier-bars, and the presser-bar is sustained by said guides to have a limited vertical play and permit a carrier-bar which occupies a slightly-irregular position to pass beneath the presser-bar. To reduce the friction on the carrier-bar and the presser-bars, I may provide the presser-bar with antifriction-rolls 49, which are loosely journaled at the receiving edge of said presser-bar; but this is an expedient which obviously

may be operated by the skilled constructor. I would have it understood that I do not strictly confine myself to the particular form of presser device herein shown, because a roll may be substituted for the bar and suitable depressing-springs employed to hold the presser-bar in the path of the carrier-bars; but as these features are details that may be varied by the skilled constructor I have not deemed it necessary to illustrate the same.

The endless web of pulp or fabric is pressed into engagement with the carrier-bars at the end of the presser-guides by a web-roll 50, which engages automatically with the presser-bar and the web when the pusher begins its backward or return stroke, thereby holding the web of pulp from being drawn forward over the carrier-bar by the weight of the loop just formed and causing it to run down on the rear side of the carrier-bar, thereby insuring uniform lengths of loops. This web-roll 50 is of sufficient weight to hold the bar and web in a stationary position on the track-rails, and said roll is journaled idly in arms or links 51, which are arranged alongside of the track-rails and have their opposite ends pivoted, as at 52, to the frame-plate 6.

The web of pulp or fabric is directed into the drying-machine by an elevated guide-roll 53, which is carried by a shaft arranged over the presser device 45, and said guide-roll for the web is thus arranged at a suitable distance in advance of the web-roll 50 to permit the web to form a loop in the interval between the rolls 50 and 53.

In the embodiment of the pusher-guide represented by Fig. 7 it is made to present a guideway 55, occupying a horizontal position within one of the frames 5, and midway of this horizontal pusher-guide 55 is arranged a tiltable plate 56, one end of which is loosely hung or pivoted, as at 57, while the free receiving end of said plate is provided with an offset or deflected guide 58, that extends from the plate 56 at an angle to the length thereof. These plates serve to elevate the pushers and support the same in their upward and forward movements, and the pivoted end of the tiltable plate 56 terminates at a suitable distance in rear of the closed rear extremity of the guide 55 to permit the traveling roller of the pusher to move around the said pivoted end of the plate and descend into the lower part of the guide, the deflected end 58 of the plate yielding upwardly for the return of the pusher to its normal position.

The operation may be described briefly as follows: The shaft 22 is driven from the power-shaft 18, and the master-gears 23 impart the reciprocating motion to the pusher-pitmen. With the pitmen in the position shown by Fig. 1, the carrier-bars arranged in two series on opposite sides of the web-roller 50, and the presser device 45 and the endless web looped in the interval between said devices 45 50 the pushers begin their forward movement by riding upwardly on the tiltable trips, so

as to present the pusher-arms 28 into engagement with the carrier-bar below the presser device 45. As the pushers are advanced by the master-gears, the tiltable trips 14 yield to permit the pushers to enter the horizontal lengths of the pusher-guides, and the advancement of the pushers moves the carrier-bar with which they engage from beneath the presser-bar 45 into engagement with the endless web, thus carrying a loop or fold of the latter along with the pushers and carrier-bars in the interval between the presser device 45 and web-roller 50. As the pushers continue to advance, the carrier-bar is carried along until its lugs 44 abut against the lugs 43 on the preceding carrier-bar, and all of said preceding carrier-bars are moved or shoved along the track-rails by the action of the pusher on the last carrier-bar, the forward stroke of the pushers not being completed until the carrier-bar with which it engages reaches a position below the web-roller 50. The series of carrier-bars, with the loops of the web, are thus advanced along the track-rails and through the drying-oven by the impulse imparted by the entire series of carrier-bars by the action of the pushers, and as the pushers engage with said carrier-bars near the ends thereof and as the carrier-bars are spaced by their lugs or arms the bars and the webs are advanced through the oven in proper order and to sustain the loops in spaced positions for the free circulation of hot air therethrough in the transit of the web and the carrier-bars through the oven. The pushers complete their return stroke by traveling backwardly in the guides and passing the tiltable trip-bars, and during the advancing and return movements of the pushers the feed mechanism for the driving-sprockets is actuated by the crank-pins 41 engaging with the feed-levers 35 to cause the feed-pawls to partly turn the ratchets and driving-sprockets, and thus the endless conveyor is moved a distance equivalent to the interval between two adjacent carrier-bars. A series of carrier-bars in advance of the presser device 45 are thus moved forward by the action of the intermittently-controlled endless conveyor, and the first of the advancing series of carrier-bars is moved to a position beneath the presser device 45 and in the path of the pusher arms or lugs of the pusher-pitmen for the latter to engage with said carrier-bar on its next upward and forward movement. This operation is repeated an indefinite number of times, and the carrier-bars and loops of the endless web are thus advanced into proper relation to the preceding carrier-bars in the oven.

I am aware that changes in the form and proportion of parts and in the details of construction may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications as clearly fall within the scope of the invention.

Having thus described the invention, what I claim is—

1. In a web-drying machine, the combination with track-rails, and carrier-bars, of a reciprocatory pusher mechanism guided to travel in horizontal and inclined paths, an intermittent carrier-bar-feed mechanism operable to deposit the carrier-bars in the horizontal plane of the track-rails and in the path of the pusher mechanism as it begins its travel in a path parallel to the plane of the track-rails, means for actuating the carrier-bar-feed mechanism intermittently and during the travel of the pusher mechanism from its delivery position to its initial position, and a web-feed mechanism to interpose a web in the path of the carrier-bars as the latter are advanced on the track-rails by the pusher mechanism, substantially as described.

2. In a web-drying machine, the combination with track-rails, and a plurality of carrier-bars, of a reciprocatory pusher mechanism guided to travel in horizontal and inclined paths, an intermittent endless carrier-bar-feed mechanism arranged to deposit carrier-bars successively on the track-rails and in the path of the pusher mechanism, means for continuously propelling the pusher mechanism, an intermittent mechanism actuated by the pusher-propelling mechanism to propel the carrier-bar-feed mechanism in the intervals between the return of the pusher mechanism to its initial feeding position, and a web-feeding mechanism to interpose a web in the path of the carrier-bars, substantially as described.

3. In a web-drying machine, the combination with suitable track-rails and a web-feeding mechanism, of a series of independent carrier-bars, a reciprocating pusher mechanism, and an intermittently-operated feed mechanism for the carrier-bars to place the latter successively in the path of the pusher mechanism, substantially as described.

4. In a web-drying machine, the combination with track-rails, of a reciprocating pusher mechanism, carrier-bars loosely fitted to the track-rails to be engaged successively by the pusher mechanism, and an intermittently-operated feed mechanism for moving the carrier-bars into the path of the pusher mechanism, substantially as described.

5. In a web-drying machine, the combination with track-rails and carrier-bars adapted to move thereon, of a single driving mechanism, a reciprocating pusher mechanism operated from said driving mechanism, means for directing said pusher mechanism to travel in inclined and horizontal paths, an endless feed mechanism arranged to deposit the carrier-bars in the path of the reciprocating pusher, and means operated from the driving mechanism to intermittently move the endless carrier-bar-feed mechanism during the horizontal travel of the pusher, substantially as described.

6. In a web-drying machine, the combina-

tion with track-rails and carrier-bars fitted to travel thereon, of a pusher-guide having a tiltable trip arranged to elevate the pusher into engagement with said carrier-bars, and
 5 reciprocating pushers adapted to travel in said guides and upon the tiltable trips thereof, substantially as described.

7. In a web-drying machine, the combination with suitable track-rails, and a series of
 10 carrier-bars, of reciprocating pushers actuated simultaneously from a suitable power mechanism, pusher-guides in the path of the pushers and adapted to elevate the latter into engagement with carrier-bars on said track-
 15 rails whereby the pushers are caused to move the carrier-bars successively into engagement with preceding carrier-bars and are retracted from the path of the tiltable trips, substantially as described.

20 8. In a web-drying machine, the combination with reciprocating pushers, of pusher-guides adjacent to the support of the carrier-bars, and tiltable trips lying in the path of said pushers and arranged to elevate the
 25 pushers when moving in one direction and to yield to the pushers on their rearward movement, substantially as described.

9. In a web-drying machine, the combination with track-rails, a web-feeding mechanism and a series of pusher-bars carrying web-
 30 loops, of horizontal pusher-guides terminating at one end adjacent to said carrier-bars and at its opposite end in juxtaposition to the web-feed mechanism, reciprocating pushers
 35 adapted to traverse the pusher-guides, tiltable trips mounted in said guides in the path of the pushers, and a feed mechanism for presenting the carrier-bars intermittently in the path of the pushers, substantially as de-
 40 scribed.

10. In a web-drying machine, the combination with track-rails, a series of carrier-bars fitted thereon and a continuously-operating web-feeding mechanism, of pusher-guides ar-
 45 ranged between the carrier-bars and the web-feeding mechanism and having tiltable trips therein, reciprocating pushers provided with carrying-rolls and pusher-arms and adapted to traverse the tiltable trips and the pusher-
 50 guides, and mechanism for feeding the carrier-bars intermittently into the path of the pusher-arms on said reciprocating pusher, substantially as described.

11. In a web-drying machine, the combination with suitable track-rails, of pusher-guides
 55 having the inclined and horizontal lengths and arranged contiguous to said track-rails, a driving-shaft provided with suitable gears, a power-shaft for rotating said driving-shaft, a
 60 reciprocating pushers connected with said gears and fitted slidably to the pusher-guides to travel in inclined and horizontal paths, a series of carrier-bars, intermittent feed mechanism for moving said carrier-bars into the
 65 path of the pusher, said feed mechanism being operated during the travel of the pusher in the horizontal path, substantially as described.

12. In a web-drying machine, the combination with track-rails, carrier-bars and a pusher mechanism, of a conveyer for moving the car-
 70 rier-bars successively into the path of the pusher mechanism, a driving-shaft, and pawl-and-ratchet feed devices between the conveyer and said driving-shaft, substantially as described.

13. In a web-drying machine, the combination with carrier-bars and a pusher mechanism therefor, of a driving-shaft by which the
 75 pusher mechanism is reciprocated, a conveyer for presenting the carrier-bars successively in the path of the pusher mechanism, sprocket-wheels mounted loosely on said shaft and en-
 80 gaging with the conveyer, pawl-carrying feed-levers engaging with ratchets on said sprocket-wheels, and driving-disks fixed to
 85 the shaft and engaging at intervals with said feed-levers, substantially as described.

14. In a web-drying machine, the combination with carrier-bars and a pusher mechanism therefor, of a conveyer, a driving-shaft,
 90 sprocket-wheels engaging with the conveyer mounted loosely on said shaft and having ratchets, feed-levers hung independently of the shaft, feed-pawls carried by said levers to engage with the ratchets of the driving-shafts,
 95 and driving-disks fixed to the shaft and provided with eccentric pins which engage at intervals with said levers, for the purpose described, substantially as set forth.

15. In a web-drying machine, the combination with carrier-bars and a pusher mechanism therefor, of a driving-shaft, driving-
 100 sprockets mounted loosely on said shaft and provided with ratchets, a conveyer which engages with said driving-sprockets, driving-
 105 disks fixed to the shaft to rotate therewith and having eccentric pins or studs, feed-levers lying in the path of the said studs or pins of the driving-disks, and feed-pawls attached to said
 110 feed-levers and engaging with the ratchets of the driving-sprockets, substantially as described.

16. In a web-drying machine, the combination with track-rails and carrier-bars fitted thereto, of a driving-shaft, a power-shaft,
 115 master-gears attached to the driving-shaft to mesh with pinions on the power-shaft and provided with wrist-pins, pushers connected to said wrist-pins, a conveyer arranged to move the carrier-bars successively into the
 120 path of the pushers, driving-sprockets loosely mounted on the driving-shaft and engaging with the conveyer, and ratchet feed mechanism operated by the driving-shaft to intermittently actuate the conveyer mechanism,
 125 substantially as described.

17. In a web-drying machine, the combination with track-rails, and a pusher mechanism, of carrier-bar-feed mechanism ar-
 130 ranged to supply carrier-bars successively in the horizontal plane of the track-rails and in the path of the pusher mechanism, a presser device situated in a plane above the track-rails and at a point where the pusher devices

first engage with the carrier-bar, said presser device preventing the carrier-bar from leaving the track-rails under the initial thrust of the pusher devices, and a web-feeding mechanism independent of the presser device and adapted to feed a web in advance of said presser device and in the path of a carrier-bar, substantially as described.

18. In a web-drying machine, the combination with pusher-guides, a pusher mechanism and track-rails, of a feed mechanism for presenting the carrier-bars successively in the path of the pusher mechanism, and a presser-bar slidably mounted on the track-rails at the point where the pusher mechanism engages with the carrier-bars, substantially as described.

19. In a web-drying machine, the combina-

tion with track-rails, pusher-guides adjacent thereto and a pusher mechanism, of a feed mechanism for positioning the carrier-bars in the path of said pusher mechanism, a presser device situated on the track-rails adjacent to the point where the pusher mechanism engages with the carrier-bars successively, and a presser-roll loosely hung on the track-rails at the terminals of the pusher-guides, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILSON B. BARLOW.

Witnesses:

GOVNOR TEATS,
O. W. BARLOW.