

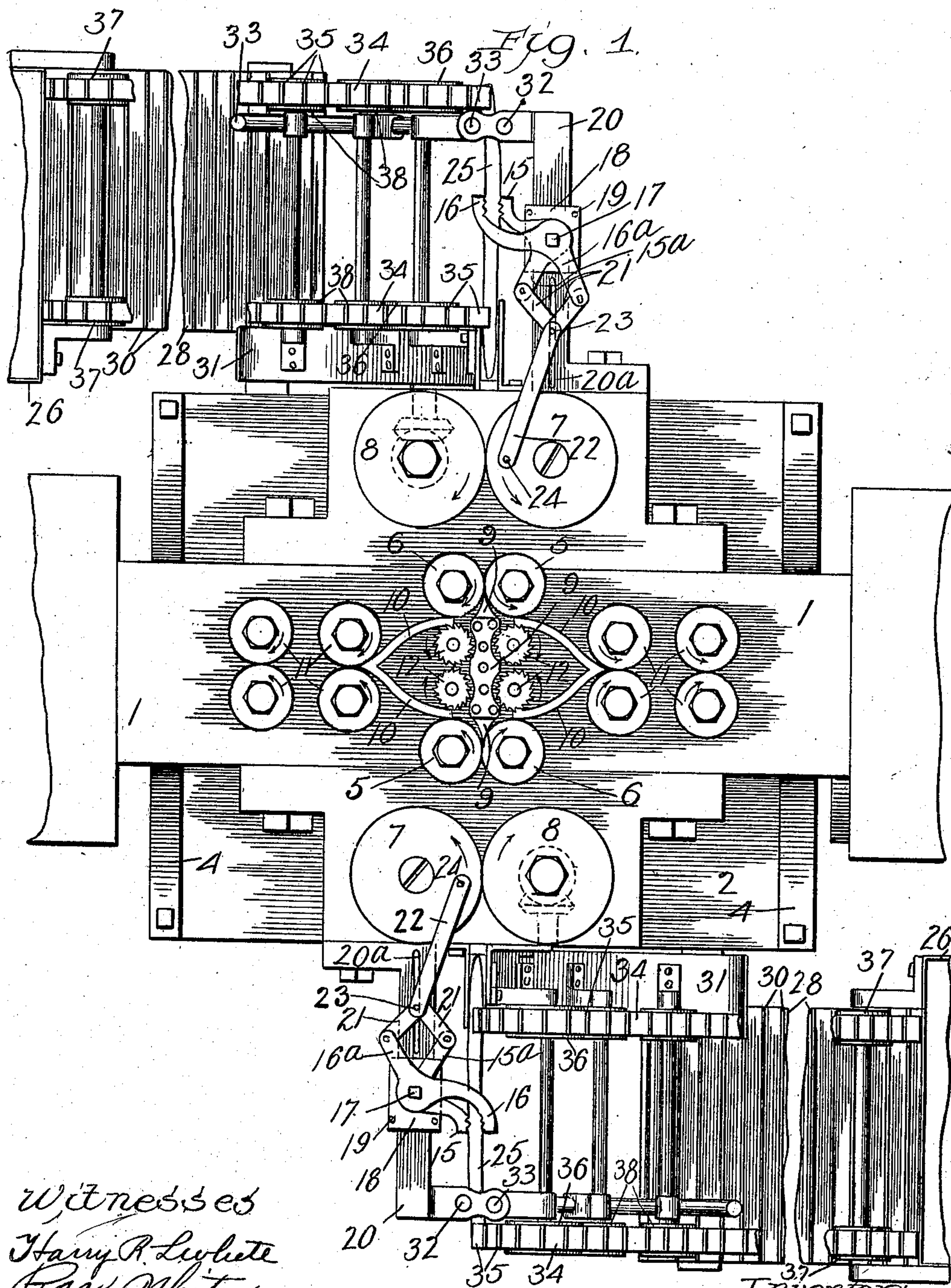
No. 858,487.

PATENTED JULY 2, 1907.

W. TRIMBLE.
QUILL FEEDING MECHANISM.

APPLICATION FILED AUG. 20, 1906.

4 SHEETS—SHEET 1.



Witnesses
Harry R. Livette
Ray White.

Inventor:
William Trimble.
By Cheever & Co. Atty's

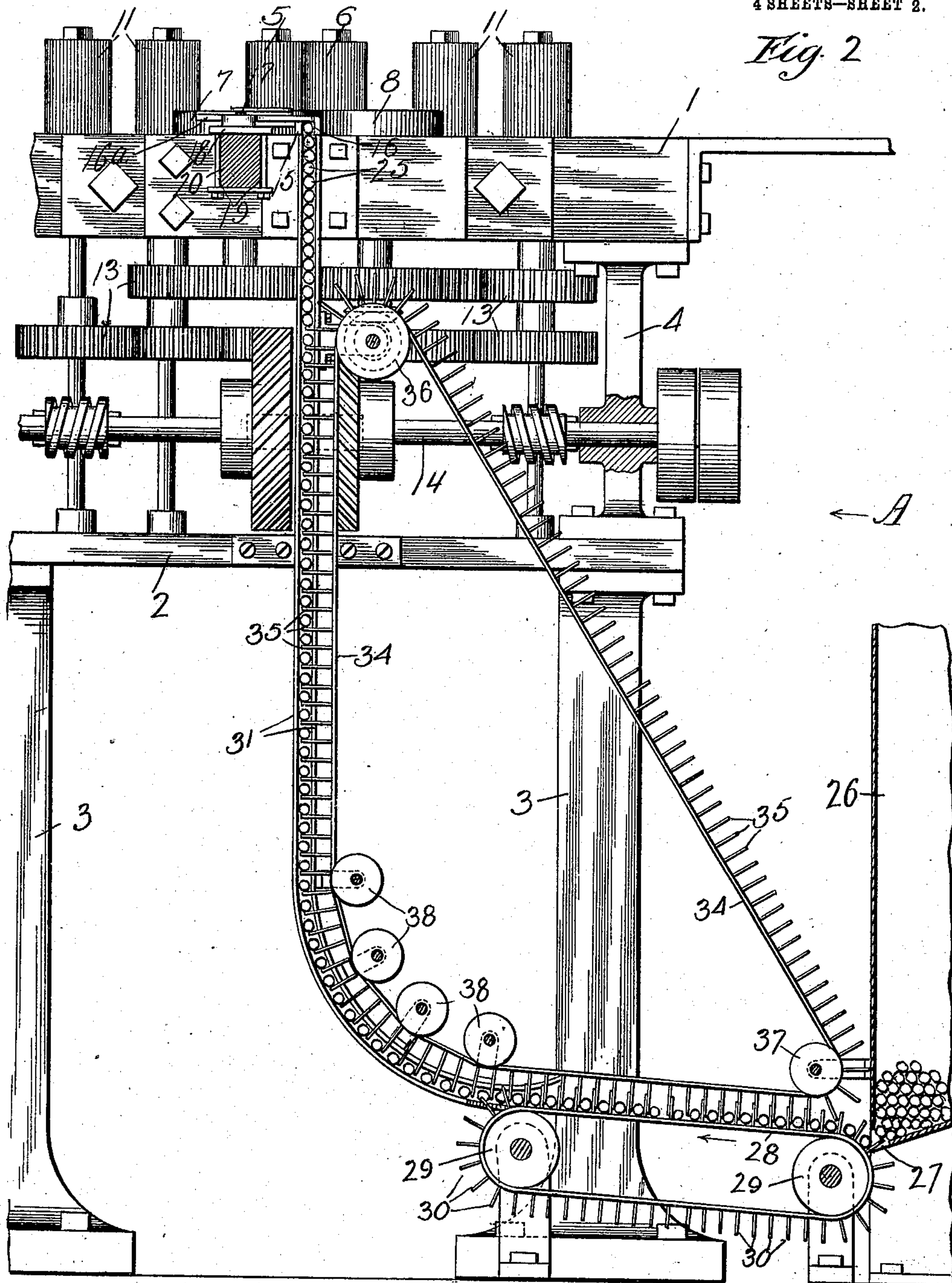
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Fig. 2



Witnesses
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Ray White.

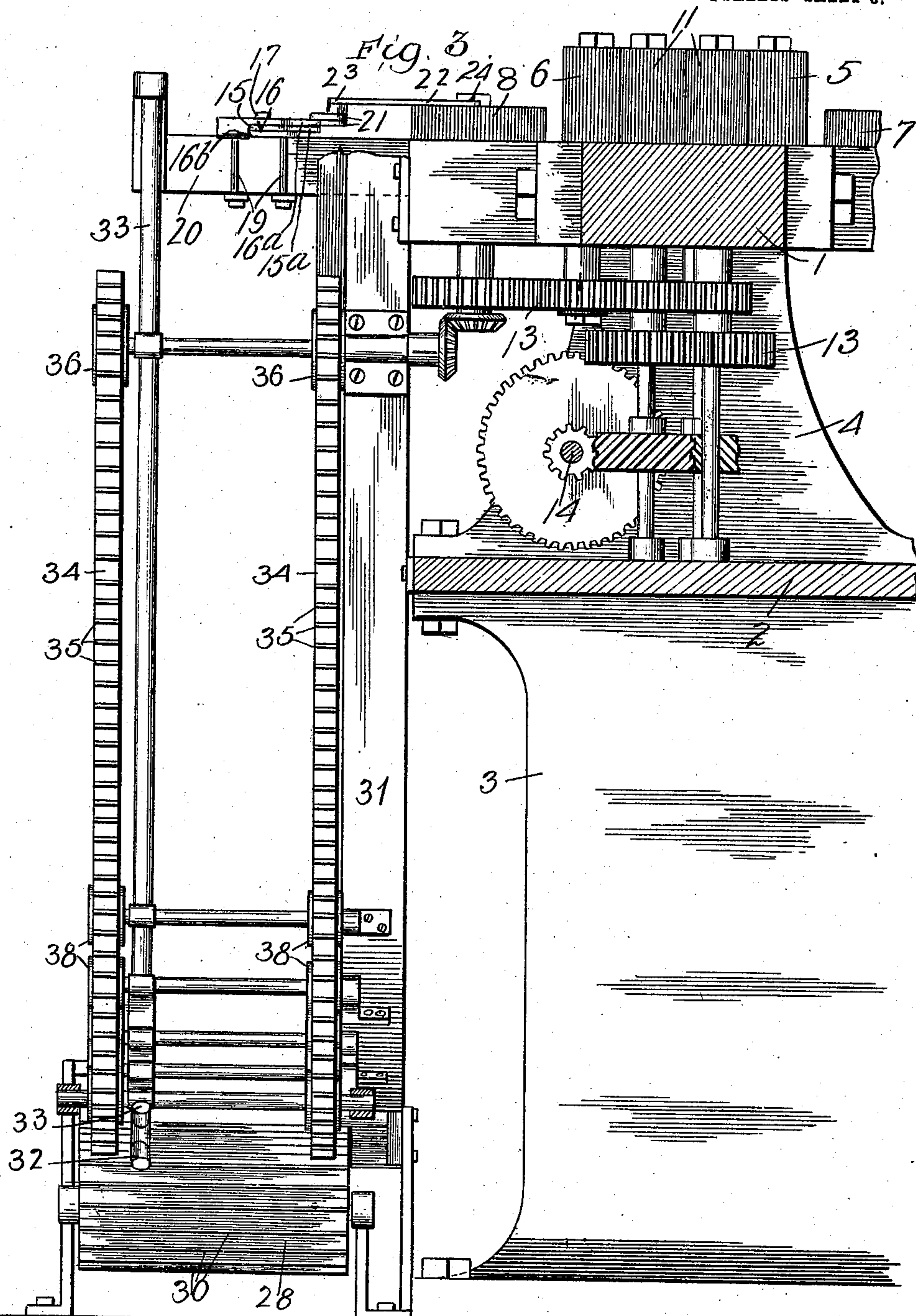
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4 SHEETS—SHEET 3.



Witnesses:
Harry R. L. White.
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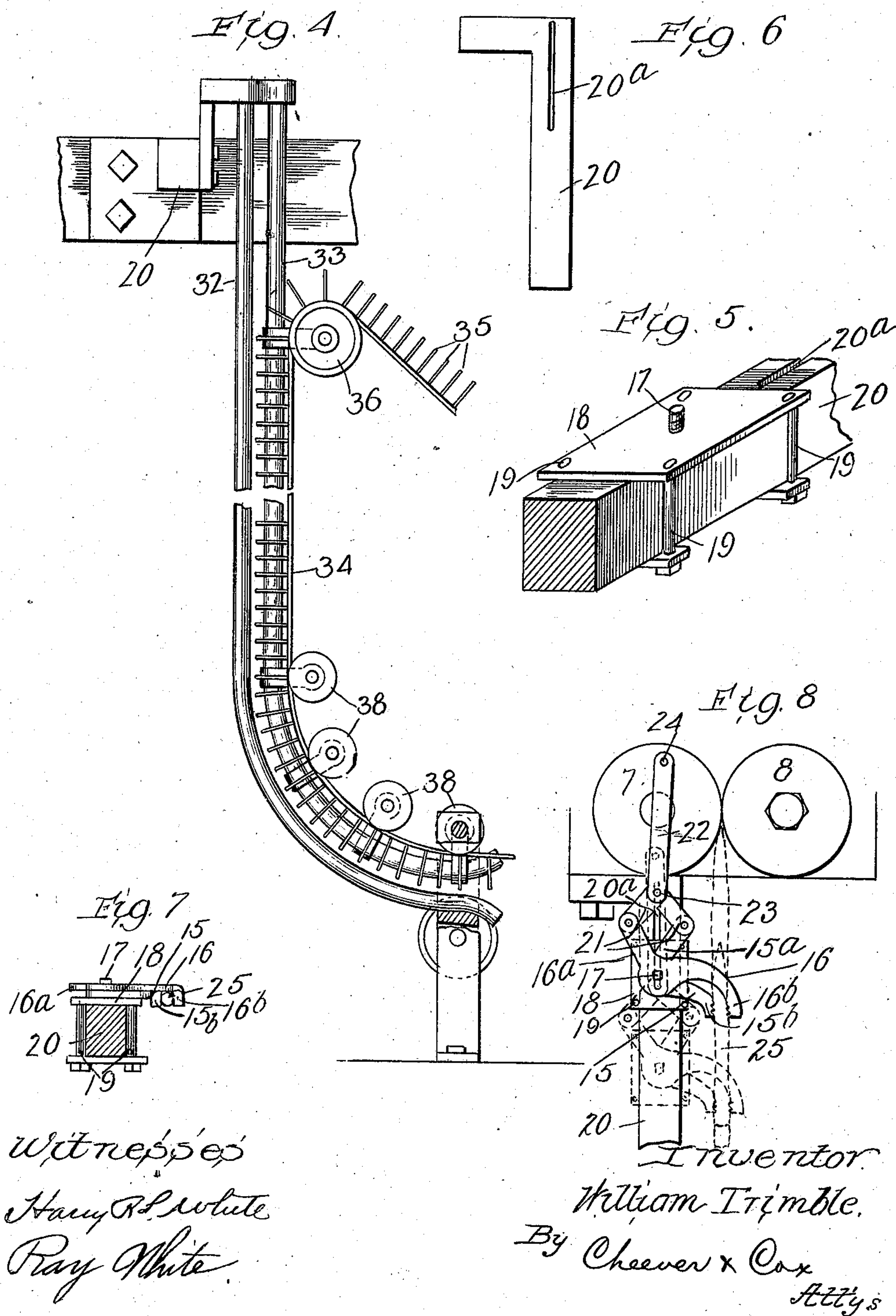
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM TRIMBLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN FEATHERBONE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

QUILL-FEEDING MECHANISM.

No. 858,487.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed August 20, 1906. Serial No. 331,374.

To all whom it may concern:

Be it known that I, WILLIAM TRIMBLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Quill-Feeding Mechanisms, of which the following is a specification.

My invention relates to quill feeding mechanisms for use in connection with the manufacture of "featherbone" which is the commercial name given to a garment stiffener composed of feather fibers bound together by thread or other wrapping material, and subsequently sized or laundered.

In the manufacture of featherbone the plumage is first removed from the quill, the quill is then split, usually in two pieces, the pith is then removed from the split quills, and the cleaned blades are split up to form thin splints or fibers. In the usual process of manufacture, the de-plumaged feather quills are fed one after another into rolls or other mechanism for splitting the quill into flat blades, and this feeding may be done by hand or by machine.

The object of this invention is to provide mechanism for automatically feeding the de-plumaged quills one after the other into the crushing rolls or whatever mechanism is employed for the next step in the process of manufacture.

Briefly speaking, the present machine comprises gripping and feeding means for seizing the quills one after the other and passing them into the bite of the crushing rolls, or whatever mechanism is employed for the subsequent treatment of the quills; and means for supplying a store of quills one after the other to the gripping mechanism as the latter discharges its quill.

I obtain my objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general view of the machine; Figs. 2 and 3 are side and end elevations thereof respectively. Fig. 4 is an elevation of the guide rods and conveying mechanism which conveys the quills from the storage tank to the gripping device; Fig. 5 is a fragmentary perspective view showing the adjustable mounting of the gripper block on its machine frame arm; Fig. 6 is a plan view of said machine frame arm; Fig. 7 is a detail view in elevation on an enlarged scale showing the gripping device looking in the direction of the length of the quill in position thereon. Fig. 8 is a detail view which, taken in connection with the feed wheels in the position shown in Fig. 1, illustrates the operation of said wheels and the gripping mechanism operated thereby.

Similar numerals refer to similar parts throughout the several views.

1 represents the bed-plate or table of the machine which is supported in any suitable manner upon the machine frame, in the present instance said frame com-

prising the base-plate 2 mounted upon the standards 3 and supporting the posts 4 whereon plate 1 is mounted.

In order to impart a clearer understanding of the functions of that part of the mechanism which embodies my invention, I have shown and will first describe a suitable form of crushing, splitting and pithing mechanism, which is suitable for the treatment of the quills, after having left the feed mechanism.

The crushing-rolls 5 and 6 are so located as to receive the quills from the feed-wheels 7 and 8, and pass them on to the point of the splitting knife 9. As is apparent from Fig. 1, the machine in the form illustrated is double in the sense of being adapted to operate on two quills at a time, one on each side of the machine. Much of the mechanism is therefore duplicated on each side of a central or median line of the machine. On each side of the point of each knife 9 is a duct 10, one duct leading to the right and the other to the left, and in the present machine the ducts at the right unite in front of the forwarding rolls 11, so that both ducts on the same side of a knife lead into a common pair of said rolls. This feature of the mechanism, however, is not here claimed, as it is the subject of claims in a co-pending application filed by me on even date herewith, Serial Number 331,373. Pithing wheels or knives 12 are so located with reference to the stationary knives 9 and ducts 10, as to remove the pith from the split quill shortly after the latter leaves the point of the knife. The wheels, 5, 6, 7, 8, and 12 are all rotated at proper speeds and in the proper directions by means of a train of gearing 13 driven from a shaft 14, all located beneath the table 1, as shown in Figs. 2 and 3.

Referring to the gripping device and the feed-rolls which are especially concerned with this invention, 15, 16 represent two co-operating gripping tongs which are pivoted on the post 17 carried on the plate 18, as best shown in Figs. 1 and 5. In the "under-feed" form of machine here illustrated the longest arm of the tongs reaches over the topmost quill and both of the tong arms have depending jaws 15^b, 16^b, for grasping the topmost quill, as best shown in Figs. 2 and 7. In the present design, plate 18 is adjustably secured by means of bolts 19 to the arm or bracket 20, which extends horizontally from the side of the machine frame 2. In the preferred shape, tongs 15, 16 have rearward extensions 15^a, 16^a, respectively, each of which is connected by means of a link 21 and a connecting-rod 22. In order to properly guide links 21 and 22 at the point of articulate union thereof, bracket 20 has a slot 20^a into which extends the pin 23 constituting the uniting pin. This guiding means has the advantage of being simple, but it is obvious that other guiding means might be substituted with the same effect. Connecting rod 22 is connected by means of the crank-pin 24 to feed-wheels

7 at a point thereon non-coincident with the axis of rotation thereof.

The gripping and feeding mechanism operates as follows:—Let it be assumed that a de-plumaged quill 25 lies at the top of the stack in the plane of motion of jaws 15^b, 16^b, and said jaws are in wide open position, illustrated in dotted lines, Fig. 8. The rotation of wheel 7 in anti-clockwise direction, as indicated by the arrow, will first tend to straighten out the links 21, which will cause the jaws of the gripper tongs to close upon the quill. As soon as the tongs have come to a firm grip upon the quill, the further closing of the jaws and straightening of the links will be prevented by the resistance to crushing of the quill itself. The parts are so designed, however, that when the jaws of the gripper tongs have firmly closed upon the quill, the connecting-rod 22 is approximately on the quarter, as shown in Fig. 1. The further rotation of wheel 7, not being able to further close the tongs, drags them together with plate 18 along bracket 20, thus moving said tongs and plate together with the engaged quill toward the bite of feed wheels 7 and 8.

The parts are so proportioned that before the connecting rod 22 has reached the half position, approximately illustrated in full lines in Fig. 8, the feed-wheels will have engaged the foremost extremity of quill 25. The continued rotation of wheel 7 in the same direction, as soon as it has reached the half position, begins to open up links 21 and jaws 15^b, 16^b, which releases the quill and permits the latter to be passed upward by said feed-wheels 7 and 8. The reason that the gripper tongs commence to open up as soon as the connecting-rod 22 has reached its half position, is that the friction of plate 18 upon its bracket 20 tends to hold the tongs back at the pivot-point thereof, and as there is an articulate joint interposed between the pivot 17 and connecting-rod 22, the thrust of rod 22 tends to set up first the spreading action in the tongs, and finally the sliding action therein to return the tongs to normal position, shown in dotted lines in Fig. 8. Thus, on the forward or positive movement of the tongs, the action is first to close upon the quill, and then pass the quill forward, whereas, upon the return stroke, the tendency of the tongs is first to open, and then to move rearwardly to normal position.

Having thus described the construction and operation of the gripping device and feed rollers, I will now describe that part of the feed-mechanism which furnishes a supply of quills to the gripper tongs.

Referring more particularly to Fig. 2, 26 represents a storage tank or bin in which the quills are laid without especial care, except to see that they all extend in the same direction parallel with the mouth of the discharge opening 27 at the bottom of the bin. Adjacent to and somewhat beneath said opening 27 is located a conveyer which, in the present design, consists of a belt 28 passing around pulleys 29, and provided with fingers 30 adapted to pick up the quills one at a time as they pass through the discharge aperture 27. Joining the said conveyer 28, 29, 30, guiding apparatus is provided for receiving the quills from said conveyer, and, in the present form, which is the one preferred, said guiding apparatus consists of a guide chute 31 adapted to receive the butt or blunt extremities of the featherquills and co-operate with the guide-rods 32, 33, best shown in

Fig. 1 and 4. Said guide chute and rods extend upward to a point on a level with jaws 15^b, 16^b, of the gripper tongs 15, 16. In order that the quills may be caused to pass forward in chute 31 and guides 32 and 33, a conveyer belt 34 having fingers 35 is provided in such location as to pass said fingers 35 upward, passing over belt pulleys 36, 37, and 38, along said guides 31, 32 and 33, as best shown in Fig. 2. Fingers 30 and 35 should consist of leather or some other flexible or at least yieldable material, in order not to jam the quills in case the timing of the conveyers 28, 29, 30, 34 and 35 should not be equal to the timing of the gripper tongs.

In operation of the feeding or supplying apparatus, the quills fall one by one between fingers 30 on belt 28, and are conveyed along until said quills are picked up by chute 31 and guide rods 32, 33. In the mean time, said quills have also been picked up by the fingers 25 on conveyer belt 34, and thus the forward movement of the quills in the guiding means is continued. It will be understood that the movement of the conveyer belts 28 and 34 is slow, so that the quills will be supplied to the gripper tongs only as fast as said tongs deliver the quills to the feed wheels 7 and 8.

What I claim as new and desire to secure by Letters Patent, is:

1. In a quill feeding mechanism the combination of a pair of tongs adapted to grip the quills; a crank; and connections between said tongs and said crank whereby the rotation of said crank produces an opening and closing of said tongs, and a bodily movement of translation thereof.
2. In a quill feeding mechanism the combination of a pair of tongs adapted to grip the quills; a pair of links adapted to operate said tongs; a connecting rod for operating said links, and a crank for operating said connecting rod.
3. In a quill feeding mechanism the combination of a pair of tongs adapted to grip the quills; a crank; a connecting rod pivoted to said crank, and connections between said connecting rod and said tongs whereby the operation of said connecting rod produces both an opening and closing of said tongs and a bodily translation thereof.
4. In a quill feeding mechanism the combination of a slidable member, a pair of quill-gripping tongs pivoted thereto, a crank and connections between said crank and tongs whereby the rotation of the crank produces a rotary movement of the tongs about their pivot and a sliding movement of said tongs with said plate.
5. In a quill feeding mechanism, the combination of a slidable member, a pair of quill-gripping tongs pivoted thereto, a crank, a connecting rod pivoted thereto, a pair of links, one pivoted to each piece of the tongs and both of said links being pivoted to said connecting rod, and means for guiding the connecting rod at the end thereof remote from said crank.
6. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs and operating connections between said feed wheels and said tongs.
7. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs and means for supplying quills to said tongs one at a time.
8. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs; guides for supplying quills to said tongs one at a time, and means for moving the quills in said guides toward said tongs.
9. In a quill feeding mechanism, the combination of

quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs and means located beneath said tongs for elevating quills to them one at a time.

10. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs; guides located beneath said tongs for guiding the quills to said tongs one at a time; and means for elevating a stack of quills in said guides.

11. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs; guides located beneath said tongs for guiding the quills to said tongs one at a time; and belt conveyers having fingers thereon for elevating quills in the guides to said tongs.

12. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a rotary and a translatory movement, a pair of feed wheels for receiving the quills from said tongs; operating connections between said feed wheels and said tongs; guides for supplying quills to said tongs one at a time, a conveyer for moving the quills in said guides, and a storage receptacle having a discharge aperture in the bottom thereof whereby quills may be fed by gravity into said conveyer.

13. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a movement of rotation and also of translation; a pair of feed wheels adapted to receive the quills from said tongs; a pair of links pivoted to said tongs for operating them; and a connecting rod pivoted eccentrically to one of said feed wheels and pivoted also to said links for operating them.

14. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a movement of rotation and also of translation; a pair of feed wheels adapted to receive the quills from said tongs; a pair of links pivoted to said tongs for operating them; a connecting rod pivoted eccentrically to one of said feed wheels and pivoted also to said links for operating them; and means for supplying quills to said tongs one at a time.

15. In a quill feeding mechanism, the combination of quill-gripping tongs the parts whereof have a movement

of rotation and also of translation; a pair of feed wheels adapted to receive the quills from said tongs; a pair of links pivoted to said tongs for operating them; a connecting rod pivoted eccentrically to one of said feed wheels and pivoted also to said links for operating them; and means beneath said tongs for elevating quills to the same one at a time.

16. In a quill feeding mechanism, the combination of means for advancing the quills lengthwise one at a time, a quill-storage receptacle having an aperture in the bottom whereby the quills may escape from the same by gravity; and means for conveying the quills from said discharge aperture to said quill-advancing means.

17. In a quill feeding mechanism, the combination of means for advancing the quills lengthwise one at a time, a quill storage receptacle having an aperture in the bottom thereof whereby the quills may escape from the same by gravity; means for guiding the quills from said discharge aperture, and means for conveying the quills along said guides to said quill-advancing means.

18. In a quill feeding mechanism the combination with mechanism for advancing the quills horizontally, of means for elevating the quills successively to the quill-advancing mechanism.

19. In a quill feeding mechanism the combination of mechanism for advancing the quills horizontally and means located beneath said quill-advancing mechanism for raising the quills thereto one after another.

20. In a quill feeding mechanism the combination of mechanism for advancing the quills horizontally, and a conveyer beneath said quill-advancing mechanism adapted to raise the quills up to said quill-advancing mechanism.

21. In a quill-feeding mechanism the combination of mechanism for advancing the quills horizontally, a storage vessel for quills, and a conveyer beneath said quill-advancing mechanism for conveying the quills from said storage vessel upward to said quill-advancing mechanism.

22. In a quill feeding mechanism the combination of mechanism for engaging the quills successively and forwarding them, of means for lifting the quills as required to said quill-engaging and quill-forwarding mechanism.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM TRIMBLE.

Witnesses:

WALTER J. MILLER,
MARTIN CONNOR.