

No. 747,695.

C. W. GAY.

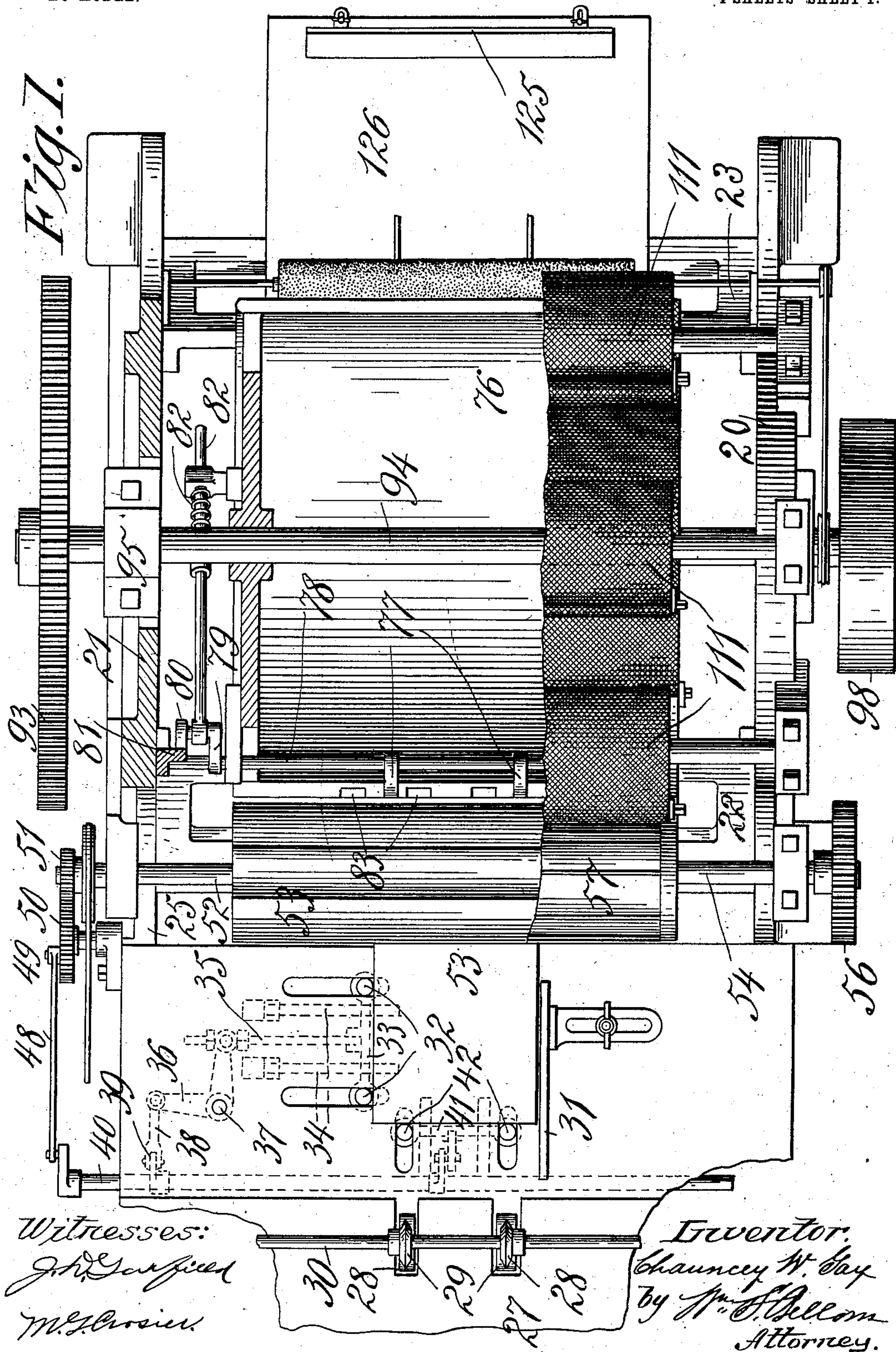
PATENTED DEC. 22, 1903.

MACHINE FOR FEEDING AND PREPARING BLANKS OF PAPER OR  
ANALOGOUS MATERIAL.

NO MODEL.

APPLICATION FILED APR. 27, 1903.

4 SHEETS—SHEET 1.





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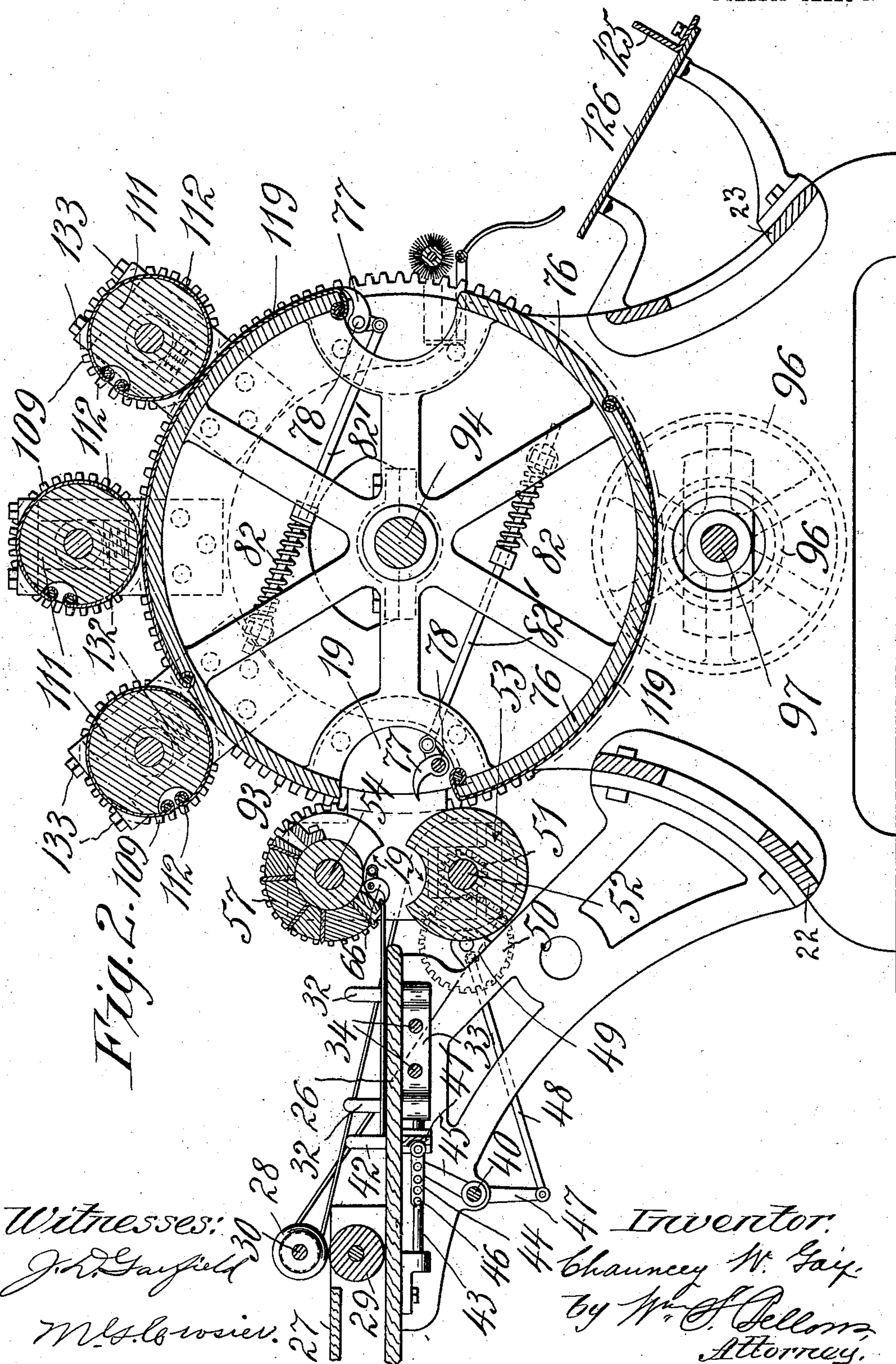
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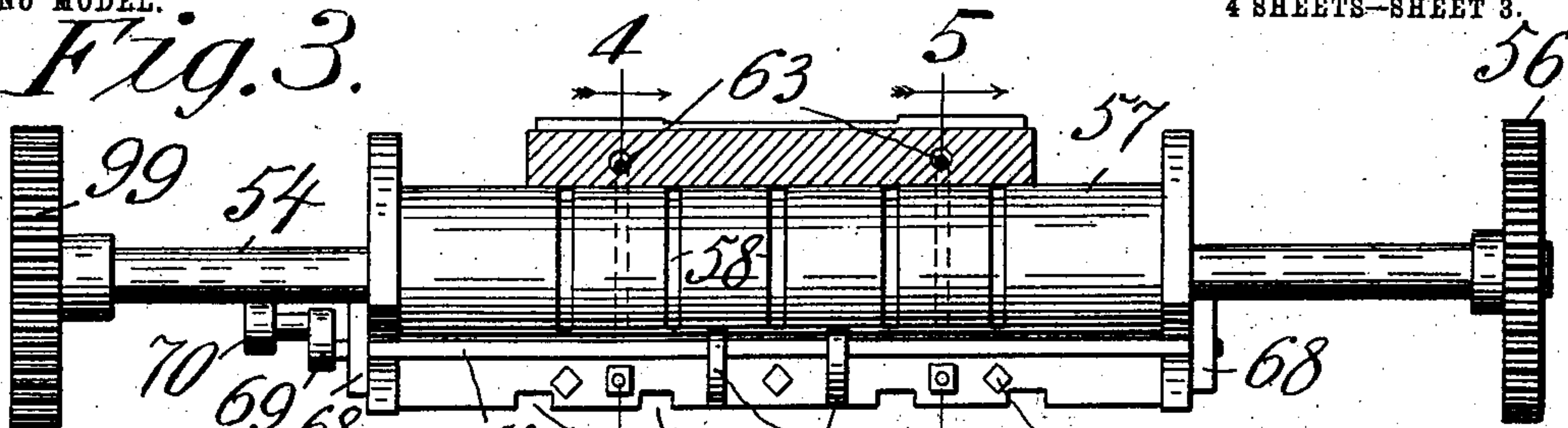
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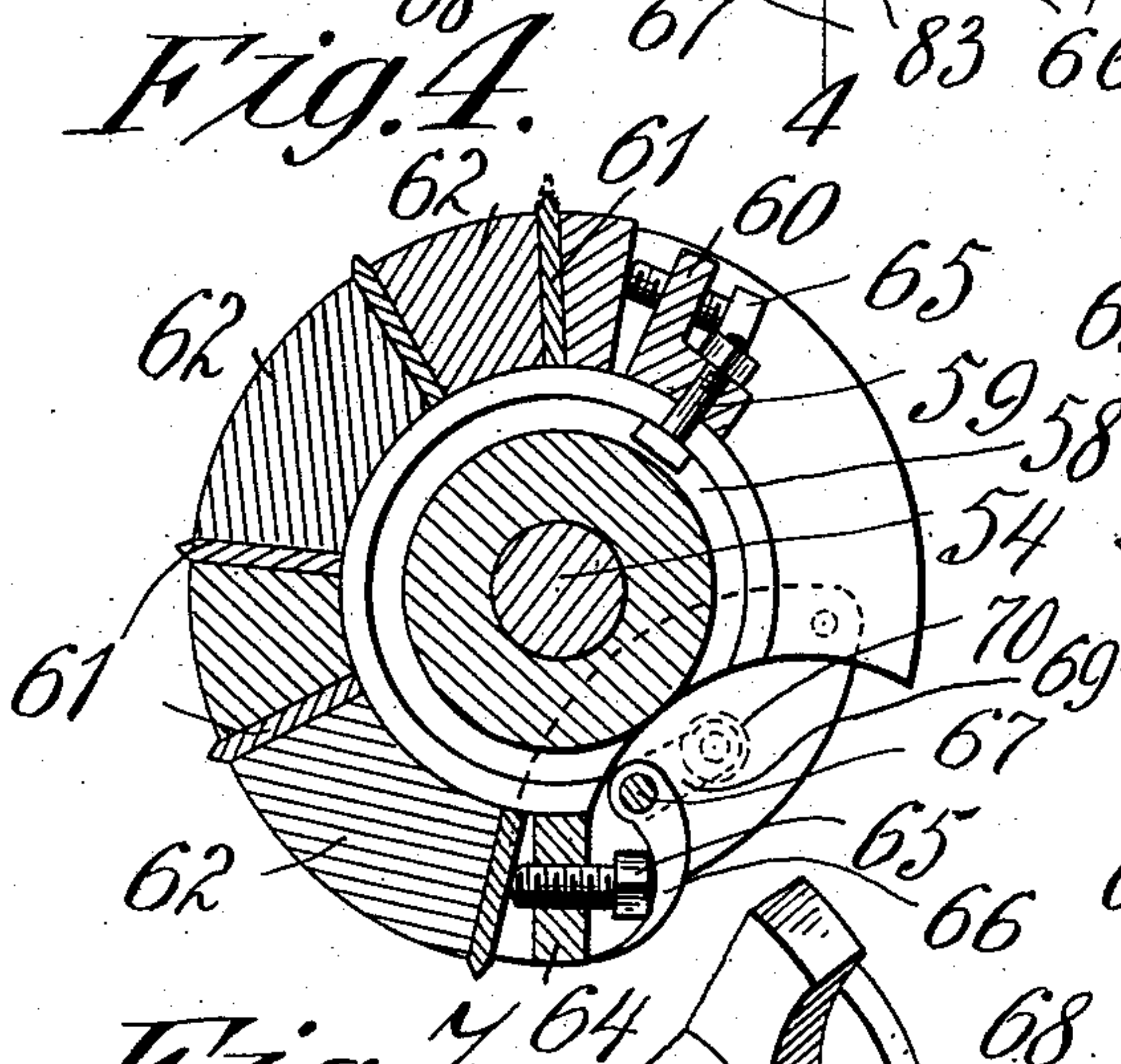
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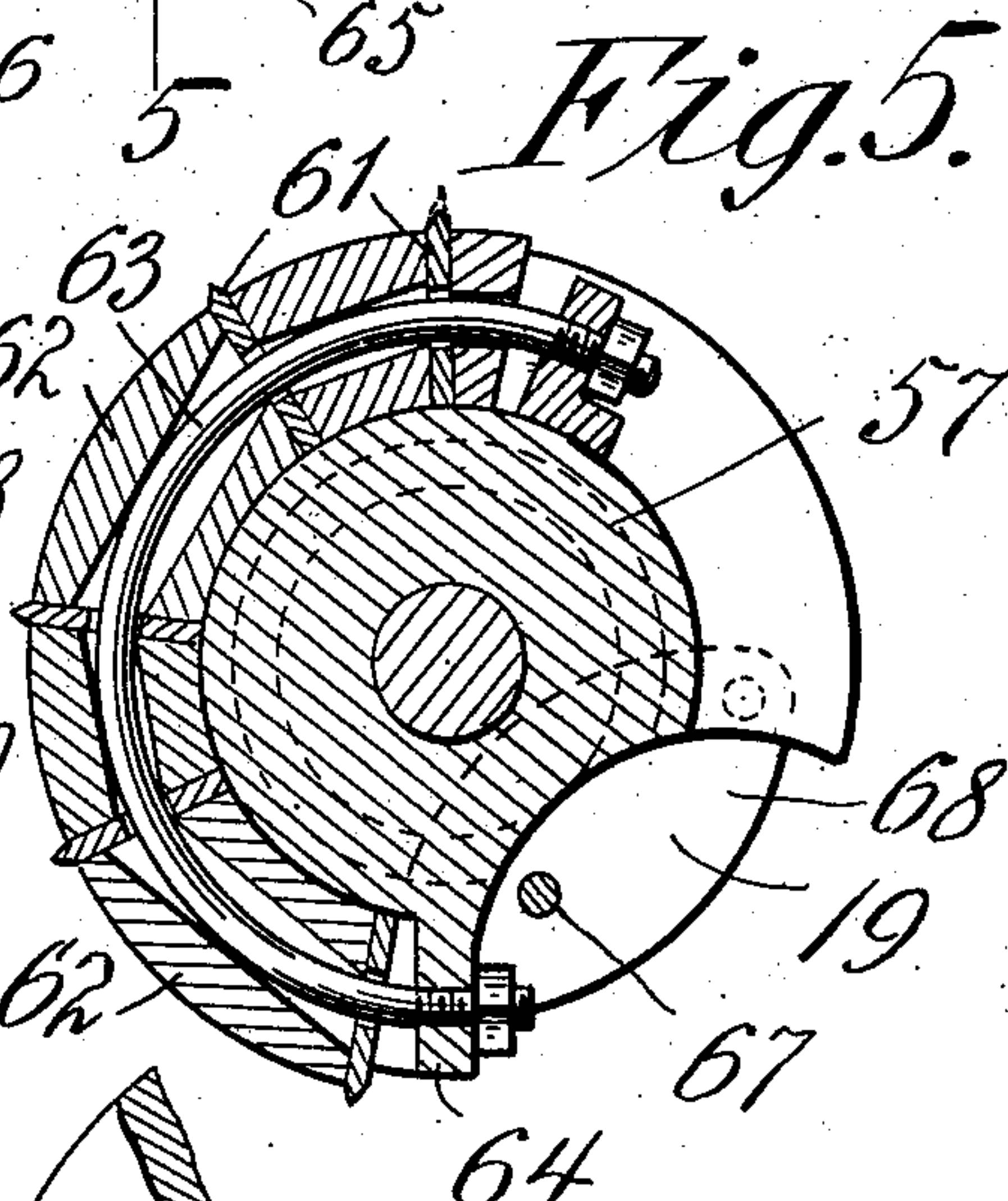
*Fig. 3.*



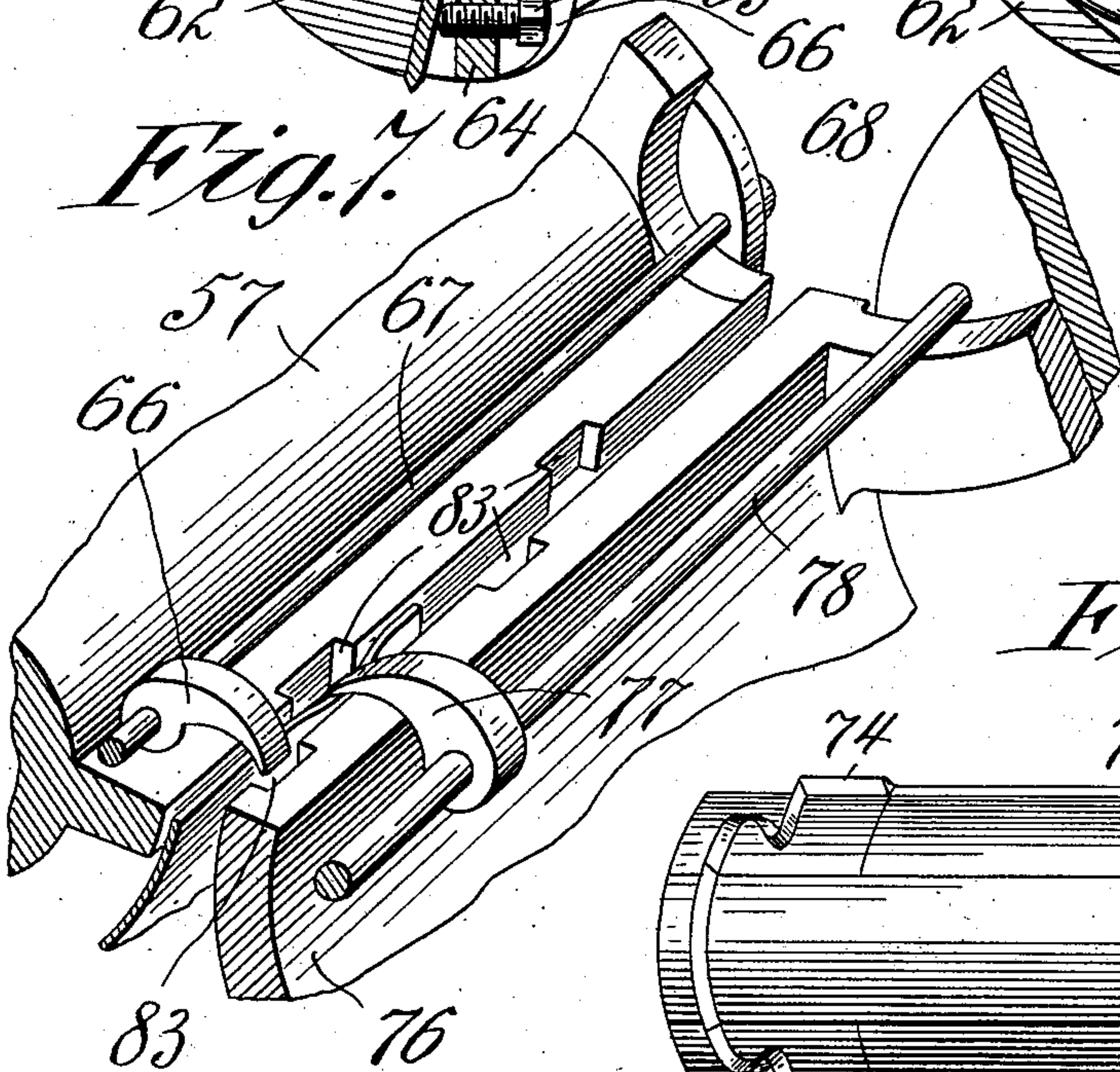
*Fig. 4.*



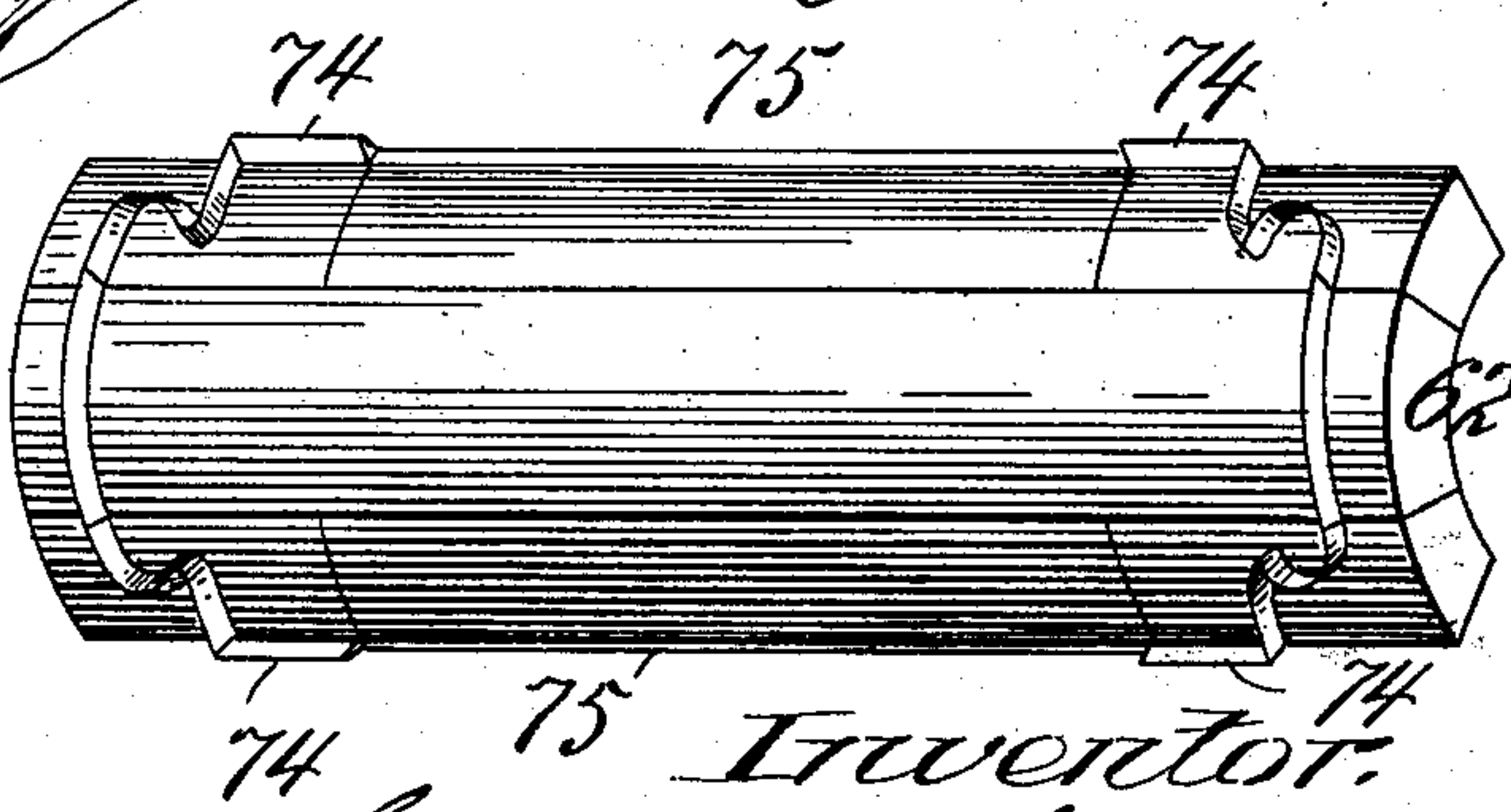
*Fig. 5.*



*Fig. 1.*



*Fig. 6.*



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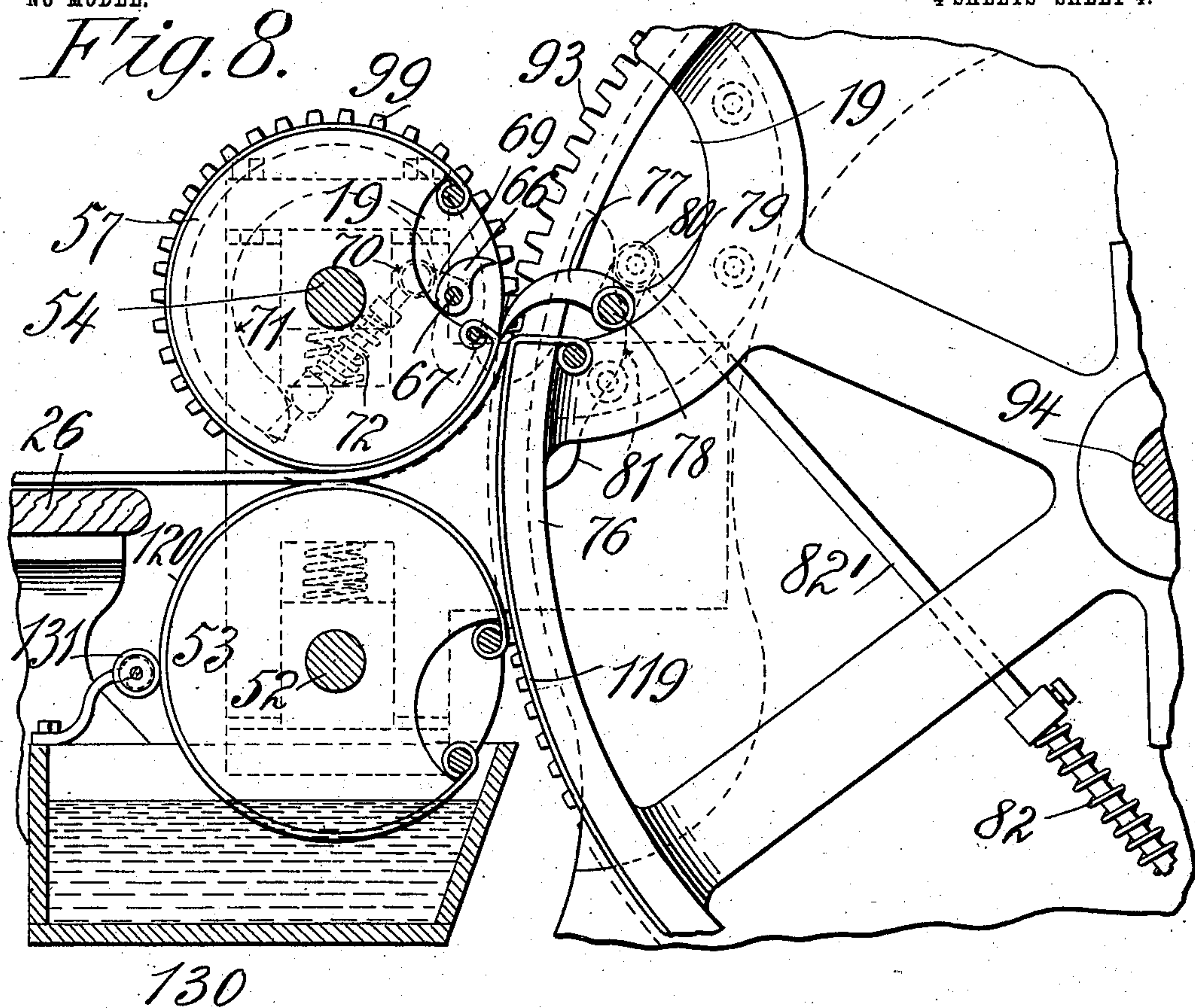
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4 SHEETS—SHEET 4.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHAUNCEY W. GAY, OF WEST SPRINGFIELD, MASSACHUSETTS.

MACHINE FOR FEEDING AND PREPARING BLANKS OF PAPER OR ANALOGOUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 747,695, dated December 22, 1903.

Application filed April 27, 1903. Serial No. 154,474. (No model.)

*To all whom it may concern:*

Be it known that I, CHAUNCEY W. GAY, a citizen of the United States of America, and a resident of West Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Machines for Feeding and Preparing Blanks of Paper or Analogous Material, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for feeding and in conjunction with such feeding otherwise preparing or operating on blanks of paper, cardboard, or analogous sheet material.

The improvements in part relate to mechanism for feeding in the blanks to secondary mechanism which receive and carry the blanks while being operated upon, whereby the blanks are properly moved, positioned relatively to, and at the proper time delivered to a set of rolls, which may be considered as comprised in the feeding mechanism, the same being coöperative in the blank-progressing action, and which set of rolls are instrumental in preparing the blank having the two-fold function of blank-progressing means and blank-preparing means.

The improvements also relate to an improved mechanism for scoring and cutting the blanks adaptable for ready adjustment to various sizes and styles, enabling the blanks subjected thereto and prepared thereby to be used for various sizes and styles of boxes.

The invention consists in the combinations and arrangements of mechanisms or devices and in the constructions of the devices and parts thereof, all substantially as hereinafter fully described, and set forth in the claims.

The improved machine is illustrated in the accompanying drawings, in which—

Figure 1 is substantially a plan view of the machine, the carrier, or supporting-cylinder on which final work on the blank fed thereto by the improved mechanism may be performed, being represented in part in horizontal section on the plane of its axis. Fig. 2 is a central vertical longitudinal section. Fig. 3 is a representation in side view of the cutting and scoring drum or roll, showing the provisions for the confinement of interchangeable

able blades and spacing-blocks. Figs. 4 and 5 are cross-sections of the drum or roll above mentioned on lines 4 4 and 5 5, respectively. Fig. 6 is a perspective view of furniture or interchangeable sections to be detachably carried by the scoring and slitting and gripper-carrying drum or roll. Fig. 7 is a perspective representation of the gripper-carrying portion of one of the drums comprised in the blank-progressing mechanism and of the gripper-carrying portion of the carrier-cylinder. Fig. 8 is a side elevation of the same and certain other adjacent parts.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings 20 21 are suitable side frames in which the several component elements of the machine are supported and which are properly distanced by ties 22 23. Secured to the frames 20 21 are brackets 24 25, which support a table 26, on which the blanks to be operated upon are properly positioned. The blanks may be fed onto the table 26 from a shelf 27 and between feed-rolls 28 29, the former of which constitute in the present instance devices for scoring the blank longitudinally, and are mounted on a shaft 30, continuously rotated in any suitable manner. After the blank has been scored longitudinally on lines of number and spacing, as desired, it will drop onto the table 26, where it will be positioned for proper presentation to the further machinery.

The means for positioning the blank comprise, preferably, a guide-plate 31, which may be stationary and at the same time adjustable laterally of the table 26. Coöperative with the guide-plate 31 are placing or jogging pins 32, mounted for movement toward and away from the plate 31—as, for instance, by a yoke 33—to which reciprocatory movement may be imparted on guide-rods 34 by a link 35, pivotally secured on the yoke 33 and having its other end adjustably secured to one arm of an angle-lever 36, which is pivoted at 37, and the other arm of which is connected, through a link 38, with a lever 39, secured upon a rock-shaft 40. The blank is in this manner properly positioned laterally of the table, and means are provided for advancing the blank toward the cross-scoring



devices for the required distance and at the proper time, these means comprising in the form thereof shown a yoke 41, having pins 42 and slidably supported on guide-rods 43, on which said yoke may be reciprocated by a link 44, connected with an arm 45 at any one of a series of adjusting-holes 46, so that the advanced position of the leading blank end may be regulated as desired.

The arm 45 is shown as secured on the rock-shaft 40, above mentioned, and which shaft may be oscillated by an arm 47, connected by a link 48 with a crank-pin 49, secured on a spur-gear 50, journaled on the bracket 25 and rotated by a pinion 51 on a shaft 52.

Mounted on the shaft 52 is a roller 53, serving as a support for the blank during the operation of the cross-scoring and cutting drum 57, which is coöperative therewith and is mounted on a shaft 54, journaled in the frame, both roller and drum being rotated simultaneously by a gear 56, mounted on the shaft 54, and a like gear on the shaft 52, directly under and in mesh with the said gear 56.

The construction of the cross-scoring and cutting drum is clearly shown in Figs. 3, 4, and 5, in which 57 designates the drum upon which the several scoring and cutting devices are mounted. The peripheral surface of the drum 57 is provided with a plurality of circumferential grooves or T-slots 58, adapted to receive correspondingly-shaped bolts 59 to secure an abutment 60 on the drum in any desired position circumferentially thereof.

Disposed on the outer surface of the drum are scoring-blades 61, which may be positioned relatively to each other by removable and interchangeable spacing-blocks 62, both blades and blocks having their surfaces concentric with the axis of the drum and preferably held thereon by one or more bolts 63 passing through apertures provided for that purpose in the scoring-blades and spacing-blocks. (See Fig. 5.) The bolts of long spring-wire may be caused to assume the arc form represented in Fig. 5. The drum is provided in this instance with a fixed abutment 64, whereby one end of the bolt 63 may be held, while its other end passes through the movable abutment 60 and may be tightened by a nut, as shown.

While it will not be understood that the several blades and spacing-blocks are thus firmly held in contact with the drum, they may, by binding-screws 65, be shifted together bodily around the same to secure perfect register with any impressions to be subsequently made on the blank by finishing devices to be hereinafter described and also to position the same at proper distances from the leading end of the blank, which may be grasped by grippers 66, mounted upon a shaft 67, which is journaled in end plates 68, af-

fixed on the drum or roll 57, and carries an arm 69, having a roller 70, adapted for engagement with a cam 71, (see Fig. 8,) preferably stationary and sustained on a suitable supporting part of the machine adjacent the end of the drum and serving to open the grippers, while a spring 72 is operable to close the same.

In Fig. 6 I have illustrated a series of blades in a combination to score as well as cut the blank on predetermined lines, so as to leave the blank-outline in an especial design. The combination here shown consists of the cutting-blades 73, the corner-cutters 74, and the scoring-blades 75, which latter are of somewhat less height than the cutting-blades. It will therefore be seen that by substituting cutting-blades of different lengths for those shown at 73 and at the same time replacing the spacing-blocks or "furniture" with others the distance between the scoring-blades may be increased or decreased, and, furthermore, that by replacing the scoring-blades with others of different lengths the distance between the cutting-blades may also be varied, thus adapting the scoring-drum for various lengths and widths of blanks and for scoring and cutting or slitting in any arrangement thereon. After the cutting and scoring operation the blank is led toward a carrier or cylinder 76, which serves as a support therefor until it has been finished. Means are provided for seizing and holding the leading end of the blank on the carrier 76, these means comprising gripper-fingers 77, mounted on a shaft 78, having at one end arm 79, the roller 80 of which is adapted to engage a preferably stationary cam 81, whereby the fingers 77 are opened and against the action of a spring 82, which acts on the arm 89 through the medium of the rod 82'. The present cylinder 76 is of such size as to have a capacity of two blanks for each rotation, so that the blank-gripping fingers are provided in duplicate.

In order to avoid interference with the proper operation of either grippers 66 and 77, the scoring-drum 57 and the carrier 76 are each provided with a series of recesses 83, adjacent to the grippers of the adjacent member, respectively, so that the gripper-fingers may be adjusted on their respective shafts in accordance with different blank widths.

In connection with the construction and action of the drum 57 and carrier 76 it is to be noted that these parts have the longitudinally-extending crescent-shaped depressions or comparatively large grooves or recesses 19 to give space for occupancy of the grippers and the portion of the blank manipulated thereby within the contours of the peripheries of these parts, and the roll 53 is likewise formed reëntrant to permit its proper coöperation with the gripper-carrying drum.

The particular method of transferring the blank from the scoring-drum to the carrier



is clearly indicated in Figs. 7 and 8, in which the roller 80 is substantially free of the opening-cam 81 to permit the spring 82 to impinge the finger 77 on the leading end of the blank and preparatory to its release from the grippers 66 of the scoring-drum, whereupon the grippers 66 are operated by the roller 70 engaging the stationary cam 71 to release the blank, as shown in Fig. 8.

After the blank has been fed into the pair of rolls 52 and 57 and further progressed thereby it will be carried along gripped by the carrier 76, the periphery of which constitutes the blank-supporting surface, and the blank will be subjected to the action of the arrangements for otherwise preparing the same—such, for instance, as layers of cloth tightly stretched on the supporting-surface of the carrier-cylinder and on one or a plurality of cylinders 111, which latter by having a comparatively forcible pressure against the blank when crowded between such roll and the carrier-cylinder insures both the top and bottom surfaces of the blank partaking of characteristics corresponding to the texture of the surface of the carrier-cylinder and the cooperating cloth-covered cylinder or cylinders 111. The gears 109 at the ends of the rolls 111, meshing with the large cylinder-gear 93, cause the proper rotary movements of the rolls 111.

Inasmuch as for some character of work it is desirable to quite thoroughly moisten the blank of paper or cardboard, provisions to this end are shown in which the one 53 of the companion rolls instrumental in the progression of the blank is utilized as a factor, such roll in Fig. 8 being shown as having a surfacing of absorbent felt 120, its so-surfaced peripheral portion moving in and through the water contained in the receptacle 130, which may be located thereunder, and by reason of its running contact on the under side of the blank being fed sufficiently moistening the blank to render it the better susceptible to the actions thereon of the devices or mechanism employed in the preparation thereof. 131 represents a wiper-roll in contact on the moistening-roll.

The blank brought to and engaged and further conveyed by the carrier-cylinder 76 and subjected to the cooperative action of the cloth-covered companion sets of rolls will in emerging from the machine have a character of surface corresponding to the texture of the covering layers of cloth on the rolls and cylinder.

In practice springs 132 are shown as under the journals for the cloth-covered rolls 111, and adjusting-bolts 133 are provided above the journals, so that the rolls may have a normal degree of peripheral separation from the carrier-cylinder slight and less than the thickness of the blank, but positively limited, and the springs 132 operate to support the rolls 111 out of contact with the periph-

ery of the carrier-cylinder when blanks are not being passed through and subject to the actions of the rolls and carrier-cylinder.

After the blank has been carried around on the cylinder 76 and subjected to the action described the carrier will take the same toward the delivery-table 126, near which point the gripper 77 will be automatically opened to release the blank, which will then be guided and drop onto the table against the adjustable gage 125.

This machine may be utilized as a blank-making machine, scoring and cutting the blank, and as a further means for preparing the blank, and it is entirely practicable to work on a continuously-running strip from a supply-roll, in which case the placing of separate blanks one at a time at the feeding-in end portion of the machine would not be necessary, and one of the blanks 61—for instance, the one represented in Figs. 4 and 5, directly above the axis of the roller-drum on which it is carried—could by having a little greater radial extent than the preceding blades in the course of the revolution of the drum serve as a cutting-off means for the successive blanks repeatedly carried to and subject to the further action of the carrier-cylinder and arrangements in combination therewith; but the machine is shown as arranged to operate on rectangular blanks of uniform size, which will be fed by hand or automatically one at a time to the action of the longitudinal scoring-rolls 30 and 29 and thereafter to the adjusting or gaging mechanism, to be then operated on by the slitting or cross-scoring drum, which grips the blank and takes it to the carrier and cylinder, and the blank may be given an endwise formation by having portions thereof cut out to form flaps or locking-tongues and according to the contour of the blades or ribs provided on the drum; but the machine may be rendered entirely automatic by permitting the cardboard-stock from the continuous supply-strip to be guided and fed to and through the initial pair of rolls 28 and 29, omitting or removing the adjusting device comprising the upstanding studs 42, and a strip from the roll may be run through the machine under proper adaptation of the latter without departing from this invention and may be scored or slitted or be subjected to a plurality of any combination of devices working thereon and may emerge from the machine in ribbon or continuous form, to be thereafter utilized as convenient.

A peculiarity noticeable in the action of this machine is that the blanks are fed in a plane substantially coincident with the axis of the carrier-cylinder 76, the arrangement of the paired rolls 53 and 57 relatively to the larger cylinder 76, having the recess 19 longitudinally at opposite sides thereon, enabling such approach to the cylinder squarely at the middle of its body and the management of the blank during the time it is being



worked upon and the time within which the carrier-cylinder makes one-half of a rotation.

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

1. In a machine of the character described, the combination with a scoring-drum, having a plurality of circumferential slots, of spacing-blocks interposed between said blades, and a bolt passing in an arc line through said blades and blocks, and for holding the same on the drum.

2. In a machine of the character described, the combination with a scoring-drum, having a fixed abutment and a movable abutment, of blades formed in interchangeable sections having their faces concentric with the axis of said drum, and clamping-screws for variably positioning said blades on the drum.

3. In a machine of the character described, the combination with a scoring-drum having the recessed side and a companion roll to said drum, of grippers located in said recess and adjustable along the length thereof, and means for periodically opening and closing the grippers.

4. In a machine of the character described, the combination with a scoring-drum having scoring-blades adjustably positioned thereon and having the recessed side, of grippers located in said recess and adjustable longitudinally of the drum, and means for operating them, of means for feeding the blank toward the drum, adjustable and operable variably as to the extent of its feeding movement, a transversely-adjustable gage, a reciprocatory blank-adjusting device working toward and away from said gage, adjustable whereby the scope of its action may be variable, and to accord with the position of said gage, and means for reciprocating said blank-adjusting device.

5. In a machine of the character described, the combination with the scoring-rolls 28 and 29 and the scoring-drum 57 having a recess and grippers therein, and a companion roll to said drum, of the table 26, having longitudinal and transverse slots, the yoke 41 having the upstanding studs 42, and the yoke 33 having the upstanding studs 32, the transversely-adjustable gage 31, the rock-shaft 40 having lever-arms, connections between the respective levers and the said yokes 41 and 33, means for operating said rock-shaft, and means for periodically opening and closing the grippers.

6. In a machine of the character described, the combination with the scoring-rolls 28 and 29 and the scoring-drum 57 having a recess and grippers therein and a companion roll to said drum, of the table 26, having longitudinal and transverse slots, the yoke 41 having the upstanding studs 42, and the yoke 33 having the upstanding studs 32, guide-supports for said yokes, the transversely-adjustable gage 31, the transverse rock-shaft 40 hav-

ing lever-arms, a link connecting one of said lever-arms and the yoke 41, an angular lever and links connecting the arms thereof with the other rock-shaft lever-arm, and with the yoke 33, means for rocking said rock-shaft, and means for opening and closing said grippers.

7. In a machine of the character described, the combination with the carrier-cylinder having a plurality of recesses opening to its periphery, and having grippers operable within said recesses, and means for periodically opening and closing them, of a pair of rolls peripherally adjacent the carrier-cylinder, and having the contacting peripheral portions thereof in the plane of, and parallel with, the axis of the carrier-cylinder, one of said rolls having a recess therein opening to the periphery thereof, having grippers therein and means for periodically opening and closing such latter-named grippers, for the purposes set forth.

8. In a machine of the character described, the combination with the carrier-cylinder having a plurality of recesses opening to its periphery, and having grippers operable within said recesses, and means for periodically opening and closing the grippers, of a pair of rolls peripherally adjacent the carrier-cylinder and having the contacting peripheral portions thereof in the plane of, and parallel with, the axis of the carrier-cylinder, one of said rolls having a recess therein opening to the periphery thereof, having grippers therein, and means for periodically opening and closing such latter-named grippers, and such roll having transverse cutting or slitting blades and scoring-ribs, and one or more impression-rolls peripherally adjacent the carrier-cylinder, and coöperating therewith, for the purposes set forth.

9. In a machine of the character described, in combination, the pair of rolls 57 and 53, the one 57 having blades and provided with a sidewise-opening recess, the carrier-cylinder of larger diameter than said blade-carrying roll having a plurality of sidewise-opening recesses, and said carrier-cylinder and blade-carrying roll having within their peripheral surfaces adjoining said recesses the apertures 83 arranged in longitudinal lines of the respective cylinders or rolls, the rock-shafts 67 and 78 located and ranging along in said recesses and having grippers 66 and 77 adjustable lengthwise thereon, and means for periodically opening and closing said grippers in the manner described.

10. In a machine of the character described, in combination, the longitudinally-scoring rolls 28 and 29, the pair of rolls 57 and 53, the one 57 having cross-slitting blades and scoring-ribs, detachable adjustable and interchangeably confined and provided with a sidewise-opening recess, the carrier-cylinder of larger diameter than said blade-carrying roll having a plurality of sidewise-opening re-



cesses, and said carrier-cylinder and blade-carrying roll having within their peripheral surfaces adjoining said recesses the apertures 83 arranged in longitudinal lines of the respective rolls, the rock-shafts 67 and 78 ranging along in said recesses and having grippers 66 and 77 adjustable lengthwise thereon, and means for periodically opening and closing said grippers in the manner described.

10 11. In a machine of the character described, the combination with a drum, having portions for cutting and scoring the blank, and having grippers mounted thereon, of a rotary blank-carrier, a plurality of blank-gripping  
15 devices mounted on said carrier and successively coöperative with the grippers of the scoring-drum, and means for actuating the gripper-fingers to engage the leading end of the blank preparatory to its release from the  
20 grippers on the scoring-drum.

12. In a machine of the character described, the combination with a scoring-drum, having recesses in its periphery, and cam-operated grippers carried on said drum for holding the  
25 leading end of the blank on said drum, of a rotary blank-carrier, having within its periphery a plurality of recesses arranged in a longitudinal line to permit the operation within said recesses of the grippers on the  
30 scoring-drum on blanks of various widths.

13. In a machine of the character described, the combination with a scoring-drum, having recesses in its periphery, devices for cutting and scoring the blank, and means for positioning said devices on the drum, longitudinally and circumferentially thereof, of a rotary blank-carrier, having in its periphery a plurality of recesses arranged in a longitudinal line to permit therewith the operation  
40 of the grippers on the scoring-drum on blanks of various widths.

14. In a machine of the character described, the combination with the carrier-cylinder having a recess opening to its periphery, and  
45 having a gripper operable within said recess,

and means for operating such gripper, of a pair of rolls adjacent the periphery of the carrier-cylinder, one of which has a recess therein, opening to the periphery thereof, having a gripper therein, and means for operating  
50 the gripper, and means for rotating the cylinder and said rolls.

15. In a machine of the character described, the combination with the carrier-cylinder having a recess opening to its periphery, having a spur gear-wheel at its end rotatable in unison with the cylinder, having a gripper operable in said recess and means for operating it, of a pair of rolls, one thereof having a peripherally-opening recess and having at  
60 its end a spur gear-wheel in mesh with the carrier-cylinder gear-wheel, having a gripper in said recess, together with means for operating such gripper and its companion roll having a gear-wheel at its end in mesh with  
65 the gripper-carrying roll.

16. In a machine of the character described, the combination with the carrier-cylinder having a peripherally-opening recess and a cylinder rotatable adjacent the side of the  
70 carrier-cylinder, having a peripherally-opening recess, gripper members located in the respective recesses of said cylinders, arranged to have gripping-bearings near the junctions of the walls of the recesses, and peripheral  
75 portions of the cylinders, and each cylinder having at the junction of its recess and peripheral wall, a subrecess 83 located opposite the plane of movement of the gripper of the respectively adjacent cylinder to permit free-  
80 dom of movement of each gripper and non-obstruction of the rotations of the said adjacent cylinders.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

CHAUNCEY W. GAY.

Witnesses:

WM. S. BELLOWS,  
A. V. LEAHY.