

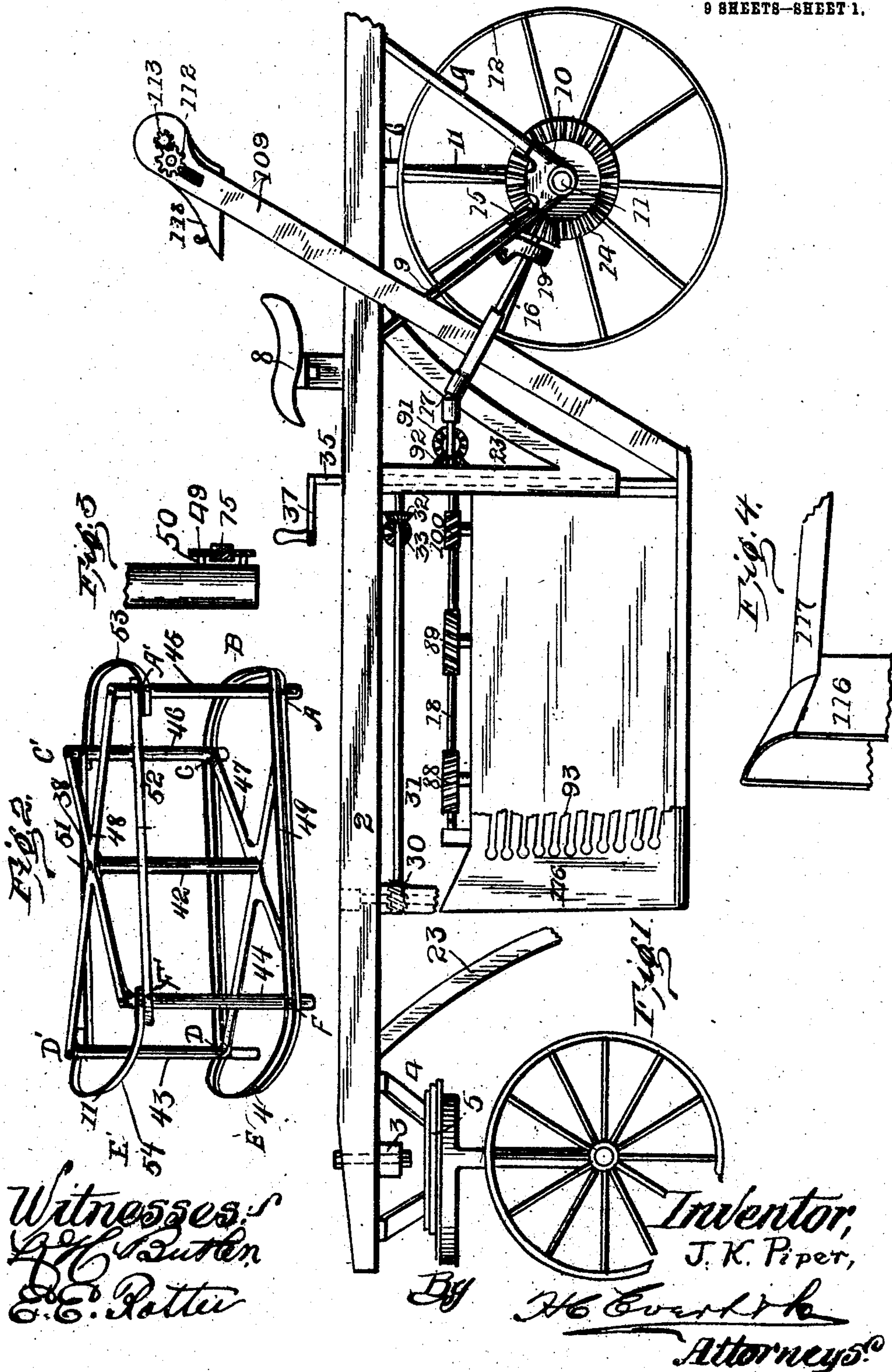
No. 840,367.

PATENTED JAN. 1, 1907.

J. K. PIPER.
COTTON PICKER.

APPLICATION FILED DEC. 24, 1902.

9 SHEETS—SHEET 1.



No. 840,367.

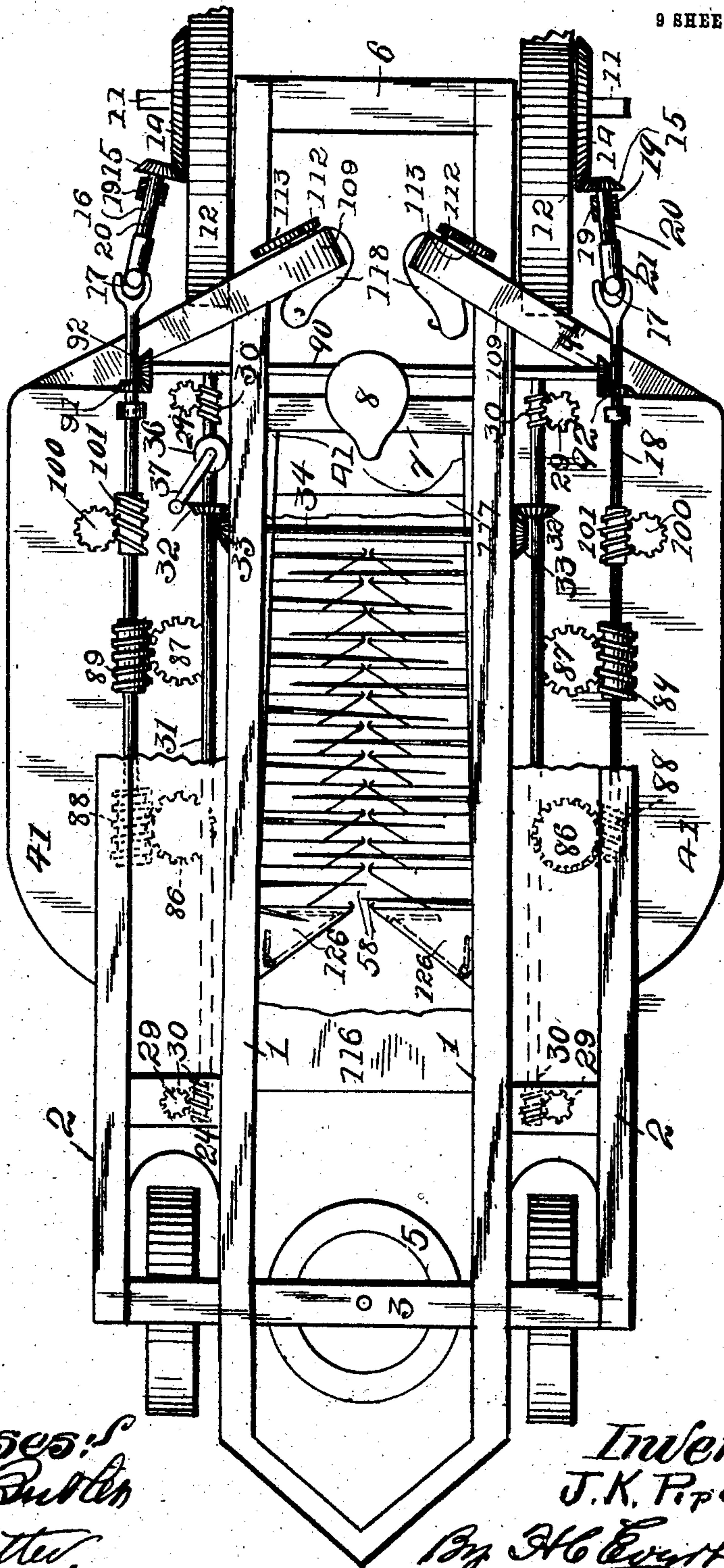
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9 SHEETS—SHEET 2.

Fig. 5.



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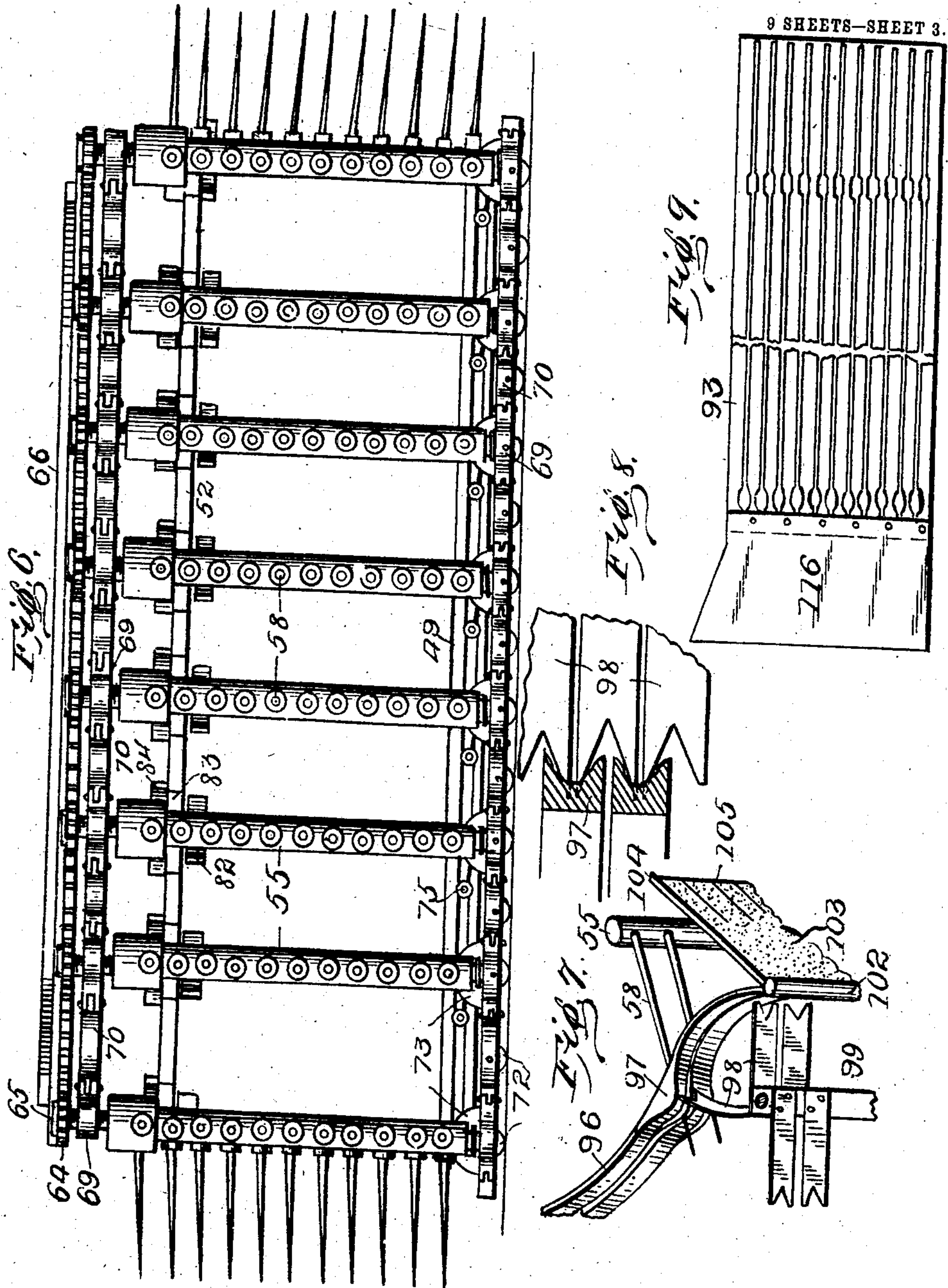
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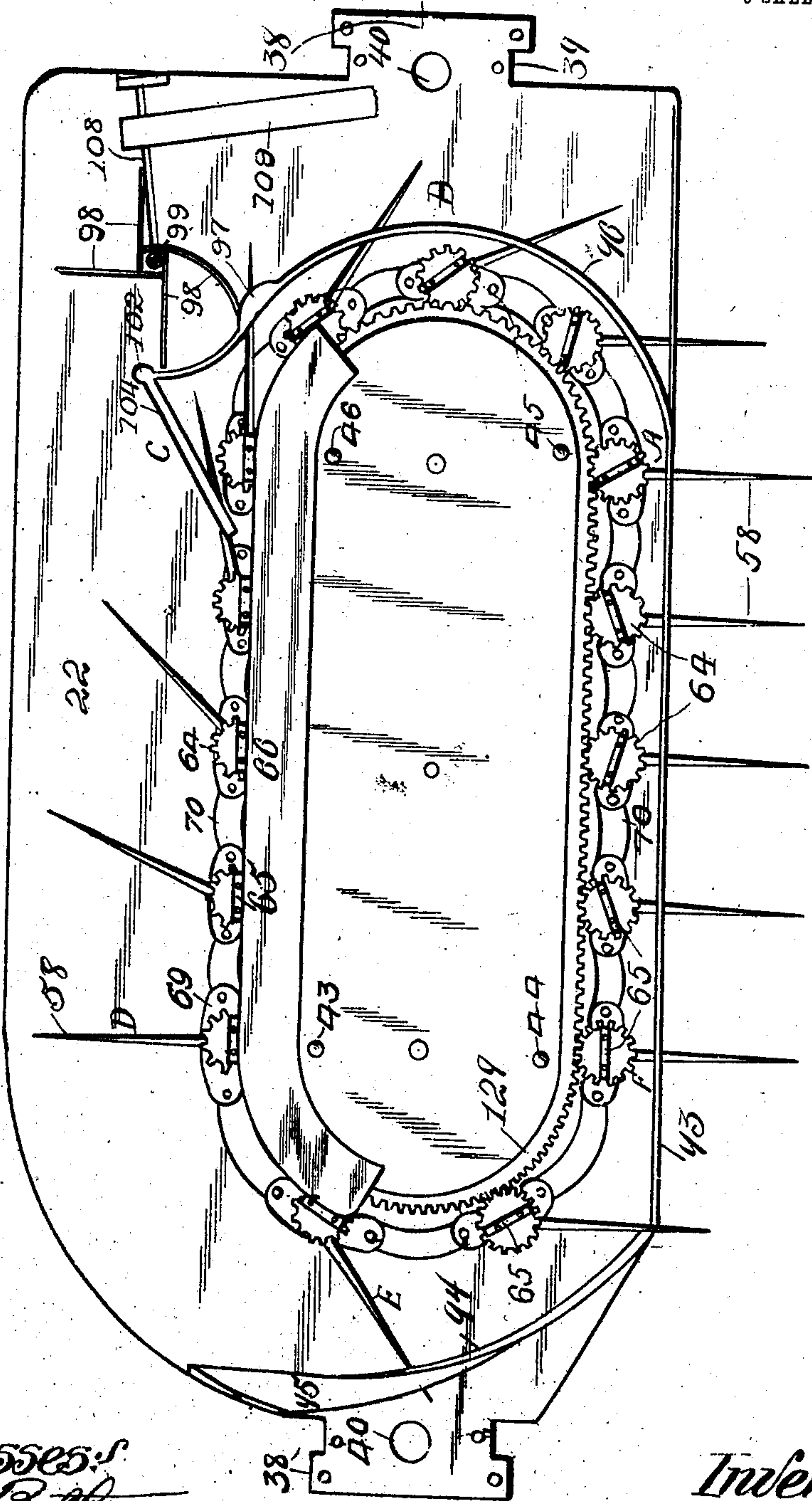
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9 SHEETS—SHEET 4.

Fig. 10.



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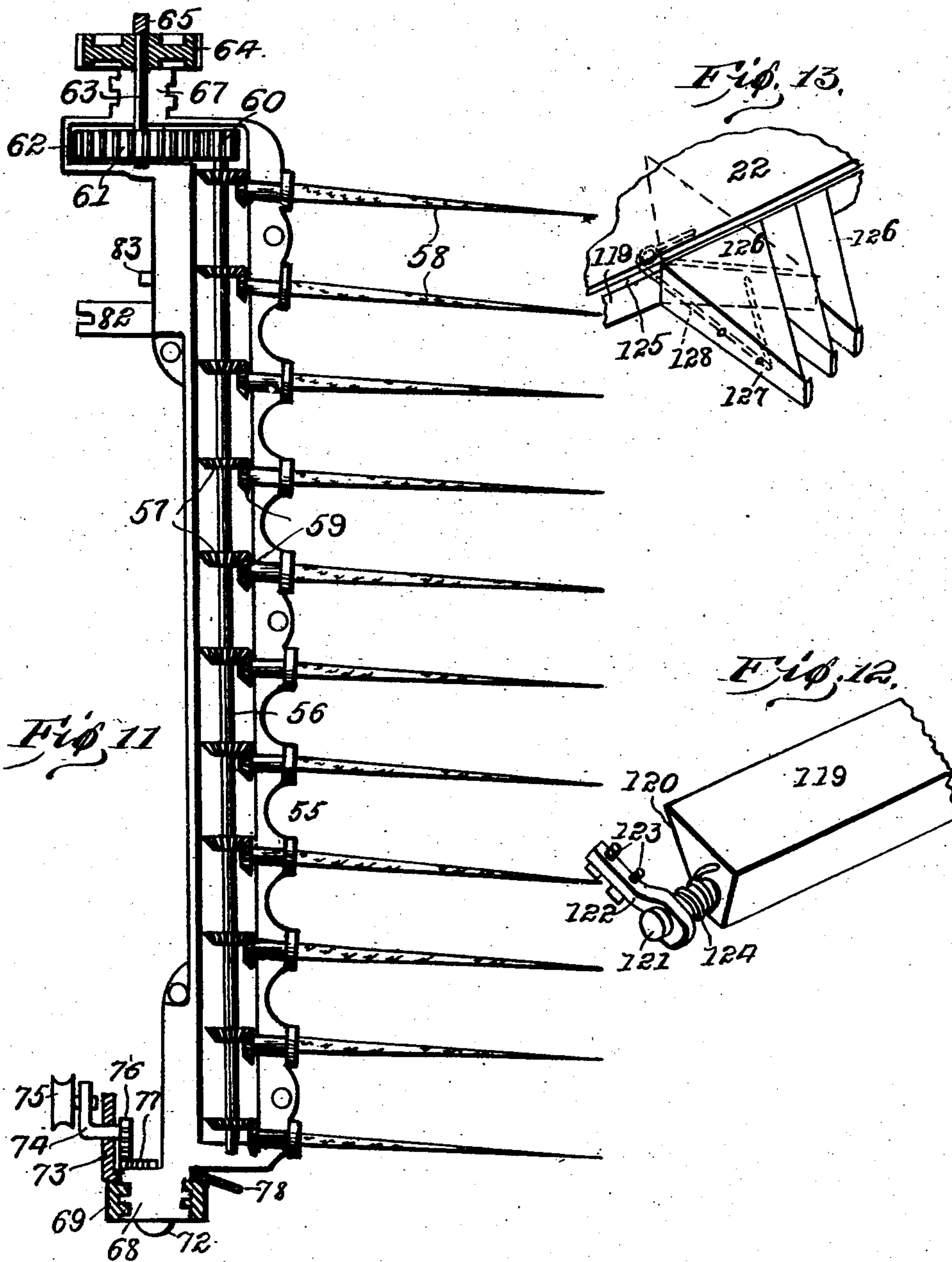
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9 SHEETS—SHEET 5.



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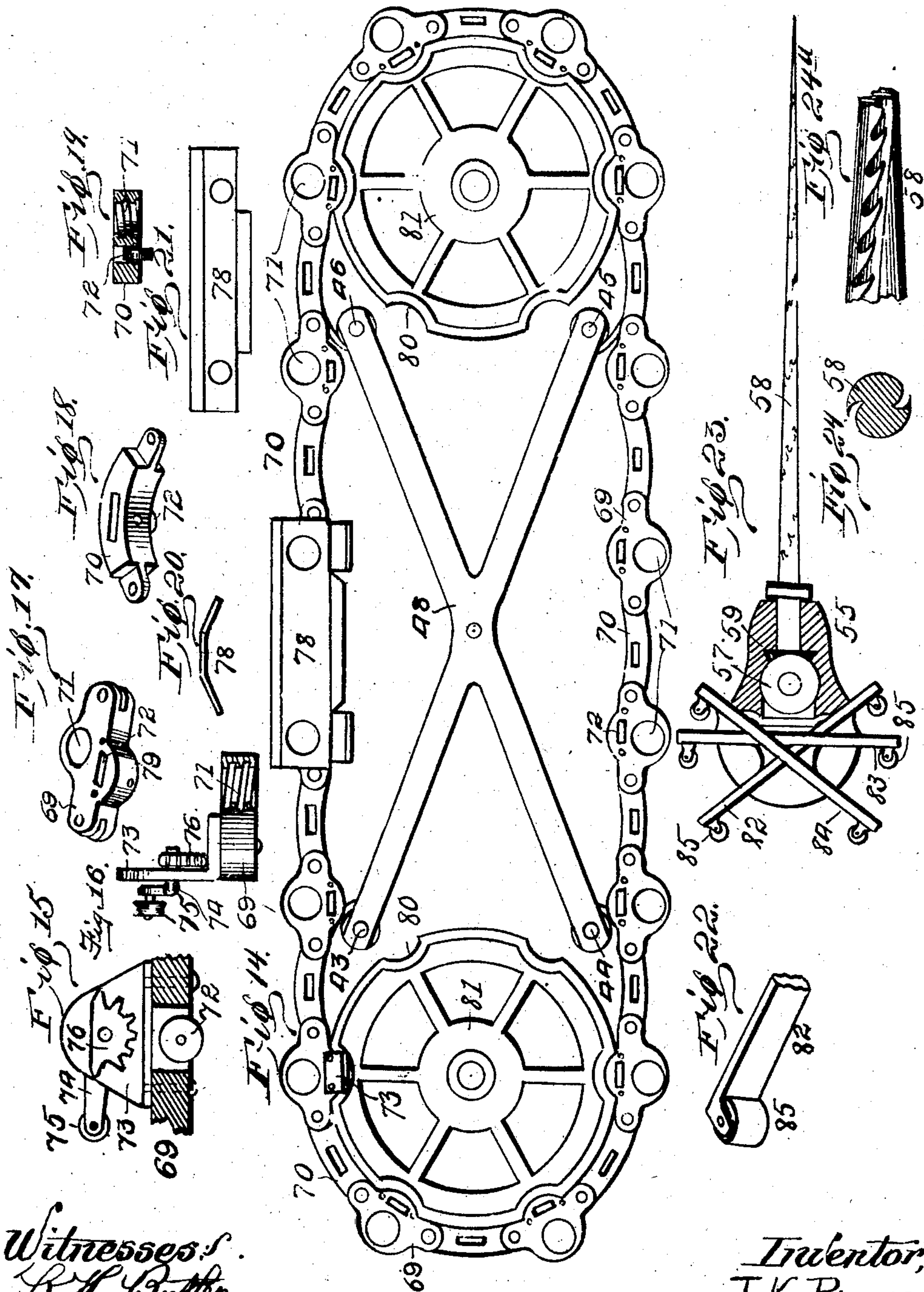
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9 SHEETS—SHEET 6.



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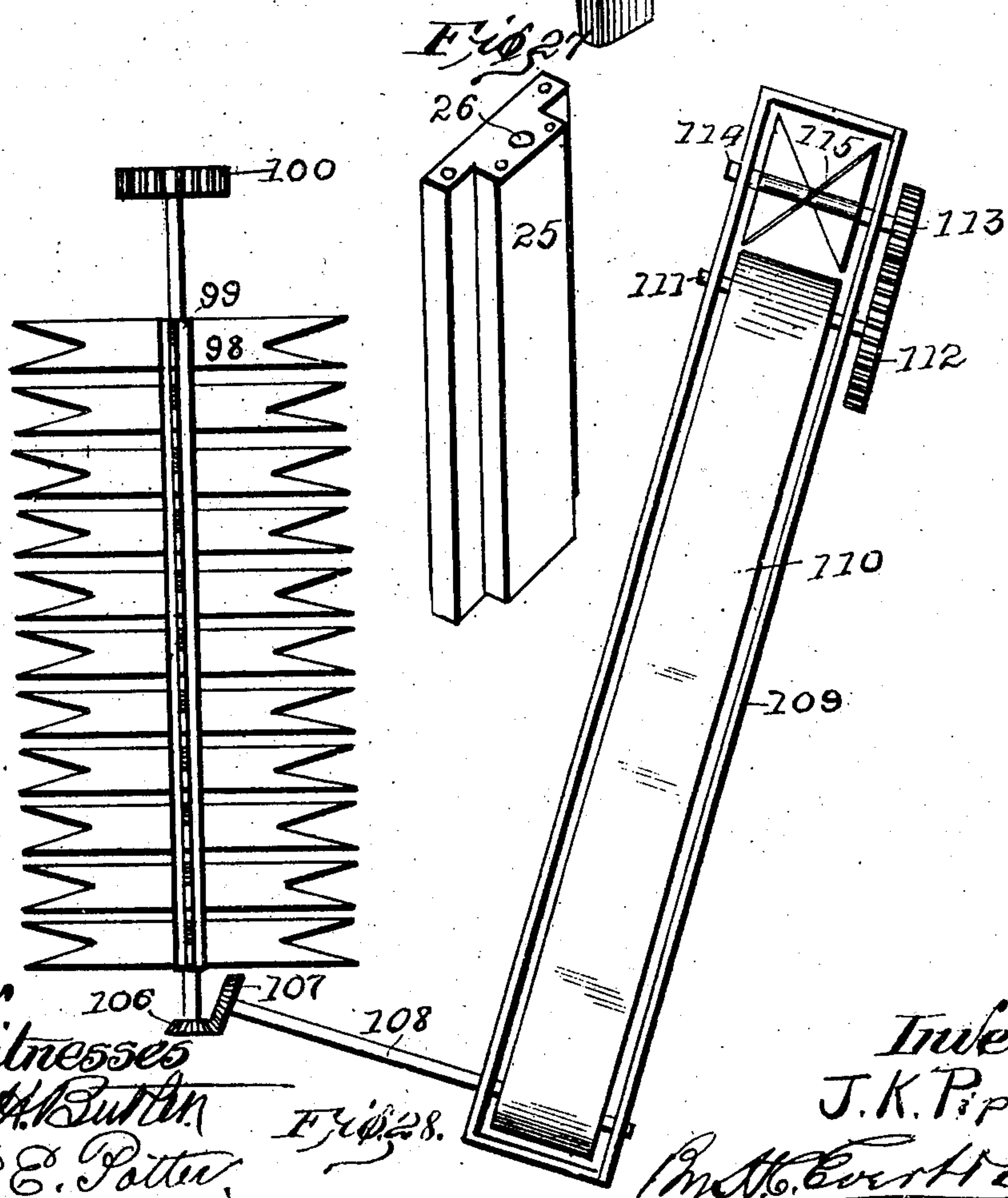
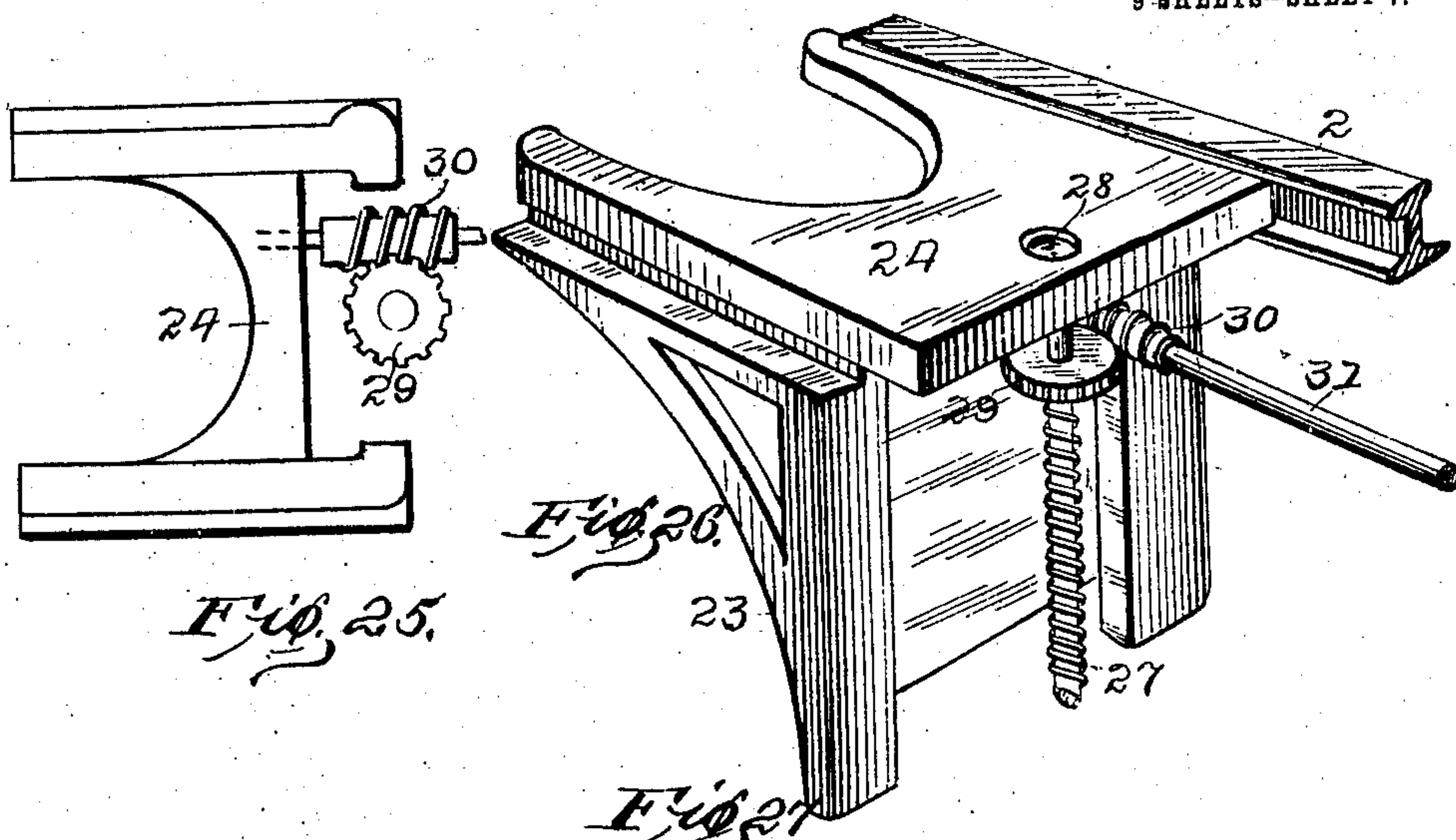
No. 840,367.

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APPLICATION FILED DEC. 24, 1902.

9 SHEETS—SHEET 7.



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APPLICATION FILED DEC. 24, 1902.

9 SHEETS—SHEET 8.

Fig. 29.

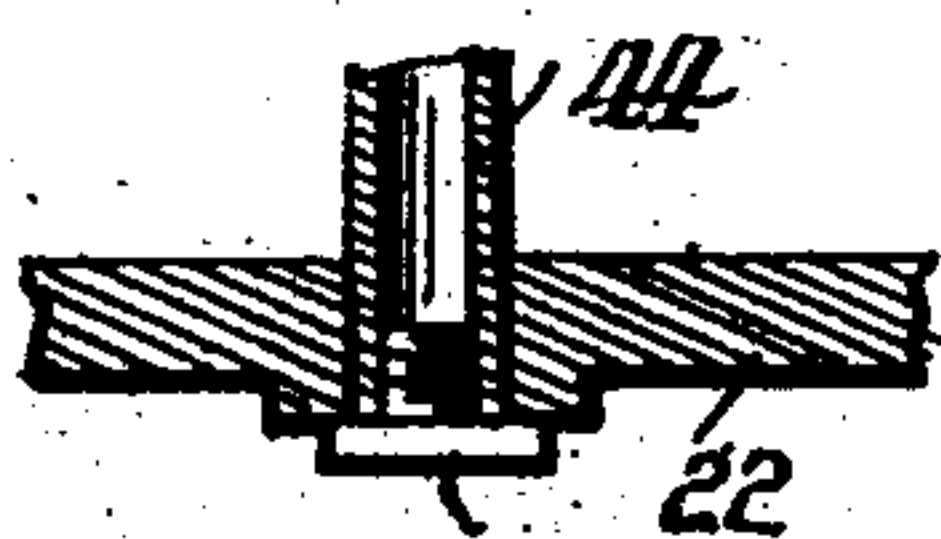
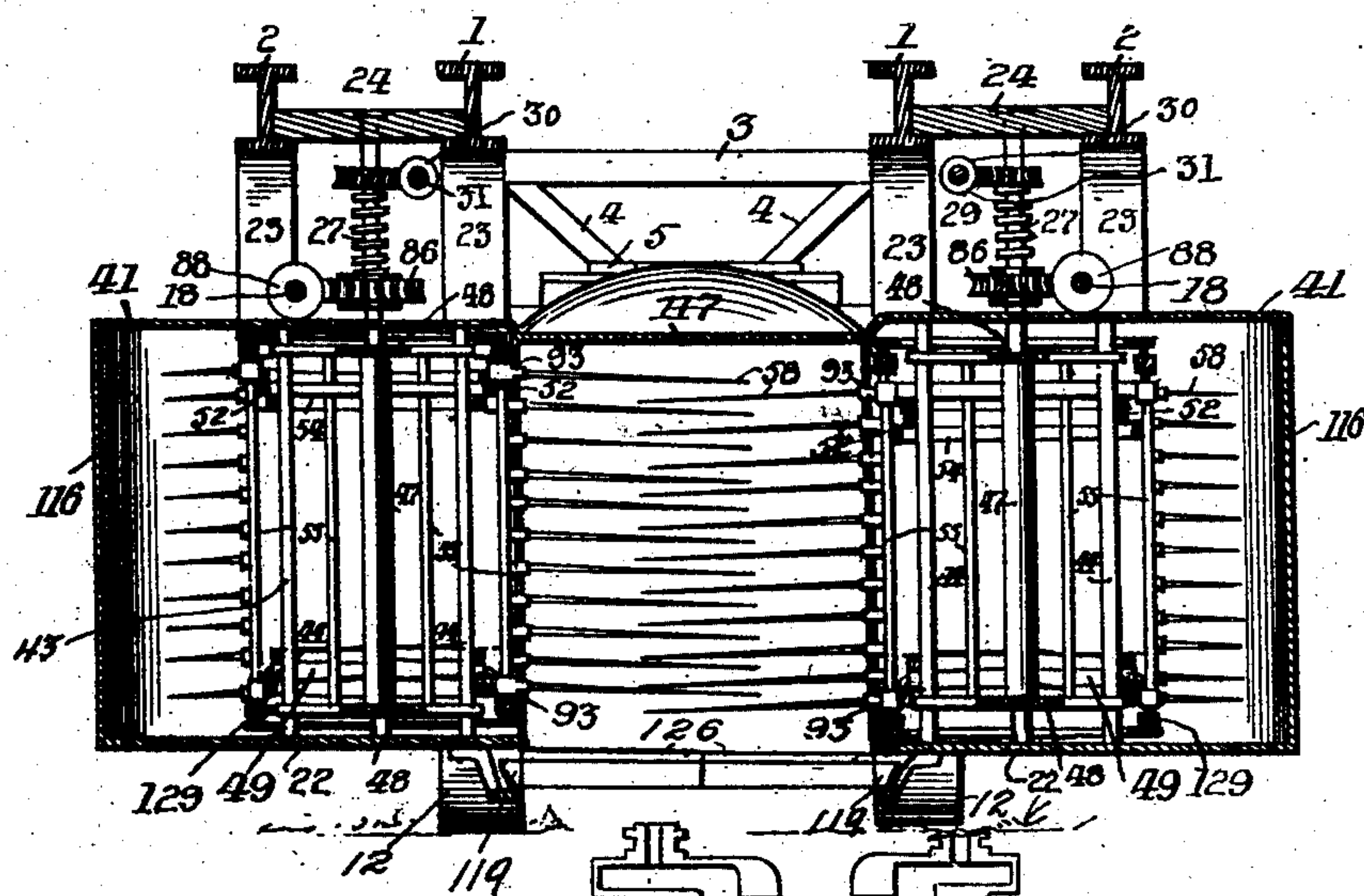
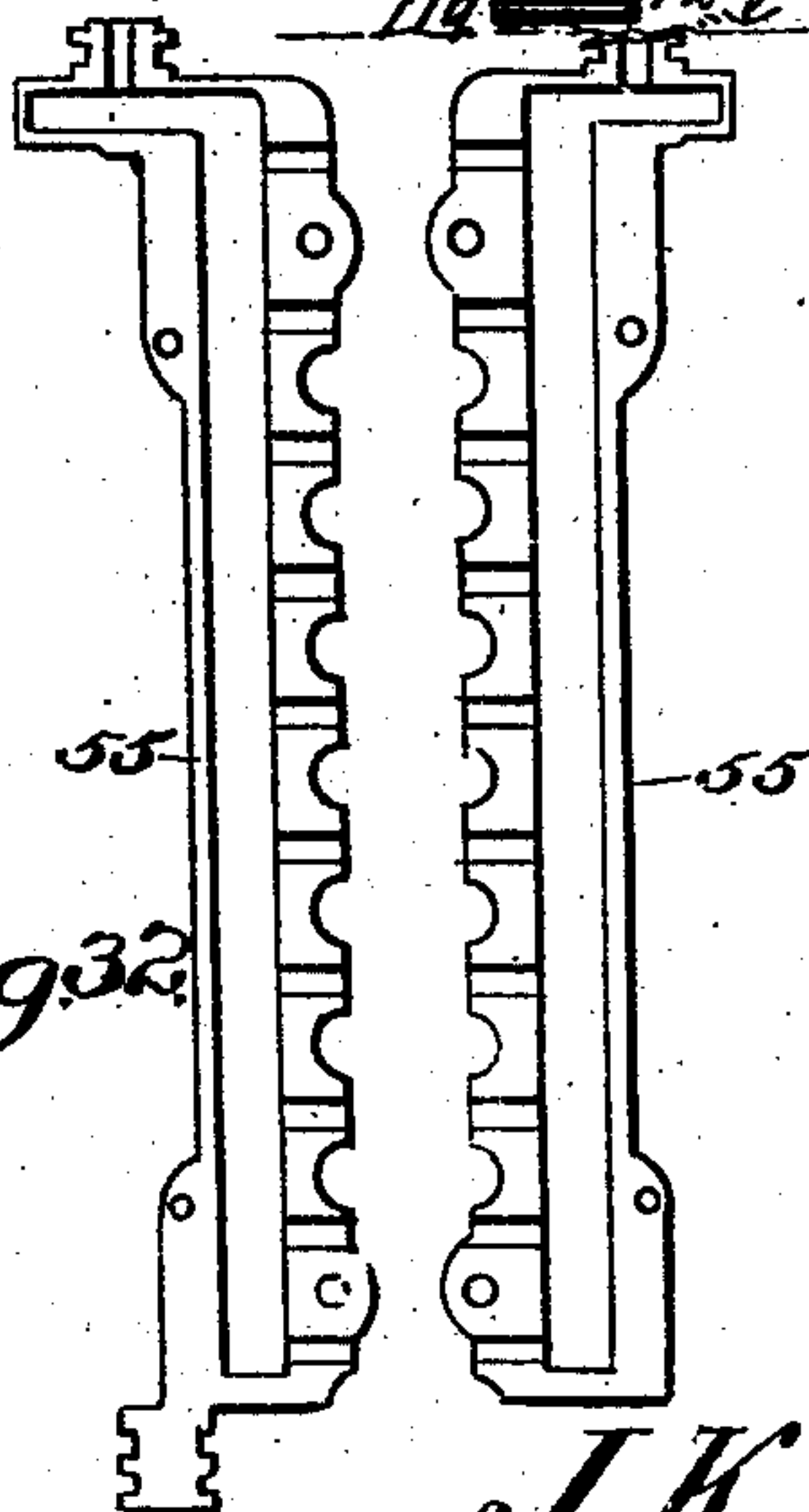


Fig. 30.

Fig. 31.



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APPLICATION FILED DEC. 24, 1902.

9 SHEETS—SHEET 9.

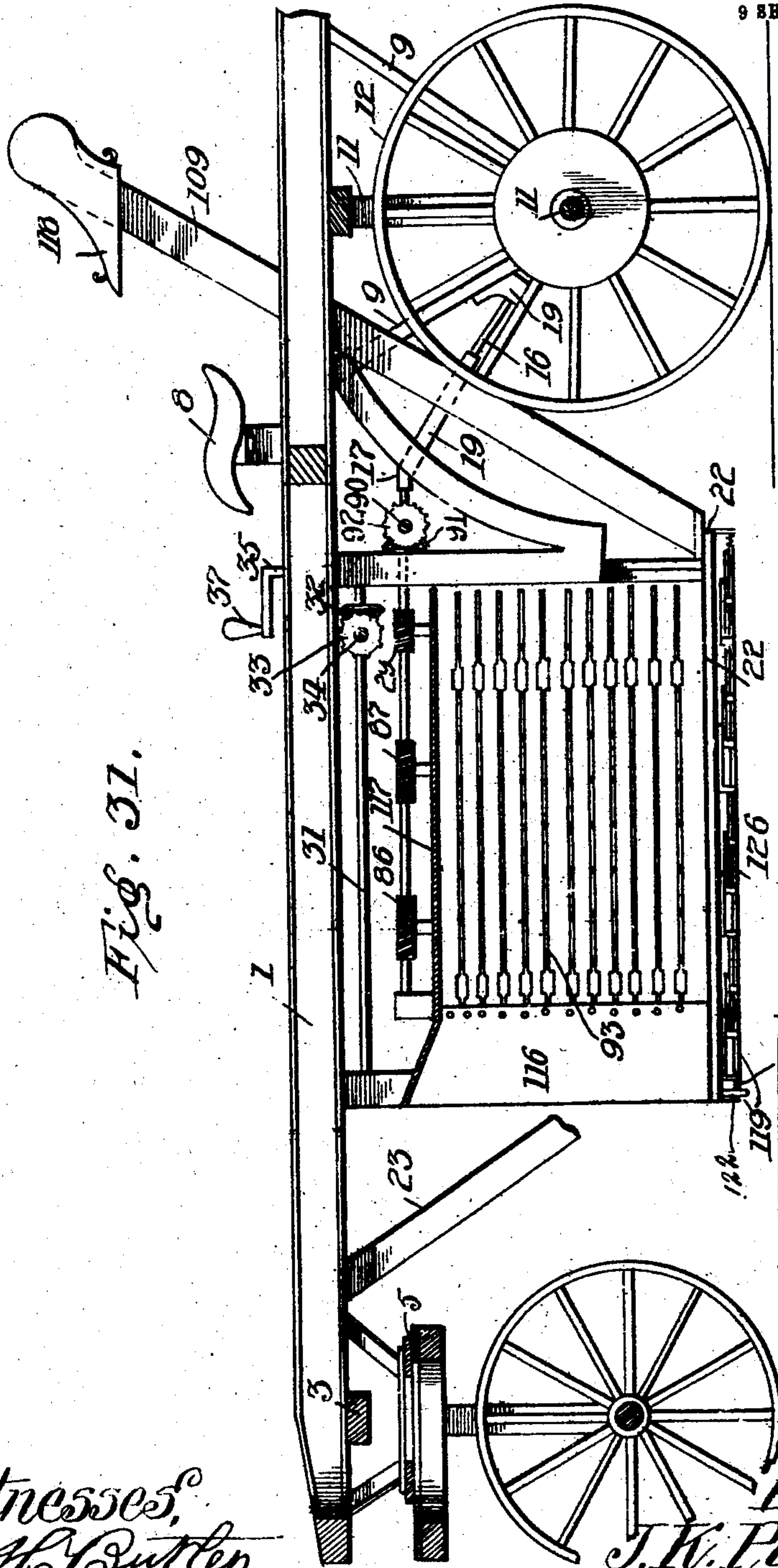


Fig. 31.

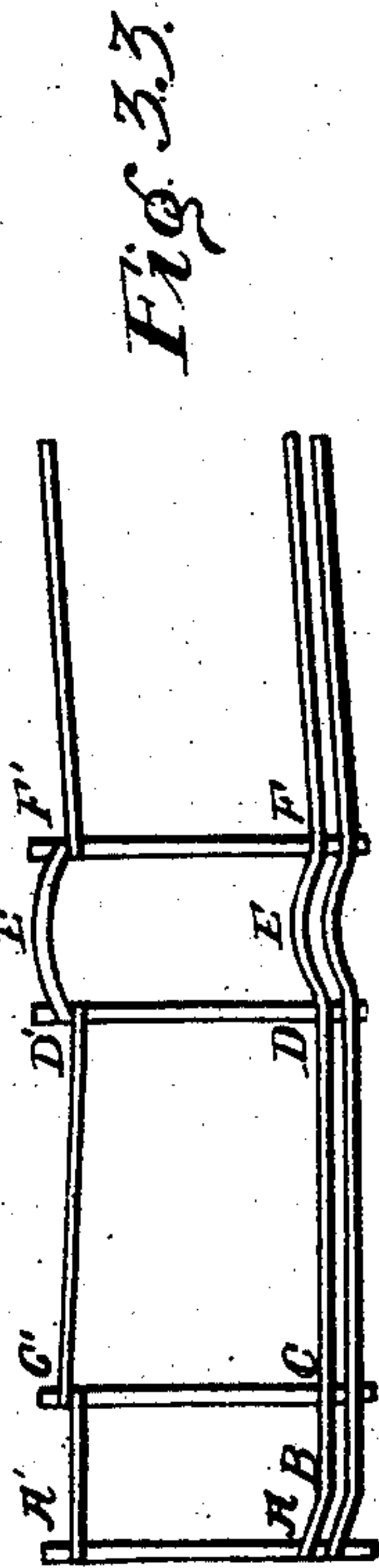


Fig. 33.

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UNITED STATES PATENT OFFICE.

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COTTON-PICKER.

No. 840,367.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed December 24, 1902. Serial No. 136,453.

To all whom it may concern:

Be it known that I, JAMES K. PIPER, a citizen of the United States of America, residing at Wilmerding, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Cotton-Pickers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in cotton-pickers; and the invention has for its main object to construct a cotton-picker with two endless series of picker-stems, which are adapted to travel in a substantially oblong path and to impart to the picker fingers or stems a swinging, forward, downward, and inward thrust at the time the fingers or picker-stems are engaged with the cotton-boll.

20 With the above object in view the invention contemplates obtaining the same with novel and simple mechanism, and aims, further, to provide a mechanism easily adjustable, simple in construction, and comparatively inexpensive to manufacture.

25 With the above and other objects in view the invention consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

30 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a side elevation of the machine, partly broken away. Fig. 2 is a detached detail perspective view of one of the tracks for the carriers. Fig. 3 is a side elevation of a part of one of the posts of said track, showing the lower track in section and also showing the wheel of one of the carrier-frames therein. Fig. 4 is a detached detail perspective view of the front hood of the casing. Fig. 5 is a top plan view of the machine, partly broken away. Fig. 6 is a detached detail side elevation of the carriers, showing the same in engagement with their tracks. Fig. 7 is a detached detail perspective view of a part of the rotary comb, showing the upper end of one of the carriers and a part of the cleaning mechanism. Fig. 8 is a partial section and partial side view of the rotary cleaner or comb and a part of the cleaning mechanism. Fig. 9 is a detached detail side

elevation, partly broken away, of one of the slotted guards. Fig. 10 is a detached detail top plan view of one side of the machine. Fig. 11 is a plan view of one-half of one of the picker-stem carriers or frames, showing the picker-stems and driving mechanism therefor. Fig. 12 is a detail perspective view of a part of the tilting platform. Fig. 13 is a like view of part of the platform, showing the catching devices attached thereto. Fig. 14 is a plan view of the lower sprocket-wheels and drive-chain which actuates the carriers and picker stems or fingers. Fig. 15 is a longitudinal sectional view of a part of one of the links of the chain. Fig. 16 is a partial side and partial cross-sectional view of the same. Fig. 17 is a detail perspective view of a part of one of the links, the angle-plate, and segment carried thereby detached. Fig. 18 is a detached detail perspective view of one of the links embodied in said chain. Fig. 19 is a cross-sectional view of the same. Fig. 20 is an end view of one of the shield-plates carried by the chain. Fig. 21 is a top plan view of the same. Fig. 22 is a detail perspective view of a part of one of the upper guide-arms for the carrier-frames. Fig. 23 is an end view of one of the carriers, partially in horizontal section and showing the picker-stem therein. Fig. 24 is a cross-sectional view of one of the picker stems or fingers. Fig. 24^a is a side elevation of a part of one of the fingers. Fig. 25 is a detached detail top plan view of one of the adjusting-brackets for the adjusting mechanism. Fig. 26 is a detail perspective view of the same. Fig. 27 is a detail perspective view of the elongated standard into which the adjusting-screw engages. Fig. 28 is a detached detail view of the rotary comb and the elevator mechanism. Fig. 29 is a section of the entire machine, taken on the line 29 29 of Fig. 5. Fig. 30 is a fragmentary sectional detail view. Fig. 31 is a longitudinal section of the machine. Fig. 32 is a detail of one of the carriers. Fig. 33 is a developed view of the parts shown in Fig. 2.

As stated, the invention embodies two endless rows of picker fingers or stems traveling in a substantially oblong path, the machine being adapted to straddle the roll of cotton.

The mechanism is supported upon a suitable frame or running-gear embodying inside top rails 1 and outside top rails 2, these rails in practice being preferably made of

the I-beam form, as such construction is simple and enables me to attach the supporting-brackets thereto in a most convenient manner. The rails 1 1 and 2 2 are connected near their forward ends by the cross-piece 3, connected by braces 4 with the fifth-wheel 5 of the front axle, the cross-braces 6 and 7 connecting the inside rails at the rear end and adjacent to the rear end of the frame or running-gear, the cross-bars 7 forming a support for the seat 8. As the endless series of picker fingers or stems and carriers therefor and the driving mechanism are identical on each side of the machine, the description of one will apply alike to both. The frame or running-gear is supported at the rear end by brackets 9, which at their lower ends carry bearings 10 to receive the projecting ends of the rear axle 11, on which the drive-wheels 12 are mounted. These axles have mounted thereon outside of the drive-wheels the beveled driving-gears 14, which engage with the beveled pinions 15, carried on the shaft 16 of the universal joint 17, said joint connecting the shaft 16 with the driving-shaft 18.

One of the braces 9 carries a suitable bearing 19, forming a journal to support the shaft 16, so that the latter will be capable of having a slight movement whereby it will accommodate itself to the different adjustments of the casings. The shaft 16 is provided with a slot 20, and the universal joint embodies a telescoping sleeve 21, (see Fig. 5,) whereby the length of the rod 16 may shorten or lengthen, according to the different adjustments of the means for elevating and lowering the carriers and their picker fingers or stems. Each side of the machine embodies a lower plate or table 22, supported by the brackets 23, which have a top plate 24 supported in the grooves in the inner faces of the rails 1 and 2. These brackets 23 receive the standards 25, which are provided with a threaded vertical opening 26 to receive the threaded screw 27, which at its upper end has a bearing 28 in the top plate 24 of the brackets. The screws 27 (there being one at the front and one at the rear side of the machine) each carry a sprocket-wheel 29 near their upper end to be engaged by the worm 30, carried by the adjusting-shaft 31. This adjusting-shaft carries a like worm near its rear end to engage with the sprocket-wheel of the rear elevating-screw, and the shaft also carries a beveled pinion 32 to mesh with a beveled pinion 33, carried on the end of the shaft 34, journaled in the inside rails 1, this shaft 34 having a like beveled pinion 33 on its opposite end to engage with the beveled pinion of the elevating-shaft on the opposite side of the machine. Thus the two shafts 31 are operated simultaneously, and they are actuated by means of the vertical shaft 35, extending

up from the base of the machine alongside of one of the horizontal shafts 31, provided with the gear 36, to mesh with a worm 30^a, carried by the shaft 31, adjacent to the shaft 35, said shaft 35 having a suitable operating handle or crank 37. The lower plate or base 22 is constructed at the ends with necks 38, having grooves 39 to receive the lower ends of the brackets 23, the standards 25 resting upon these necks and the screw-threaded aperture 26 in said standards registering with the threaded aperture 40 in the necks.

A casing is of course provided for the mechanism, the same being more clearly shown in Fig. 29. As stated, each side of the machine embodies a series of picker fingers or stems mounted in carriers connected together and traveling in a substantially oblong path. These travelers operate on tracks, one of which is shown in detail in Fig. 2 and to which reference will now be specifically had. These tracks embody in their construction a central post 42 and the corner-posts 43, 44, 45, and 46, the central post being connected to the hub of a spider or brace 47 at its lower end, the respective arms or brackets of which connect with the various corner-posts, and the upper end of the central post 42 having the hub or center of the spider 48 connected thereto, the various brackets or arms of which are attached to the upper ends of the corner-posts, these posts all being of equal length and being firmly secured to the base or bottom plate 22, as shown in Fig. 30. The lower track 49 consists of two endless bars or strips of metal passing around the corner-posts and spaced away therefrom in order to give sufficient clearance between the tracks and the posts, as is shown in detail in Fig. 3, the bars forming the track being connected to the posts by pins or studs 50, as shown in said Fig. 3. The upper track, while it is an endless one, is not constructed of continuous strips or bars, as is the case with the lower track, but has offsets at different points in order to perform particular functions, as will be hereinafter described. This upper track embodies the side rails 51 52 and the curved end rails 53 54. The ends of the curved forward end rail 54 terminate above the ends of the side rails 51 52; while the ends of the curved rear end rail 53 terminate below the opposite ends of the side rails 51 52. The carriers or carrier-frames travel around these tracks, and each of these carrier-frames are cast in two sections or halves 55. (See Fig. 11.) The two sections or halves of each carrier-frame are securely bolted together at suitable points.

The carriers have a vertical shaft 56 extending therethrough, which carries a series of beveled pinions 57, one pinion for each picker finger or stem 58, carried by the carrier, the beveled pinions 57 meshing with

the beveled pinions 59, carried on the inner ends of the picker fingers or stems. These picker fingers or stems are preferably of an especial construction, as shown in detail in Figs. 24, 24^a, being provided with undercut longitudinal grooves and curved screw-like teeth 58', whereby they will more effectually engage the cotton during the rotation and hold the same until removed therefrom by the cleaning mechanism. The shaft 56 is driven at the upper end through the medium of the pinion 60, mounted on the upper end of said shaft and engaging the gear 61, which rotates within the box or housing 62 at the upper end of the carrier or frame and is carried on the spindle or shaft 63, having a drive-gear 64 mounted on its upper end. On the upper face of this drive-gear 64 is a rib 65, which is adapted to engage with rail or plate 66 (see Fig. 10) during the time that the carriers are traveling along the outside leg of their path or travel. Each carrier is provided at its upper end between the box or housing 62 and the drive-gear 64 with a screw 67, which engages the upper drive-chain, and at their lower ends each carrier is provided with a screw 68, which engages in the links of the lower drive-chain.

In Figs. 14 to 21, inclusive, I have shown in detail the lower driving-chain, and in this connection I would state that the upper drive-chain is identical in construction with the lower drive-chain, with the exception that the small rollers employed in the lower drive-chain for traveling on the base or bed 22 are dispensed with in the upper chain, and also the carrier-actuating mechanism, attached to the lower drive-chain, and engaging with the lower track, is dispensed with in the upper driving-chain. Fig. 14 shows the lower drive-chain with all except one of the shields removed from the chain in order to illustrate the construction of the latter. This chain embodies the alternate links 69 and 70. The links 69 are provided with screw-apertures 71 to receive the screws 67 at the upper end of the carriers or screws 68 at the lower end of the carriers, as the case may be. The links 69 and 70 are pivotally connected, and in the casing of the lower chain each of the links carry rollers 72, adapted to travel upon the bed or base 22. Each of the links of the lower chain carries an angle-plate 73, in which is journaled the crank-shaped shaft 74, having the roller 75 mounted on one end for engagement with the rails of the lower track, operating between the same, (see Fig. 3,) and at its other end this shaft 74 carries a toothed segment 76 to engage with the segment 77, carried on the upper face of the screw 68 of each carrier.

In order to exclude dirt or dust from the chain to as great an extent as possible, I employ thin metallic shields 78, (shown in detail in Figs. 20 and 21 and which are made

of such a material as will not interfere in any manner with the travel of the chain around the sprocket-wheels and the swelled or offset portions 79 of the links 69, engaged in the notches 80 of the driving-sprockets 81.)

The shield-plates, it is to be noted, are provided with openings registering with the openings in the links, which openings receive the screws 68 on the lower end of the carrier-frames. The carrier-frames are each provided with cross-arms 82, 83, and 84, each of which is provided at its outer ends with rollers 85, the rollers on the arms 82 engaging the curved end tracks 53 54 during the travel of the carriers, the rollers on the guide-arms 83 engaging the track 52 during the travel of the carriers and the rollers on the guide-arm 84 engaging the track 51 during the travel of the carriers. The shafts 80^a, upon which the sprocket-wheels 81 are mounted, carry at their upper ends sprocket-wheels or gears 86 87, which are engaged, respectively, by right and left hand worms 88 89, which worms are mounted on the operating-shafts 18. The operating-shafts 18 are connected together by the cross-shaft 90, having beveled gears 91 at its ends to mesh with the beveled gears 92, carried by the said shaft 18. The picker fingers or stems in their travel as they approach the front of the machine are guided into engagement with the slotted guard 93 by guides 94, having flat faces 95, formed by turning over the material of which the guides are formed, so as to insure a guiding-surface for the picker stems or fingers. The picker stems or fingers as they begin to leave the guards 93 enter between the curved scrapers 96 near the rear of the machine, these curved scrapers being provided near their outer ends with curved offsets or shoulders 97 to be engaged by the fan-tail ends of the rotary fan-blades or vanes 98, these fan-blades or vanes 98 being mounted on the central support or stem 99, provided at its upper end with a gear or sprocket-wheel 100, to be engaged by the worm 101, mounted on the shaft 18 near the rear end thereof, so as to impart a rotary movement to the fan simultaneously with the driving of the shaft 18.

The scrapers 96 terminate at their outer ends in the post 102, to which is connected the carded cleaning-apron 103. This carded cleaning-apron is arranged upon the spring-arms 104 and is preferably made of stiff leather or other like material, being provided along its outer edge with slits 105, so that the picker stems or fingers as they strike the cleaning-apron will be drawn through said slits, the material spreading on each side of the slits, so as to permit the fingers passing therethrough and effectually cleaning or removing any cotton from the fingers that may still have adhered thereto. The shaft of the rotary comb is provided on its lower end with

a beveled gear 106, which meshes with the beveled gear 107 on the end of the shaft 108, the latter extending into the frame 109, which is suitably mounted near the rear of the machine at a rearward and upward inclination and has the carded belt 110 operating therein over the drum (not shown) on the shaft 108 and over the drum (not shown) on the shaft 111 near the upper end of the frame. This shaft 111 carries on its one end the gear-wheel 112 to mesh with the pinion 113, carried on the shaft 114, on which latter shaft the rotary fan or brush 115 is mounted. The front hood 116 embraces the sides of the course at the forward end of the same and has a rearward extension 117, which lies over the top of the casing to inclose the same at the upper side. A sack or other suitable receptacle (not shown) is attached to the discharge-spout 118 of the elevator or carded-wheel casing.

Catching devices are provided to be engaged by the cotton-stalks and force the same to assume a position away from the inner walls of the casing. This arrangement embodies a platform-bar 119, having a beveled lower face 120. In the ends of the bar are studs or pins 121, on which are mounted bracket-arms 122, connected by bolts 123 or other suitable means to the bottom plate 22. Coil-springs 124 are wound on the studs or pins 121 with their outer ends permanently fastened to the bracket-arm 122 and their other ends permanently fastened to the end of the platform-bar 119. This platform-bar is supported at a slight distance below the bed or base plate 22, whereby to form a slideway 125, in which substantially triangular plates 126 may move as these plates contact with the cotton-stalks. These plates are carried on arms 127, the inner ends of which bear against the edge of the platform-bar 119 and which are connected by springs 128, attached to the underneath face of the bed or base plate 22. These plates are arranged in stepped series, (see Fig. 31,) one overlapping the other, and, as heretofore stated, while directing the stalks will have a movement whereby any damage thereto is avoided.

In operation it is to be noted that the picker stems or fingers and their carriers travel along the outside leg of their endless course without the rotating of the picker stems or fingers, and as the picker stems or fingers arrive at the forward end of the course the gear 64 on the upper end of the carrier-frames engages with the rack 129, supported in any desired manner on the track-supporting posts, whereby to impart a rotary movement to the picker stems or fingers, which rotary movement is continued until the carrier-frames pass out of contact with the rack 129, at the rear end thereof. At the time the picker stems or fingers are

given the rotary movement a sweeping downward forward thrust is imparted to these picker stems or fingers, which is accomplished by the arrangement of the upper and lower tracks. To describe the particular arrangement of the tracks, reference will be had specifically to Fig. 2 of the drawings. The lower track, in order to impart the desired movement to the carrier-frames, is constructed from point A to point B, which latter point is to the center of the rear track, with an abrupt descent, and from point B to point C the tracks extend substantially on a horizontal plane. From point C to point D the tracks extend at a slight inclination downwardly and from point D to point E have an abrupt ascent and then descend abruptly from point E to point F, making point E the high point of the track, which is at the forward end of the machine, and from point F to point A this lower track extends on a slight ascent. It is to be noted that the lower track, together with the mechanism which connects with the lower end of the carriers, is intended ordinarily to perform the operating of the carrier-frames and that the upper tracks, together with the guide-arms 82 83 84, are intended only as a supplemental operating means to actuate the carriers in event of the operating mechanism at the lower end of the carriers becoming inoperative for any reason. As the outside rails of the track incline with a slight descent from C to D, the outside upper rail 51 will be arranged on a corresponding descent from point C' to D', and the forward rail 54 will incline upwardly from point D' to point E' and then downwardly to point F', the rail 52 inclining slightly upwardly from point F' to point A', and the rail 53 inclining downwardly from point A' to point C'. Now as the carriers travel around the outside of the endless course the rib 65, sliding against the outer edge of the plate 66, and the driving-pinion 64 being out of engagement with the rack 129, the said carriers are traveling at a slight descent, and as they reach the point D, Fig. 10, the carriers begin to ascend and continue to ascend until point E is reached. At this time the drive-pinion 64 comes into engagement with the teeth of the rack 129, and the picker stems or fingers 58 are swung around to position shown in Fig. 10 and travel on an incline, at this time during their passage from point E to point F, at which time they have assumed the position transverse to the moving path of the machine. From point F to point A the carriers travel on a slight ascent until they reach point A, at which time they enter the scrapers 96, and from which point the carriers abruptly descend until point B is reached, from which point they travel around substantially on a plane until point C is reached, where they again begin to slightly descend until they again reach point D.

By reference to Fig. 10 it is to be noted

that the picker-fingers are turned during their passage through the scrapers 96 so that the entire length of the fingers is drawn through these scrapers, and by the time the fingers arrive at the offsets or shoulders 97 of the scrapers the cotton upon the fingers has been drawn to the smaller or tapered ends thereof. The fan-blades or vanes 98 are made of a length sufficient to engage with the shoulders or offsets 97, requiring these fan-blades or vanes to bend somewhat in order that they may spring past the offsets or shoulders of the scrapers. The fan-tail ends of the blades strike the cotton now drawn to the ends of the fingers and throws the same into engagement with the carded belt, which carries it upwardly, and the fan or brush 115 removes the cotton from the belt and discharges the same through the spout in the sack or other receptacle provided therefor. As the picker stems or fingers leave the scrapers 96 the same engage with the carded cleaner 103 and are drawn through the edge thereof, effectually removing any particles of cotton that may have remained on the picker stems or fingers during their passage through the scrapers.

The fingers of the respective carriers on each side of the machine overlap a greater distance as they travel toward the rear of the machine, as best seen in Fig. 5 of the drawings.

It will be noted that various changes may be made in the details of construction without departing from the general spirit of my invention.

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

1. In a cotton-picker, a series of carriers traveling in an endless oblong course, picker stems or fingers carried by said carriers, endless oblong tracks for said carriers, means for driving the carriers, means for rotating the stems or fingers during a portion of the travel of the carriers, and means for elevating and lowering said carriers to impart forward and downward movement to the picker stems or fingers at the forward end of their path of travel, substantially as described.

2. In a cotton-picker, a series of carriers traveling in an oblong endless course, means for imparting movement to said carriers, picker stems or fingers journaled in the carriers, means for rotating said picker stems or fingers during a portion of their travel, upwardly and downwardly inclined endless tracks for said carriers, means connected to the carriers engaging in said tracks for elevating and lowering the carriers during their travel, slotted guards for said picker-fingers, guides arranged to conduct the picker-fingers within the slotted guards, scrapers arranged to receive said picker fingers or stems to remove the cotton therefrom, a rotary fan, a

cleaner arranged to engage the fingers after they have passed from engagement with the scrapers, and means for operating the rotary fan simultaneously with the carriers substantially as described.

3. In a cotton-picker, a series of carriers arranged to travel in an oblong endless course, screws on the lower ends of said carriers, a chain engaging said screws, means for operating said chain to impart movement to the carriers, an endless oblong track irregular in this endless course, means carried by the lower ends of the carriers for engagement with said track to elevate and lower the carriers during their travel around the track, a supplemental track, a supplemental elevating and lowering means near the upper end of the carriers to engage said supplemental track, and means for imparting a rotary movement to the picker stems or fingers during a portion of their travel around the endless track, substantially as described.

4. In a cotton-picker, the combination with a supporting-frame, a platform carried thereby, spring-pressed catching devices carried by said platform and adapted when pressed to slide beneath the platform, a series of carriers connected together in the endless oblong course, picker stems or fingers carried by said carriers, a track for said carriers having upwardly and downwardly inclined portions, and means for elevating and lowering the carriers during their travel around the track to impart a forward, downward and inward thrust to the fingers at the forward end of their travel, substantially as described.

5. In a cotton-picker, the combination of a series of carriers, endless chains at their upper and lower ends, the ends of the carriers being screwed into the links, means for driving said chains, a series of picker fingers or stems carried by each of the carriers, and means for rotating said picker fingers or stems during a part of the travel of the carriers, substantially as described.

6. In a cotton-picker, a supporting-frame, supporting-brackets secured to said frame, a base connected to said brackets, means for elevating or lowering said base or bed plate, a series of carriers traveling in an endless oblong course, chains engaging the upper and lower ends of said carriers, a track having upwardly and downwardly inclined portions, and means engaging said track for elevating and lowering said carriers to impart a forward and downward movement to the fingers at the forward end of their travel, substantially as described.

7. In a cotton-picker, the combination with a traveling carrier, the means for operating the same, the picker stems or fingers rotatably mounted in said carrier, the means for rotating said picker stems or fingers, of scrapers adapted to receive the picker stems

or fingers and provided with shoulders or offsets, and a rotary fan having blades or vanes adapted to engage the offsets or shoulders of the scrapers during their rotation, as and for the purpose described.

8. In a cotton-picker, the combination with the carriers, chains engaging the upper and lower ends of said carriers, means for driving said chains to move the carriers in an endless oblong course, picker stems or fingers rotatably mounted in said carriers, means for rotating said picker stems or fingers, a track irregular in its course, means to elevate and lower the carriers, scrapers arranged to receive said fingers, a rotary fan to engage and remove the cotton from the picker stems or fingers as they pass out of engagement with the scrapers, and a cleaner arranged to be en-

gaged by said picker stems or fingers after they have passed from engagement with the scrapers, substantially as described.

9. The combination with a pair of casings spaced apart, a platform-bar arranged below each casing at the inner side thereof, a plurality of arms bearing against said platform-bar, substantially triangular plates carried by said arms, and springs attached to the base-plate of the casing and to said arms whereby the plates are projected outwardly from the bar, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES K. PIPER.

Witnesses:

A. M. WILSON,
E. E. POTTER.