No. 699,109. Patented Apr. 29, 1902.

L. L. KELSEY.

CARRIER AND DRIER.

(Application filed Oct. 26, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

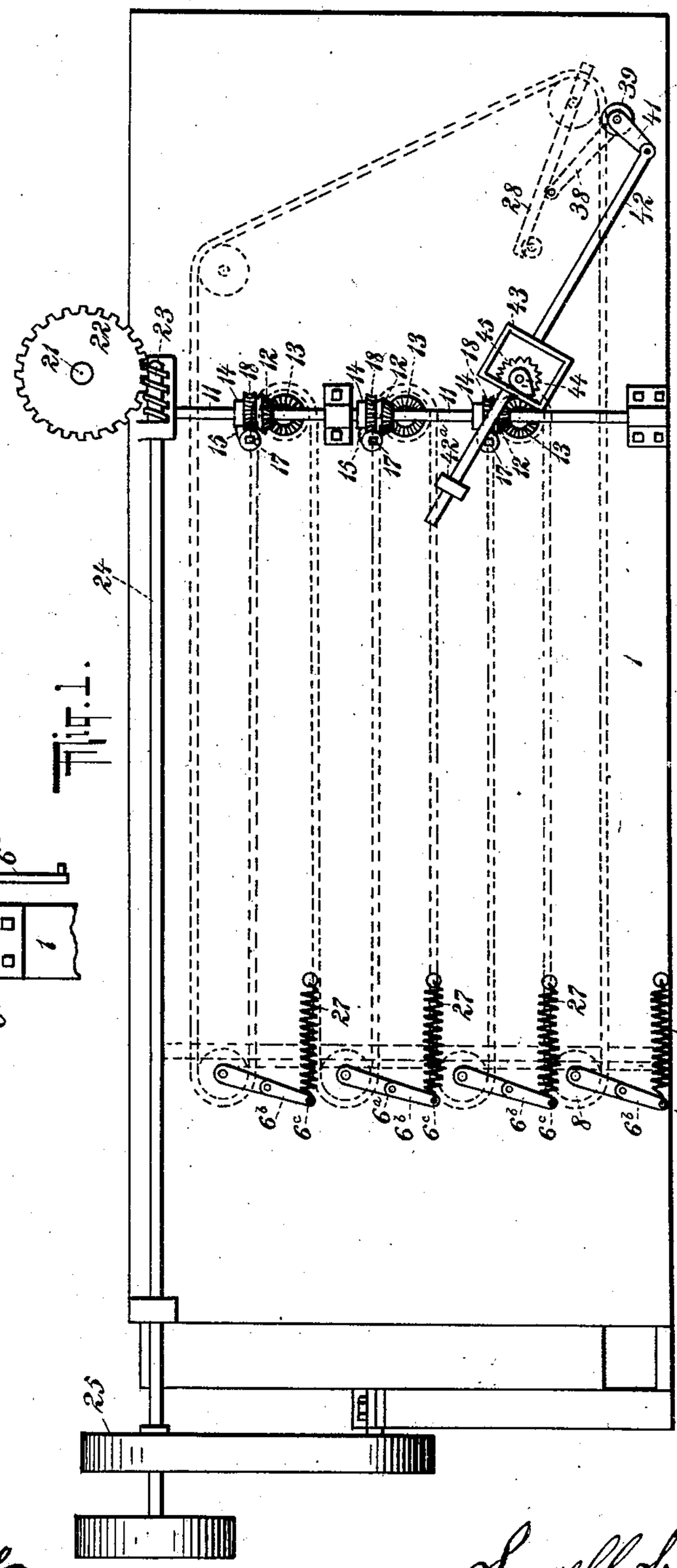
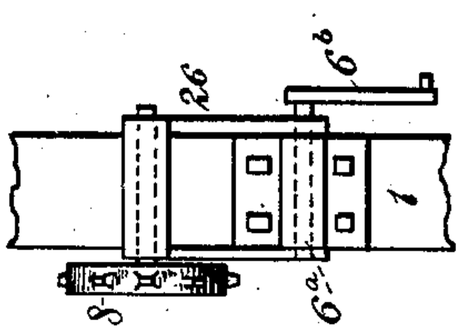


Fig. 7.



WITNESSES

Elwood Bell

J. M. Hoctor

INVENTOR

Lovell L. Kelsey,

BY Raymond Ives Blakeslee

his ATTORNEY.

No. 699,109. Patented Apr. 29, 1902.

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(No Model.) 3 Sheets—Sheet 2.

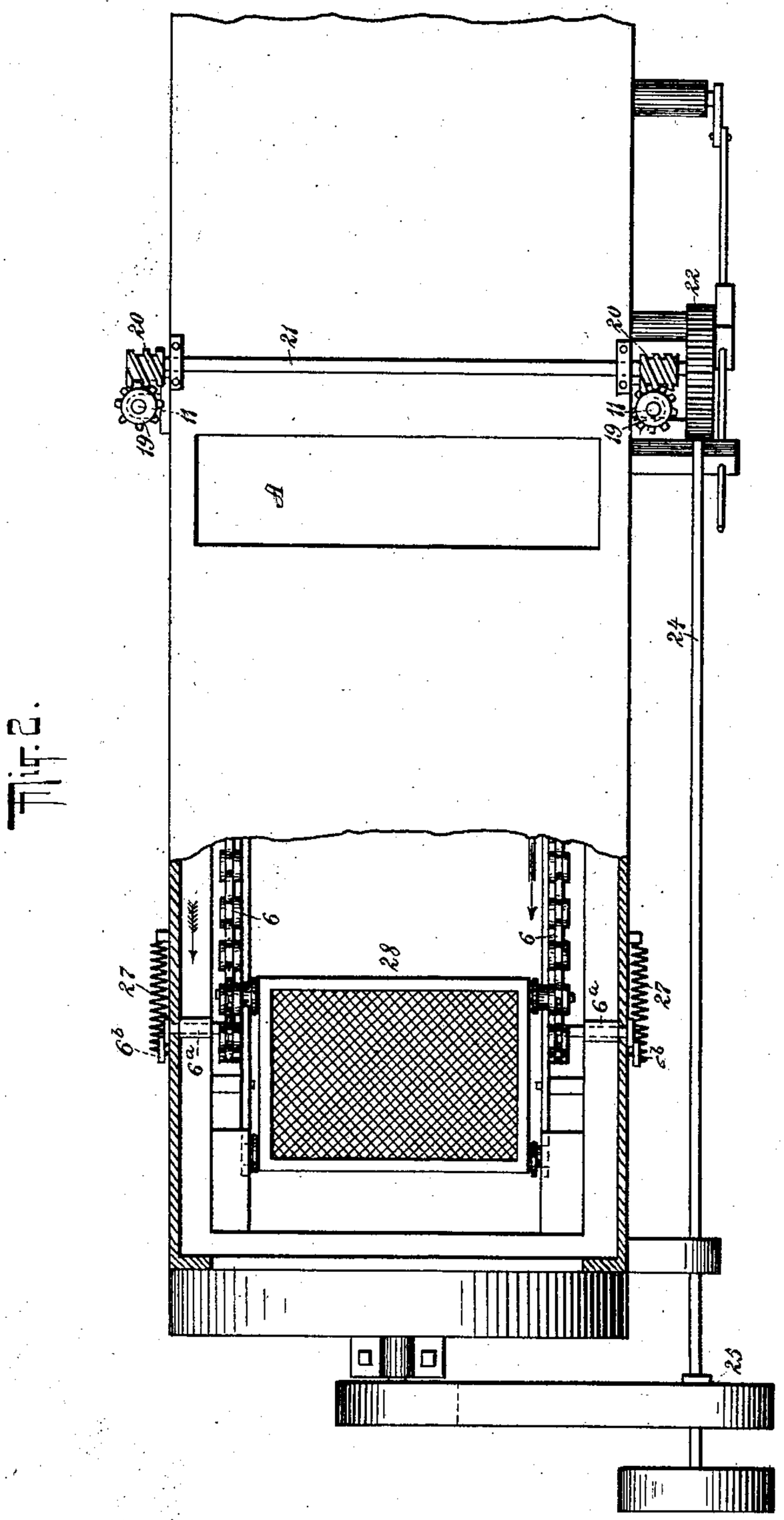

Fig. 2.

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CARRIER AND DRIER.

(Application filed Oct. 26, 1900.)

(No Model.) 3 Sheets—Sheet 3.

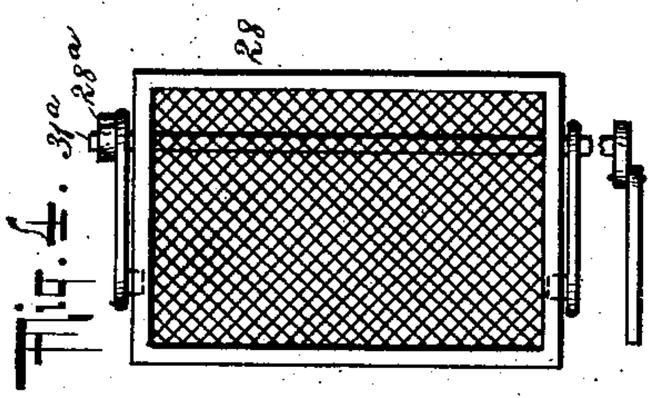

Fig. 4.

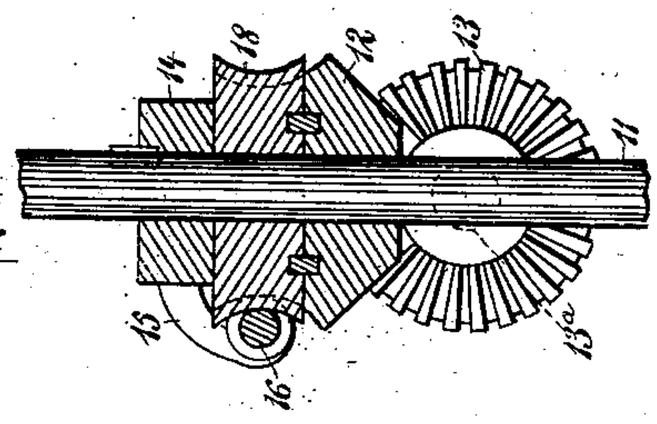

Fig. 6.

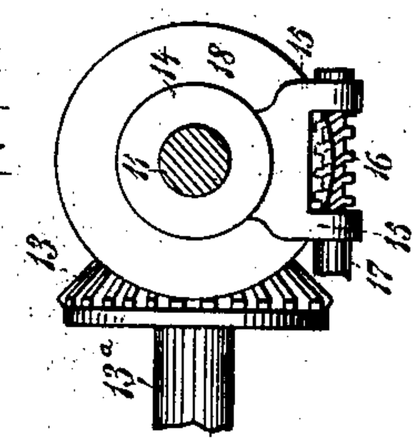

Fig. 5.

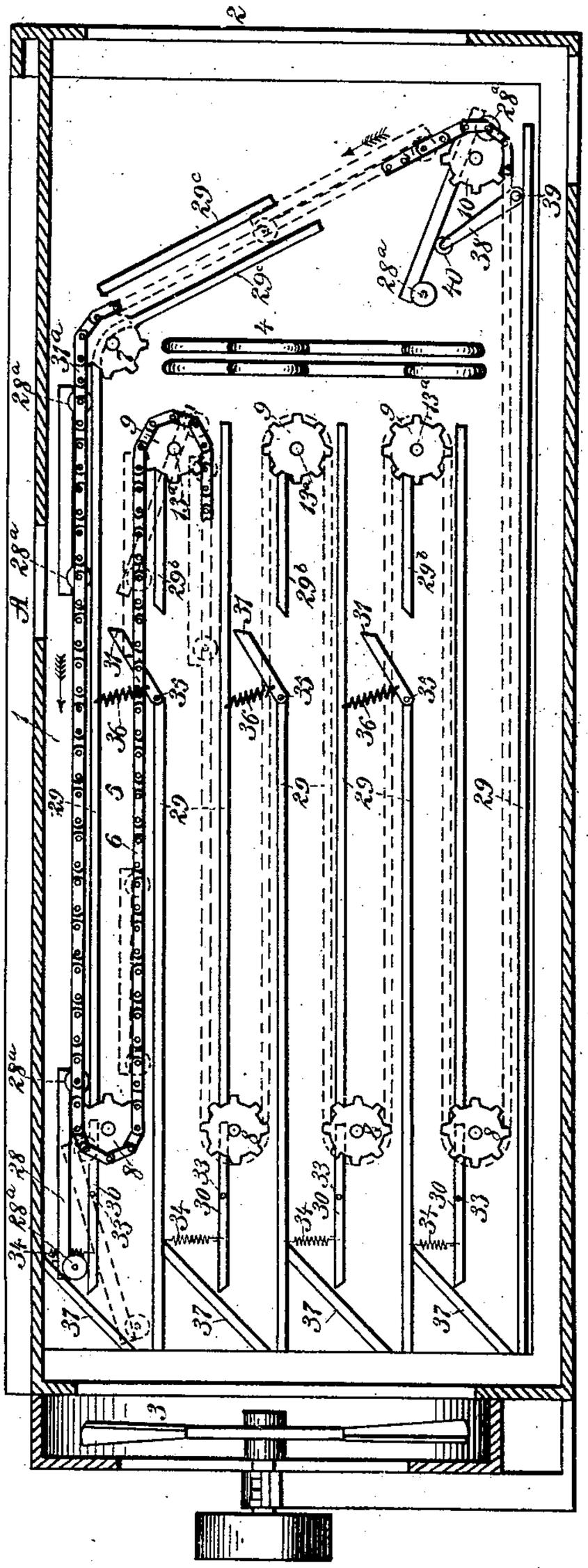

Fig. 3.

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J. M. Hoctor

BY

INVENTOR
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Raymond Van Blakeslee,
his ATTORNEY.

UNITED STATES PATENT OFFICE.

LOVELL LAZEL KELSEY, OF GUILFORD, CONNECTICUT, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO FEDERAL GLUE COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CARRIER AND DRIER.

SPECIFICATION forming part of Letters Patent No. 699,109, dated April 29, 1902.

Application filed October 26, 1900. Serial No. 34,525. (No model.)

To all whom it may concern:

Be it known that I, LOVELL LAZEL KELSEY, a citizen of the United States, residing at Guilford, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Carriers and Driers, of which the following is a full, clear, and exact description, such as will when taken in connection with the accompanying drawings, which form a part thereof, enable those skilled in the art to which it appertains to make and use the same.

This invention relates to carriers and driers; and it has for its object to provide an improved apparatus of this class particularly adapted for carrying or conveying glue, pigments, confections, and other products and subjecting the same to the drying or setting influence of predetermined atmospheric conditions. By means of the employment of my improved apparatus, time, labor, and extent of plant may be economized.

The present invention embodies an endless carrier to which nets or frames are coupled and which for the most part travels in a to-and-fro course and in different planes through a casing or compartment in which predetermined atmospheric conditions are maintained. The carriers finally travel upwardly, and the load of the nets is automatically discharged in dry finished form. The to-and-fro movement is permitted and established by a series of tracks provided with automatic switches, with which the nets coact during continuous travel of the carrier.

In the drawings, Figure 1 is a side elevation of my improved carrier and drier. Fig. 2 is a top plan view of the same, partly broken away to show the construction. Fig. 3 is a vertical longitudinal sectional view of the same. Fig. 4 is a plan view of one of the nets or frames in detached position. Fig. 5 is a top plan view, partly in section, of an important element of the present invention. Fig. 6 is a vertical sectional view of the same. Fig. 7 is a detail face view of another important element of the present invention.

Corresponding parts in all the figures of the drawings are denoted by the same reference characters.

Referring more particularly to the drawings, 1 designates a casing having at one end a duly-proportioned air-inlet opening 2 and preferably provided at its other end with any suitable exhaust-fan 3, assuring air circulation through the casing to draw off moisture, fumes, or volatile matter arising within the casing. The air-current is preferably maintained at proper temperature and is given the desired dryness by the precipitation of the moisture, as dew or frost, by means of suitable refrigerating appliances within the casing, preferably adjacent to the air-inlet 2—such, for instance, as one or more ammonia-circulating coils, (indicated at 4 in Fig. 3 of the drawings.)

As illustrated, the carrier 5, which is moved to and fro throughout the casing 1, comprises two endless link belts 6 6, arranged one at each side of the casing and running over suitable sprocket-wheels, which guide the carrier mainly in a to-and-fro course. Beginning at a predetermined point, the belts 6 run over wheels 7, and thence forward to the upper wheels of the two series of vertically-arranged wheels 8 at or near one end of the casing, around which they pass backward to the upper wheels of two series of vertically-arranged wheels 9 in the opposite part of the casing, thence forward again to the next lower wheels of series 8, backward to the next lower wheels of series 9, thence forward to the next lower wheels of series 8, and so forth, until from the bottom wheels of series 8 the belts travel to wheels 10, whence they pass upward and preferably at an incline to the wheels 7. The series of wheels 9 are driving-wheels for the endless belts 6, and the series of wheels 8 and wheels 7 and 10 are idlers which merely support and guide the belts.

At each side of the casing is journaled a vertical shaft 11, carrying miter or bevel gears 12, engaging miter or bevel gears 13 on the shafts 13^a of the carrier-belt wheels or sprockets 9, which are stub-shafts journaled in the sides of the casing 1. The bevel-gears 12 are not fixed to the shafts 11, but are loosely mounted thereon, so that, if desired, they may be adjusted on the shaft 11.

Above the gears 12 and on the shafts 11 are

rigidly secured or keyed collars 14, with laterally-depending arms 15, forming bearings for worms 16, which may be rotated in their bearings by means of squared or angular projecting ends 17. The worms 16 mesh with worm-wheels 18, loosely mounted on the shafts 11 above the bevel-gears 12, the worm-wheels 18 being rigidly connected or formed integral with the bevel-gears 12. The rotation about the shafts 11 of the lateral arms 15, carrying the worms 16, will rotate the worm-wheels 18 and gears 12, with the shafts, while the turning of the worms 16 will rotate the gears 12 independently of the shafts, if desired. If there is any undue slackness of a part of one of the link belts 6 between two adjacent driving-sprockets 9 relative to the remainder of the link belts, it may be overcome by the rotation of one of the worms 16, and through it of its associated bevel-gear 12, which will slightly change the relation of the particular driving-sprocket 9 to the remainder of the series thereof. Similarly the two link belts 6 may be relatively adjusted to bring two predetermined points thereof into step.

The two vertical shafts 11 have upper worm-gears 19 19 engaged by worms 20 20 on a transverse shaft 21, carrying a gear-wheel 22, engaged by a worm 23 on a main shaft 24, rotated by a belt running to its pulley 25 from any source of power.

To prevent undue slackness of the endless link belts 6, the idler-sprockets of the series 8 at both sides of the casing are journaled each in individually-swinging yoke-levers 26, fulcrumed to the casing at 6^a and having arms 6^b, to which are attached at 6^c suitable springs 27, normally throwing the sprockets 8 forward against the bight of the belts 6, thereby keeping the entire belts normally tight under all conditions of use. This construction is shown in detail in Fig. 7.

The above-named driving-gearing is proportioned to give a slow uniform travel to both link belts 6 6 within the casing. The disposal of the carrier in a to-and-fro course over the wheels 7 to 10 affords a very large path of travel through a comparatively small casing 1 for the carrying frame or nets 28, which are operated by the belts 6, as immediately hereinafter described.

The frames or nets 28 may have any approved closed, open-bottomed, or foraminous construction and are preferably provided with two pairs of wheels 28^a, running on tracks 29, with their pivoted switches 30 31, and which tracks range along the sides of the casing 1. Each net is pivoted at or near one edge, preferably by the axles 31^a of one pair of its wheels, to the opposite link belts 6 6, and the tracks and their switches are arranged in parallel planes beneath the belts, allowing the nets to oscillate through the open switches in taking successively lower planes or levels in the casing 1. As shown, the switches 30 are pivoted at 33 to the casing, and springs 34 hold them closed and in alinement with the tracks 29. The switches 31 are pivoted at 35, and springs 36 hold them inclined and normally opened or away from the ends or detached portions 29^b of the tracks 29. The belts move in the direction denoted by the arrows adjacent thereto, and as each net 28 passes under the feeding-space A, which may be part of any desired delivery device, it receives a load, and the slowly-traveling link belts 6 6 by their pivotal connections with the net advance until the forward part of the net runs upon the upper switches 30 and strikes inclined guides 37, preferably provided in the casing. These guides cause the forward ends of the net to positively lower one end of the switch 30, and I provide openings at the other ends between the switches and tracks, so that when the rear end of the net, with the net-pivots 31^a, reaches its farthest forward position the rear net wheels or pivots slip through the openings at the rear of the switches, and the net then takes the next lower tracks 29. Upon the release of the switches the openings are closed by the springs 34 operating upon the switches. The net is now actuated backward on the lower tracks 29 and strikes and downwardly closes the switches 31 therein against the tension of springs 36, which automatically open them again as the net passes by and about at the time the net-pivots 31^a have reached their extreme limit of backward movement around the upper drive-wheels 9. As the pivots and rear end of the net are lowered to the next tracks 29 about the ends of the last said tracks 29 and carried forward again by travel of the belts the free or forward end of the net passes through the openings in the tracks provided by the raised switches 31, and the net is now pushed forward again and upon the lower tracks 29, and so on, until the net passes upon the lowermost track 29, along which it runs until its pivots 32 are about to pass the idler-wheels 10. By this time the load on the net has been thoroughly dried by its long slow travel through the regulated temperature of the casing and is ready for discharge from the net. The guides 37 are not essential, as the nets by their gravity alone may open the switches 30 to reach the next lower tracks 29, and as the inclination of the net while descending from one part of the track 29 to the next lower is slight the load will remain in place on the nets.

The discharge of the load from the net is effected automatically and, as herein shown, is accomplished by a pair of arms 38, fixed to a rock-shaft 39 and preferably having anti-friction-rollers 40 acting beneath opposite side parts of the net. The shaft 39 has a rigid arm 41 coupled to a rod 42, guided in suitable bearings 42^a on the casing 1 and having a yoke 43, on which acts a cam 44, fixed to a shaft carrying a gear 45, driven by one of the gear-wheels 13. When the shaft 39 is rocked at proper time by this mechanism, the net 28

is swung upwardly at its free rear part, which is held up long enough to cause the now rising link belts 6 to advance the net upon inclined parts 29c of the tracks, over which the belts carry the net until it passes the idlers 7 and again takes its first-named position under the feeding-space A to receive its next load. It will be understood that during the upward tilting of the net by the arms 38 and its travel upon the tracks 29c the load is discharged by gravity from the net and falls into a receptacle 46. Any suitable agency (not shown)—such as agitators, beaters, or strippers—may be used to facilitate this discharge. I prefer to make the inclined tracks 29c as steep as possible to assure gravity discharge of the load, while avoiding backward tilting of the nets. In practice the nets will as closely as possible follow each other, and the endless link-belt carrier may have any desired number of driving and idler wheels.

The operation and advantages of my improved carrier and drier will be readily understood from the foregoing description. The nets or frames are moved continuously through a long course of travel and under predetermined atmospheric conditions, and the load carried by the nets when discharged from the same is in proper dry finished condition.

This apparatus dispenses with net-stacking and accomplishes the required results from a dry finishing standpoint with extreme expedition and effectiveness.

I do not desire to be understood as limiting myself to the particular construction and arrangement of parts as herein specified, as it is manifest that I may considerably modify and vary the same in adapting my improvements to varying conditions of use. I therefore reserve the right to all such modifications and variations as fall within the scope of my invention and the terms of the following claims.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, endless carrier-belts, trays pivoted off center thereto, wheels supporting the belts, tracks for the trays and having switches, and devices automatically tilting the traveling trays at a predetermined phase of the movement of the carrier, substantially as described.

2. In an apparatus of the class described, an endless carrier disposed in part for upward travel, trays pivoted to the carrier, tracks therefor, a shaft having arms arranged to engage the trays, and mechanism rocking the shaft for tilting the trays to automatically discharge their contents, substantially as described.

3. In an apparatus of the class described, an endless carrier disposed in part for upward travel, trays pivoted thereto, tracks upon which said trays are moved, a rock-shaft having arms arranged to engage and tip said trays in the phase of upward movement of said trays, a reciprocating crank-rod coupled to said shaft, and means operated by the carrier-driving mechanism whereby said rod is actuated, substantially as described.

4. In an apparatus of the class described, an endless traveling carrier, a driving-shaft, a power-transmitting wheel for operating said carrier loosely mounted on said shaft, and mechanism mounted on said shaft and engaging said wheel to rotate the same with said shaft and capable of rotating said wheel independently of said shaft, substantially as described.

5. In an apparatus of the class described, an endless traveling carrier, a driving-shaft, a power-transmitting wheel for operating said carrier loosely mounted on said shaft, a collar rigidly secured to said shaft to rotate therewith, and a gear mounted on said collar having its axis of rotation in a line other than that of said shaft and arranged to operate said wheel, substantially as described.

6. In an apparatus of the class described, an endless carrier, operating means whereby said endless carrier is moved, and independently-adjustable power-transmission devices comprised within said operating means whereby said endless carrier may be adjusted independently of said operating means as an entirety.

7. In an apparatus of the class described, an endless carrier disposed in a zigzag course, trays coupled to the endless carrier, and tracks arranged to support the moving trays; said tracks being provided with spring-retracted switches operated by the trays and permitting the trays to follow different planes of the carrier.

8. In an apparatus of the class described, an endless carrier disposed partly in a zigzag course and in part having an upward movement, trays coupled to the endless carrier, and means for positively tilting the trays at the upward phase of movement of the carrier while retaining the upper surfaces of the trays uppermost to discharge the load.

In testimony whereof I have hereunto set my hand this 11th day of October, 1900.

LOVELL LAZEL KELSEY.

Witnesses:

MARCUS O. BABCOCK,

REBECCA H. BABCOCK.