No. 660,086.

Patented Oct. 16, 1900.

T. L. CAMP.

PACKING MACHINE.

(Application filed Jan. 22, 1900.)

(No Model.)

6 Sheets—Sheet 1

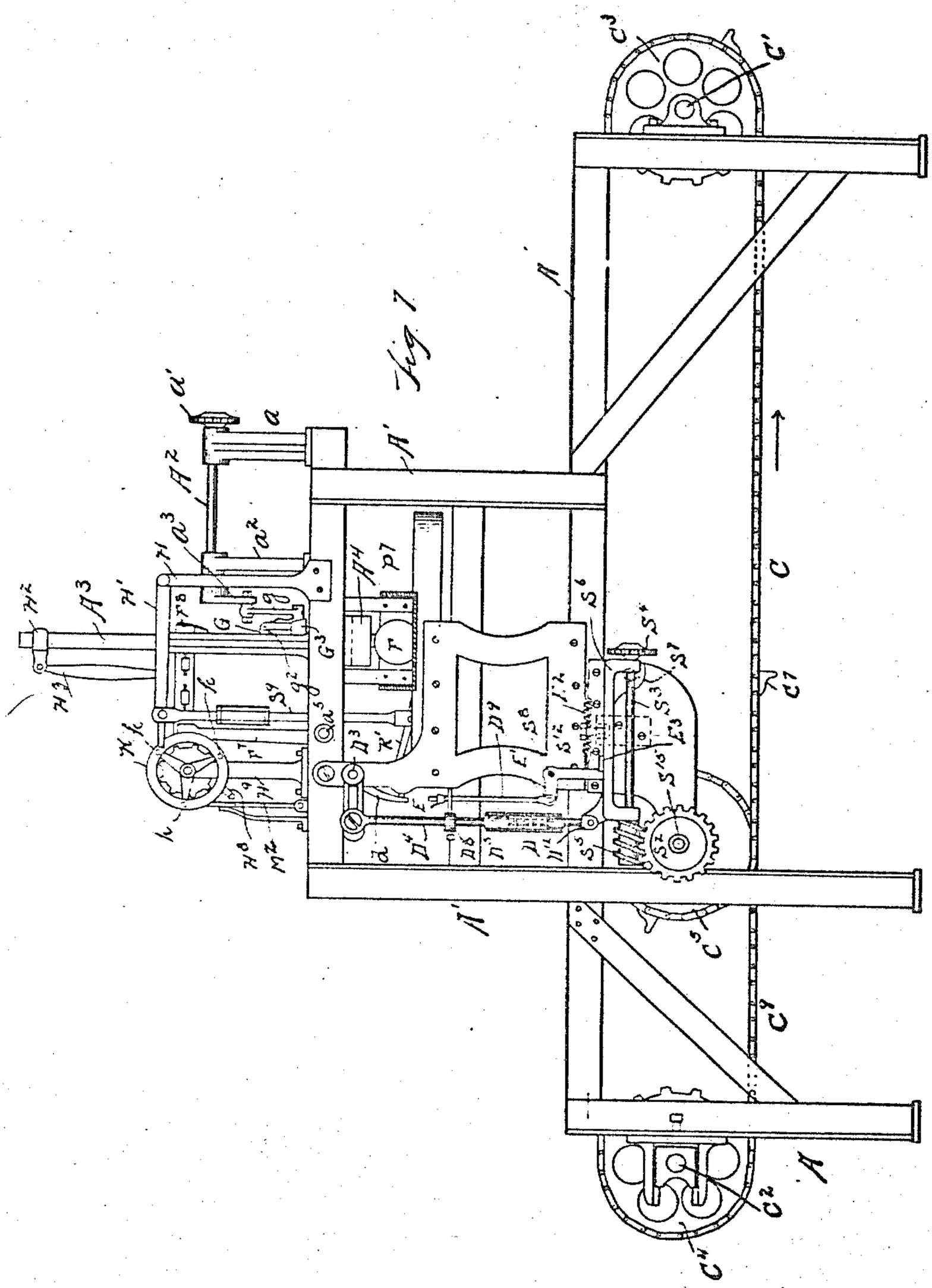

Fig. 1

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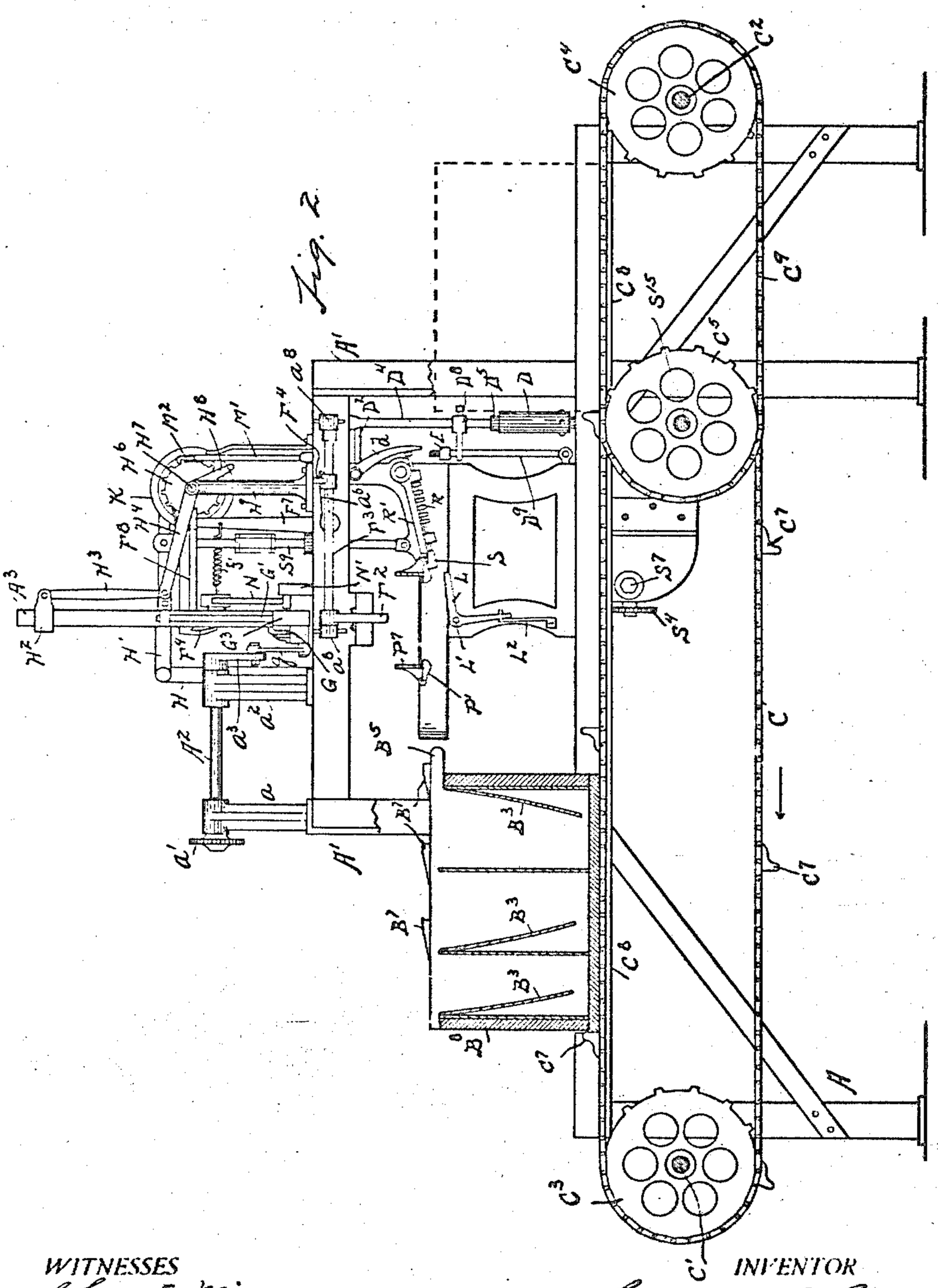
Fig. 2.



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(No Model.) 6 Sheets—Sheet 3.

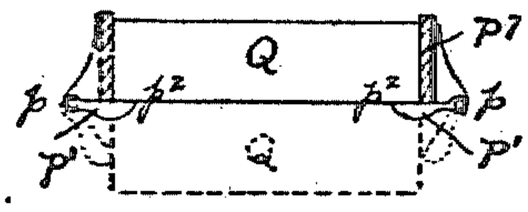

Fig 12.

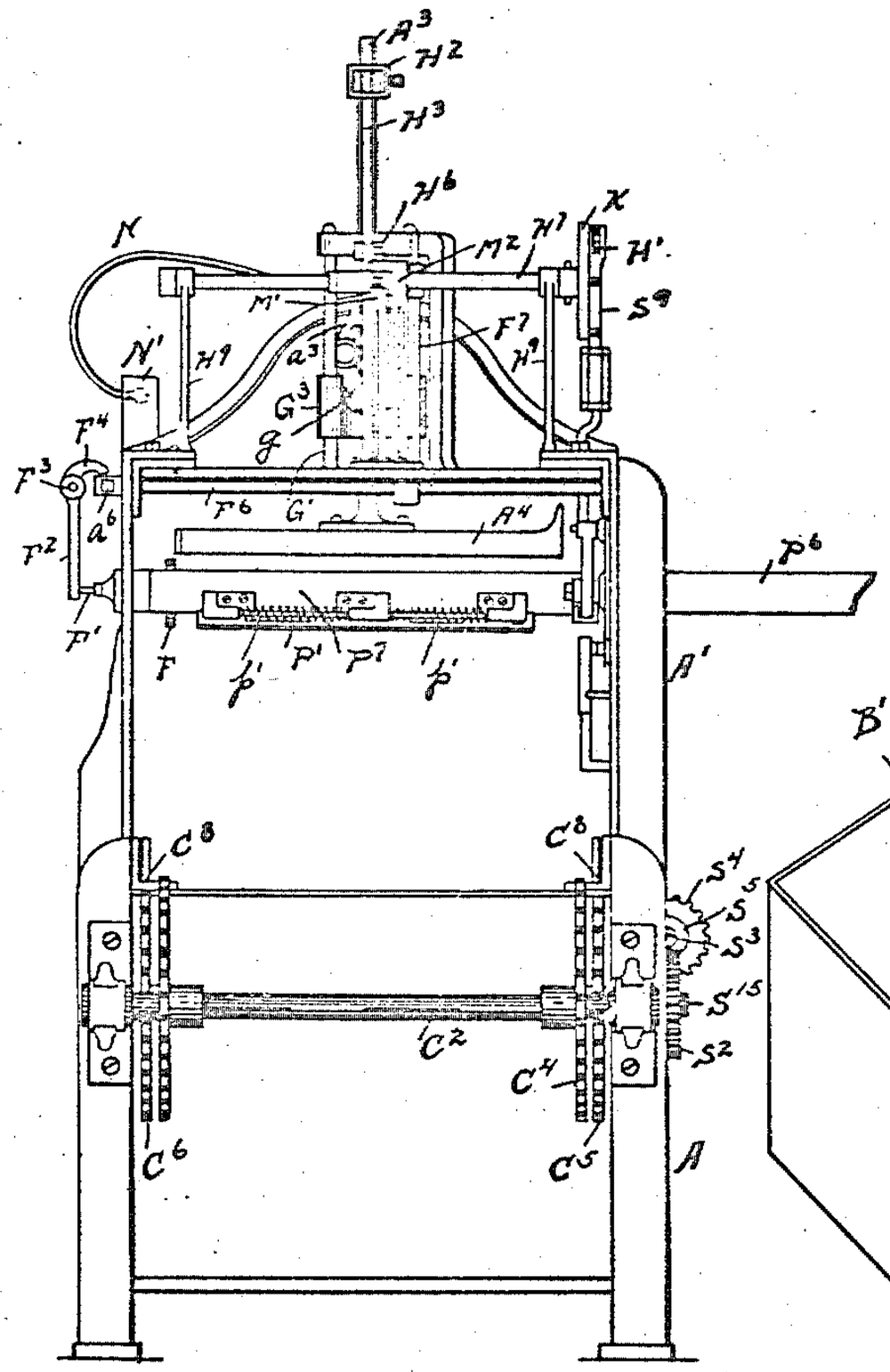

Fig. 3.

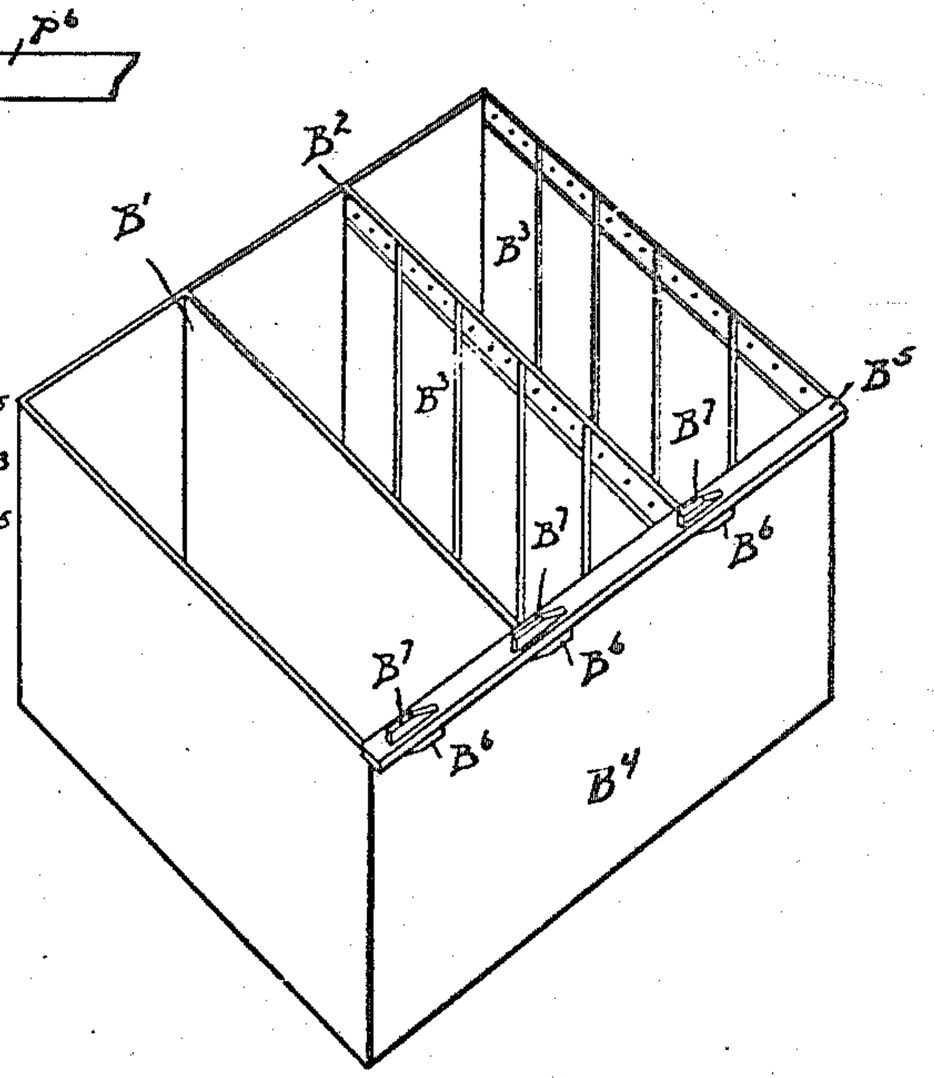

Fig. 4.

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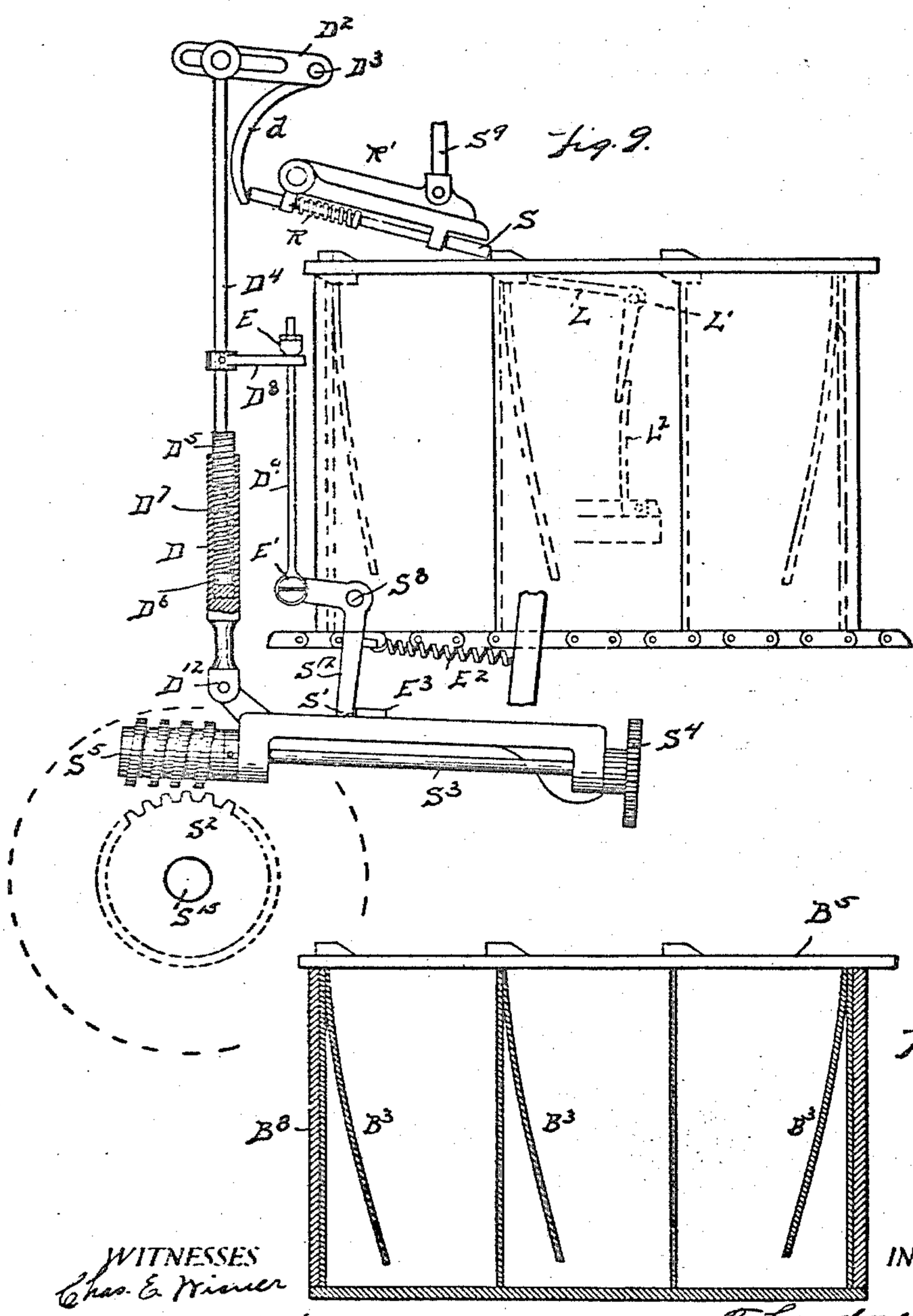

Fig. 9.

Fig. 5.

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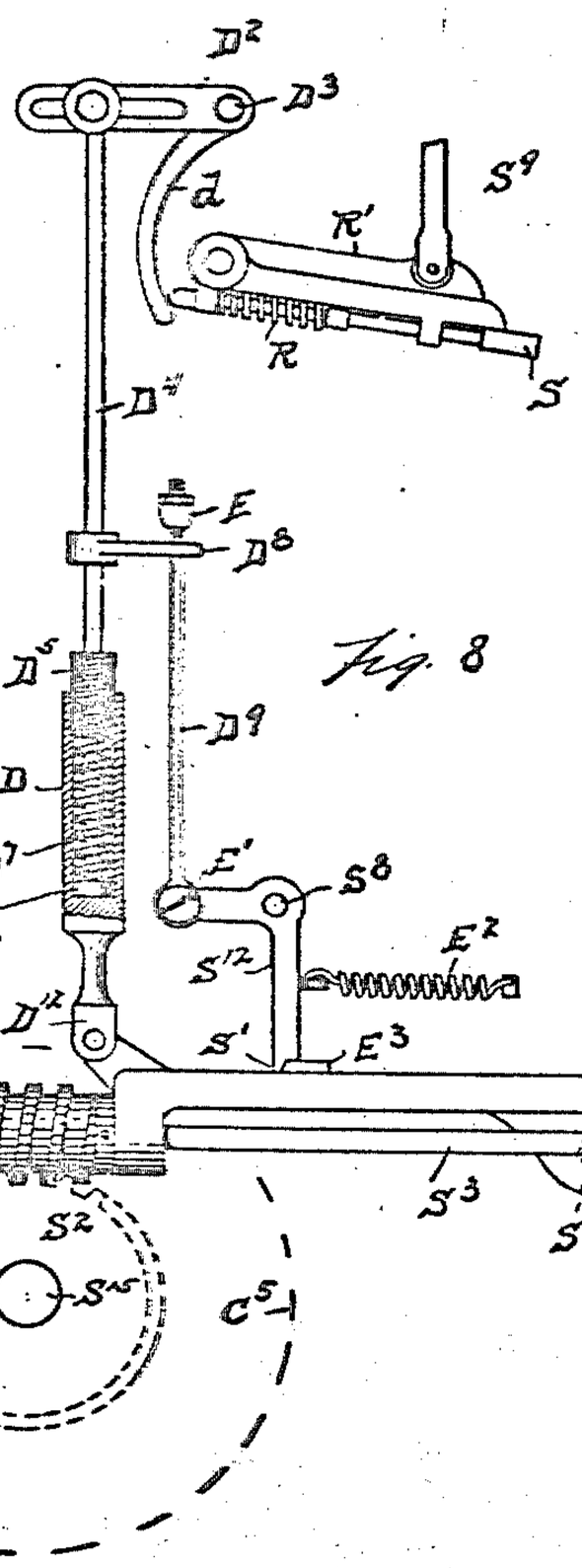

Fig. 8

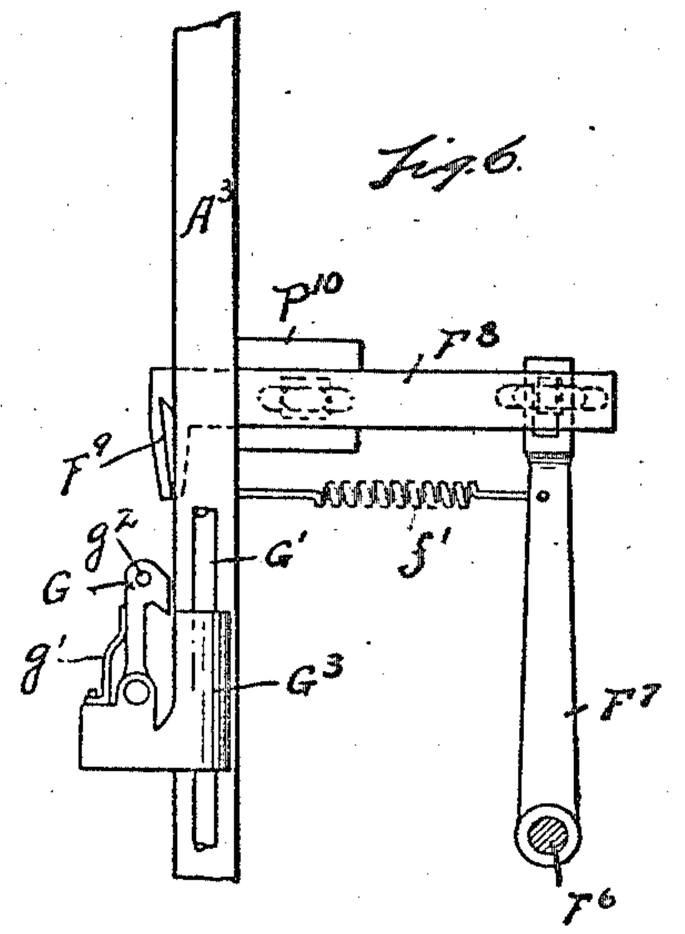

Fig. 6.

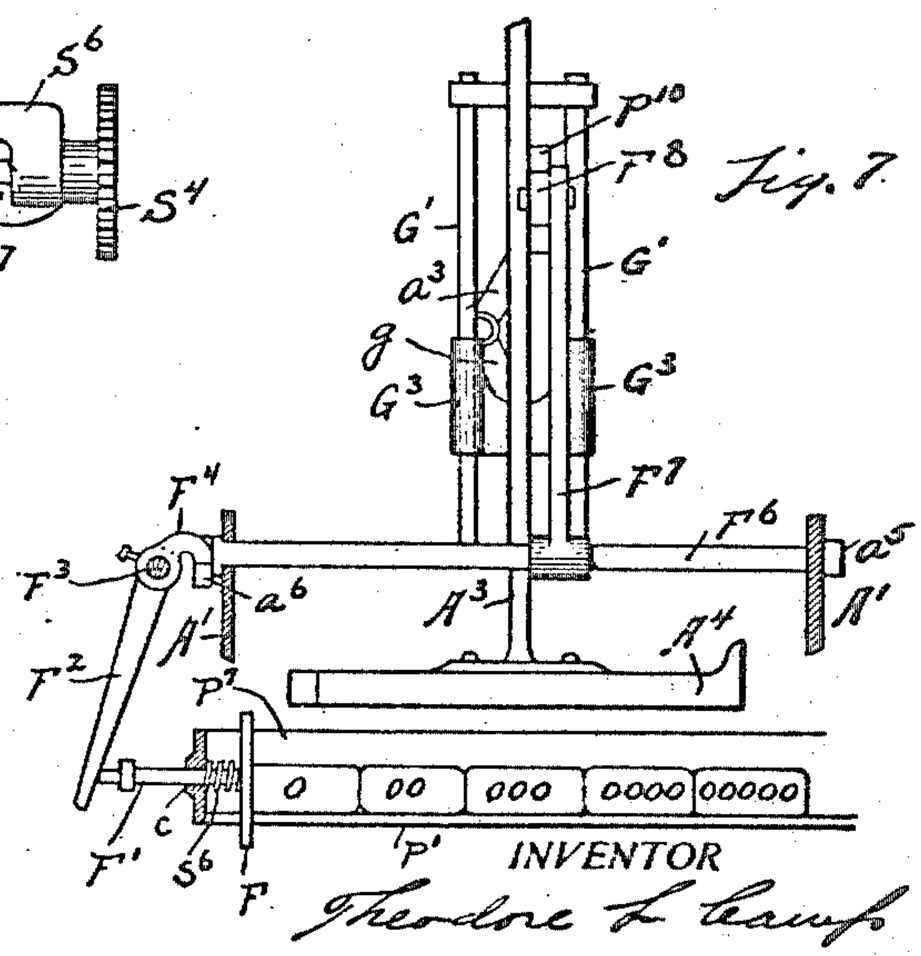

Fig. 7.

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Fig. 10.

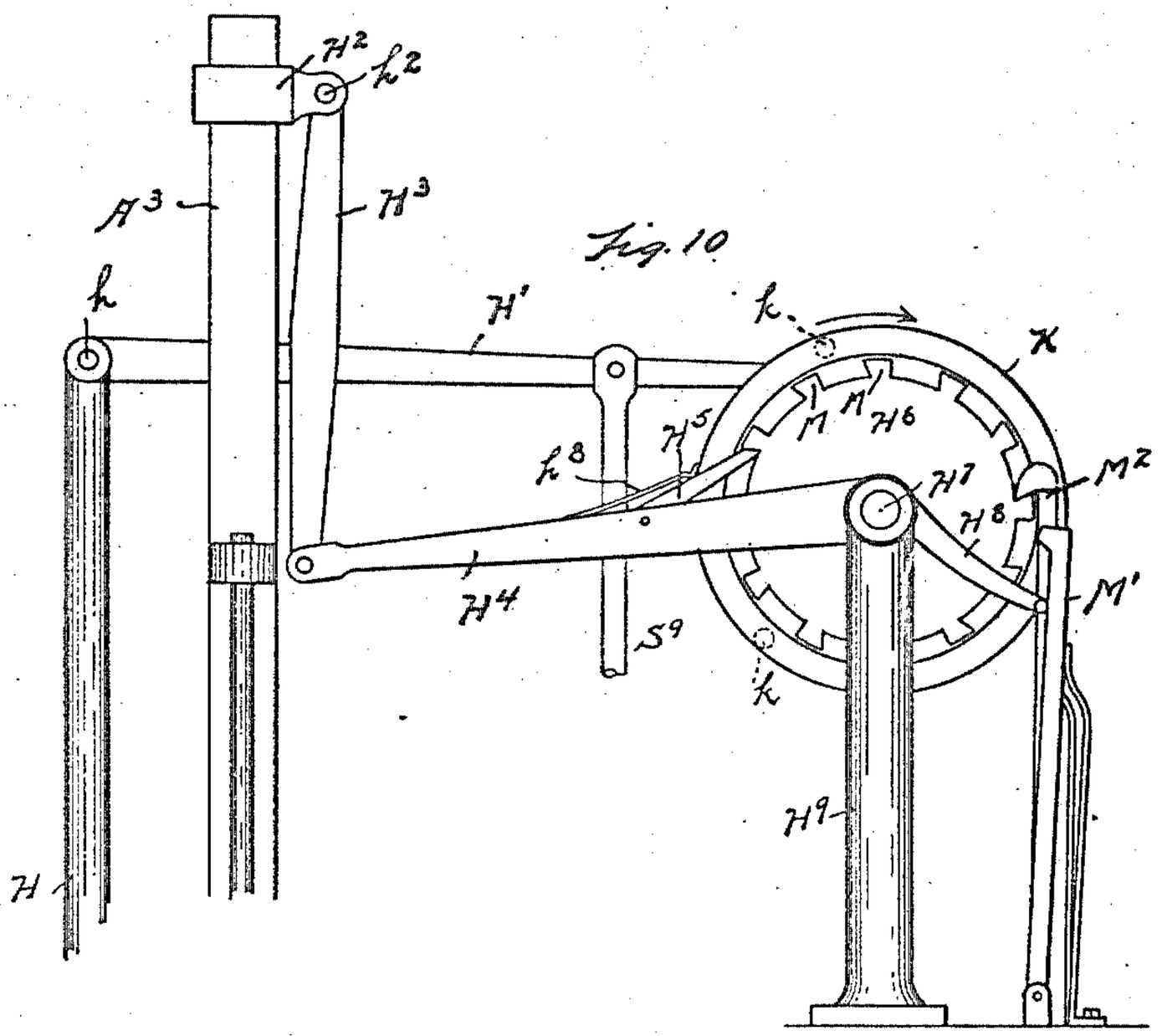
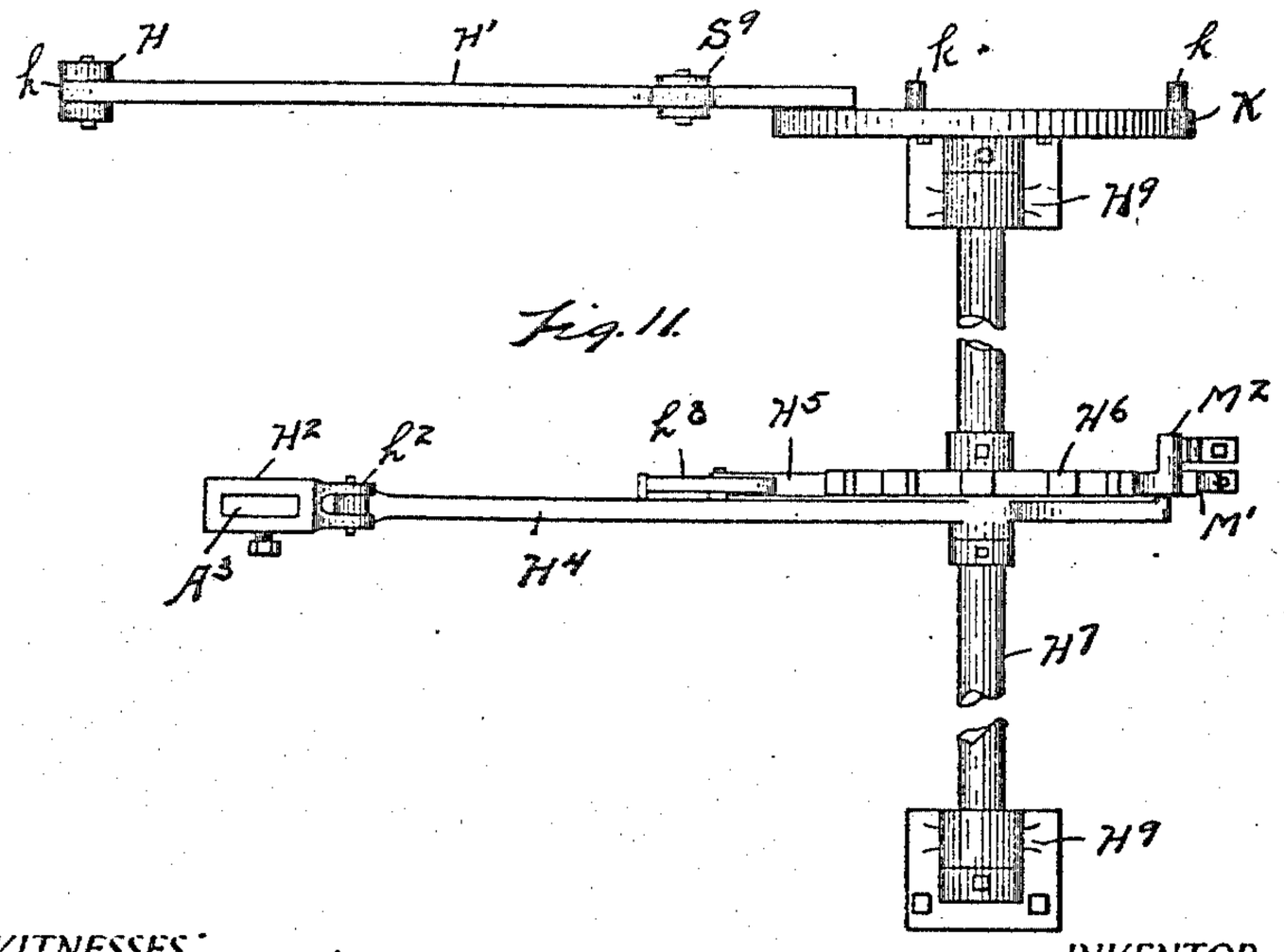


Fig. 11.



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THEODORE L. CAMP, OF CHICAGO, ILLINOIS, ASSIGNOR TO JAMES H. PEIRCE, TRUSTEE, OF SAME PLACE.

PACKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 660,086, dated October 16, 1900.

Application filed January 22, 1900. Serial No. 2,260. (No model.)

To all whom it may concern:

Be it known that I, THEODORE L. CAMP, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Packing-Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to machines for automatically packing articles in boxes, such as cakes of soap, boxes of matches, or any analogous packages; and it consists in the various constructions, arrangements, and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the machine, looking at the left-hand side, considering the right-hand end of the figure as the front of the machine, to which boxes to be filled are introduced, and the left-hand end being the rear, from which they are delivered filled for the purpose of closure and shipping. Fig. 2 is a view of the opposite or right-hand side, the left-hand end of the figure being the front of the machine. Fig. 3 is an elevation of the rear end of the machine. Fig. 4 is a perspective view of a skeleton or honeycomb box by means of which the articles are packed in shipping-boxes. Fig. 5 is a sectional view of the honeycomb packing-boxes inside of a shipping-box. Fig. 6 is a detail of tripping mechanism hereinafter described. Fig. 7 is a detail view of the packing-plunger and also of the plunger mechanism actuating the tripping mechanism. Fig. 8 is a detail of the box-moving mechanism. Fig. 9 is a detail view of the mechanism by means of which the boxes to be filled are automatically caused to move forward to the filling or packing position as well as being fed into and delivered from the machine. Fig. 10 is a detail of a portion of the mechanism which governs the operation of the mechanism shown in Fig. 9. Fig. 11 is a view of the mechanism operated by the mechanism shown in Fig. 10. Fig. 12 is a sectional view of the chute from which the articles are forced into the packing-box.

Similar letters refer to similar parts.

In the drawings, A indicates the main frame of the machine.

A′ is a supplemental frame rigidly attached to the main frame A. Upon one end of the frame A′ is erected a support a, in which is journaled a shaft A^2. Upon the end of this shaft is a sprocket-wheel a', which is continuously driven by any suitable source of power, but preferably by a sprocket-chain, for the reason that it does not slip, it being essential that all the parts should be driven in exact relations. This chain is not shown, because the manner of driving is immaterial to the invention, provided it be by exact means, and such constructions are very common. The opposite end of the shaft A^2 is journaled in a standard a^2 and carries at its extremity a crank a^3. Pivoted upon the crank-pin of this crank is a connecting-rod g. The opposite end of g is connected to and operates a reciprocating block G^3. (See Figs. 6 and 7.) This block reciprocates upon the ways G′ G′, which are fixed upon the frame of the machine and which are necessarily rigid. The block or cross-head G^3 carries a hook G, pivoted thereto and controlled by a spring g'. Upon the angle of the hook G and projecting therefrom is a pin g^2. Between the ways or gallows-frame G′ G′ is a stem A^3, which reciprocates perpendicularly in suitable ways. The lower end of this stem carries a rectangular plunger A^4, as shown in Fig. 7 and as hereinafter described, of the proper size to cover any assignable number of packages to be placed in the box. Five of these are shown in this figure, as O, OO, OOO, &c.

Upon the stem A^3 is fashioned a spur F^9, over which the hook G is adapted to engage, the downward reciprocations of the cross-head G^3 intermittently drawing down the stem A^3, and thus carrying with it the plunger A^4 for purposes hereinafter described.

Upon the guide-frame is located another guide P^{10}, in which reciprocates a guard F^8. This guard projects in close proximity to the spur F^9 upon the stem A^3 and also in such relation to the hook G that the pin g^2 thereon rides up upon the guard, and therefore it prevents the hook from engaging the spur F^9 until the guard is withdrawn. By this means the continual rotation of the shaft A^2 and the reciprocations of the cross-head do not com-

pel the descent of the stem A^3 and its plunger-head A^4 only at such reciprocations as may be determined upon by the further construction and operation of the machine, and this is determined by the withdrawal of the guard F^8. The withdrawal of this guard is accomplished by a swinging arm F^7, adjustably pivoted thereto and controlled by a spring f', the tendency of which is to restore the guard F^8 to the position shown in Fig. 6, which is a view looking toward the left-hand of Fig. 7. The arm F^7 is fixedly attached to a shaft F^6, which is journaled in the subframe A' upon either side thereof, as shown at A^5. At the left-hand side of Fig. 7 is a bell-crank a^6, attached to shaft F^6. This is more clearly shown in Fig. 2. Arranged longitudinally with the frame A' and upon the right-hand side of the machine, as shown in Fig. 2, is a crank-shaft F^3, which rotates in appropriate bracket-journals attached to the frame and shown at a^8 a^8. To this shaft is fastened a finger-arm F^4, which is adapted to come in mechanical contact with the outer end of the arm a^6 and depress it, and this depression of the arm a^6 by virtue of its attachment to and through the shaft F^6 rocks the arm F^7 backward, withdraws the guard F^8, and permits the hook G to engage in the spur F^9 upon the stem A^3. The crank-shaft F^3 is operated by means of the arm F^2 attached thereto, which in turn is operated by a plunger F', the outer extremity of which is constantly in contact with the lower end of the arm F^2. The opposite end of the plunger carries a disk F. The plunger operates in ways *c* in the end of a box or chute P^7, into which the articles to be packed O, OO, OOO, &c., are fed, the foremost of which coming in contact with the disk pushes it outward and, as shown in Fig. 7, thus operating the stem F', forcing the plunger back against the spiral spring s^6, which returns it to its normal position when the means of compression are removed, and thus operating the arm F^2. It results, therefore, that when the articles are in proper position to be delivered through the chute to the box below they operate the plunger F' and by means of the arm F^2 rotate the shaft F^3, which in turn rotates shaft F^6 through the connections, withdrawing the guard F^8. The hook G thereby engages the spur F^9 upon the stem A^3, and it is pulled down by the reciprocation of the cross-head G^3, carrying the plunger, which forces the articles to be packed down into the honeycomb box to the extent of the descent of the plunger A^4, which is governed by the throw of the crank a^3 upon the shaft A^2. The cross-head and plunger are returned by the spring N, one end of which is rigidly fastened to the machine at N', and the outer free end comes underneath or is attached to the sliding block G^3. The cross-head G is brought down against the tension of this spring and is raised or returned by it, as stated. These operations are repeated until the compartment of the box is filled, as hereinafter described. When filled, there is a requisite that the box shall be moved forward and a new compartment brought forward in order that it may be filled in turn, &c. The mechanism whereby this is accomplished is shown in detail in Figs. 9, 10, and 11. Upon the upper end of the stem A^3 is attached a block H^2. Pivoted to this block at h^2 is an arm H^3. This arm is pivoted to a swinging arm H^4, and this actuates a shaft H^7, to which it is attached. A continuation H^8 of the arm H^4 actuates a spring-pawl M'. Upon the shaft H^7 is fixed a ratchet-wheel H^6 of somewhat peculiar construction and in close proximity to the swinging arm H^4, the shaft H^7 forming merely a pivot upon which the swinging arm H^4 turns. It does not therefore turn with the swingings of that arm which corresponds with the reciprocations of the stem A^3. Upon the arm H^4 is fastened a pawl H^5, controlled by a spring h^8. These engage peculiarly-shaped teeth M M upon the periphery of the wheel H^6. A spring-pawl M^2 prevents the wheel from rotating in an opposite direction to the arrow, whereas the reciprocations of the arm H^4 compel the ratchet H^6 to turn in the direction of the arrow through the space of one tooth at each movement. In order to prevent an overthrow of the wheel H^6, there is the spring-pawl M', which is allowed to engage a tooth when the turning of the wheel is compelled by the rising of the outer end of the arm H^4 and the withdrawal of the arm H^5 from contact with the pawl M', the head of this pawl dropping in advance of a tooth, and thus preventing the wheel from rotating beyond the proper position. When the parts are in proper position for rotation, the arm H^8 throws out the pawl M', as already stated, and thus permits the wheel to rotate; but this pawl acts as a back-stop, and the pawl M^2 engages the teeth by slipping over it at the same instant at all times, except when the wheel is allowed to rotate it is held by one of its teeth being firmly engaged between the back-stop M' and the pawl M^2. The shaft H^7 is journaled in bearings attached to the frame at H^9 H^9 and carries at its outer extremity a wheel K, upon the outer face of which and perpendicular to the plane thereof are pins *k k*. These pins lift and operate a spring-arm H', to which is pivoted a connecting-rod S^9, the opposite end of the rod H' being journaled at *h* in a standard H.

It is obvious by considering this mechanism thus far described that the cross-head G^3, which continually reciprocates, does so without connection with the stem A^3 until by the delivery of articles in the chute to be packed, as shown in Fig. 7, the hook G upon the cross-head engages the stem A^3 in the manner described, and the stem thereby is compelled to descend, carrying with it the plunger A^4, which also carries down the articles O, OO, OOO, &c., to be packed. Every descent of

the plunger rotates the ratchet-wheel H⁶ to the distance of one of its teeth, and this actuates the wheel K to the corresponding extent. If, therefore, the pins *k k* are so spaced that five teeth come between them—in other words, five strokes of the stem A³—they can be arranged so that for each five strokes of the stem A³ the spring-arm H′, carrying the connecting-rod S⁹, will be actuated once. If, therefore, there were five layers in a box of packages O, OO, OOO, &c., to be packed, when the five layers were completed the connecting-rod S⁹ would be actuated by the mechanism hereinbefore described, and if the connecting-rod S⁹ be now connected to proper mechanism for actuating a delivery of the boxes the distance of another compartment it will be then carried forward and be ready to receive another series of packages, which will complete the filling of that compartment, and thus the operation could proceed indefinitely. I will now describe the mechanism which effects this connection and result. As shown in Figs. 8 and 9, the lower end of the connecting-rod S⁹ pivotally connects with a pivoted frame R′, pivoted to the side bearings of the frame. The lower side of this frame carries in appropriate ways a reciprocating plunger S, controlled by a spring R, which surrounds the stem of the plunger S and is compressed between a fixed part on R′ and a nut on the plunger and which tends to maintain the plunger in the position shown in Fig. 8; but when the plunger comes in contact with any one of the lugs B⁷ on the frame of the honeycomb box the spring is compressed and the plunger takes the position shown in Fig. 9. The extremity of this plunger comes in contact with a swinging arm *d*, attached to a rocking shaft D³, properly journaled, and which in turn actuates another swinging arm D². Fixed thereon, adjustably pivoted and attached to the swinging arm D², is a stem D⁴, and adjustably attached to the stem D⁴ is an arm D⁸. At the lower end of the stem D⁴ at D⁵ is a guide-block and abutment against which impinges a spiral spring D⁷, held in a case D. The lower end of the stem D⁴ carries a head D⁶, upon which the spring rests and by which it is compressed. The guide-block D⁵ being rigidly fixed in the case D, it is obvious that if the case be firmly held in any position the raising of the stem or rod D⁴ would compress the spring between the guide-block D⁵ and the head D⁶. The case D is pivotally attached to a frame S⁶, which is pivoted at S⁷ to a bracket attached to the main frame A. In the frame S⁶ is journaled a shaft S³, upon which there is fixed a sprocket-wheel S⁴ at one end and a worm-gear at the other end. The worm-gear intermittently engages in a gear-wheel S², fixed upon a shaft S¹⁵, which is journaled in bearings in a bracket attached to the frame A′. The spur D⁸ upon the rod D⁴ carries at its outer extremity by a slip connection controlled by a screw-nut E a stem D⁹. This is pivoted at E′ to rock-shaft S⁸, which is also journaled in a bracket upon the main frame. Extending from the rock-shaft downward is an opposite arm S¹², controlled by a spring E², which puts a constant tension upon the arm S¹². Upon the frame S⁶ is a block E³, the lower end of the swinging arm S¹² at S′ being notched to fit the edge of the block, which is so constructed as to be adapted to engage the notch when the worm-gear S⁵ engages the worm-wheel S², as shown in Fig. 8, and thus forms a trigger-stop.

To return to Fig. 11, when the rotation of the pin-wheel K, carrying the pins *k k*, is such that one of the pins comes underneath the extremity of the arm H′ the next succeeding partial revolution of the wheel of one notch caused by the ratchet acting on the ratchet-wheel lifts the outer end of the arm H′, which raises the rod S⁹. This in turn raises the arm R′, carrying the plunger S, which is instantly thrown forward by the spring R. The arm D² descends by reason of its weight, which had been resisted by the plunger S in a manner hereinafter described. This brings the worm-gear into gear with the wheel S², and it is locked in that position by the trigger-action of the arm S¹² acting upon the block E³ on the frame S⁶. The sprocket-wheel S⁴, being continuously driven, at once commences to rotate the wheel S² and continues its rotation so long as the worm-gear is in position.

It will now be necessary to turn to another feature of my invention.

In Figs. 4 and 5 I have shown the box which I employ and which has heretofore been designated as a "honeycomb" box. It consists of thin metal sides and has an open bottom. In the box and dividing it into equal spaces are two partitions B′ B². Upon the upper end and one edge of the box at right angles to these partitions is located a bar B⁵, firmly attached to the wall of the box. Upon the bar B⁵ are firmly attached lugs B⁷ B⁷. Upon the under side of the bar, which projects out beyond and over the side of the box, are counter-lugs B⁶ B⁶. The wall of the honeycomb box is marked B⁴. Riveted to the partitions B′ and B² and to two sides of the walls of the box are thin sheet-metal springs B³ B³. They are shown in Fig. 5 in section, with the side wall of the honeycomb box removed, leaving the ledge B⁵ and the cross-walls with springs. (Shown in section.) The springs are shown in their normal position. The honeycomb box fits inside of a common packing-box B⁸, (also shown in Fig. 5 in section,) from which it is removed after the delivery of the whole assemblage containing the articles packed from the machine, as hereinafter stated. Journaled to the main frame of the machine A are shafts C′ C². These each carry a pair of sprocket-wheels C³ C⁴, it being understood that they are alike, one each upon opposite sides of the machine, a pair upon each shaft. Upon the shaft S¹⁵ are fastened a pair of sprocket-wheels C⁵ C⁶, each of said pair C⁵ C⁶ being upon the same shaft as the worm gear-

wheel S^2 and therefore travel with it. Encircling the sprocket-wheels C^8 and one of each pair of the sprocket-wheels C^5 C^6 are carrying sprocket-chains C, which intermittently travel in the direction of the arrow shown in Fig. 1, while carried by the wheel C^2 and the opposite one of each pair of sprocket-wheels C^5 C^6 is another pair of sprocket-chains C^9, which also intermittently move, as hereinafter stated. These sprocket-chains have attached to proper links thereof lugs or projections C^7 C^7. The upper part of the band of the sprocket-chain travels upon ways C^3, formed on the main frame. The office of these sprocket-chains is to carry the packing-box already described, in which is inserted the honeycomb box, as shown in Fig. 2. The sprocket-wheel S^4 being put continuously in motion operates the worm S^5, as stated. This in turn when engaged with S^2 operates the worm-wheel S^2 and by means of the sprocket-wheels C^5 C^6 on the shaft S^{15} of the worm gear-wheel drives the sprocket-chains in the direction indicated by the arrow in Figs. 1 and 2. So long as the worm S^5 is in engagement with the worm-gear S^2, the sprocket-wheel S^4 being continuously driven, it follows that the sprocket-chains would be also continuously driven whenever the worm-gear is in connection and would stop whenever the worm was disconnected. This connection between the worm and worm-gear would be established at all times except under conditions hereinafter stated. A box being placed upon the ways C^8 would by the movement of the sprocket-chains, as described, be finally caught and actuated by a pair of the projections upon each chain C^7 C^7. It would be carried forward to a position underneath the plunger A^4, when the foremost lug B^7 (see Fig. 4) would come in contact with the plunger S, thus compelling the plunger to move against the arm *d* and throw the rock-shaft D^3 and the arm D^2, raising the stem D^4, causing the arm D^8 to slide upon the stem D^9 until it engaged the nut E, and until it did engage the nut E the trigger-arm S′ would be in contact with and over the block E^3, whereby the arm S^6, shaft S^3, and worm S^5 would be held down in contact with the wheel S^2, as hereinbefore described. During the time of the raising of the arm D^2 and its connecting-stem the spring D^7 is compressed by means of the nut D^6 on the end of the stem D^4, and when the arm D^8 comes in contact with the nut E a continuing upward movement operates the arm E′ and the rock-shaft S^8, and thus disengages the trigger S′ from the stop-block E^3. The instant of disengagement results in the spring D^7 acting against the plug D^5 in the case D and raises, through the connection D^{12}, that end of the frame S^6 which carries the worm S^5, thus instantly disengaging the worm-wheel from the worm-gear, and necessarily at that instant the further progress of the box is arrested by the stoppage of the driving sprocket-chain. This is shown in outline in Fig. 9.

Upon the side of the main frame at L′ is pivoted a dog L, controlled by the spring L^2, also attached to a bracket upon the main frame. The office of the dog L is to instantly engage the under lug B^6. Thus the box is locked in such receiving position between the lugs B^7 and B^5. This dog and spring are shown in dotted lines in Fig. 9. The position of the box is now such that its advanced compartment is directly underneath the plunger A^4 and registers with it. Underneath the plunger A^4 is a chute or framework. (Shown in section in Fig. 12, also in Fig. 2.) Leading thereto from the side of the machine is a trough P^6. This trough is for the purpose of taking into the machine the articles to be packed, and it leads directly into the chute P^7, which is also shown in section in Fig. 12. The lower edges of the chute P^7 at *p p* are broadened slightly outwardly, and pivoted thereto are narrow strips P′, controlled by springs *p′ p′*, which keep the strips P′ P′ horizontal and extending inward from the inner wall of the chute sufficiently far, as shown at p^2 p^2, to form a support for any article therein to be packed, an article being shown in Fig. 12 as Q. These spring ledges or strips P′ P′ form a continuation of the bottom of the trough P^6, and as articles are fed regularly into the trough P^6 and pushed along a number of them arrive in the chute P^7, five of which are shown in Fig. 7 as O, OO, OOO, &c. As already stated, when the proper number have arrived in the chute and placed upon the spring-strips the advanced article, as O, comes in contact with the plunger F and sets in motion the mechanism whereby the reciprocation of the cross-head G^3 is enabled to force down the plunger A^4, which coming in contact with the upper surface of the articles that are in the chute forces those articles below the chute, opening out the ledges P′ P′ to permit their passage into that compartment of the box which is directly underneath the chute and registers with it. Instead of being forced clear to the bottom of the box they are held by the spring sides of the honeycomb box, so that on the stoppage of the downward motion of the plunger the articles are held in the position as left by the plunger or in proper position. On the plunger being withdrawn by the upward motion of the stem A^3, which is done by a spring N, attached to the top of the frame at N′, the articles remain in position until the second layer is forced down. Filling the second layer forces the first layer just the distance equal to the thickness of the first layer toward the bottom of the box. The number of layers in the box being proportioned to the distance between the pins *k k* upon the wheel K, attached to the shaft of the ratchet-wheel H^6, it follows that, say, four strokes of the plunger will be made and four layers of articles to be packed will be forced into a compartment before the mechanism set in motion by the next succeeding pin—to wit, the swinging arm H′, the stem H^9, and its

connecting mechanism—will be actuated, and when this is actuated by means of this connecting mechanism the worm S^5 will be dropped into position and locked therein in connection with the worm-wheel S^2, whereupon by the mechanism hereinbefore described the sprocket-chains C and C^9 will be set in motion until the next lug B^7 upon the honeycomb box is brought into contact with the plunger S, attached to or connected with the swinging arm R', and this connection will again detach the worm-wheel and worm and the box will stop to enable the second compartment of the honeycomb box to be filled in the manner already described, and this process is repeated so long as there are any boxes of the kind and construction carried by the chain C. It follows, therefore, that so long as boxes of this description are fed into the machine upon the ways and adapted to be conveyed by the sprocket-chain C and delivered by the sprocket-chain C^9 and so long as articles to be packed are fed into the chute P^6 in the proper manner the compartments will be regularly filled in order and the boxes delivered at the rear of the machine, from whence they are taken off in any convenient manner, the honeycomb box is drawn from inside the packing-box, and articles to be packed pass through the bottom of each compartment of the honeycomb box and remain in the packing-box in proper form for the closure of those boxes.

It is obvious that, while I have shown five articles in a layer and four layers in a compartment and three compartments in a box, by proper adjustment any number of articles in any number of layers and any number of compartments could be used, provided the requisite corresponding adjustment of the mechanism was made. It is also obvious that if no articles to be packed are fed into the machine and if boxes were placed upon the ways as described they would simply move forward until they were stopped by the lugs, and if no articles were fed in there would not be any means whereby the unlocking of the mechanism which prevents the motion of the sprocket-chains would be secured, and therefore the movement of the boxes would be wholly arrested and no further movement could take place. Hence it is impossible for any jamming or other disarrangement of the mechanism to take place by reason of placing boxes therein and attempting to feed them into the machine without feeding in the articles. In other words, the motion of the box depends upon the filling of the compartments by articles to be packed, and unless this takes place all motion on their part is arrested and held in position until the articles are fed in proper form.

It is obvious the articles might be fed into the machine by hand or by any machine which would feed them regularly and in correspondence with the operations of the machine.

What I claim is—

1. In a packing-machine, the combination of a continuously-rotating shaft, a plunger adapted to force articles to be packed into a packing-box, means for intermittently connecting the said shaft with the plunger, means actuated by the articles to be packed when a predetermined and proper number thereof arrive at the packing position whereby said intermittent action of the plunger is permitted, means for receiving the articles in a packing-box, and means compelling the packing-box to travel intermittently as fast as filled, substantially as described.

2. In a packing-machine, the combination of a chute into which the articles to be packed are fed, said chute consisting of two side walls, means whereby the articles to be packed are held between the walls, a plunger actuated by a stem adapted to enter the chute from above and force the articles to be packed downward, and means operated by the longitudinal advancing articles in the chute whereby the plunger is set in motion at the proper time, substantially as described.

3. In a packing-machine, the combination of an endless chain or chains, lugs thereon, means for driving the chains, ways in which the chains move, and means governing the intermittent action of the chains, which means are operated by the advancing box on the chain when the box arrives at the proper position to receive articles to be packed, substantially as described.

4. In a packing-machine, an endless chain having thereon lugs to compel the forward movement of a packing-box, a packing-box carrying a honeycomb box located thereon said honeycomb box carrying at its upper edge means for engaging mechanism for stopping the advancing of a chain whereby when the box advances to the proper position its further advance is stopped, substantially as described.

5. In a packing-machine, an endless chain having thereon lugs to compel the forward movement of a packing-box, a packing-box carrying a honeycomb box located thereon said honeycomb box carrying at its upper edge means for engaging mechanism for stopping the advancing of a chain whereby, when the box advances, to the proper position, its further advance is stopped, means for automatically operating the chain and advancing the box when filled with articles to be packed, substantially as described.

6. The combination of a skeleton box having spring walls for grasping and holding articles in process of packing and adapted to be inserted in a packing-box and then filled as described with articles to be packed, and adapted to be removed therefrom without removing the articles, substantially as described.

7. The combination with a packing-box of a skeleton box adapted to be inserted therein

and having spring-partitions in the skeleton box adapted to hold the articles to be packed in the position in which they are left by a retreating plunger, and means upon the skeleton box whereby mechanism is set in operation to stop the forward movement of the box in a registering position, means to cause the boxes to travel and be stopped, means for retaining the articles to be packed over the box to be operated upon by a plunger, said plunger and means for intermittently moving the plunger, substantially as described.

8. In a machine of the character described, a continuously-rotating shaft, a gear adapted to be operated thereby, means for intermittently bringing the gears into operative relation, which means is operated by advancing the articles operated on into the machine and means governing the intervals at which the gears shall be brought into operative relation, relative to the introduction of the articles operated upon, substantially as described.

9. The combination of a pair of side walls in a chute, each having at their lower edges spring-controlled ledges adapted to support articles, a plunger adapted to be operated to force the articles through below the side walls opening the spring-supports, means whereby the plunger is operated, means governed by the articles for setting the plunger into operative connection with the means for operating it, and means for returning the plunger to its original position, substantially as described.

10. The combination of a continuously-rotating shaft, a crank thereon, a cross-head operating on ways, a connecting-rod, a rod slidably operating in ways and in proximity to the cross-head, means on the cross head adapted to engage a spur on the rod, means in proximity to the rod to prevent said engagement, and means for withdrawing the inhibitory element at predetermined intervals, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

THEODORE L. CAMP.

Witnesses:

G. FRED RUSH,

HERBERT M. VANZWOLL.