

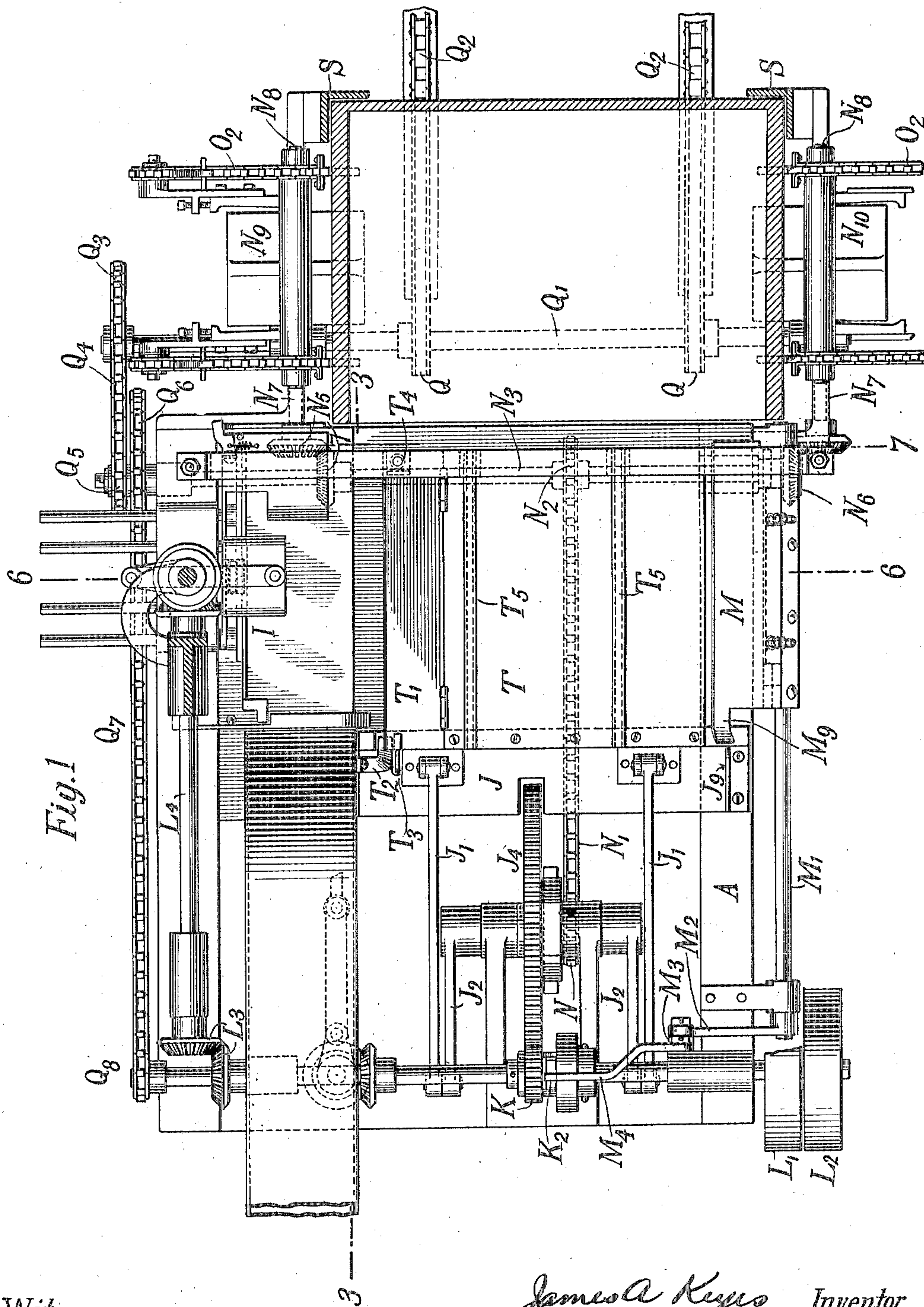
No. 817,375.

PATENTED APR. 10, 1906.

J. A. KEYES.
PACKING MACHINE.

APPLICATION FILED JULY 17, 1903.

7 SHEETS—SHEET 1.



Witnesses:

Raphael Ketter
Jessie B. Kay

James A. Keyes Inventor
By Duncan & Duncan Attys

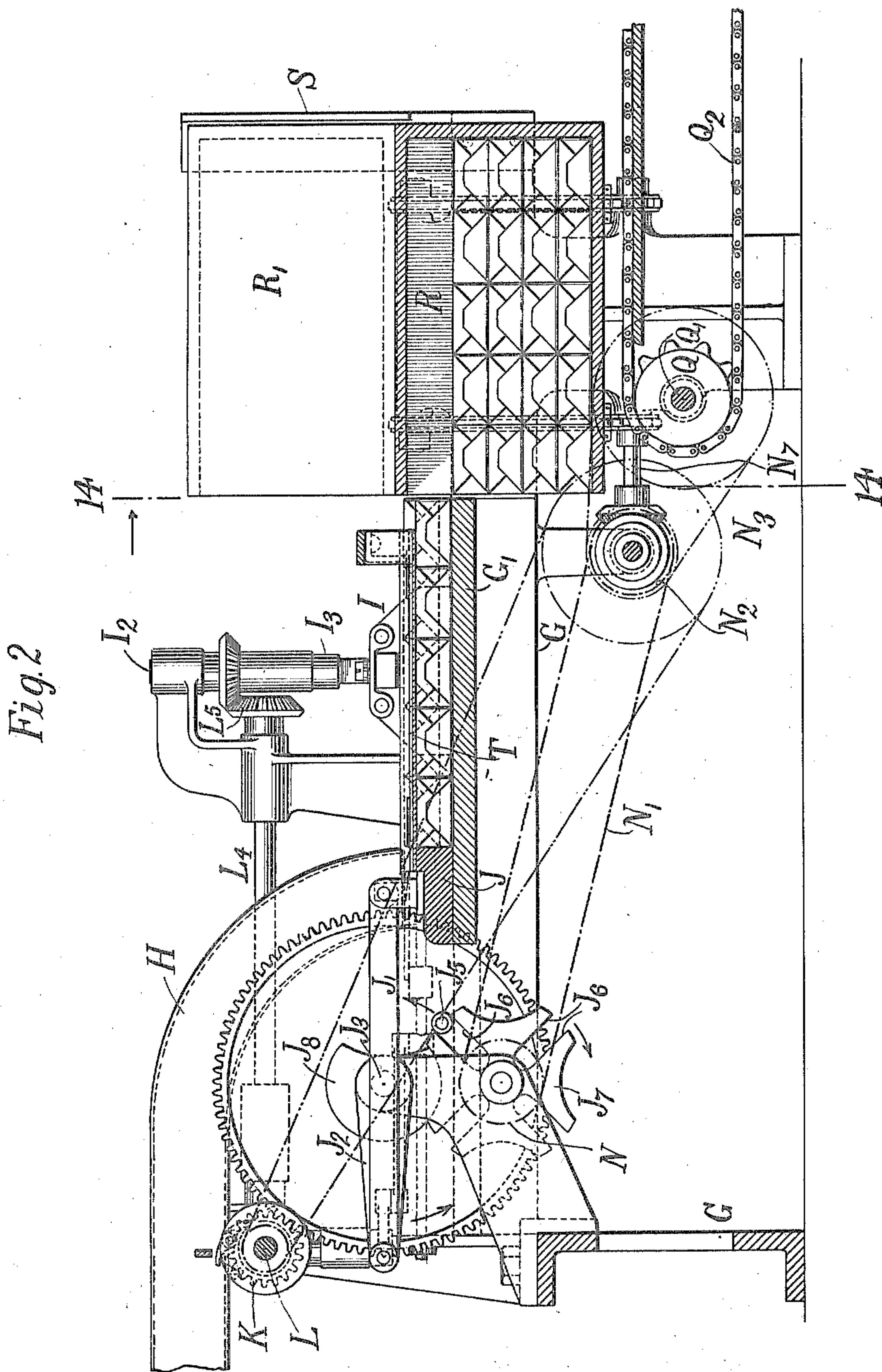
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Witnesses:
Raphaël Petter
Jessie B. Kay.

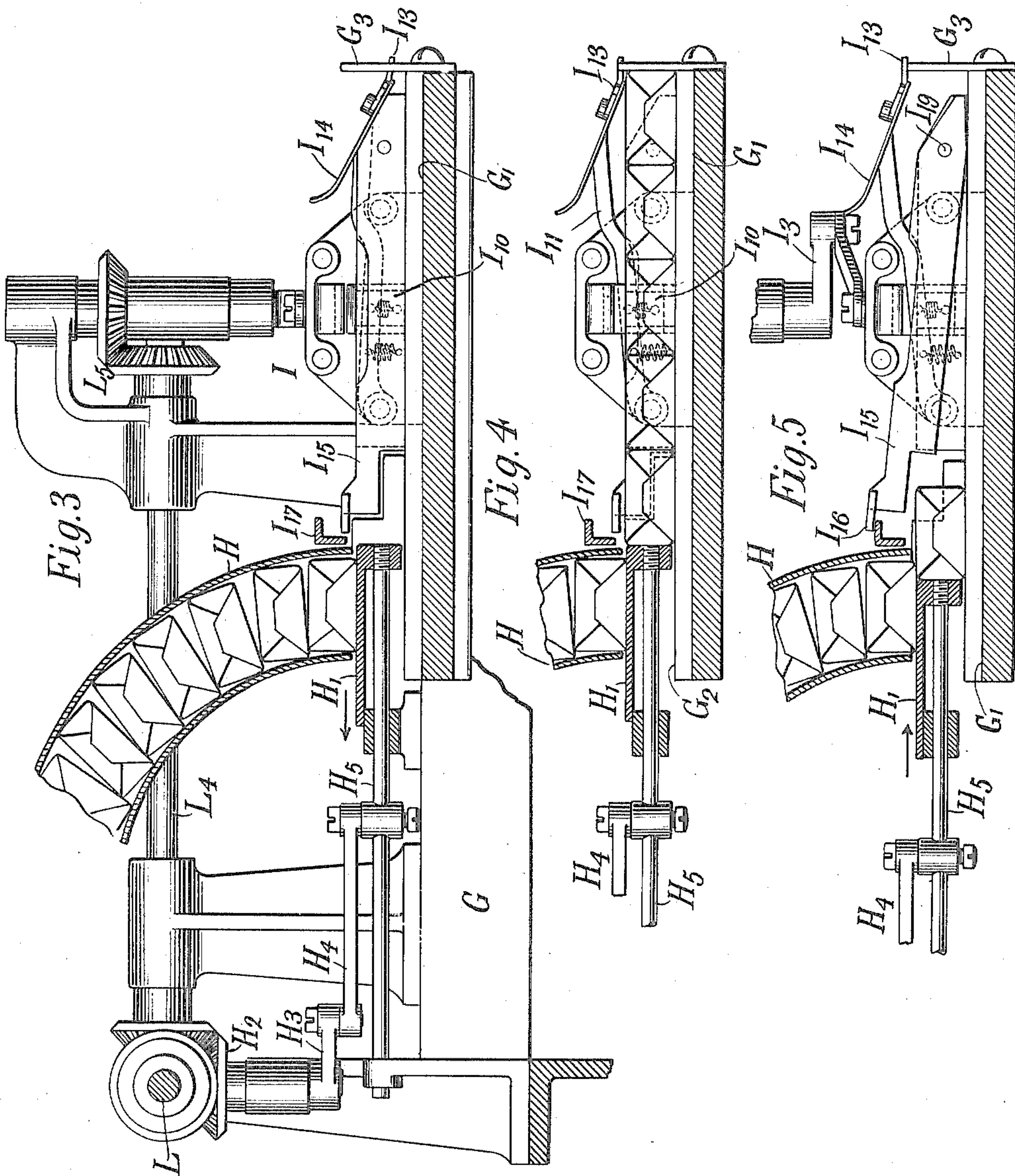
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Witnesses:
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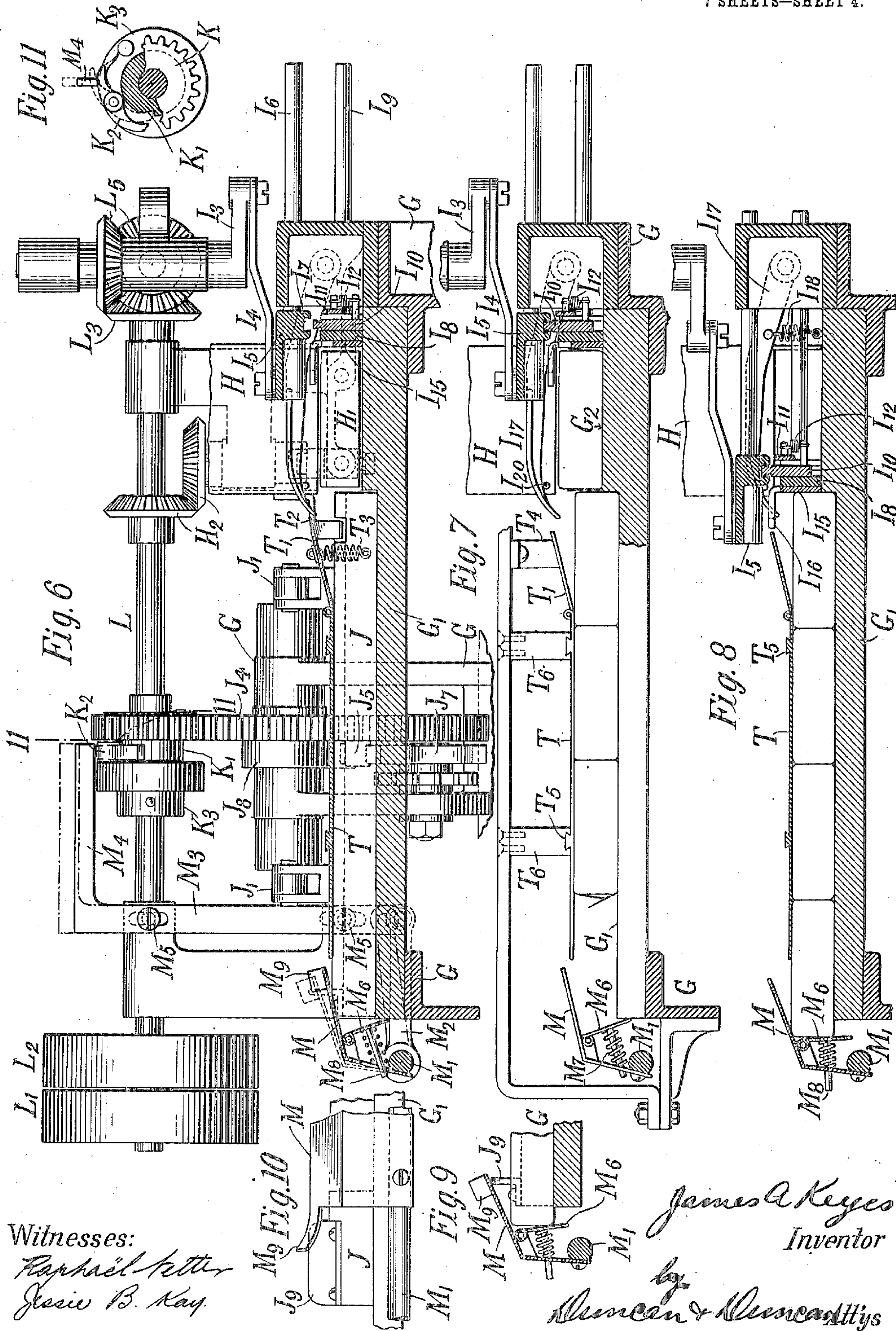
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7 SHEETS—SHEET 4.



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7 SHEETS—SHEET 5.

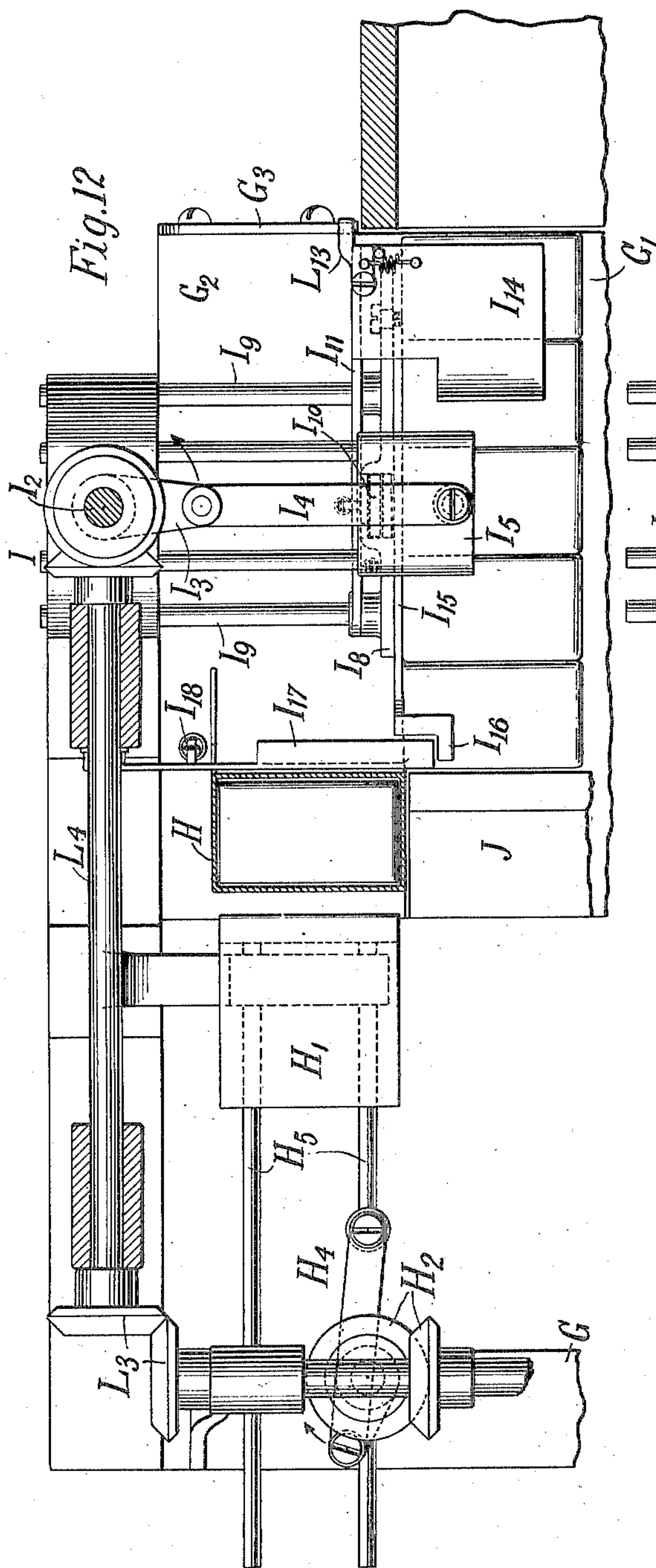


Fig. 12

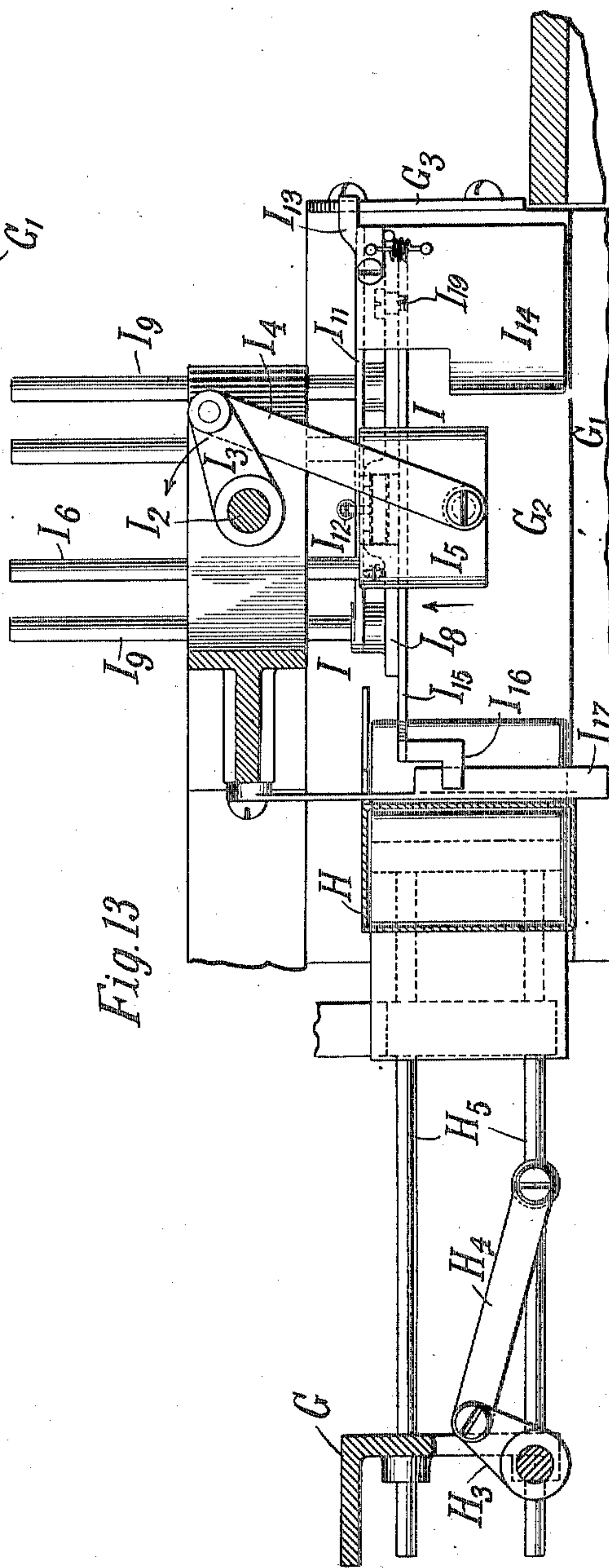


Fig. 13

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Fig. 14

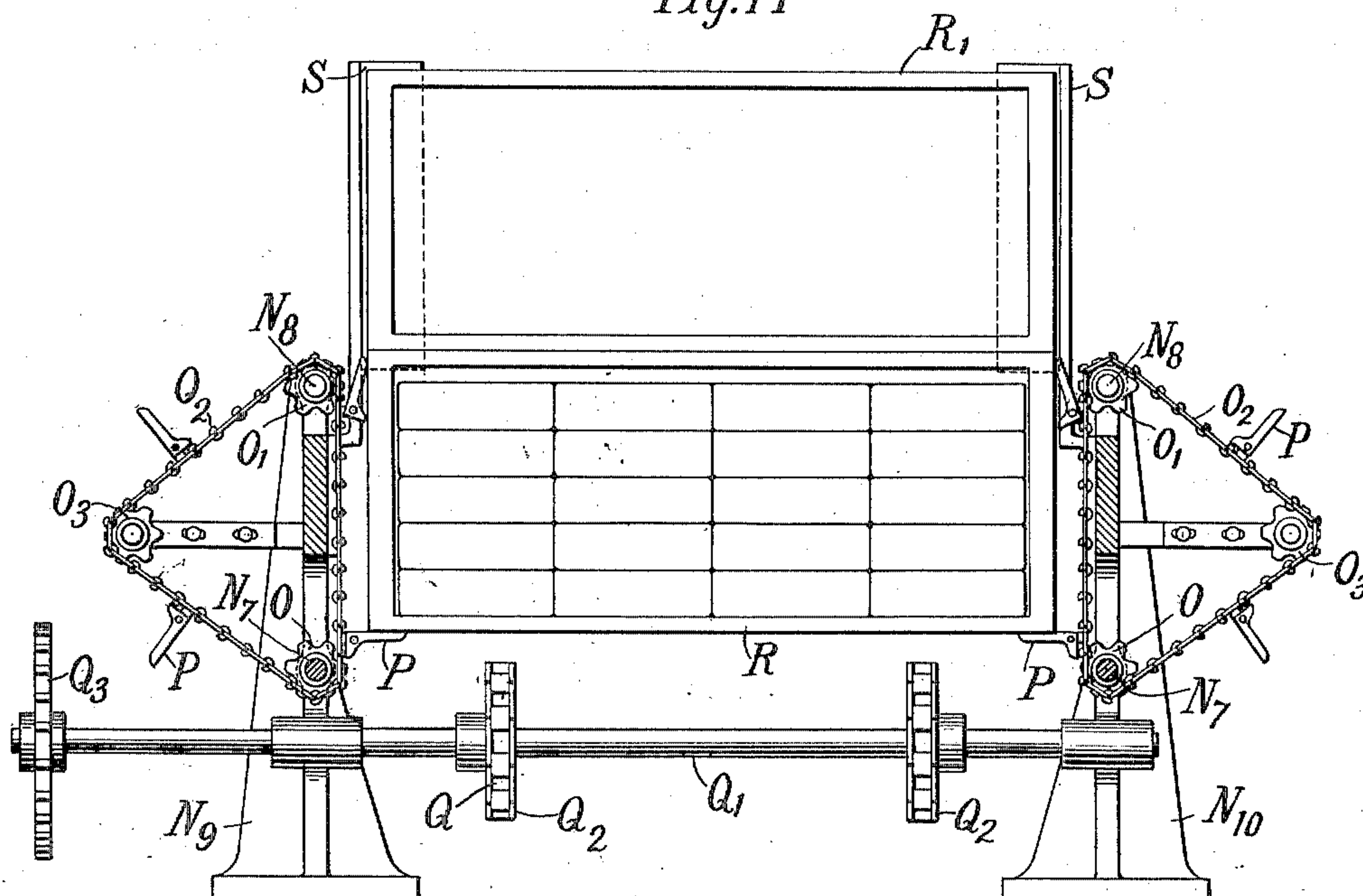
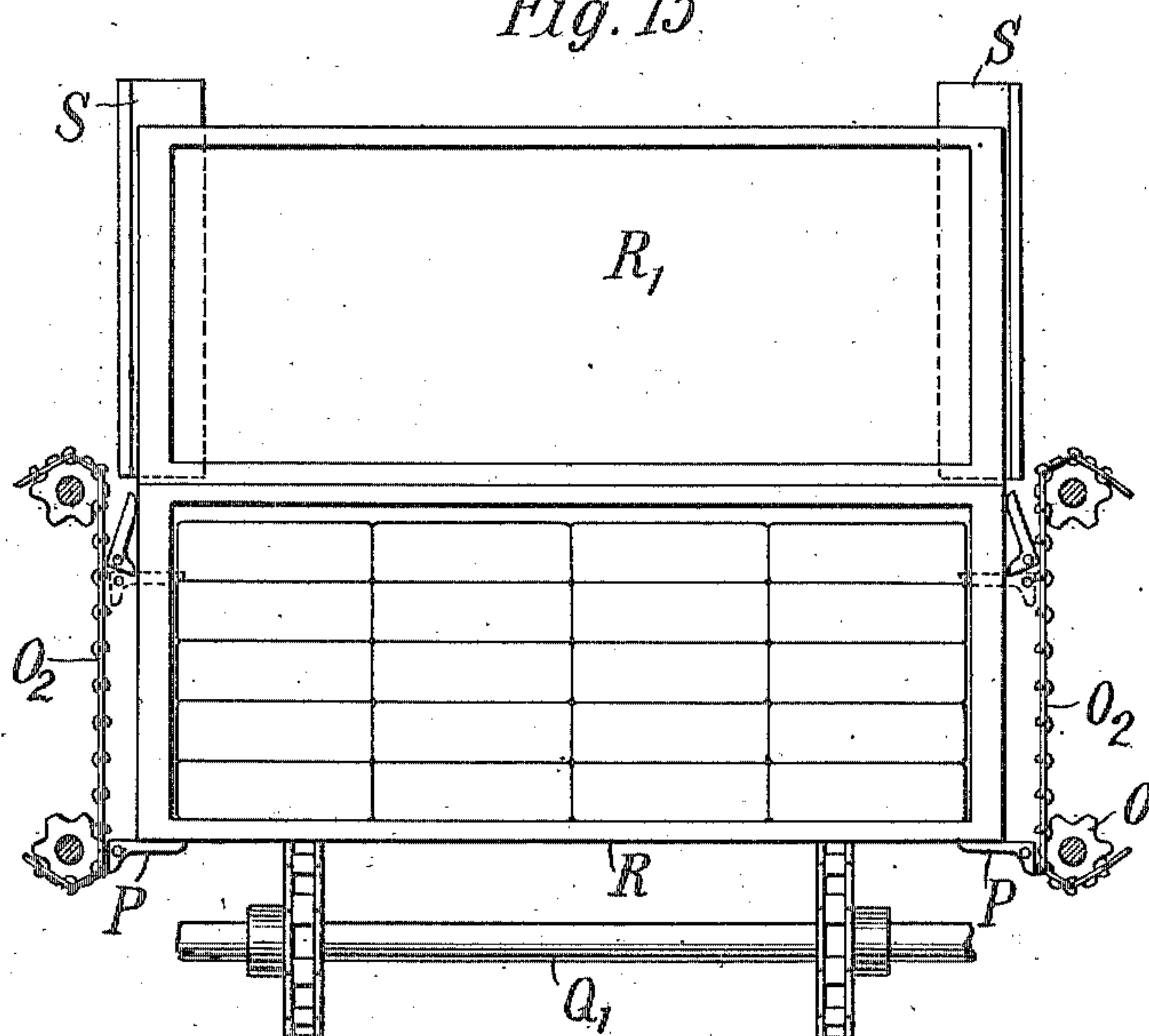


Fig. 15.



Witnesses:

Witnesses:
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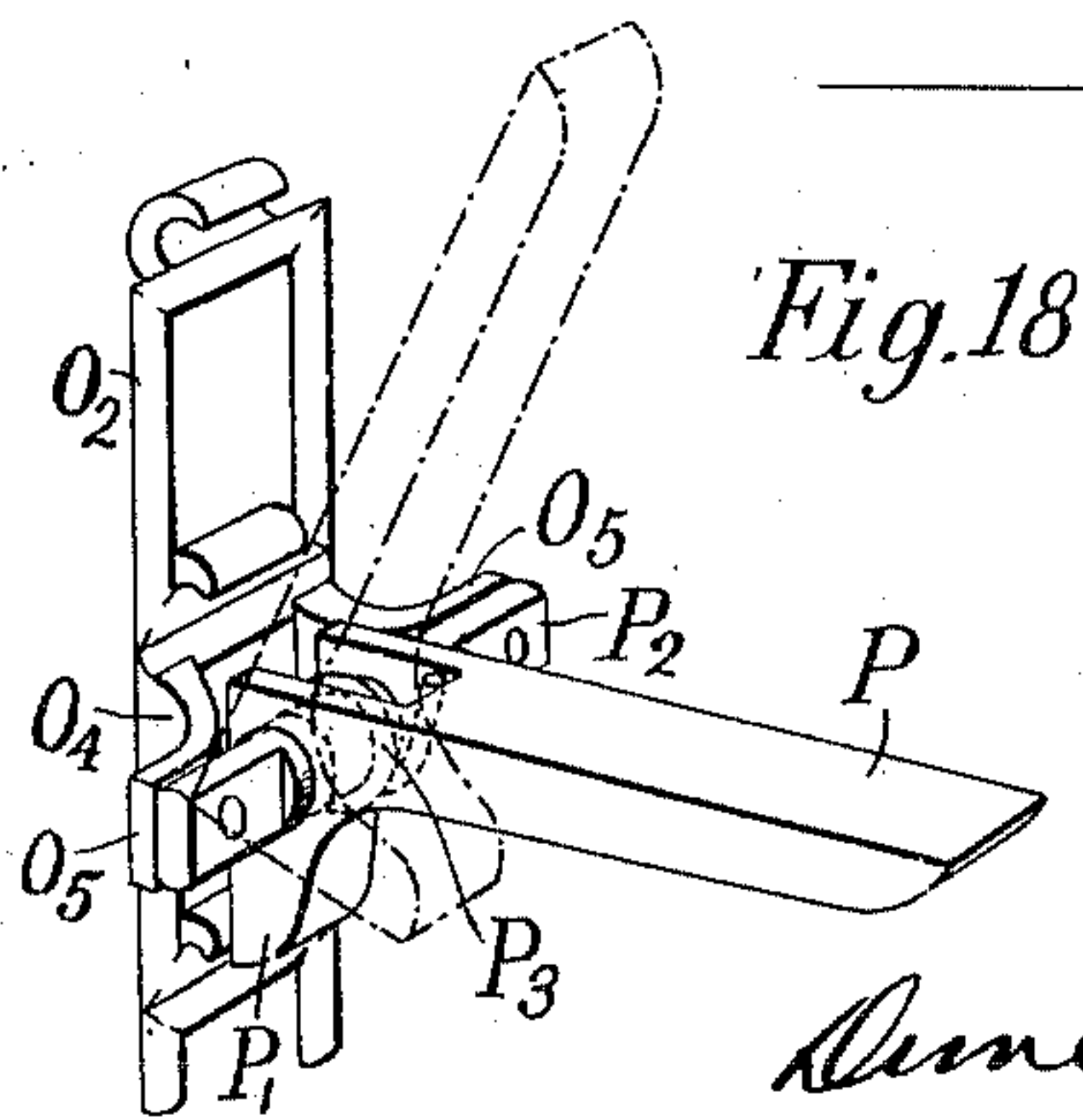
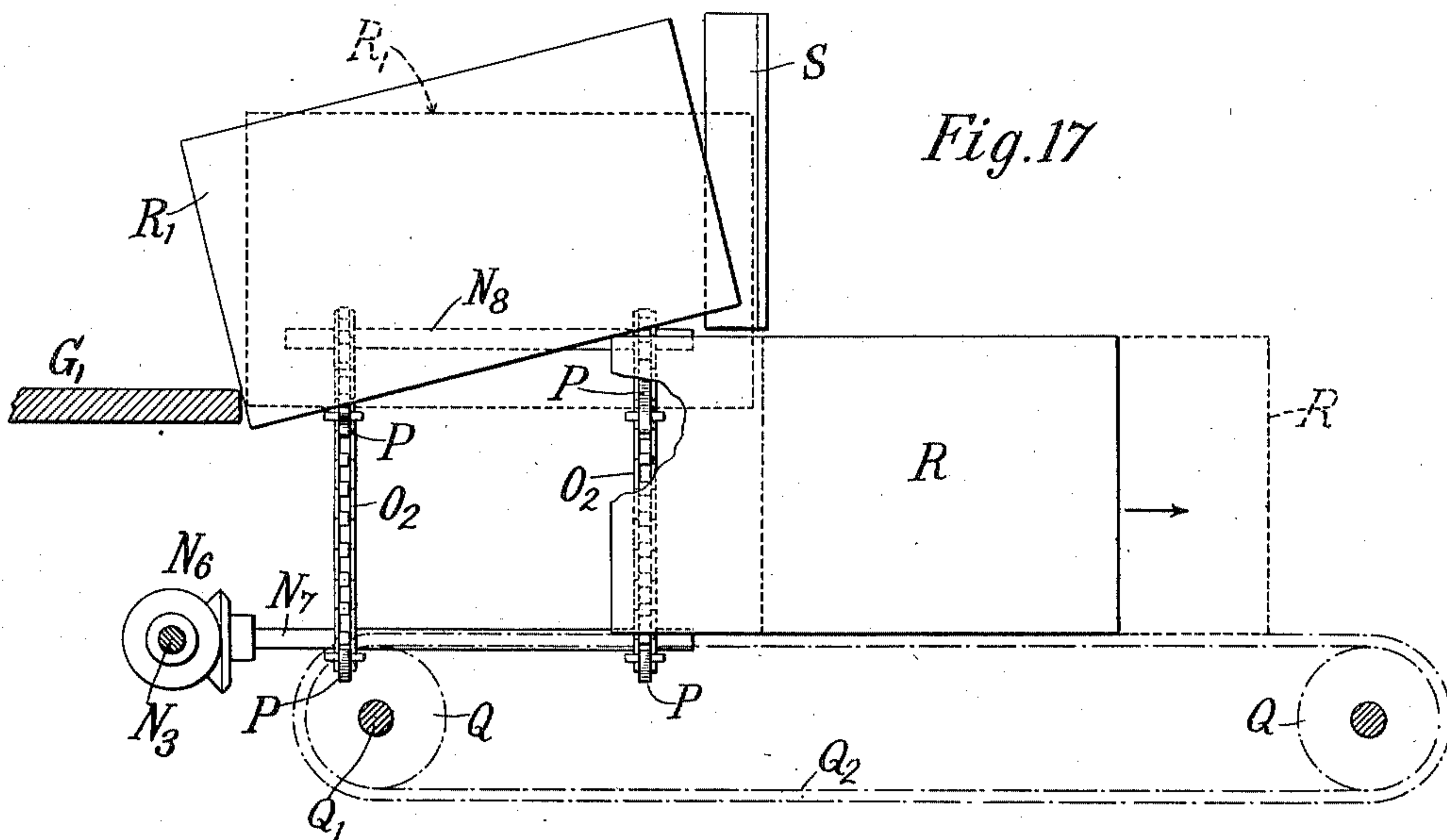
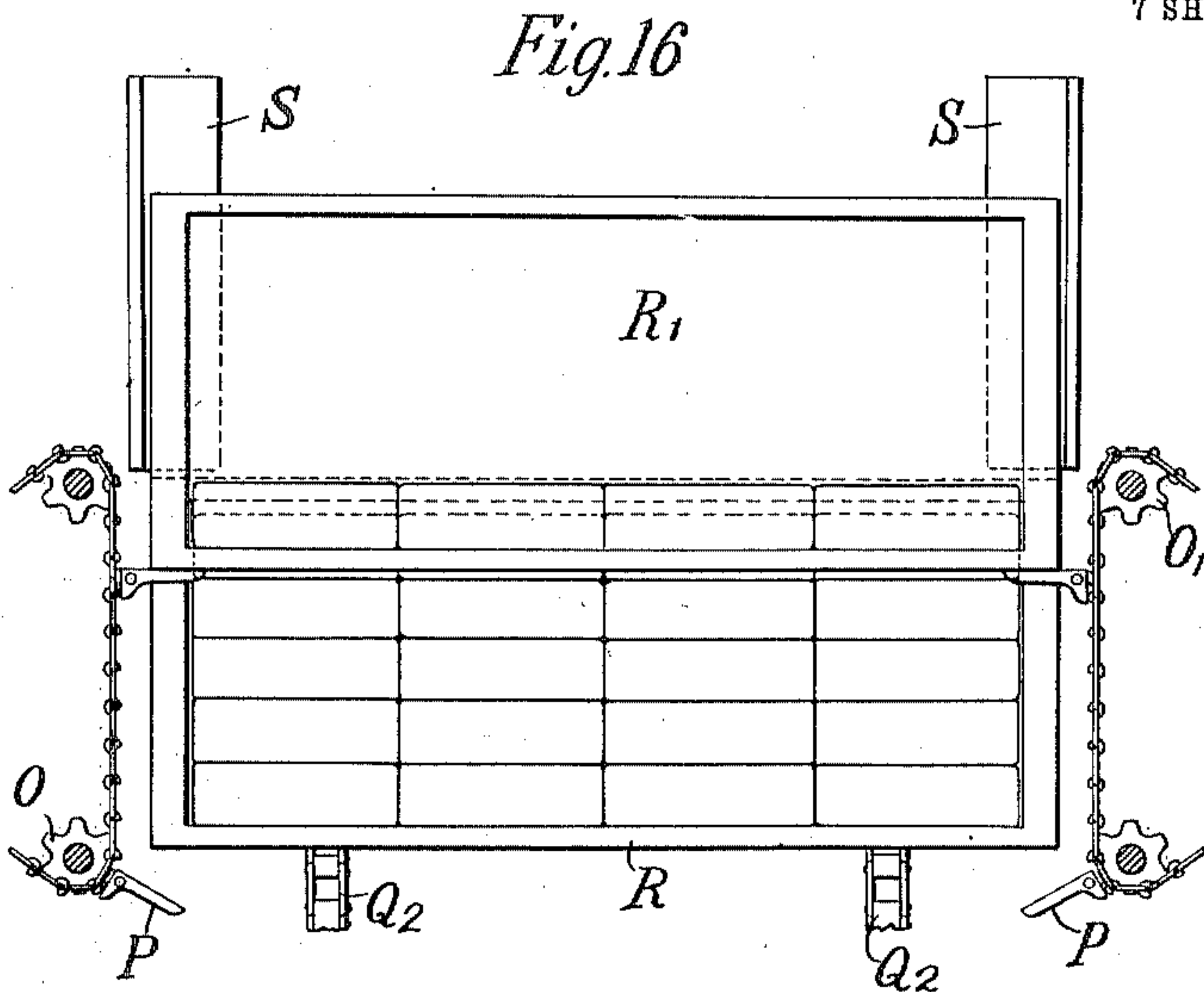
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APPLICATION FILED JULY 17, 1903.

7 SHEETS—SHEET 7.



Witnesses:
Raphaël Ketter
Jesse B. Kay.

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UNITED STATES PATENT OFFICE.

JAMES A. KEYES, OF NEW YORK, N. Y.

PACKING-MACHINE.

No. 817,375.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed July 17, 1903. Serial No. 165,940.

To all whom it may concern:

Be it known that I, JAMES A. KEYES, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Packing-Machines, of which the following is a specification, taken in connection with the accompanying drawings, which form a part of the same.

This invention relates to packing-machines, and relates especially to machines for packing wrapped articles into boxes or similar receptacles.

In the accompanying drawings, in which the same reference character refers to similar parts in the several figures, Figure 1 is a plan view, partly in section, of a machine embodying this invention. Fig. 2 is a longitudinal side section of the same. Figs. 3, 4, and 5 are partial longitudinal sectional views taken substantially along the line 3 3 of Fig. 1, showing the supply mechanism in different positions. Fig. 6 is a partial transverse sectional view taken substantially along the line 6 6 of Fig. 1, showing the transfer mechanism. Figs. 7 and 8 are similar views taken substantially along the line 7 7 of Fig. 1. Figs. 9, 10, and 11 are details of this mechanism, Fig. 11 being taken substantially along the line 11 11 of Fig. 6. Figs. 12 and 13 are partial plan views showing the transfer mechanism. Figs. 14, 15, and 16 are partial transverse sectional views showing the box-feeding mechanism. Fig. 17 is a partial longitudinal view of the same. Fig. 18 is a detail of this mechanism.

In the embodiment of this invention indicated in the drawings a supply mechanism is provided to form a row of articles, such as wrapped cakes of soap, adjacent the table of the machine. A transfer mechanism operates upon this row of articles when formed and forces them upon the table, forming a layer of articles from a number of rows. The layer of articles is then pushed by the insert mechanism into the box or receptacle, the box being fed forward by suitable box-feeding devices and being discharged when filled.

Supply mechanism.—The embodiment of this invention is shown in the drawings as formed with a suitable rigid frame G, upon which the various parts of the mechanism are mounted. The table G' is mounted upon this frame, and the runway or support G² to receive a row of articles is formed adjacent this table and preferably slightly elevated above the same, as is indicated in Fig. 7. The

supply-chute H (see Fig. 3) is located adjacent the runway, and the series of articles are successively fed along this chute, and these articles may be suitably wrapped and be supplied by any desired form of wrapping mechanism. The supply-plunger H' operates below the mouth of the chute H and is mounted upon the supply-rod H⁵, this rod operating in suitable bearings and being reciprocated by the bevel-gear H², driven from the power-shaft L, having the fast and loose pulleys L' L² and connected with the supply-crank H³. This crank is connected with the rod H⁵ by the link H⁴, so that the plunger is by this means constantly reciprocated. This plunger in its backward movement passes out from under the supply-chute. The lower article, such as a wrapped cake of soap, then drops upon the runway G² and is fed forward by the plunger, as indicated in Fig. 5, the plunger operating continually in this way and forming a row of articles upon the runway, as is indicated in Fig. 4.

Transfer mechanism.—The guides I⁶ are secured to the frame adjacent the runway, and the transfer-slide I⁵ is mounted to move upon these guides and is constantly reciprocated by the bevel-gear L⁵, connected to the crank I³, this crank operating the slide I⁵ through the link I⁴. The guides I⁹ are also mounted adjacent the runway, and the transfer-plunger I⁸ is mounted upon these guides to reciprocate thereon. The transfer-latch I¹⁰ is mounted to move vertically in suitable guides in the plunger, so as to cooperate with the notch I⁷ in the transfer-slide. This latch is connected, through the spring I¹², with the transfer-trigger I¹¹, which is preferably pivotally mounted upon the plunger. This trigger, as is seen in Figs. 3, 4, and 5, is formed with a trigger-plate I¹⁴ at its outer end. This plate, when engaged by the leading article in the completed row, as is seen in Fig. 4, is raised thereby raising the latch into engagement with the notch in the transfer-slide, as is seen in Fig. 7. The slide in its next reciprocation transfers the row of articles from the runway to the table, the parts taking the position indicated in Fig. 8, in which a complete layer of articles is indicated upon the table.

The trigger-plate is preferably provided with the movable cam-piece I¹³, (indicated in Fig. 13,) which may be spring-pressed, if desired, and which as the transfer-plunger moves rearward from the advanced position

(indicated in Fig. 8) rides over the guide-plate G^3 , thereby holding the trigger-plate in elevated position until its rearward position is reached, when the cam-piece may drop 5 around the curved end of the guide-plate. The transfer-gate I^{15} is preferably movably mounted upon the transfer-plunger, the gate-pin I^{19} being indicated for that purpose. A suitable light spring may be employed, if 10 desired, to normally hold this gate down. The outer end of the gate is formed with the gate-finger I^{16} , which as the gate moves outward raises the pivoted gate-cam I^{17} , normally held downward by the spring I^{18} 15 against the stop-pin I^{20} . In its outer position the gate-finger is above the end of this cam, and on the rearward movement of the transfer-plunger the gate-finger rides over the top of the cam, thus raising the gate into 20 the elevated position (indicated in Fig. 5) and keeping this gate out of engagement with the first article fed from the supply-chute, as is clearly seen in that figure. The gate-finger in its rearward position moves out of en- 25 gagement with the cam and falls into the lower position. (Shown in Figs. 3 and 7.)

Insert mechanism.—As is seen in Fig. 2, the insert-plunger J is indicated as connected with the cover T , which is preferably pro- 30 vided for the purpose of accurately guiding the articles as they are inserted into the box R , which is supported adjacent the table G' . This plunger is connected with the links J' , operated, through the cranks J^2 , by the shaft 35 J^3 . This shaft is rotated by the gear J^4 , which meshes with the pinion K . This pinion K is fast with the adjacent clutch-disk, which is provided with the notch K' , as is indicated in Fig. 11. The disk K^3 , fastened 40 to the power-shaft L , carries the spring-pressed pawl K^2 , which normally tends to engage the notch K' and operates the plunger through the mechanism described. The trigger-plate M for this mechanism is secured 45 to the trigger-rod M' , this rod being connected by the arm M^2 with the trigger M^4 , guided in its vertical movement by the bolts or screws M^5 , which engage suitable slots in the portion M^3 of the trigger, as indicated. 50 The edge guide M^6 is indicated as pivoted to the trigger-plate and as provided with the rods M^8 , which support the springs M^7 , normally tending to throw the edge guide outward. This spring-pressed guide engages 55 the ends of the wrappers of the articles fed along the table and effectually closes the same, holding them in position against the articles. The trigger M is formed at its rearward end with the upturned trigger-cam M^9 . 60 (Shown in Fig. 10.) The cam-lug J^9 , secured to the plunger J , engages this cam as soon as the plunger moves forward and raises the trigger-plate into the elevated position, (indicated in Fig. 9,) so that the plate is held out of engage- 65 ment with the articles and maintained in

this elevated position until the insert-plunger reaches its rearward position after forcing the layer of articles into the box.

The leading row of the complete layer of articles raises the trigger-plate M , as is seen 70 in Fig. 8. This operates, through the connecting mechanism, to raise the trigger M^4 into the dotted position indicated in Fig. 6. The trigger, as is seen in Fig. 11, thus re- 75 leases the pawl K^2 , which thereupon engages the notch K' and operates, through the connecting mechanism described, to reciprocate the insert-plunger, the trigger being held in this position through the trigger-cam and 80 lug described until the plunger again reaches its rearward position, when the trigger descends into engagement with the pawl K^2 , thus preventing further movement of the plunger.

The cover is preferably provided with sup- 85 porting mechanism, which may take the form of the slides T^5 , which engage the corresponding guideways T^6 , secured to the frame, to hold the cover at the proper height during its reciprocation. The cover may 90 also be provided, if desired, with the hinged cover-flap T' , (see Figs. 6 and 7,) preferably lowered when moved forward by the spring T^3 indicated. When the plunger is in the 95 rearward position, (indicated in Fig. 6,) the flap rides up on the cover-guide T^2 , secured to the frame, and is forced into the elevated position indicated, the cover-flap coming into contact with the stop T^4 .

Box-feeding mechanism.—The boxes into 100 which the articles are packed are located adjacent the table, as indicated in Fig. 2, and preferably automatically fed forward as the articles are inserted therein, being supported and fed by suitable box-feeders, which pref- 105 erably have box-supports spaced thereon at a less distance apart than the width of the box, so that on the discharge of one box another at once assumes the proper position with relation to the table. These box-feed- 110 ers may take the form of the box-chains O^2 , indicated in Fig. 14 as passing around the sprockets O , O' , and O^3 , and as being provided with the movable supports P , indicated in Fig. 18 as mounted upon the pivots P^2 , 115 secured to the projecting portions O^5 of the brackets O^4 upon the chain. The springs P^3 normally force these supports outward, so that the heels P' of the same engage the box-chains, although the supports may move into 120 the dotted position shown. The box R is supported by the fingers P beneath the same.

As each layer of articles is inserted in the box the box is fed downward the proper dis- 125 tance by the feed-roll J^5 , which at the end of the revolution of the gear moves into one of the slots J^6 of the stop-wheel and rotates this stop-wheel through a quarter of a revolution, the stop-rim J^8 , secured to the gear, there- 130 upon engaging the sector J^7 to secure the

alignment of this stop-wheel. (See Fig. 2.) The stop-wheel is connected by the sprocket-chain N' with the sprocket-wheel N² upon the shaft N³, this shaft rotating the chain-shafts N⁷ through the bevel-gears N⁶, the box-chains O² being operated by the sprockets O on these shafts, which, as are indicated, are mounted in suitable bearings in the columns N⁹ N¹⁰. It will therefore be apparent after the insert-plunger has forced a layer of articles into the box R, which is guided by the box-guides S, that the box after the plunger has withdrawn therefrom is fed forward through a space substantially equal to the thickness of the layer of articles inserted. The box when filled is lowered by the box-feeder upon the box-discharge, indicated as a chain conveyor Q², mounted upon the sprocket-wheels Q and continually rotated by the shaft Q' by means of a sprocket-chain Q⁴, connecting the sprocket-wheels Q³ and Q⁵. The sprocket-wheel Q⁵, which is loose upon the shaft N³, is connected with the sprocket-wheel Q⁶ (indicated in Fig. 1) and is driven by the sprocket-chain Q⁷ engaging the sprocket-wheel Q⁸ on the drive-shaft L.

As is seen in Fig. 17, the filled box R as it is lowered upon the box-discharge is moved in the direction of the arrow, passing under the guides S and allowing the upper box R' to descend into engagement with the box-supports P. Before the removal of the filled box the upper series of box-supports were in engagement with the sides of the filled box, as indicated in Figs. 14 and 15; but as the filled box moves rearward past the box-chains the box-supports are thrown downward by their springs into the dotted position indicated in Fig. 15, so that the upper empty box R' descends first upon one pair of these supports, as indicated in full lines in Fig. 17, and then as the filled box is completely removed from beneath the upper box the latter descends into the dotted position, engaging all of the supports and coming into proper alignment with respect to the table G'. In this way by spacing the box-supports a less distance apart on the box-feeders than the width of a box the thickness of the sides of the box may be compensated for, although the extent of movement of the feeders is the same at all times. The filled box as it is fed over the end of the box-discharge tilts over and is deposited upon the floor in an upright position, the open end of the box being on top, the height of the box-discharge being regulated to effect this result.

It is of course understood by those familiar with this art that many modifications may be made in the number, proportions, and sizes of parts of this machine without departing from the spirit of this invention or losing the advantages of the same. Furthermore, parts of this machine may be omitted and parts may be used in connection with other devices

by those familiar with this art. I do not, therefore, desire to be limited to the disclosure which has been made in this case; but

What I claim as new and what I desire to secure by Letters Patent is set forth in the appended claims.

1. In packing-machines, a table having a runway adjacent thereto, a feed-plunger to feed a row of articles along said runway, a transfer-plunger mounted adjacent said runway and provided with a trigger to be engaged by said articles, a reciprocating slide adjacent said transfer-plunger to be connected therewith by said trigger to transfer said row of articles to said table, an insert-plunger and operating mechanism adjacent said table, means actuated by said articles connected with said operating mechanism to operate said plunger, and box-feeding means adjacent said table to support and feed forward boxes as articles are inserted therein.

2. In packing-machines, a table having a runway adjacent thereto, means to feed a series of articles along said runway, a reciprocating transfer-slide adjacent said runway, a transfer-plunger disengageably connected with said slide, a transfer-trigger to be engaged by said articles on said runway to connect said plunger and said slide to transfer said articles upon said table, means to support a box adjacent said table, an insert-plunger adjacent said table, disengageable operating mechanism connected therewith and means actuated by said articles to connect said operating mechanism and said plunger to insert said articles on said table into said box.

3. In packing-machines, a table having a runway adjacent thereto, means to successively feed a series of articles along said runway to form a row, transfer mechanism actuated by said articles to transfer each completed row of articles from said runway to said table to form a layer, means to support a box adjacent said table and means actuated by the complete layer of articles on said table to insert said layer into said box.

4. In packing-machines, a table having a runway adjacent thereto, means to successively feed a series of articles along said runway to form a row, a reciprocating slide adjacent said runway, a transfer-plunger cooperating with said slide, a trigger movably mounted on said plunger and normally in the path of said row to be engaged by the leading article of a completed row and to connect said slide and said plunger to transfer said row from said runway to said table and means to hold said trigger in operative position to maintain the engagement between said slide and said plunger until they move into rearward position.

5. In a packing-machine, a runway, means to successively feed a series of articles upon said runway to form a layer, a reciprocating slide adjacent said runway, a plunger to co-

- operate with said slide, a trigger movably mounted on said plunger and normally in the path of said row to be engaged by the leading article of a completed row to connect said plunger and said slide to discharge said row from said runway, a movable gate on said plunger and a gate-cam to withdraw said gate from the path of an article entering said runway as said plunger is moved backward.
6. In packing-machines, a runway, means to successively feed a series of articles upon said runway to form a row, a plunger, means to reciprocate said plunger, a movable gate connected with said plunger and means to withdraw said gate from the path of an article entering said runway as said plunger is moved rearward.
7. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert-plunger formed with a cover cooperating with said table, a movable cover-flap mounted on said cover, means to feed articles from said runway upon said table, means to reciprocate said plunger to insert said articles into said box and means to lower said cover-flap as said articles are inserted into said box.
8. In packing-machines, a table, means to support a box adjacent said table, an insert-plunger cooperating with said table to insert articles into said box, a trigger-rod adjacent said table and connected with a trigger, means to reciprocate said plunger comprising a pawl in the path of said trigger, and means to feed articles to said table to engage said trigger-plate to actuate said plunger and means to hold said trigger in operative position until said plunger is withdrawn.
9. In packing-machines, a table, a plunger cooperating with said table to discharge articles therefrom, a trigger-plate adjacent said table to be engaged by said articles, means to operate said plunger disengageably connected therewith and controlled by said trigger-plate and means on said plunger to engage said trigger-plate and to hold the same in operative position until said plunger is retracted.
10. In packing-machines, a table, means to feed a series of articles upon said table, a trigger-plate adjacent said table, an edge guide adjacent said table, a plunger cooperating with said table to discharge articles therefrom, actuating means to be engaged by said articles to operate said plunger and means connected with said plunger to maintain said actuating means in operative position until said plunger is withdrawn.
11. In a packing-machine, a table, a plunger to feed a series of articles from said table, box-feeding means adjacent said table provided with supports spaced apart at a less distance than the width of a box, means to operate said box-feeding means from said plunger to move said box as articles are inserted therein and a box-discharge to remove a filled box from said feeding means and to bring another box into engagement with another set of supports.
12. In packing-machines, box-guides, box-feeders adjacent said guides, movable supports on said box-feeders spaced apart at a different distance than the width of a box, means adjacent said box-feeders to feed articles into a box and to simultaneously operate said box-feeders and a box-discharge to remove a box from said box-feeders and to bring another box into engagement with the supports thereon.
13. In packing-machines, box-guides, box-chains adjacent said guides, pivoted spring-pressed supports on said chains spaced apart at a less distance than the width of a box, means adjacent said chains to feed articles into a box and to simultaneously operate said chains and a box-discharge to remove a filled box from said supports and to allow another box to engage another series of said supports.
14. In packing-machines, a table having a runway adjacent thereto to guide a series of articles, transfer mechanism actuated by said articles to transfer each completed row of articles from said runway to said table to form a layer, means to support a box adjacent said table and means actuated by the complete layer of articles on said table to insert said layer in said box.
15. In packing-machines, a runway to guide a series of articles to form rows, transfer mechanism actuated by said articles to transfer each completed row of articles from said runway to form a layer and means actuated by the complete layer of articles to discharge said layer.
16. In packing-machines, a runway to guide a series of articles, transfer mechanism to transfer each completed row of articles from said runway to form a layer and separate means to discharge each complete layer of articles.
17. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert-plunger, means to feed rows of articles from said runway upon said table to form a layer and means directly engaged and actuated by said layer to reciprocate said plunger to insert said layer of articles into said box.
18. In packing-machines, a table, means to feed a series of articles upon said table, a trigger-plate adjacent said table, a plunger cooperating with said table to discharge articles therefrom, actuating means to be engaged by said articles to operate said plunger and means connected with said plunger to maintain said actuating means in operative position until said plunger is withdrawn.
19. In packing-machines, a table, a plunger cooperating with said table to discharge articles therefrom, actuating means to be di-

rectly engaged by said articles, means to operate said plunger disengageably connected therewith and controlled by said actuating means and means to hold said actuating means and trigger-plate in operative position until said plunger is retracted.

20. In packing-machines, transfer means to engage and transfer articles, actuating means to be directly engaged by said articles, means to operate said transfer means disengageably connected therewith and controlled by said actuating means and devices engaging said transfer means to hold said actuating means in operative position until said transfer means is retracted.

21. In packing-machines, article-feeding means to feed a series of articles into a box, box-feeding means provided with supports spaced apart at a different distance than the width of a box, means to operate said box-feeding means from said article-feeding means to move said box as articles are inserted therein and a box-discharge to remove a filled box from said feeding means and to bring another box into engagement with another set of supports.

22. In packing-machines, box-feeders, supports on said box-feeders spaced apart at a different distance than the width of a box, means adjacent said box-feeders to feed articles into a box, means to operate said box-feeders and a discharger to remove a box from said feeders and to allow another box to move into engagement with the supports thereon.

23. In packing-machines, box-feeders, means to operate said feeders, alining lugs on said feeders spaced apart at different distances than the width of a box and means to discharge a box from said feeders and to allow another box to move relatively to said feeders to engage the supports thereon.

24. In packing-machines, box-chains, means to operate said box-chains, alining lugs on said box-chains spaced apart at a different distance than the width of a box, and means to move unfilled boxes relatively to said chains after a filled box has been removed from said chains to bring said unfilled box into alinement against said alining lugs.

25. In packing-machines, a runway to

guide a series of articles, transfer mechanism to transfer separately each completed row of articles from said runway to form a layer and means to discharge each completed layer of articles.

26. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert-plunger, means to feed rows of articles from said runway upon said table to form a layer, said plunger mounted to move in the same plane as the layer of articles, and means engaged and actuated by said layer to reciprocate said plunger and insert said layer of articles in said box.

27. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert-plunger, adapted to move in a horizontal plane, means to feed rows of articles from said runway upon said table to form a layer, said layer adapted to be moved in a horizontal plane by the insert-plunger and means engaged and actuated by said layer to reciprocate said plunger and insert said layer of articles into said box.

28. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert plunger, means to feed rows of articles from said runway upon said table to form a layer, said plunger mounted to move in the same plane as the layer of articles and means directly engaged and actuated by said layer to reciprocate said plunger and insert said layer of articles in said box.

29. In packing-machines, a runway having a table adjacent thereto, means to support a box adjacent said table, an insert-plunger, adapted to move in a horizontal plane, means to feed rows of articles from said runway upon said table to form a layer, said layer adapted to be moved in a horizontal plane by the insert-plunger and means directly engaged and actuated by said layer to reciprocate said plunger and insert said layer of articles into said box.

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Witnesses:

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W. L. BREMER.