

No. 762,275.

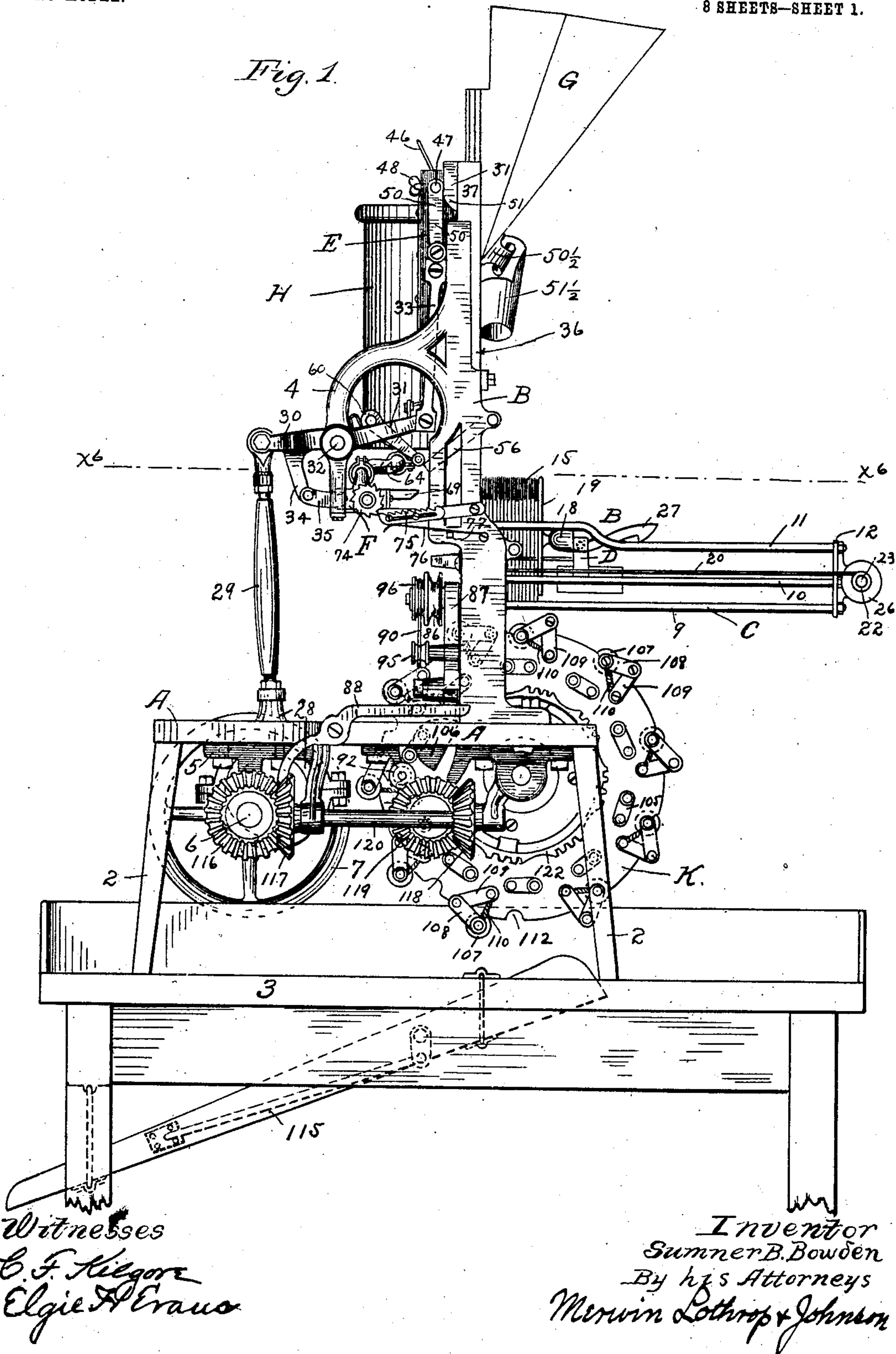
PATENTED JUNE 14, 1904.

S. B. BOWDEN.
BAG FILLING MACHINE.

APPLICATION FILED JULY 13, 1899.

NO MODEL.

8 SHEETS—SHEET 1.



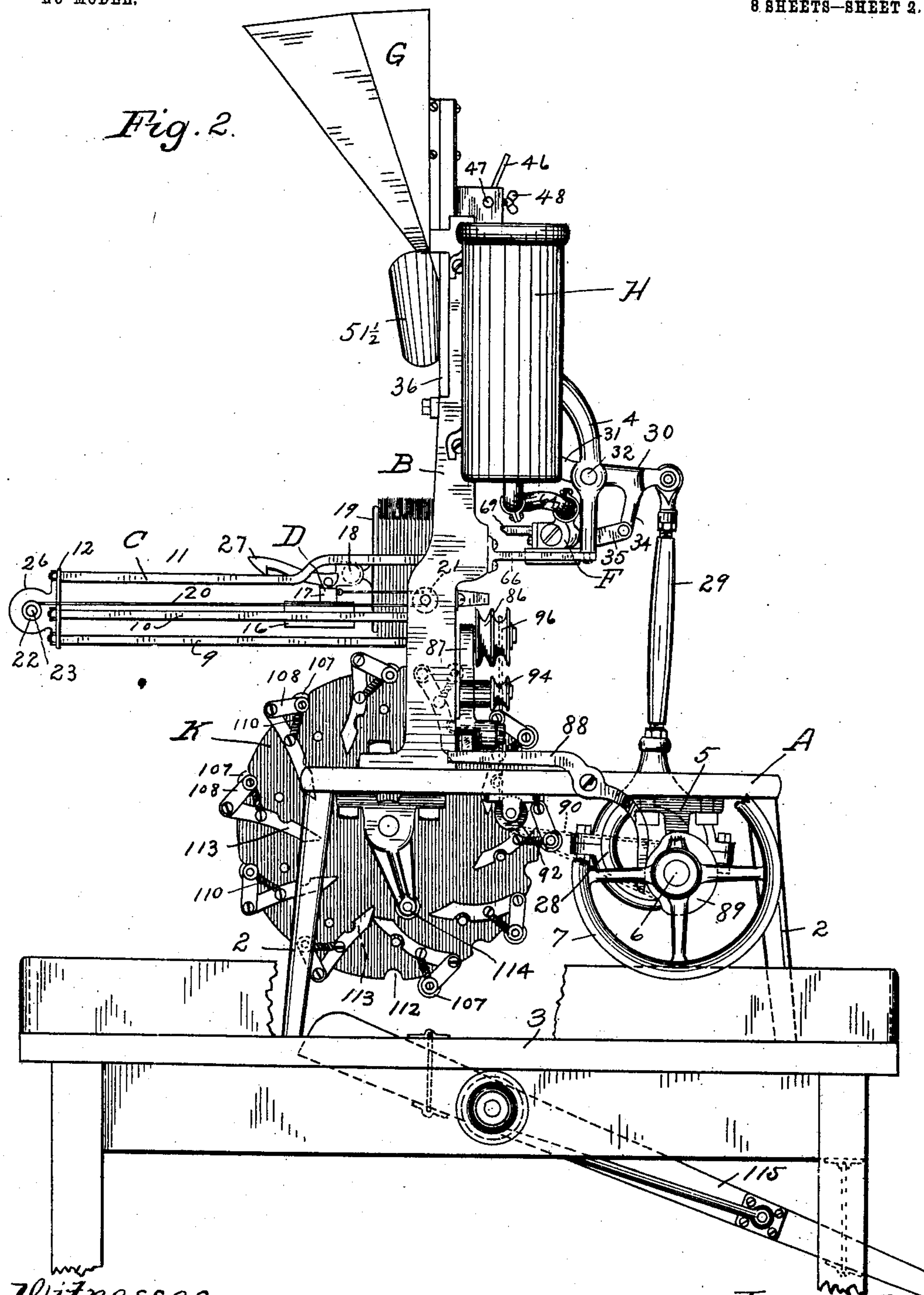
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8 SHEETS—SHEET 2.



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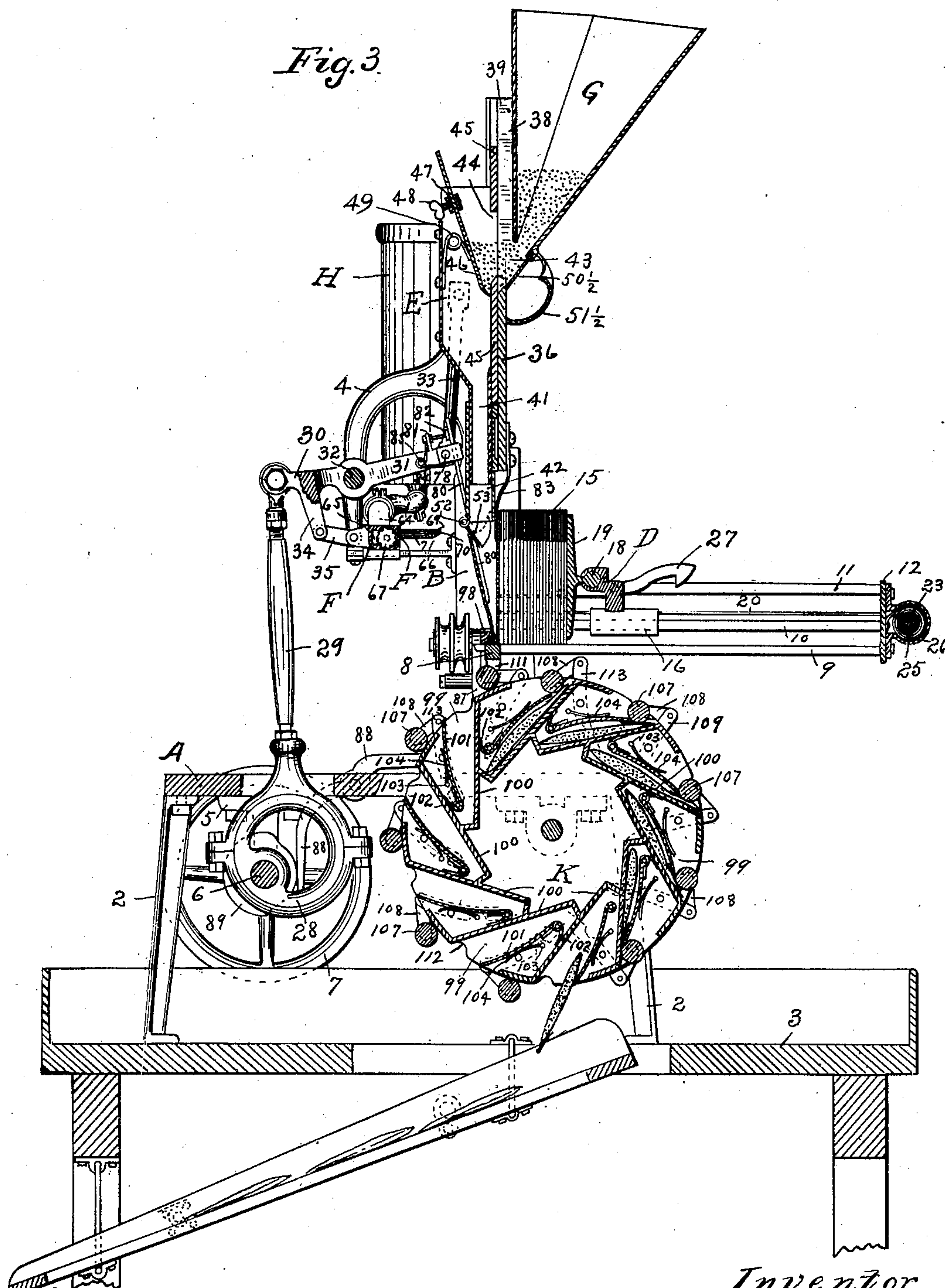
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8 SHEETS—SHEET 4.

Fig. 4.

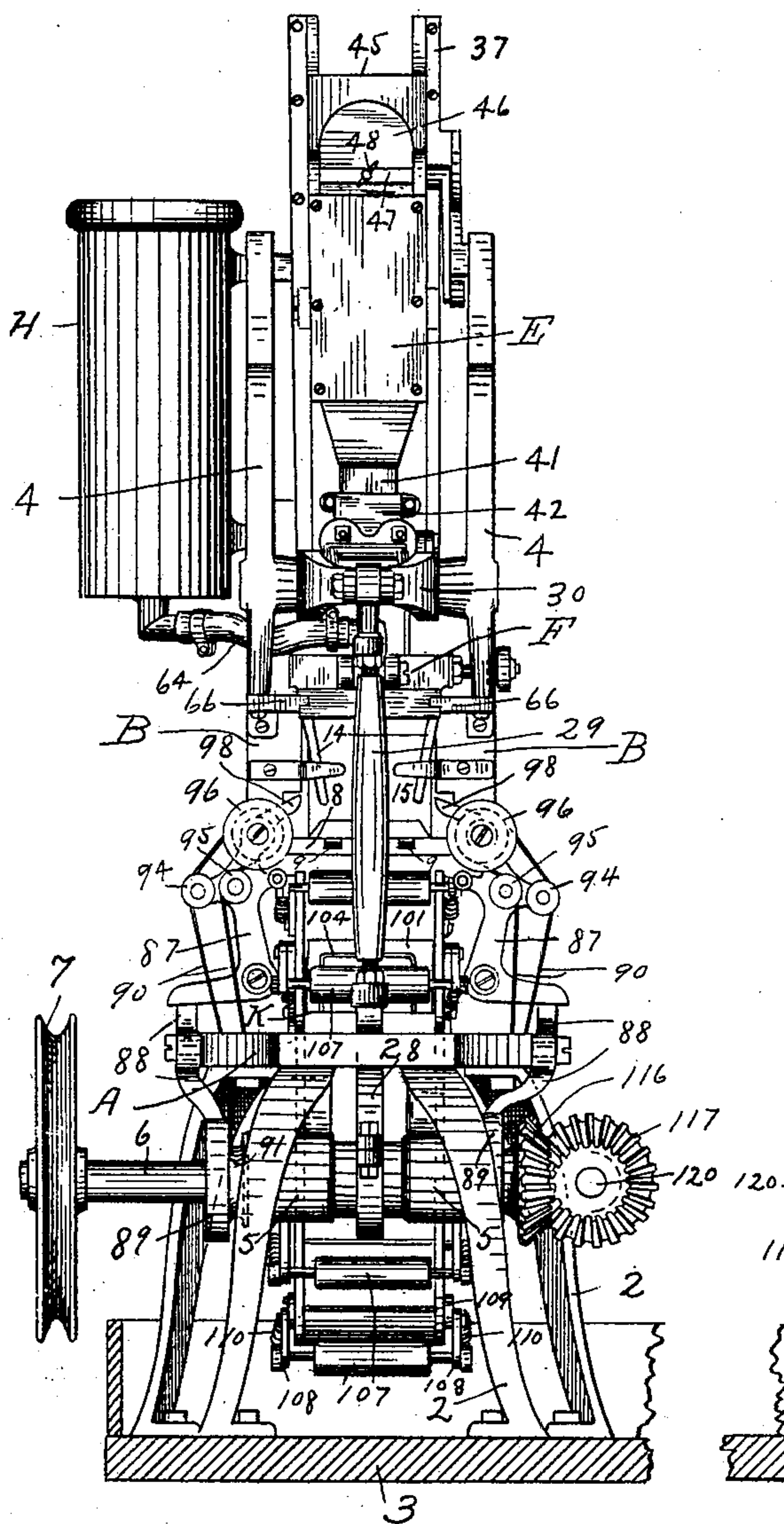
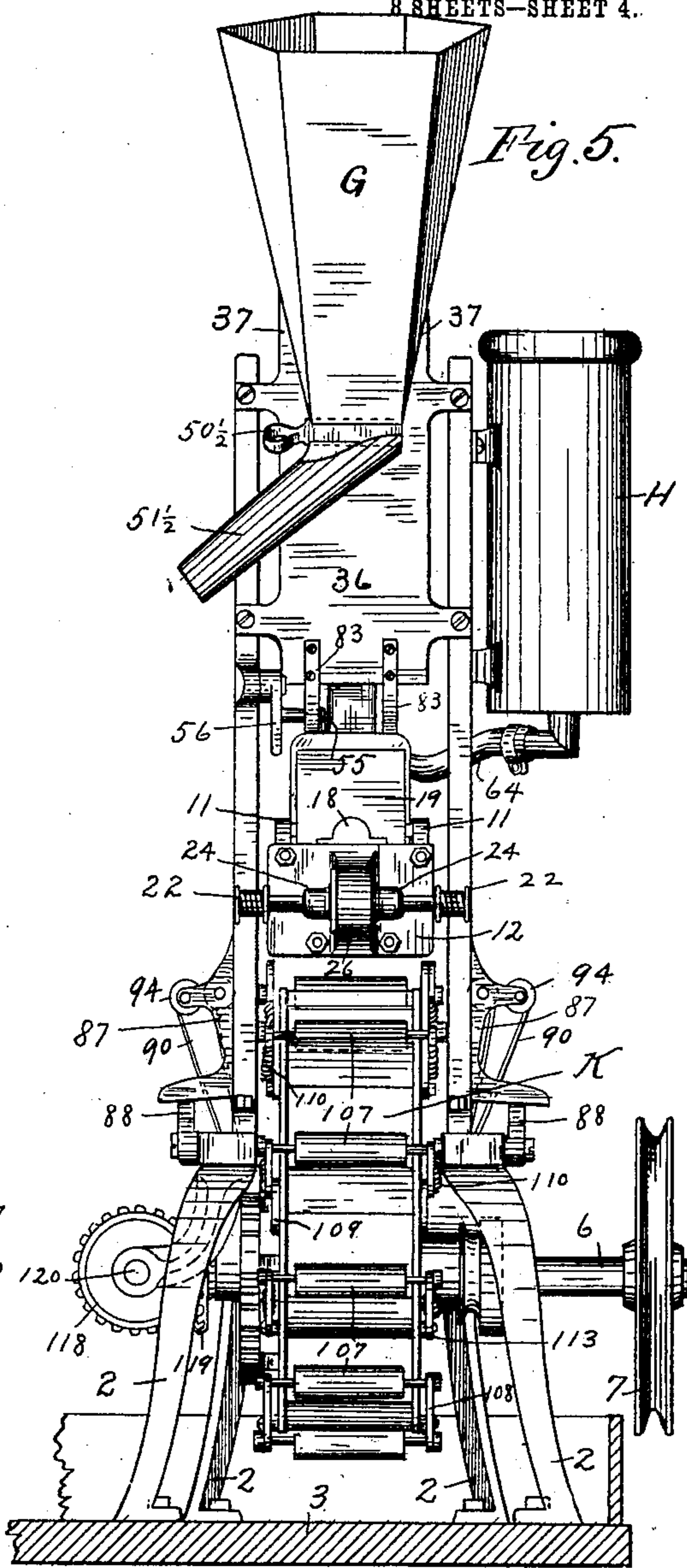


Fig. 5.



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8 SHEETS—SHEET 5.

Fig. 8.

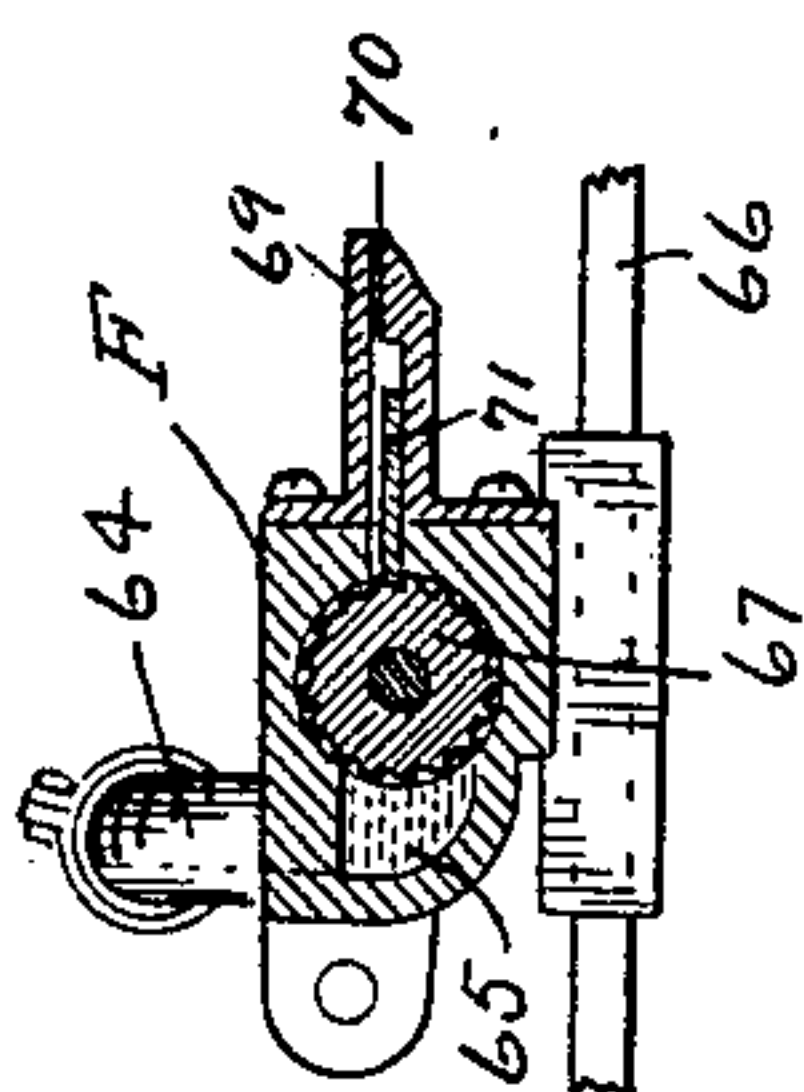


Fig. 7.

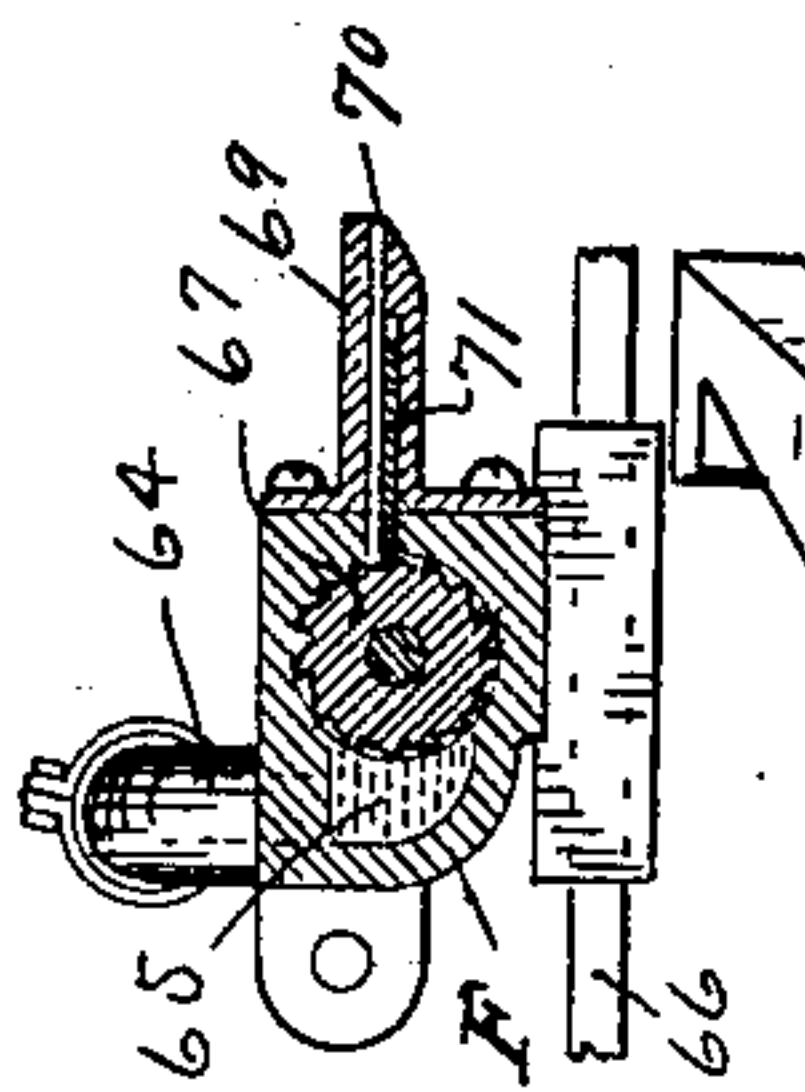
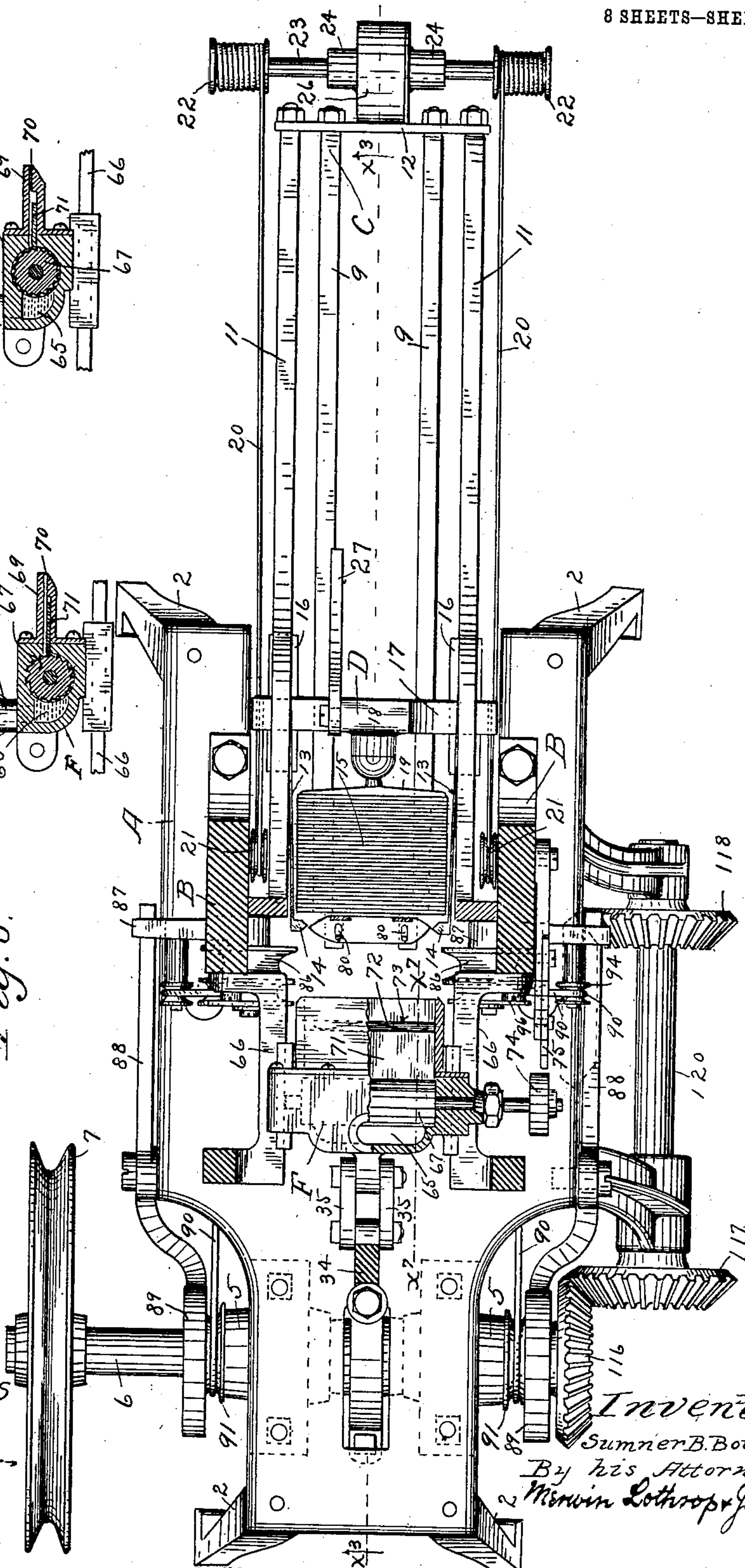


Fig. 6.



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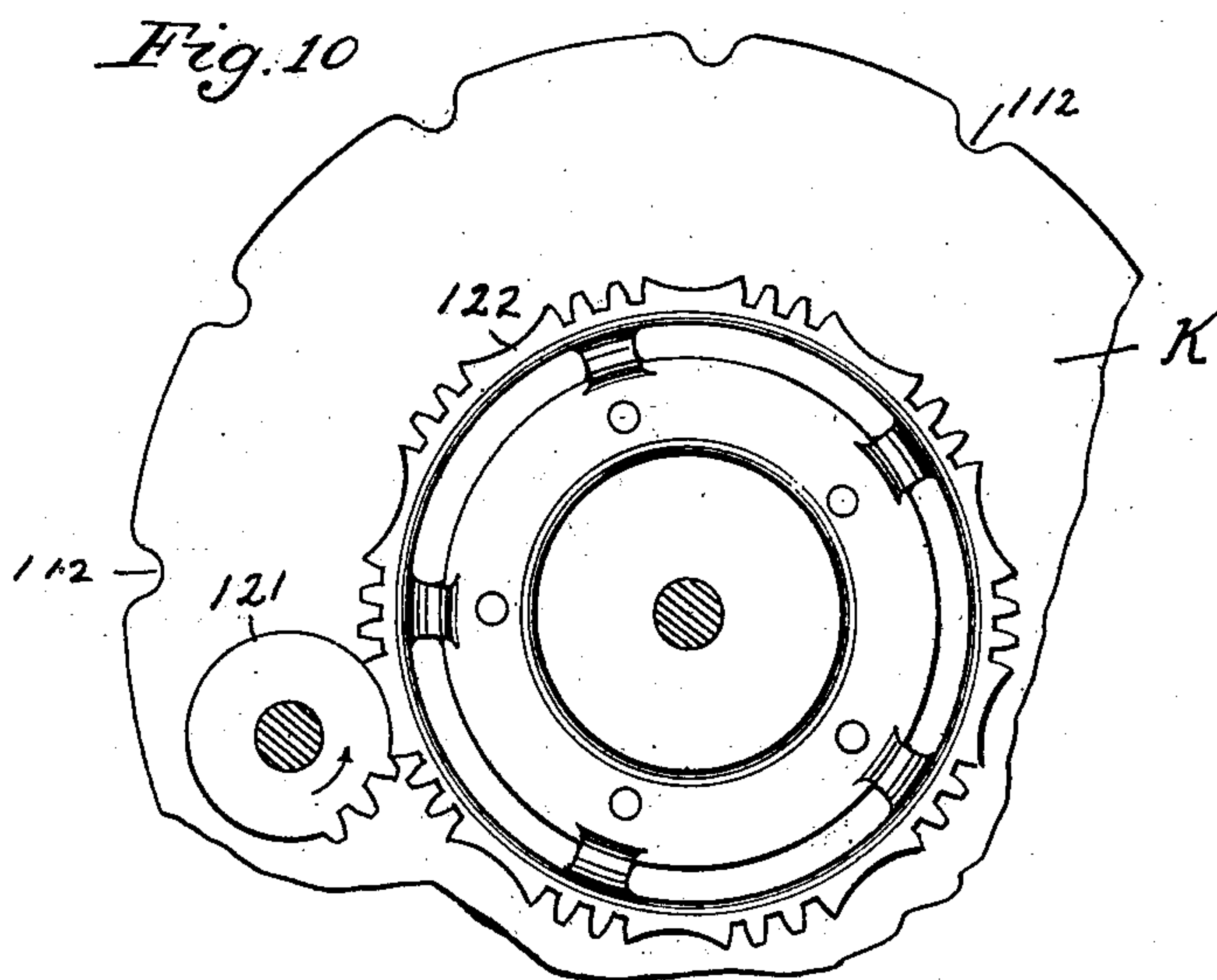
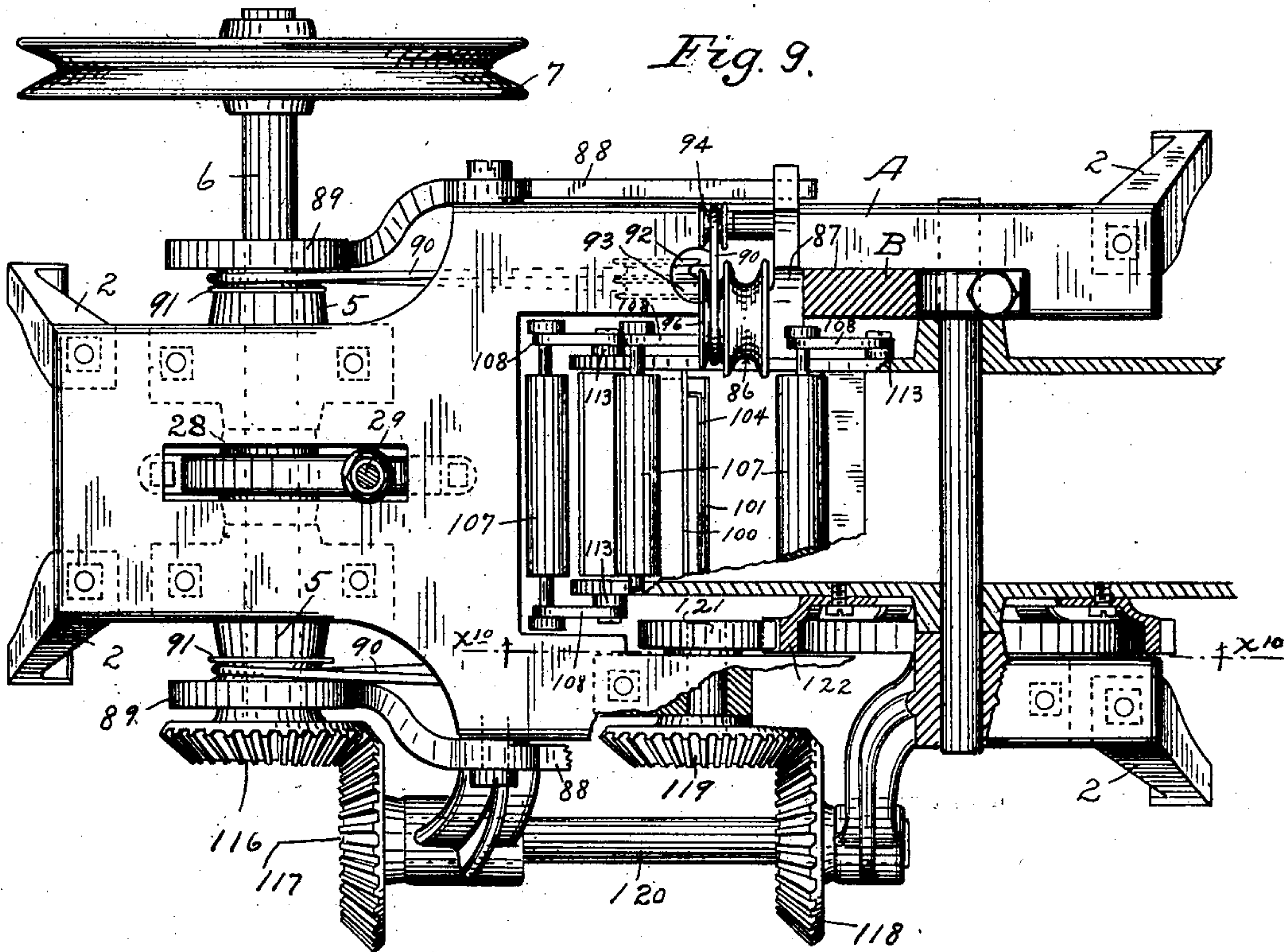
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8 SHEETS—SHEET 6.



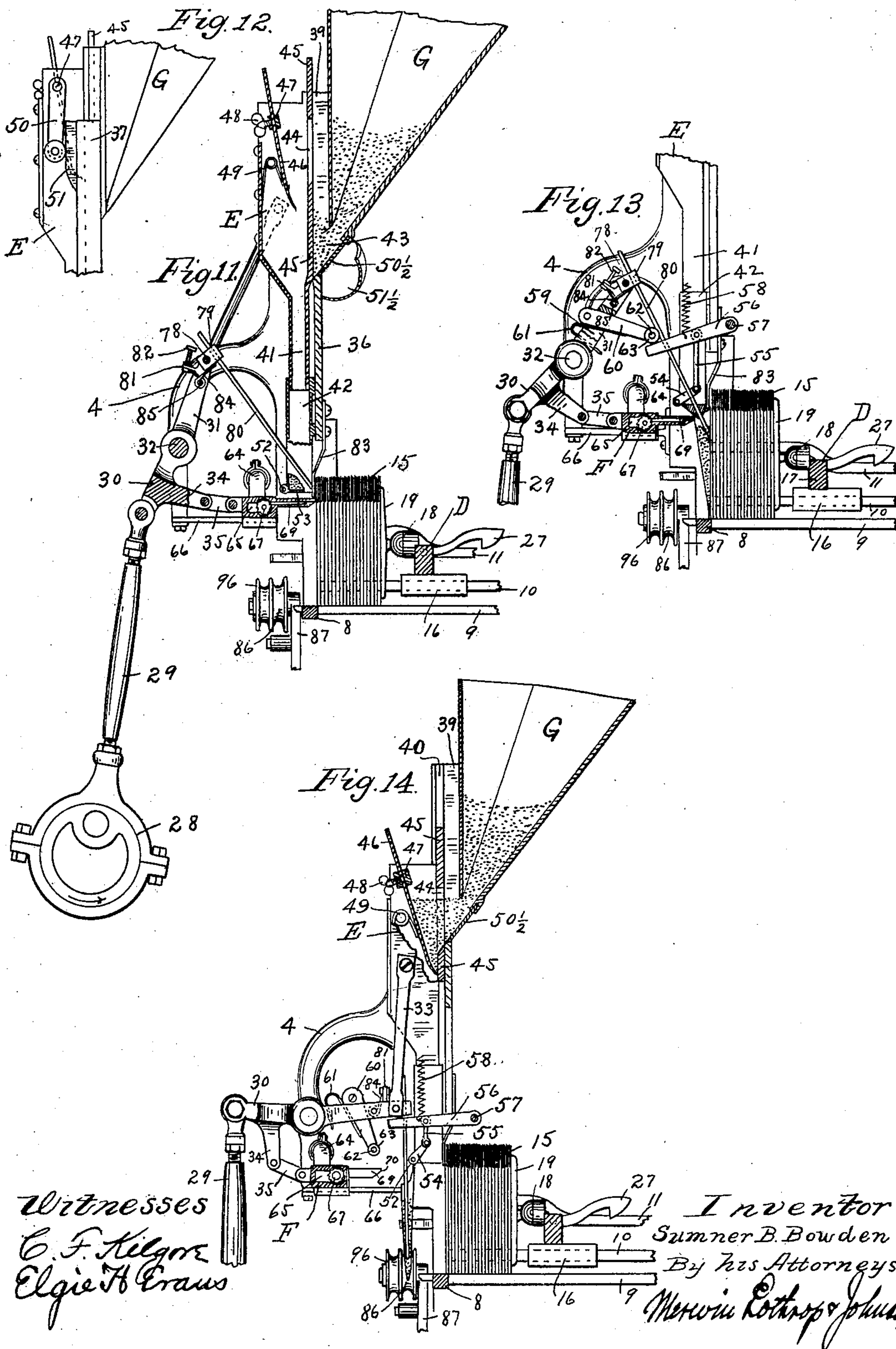
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8 SHEETS—SHEET 7.



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NO MODEL.

8 SHEETS—SHEET 8.

Fig. 15.

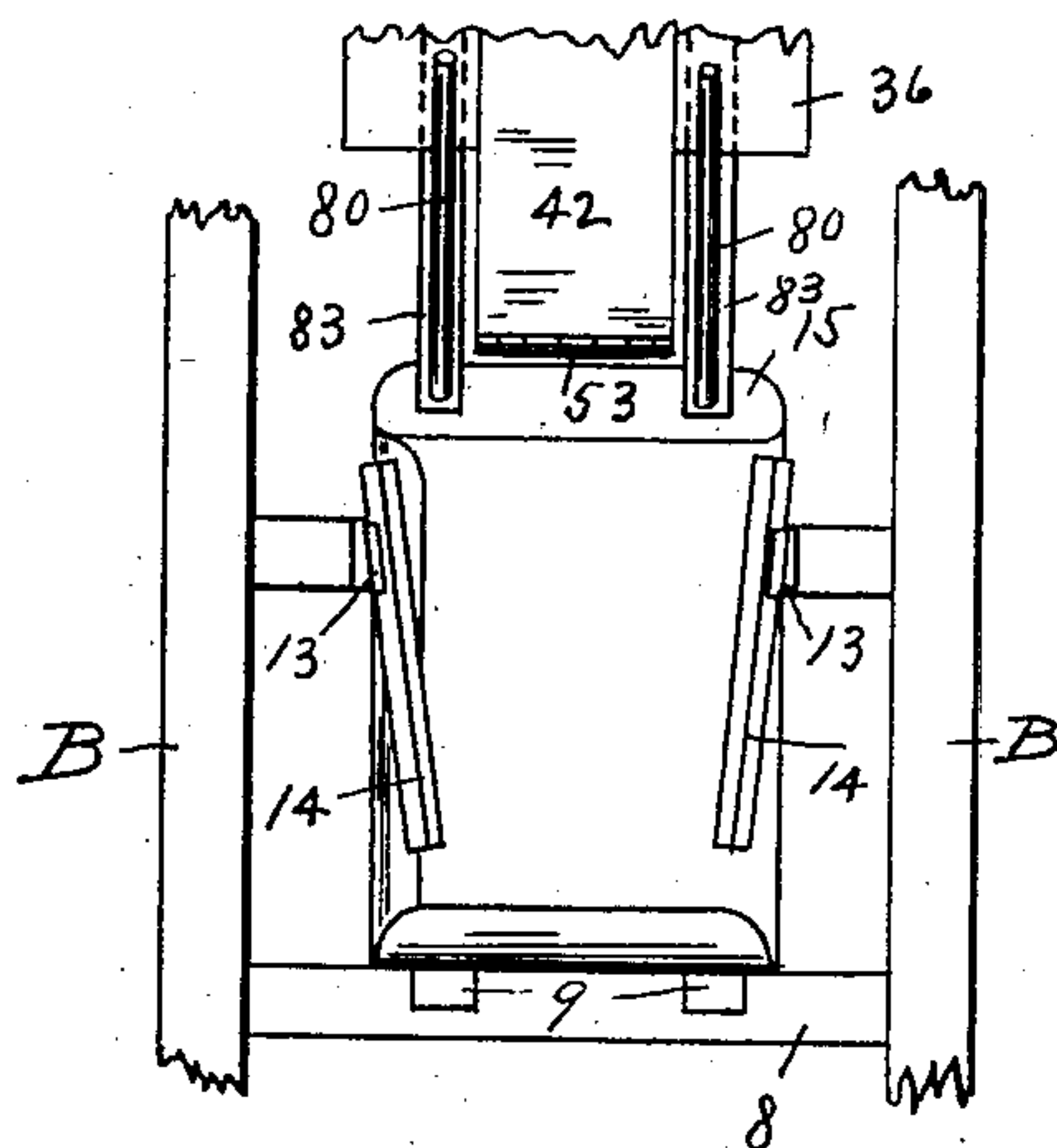


Fig. 16.

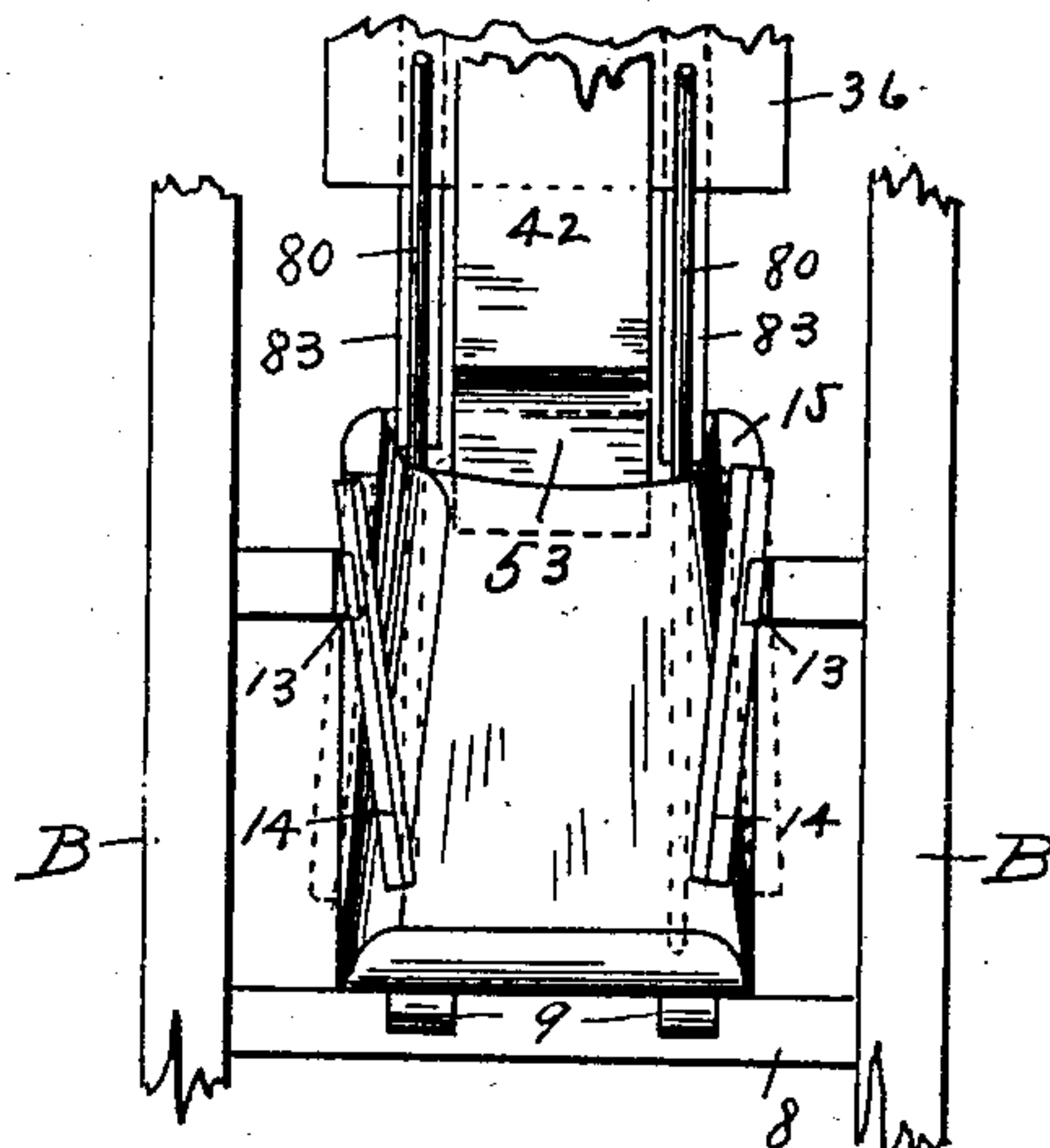
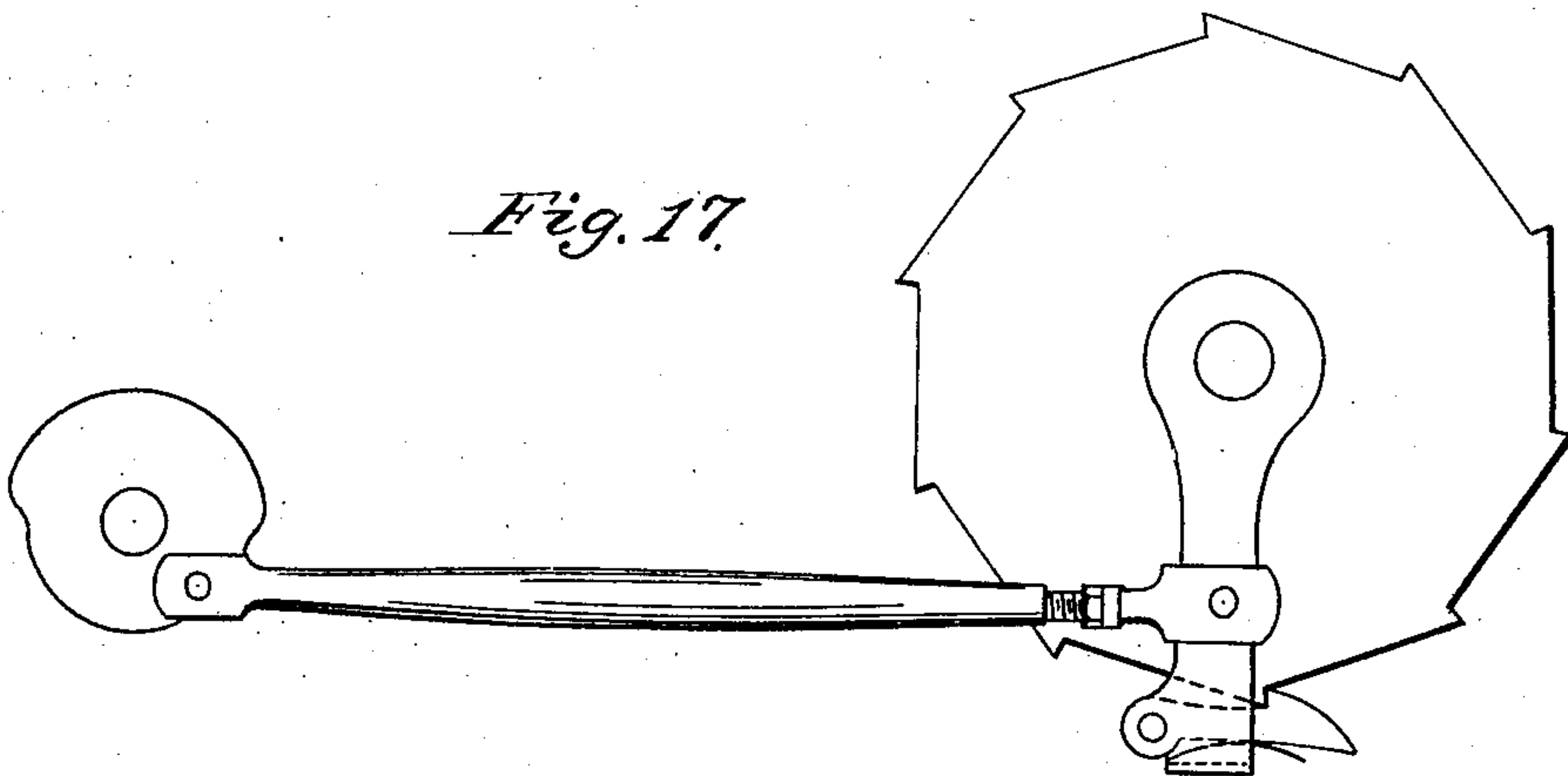


Fig. 17.



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UNITED STATES PATENT OFFICE.

SUMNER B. BOWDEN, OF ST. PAUL, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE AMERICAN BAG FILLING MACHINE COMPANY, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

BAG-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 762,275, dated June 14, 1904.

Application filed July 13, 1899. Serial No. 723,666. (No model.)

To all whom it may concern:

Be it known that I, SUMNER B. BOWDEN, a subject of Victoria, Queen of Great Britain and Ireland, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Bag-Filling Machines, of which the following is a specification.

My invention relates to improvements in machines for filling bags, and has for its object to provide a machine which shall be simple in construction and operation for automatically and expeditiously filling bags with a measured quantity of seed or other similar material, then gumming and sealing the mouth of the bags, and finally carrying the sealed bags and depositing them in a suitable receptacle or place of deposit.

With this object in view my invention consists in the construction, combination, and arrangement of parts, as hereinafter described, and specifically pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my improved bag-filling machine, showing the side away from the gum-receptacle. Fig. 2 is a side elevation showing the side carrying the gum-receptacle. Fig. 3 is a vertical section on line $x^3 x^3$ of Fig. 6, showing, among other things, the manner in which the measuring-magazine is filled from the seed-hopper and the manner in which the filled bags are sealed and carried to their place of deposit. Fig. 4 is a front end elevation of the machine without the hopper. Fig. 5 is a rear end elevation. Fig. 6 is a section in plan taken on line $x^6 x^6$ of Fig. 1 with some parts broken away. Figs. 7 and 8 are sections of the paster or gum-box, taken on line $x^7 x^7$ of Fig. 6, showing the gum-carrying plate in different positions. Fig. 9 is a section in plan with some parts broken away to show the gearing which actuates the bag-carrying drum or cylinder. Fig. 10 is a detail of the gearing, taken on line $x^{10} x^{10}$ of Fig. 9. Fig. 11 is a detail in section showing the measuring-magazine in its uppermost position. Fig. 12 is a detail showing the cam and trip-arm for

the measuring device. Fig. 13 is a detail showing all the parts in filling position. Fig. 14 is a detail showing the measuring-magazine in its lowermost position. Figs. 15 and 16 are details of the bag holding, opening, and extracting devices; and Fig. 17 is a modification of the gearing mechanism actuating the bag-carrying drum.

The framework of the machine consists, essentially, of the base A, supported by legs 2 upon a suitable platform or table 3, and the upwardly-projecting standards B, secured to the base A and formed with forwardly and downwardly projecting arms 4. Journaled in suitable bearings 5, secured to the under side of the base A, is the main shaft 6, carrying a suitable pulley 7, to which is applied the power to drive the machine.

As the machine consists of several somewhat independent, although mutually coöperating, groups of mechanism, these groups will be taken up and described separately. These groups may for convenience be called, respectively, the bag-feeding devices, the seed-measuring and the bag-filling devices, the gumming or pasting devices, the bag opening and extracting devices, and the bag-removing devices. The bag-feeding devices will first be described.

Mounted transversely upon the standards B and extending rearwardly therefrom is the bag-holding trough or framework C. (Shown in side elevation in Figs. 1 and 2, in vertical section in Fig. 3, and in plan in Fig. 6.) This trough is supported upon a cross-bar 8, bolted to the inner sides of the standards B, and consists of bottom plates or bars 9, jointed to the cross-bar by a flush joint and extending forward a little beyond the cross-bar in order that the bags may not slip down prematurely, guides 10 for the bag-pushing carriage D, guides 11 to hold the side edges of the bags in alinement in upright position, and a back plate 12, to which are secured the rear ends of the bottom plates 9 and the guides 10 and 11. The forward ends of the guides 10 and 11 are secured to shoulders upon the inner sides of the standards B. Secured at their

rear ends to the inner sides of the guides 11, as best shown in Fig. 6, are flat springs 13, carrying upon their free ends downwardly-projecting bag-retaining arms or side holds 14, secured to said springs intermediately between their ends, as shown in Figs. 4 and 15, and so arranged that their lower ends project inwardly and overlap the side edges of the foremost of the row of bags 15 more than their upper ends, thus holding the bags until they shall have been surely engaged by the bag-extractor, as hereinafter described. The bags to be filled are placed upon and in upright position in said trough in front of the bag-pushing carriage D, with the shorter plies of bags facing the front of the machine. The row of bags is acted upon and pressed forward in a manner hereinafter to be described by the bag-pushing carriage D, consisting of slides 16, adapted to travel upon the guides 10 and connected by a cross-bar 17. The bags are directly acted upon by the bag-pressing plate 19, which is attached to the cross-bar of the carriage by a ball-and-socket joint 18 and made somewhat less in width than the space between the guides 10 in order to allow it to play freely upon the joint, so that the pressure of the plate upon the different parts of the row of bags may be equalized to conform to any variations in thickness. In order that the pressure may be slightly greater at the top of the bags, where the thickness is less on account of the upturned flaps, the plate 19 is mounted upon the joint 18 somewhat below its center, thus causing the upper part of the plate to dip normally forward. The bag-pushing carriage D, carrying the plate 19, is held normally in forward position against the row of bags to be filled by cords or straps 20, attached to the cross-bar 17 of the carriage and led over sheaves 21, mounted upon studs upon the inner sides of the standards B, and thence back over rollers 22, carried by the shaft 23, journaled in suitable bearings 24 upon the back plate 12. These cords are held normally wound upon said rollers and tend to pull forward the carriage D by a coil-spring 25, as shown in Fig. 3, attached to the shaft 23 and inclosed in a suitable casing 26. Pivoted to the cross-bar 17 of the carriage is a rearwardly-projecting catch 27, adapted to engage with and catch the back plate 12 when the carriage is pulled back the full distance of its travel to allow the bag-receptacle to be filled with a fresh row of bags.

The seed-measuring and bag-filling devices are operated from the main shaft 6. Upon this shaft is mounted an eccentric 28, carrying an eccentric-rod 29, to the upper end of which is pivoted a rearwardly-extending stirrup-shaped lever 30, with forked arms 31 fulcrumed upon the rod 32, which has fixed support in the arms 4 of the standards B. The free ends of the lever-arms 31 are pivotally connected by links 33 with the seed-measur-

ing magazine E, hereinafter to be described. Between its fulcrum-support and its pivotal connection with the eccentric-rod said lever is formed with a downwardly and rearwardly projecting arm 34, pivotally connected by the link 35 with the gumming-box or paster F, hereinafter to be described.

To the standards B above the trough C is secured a plate 36, carrying upwardly-projecting columns 37, to which is attached the seed-hopper G, as best shown in Fig. 2, the face of which is preferably set off from the columns by flanges 38 upon either the back of the columns or the face of the hopper to form a space or pocket 39 for a purpose hereinafter to be mentioned. The receptacle E, which may be called the "seed-measuring magazine," since by its construction and operation it determines the amount of seed to be conveyed to the bag, is arranged to slide up and down in front of the hopper in guides 40 upon the face of the plate 36 and the columns 37 when actuated by the lever-arms 31 and connecting-links 33. The bottom of the measuring-magazine terminates in a tube 41, which projects down within the funnel 42, secured to the plate 36. The face of the hopper is cut away at the bottom to form an opening 43 just above the top of the plate 36, to the top of which plate is secured the slanting rear wall of the hopper, and in the back plate or wall of the measuring-magazine is a similar opening 44 to allow the seed to pass from the hopper to the measuring-magazine. The better to facilitate and regulate the passage of the seed the top of the plate 36 and the top of that part of the rear plate 45 of the measuring-magazine which is below the opening 44 are beveled or cut away downwardly toward the measuring-magazine, so that when the measuring-magazine is in its lowermost position, as shown in Fig. 14, the beveled tops of said plates shall form with the rear wall of the hopper a continuous sloping surface.

The seed-measuring device consists more particularly of a partition 46 within the measuring-magazine, pivoted to the sides of said magazine by a pivot 47 and vertically adjustable thereon by a set-screw 48, the lower end of which partition is held normally in contact with the rear wall 45 of said magazine by a suitable spring 49. Attached to the pivot 47 beyond the side of the measuring-magazine is a downwardly-depending trigger-arm 50, which as the measuring-magazine moves in its upward travel is engaged by the cam or trip 51 upon the column 37, as shown in Fig. 12, to turn the pivot 47 and the partition 46, whereby the lower end of said partition is forced away from the rear wall of the magazine, thus allowing the contained seed to drop into the funnel 42 below. The operation of this part of the machine is as follows: When the measuring-magazine is at

its lowermost position, as shown in Fig. 14, with the bottom of the partition 46 held in closed position against the rear wall of the magazine, the openings in the face of the hopper and in the rear wall of the magazine register, and a quantity of seed passes through these openings, filling said openings and the space below them between the partition 46 and the lower part of the rear wall 45 of the measuring-magazine. As the measuring-magazine, actuated by the lever 30 and links 33, moves upon its upward travel, the supply of seeds is cut off by the upward movement of the lower part of the rear wall of the magazine. As this wall passes up through the seeds the seeds in the measuring-magazine above the beveled edge of the wall drop back into the space or pocket 39 between the face of the hopper and the back of the wall of the magazine, leaving within the partition the exact measure of seed required for filling one of the bags. Just before the magazine reaches its uppermost position, as shown in Fig. 11, the bottom of the partition is opened by the means hereinbefore described and the contained seed allowed to drop into the funnel 42 below. As the measuring-magazine again descends the partition is once more thrown back by the spring 49 against the wall of the magazine in readiness to receive another supply of seed. In order to remove the seeds from the hopper when it is desired to empty the same without filling the bags, there is provided a sliding gate 50½ at the bottom of the rear side of the hopper, and below is a chute 51½ for the discharge of the seeds when the gate is opened.

Heretofore in devices of this kind there has been great difficulty in accurately measuring the required amount of seed and in shutting off the supply without cutting or bruising the seeds or jamming them between the moving parts. In my invention by suitably adjusting the partition 46 I can measure with great accuracy the amount of seed to be dropped into the bag, and by leaving the space or pocket 39 between the face of the hopper and the back of the wall of the magazine I obviate all possibility of cutting or bruising the seeds, for the beveled edge of the rear wall in its upward travel does not force the seeds against any hard substance, but simply throws them aside into the pocket 39, as shown in Fig. 11.

The discharge of the seeds from the funnel 42 into the bag to be filled is accomplished in a manner now to be described.

At the bottom of the funnel and hinged to its face by the pintle 52 is a valve or lid 53, formed preferably with upwardly-projecting sides, which fit within the funnel when the valve is closed. The valve is held normally in closed position, as shown in Fig. 14, by the lever-arm 54, attached to the pintle of the hinge and pivotally connected by the link 55 with the trigger-arm 56, which is ful-

crumed at its rearward end upon a pivot 57, carried by the standard B and held normally in raised or valve-closing position by a spring 58, attached to said standard. Pivotally mounted upon the upper side of one of the lever-arms 31 and extending downwardly and rearwardly through a slot 59 therethrough, as shown in Fig. 13 and by the dotted lines in Fig. 1, is an arm 60, held normally in raised position against the rear edge of said slot by a spring 61. The free end of the arm 60 carries a stud 62, upon which is loosely mounted a roller 63. As the measuring-magazine is actuated to move upon its downward travel after dropping the seed into the funnel said stud and roller engage the free end of the trigger-arm 56, forcing it downward, and thereby, through the medium of the link 55, depressing the lever-arm 54 and turning the valve upon its hinge into open position, as shown in Fig. 13, to allow the contained seed to drop into the bag below, the mouth of which has been opened to receive the seed by means hereinafter to be described. As the free end of the arm 60, moving in the arc of a circle, continues its downward travel it moves out of engagement with the trigger-arm 56, which is thereby released and springs back to its normal position under the tension of the spring 58, carrying with it the lever 54 and closing the valve 53, as shown in Fig. 4. As the arm 60 again engages the trigger 56 in its upward travel it yields upon its pivotal support to the trigger, which is held rigidly against a shoulder upon the standard B until said arm 60 is swung far enough back to pass the end of the trigger, when it is brought by the spring 61 to its normal position against the edge of the slot 59. Before the bags have been filled they are acted upon by a gumming device, which will now be described.

Attached to one of the standards B is a gum-reservoir H, from which the gum is conveyed by a tube or duct 64, preferably flexible, to the trough 65 of the gumming-box or paster F, which is arranged to slide upon guides 66, secured to the standards B, to and from the bag-trough C when its actuating-lever 30 is reciprocated by the eccentric-rod 29. Within the paster and having journal-support in the sides thereof is a longitudinally-grooved cylinder 67, as best shown in Figs. 6, 7, and 8, adapted to carry the gum from the receiving-trough 65 to the plate 71. Except on the side of said trough the teeth between the grooves of the cylinder fit closely against the casing of the paster. On the side toward the row of bags to be filled the paster is formed with a horizontally-slotted delivery-snout 69 for carrying the gum to the bag. Slidably arranged in said slot 70 is a thin scraper-plate 71, held normally in contact with the cylinder 67 by a spring 72, as shown in Fig. 6, interposed between the edge of said plate and a

shoulder 73 within said snout. Upon the journal of the cylinder 67 is mounted a ratchet 74, adapted to be engaged and intermittently rotated by the rack 75 as the paster is actuated to move toward the row of bags. This rack has pivotal support at one end upon the standard B and is held normally in contact with said ratchet by a spring 76, attached to the standard and supported near its center upon a stud 77. As the cylinder is rotated the paste is carried in the grooves on its surface from the trough 65 to the plate 71, the edge of which is held under the tension of the spring 72 normally pressing against the cylinder and into the grooves, so that the gum is scraped out of said grooves and deposited upon the plate. As the cylinder continues to revolve more gum is scraped out, forcing the gum already deposited on the plate along the plate and finally out of the mouth of the slot, where it is delivered against the face of the bag. As the teeth between the grooves of the cylinder fit closely against the casing, it will be evident that there is no avenue of escape for the gum except along the plate 71 and out of the slot. The rack 75 is made adjustable in length in order to regulate the supply of gum. When the measuring-magazine is at its lowermost position, as shown in Fig. 14, the paster F is at the beginning of its travel away from the row of bags to be filled, and the end of the lever 30 pivoted to the eccentric-rod 29 is in its uppermost position. When the lever 30 is forced down by the eccentric-rod, the measuring device is actuated by the lever-arms 31 to begin its upward travel, and at the same time the paster F is actuated by the arm 35 to travel forward upon the guides 66, and the pinion 74, engaged by the rack 75, causes the cylinder 67 to revolve within the paster. The paster continues its travel toward the bags until the snout 69 comes in contact with the upper part of the shorter ply of the foremost bag and delivers upon it a supply of gum, the measuring-magazine having at the same time reached its uppermost or seed-discharging position, as shown in Fig. 11. By the reversed action of the lever 30 the paster is then immediately retracted and started upon its return travel and the measuring-magazine started upon its downward travel. At the same moment the mouth of the foremost bag is opened to receive the seed in a manner now to be described.

Pivotaly mounted upon the rod 78, connecting the ends of the lever-arms 31, are sleeves 79, preferably two in number, separate and independent from each other. To each sleeve is adjustably secured a rigid downwardly-extending bag opening and extracting rod or finger 80, as best shown in Figs. 3, 11, and 13, the upper end of which projects above the sleeve for a purpose to be described. Attached to the arms 31 behind the rod 78 is an upwardly-projecting plate 81, to which is ad-

justably secured a bar 82, adapted to form a rigid back support for the upper ends of the fingers 80 to check their further turning upon the pivot 78 after they have well entered the bags below. The lower ends of the fingers 80 are held normally in extended position against guides 83 in position to enter the mouth of the foremost of the row of bags by a spring 84, attached to a rod 85 back of the plate 81 and bearing against the under side of the sleeves 79. In order to prevent the ends of the fingers from getting behind the bag to be opened and to guide them unerringly into the mouth of the bag, I prefer to provide suitable guides 83, attached to the plate 36 and depending downwardly therefrom in front of the upturned flap or lip of the foremost of the row of bags to be filled. To facilitate the entry of the fingers into the bag, their acting ends may be made beveled or rounded or otherwise suitably shaped. Directly after the gum has been delivered upon the foremost bag, as above described, the bag-opening fingers 80, actuated by the downward movement of the lever-arms 31, enter the bag and pass down within it, thus opening it for the delivery of the seed from the funnel, which immediately follows. When the fingers 80 have nearly reached the bottom of the bag, their upwardly-projecting ends come into engagement with the supporting-bar 82, which holds them from turning further upon their pivots. By the further downward movement of the lever-arms 31 the fingers, being thus held from turning and moving in the arc of a circle, are brought into a vertical position, as shown in Fig. 14, disengaging the filled bag from its retaining devices and carrying it into a position to be engaged by the rollers 86, hereinafter mentioned. Before the bag has been entered by the fingers 80 the retaining-arms or side holds 14 stand in the position shown in Fig. 15, overlapping the side edges of the bag more at the bottom than at the top. As the fingers 80 are actuated to carry the foremost bag forward between the side holds the pressure of the bag first forces them apart until the springs 13 engage the guides 11, as shown in Fig. 16, and then turns them upon these guides as pivots, forcing the lower ends of the side holds apart to release the foremost bag and the upper ends inward to hold the next succeeding bag, as shown by dotted lines in Fig. 16. When the foremost bag is entirely drawn out, the side holds spring back into their normal position, as shown in Fig. 15. By mounting the fingers 80 upon separate sleeves, each finger working independently of the other, I am enabled to avoid all difficulty in entering the bag if its face should be unevenly presented.

By constructing and attaching the bag-opening fingers and allied mechanism in the manner described I am enabled to use rigid rods, which serve not only to open the bag, but to disengage it from the bag-holding trough,

thereby dispensing with all other means for detaching the bag. Furthermore, the rigid rods or fingers when held from turning upon their pivots exert a uniform unyielding pressure upon the bag in disengaging it from the trough or receptacle and do not tear the bag. Heretofore in machines of this kind it has been found necessary to use elastic or yielding fingers, which have not sufficient rigidity to disengage the bag from its receptacle without the use of other coöperating or independent means and are apt to tear the bag.

The use of the fingers 80 as bag-openers, although very desirable to insure the perfect opening of the bags, is not indispensable, for the bags can be opened in advance of the entry of the fingers by the combined action of the gumming devices and the valve 53 sufficiently to receive the measure of seed. When the paster is retracted after delivering the gum upon the face of the bag, the shorter ply of the bag is pulled out by the cohesion of the gum and the bag partially opened. Now by properly adjusting the trigger-arm 56 and the valve-controlling mechanism the valve may be made to open the moment the paster is retracted and before the fingers 80 have entered the bag. As it opens the valve 53 engages the edge of the shorter ply of the bag, already partly pulled out by the gum, and throws it back, thereby opening the bag sufficiently to receive the seed, which is immediately delivered.

When the filled bag has been disengaged and is held by the bag-extracting fingers 80 in vertical position, its side edges are engaged by the rollers 86, preferably grooved, mounted upon the studs upon the upper ends of bell-cranks 87, fulcrumed upon the standards B. The lower arms of said bell-cranks rest upon and are actuated by the inner arms of the levers 88, having fulcrum-support upon the sides of the base A and actuated by the cams 89, mounted upon the main shaft of the machine. When the bag is in the position described, the rollers 86 are moved forward by the action of said levers and cams to engage and compress the edges of the bag, thereby squeezing it open at the bottom, and at the same time are made to revolve by endless cords or belts 90, which pass over pulleys 91, carried by the main shaft, and thence over guide-pulleys 92 and 93, secured to the base of the machine, and guide-pulleys 94 and 95 upon the arms of the bell-cranks 87, and finally over pulleys 96, carried by the rollers. When the filled bag is engaged by these rollers, it is carried down by their revolution until it enters one of the pockets 99 of the bag-carrying drum K below, when it is released by the action of the rollers in again moving outward and away from each other. The upper ends of the bell-cranks 87 are provided with shoulders 98, which, as the upper ends of the bell-cranks move inward with the rollers, bear

against the bottom of the foremost of the row of bags 15 to be filled to hold it back in place preparatory to being opened and filled. By having the rollers engage and compress the side edges of the bag instead of its face, as in analogous devices heretofore, I am enabled to dispense with all other means for separating the lower part of the plies of the bag to allow the seeds to get to the bottom, such as has been necessary with the devices heretofore used.

The bag-carrying drum, as best seen in Fig. 3, has journal-support in the base of the machine. Within said drum are bag-receiving pockets 99 with walls 100, each wall forming at once the front wall of one pocket and the rear wall of the next succeeding pocket. The drum is journaled in the framework in such position that the back wall of the pocket about to receive the filled bag shall come into vertical position directly below the bag. Pivoted within said pockets are holding-plates or holders 101, slightly curved to conform to the shape of the filled bag, the outer ends of which are held normally away from the back walls by the springs 102. Within said pockets and pivoted to the sides of the drum by pivots 103 are fingers 104, resting normally against the backs of the holders 101. To the ends of the pivots outside the drum are attached trigger-arms 105, adapted to be engaged by the cam or trip 106 as the drum continues its revolution after receiving the filled bag to turn the pivot 103 and the finger 104, carried thereby, whereby the holders are pressed against the bags, which they hold firmly against the walls 100 while the flaps are being sealed.

The sealing device consists of rollers 107, journaled in links 108, pivotally secured to levers 109, pivoted to the sides of the drum. The rollers are held normally in position upon the periphery of the drum by springs 110, connecting their journals with the pivotal support of the levers 109. As the drum continues its revolution after receiving the filled bag, the outwardly-projecting ends of the journal of the roller behind the receiving-pocket are engaged and held by trips 111, attached to the standard B, until the roller reaches the edge of the pocket-wall 100, when it is pulled over the edge by the tension of the springs 110, turning the upwardly-projecting flap of the filled bag and rolling it tightly against the gummed top of the shorter ply of the bag, and thus sealing the bag, the roller-journal being received and held by scallop-shaped sockets 112 in the sides of the drum. When in the continued revolution of the drum the pockets reach a suitable position for the discharge of the bags, the projecting arm 113 of the lever controlling said roller on the side of the gum-reservoir, as shown in Fig. 2, is engaged by the trip-arm 114, attached to the base of the machine, to throw said roller back to its normal position

on the periphery of the drum. The bag being thus released drops into the trough 115 below.

In order to insure the proper coöperation 5 of the bag removing and sealing devices with the bag-filling devices, it is necessary that the drum be revolved intermittently. This may be accomplished by any suitable mechanism; but I prefer to use that shown in Figs. 10 9 and 10. Asso shown, the drum is actuated by bevel-gears 116, mounted upon the main shaft, and 119, journaled in the base of the machine, intermeshing with bevel-gears 117 and 118, mounted upon the shaft 120. Upon 15 the shaft of bevel-gear 119 is mounted a partially-toothed driver 121, adapted to engage with the partially-toothed follower 122, mounted upon the journal of the drum. By this means the drum is made to revolve until 20 the receiving-pocket comes below the filled bag, when it is allowed to remain stationary long enough to allow the bag to be deposited within the pocket. The drum may also be revolved intermittently by a ratchet-wheel actuated by a spring-pressed click reciprocated 25 by a cam-wheel and connecting-rod, as shown in Fig. 17.

I do not herein claim, broadly, the improved seed-measuring devices above shown and described, as they are made the subject of express claim in a divisional application filed 30 October 28, 1902, Serial No. 129,066.

Having now described my invention, what I claim as new, and desire to secure by Letters 35 Patent, is—

1. In a machine of the class described, the combination, with bag-supporting means, of a gum-box formed with a delivery-slot, a rotatable gum-conveying cylinder within the 40 box, and a scraper-plate slidably arranged in the slot and held by spring-pressure with one edge normally in contact with the cylinder, for the purpose set forth.

2. In a machine of the class described, the 45 combination, with bag-supporting means, of a gum-box formed with a delivery-slot, a longitudinally-grooved cylinder rotatably mounted within the gum-box, and a plate slidably arranged in the slot and held by spring-pressure normally in contact with the cylinder, 50 for the purpose set forth.

3. In a machine of the class described, the combination with means to support the bags, of a reciprocating gum-box formed with a delivery-slot, a longitudinally-grooved cylinder 55 within said box, a plate slidably arranged in said slot and held by spring-pressure with one edge normally in contact with said cylinder, and means for intermittently rotating said 60 cylinder.

4. In a bag-filling machine, means to support the bags and feed them into the machine, in combination with a reciprocating gum-box 65 provided with a slotted snout, a plate slidably arranged in said slot, and a rotatable cylinder

within said box for conveying the gum from the receiving-trough of said box to said plate.

5. In a bag-filling machine, means to support the bags and feed them into the machine, in combination with a reciprocating gum-box 70 provided with a slotted snout, a rotatable cylinder within said box, and a spring-pressed plate in said slot adapted to convey the gum from said cylinder to the mouth of said snout.

6. In a bag-filling machine, means to support and hold the bag to be filled, in combination with rigid bag-opening fingers, and guides to direct said fingers into the mouth of the bag. 75

7. In a bag-filling machine, the combination, 80 with means for holding bags to be filled, of rigid pivotally-supported fingers arranged in position to enter the mouth of a bag, means for preventing the fingers from turning upon their pivots when they have well entered the 85 bag, whereby they exert upon the bag a uniform unyielding pressure, and means for actuating the fingers to enter the bag and disengage it from its holding means.

8. In a bag-filling machine, the combination, 90 with a device for holding bags to be filled, of rigid pivotally-supported fingers disposed in position to enter the mouth of a bag, means for imparting to the fingers a vibrating movement, and means for holding the fingers from 95 turning upon their pivots when they have well entered the bag, whereby they exert a uniform unyielding pressure in extracting the bag.

9. In a bag-filling machine, the combination, with a device for holding bags to be filled, of 100 rigid fingers supported pivotally, but independently of each other, in position to enter the mouth of a bag, means for imparting to the fingers a vibrating movement, and means 105 for holding the fingers from turning upon their pivots, when they have well entered the bag, to disengage the bag from its holding device.

10. In a bag-filling machine, the combination, with a device for holding bags to be filled, 110 of bag-extracting fingers, means for thrusting the fingers into the mouth of a bag and disengaging the bag from its holding means, and means for preventing the fingers from yielding to the pressure of the bag in disengaging it from its holding device. 115

11. In a bag-filling machine, a stationary bag-holding receptacle combined with means for feeding the bags into the machine, rigid fingers adapted to open the mouth of the bag 120 to be filled and disengage it from said receptacle, and guides to direct said fingers into the mouth of the bag.

12. In a bag-filling machine, a bag-holding receptacle, in combination with rigid bag-opening fingers, means for holding the acting 125 ends of said fingers normally in extended position to enter the mouth of the bag, and means for holding said fingers in rigid position to extract the bag from its receptacle. 130

13. In a bag-filling machine, a bag-holding receptacle in combination with pivotally-supported bag-opening fingers, means for holding the acting ends of said fingers normally in extended position to enter the mouth of the bag, and means for holding said fingers from turning upon their pivots when in position to extract the bag from its receptacle.

14. In a bag-filling machine, a bag-holding receptacle, in combination with rigid pivotally-supported bag-opening fingers, means for holding the acting ends of said fingers normally in extended position to enter the mouth of the bag, and means for holding said fingers from turning upon their pivots when they have entered the bag.

15. In a bag-filling machine, a bag-holding receptacle, in combination with a plurality of mutually-independent pivotally-supported bag-opening fingers, means for holding the acting ends of said fingers normally in extended position to enter the mouth of the bag to be filled, and means for holding said fingers from turning upon their pivots when they have entered the bag.

16. In a bag-filling machine, a bag-holding receptacle, in combination with rigid pivotally-supported bag opening and extracting fingers, the acting ends of which are adapted to move in the arc of a circle, means for holding the acting ends of said fingers normally in extended position to enter the mouth of the bag, and means for holding said fingers from turning upon their pivots when they have entered the bag.

17. In a bag-filling machine, the combination, with means to support a bag to be filled, of bag-opening fingers pivotally mounted between their ends, means to impart to said fingers a vertically-vibrating motion, spring means for holding the lower ends of said fingers normally in extended position to enter the mouth of the bag, and a back support engaging the upper ends of said fingers when they have entered the bag, to hold them from turning upon their pivots.

18. In a bag-filling machine, the combination, with means to support a bag to be filled, of a vertically-vibrating lever, bag-opening fingers pivotally mounted in the end of said lever between their ends, means for holding the lower ends of said fingers normally in extended position to enter the mouth of the bag, and a back support carried by said lever and adapted to engage the upper ends of said fingers, when they have entered the bag, to hold them from turning upon their pivots.

19. In a bag-filling machine, the combination, with means to support a bag to be filled, of a vertically-vibrating lever, bag-opening fingers pivotally and adjustably mounted upon said lever between their ends, means for holding the lower ends of said fingers normally in extended position to enter the mouth of the

bag, and a back support adapted to engage the upper ends of said fingers, when they have entered the bag, to hold them from turning upon their pivots.

20. In a bag-filling machine, the combination, with means to support a bag to be filled, of rigid bag-opening fingers mounted pivotally and adjustably along their length, means for holding the acting ends of said fingers normally in extended position to enter the mouth of the bag, and means for holding said fingers from turning upon their pivots when they have entered the bag.

21. In a bag-filling machine, in combination with means to support a bag to be filled, a plurality of mutually-independent bag-opening fingers mounted pivotally and adjustably between their ends, means for holding the lower ends of said fingers normally in extended position to enter the mouth of the bag, and a back support engaging the upper ends of said fingers when they have entered the bag, to hold them from turning upon their pivots.

22. In a bag-filling machine, the combination, with means to support a bag to be filled, of bag-opening fingers pivotally mounted between their ends, means for holding the lower ends of said fingers normally in extended position to enter the mouth of the bag, and a back support adjustable toward and from the upper ends of said fingers in position to engage and hold the same from turning when their lower ends have entered the bag.

23. In a bag-filling machine, means to support the bag to be filled, combined with a reciprocating gum-box adapted to deliver a supply of gum upon the face of the bag, a vertically-reciprocating measuring-magazine, a funnel enveloping the lower part of said magazine, a valve hinged to the bottom of said funnel and means for automatically turning said valve as the bag is being acted upon by the gumming-box.

24. In a bag-filling machine, the combination with the bag opening and extracting fingers, of pockets for receiving the filled bags, and means for carrying said bags from the fingers to the pockets.

25. In a bag-filling machine, the combination with the bag opening and extracting fingers, of pockets for receiving the filled bags, and means for engaging and compressing the side edges of said bags and carrying them from said fingers to said pockets.

26. In a bag-filling machine, in combination, bag-extracting fingers, means for engaging and compressing the side edges of the filled bags, receiving-pockets for said bags, and means to convey said bags from said bag-extracting fingers to said pockets.

27. In a bag-filling machine, in combination, bag-extracting fingers, pockets to receive the filled bags, intermittently-reciprocating rollers adapted to engage and compress the side

edges of the filled bags and carry them from said fingers to said pockets and means for revolving said rollers.

28. In a bag-filling machine, the combination with the bag-extracting fingers, of rollers adapted to engage and compress the side edges of the filled bags and remove them from said fingers, means to give said rollers an intermittently-reciprocating motion and means to revolve the same.

29. The combination with the bag-extracting fingers, of an intermittently-rotatable drum provided with pockets, rollers adapted to move inward and engage the side edges of the filled bags and to carry said bags into said pockets, means for intermittently reciprocating said rollers and means for revolving them.

30. In a bag-filling machine, the combination with the bag-removing rollers, of a drum provided with bag-receiving pockets, means to rotate said drum intermittently, bag-sealing rollers, attached to said drum, and means for actuating said rollers to turn the flaps of the filled bag down and upon the pasted shorter ply.

31. In a bag-filling machine, the combination of the bag-removing rollers, of a rotatable drum provided with bag-receiving pockets, means to hold the bags against the walls of said pockets bag-sealing rollers carried by said drum, means for actuating said rollers to roll the flap of the filled bag down upon the pasted shorter ply, and means for releasing said rollers from the bag.

32. In a bag-filling machine, means to support a bag to be filled, combined with a reciprocating gumming-box adapted to deliver a supply of gum upon the face of the bag and then be retracted therefrom, a vertically-reciprocating measuring-magazine, a funnel below said measuring-magazine, a valve at the bottom of said funnel adapted to enter the mouth of said bag when opened, and means for automatically opening said valve as the bag is being acted upon by the gumming-box.

33. In a bag-filling machine, in combination, a hopper, a measuring device cooperating therewith, means for reciprocating said measuring device, rigid bag-opening fingers, means actuating said fingers to enter the mouth of the bag to be filled, a gumming-box, and means for reciprocating the same to and from said bag, bag-removing devices adapted to engage the side edges of the bag when filled and carry it into position to be sealed, means actuating said bag-removing devices to engage said bag, and means for turning and sealing the flap of said bag.

34. In a bag-filling machine, the combination with a bag-receptacle to hold a series of bags, and means to feed said bags into the machine, of a bag-extracting device, reciprocating rollers adapted to move in and engage the side edges of the bags and carry them into position to be sealed, levers actuating said

rollers, and means carried by said levers for pressing back the lower part of the endmost bag of the series, as said rollers are moved inward.

35. In a bag-filling machine, the combination with a hopper, and a bag-receptacle, of a vertically-reciprocating measuring-magazine, and a lever actuating the same, rigid bag opening and extracting fingers pivotally mounted upon the arms of said lever, and a reciprocating gumming device actuated by said lever to move inward as said measuring-magazine and bag opening fingers are actuated to move downward.

36. In a bag-filling machine, the combination with a hopper, of a vertically-reciprocating measuring-magazine terminating at the bottom within a funnel, bag opening and extracting fingers adapted to enter the mouth of a bag to be filled as the measuring-magazine moves down, a transversely-reciprocating gumming-box adapted to be retracted from said bag as said measuring-magazine and fingers are moving down, and means for actuating all of said devices in unison.

37. In a bag-filling machine, the combination with a hopper, of a reciprocating measuring-magazine terminating at the bottom within a funnel, a valve in said funnel, bag opening and extracting fingers adapted to enter the mouth of a bag to be filled as the measuring-magazine moves down, a reciprocating gumming device adapted to be retracted from said bag as said measuring-magazine and fingers are moving down, and means for actuating all of said devices in unison.

38. In a bag-filling machine, the combination with a hopper, of a vertically-reciprocating measuring-magazine terminating at the lower end within a funnel, a valve in said funnel, bag opening and extracting fingers adapted to enter the mouth of a bag to be filled as the measuring-magazine moves down, a reciprocating gumming device adapted to be retracted from said bag as said measuring-magazines are moving down and a lever for actuating all of said devices in unison.

39. In a bag-filling machine, the combination, with bag opening and extracting fingers, of rollers adapted to be moved into and out of engagement with the filled bag, means for reciprocating said rollers toward and from said bag, and means for revolving said rollers when the same are in engagement with the bag, substantially as and for the purpose described.

40. In a bag-filling-machine, the combination, with a bag-holding receptacle, and means to press the bags forward therein, of bag-extracting fingers, and a downwardly-extending arm pivotally mounted between its ends at each side of the receptacle.

41. In a bag-filling machine, the combination, with a bag-holding receptacle, means to press the bags forward therein, and bag-opening devices, of arms pivotally supported be-

tween their ends at the sides of the receptacle, and adapted to be turned in a plane transverse thereto, the lower ends of said arms normally projecting inwardly, substantially as and for the purpose described.

42. In a bag-filling machine, the combination with a bag-holding receptacle, means to press the bags forward therein, and bag opening and extracting fingers, of downwardly and inwardly extending arms pivotally mounted between their ends, one at each side of the receptacle.

43. In a bag-filling machine, the combination, with a bag-holding receptacle, and means to press the bags forward therein, of bag opening and extracting fingers, and spring-pressed downwardly and inwardly extending arms pivotally mounted between their ends, one at each side of the receptacle.

44. In a bag-filling machine, the combination, with a bag-holding receptacle, and bag opening and extracting fingers, of downwardly-extending arms pivotally mounted between their ends, one at each side of the receptacle, and held by spring-pressure with their lower

ends normally projecting inwardly, substantially as and for the purpose described.

45. In a bag-filling machine, the combination, with a bag-holding receptacle, means for pressing the bags forward therein, and bag-extracting fingers, of a pair of arms pivotally supported, one at each side of said receptacle, and normally inclined inwardly toward each other, substantially as and for the purpose described.

46. In a bag-filling machine, the combination with a receptacle to hold a row of bags, means for pressing the bags forward therein, and bag-extracting fingers, of bag-retaining devices, arranged at the sides of the receptacle, and normally overlapping the side edges of the foremost bag, more at the bottom than at the top substantially as and for the purpose described.

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

SUMNER B. BOWDEN.

Witnesses:

ELGIE H. EVANS,

ARTHUR P. LOTHROP.