

No. 724,540.

PATENTED APR. 7, 1903.

H. E. BRETT:
CONVEYER.

APPLICATION FILED MAR. 7, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

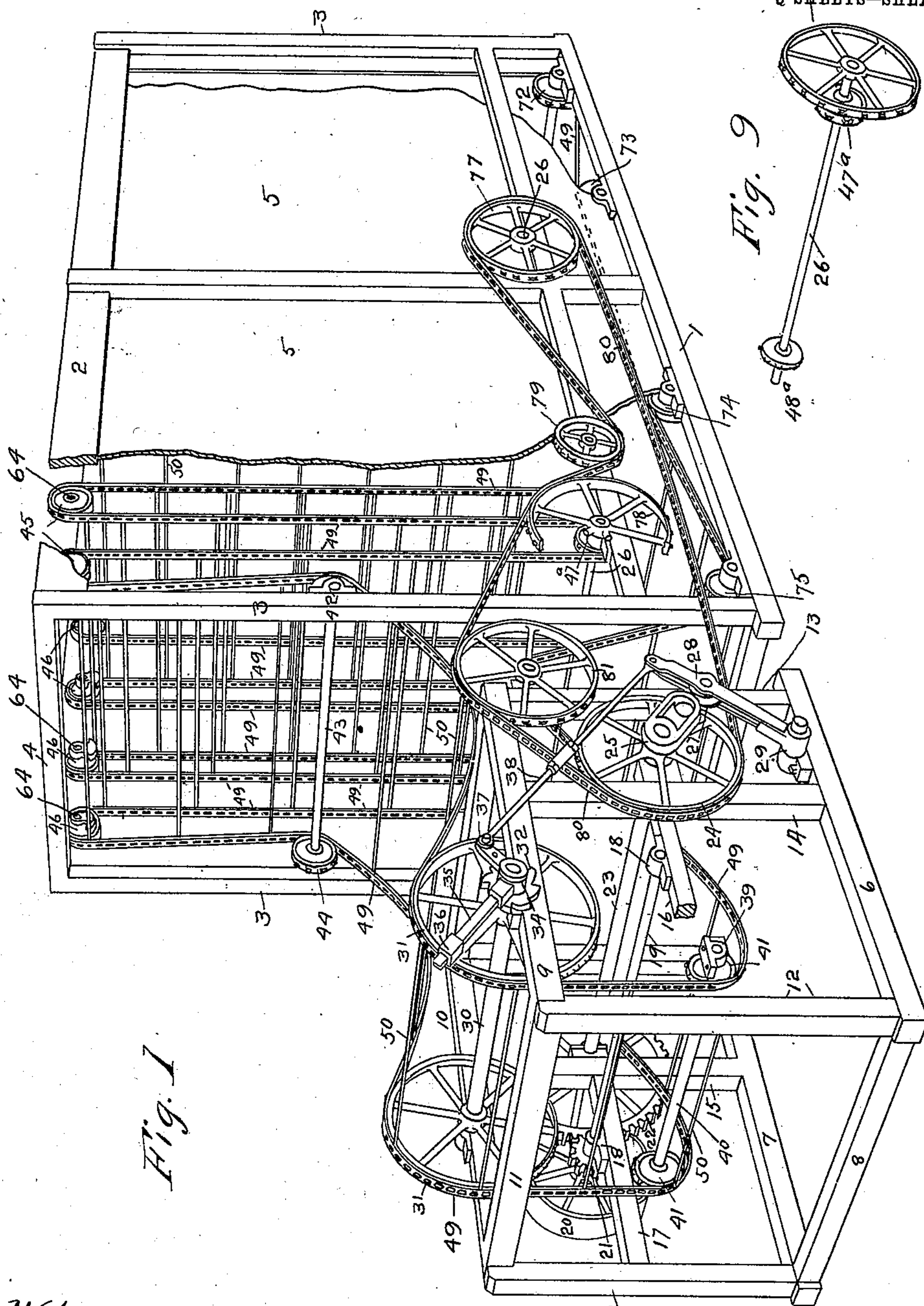


Fig. 1

Fig. 9

Witnesses

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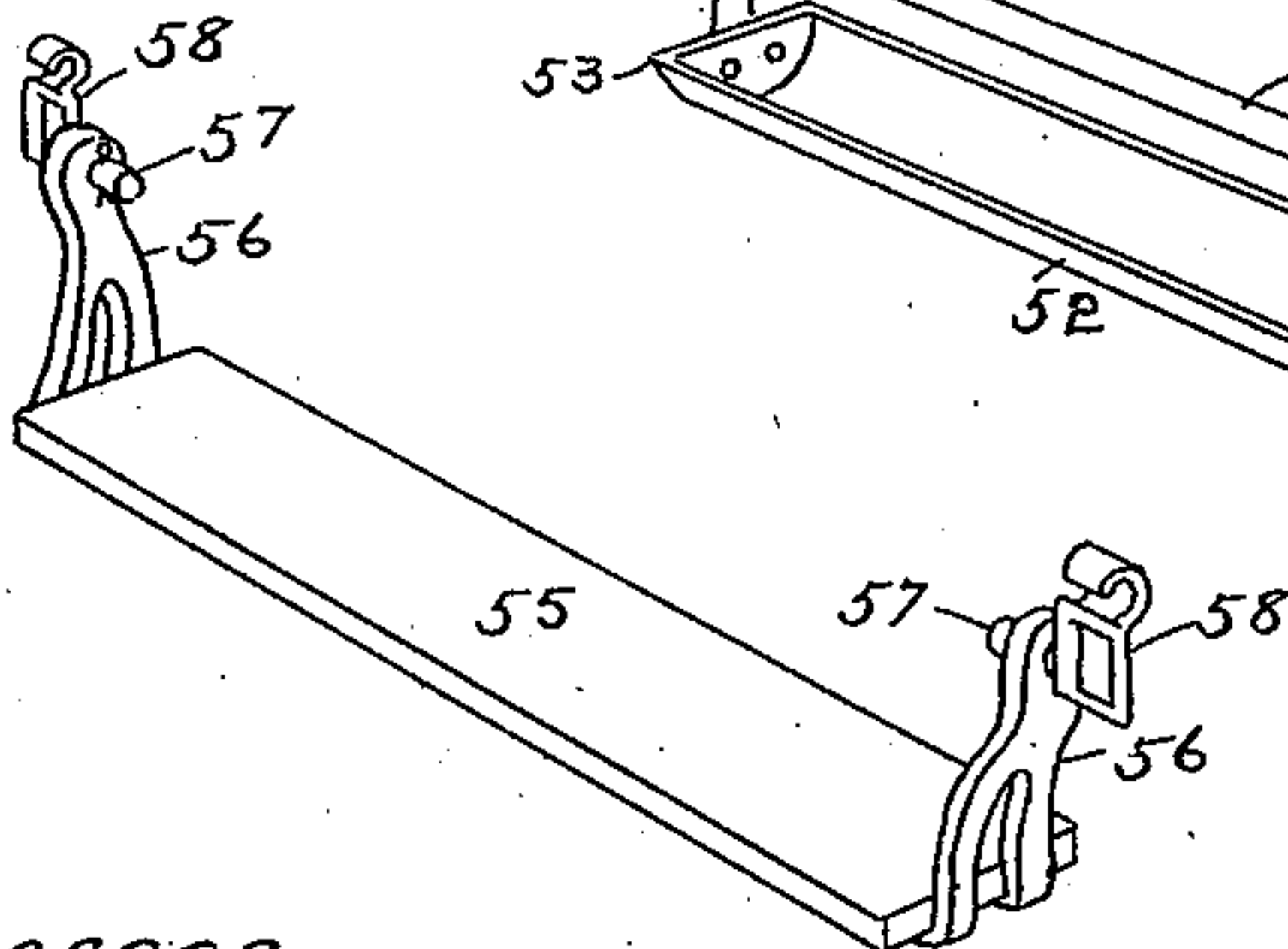
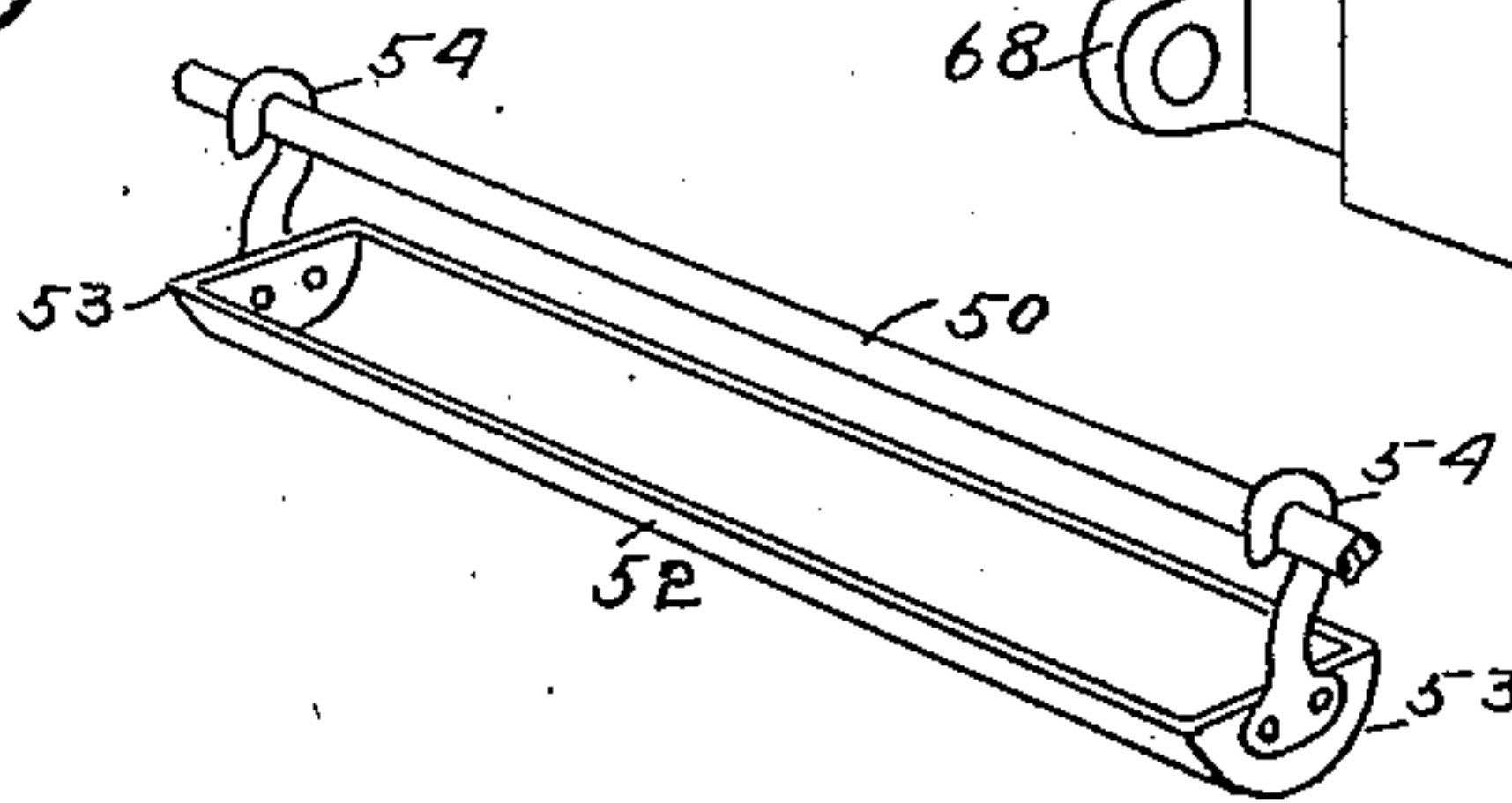
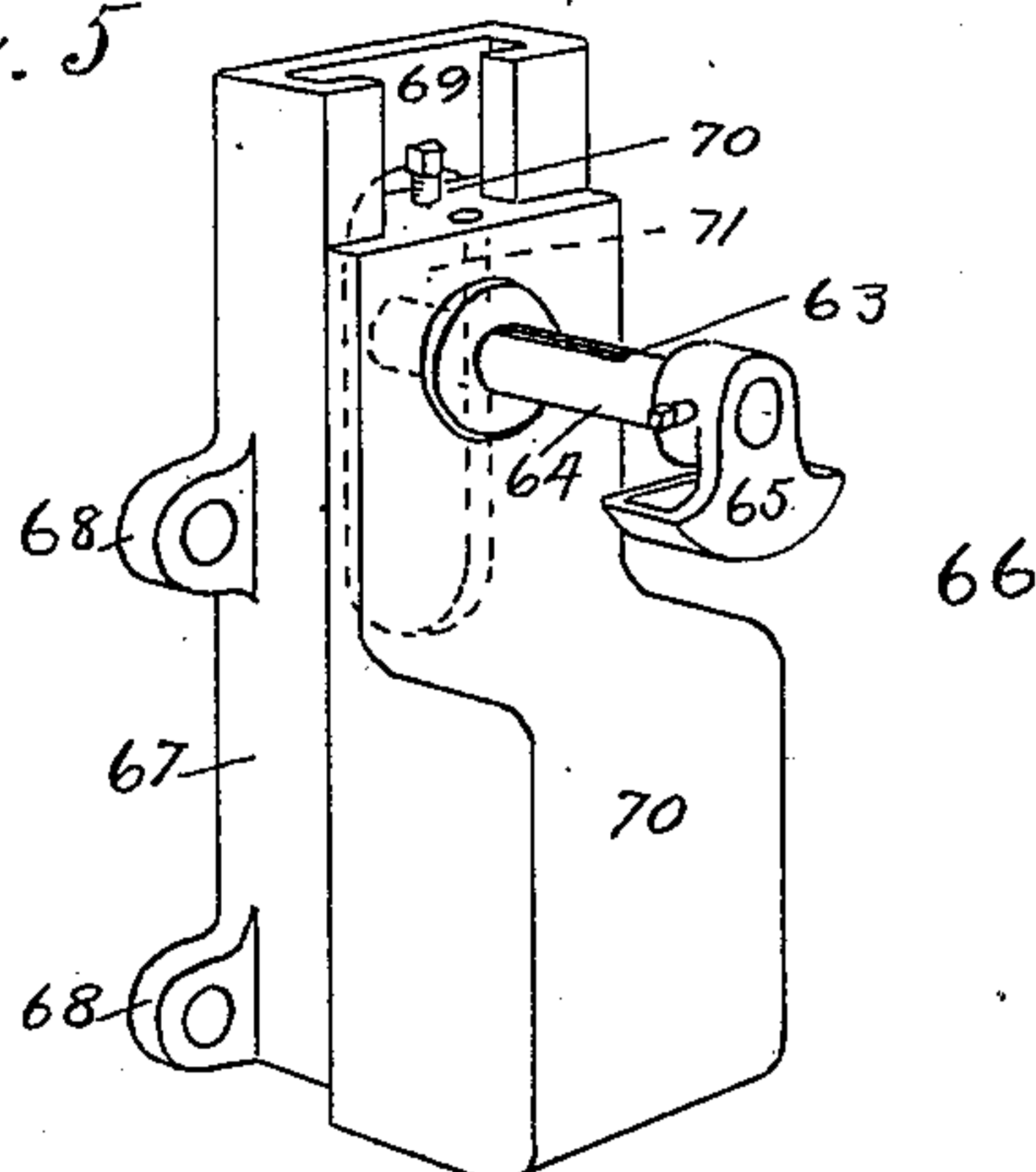
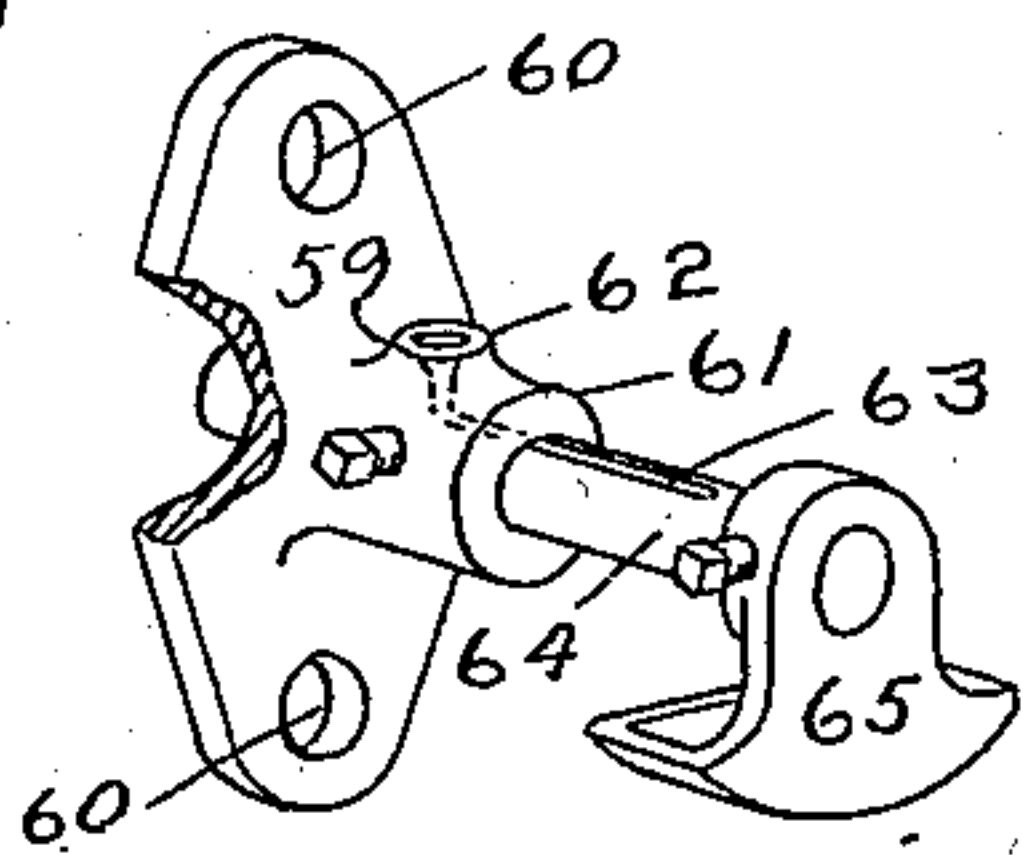
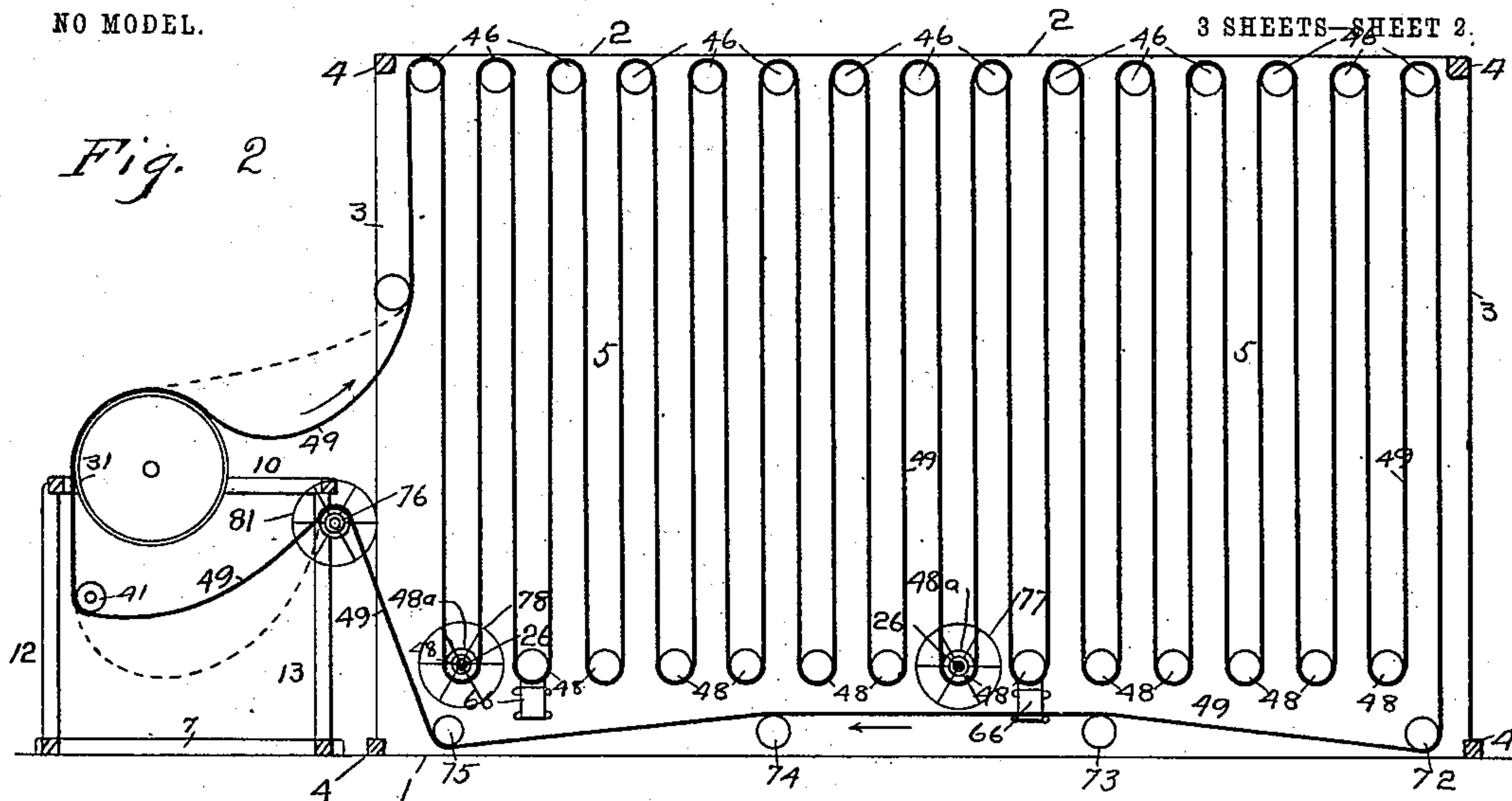
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3 SHEETS-SHEET 2



Witnesses
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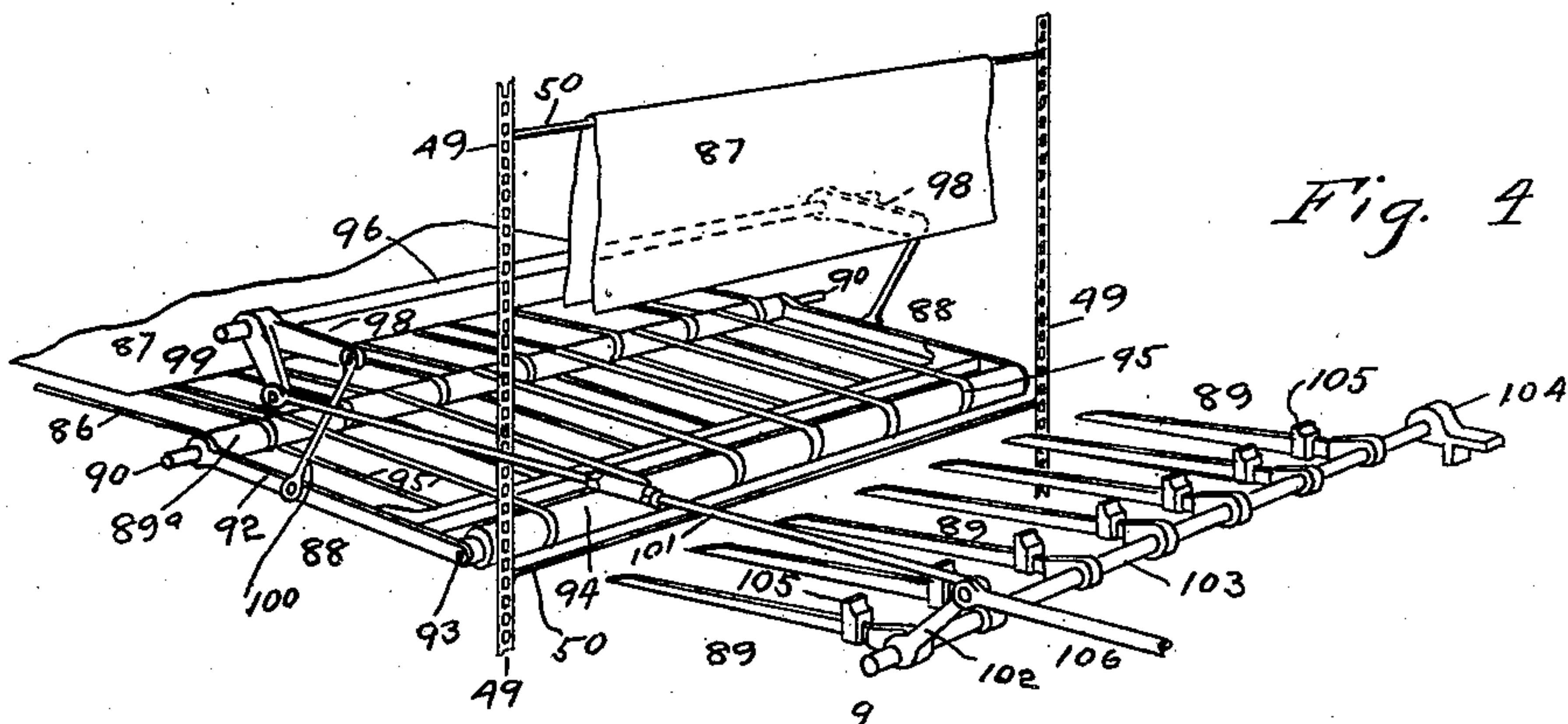
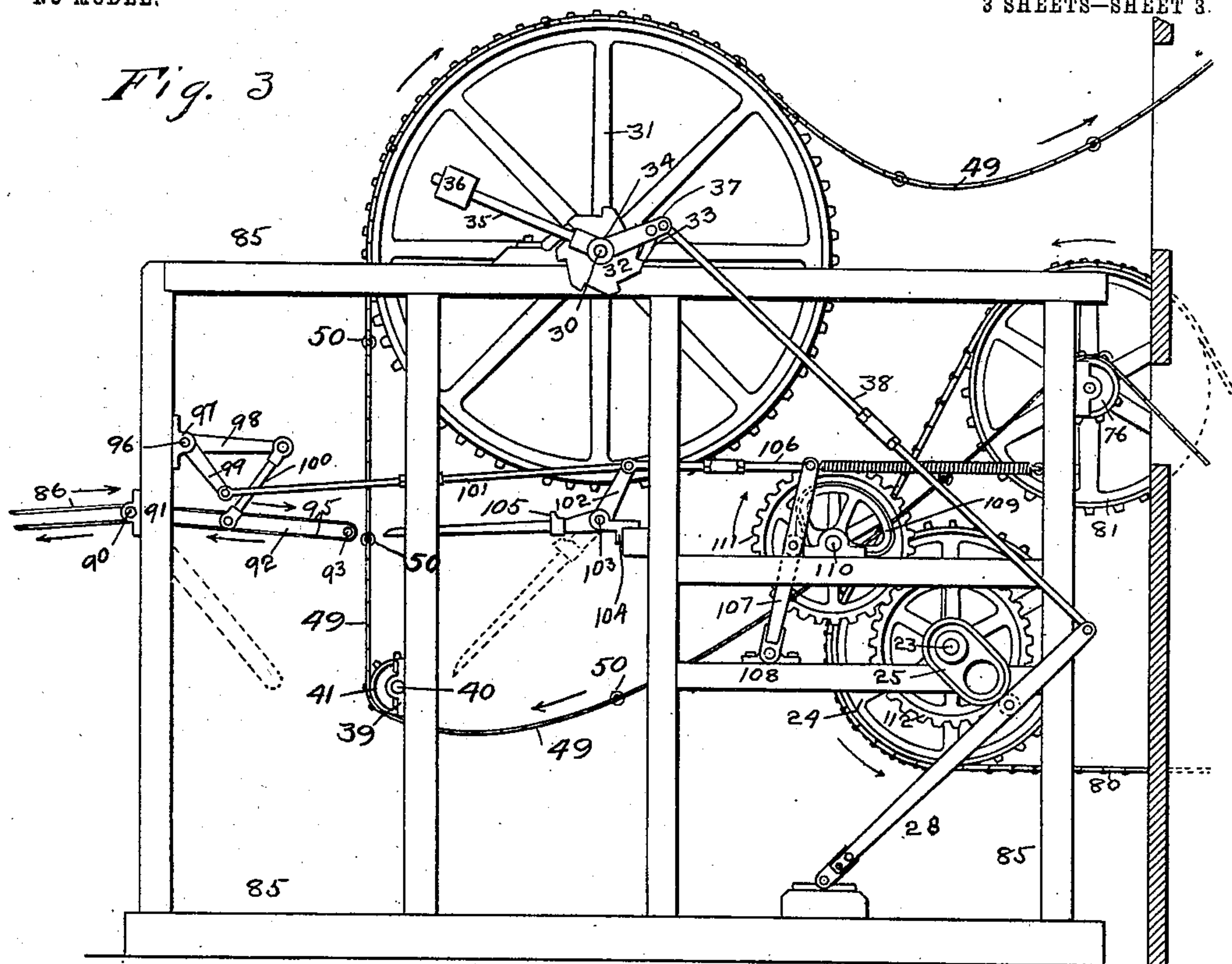
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NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HENRY E. BRETT, OF LOS ANGELES, CALIFORNIA.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 724,540, dated April 7, 1903.

Application filed March 7, 1902. Serial No. 97,081. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. BRETT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Conveyer, of which the following is a specification.

This invention relates to conveyers, and particularly to apparatus of this general character wherein is employed a carrying element of great length; and some of the objects of the invention are to provide a conveyer wherein power is employed at different intervals or positions throughout the length of the carrying element to actuate or propel the same.

Another object of the invention is to provide a carrying element capable of a continuous and intermittent motion simultaneously.

A further object of the invention is to provide a conveyer adapted to transport materials or articles in the process of manufacture or treatment.

With these and other objects in view the invention consists, essentially, in the construction, combination, and arrangement of parts, substantially as more fully described in the following specification, and illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a perspective view of the conveyer, parts thereof being broken away to facilitate the illustration of the same. Fig. 2 is a side elevational view of the endless carrying element, showing the same in two positions by means of full and dotted lines. Fig. 3 is a side elevational view of the front portion of the apparatus embodying means for feeding sheet material into the apparatus. Fig. 4 is a perspective detail view of a portion of the feeding means. Fig. 5 is a detail view of the tension device for the conveying element. Fig. 6 is a detail view of bearing and drip-cup for the sprocket-wheels of the conveying element. Figs. 7 and 8 are detail views of different kinds of receivers, and Fig. 9 is a detail view of the drive-shaft of the apparatus.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, and particularly to Fig. 1 thereof, there is illustrated a main

frame, which may be composed of bottom pieces or sills 1, top pieces 2, end pieces 3, and cross-pieces 4, and, if desired, the frame may be inclosed by sides 5, as shown. Adjacent to the main frame may be located an auxiliary frame comprising bottom members 6, 7, and 8, top members 9, 10, and 11, and end members 12 and 13, also vertical braces 14 and 15 and intermediate side braces 16 and 17, extending between the end members 12 and the vertical braces 14 and 15, or they may be extended to the end members 13, if found desirable. Mounted in bearings 18 on the intermediate side braces 16 and 17 is a drive-shaft 19, carrying a driving wheel or pulley 20, which may be actuated from any suitable engine or motor, and secured upon the shaft 19 is a driving-pinion 21, meshing with a driven gear-wheel 22 upon a driven shaft 23, carrying at the opposite end thereof a driving sprocket-wheel 24 and a cam 25, preferably operating a rocking lever 28, desirably having a roller 27, constructed to receive the action of the cam 25, and the rocking lever 28 is preferably pivotally mounted, as at 29, to the bottom member 6 of the auxiliary frame. Preferably journaled in the top members 9 and 11 of the auxiliary frame is a shaft 30, desirably carrying regulating sprocket-wheels 31, and on the shaft 30 is secured a ratchet-wheel 32, constructed to receive a pawl 33, pivoted to an elbow-lever 34, preferably provided with an arm 35, carrying a counterweight 36, and with another arm 37, connected with the free end of the rocking lever 28 by an adjustable rod or link 38, by means of which construction the regulating sprocket-wheels 31 are rotated a predetermined distance by the action of the cam 25 upon every revolution of the driving sprocket-wheel 24, as will be readily understood. Preferably journaled in bearings 39 upon the intermediate side braces 16 and 17 is a shaft 40, carrying guide sprocket-wheels 41, and journaled in bearings 42 upon the end pieces 3 of the main frame is a shaft 43, carrying guide sprocket-wheels 44 to guide the carrying element in the passage of the same to the sprocket-wheels mounted in the main frame. Desirably mounted in the upper portion of the main frame are a plurality of sprocket or sheave wheels 45 and 46, and in

the lower portion of this frame there is desirably mounted a plurality of similar wheels 48, and preferably over these wheels is made to pass an endless carrying element 49, which desirably consists of a chain; but a perforated belt, a knotted rope, or other device may be employed, if found desirable in practice. The endless carrying element 49 is here illustrated as consisting of two endless chains 49, connected by bars or rods 50, adapted to receive and support the material where the same is of such character as to be retained upon the bars 50, as is the case in an application of this invention illustrated in Figs. 3 and 4 of the drawings and hereinafter described; but when the material treated or handled is not of such character then separate receivers or conveyers may be employed, to be attached to the bars 50, as stated herein.

Referring particularly to Figs. 7 and 8, there are illustrated two forms of receivers or conveyers that may be employed. The construction shown in Fig. 7 embodies a semi-cylindrical portion 52, having closed ends 53, to which are attached hooks 54, constructed to removably engage and be movably supported upon the bars or rods 50 of the carrying element and to depend therefrom, so as to prevent the accidental discharge of their contents, as will be readily understood.

In Fig. 8 there is shown a modified form of receiver or conveyer embodying a plate 55, provided with end hangers 56, having openings in the free end thereof to receive trunnions or lateral projections 57, formed on or connected with the links 58 of the endless carrier 49, and in this construction the bars or rods 50 are dispensed with and the receivers or conveyers 55 are connected directly to the endless-carrier chains.

By varying the construction of the receivers or conveyers this apparatus may be used for conveying or handling materials generally, for drying of materials—such as sand, salt, grain, printed or varnished sheets of paper, &c.—for drying and curing fruits, vegetables, lumber, &c., and for the manufacture of various articles—such as artificial fuel, bricks, &c.—which in the process of manufacture may be required to be cooled, heated, dried, or transferred from one place to another.

Referring now to the construction illustrated in Fig. 6, the bearings of the sprocket or sheave wheels in the main frame are shown preferably embodying an attaching plate or casting 59, having openings 60 therein for the reception of securing screws or bolts to retain the bearing in position, and formed on or connected with the plate 59 is a hub 61, preferably provided with an oil reservoir or receiver 62, communicating with the hollow interior of the hub 61, so that the lubricant introduced within the reservoir 62 will pass to the interior of the hub and into the longitudinal groove or recess 63 in the shaft 64 of the wheels aforesaid to lubricate the same, and the shaft preferably is extended into the sup-

porting member to remove the strain from the attaching-bolts, and to prevent the possibility of the lubricant dropping upon and injuring the material being transported by the carrying element 49 below a drip-cup 65 is preferably secured upon the free end of the shaft 64, substantially as shown in Fig. 6.

In order to provide a proper or uniform tension throughout the length of the endless carrying element 49, tensionizers 66 may be provided at various places or points in the main frame, substantially as shown in Figs. 2 and 5 of the drawings. These tensionizers preferably embody slotted attaching brackets or blocks 67, having lateral extensions or lugs 68 to receive securing bolts or screws, by which the brackets are secured in position, and the brackets are desirably provided with a T-shaped longitudinal slot 69 to receive a similarly-shaped extension upon the counter-weighted bearing 70, carrying the shaft 64, whereon the wheels 47 and 48 are mounted and which is preferably extended through the slot 71 in the block 67 to limit the movement of the bearing 70, as shown.

It will be understood that all of the shafts carrying the wheels 45, 46, 47, and 48 are provided with the longitudinal groove for the lubricant and also with a drip-cup, if desired.

The endless carrying element or endless carrier 49 preferably embodies two endless chains carried by the sprocket-wheels 45 and 47 on one side of the main frame and the sprocket-wheels 46 and 48 upon the other side thereof, so that the carrier 49 is made to travel over said wheels by a series of outgoing and return movements, any number of such wheels being employed, according to the length of the carrier 49, which may be as long as desired. After passing over the wheels 45, 46, 47, and 48 successively the carrier 49 preferably passes under sprocket or sheave wheels 72, mounted in the corner of the main frame, desirably below the other wheels, and from thence successively over similar wheels or rollers 73, 74, and 75 in the lower portion of the main frame, from which it passes over another wheel or set of wheels 76 in the auxiliary frame, (it being understood that there is a wheel for each carrier,) then over the guide-wheels 41 in the forward portion of the auxiliary frame to the large regulating sprocket-wheels 31, and to and over the guide-wheels 44 to the wheels 45 and 46, first mentioned, thereby completing the circuit or cycle of operation.

It is an object of this invention to so construct the conveyer that one portion of the carrier may be kept in motion at a uniform velocity while another portion thereof may be subjected to an intermittent or varying velocity for the purpose of performing some function pertaining to the art in which the conveyer is employed. Therefore to accomplish this object the construction herein described and shown produces a uniform velocity in that portion of the carrier 49 which

is passing over the sprocket-wheels mounted in the main frame, while subjecting that portion thereof passing through the auxiliary frame to an intermittent movement by reason of the excessive length or slack of the endless carrier and the action of the regulating sprocket-wheels 31, which are rotated a predetermined distance upon every revolution of the driven shaft 23, carrying the cam 25, operating the rocking lever 28, connected with the elbow-lever 34, having ratchet-and-pawl engagement with the shaft 30, carrying said regulating-wheels 31, as before described.

It is also an object of this invention to provide a conveyer wherein the operating power is transmitted or applied to said conveyer at various positions or intervals throughout the length thereof, thus mechanically arranging the endless carrying element into separate sections or bays, each having its own driving devices acting synchronously, said application of power being for the purpose of equalizing and regulating the velocity of the carrying element and reducing the stress therein. To accomplish this object, a plurality of driving sprocket-wheels 77 and 78 are mounted upon certain of the shafts 26, carrying the sprocket-wheels 47^a and 48^a, substantially as shown in Fig. 9 of the drawings. A sprocket-chain or its equivalent 80 preferably passes around the main or initial driving sprocket-wheel 24, thence over the driving sprocket-wheel 77, under an idler or guide wheel 79, around the driving sprocket-wheel 78, over the wheel 81, and finally back to the wheel 24, essentially as illustrated in Fig. 1. By means of this construction power is applied at a plurality of positions or intervals throughout the length of the endless carrier 49, thereby lessening the strain or stress thereon at the initial driving position or interval, together with a decrease of friction, and rendering it possible and practical to drive or actuate an endless carrier of great length.

The operation of the construction shown and described is substantially as follows, to wit: The driving-shaft 19 (actuated from any source of power) rotates the driving-pinion 21, which drives the gear-wheel 22, thereby rotating the driven shaft 23, carrying the initial or main driving sprocket-wheel 24, carrying the driving chain or belt 80, passing over and imparting motion to the driving sprocket or band wheels 77 and 78, (any number whereof may be employed,) and the latter in turn drive the respective sprocket or pulley wheels 47^a and 48^a, mounted upon the same shaft 26, thereby distributing the driving power to each section or bay throughout the length of the endless carrier 49 and distributing the strain thereon. Upon every revolution of the driven shaft 23 the cam 25 thereon operates the rocking lever 28, connected with the counterweighted elbow-lever 34, carrying a pawl engaging the ratchet 32 on the shaft 30, carrying the regulating sprocket-wheels 31, thereby imparting to

the latter an intermittent motion, as will be readily understood. As soon as the cam 25 shall have released the rocking lever 28 the latter and the elbow-lever and the pawl are retracted by the action of the counterweight 36 upon the arm 35 of the elbow-lever 34, and these parts remain in the retracted position until again operated by the cam 25. When the regulating sprocket-wheels 31 are thus partially rotated by the action of the parts just described, the slack in the endless carrier 49 below said wheels is taken up or transferred to that portion of the carrier above said wheels 31 to be taken up or consumed by the continuous movement of the carrier 49 while passing over the sprocket-wheels 45, 46, 47, and 48, mounted in the main frame, which wheels are rotated at a constant velocity by the mechanism before described. By the time the regulating sprocket-wheels 31 are again actuated by the action of the cam and connected parts the sprocket-wheels 76 have fed below the regulating-wheels 31 a sufficient length of slacked carrier 49 to permit of another consumption of such slack, as just described.

In Fig. 3 of the drawings the full lines illustrate the position of the slacked portion of the carrier 49 after the regulating-wheels 31 have been operated, as before described, while the dotted lines in said figure show the position of the slacked portion of the carrier just before such operation of the wheels 31.

Referring now to Figs. 3 and 4 of the drawings, there is illustrated one application of the conveyer, embracing a frame 85, substantially similar to the auxiliary frame before shown and described, and within or upon this frame 85 are preferably mounted the regulative sprocket-wheels 31 upon the shaft 30, carrying the ratchet-wheel 32, and the counterweighted elbow-lever 34, having the pawl 33 and connected by the link or rod 38 with the rocking lever 28, operated by the cam 25 upon the driven shaft 23, carrying the main or initial driving sprocket-wheel 24, over which and the sprocket-wheel 81 passes the driving sprocket-chain 80, also passing over the driving sprocket-wheels 77 and 78 and over the wheels 79 and 81, substantially as before described in connection with Fig. 1. The endless carriers 49 pass over the sprocket-wheels 45, 46, 47, 48, 72, 73, 74, and 75 in the main frame, substantially as before described, and thence over the sprocket-wheels 76 and 41 and regulating sprocket-wheels 31 back to the said wheels in the main frame.

The application of the conveyer illustrated in Figs. 3 and 4 preferably embodies traveling or feeding bands 86, (only a portion whereof is shown,) adapted to convey sheets of material 87, Fig. 4, upon fliers 88 and 89, and these bands 86 preferably pass over and rotate a sleeve 89^a, revolubly mounted upon a shaft 90, journaled in bearings 91 on the frame 85, and mounted on said shaft are arms 92, carrying in the free ends thereof a cross-

rod 93, also provided with a revoluble sleeve 94, over which and the sleeve 89^a pass endless belts 95, driven by the rotation of the sleeve 89^a, which is driven by the bands 86, as will be readily understood. A shaft 96 may be journaled in bearings 97 upon the frame 85 and preferably carries fixed arms 98 and 99, the former being connected to the arms 92 by links or rods 100 and the latter being connected by an adjustable rod or link 101 with an arm 102 on a shaft 103, mounted in brackets 104 upon the frame 85, substantially as shown in Figs. 3 and 4. Fast upon the shaft 103 are fliers 89, carrying stops 105 to regulate the position of the sheets of material 87 delivered thereon by the belts or bands 86 and 95, and between the free ends of the fliers 88 and 89 passes the endless carrier 49, provided with the rods 50 to receive the sheets of material 87, as shown in Fig. 4, when the fliers 88 and 89 are depressed, as shown in dotted lines in Fig. 3, and the carrier 49 is elevated, as hereinafter more fully explained. A spring-retracted pull-rod 106 is preferably connected at one end to the frame 85, and one end of a rocking lever 107 is desirably attached thereto and pivoted at the other end to the frame 85, as at 108, and said lever is preferably provided with a roller constructed to engage a cam 109 on a shaft 110, also carrying a gear-wheel 111, meshing with and driven by a gear-wheel 112 on the driven shaft 23, so that the rotation of the latter revolves the shaft 110 and causes the cam 109 thereon to operate the rocking lever 107, which depresses the fliers 88 and 89 through the mediation of the pull-rod 106, rod 107, and arms 98, 99, and 102, as will be readily seen from the drawings. As the parts just described all operate synchronously, the fliers 88 and 89 will be depressed, and a sheet of material 87 will be deposited upon the rod 50 of the endless carrier 49 at the time the latter is elevated by the action of the regulating-wheels 31, as before explained.

It is not desired to limit this invention to use with the apparatus shown in Figs. 3 and 4, as the same is illustrated and described merely as an application of the invention which is equally capable of various other applications, as hereinbefore set forth.

The invention is not confined to the specific construction, combination, and arrangement of parts hereinbefore shown and described, and the right is reserved to make all such changes in and modifications of the same as come within the spirit and scope of this invention.

I claim—

1. A conveyer provided with a frame, wheels movably mounted on shafts journaled in the upper and lower portions of said frame in zigzag relation, an endless carrying element passing alternately up over and down under said wheels in succession, separate driving devices mounted upon the shafts of certain of the guiding or supporting wheels, a driving belt

or chain passing over said separate driving devices and driving the same continuously and means for driving said belt.

2. A conveyer provided with an endless carrying element, shafts, devices constructed to movably support the same, tensionizers forming the bearings for and hanging free from the shafts of certain of said devices to equalize the tension throughout said element and means for actuating said element.

3. A conveyer provided with a frame, an endless carrying element therein, slotted brackets attached to said frame, devices within said frame having shafts and constructed to movably support said carrying element the shafts of certain of said devices passing through the slot in said brackets, means mounted upon said brackets forming the bearing for and depending from said shafts to equalize the tension throughout said element and means for actuating the parts.

4. A conveyer provided with a frame, an endless carrying element therein, slotted brackets secured to said frame and having guides therein, wheels mounted in said frame having shafts and constructed to movably support said element, the shafts of certain of said wheels passing through said slots and extending beyond said brackets devices mounted in said guides and forming the bearing for said extended shafts to equalize the tension throughout said element and means for actuating the parts.

5. A conveyer provided with a long endless carrying element, wheels for supporting and maintaining the major portion of said element in a taut condition, means for actuating certain of said wheels to continuously drive said major portion, said carrying element having a slacked minor portion, regulating devices acting upon said slacked portion, and mechanism for actuating said regulating devices intermittently to deliver all of said slacked portion to said wheels by one motion.

6. A conveyer provided with a frame, a long endless carrying element mounted therein, wheels mounted in said frame to support and maintain that portion of said element within said frame in a taut condition, means for actuating certain of said wheels to continuously drive said portion of said element, said element having a slack portion outside of said frame, regulating devices operating upon said outside portion of said element and mechanism for actuating said regulating devices to intermittently deliver all of said outside portion to said wheels by one motion.

7. A conveyer provided with a long, endless carrying element guided in zigzags or loops and having such length as to permit of a free festoon at one portion thereof, said loops being grouped consecutively into separately-driven sections, separate devices for each of said sections constructed to support and maintain that portion of said element within that section in a taut condition, means

for driving certain of said devices in each section continuously, regulating-wheels constructed to support and in one motion to transfer said festoon from one location to another and mechanism for imparting such motion intermittently to said wheels.

8. A conveyer provided with an endless carrying element having an excess of length therein, devices for supporting that portion of said element that is kept taut, regulating-wheels operating upon the slacked portion of said element, an elbow-lever upon the shaft carrying said wheels and having intermittent engagement therewith, a cam-carrying shaft, means operated by the said cam and connected with said elbow-lever to take up and feed to said devices the slack in said element, and mechanism for driving said element.

9. A conveyer provided with an endless carrying element having an excess of length therein, devices for supporting that portion of said element that is normally taut, regulating-wheels operating upon the slacked portion of said element, an elbow-lever upon the shaft carrying said wheels and having intermittent engagement therewith, a cam-carrying shaft, a rocking lever connected to said elbow-lever and operated by said cam, whereby the slack in said element is taken up and fed to said devices and mechanism for driving said element.

10. A conveyer provided with an endless carrying element having an excess of length therein, driving devices for supporting and maintaining the main portion of said element in a taut condition, means for actuating said devices to continuously drive said main portion, fliers constructed to receive and convey sheet material to said element and mechanism for depressing the fliers to deposit said material on the excess portion of said element and to feed said portion to said devices.

11. A conveyer provided with a carrying element having rods, means for supporting and driving the same, fliers constructed to receive and transport sheet material over said rods, arms connected with said fliers and with each other, a spring-retracted rod in said connections and means for extending said spring

and depressing said fliers, whereby said material is deposited upon said rods.

12. A conveyer provided with a carrying element having rods, means for supporting and driving the same, fliers constructed to receive and transmit sheet material over said rods, arms connected with said fliers and with each other, a spring-retracted rod in said connection, a cam-carrying shaft and a rocking lever attached to said rod and operated by said cam to depress said fliers and deposit the material on said rods.

13. A conveyer provided with a frame, slotted brackets secured thereto having grooves, wheels mounted in said frame having shafts passing through said slots, weighted bearings depending from said shafts and engaging said grooves, an endless carrier passing over said wheels and means for actuating said carrier.

14. A conveyer provided with a frame, a long endless carrying element guided in zig-zags or loops, such loops being grouped consecutively into separately-driven sections, devices constructed to immovably support said element, means connected with certain of said devices within each section to continuously drive the same, separate tensionizers within each section cooperating with said driving devices, to regulate the tension of said element within such section and mechanism for actuating said means.

15. An apparatus provided with bearings each having a reservoir for a lubricant, shafts mounted in said bearings having longitudinal channels to receive the lubricant from said reservoir, wheels on said shafts covering said grooves, retaining-collars on said shafts each having a drip-cup to receive the discharged lubricant, an element passing over said wheels and means for driving said element.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY E. BRETT.

Witnesses:

J. W. KEMP,
L. B. ALDERETE.