No. 619,834. Patented Feb. 21, 1899.

W. E. NICKERSON.

APPARATUS FOR FILLING BAGS.

(Application filed Feb. 7, 1898.)

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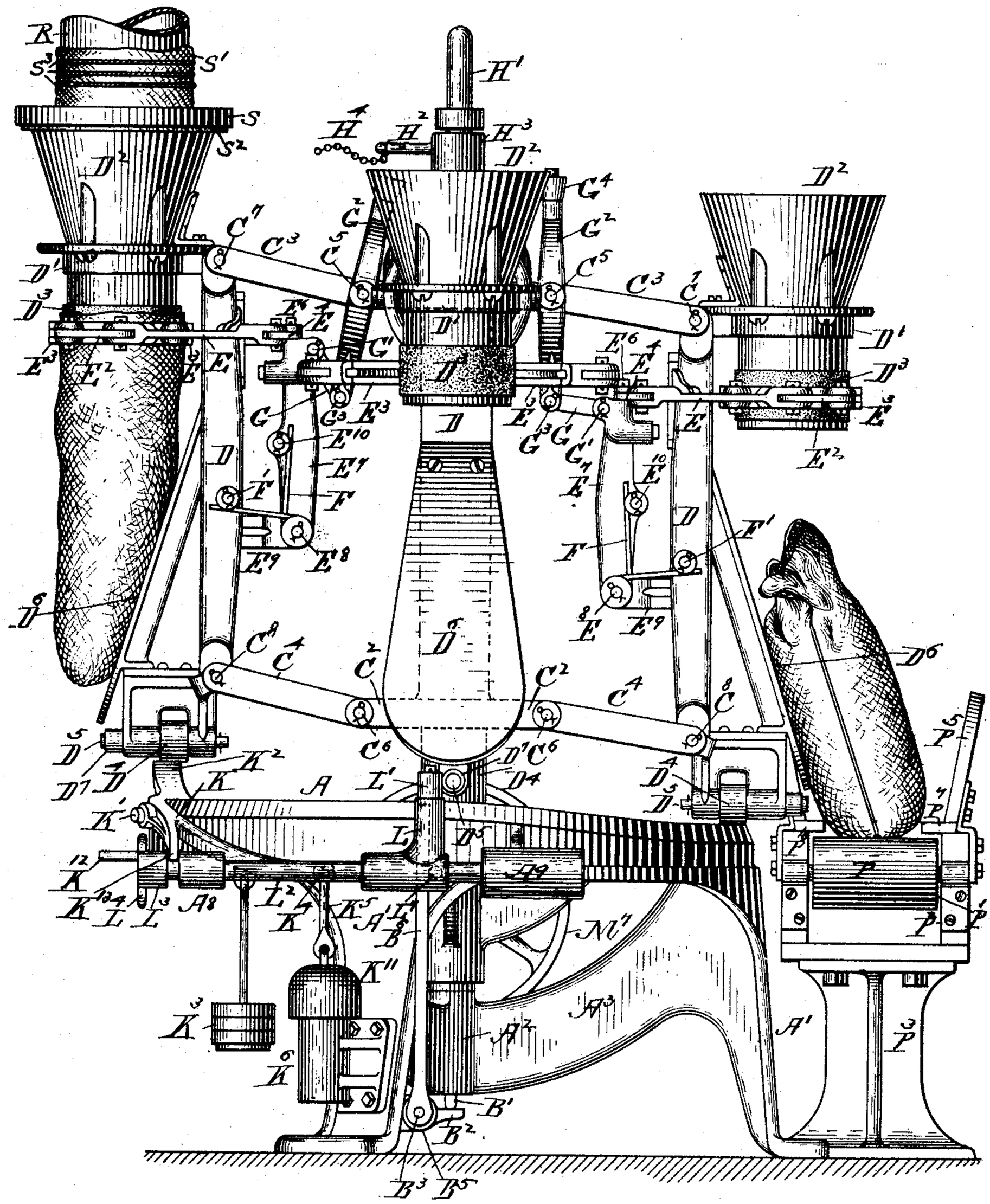

Fig. 1.

WITNESSES

Frank G. Parker

William H. Parry.

INVENTOR.

William Emery Nickerson

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W. E. NICKERSON.

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(No Model.) 5 Sheets—Sheet 2.

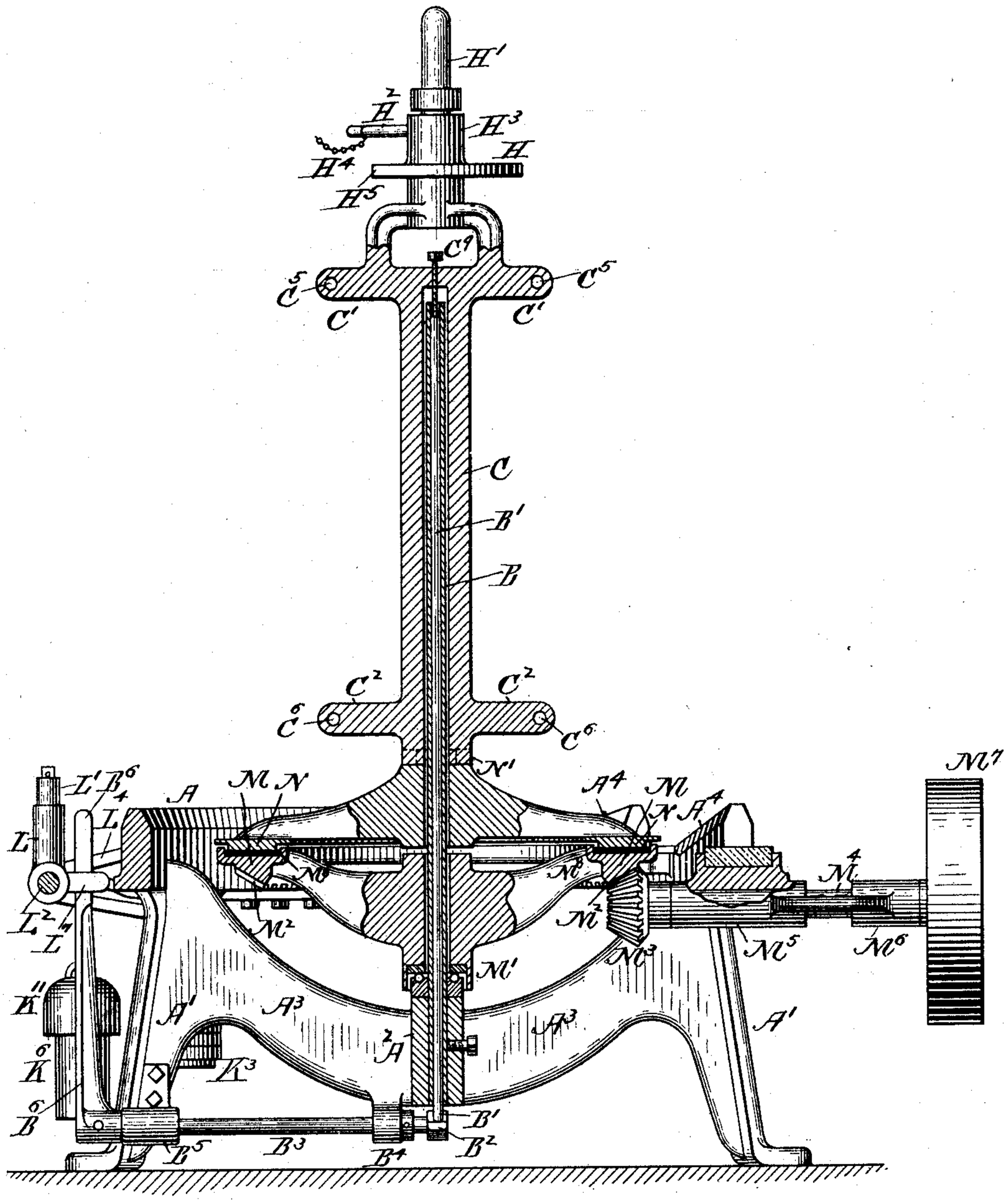

Fig. 2.

WITNESSES:
Frank G. Parker.
William H. Parry.

INVENTOR:
William Emery Nickerson

No. 619,834. Patented Feb. 21, 1899.

W. E. NICKERSON.

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(No Model.) 5 Sheets—Sheet 3.

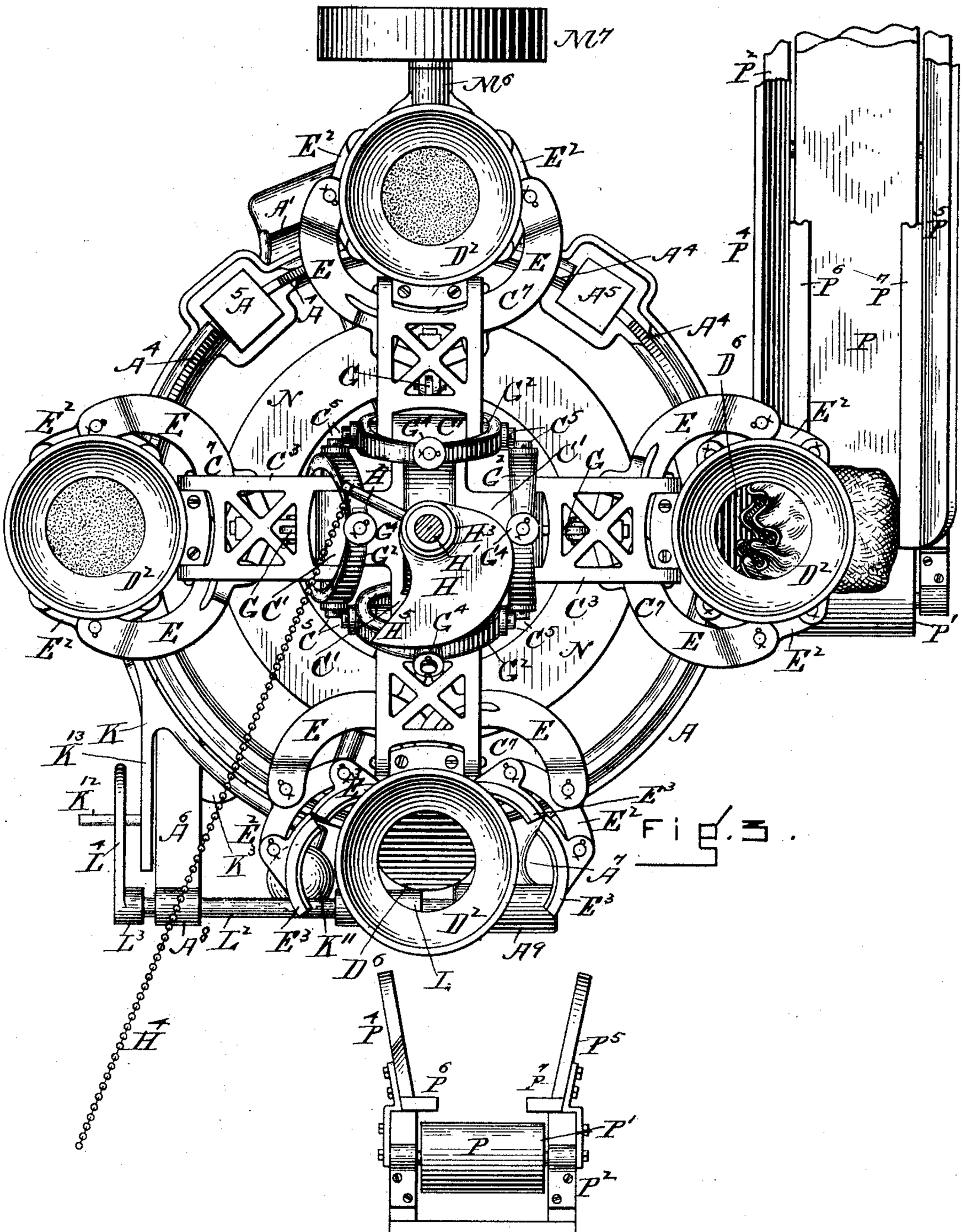

Fig. 3.

Fig. 4.

WITNESSES
Frank G. Parker.
William H. Parry.

INVENTOR
William Emery Nickerson

No. 619,834. Patented Feb. 21, 1899.

W. E. NICKERSON.

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(No Model.) 5 Sheets—Sheet 4.

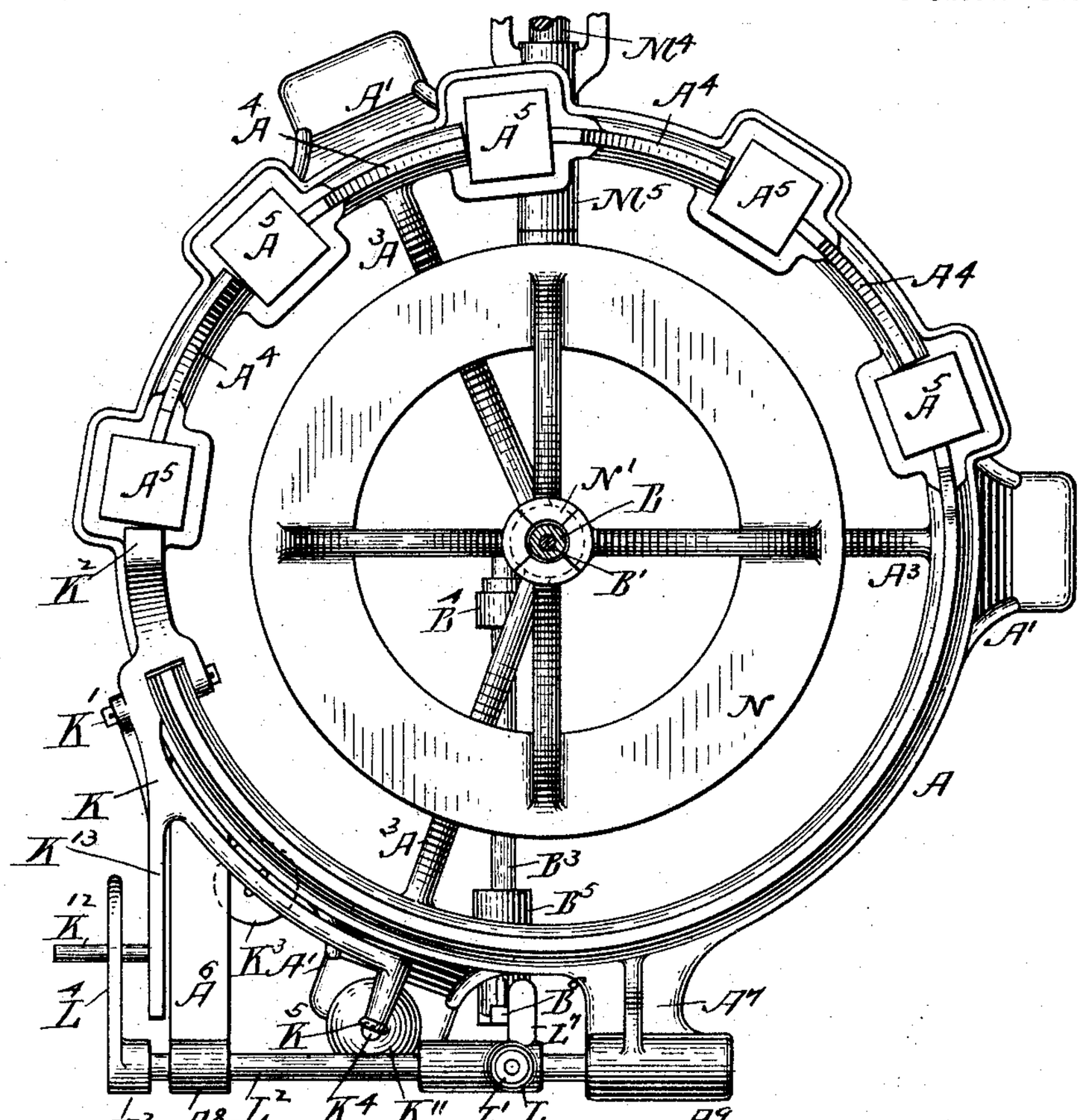

Fig. 5.

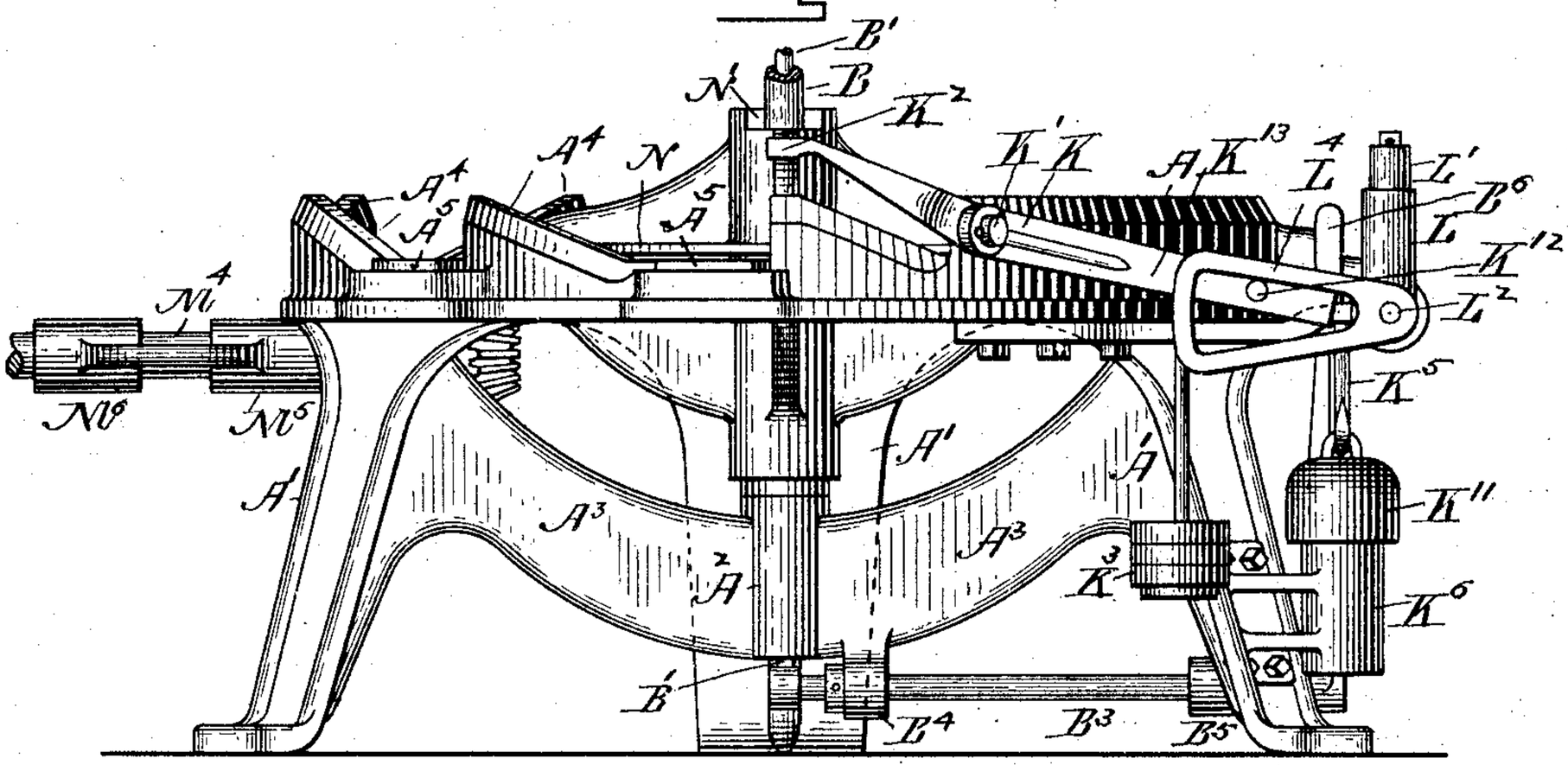

Fig. 6.

WITNESSES:
Frank G. Parker
William A. Parry.

INVENTOR:
William Emery Nickerson

No. 619,834. Patented Feb. 21, 1899.

W. E. NICKERSON.

APPARATUS FOR FILLING BAGS.

(Application filed Feb. 7, 1898.)

(No Model.) 5 Sheets—Sheet 5.

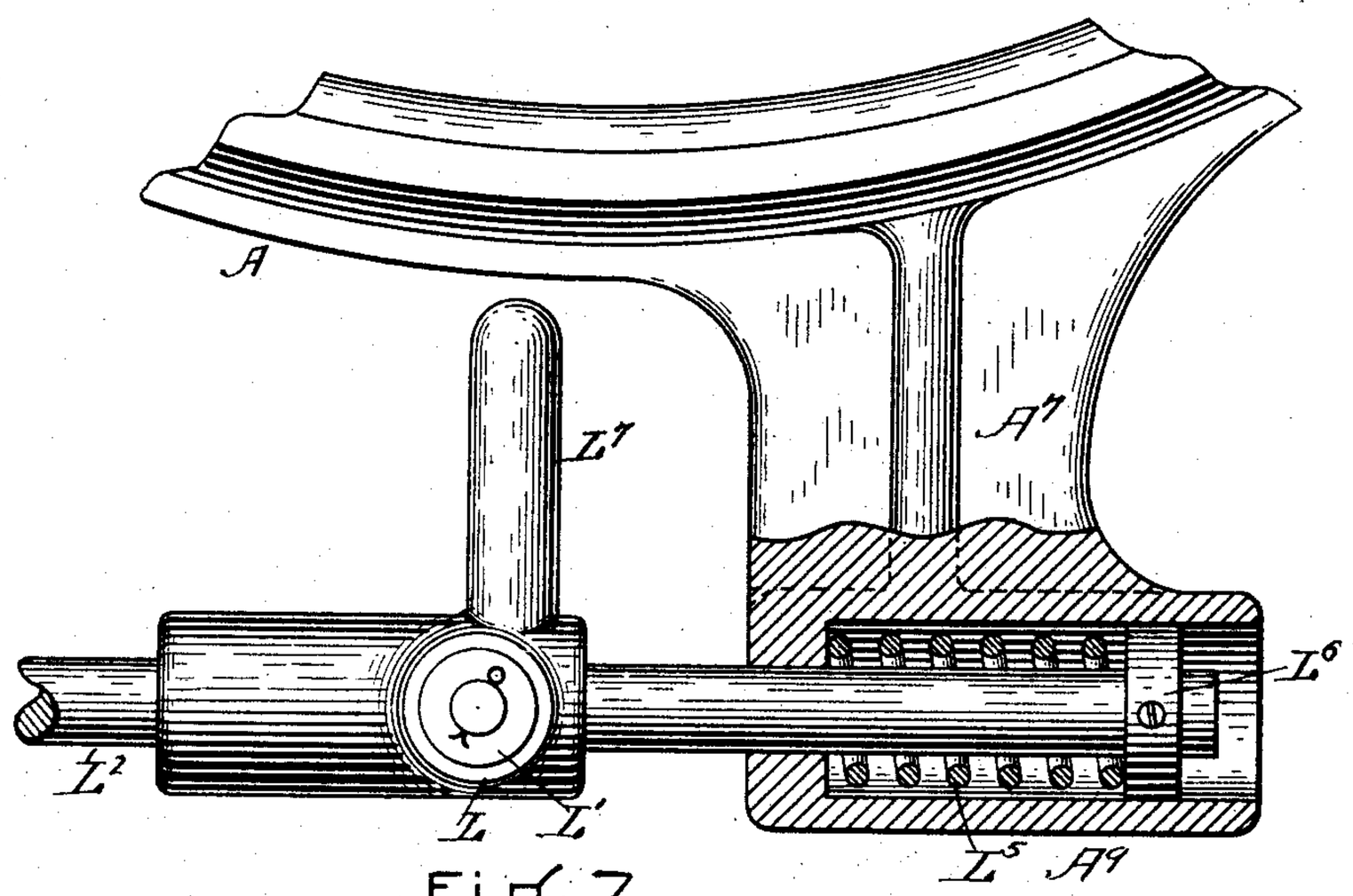

Fig. 7.

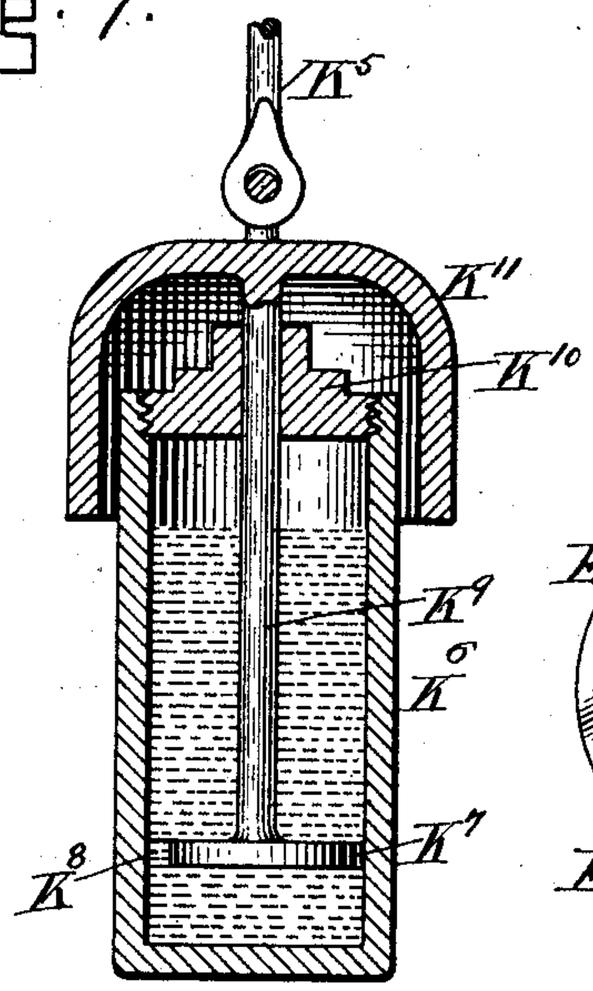

Fig. 8.

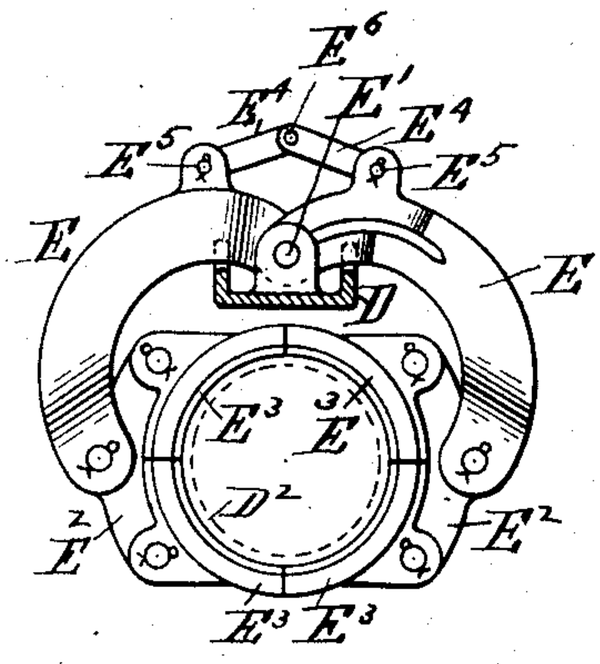

Fig. 9.

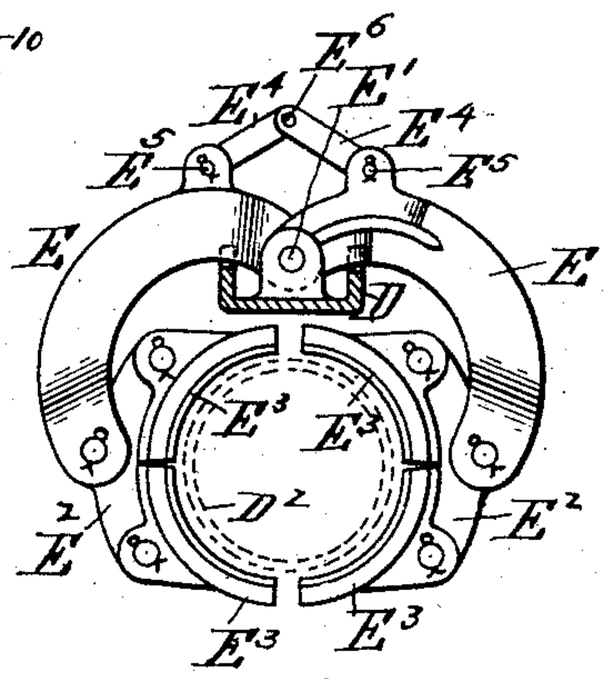

Fig. 10.

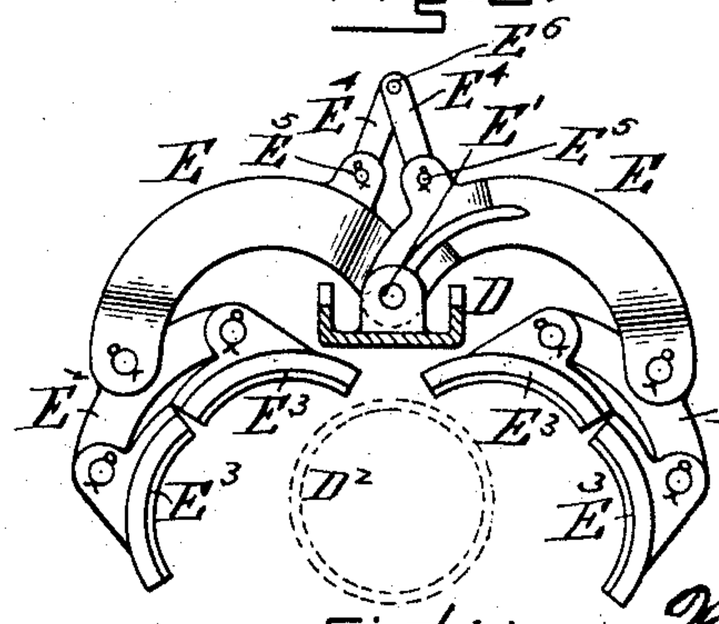

Fig. 11.

Witnesses:
Frank G. Parker
William H. Parry.

Inventor
William Emery Nickerson

UNITED STATES PATENT OFFICE.

WILLIAM EMERY NICKERSON, OF CAMBRIDGE, MASSACHUSETTS.

APPARATUS FOR FILLING BAGS.

SPECIFICATION forming part of Letters Patent No. 619,834, dated February 21, 1899.

Application filed February 7, 1898. Serial No. 669,298. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EMERY NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Filling Bags, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to apparatus for filling bags, and is especially adapted to operate in connection with an automatic weighing-machine. It is designed to receive and hold empty bags, present them for filling, shake down the material introduced therein when required, and finally to convey them to operatives, who sew or otherwise close them up.

It consists, essentially, of a rotating standard to which are attached bag-supporting mechanisms, the standard being mounted upon a suitable base and its rotary motion being controlled by a latch mechanism which allows a limited rotary movement at each introduction of material into an empty bag. Coöperative with these fundamental elements are various supplementary devices adapted to settle the material in the bags, to transport the latter when filled, to prevent the escape of dust, and otherwise to secure the perfect operation of the apparatus.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view of my apparatus in elevation as seen from the left-hand side, the side where the bag is shown as having been dropped upon a conveying-apron being considered the front. This view shows the base upon which the rotary portions are mounted, and attached to this base the latch mechanism is seen with its counterweight and small hydraulic retarder. It also shows at the left one of the bag-supporting mechanisms in position under a discharge-orifice, as of a weighing-machine, and a similar mechanism at the right, from which a bag has been dropped upon a conveying-apron for removal. A third bag-supporting mechanism is visible in the central part of the view with the bag-clamp wide open ready to receive an empty bag from the hands of the operator.

Fig. 2 is a front view and shows, partly in elevation and partly in vertical cross-section, the base-piece and the construction within the rotating standard. It also discloses the method employed of driving the standard by means of friction-wheels and the manner in which the friction is reduced when the rotating portions are arrested by the latch mechanism.

Fig. 3 is a general plan of my apparatus. It exhibits four bag-supporting devices which are independently and movably attached to the rotating standard, being relatively movable in a vertical line as well as partaking of the general rotary motion of the standard. On the left of the figure is seen the plan of a bag-supporting mechanism in the position which it occupies when receiving a charge of material. On the upper side of the figure a similar mechanism is shown in an intermediate position which it occupies while in transition from the loading position to that from which the bag is dropped upon a conveying-apron for removal, the latter being on the right-hand side of the figure. On the lower side of the figure a bag-supporting mechanism is seen with the bag-clamp open ready to receive an empty bag. Centrally in the figure is shown the plan of an irregular cam, which actuates the bag-supporting clamps, allowing the latter to grip the bag or to drop the same, according to their position relative to the cam.

Fig. 4 is an end view of a conveying-apron, showing the supporting framework with slightly-inclined side boards for guiding filled bags while being transported by the apron and regulating-strips to prevent the bag from turning on the apron.

Fig. 5 is a view in plan of the base-piece, latch mechanism, and the upper of the two friction-wheels which drive the rotating standard. The standard itself and the bag-supporting mechanisms are removed in order to fully disclose the base, as seen in plan. This view shows certain cushions of rubber, upon which the bag-supporting mechanisms are allowed to drop after moving up inclines on the base-piece for the purpose of shaking down the material in the bags. The left-hand side of this figure is that part which is located under the filling position of the bags and the right-hand side is next the conveying-apron.

Fig. 6 is a view in rear elevation of the same subject-matter as that disclosed in Fig. 5,

that part of the mechanism shown at the left in Fig. 5 being in front in Fig. 6. This view shows conspicuously the inclines in the base-piece up which the bag-supporting mechanisms move before dropping upon the cushions shown in Fig. 5. It also shows a pivoted arm connected with the latch mechanism, upon which arm the bag-supporting mechanisms each rest in turn while they are in the filling position.

Fig. 7 is a view, enlarged, partly in plan and partly in horizontal section, of a portion of the latch mechanism. It discloses a spring, which cannot be seen in the other views, which prevents undue concussion when the motion of the rotating parts of the apparatus are arrested by the latch mechanism, and also assists in throwing back the latch after its release.

Fig. 8 is a view, mostly in vertical section, of a small hydraulic retarder which is attached to the latch mechanism and prevents a too-sudden release of the rotating parts, whereby spilling is prevented.

Fig. 9 is a plan of a bag-clamp in the closed or gripping position.

Fig. 10 is a plan of a bag-clamp sufficiently opened to drop the bag.

Fig. 11 is a plan of a bag-clamp wide open and ready to receive an empty bag.

Having thus in a general way described the drawings by which my invention is illustrated, I will now set forth in detail the construction and mode of operation of my apparatus as herein exemplified. It is obvious that the construction shown might be considerably varied in many details without departing from the spirit of my invention.

In the drawings, A represents a strong circular base-piece, preferably of iron cast in one piece. It is shown in elevation in Figs. 1 and 6, in vertical section in Fig. 2, and in plan in Figs. 3 and 5. It is provided with legs A′ A′ A′, which support it at a sufficient height from the floor. Centrally within the circular part of the base-piece, but at a somewhat lower level, is a strong hub A^2, Figs. 1, 2, and 6, which is rigidly connected with the base-piece by the spokes A^3 A^3, Figs. 1, 2, 5, and 6. The hub A^2 receives and rigidly holds the vertical tubular shaft or spindle B, Figs. 2, 5, and 6, upon which the rotating standard C, Figs. 1 and 2, is mounted.

The rotating standard C is provided with short horizontally and radially projecting arms, four of which, C′ C′, are located near the top of the standard and are shown in Figs. 2 and 3. Four others of these arms C^2 C^2 are arranged near the bottom of the standard C, two of which are shown in Figs. 1 and 2. These arms C′ C′ and C^2 C^2 serve for the attachment of the movable links C^3 C^3, Figs. 1 and 3, and C^4 C^4, Fig. 1, respectively. The links C^3 C^3 are attached to the arms C′ C′ by and oscillate upon the pins C^5 C^5, Figs. 1, 2, and 3, and the links C^4 C^4 are similarly attached to the arms C^2 C^2 by means of the pins C^6 C^6, Figs. 1 and 2. The links C^3 C^3 and C^4 C^4 connect the upright frames D D, Figs. 1, 9, 10, and 11, of the bag-supporting mechanisms with the standard C, allowing them a limited motion in a nearly-vertical direction and causing them to revolve around the standard as the latter rotates. The links C^3 C^3 and C^4 C^4 are attached to the upright frames D D by the pins C^7 C^7, Figs. 1 and 3, and C^8 C^8, Fig. 1, respectively. The frames D D support at their upper ends by means of the ring-shaped horizontal projecting arms D′ D′, Fig. 1, the funnels D^2 D^2, Figs. 1 and 3, whose lower ends are adapted to have the top of a bag drawn over them and there held by means of a suitable clamping device. This clamping device is shown in side elevation in Fig. 1 and in plan in Figs. 3, 9, 10, and 11. It consists of several coöperating parts, which will now be enumerated and described. First in order are two horizontally-swinging arms E E, Figs. 1, 3, 9, 10, and 11, which are pivoted to the back of the upright frames D D by means of the pins E′ E′, Figs. 9, 10, and 11. The arms E E bear at their outer ends the pivoted equalizing-bars E^2 E^2, Figs. 1, 3, 9, 10, and 11, and these equalizing-bars have pivoted at their ends the quadrant clamp-pieces E^3 E^3, Figs. 3, 9, 10, and 11, which are preferably faced with rubber. The quadrant clamp-pieces E^3 E^3 being pivoted to the equalizing-bars and these bars in turn to the swinging arms E E, a clamping or gripping mechanism results, which is able to hold the bags upon the lower ends of the funnels D^2 D^2 with a uniformly-distributed pressure, thus insuring a dust-tight connection and an even support for the bag. The lower ends of the funnels D^2 D^2 are also provided, preferably, with rubber coverings D^3 D^3, Fig. 1, which serve to increase the effectiveness of the clamp mechanisms in firmly supporting the bags.

The horizontally-swinging arms E E are actuated by means of the links E^4 E^4, which are pivoted to the arms at E^5 E^5, Figs. 1, 9, 10, and 11, the other ends of these links being pivoted upon and actuated by the pins E^6 E^6, said pins being firmly fixed into the tops of the actuating-levers E^7 E^7, which are pivoted upon the pins E^8 E^8, the latter being fixed into the horizontally-projecting arms E^9 E^9, which are rigidly attached to the bag-supporting frames D D. The power to close the clamp mechanisms upon the bags is furnished by the springs F F, which consist of several turns of strong spring-wire around small bushings mounted on the ends of the pins E^8 E^8, which latter project through the bifurcated ends of the rigid arms E^9 E^9 to receive them. These springs are each held at one end by the pin F′ F′, fixed in the bag-supporting frames D D, the other ends of the springs bearing against the pins E^{10} E^{10}, fixed in the levers E^7 E^7. The clamp mechanisms are opened in opposition to the action of the springs F F by means of the drawback-links G G, pivoted to the levers E^7

E^7 at G′ G′ and to the ring-shaped drawback-levers G^2 G^2 at G^3 G^3. The ring-shaped drawback-levers G^2 G^2 swing upon the pins C^5 C^5 and carry upon their top portions the rollers G^4 G^4, mounted upon suitable pins. The rollers G^4 G^4 bear in due turn upon the rim of cam H, which is mounted upon the short upright shaft H′, the latter being firmly fixed into the top of the rotating standard C. The cam H is provided with a horizontally-projecting arm H^2, fixed in the cam-hub H^3. The arm H^2 is connected by a chain H^4 to a foot treadle or lever, (not shown,) whereby the cam is prevented from rotating with the table, and by means of which a limited rotary movement in a horizontal plane may be given it. The rotation of the table causes each of the rollers G^4 G^4 in turn to bear upon the edge or rim of the cam H and by rolling toward the outer portion of the cam open the clamp mechanism. The position of the cam H is so adjusted that when the rotating parts have been brought to rest by the latch L the clamp of the bag-supporting mechanisms, which has come around to the place where the operator for putting on the bags stands, will be wide open to receive a bag, and the clamp on the side of the removing-apron will have opened enough to drop the filled bag which it has been holding. A slight forward rotary movement now given the cam will cause the wide-open clamp to close upon the empty bag by its respective roller G^4 rolling off the end H^5 of the cam. This action can be understood by referring to the view in plan in Fig. 3. Instead of adjusting the cam H so that the filled bag will be dropped on the conveying-apron as the table approaches the position of rest it may, if preferred, be so adjusted that the bag will not be dropped on the apron until the operator gives the cam the forward rotary movement for closing the clamp of the preceding arm upon the empty bag.

The bag-supporting frames D D rest and move upon rollers D^4 D^4 (mounted upon the pins D^5 D^5) at their lower extremities. These rollers, which travel upon the ring-shaped top of the base-piece A, allow the bag-supporting frames D D to freely partake of the rotary motion of the standard C. The deflecting-pieces D^6 D^6, Figs. 1 and 3, serve to guide the movement of the filled bags when they drop upon the removing-apron. The ring-shaped top of the base-piece A on that side over which the rollers D^4 D^4 travel while moving from the filling position to that from which the bags are dropped onto the removing-apron is provided with a series of inclines A^4 A^4, Figs. 3, 5, and 6, and, following each incline, a cushion A^5 A^5, of rubber or other suitable material, firmly attached to the base-piece, the object being that thereby the bag-supporting frames while holding a filled bag are during a movement of the rotating parts gradually raised by mounting the inclines A^4 A^4 on their rollers D^4 D^4 and are then dropped on the cushions A^5 A^5 for the purpose of settling the material in the bags. In the event that the material which is being bagged does not require shaking down the inclines and cushions on the base-piece may be dispensed with. Mounted upon that side of the base-piece which is under the filling position of the bags is the pivoted and counterweighted arm K, which has a limited movement upon the pin K′, Figs. 1, 3, 5, and 6. One part of the arm K inclines upward, terminating in the end K^2, the latter being located directly under the filling position of the bags. The rollers D^4 D^4 of the bag-supporting frames D D roll up the incline of the arm K, and when each roller in turn has reached a point near the end K^2 the movement of the rotating parts is arrested by a latch mechanism, to be described, leaving the roller and its respective bag-supporting frame resting upon the arm K at K^2. The arm K is counterbalanced against the downward pressure of the bag-supporting frames by the counterweight K^3, which is heavy enough to resist the pressure of the frames when they hold only empty bags, but light enough to yield to the pressure of a frame when holding a filled bag, and so allow a downward movement of the end K^2 of the arm K. Attached to the end of the arm K at K^4 by means of the connecting-rod K^5 is a small hydraulic retarder consisting of the cylinder K^6, nearly filled with oil or other suitable liquid, the piston K^7, having in its edge the aperture K^8, the piston-rod K^9, cover K^{10}, and dust-protector K^{11}. The function of this retarder is to prevent the rotating parts from starting too quickly, as will be explained hereinafter. Mounted upon the base-piece A by means of the rigid arms A^6 and A^7 is the latch L, Figs. 1, 2, 3, 5, 6, and 7, carrying at its top the roller L′, mounted upon a suitable pin. The latch L is firmly fastened upon the horizontal shaft L^2, said shaft having both longitudinal and rotary motions to a limited degree and being mounted in the bearings A^8 and A^9, which form the outer ends of the rigid arms A^6 and A^7, respectively. Rigidly mounted upon one end of the shaft L^2 by means of the hub L^3 is the slotted arm L^4, which engages with the pin K^{12}, firmly fixed in the branch K^{13} of the arm K, the said pin K^{12} projecting through the slot in the arm L^4. The longitudinal motion of the shaft L^2 is limited in one direction by the hub L^3 coming in contact with the bearing A^8 and in the reverse direction by the spring L^5, Fig. 7, which surrounds the shaft L^2 between the bearing A^9 and the collar L^6, the latter being rigidly attached to the said shaft. Its rotary motion is limited by the restraining action of the pin K^{12}, operating within the slot in the arm L^4. The latch-roller L′ is adapted to make contact with the small rollers D^7 D^7, mounted on the outer ends of the pins D^5 D^5 of the bag-supporting frames D D, Fig. 1, and thereby arrest the motion of the rotating parts of the apparatus. This contact of the latch-roller L′ and a roller D^7 continues until a discharge of material into

a bag held by a bag-supporting frame, which is in the loading position, causes the end K^2 of the arm K to become depressed, thereby elevating the pin K^{12} and through it the slotted arm L^4, Fig. 6, whereby a limited rotary and outward motion is communicated to the latch-piece L, thus throwing the latch-roller L′ outward and out of contact with the roller D^7 and so removing the restraint on the motion of the rotating parts of the apparatus.

Rotary motion is given to the standard C and attached parts by means of friction-wheels which rotate in a horizontal plane about the fixed upright tubular spindle B. These friction-wheels each consists of a rim whose friction-surface is in a horizontal plane, a hub through which the spindle B passes, and spokes connecting each hub with its respective rim. The weight of the lower of these wheels M, Fig. 2, is sustained by the ball-bearing M′, which in turn rests upon the fixed hub A^2 of the base-piece A. The ball-bearing M′ being of an ordinary and well-known construction does not require further explanation. This lower friction-wheel M is provided on the under side of its rim with gear-teeth, as disclosed at M^2, Fig. 2, into which meshes the pinion M^3, the latter being mounted upon the driving-shaft M^4, housed in the bearings M^5 and M^6 and carrying on its outer end the belt-pulley M^7, whereby a continuous rotary motion is given to the under friction-wheel M. The upper, N, of the pair of friction-wheels rests by its rim on the rim of the under one, M, with preferably a thickness of leather M^8 between them, and when its motion is not restrained rotates with the wheel M. The upper end of the hub of the friction-wheel N is notched at N′, Figs. 2, 5, and 6, to form what is known in the mechanic arts as a "crown-clutch," whereby it locks into the lower end of the standard C, which is correspondingly notched to fit it, so that when the wheel N rotates its motion will be communicated to the standard C, but so also that the standard C may be slightly raised and its weight taken off the wheel N without unlocking the crown-clutch. The apparatus is so designed that when the standard C and attached parts are turning the weight of the standard shall rest upon the friction-wheel N and that when the movement is arrested by the latch L the weight of the standard shall be lifted from the said wheel N and the driving strain relieved. This is accomplished in the following way: Within the tubular spindle B, Fig. 2, is located a vertical rod B′, extending from near the top of the spindle to a point just below the bottom of the hub A^2 of the base-piece A. This rod rests upon a short arm B^2, Figs. 1 and 2, firmly fastened upon the shaft B^3, the latter being mounted in the bearings B^4 and B^5. On the end of the shaft which is opposite the arm B^2 is firmly secured the vertical arm B^6, Figs. 1, 2, 5, and 6, the upper end of which engages with the pin L^7, Figs. 1, 2, and 5, projecting horizontally inward from the latch L. Whenever the movement of the rotating parts is arrested by a roller D^7 coming against the latch-roller L′, the latch L and shaft L^2 are forced ahead as far as the spring L^5 will allow. This forward movement of the latch mechanism causes the pin L^7 to act on the vertical arm B^6 and carry it also forward, which movement, acting through the shaft B^3 and short arm B^2, slightly raises the vertical rod B′, bringing it in contact with the set-screw C^9, Fig. 2, located at the top of the standard C, and thus raise the standard sufficiently to take its weight off the friction-wheel N and so relieve the driving-gear and latch mechanism of the full driving strain while the rotating parts are stopped against the latch. When, on the other hand, the latch mechanism trips by a discharge of material into a bag or otherwise, the latch-rod L is drawn back again by the spring L^5 or by the weight of the standard C, acting through the vertical rod B′ and arm B^2, the shaft B^3 and arm B^6, or through the action of both combined, and the standard C again rests its weight on the friction-wheel N, and the full driving power of the friction-wheels is restored.

The removing-apron consists of an endless belt P, Figs. 1, 3, and 4, running over the roller P′ and driven by gearing. (Not shown in the drawings.) The whole is supported by a wooden framework P^2 and rests upon suitable legs P^3. On each side of the framework are located the slightly-inclined side boards P^4 and P^5, which serve to support in a slightly-inclined position the filled but as yet untied bags while they are being transported by the apron. The bags, if of cloth, are always so placed upon the bag-supporting frame that the seam at the bottom of the apron is parallel to the apron when the bag is dropped upon it, Fig. 1. On one or both sides of the apron are placed the regulating-strips P^6 and P^7, which expose only enough of the apron to allow the bottoms of the bags to rest upon it when the seam of the bag is parallel to it. These regulating-pieces prevent the bag from turning on the apron and may be adjusted to different sizes of bags. By use of the regulating-pieces P^6 and P^7 and side boards P^4 and P^5 there is no difficulty in transporting a filled but untied bag on the apron without spilling, provided it is dropped thereon with the seam of the bag parallel to the apron, as there is considerable stability to the filled bag along the line of the seam, and the bag is supported across the line of the seam by the side boards.

Upon the lower end of the discharge-pipe (indicated by R, Fig. 1) is attached by means of a band of cloth S′ or other flexible material a ring S, of wood or other substance, preferably faced with felt S^2 on the under side. The ring S loosely encircles the lower end of the pipe R, and is so suspended by the cloth band S′ as to be easily lifted a short distance by pressure applied from below. The lower edge of the cloth band is tacked onto

the inside of the wooden ring S, and its upper edge is fastened to the sides of the pipe R by means of the bands S^3 S^3. The function of the ring S and cloth band S′ is to make a sufficiently-tight connection between the discharge-pipe R and the top of the funnels D^2 D^2 when the latter are in the filling position under the said pipe to prevent the escape of dust when material is discharged from the pipe through the funnels into the bags held beneath. As each of the bag-supporting frames D D in due turn approaches the loading position under the pipe R it moves up the inclined part of the arm K to the end K^2, Fig. 1, thus causing the respective funnels D^2 D^2 to rise under the ring S until when the frame has come into the loading position and the movement has been stopped by the latch L the ring S is resting upon the top of the funnel, which has slightly raised and now supports it, forming thereby a dust-tight connection. After a discharge of material into the bag the bag-supporting frame is depressed and the top of its funnel drops out of contact with the ring S preparatory to moving into a new position.

Having now described in detail the various parts of my apparatus and set forth their construction and functions, I will next explain the mode of operation of the apparatus as a whole.

Let it be assumed that the parts are in the positions shown in Figs. 1 and 3, in which there is an empty bag held by a bag-supporting frame and clamp under the discharge-pipe R, a filled bag has just been dropped upon the removing-apron, and a bag also filled is held by the clamp and frame, which are midway between the filling position and that which is over the apron. The remaining bag-clamp (shown in front in Fig. 1 and on the lower side of Fig. 3) is wide open and ready to receive an empty bag. The bag-supporting frame, which is holding an empty bag under the discharge-pipe R, is resting on the end K^2 of the arm K and held in that position by the counterweight K^3. The rotating parts are held from turning by the latch L, of which the roller L′ is in engagement with one of the rollers D^7 D^7, as shown in Fig. 1, and the weight of the standard C is lifted from the friction-wheel N by the vertical rod B′, arm B^6, and intermediate mechanism. The operator now draws the top of an empty bag over the funnel next him, and by means of the chain H^4 and a treadle (not shown) gives the cam H a slight forward rotary movement, and thereby sets the corresponding clamp upon the bag. The apparatus is now ready for a discharge of material into the bag which is under the pipe R. As soon as this discharge takes place the weight of the material which now enters the bag, added to that of the respective bag-supporting frame, overcomes the resistance of the counterweight K^3, causing the end K^2 of the arm K to descend and the pin K^{12} to rise, thereby causing an upward movement of the slotted arm L^4 and consequent outward movement of the latch L and latch-roller L′, freeing the latter from engagement with the roller D^7. The latch L, shaft L^2, and slotted arm L^4 now move back to the limit of the longitudinal movement of the shaft L^2 by the action of the spring L^5 and vertical arm B^6, the latter acting on the pin L^7, thereby allowing the weight of the standard C, by means of the movement of the arm B^6, vertical rod B′, and intermediate parts, to rest on the friction-wheel N. The rotating parts of the apparatus, consisting of the standard C and attached bag-supporting frames, being now relieved from the restraint of the latch L are free to turn and, having the weight of the standard C added to that of the friction-wheel N, proceed to rotate, and so continue until the standard C has made a quarter of a full rotation. This movement carries the bag-supporting frame, which was holding a filled bag in the position intermediate between the loading and the dropping positions, over the removing-apron, upon which it is dropped. The bag just filled is carried to the position vacated by the first-mentioned bag and the empty bag just put on is moved under the discharge-pipe R. As the filled bag leaves the position under the pipe R its supporting-frame drops off the end K^2 of the arm K upon the cushion next in order, and during the rest of its movements from the filling to the dropping positions the charge in the bag is settled by the supporting-frame moving up the inclines A^4 A^4 and successively dropping onto the cushions A^5 A^5. As soon as the latch L is disengaged and the respective roller D^7 has passed by the latch mechanism resumes the position shown in Fig. 1 and is ready to stop the rotating parts on coming in contact with the next roller in order of the series D^7 D^7. The retarder connected with the arm K causes the movement of the arm K to be gradual under the weight of the material discharged into the bag, and thereby keeps the bag under the discharge-pipe R long enough to receive the last portions of the charge, which require a short interval to descend. The rotating parts now again come to rest by the reëngagement of the latch L. During the movement of the bag-supporting frame from the dropping position to the position for putting on of an empty bag the respective clamp is opened by the action of the cam H, as before described. The operator now puts another empty bag on the funnel next him and presses the treadle, (not shown,) which moves the cam H, whereby the clamp is closed and secures the bag. The apparatus is now ready for another discharge, upon which the foregoing movements are repeated, but with parts next in order.

I claim—

1. In an apparatus for filling bags, in combination, the base-piece A, the rotating standard C, the vertically-movable bag-supporting

frames D D, attached to the standard C, and having suitable mechanisms for holding bags, the latch L adapted to hold the rotating parts, means for causing the said standard C to rotate when unrestrained by the said latch L, mechanism whereby the weight of material in a bag releases said latch and necessary connecting and supporting parts, substantially as and for the purpose set forth.

2. In an apparatus for filling bags, in combination, the circular base-piece A, having the inclines A^4 A^4 and cushions A^5 A^5, the rotating standard C, the vertically-movable bag-supporting frames D D attached to and rotating with the said standard C, and having suitable mechanisms for holding bags and adapted to move over the said circular base A, up the inclines A^4 A^4 and then drop on the cushions A^5 A^5, the latch L adapted to arrest the rotation of said standard until the weight of material in a bag causes the release of said latch, mechanism for causing the said standard C to rotate when unrestrained and necessary connecting and supporting parts, substantially as and for the purpose set forth.

3. In an apparatus for filling bags, a bag-clamping device consisting of the following elements viz: the funnels D^2 D^2, the movable arms E E, the equalizing-bars E^2 E^2 pivoted upon the arms E E, the clamp-pieces E^3 E^3 pivoted upon the ends of the equalizing-bars E^2 E^2 respectively, and means for actuating the arms E E, whereby bags may be firmly clamped upon the funnels, by the action of the equalizing-bars and clamp-pieces, with a pressure which is uniformly distributed around the funnel, forming thereby an even support and a dust-tight connection, substantially as and for the purpose set forth.

4. In an apparatus for filling bags, a bag-clamping device consisting of the following parts; a funnel D^2, pivoted arms E E, equalizing-bars E^2 E^2 pivoted upon the ends of the said arms, clamp-pieces E^3 E^3 pivoted upon the ends of the said equalizing-bars, links E^4 E^4, and means for actuating said arms by said links, substantially as and for the purpose set forth.

5. In an apparatus for filling bags, a bag-clamping device consisting of the following parts, the pivoted arms E E, the equalizing-bars E^2 E^2, the clamp-pieces E^3 E^3, the links E^4 E^4, the actuating-lever E^7 suitably connected with and adapted to actuate said links, the spring F adapted to actuate said lever E^7 in closing said clamp, means for drawing the clamp open against the action of said spring when required, and necessary supporting and connecting parts, substantially as and for the purpose set forth.

6. In an apparatus for filling bags, the swinging arms E E having suitable clamp-pieces for holding bags against a funnel, links E^4 E^4, levers E^7 E^7, draw-back links G G, draw-back levers G^2 G^2, cam H, means for actuating the links E^4 E^4 to close the clamps and to operate the said cam and necessary connecting and supporting parts, substantially as and for the purpose set forth.

7. In an apparatus for filling bags, the swinging arms E E, the equalizing-bars E^2 E^2, the quadrant clamp-pieces E^3 E^3, the links E^4 E^4, actuating-levers E^7 E^7, springs F F, links G G, levers G^2 G^2, cam H, and necessary actuating and connecting mechanism, substantially as and for the purpose set forth.

8. In an apparatus for filling bags, in combination, a rotatable standard; bag-supporting mechanism attached to said standard; means for rotating said standard when the latter is not restrained; a latch adapted to arrest the rotation of said standard, said latch having two sets of movements, one set throwing it in or out of engagement for respectively arresting or releasing said standard, and another set caused by the impact of the standard against the latch when its rotation is arrested by the latter and including the return movement of the latch when released; mechanism whereby the movement of the latch due to the impact of the standard when arrested, shall operate to suspend the action of the means for rotating, and whereby the release and consequent return movement of the latch shall cause the means for rotating the standard to be again applied; means for releasing the latch when required, and necessary connecting and supporting parts, substantially as and for the purpose set forth.

9. In an apparatus for filling bags, in combination, the rotating standard C adapted to turn when not restrained by a latch mechanism, the tubular spindle B, the vertical rod B′, short arm B^2, shaft B^3, arm B^6, contact-pin L^7, latch L, friction-wheels N and M, means for rotating said wheel M and necessary connecting and actuating mechanism, whereby the weight of the standard C rests on the friction-wheel N, while it is in motion and is taken off while it is at rest against the latch L, substantially as and for the purpose set forth.

10. In an apparatus for filling bags, in combination, the rotating standard C, and suitable vertically-movable bag-supporting mechanisms adapted to rotate with the said standard C, the circular base A, the movable counterweighted arm K, adapted to support a bag-supporting mechanism, the latch L adapted to arrest the motion of the said rotating standard C, and said latch L being mechanically connected with the said arm K by the pin K^{12}, whereby a discharge of material into a bag supported by the arm K, shall release the said latch L, and necessary driving and connecting mechanisms, substantially as and for the purpose set forth.

11. In an apparatus for filling bags, in combination, the rotating standard C and attached bag-supporting mechanisms, the circular base A, the counterweighted arm K, and a retarder suitably connected with the said arm K, whereby the rapidity of the movement of the said arm may be regulated, the arm L^4 and

pin K^{12}, the shaft L^2, the latch L, means for causing the said standard C to rotate when not restrained by the latch L and necessary connecting and actuating mechanisms, substantially as and for the purpose set forth.

12. In an apparatus for filling bags, in combination, the discharge-pipe R, the ring S, the flexible band S′ attached by its upper edge to the pipe R and by its lower edge to the ring S, the funnel D^2, the vertically-movable frame D supporting the said funnel and attached to a rotating standard, said frame D and funnel D^2 being adapted to have an upward movement as they approach position under the said ring S, whereby a tight joint is formed between the funnel and the ring, and said funnel being adapted to automatically drop away from said ring when the weight of material is in the respective bag preparatory to the movement of the funnel away from under the ring S, substantially as and for the purpose set forth.

13. In an apparatus for filling bags, the conveying-apron P, the side boards P^4 and P^5, and the regulating-strips P^6 and P^7, said regulating-strips being adapted to expose only so much of said apron as will receive the bag when it is placed with its bottom seam parallel with the apron, whereby a filled but open bag may be transported by said apron without spilling and necessary actuating and supporting mechanisms, substantially as and for the purpose set forth.

14. In an apparatus for filling bags, in combination, a rotatable standard, bag-supporting frames independently attached to said standard and admitting of a vertical movement relative thereto, bag-holding clamps attached to said frames, a base surrounding said standard and upon which said frames move and are supported, a latch device whereby the rotation of said standard is restrained or allowed as required, means for causing the standard to rotate when not restrained by the latch, means for releasing said latch when required in order to allow the standard to rotate and bring an empty bag into the filling position, and necessary connecting and supporting parts, substantially as and for the purpose set forth.

15. In an apparatus for filling bags, in combination, a rotating standard, bag-supporting mechanisms attached to said standard, a latch device adapted to restrain the motion of said standard until released, two complementary friction-wheels for rotating said standard when the latter is not restrained by said latch, mechanism connected with said latch and with said standard whereby said standard is lifted off said friction-plates while the motion of the standard is restrained by said latch, and whereby said standard is allowed to rest on said friction-plates when said latch is released and said standard is rotating, and necessary actuating and connecting mechanisms, substantially as and for the purpose set forth.

16. In an apparatus for filling bags, in combination, the rotating standard C, the bag-supporting frames D D having suitable bag-holding clamps, the links C^3 C^3 and C^4 C^4 adapted to connect the standard C with the said frames D D and to allow a limited vertical movement of the latter, the circular base-piece A, a suitable latch mechanism, means for rotating the standard C when not restrained by the said latch mechanism, and necessary actuating and connecting mechanisms, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of February, A. D. 1898.

WILLIAM EMERY NICKERSON.

Witnesses:
FRANK G. PARKER,
WILLIAM H. PARRY.