

M. H. BALLARD
FEEDING MECHANISM FOR ORANGES AND OTHER ARTICLES.

APPLICATION FILED DEC. 30, 1904.

4 SHEETS—SHEET 1.

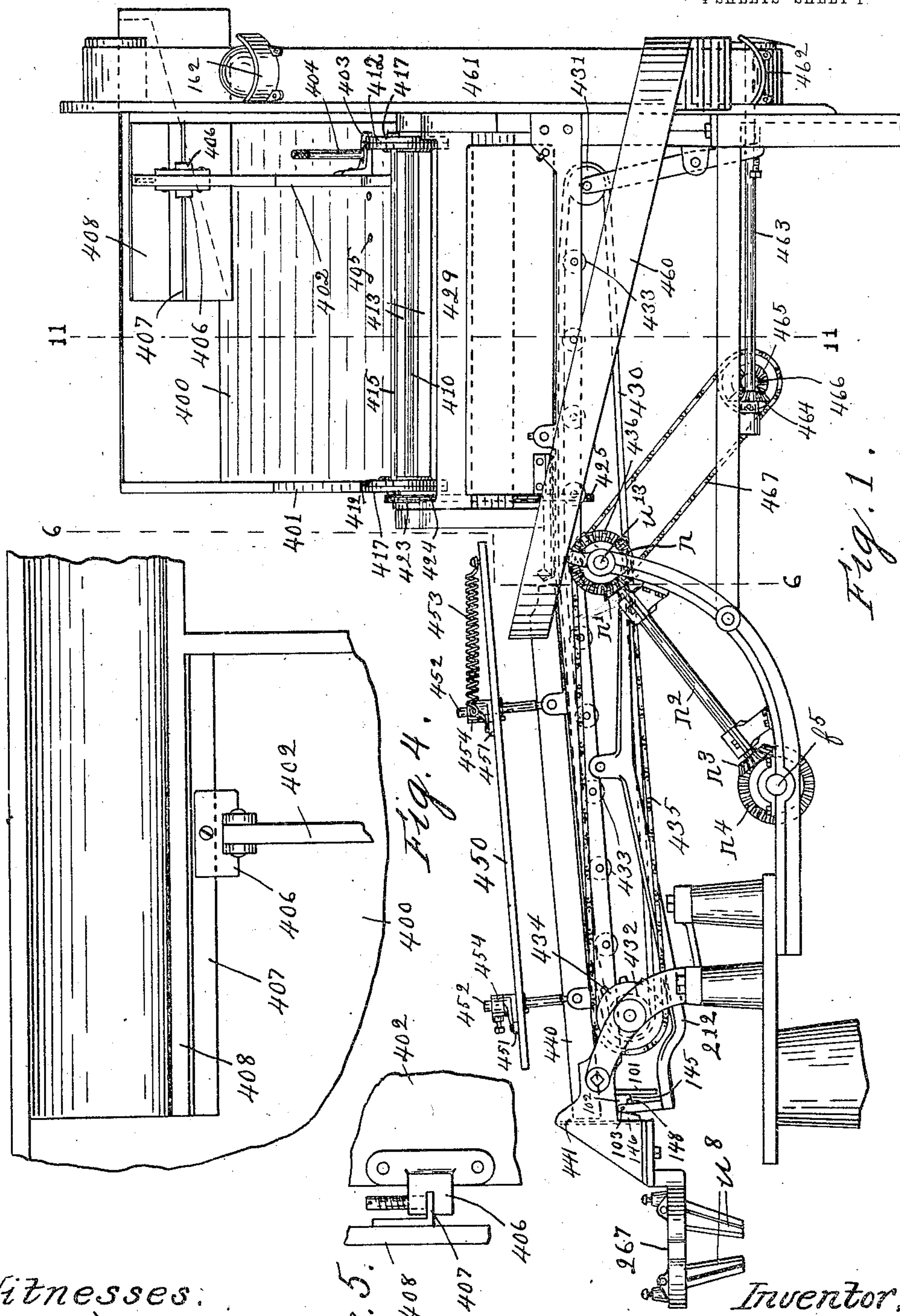


Fig. 1.

Fig. 4.

Fig. 5.

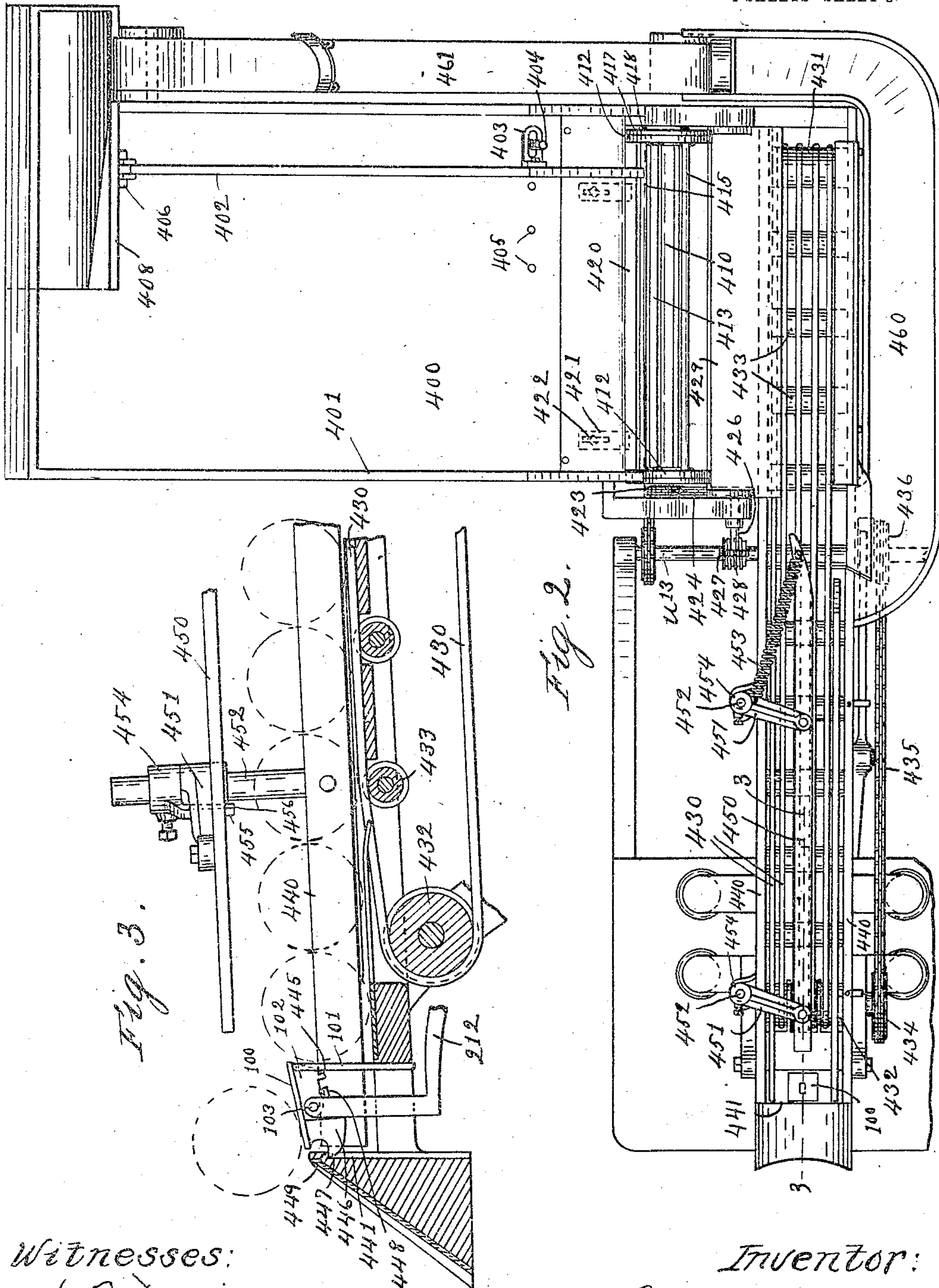
Witnesses:
H. B. Davis.
Maud M. Piper

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Milton H. Ballard
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4 SHEETS-SHEET 2.



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No. 820,084.

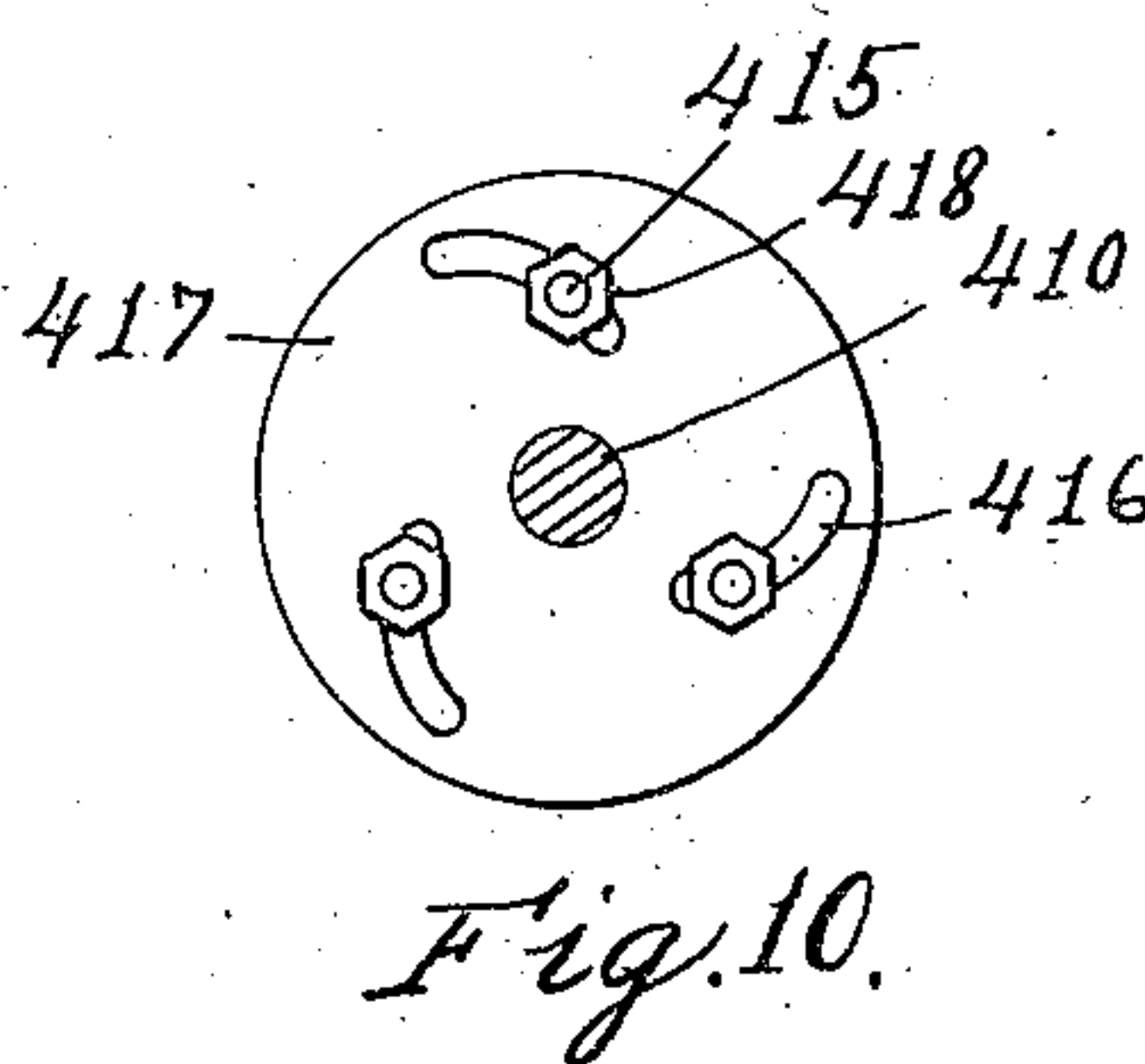
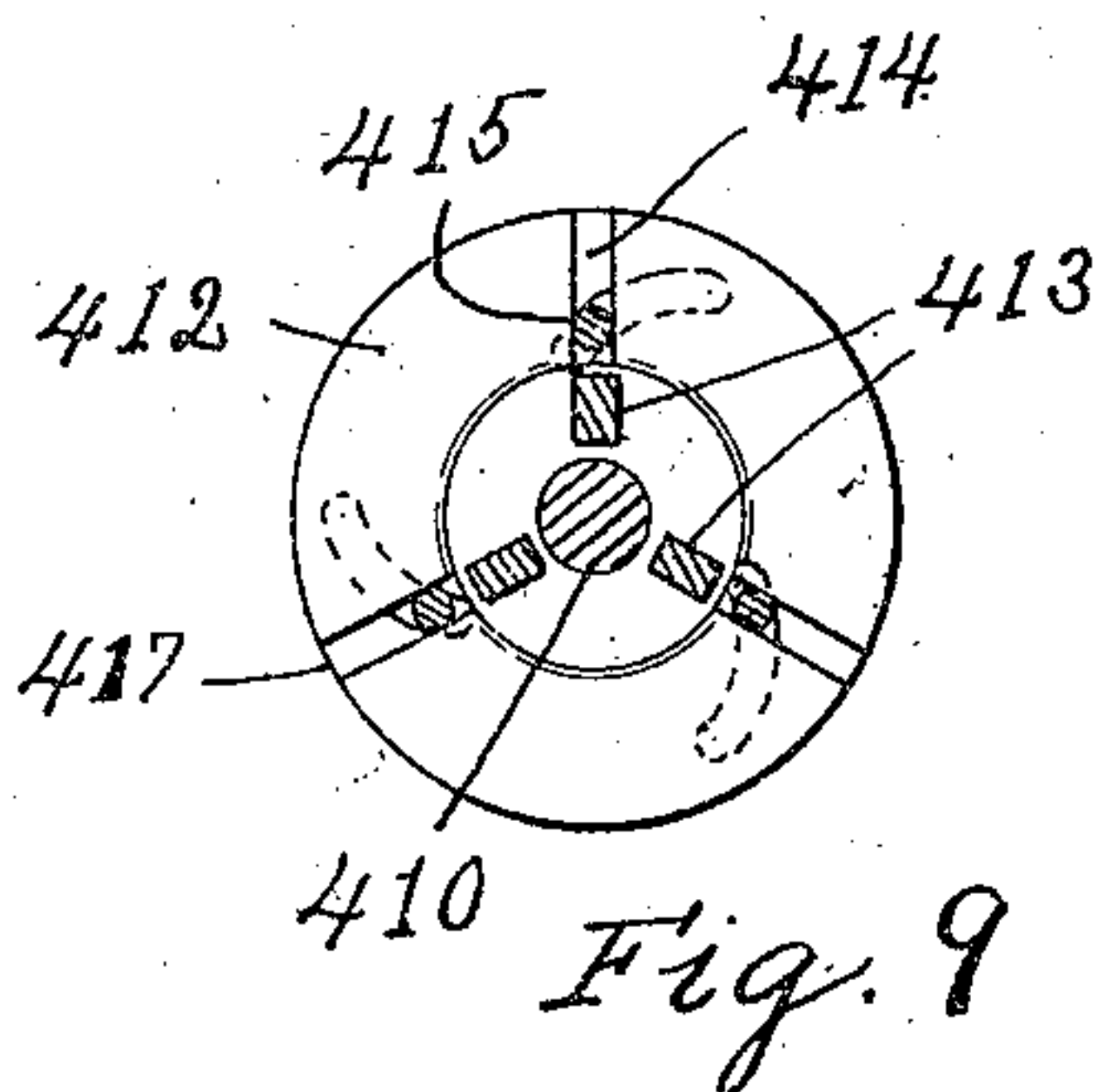
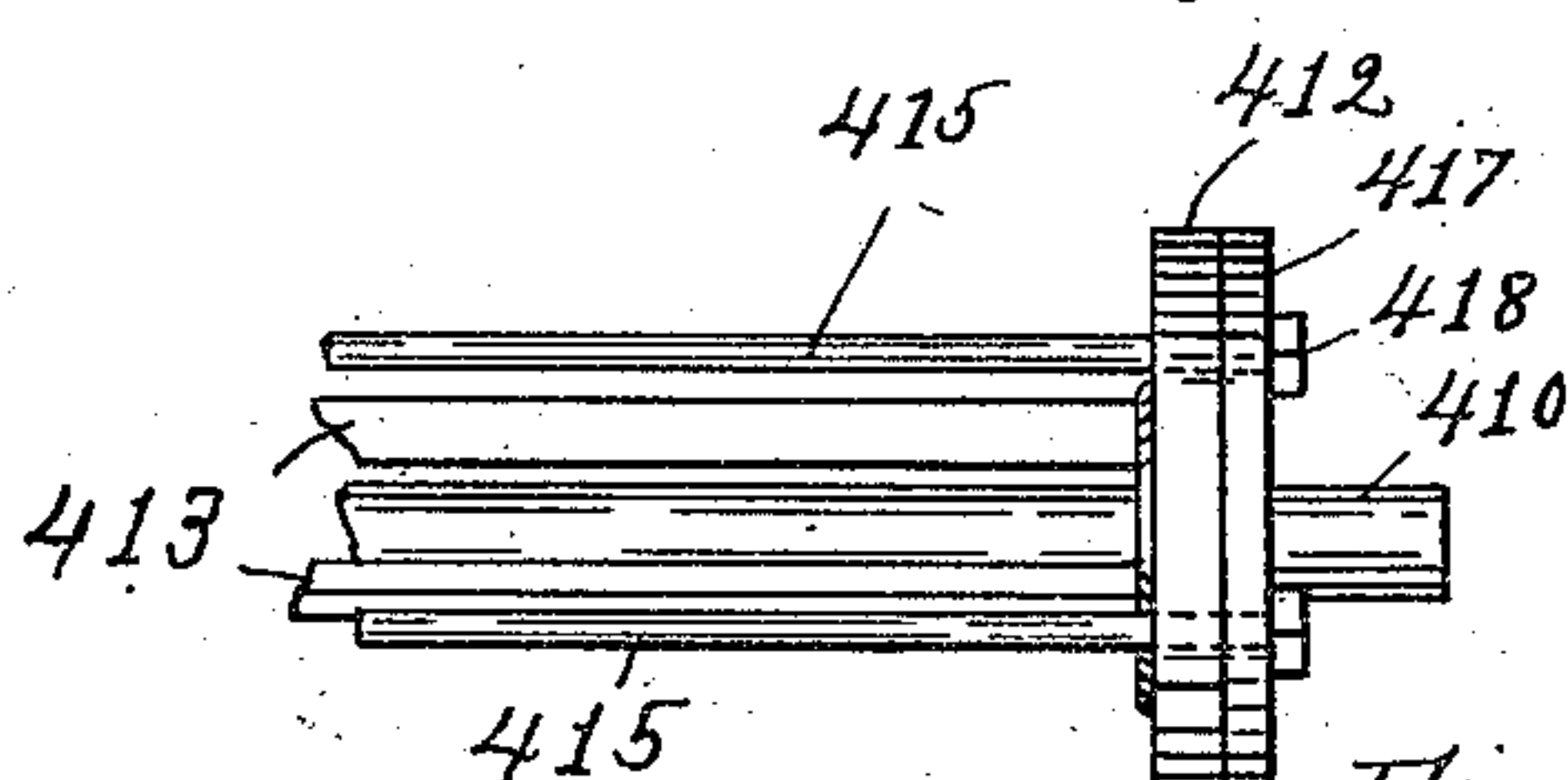
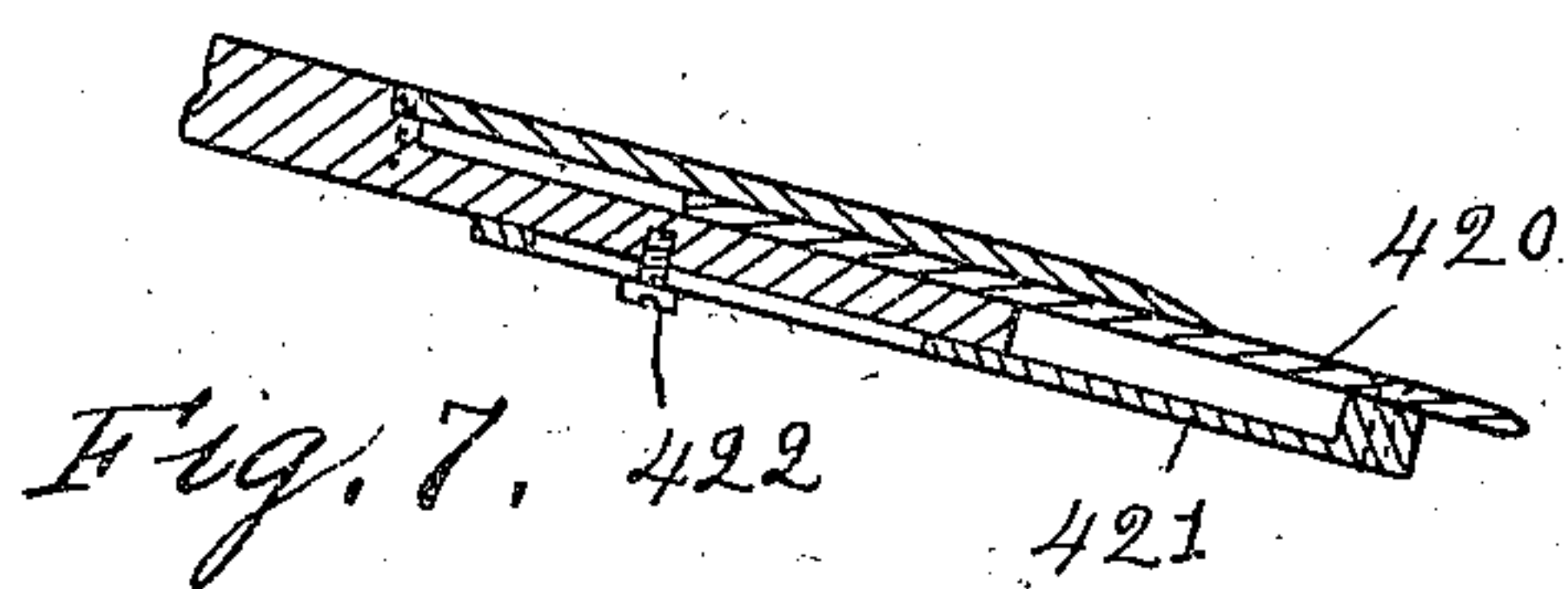
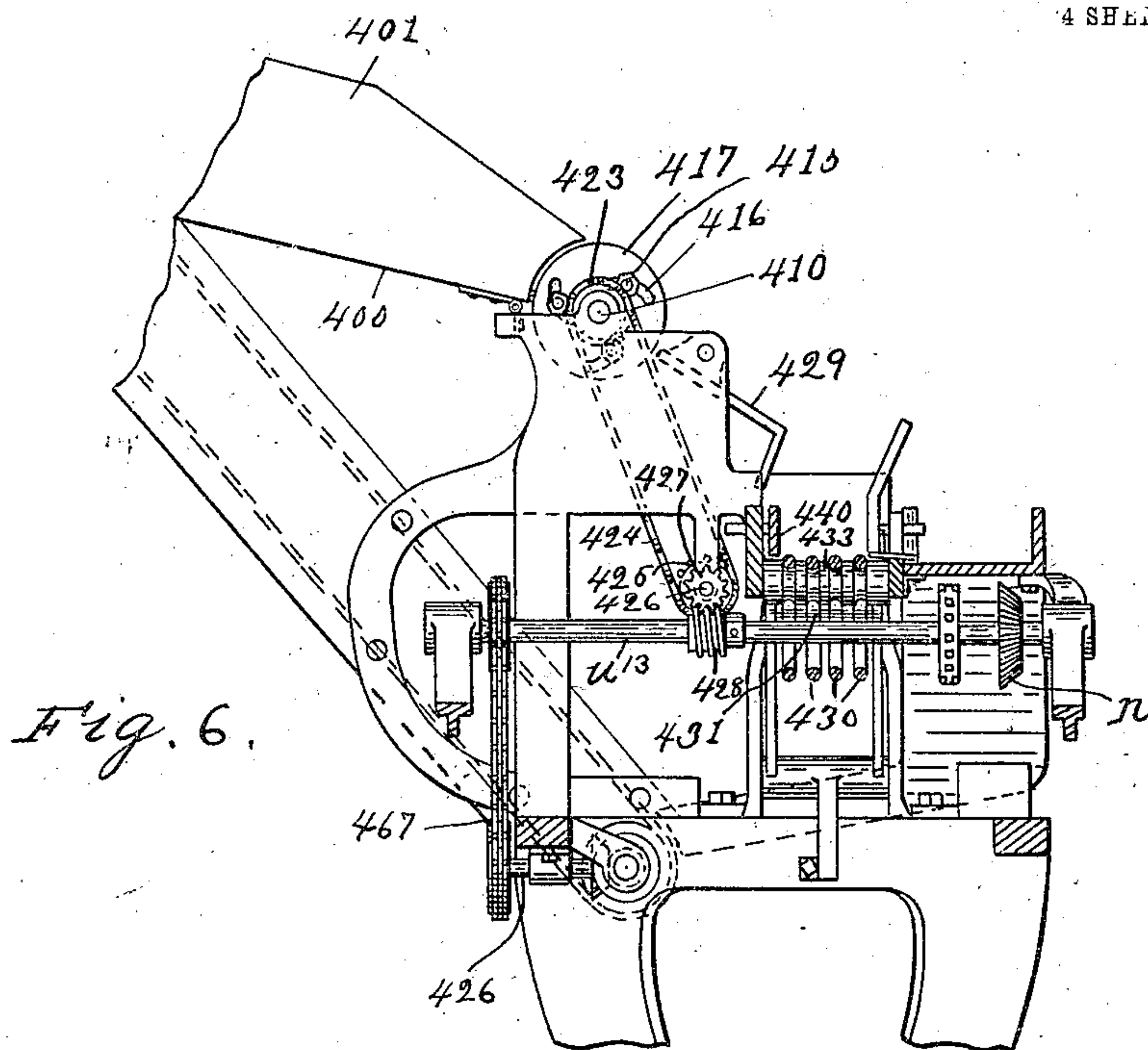
PATENTED MAY 8, 1906.

M. H. BALLARD.

FEEDING MECHANISM FOR ORANGES AND OTHER ARTICLES.

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4 SHEETS—SHEET 3.



Witnesses:

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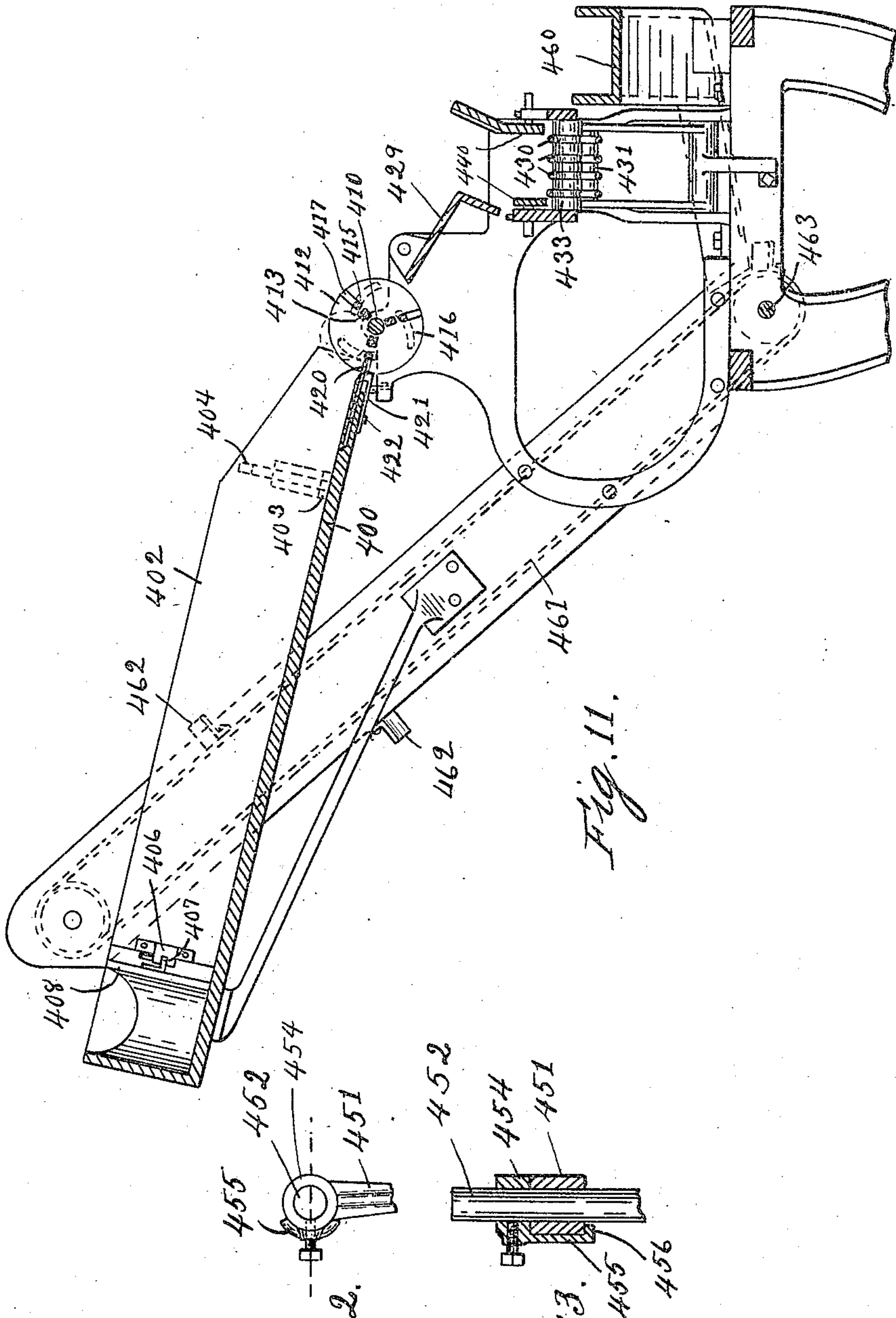


Fig. 11.

Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE.

MILTON H. BALLARD, OF LYNN, MASSACHUSETTS, ASSIGNOR TO TRIPP
FRUIT WRAPPING MACHINE COMPANY, OF LYNN, MASSACHUSETTS,
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FEEDING MECHANISM FOR ORANGES AND OTHER ARTICLES.

No. 820,084.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed December 30, 1904. Serial No. 239,056.

To all whom it may concern:

Be it known that I, MILTON H. BALLARD, of Lynn, county of Essex, State of Massachusetts, have invented an Improvement in Feeding Mechanism for Oranges and other Articles, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to machines for feeding oranges and other articles, and has for its object to construct a machine of large capacity having a large range of adjustment for oranges or other articles of different sizes.

The invention consists in the combination with a declining chute made wide enough to deliver several oranges at a time, these being arranged in a row at the exit of the chute of a conveyer adapted to receive the oranges taken from the declining chute a row at a time and for delivering the same to the conveyer.

The invention also consists in certain means for removing the endmost orange from the row which is supported by the conveyer; also, in means for preventing any of the oranges in the row supported by the conveyer from being forced upward, a result otherwise liable to happen due to overcrowding; also, to prevent the next to the endmost orange of the row supported by the conveyer from becoming wedged between the rear edge of the lifter and the front edge of the plate provided for preventing the oranges from rising in the row; also, in means for returning any surplus oranges from the conveyer to the declining chute if more oranges should be delivered to the conveyer than can be accommodated.

The machine herein shown is especially adapted for feeding oranges to a wrapping-machine; but this employment of my invention is merely for the sake of illustration, as it is obvious that it may be put to other uses.

Figure 1 is a front elevation of a machine for feeding oranges and other articles embodying this invention. Fig. 2 is a plan view of the machine shown in Fig. 1. Fig. 3 is a longitudinal sectional detail of the end portion of the feeding-trough, taken on the dotted line 3-3, Fig. 2. Figs. 4 and 5 are details of the movable side wall of the declining chute. Fig. 6 is a vertical section of the ma-

chine shown in Fig. 1, taken on the dotted line 6-6. Fig. 7 is a sectional detail of the extensible bottom wall of the declining chute. Figs. 8, 9, and 10 are details of the rotating device between the declining chute and conveyer. Fig. 11 is a vertical section of the machine shown in Fig. 1, taken on the dotted line 11-11. Figs. 12 and 13 are details of the support for the plate which is located above the feeding-trough.

The oranges which are to be fed to the wrapping-machine are dropped onto a declining chute having a declining bottom wall 400 and a fixed side wall 401 and a movable side wall 402. The side wall 402 has near its lower end a slotted ear 403, through the slot of which a pin 404 passes, which is screwed into any one of a series of holes 405 in the bottom wall, and said side wall has at its upper end a slotted ear 406, which engages any part of a horizontal flange 407, projected from an upright support 408, which is located at the upper end of the declining wall 400. The declining chute is made wide enough to provide for the simultaneous passage of several oranges arranged side by side in a row, and at the lower end of said chute a rotating device is provided adapted to take the endmost row of oranges from the chute and deliver it to a traveling conveyer.

The rotating device consists of a shaft 410, having fixed to it two disks 412 at or near its opposite ends and several horizontal bars 413, attached at their ends to said disks, three such bars being herein shown located at equal distances apart, and said disks 412 each have radial slots 414, through which rods 415 freely pass, and said rods 415 extend beyond the disks 412 and pass through curved slots 416, formed in disks 417, two in number, loosely mounted upon the shaft 410 just back of the disks 412, and the ends of said rods are screw-threaded to receive upon them nuts 418. When the nuts are tightened, the loose disks 417 are clamped against the fixed disks 412 and the rods 415 rigidly supported; but whenever said nuts are loosened the disks 417 can be turned on the shaft 410 as an axis and the rods 415 moved along in the curved slots 416, and thereby caused to move along in the radial slots 414 in the fixed disks, being thereby adjusted toward and from the shaft 410. The rods 415

are located in radial planes with the bars 413, and as they are moved in and out will occupy different distances from said bars.

The bars 413 and rods 415 together form the orange-engaging portions of the rotating device, and as the shaft bearing them revolves each orange-engaging portion will take the endmost row of oranges from the chute and deliver it to a conveyer. Radial adjustment of the bars 415 is provided for the purpose of adapting the rotating device to pick off or remove the endmost row of oranges of different sizes. When the orange-engaging portions are adjusted radially for small oranges—as, for instance, when the rods 415 are set quite close to the bars 413—the lower edge of the bottom wall 400 will terminate too great a distance from said rods 415, if said wall was constructed to terminate close to the path of travel of said rods 415 when moved outward to accommodate the large oranges. Hence the lower end of the bottom wall is made extensible. 420 represents an extension-plate, which is attached to a slotted plate 421, through the slot of which passes a screw 422, which secures said plate to the bottom wall 400 and provides for its longitudinal movement. The shaft of the rotating device has secured to it a sprocket-wheel 423, around which passes a sprocket-chain 424, which passes around a sprocket-wheel 425, secured to a shaft 426, bearing a worm-wheel 427, which engages a worm 428, secured to a driving-shaft u^{13} . The row of oranges taken from the declining chute passes by gravity from the rotating device onto a declining wall 429 and then down onto the movable conveyer.

The movable conveyer consists of several endless bands 430, passing over end rolls or pulleys 431 432 and over a set of idle rolls 433, located between said end rolls, and the end roll 432 is located in a plane below the end roll 431, so that the row of oranges deposited on the conveyer will be moved in a declining plane toward the wrapping-machine. One of the end rolls—as 432, for instance—is positively driven, and to accomplish this result a sprocket-wheel 434 is secured to the shaft of said end roll, around which passes a sprocket-chain 435, which also passes around a sprocket-wheel 436, secured to the shaft u^{13} . The conveyer moves the oranges at right angles to the movement given them by the declining chute. The shaft u^{13} has secured to it a bevel-gear n , which is engaged by a bevel-pinion n' , secured to an oblique shaft n^2 , having secured to it a bevel-pinion n^3 , which engages a bevel-gear n^4 , secured to a driving-shaft f^5 . At the end of the frame supporting the movable conveyer a centering device is provided for the oranges, which is the same as shown in my application for Letters Patent No. 193,392, filed February 13, 1904, and consists of a ring 267, having a set of depending arms u^8 . At

each side of the movable conveyer an upright wall 440 is provided, so that said conveyer serves as the movable bottom wall of the trough thus formed. At the lower end of said trough an end wall or shoulder 441 is provided, against which the endmost orange of the row strikes, and next to said shoulder a lifter is provided for lifting the endmost orange to the top of the shoulder, so that it will pass over the shoulder and then onto the centering device.

The lifter consists of a plate 100, having a web 102 on its under side formed with a shoulder 445, and also having a web 446 on its under side formed with a toe 447, and said plate is pivotally connected to the lifter-arm 212 by a pivot 103, passing through the web. The plate is adapted to rock on said pivot 103. On the upright portion of the lifter-arm 212 a projection 448 is formed, against which a shoulder 445 strikes to limit the movement of the plate in one direction, and at the upper end of the shoulder 441 a ledge 449 is formed, against which the toe 447 strikes to rock the plate on its pivot. The plate when thus rocked assists the passage of the orange over the shoulder. Arms 101 are attached to the web 102 which close the passage beneath the plate 100 and which assist in guiding the plate in its vertical movement. Sometimes it happens that one of the oranges of the row becomes superimposed on the others, and to obviate this a plate 450 is disposed above the trough containing the row of oranges, said plate being made of any suitable width and length. The forward end of the plate terminates near the lifter, and occasionally the next to the endmost orange is crowded forward and tends to pass onto the lifter, and to obviate this and prevent it from becoming wedged between the rear edge of the lifter and the forward edge of the plate 450 said plate is made movable longitudinally. As herein shown, the plate 450 is loosely connected to the extremities of a pair of arms 451, projected from hubs mounted upon upright posts 452, rising from ears projecting from one of the side walls of the feeding-trough, and upon said upright posts suitable frames are adjustably secured adapted to support said hubs at different elevations and also to provide for a limited movement only of the arms to thereby determine the position of the forward end of the plate 450 relative to the rear edge of the lifter. This frame consists of a collar 454, placed upon a post having an adjustable screw for securing it to the post at different elevations, and also having a depending portion 455, formed at its lower end with a lip 456. (See Fig. 13.) The hub occupies a position between the collar 454 and the lip 456 and is free to turn on the post as a pivot; but its movement is limited by the arm engaging the edges of the depending portion of

the frame. By loosening the adjusting-screw the collar may be raised or lowered on the post to thereby change the elevation of the plate, or said collar may be turned on the post and the depending portion of the frame thereby moved about the post as a center, so that the edges thereof, which serve as limiting-stops for the arms, may occupy different positions, and the plate 450 be thereby held nearer to or farther from the rear edge of the lifter. A spring 453 is attached at one end to the rear end of said plate and at the other end to a pin projecting from the frame 454, the action of which is to draw the plate forward until the arms or either of them strike one edge of said frame. If an orange should tend to wedge between the rear end of the lifter and the front end of said plate, said plate is thrust rearwardly, and the lifter thereby relieved. The lifter is operated intermittently at regular intervals regardless of the size of the oranges, and the rotating device which conveys the oranges from the chute to the conveyer likewise operates to convey said oranges at regular intervals regardless of their size. Hence when feeding small oranges the trough will become overcrowded at times, notwithstanding the number taken from the chute at a time may be decreased by adjustment of the side walls, and in such event the extra oranges will become superimposed upon those in the trough, and to provide for the removal of such superimposed oranges a declining trough 460 leads from one side of the feed-trough near its top, into which the superimposed oranges are free to escape. It is also designed to return these oranges to the declining chute. Hence an endless conveyer 461 is located at the end of the machine, consisting of a belt having several orange-carriers 462 thereon, which is adapted to take the oranges from the lower end of said declining trough 460 and deliver the same to the declining chute. The lower end of the endless belt 461 passes around a pulley secured to a shaft 463, having a bevel-gear 464 secured to it, which is engaged by a bevel-gear 465, secured to a shaft 466, to which a sprocket-wheel is secured, around which passes a sprocket-chain 467, which passes around a sprocket-wheel secured to the shaft *u*¹³.

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

1. In a machine for feeding oranges and other articles, the combination of a declining chute, a conveyer moving at right angles thereto, a rotating device at the lower end of said chute, next the conveyer, for removing the endmost row of oranges from said chute and for delivering said row to said conveyer, and means for removing the oranges from said conveyer singly, substantially as described.

2. In a machine for feeding oranges and other articles, the combination of a declining chute, a conveyer moving at right angles thereto, a rotating device at the lower end of said chute, next the conveyer, having radially-adjustable engaging portions for removing the endmost row of oranges from said chute, and for delivering said row to said conveyer, and means for removing the oranges from said conveyer singly, substantially as described.

3. In a machine for feeding oranges and other articles, the combination of a declining chute having an extensible bottom wall, a conveyer moving at right angles thereto, a rotating device at the lower end of said chute next the conveyer, having radially-adjustable orange-engaging portions, for removing the endmost row of oranges from said chute, and for delivering said row to said conveyer, and means for removing the oranges from said conveyer singly, substantially as described.

4. In a machine for feeding oranges and other articles, the combination of a declining chute, a conveyer moving at right angles to the chute, a rotating device at the lower end of said chute for successively removing the endmost row of oranges therefrom and for delivering said row to said conveyer, a shoulder at the end of said conveyer, a lifter for lifting the endmost orange to the top of said shoulder, and means for operating said lifter, substantially as described.

5. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange of the row in the trough to the top of said shoulder, consisting of a rocking plate having a toe, a ledge on the shoulder adapted to be engaged by said toe and an arm supporting said rocking plate, substantially as described.

6. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange of the row in the trough to the top of said shoulder, consisting of a rocking plate having a toe, a ledge on the shoulder adapted to be engaged by said toe, means for limiting the descent of the rear end of said plate, and an arm supporting said rocking plate, substantially as described.

7. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange of the row in the trough to the top of said shoulder, consisting of a rocking plate having a toe, a ledge on the shoulder adapted to be engaged by said toe, arms extending downward beneath said plate, and an arm supporting said rocking plate, substantially as described.

8. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange

of the row to the top of said shoulder, means for operating said lifter, a longitudinally-movable plate located above said trough, the front end of which terminates near the lifter, substantially as described.

9. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange of the row to the top of said shoulder, means for operating said lifter, a longitudinally-movable plate located above said trough, the front end of which terminates near said lifter, and means for varying the position of said plate relative to the lifter, substantially as described.

10. In a machine for feeding oranges and other articles, a trough having a shoulder at the end, a lifter for lifting the endmost orange of the row to the top of said shoulder, means for operating said lifter, a longitudinally-movable plate located above said trough, the front end of which terminates near said lifter, and means for varying the elevation of said plate above the trough, substantially as described.

11. In a machine for feeding oranges and other articles, a feeding-trough, a declining chute, means for delivering oranges from the chute to the feeding-trough, a declining trough leading from one side of said feeding-trough near its top, to receive the superimposed oranges and means for conveying the oranges from said declining trough to said declining chute, substantially as described.

12. In a machine for feeding oranges and other articles, the combination of a declining chute, made wide enough to provide for the simultaneous passage of several oranges, arranged side by side, in rows extending transversely across it, a conveyer moving at right angles thereto adapted to receive the oranges, a row at a time, means controlling the deliv-

ery of the oranges, a row at a time, from the chute to the conveyer and means controlling the delivery of the oranges from said conveyer singly, substantially as described.

13. In a machine for feeding oranges and other articles, the combination of a declining chute, made wide enough to provide for the simultaneous delivery of several oranges, arranged side by side in a row extending transversely across it, a conveyer adapted to receive the oranges, a row at a time, and means controlling the delivery of the oranges, a row at a time, from the chute to the conveyer, substantially as described.

14. In a machine for feeding oranges and other articles, the combination of a declining chute, made wide enough to provide for the simultaneous delivery of several oranges, arranged side by side in a row extending transversely across it, a conveyer adapted to receive the oranges, a row at a time, and a rotating device controlling the delivery of the oranges, a row at a time, from the chute to the conveyer, substantially as described.

15. In a machine for feeding oranges and other articles, the combination of a declining chute, made wide enough to provide for the simultaneous delivery of several oranges, arranged side by side in a row extending transversely across it, a conveyer adapted to receive the oranges, a row at a time, and a rotating device adapted to receive the endmost row of oranges from said chute and to deliver the same to said conveyer, substantially as described.

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

MILTON H. BALLARD.

Witnesses:

B. J. NOYES,
H. B. DAVIS.