

No. 713,491.

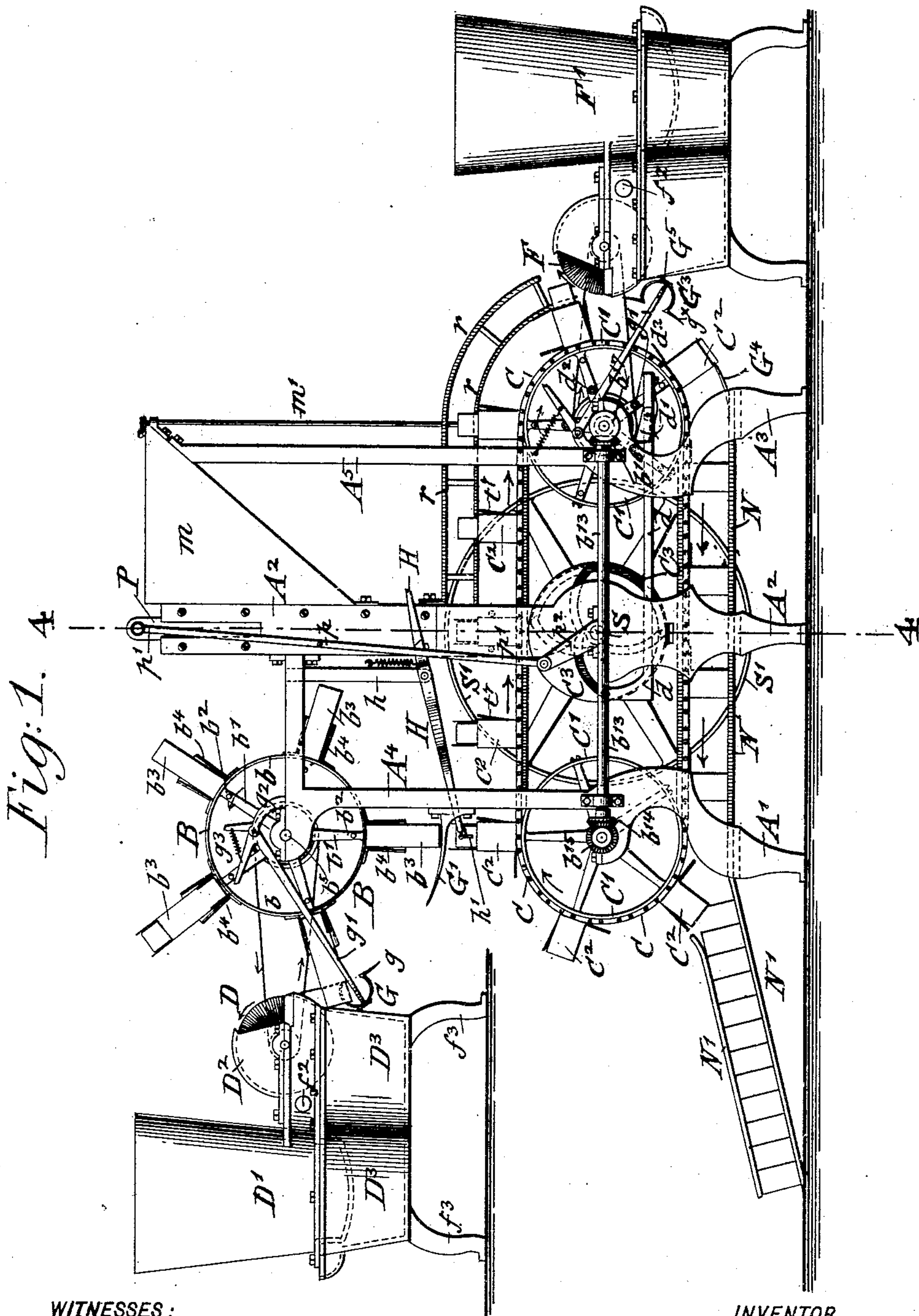
Patented Nov. 11, 1902.

C. DE QUILLFELDT.
MACHINE FOR FILLING AND CLOSING PAPER BOXES.

(Application filed Oct. 29, 1901.)

(No Model.)

6 Sheets—Sheet 1.



WITNESSES:
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C. DE QUILLFELDT.

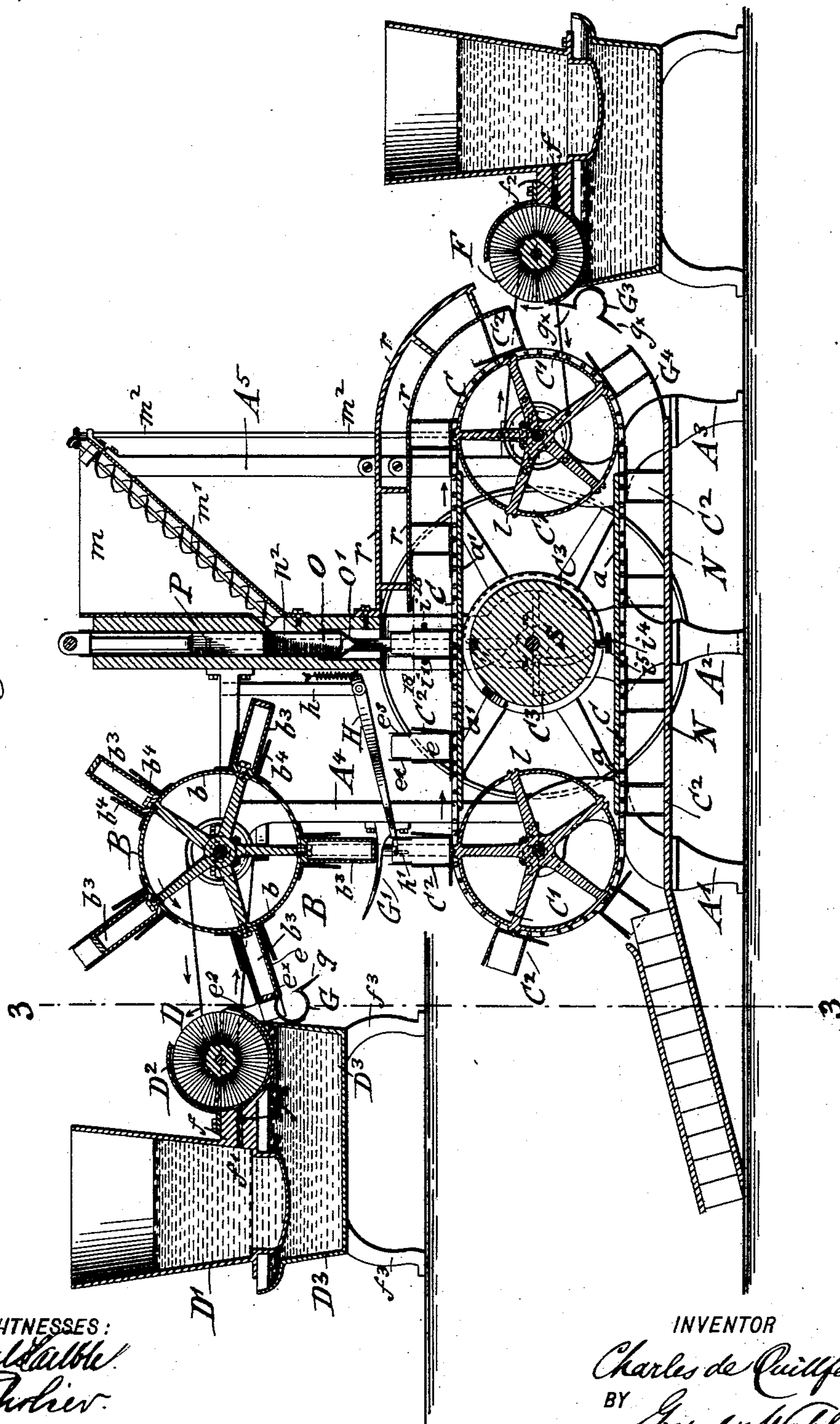
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6 Sheets—Sheet 2.

Fig. 2.



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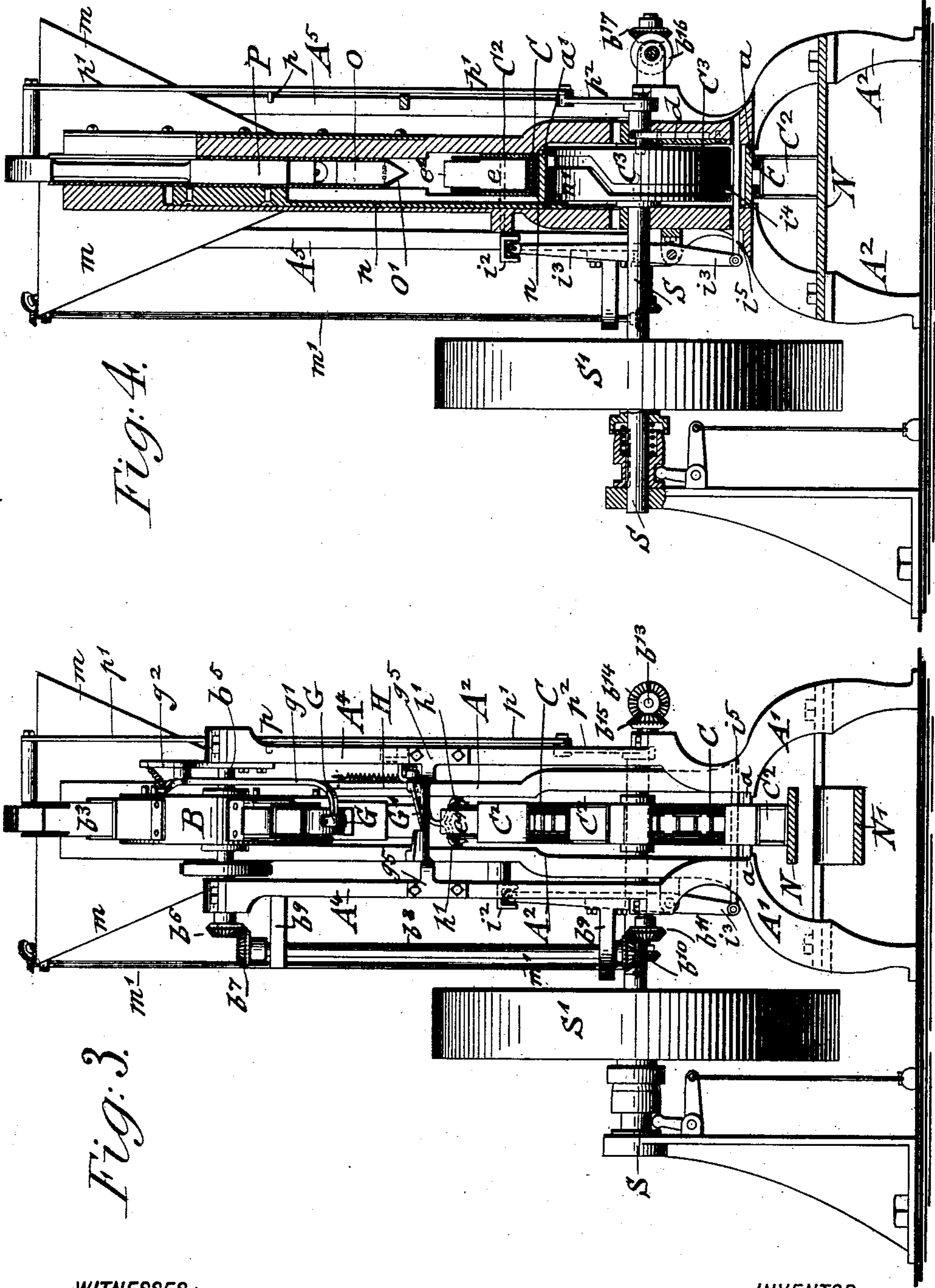
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6 Sheets—Sheet 3.



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6 Sheets—Sheet 4.

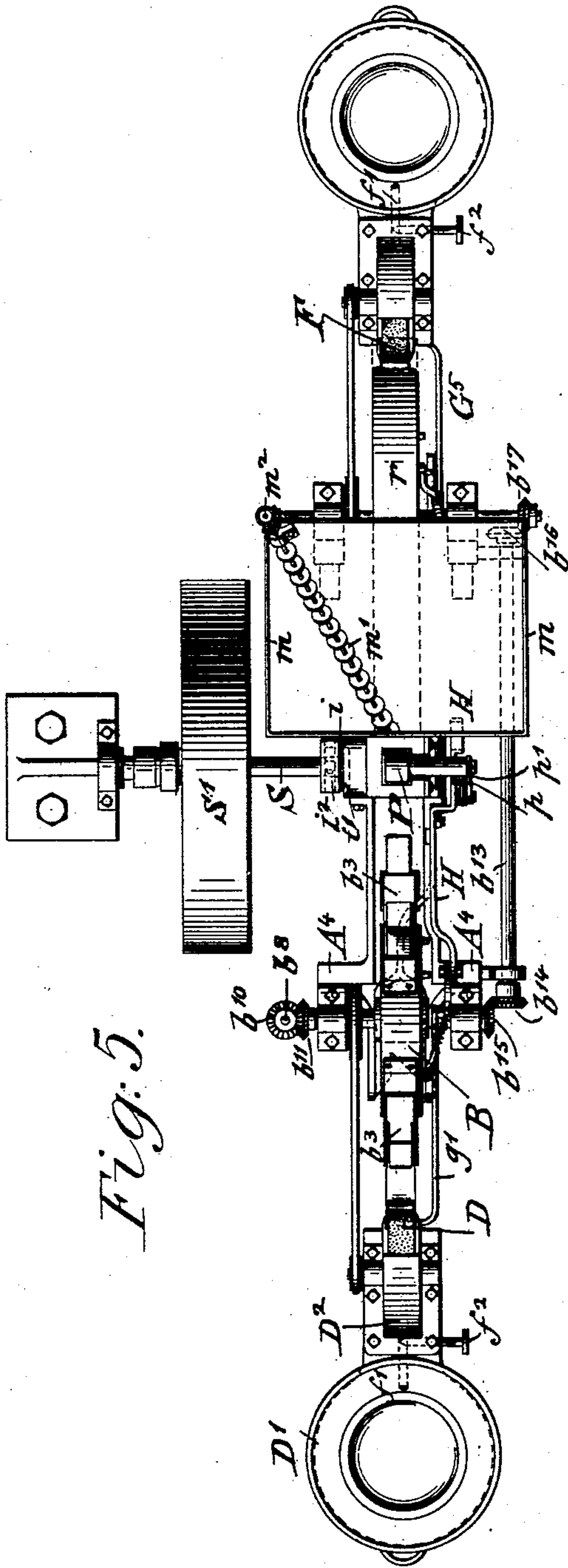


Fig. 5.

Fig. 8.

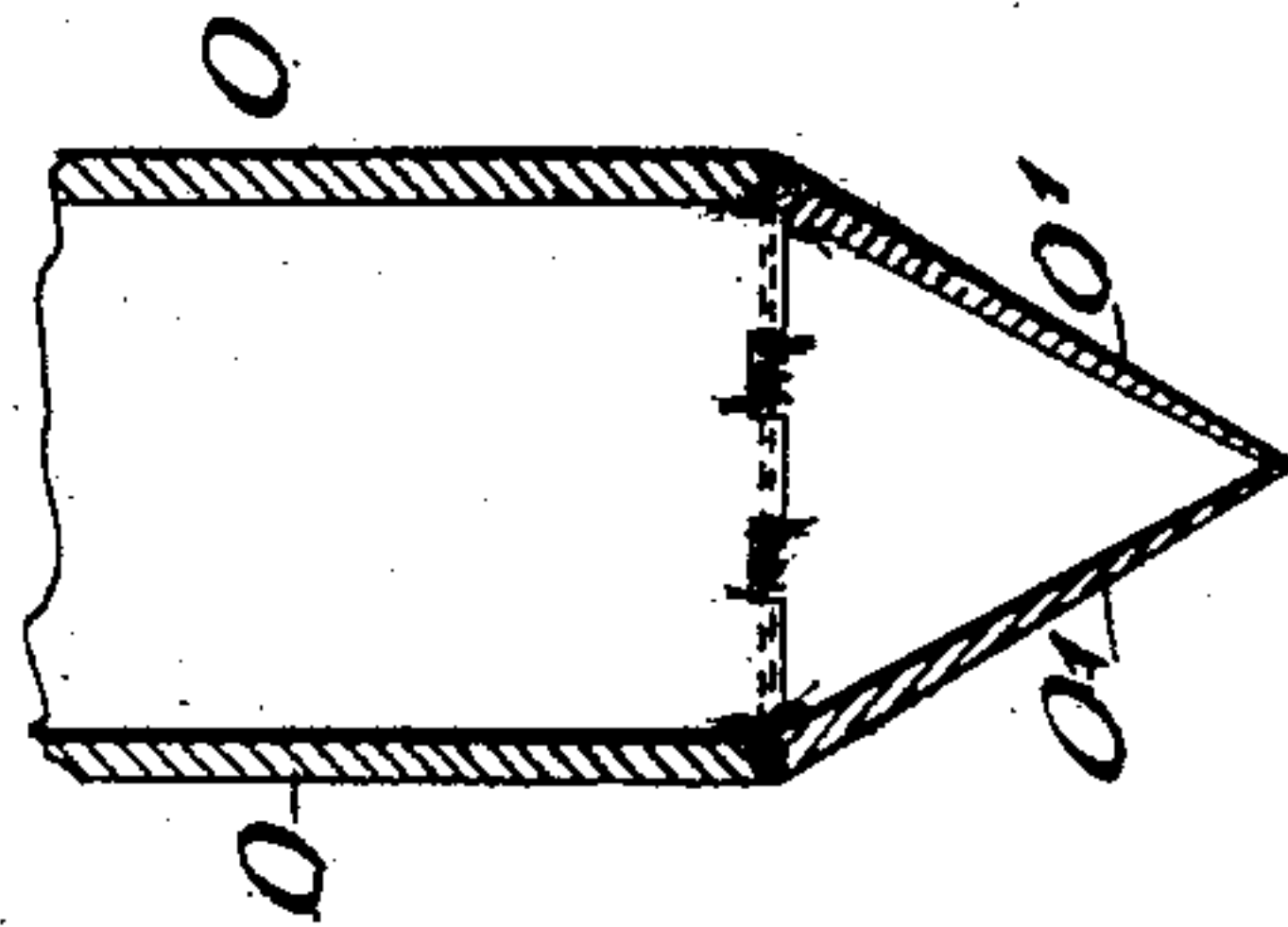


Fig. 7.

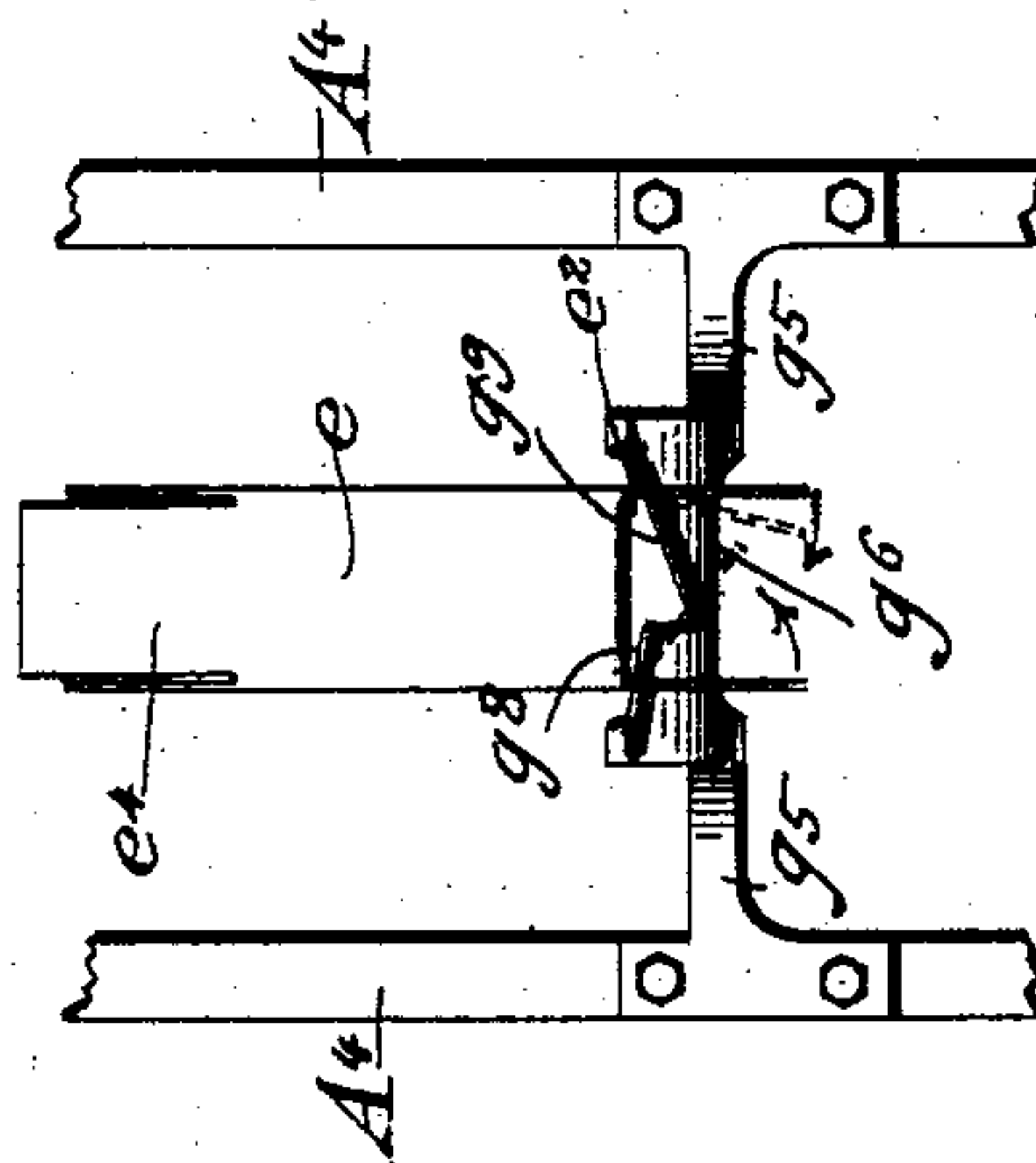
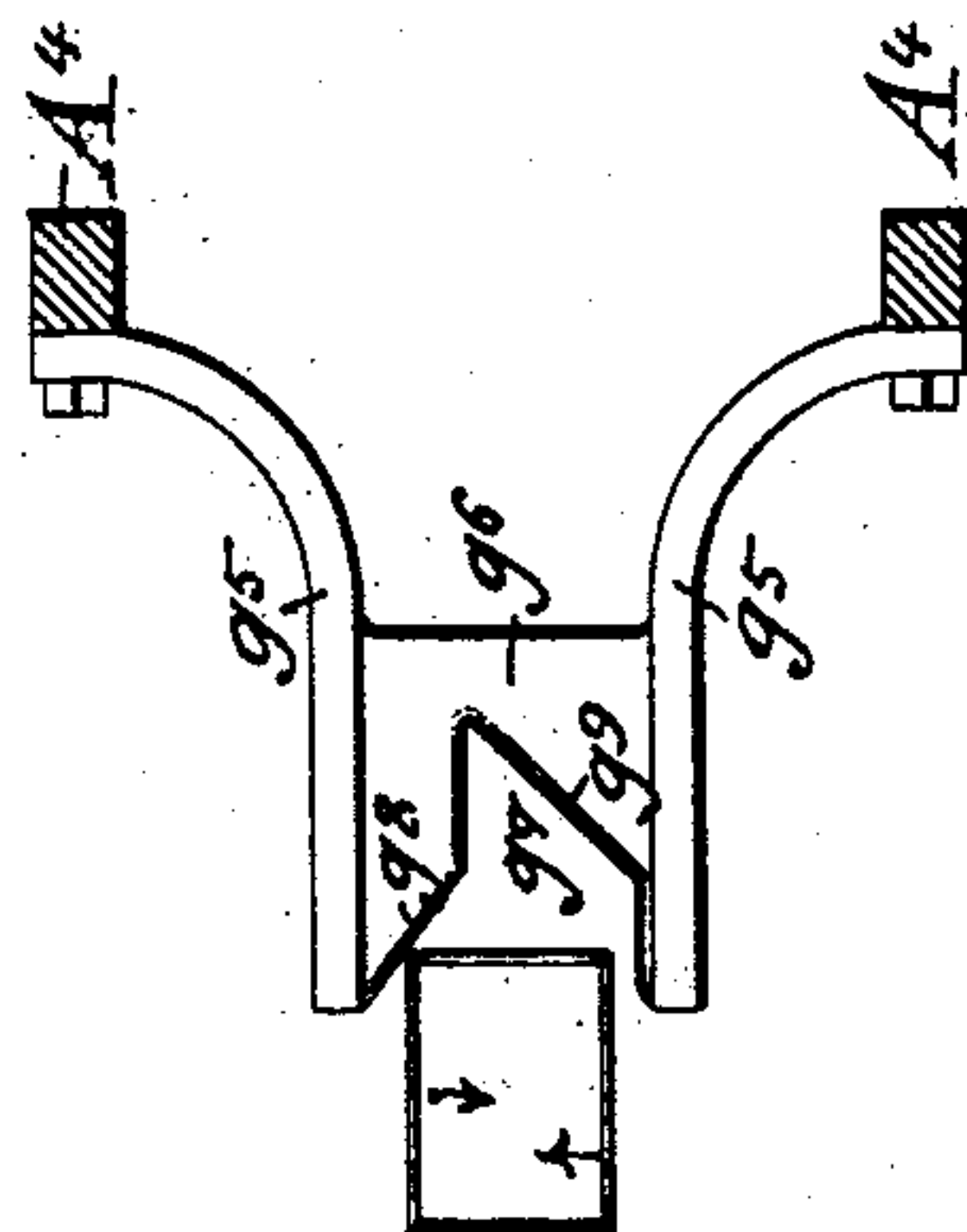


Fig. 6.



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6 Sheets—Sheet 5.

Fig. 10.

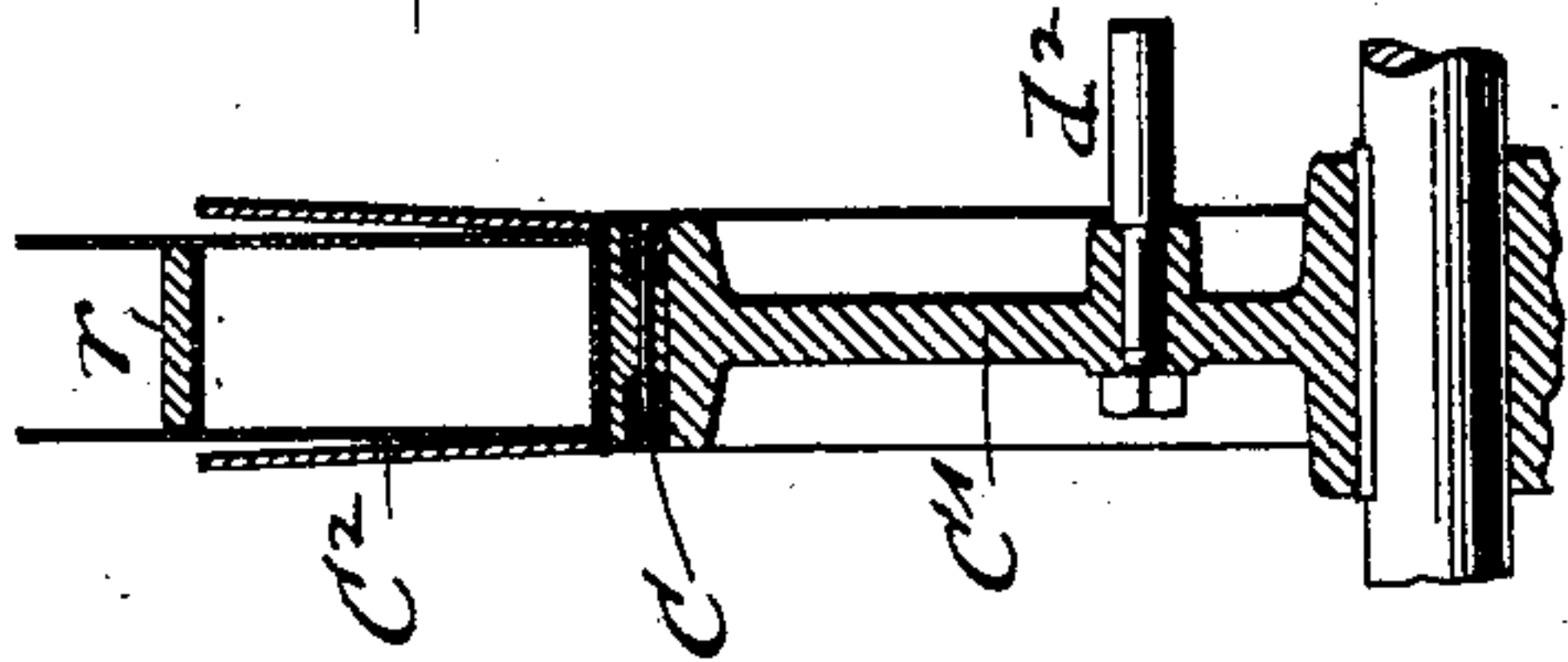


Fig. 14.

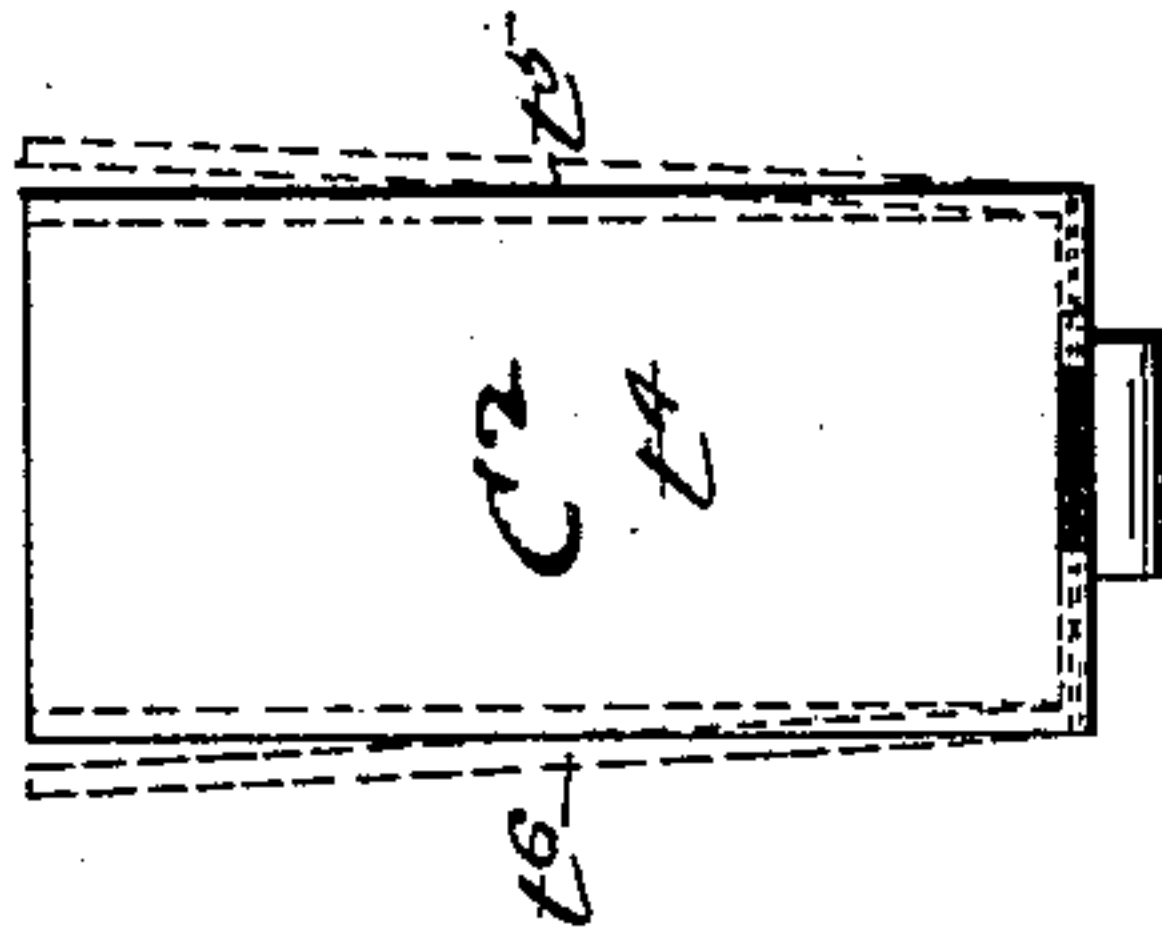


Fig. 13.

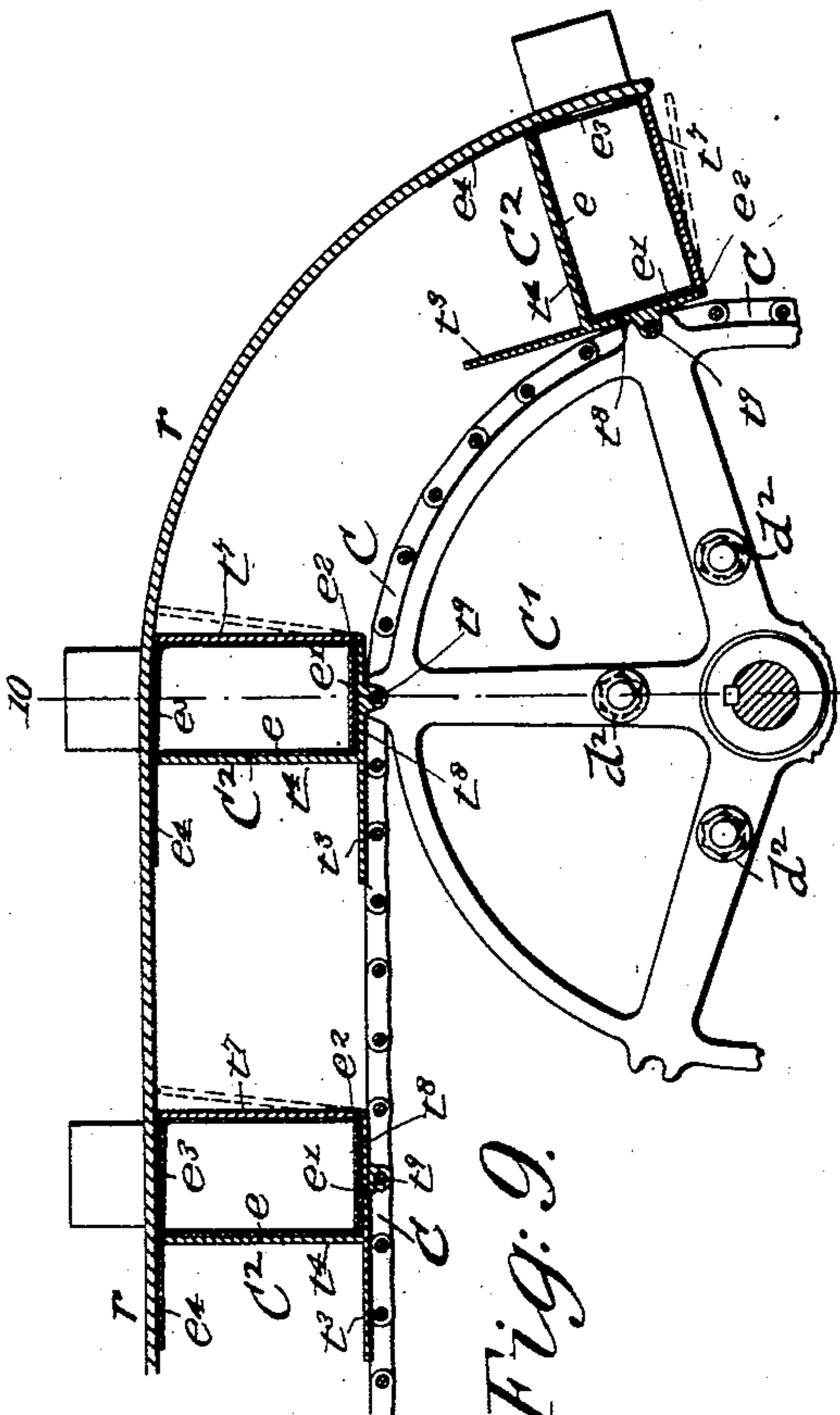
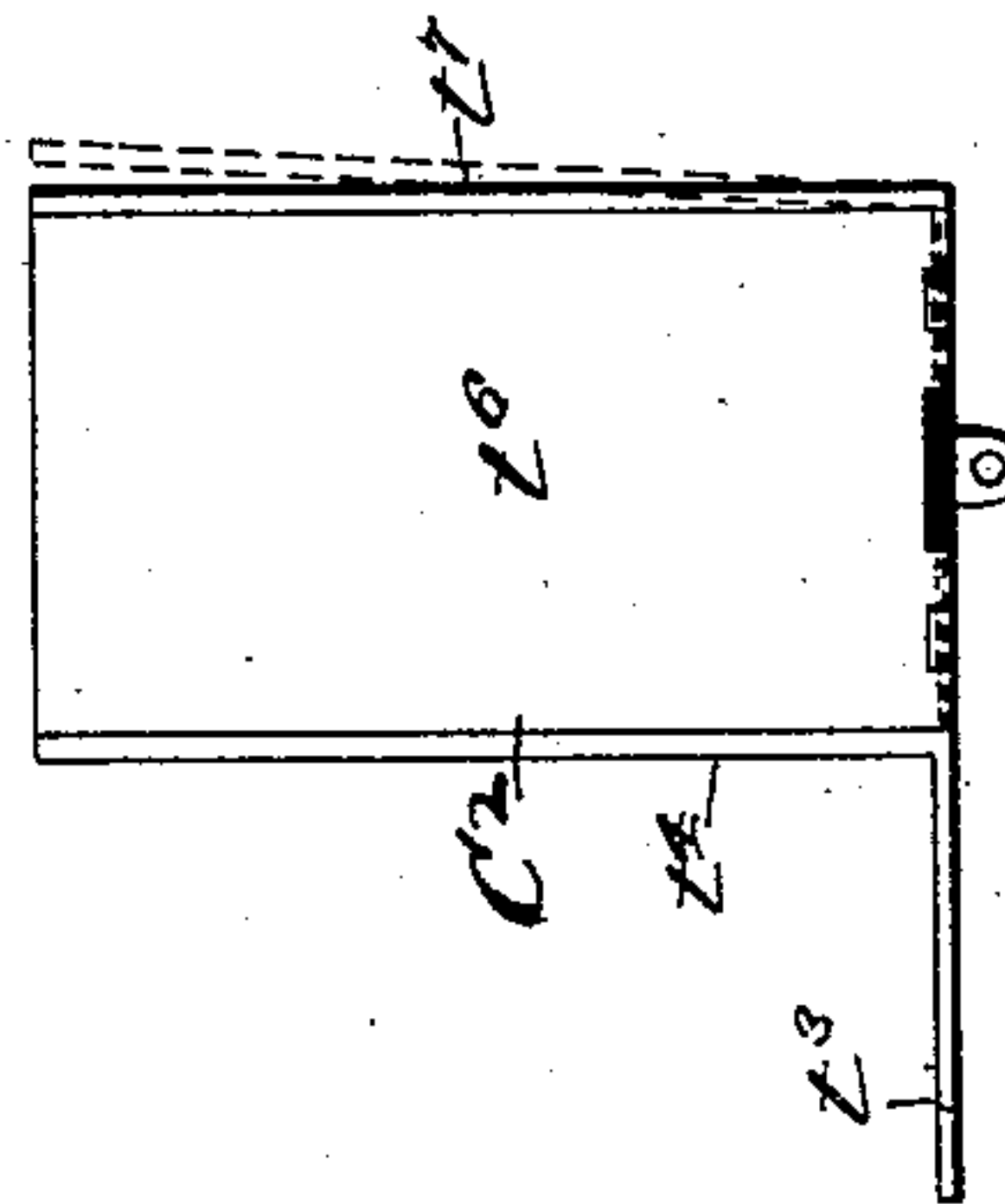
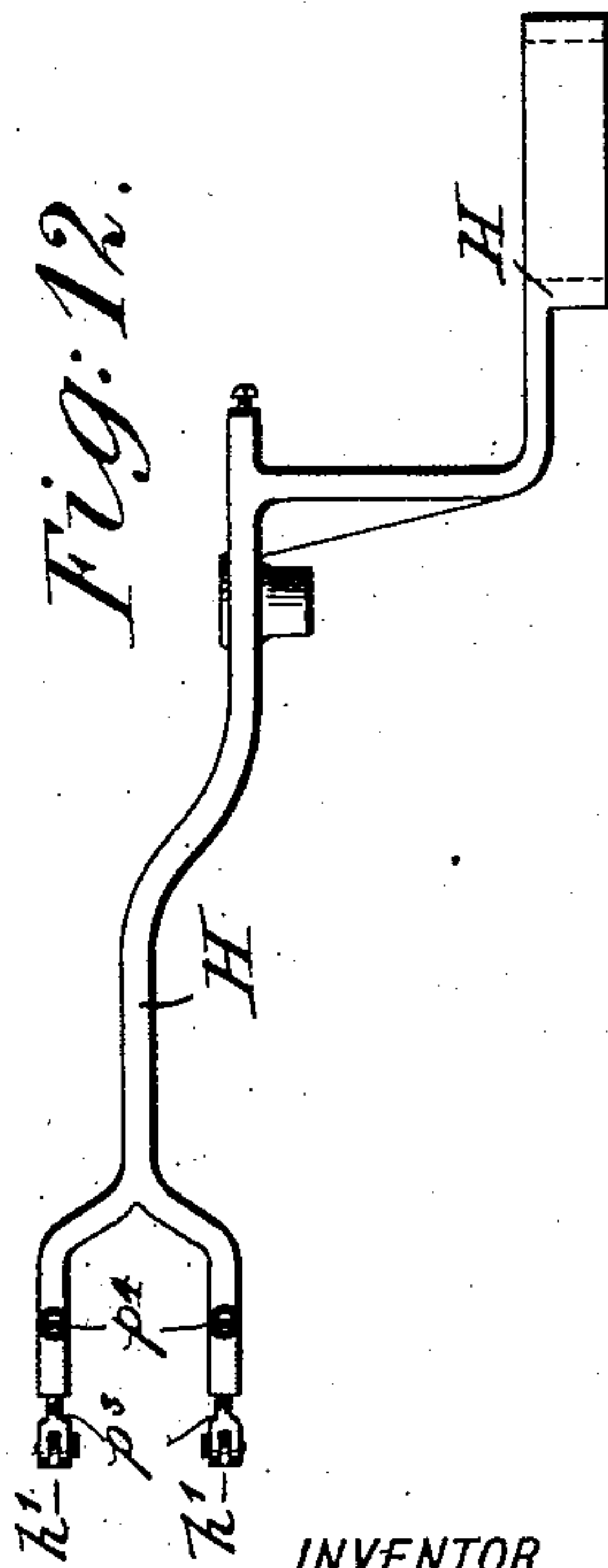


Fig. 9.

Fig. 11.



Fig. 12.



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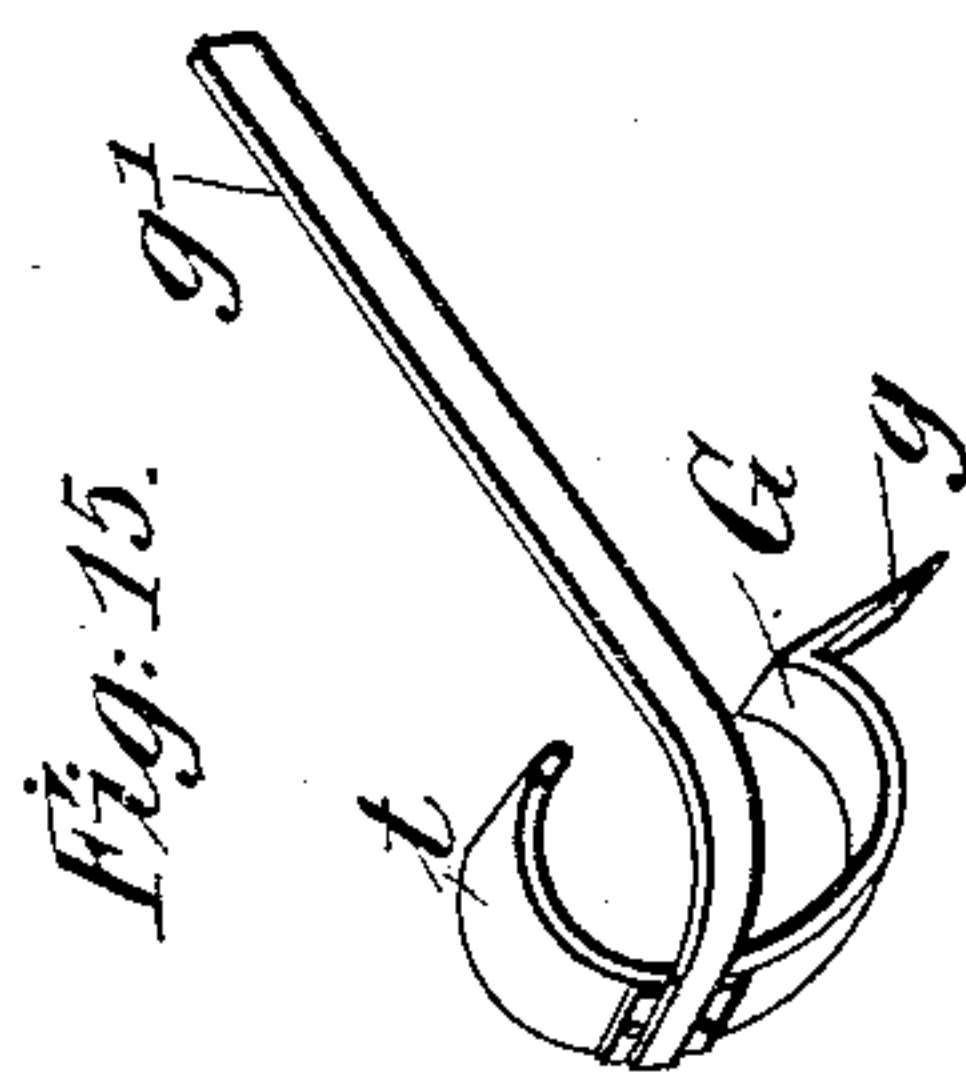
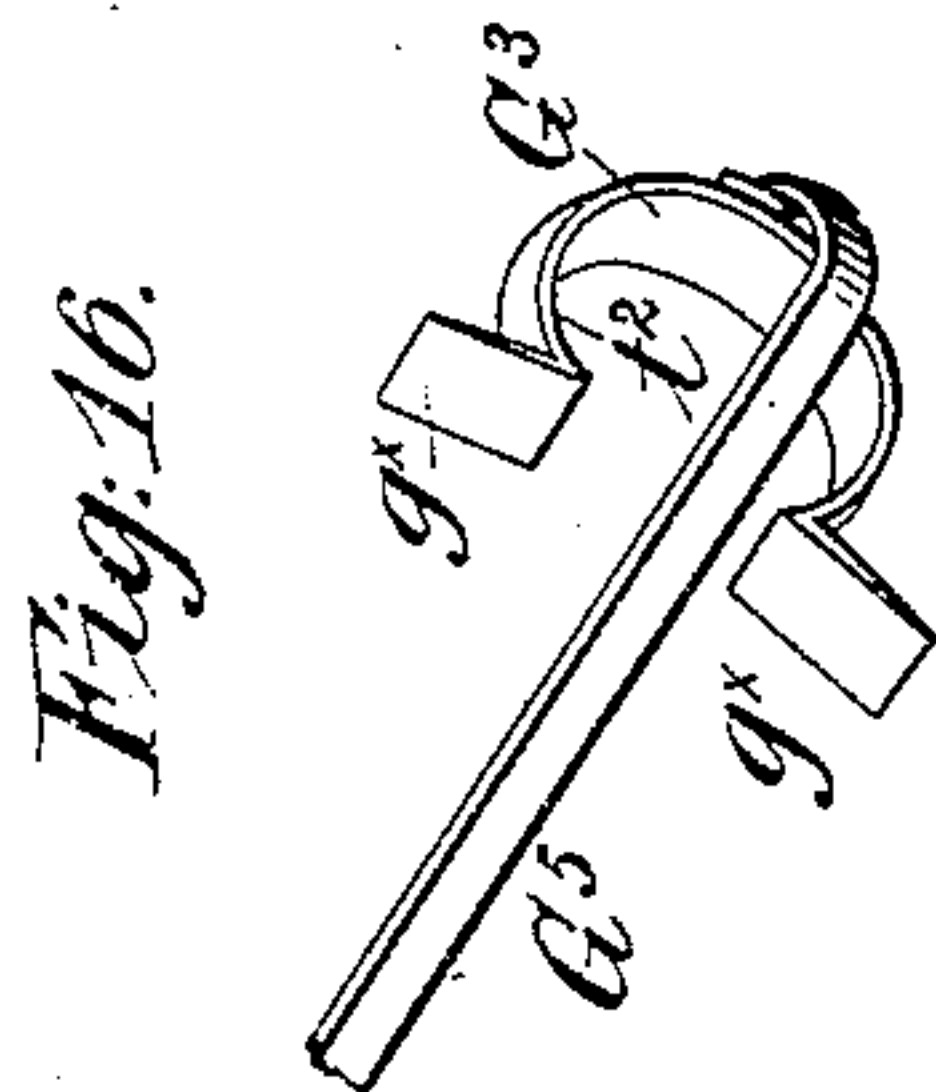
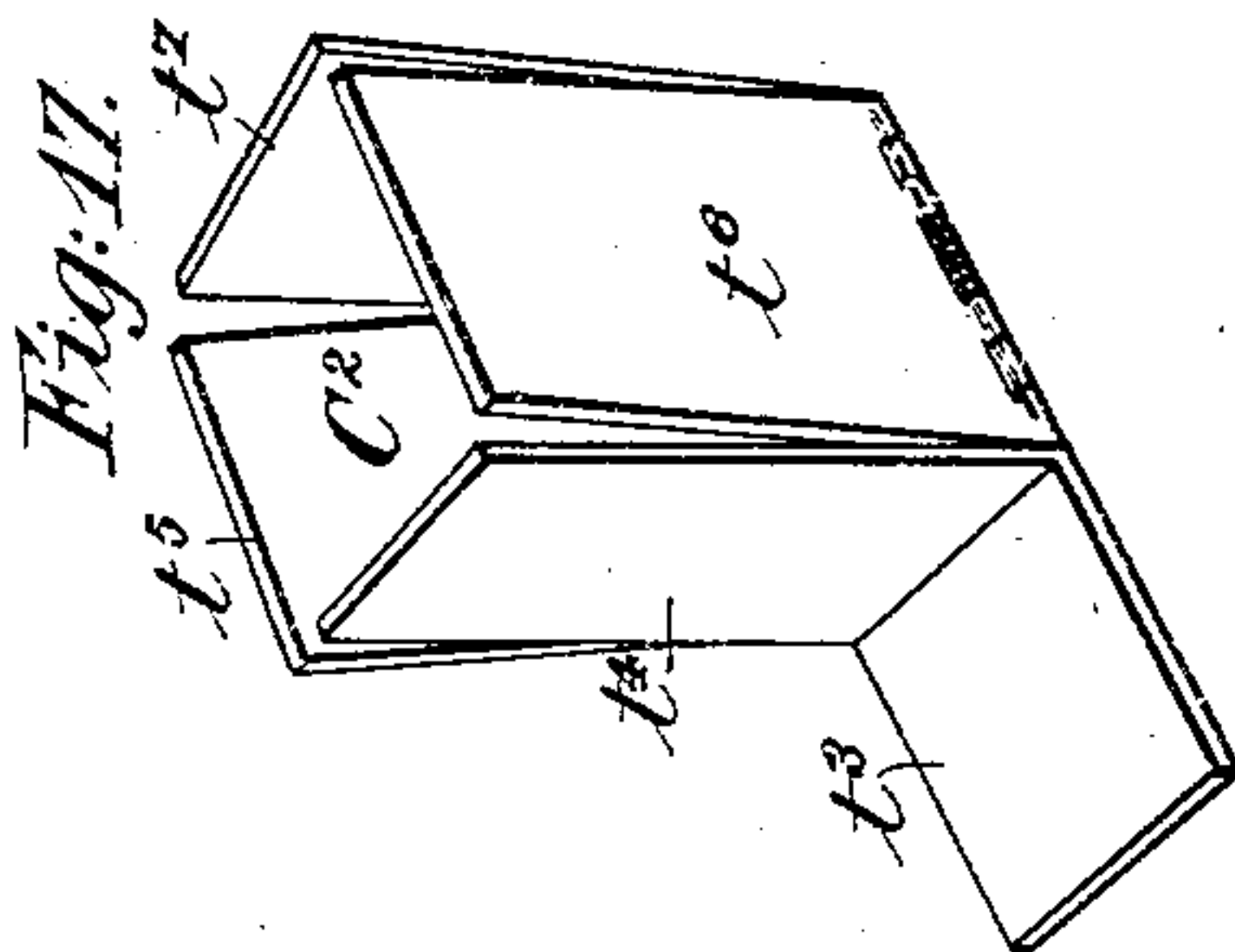
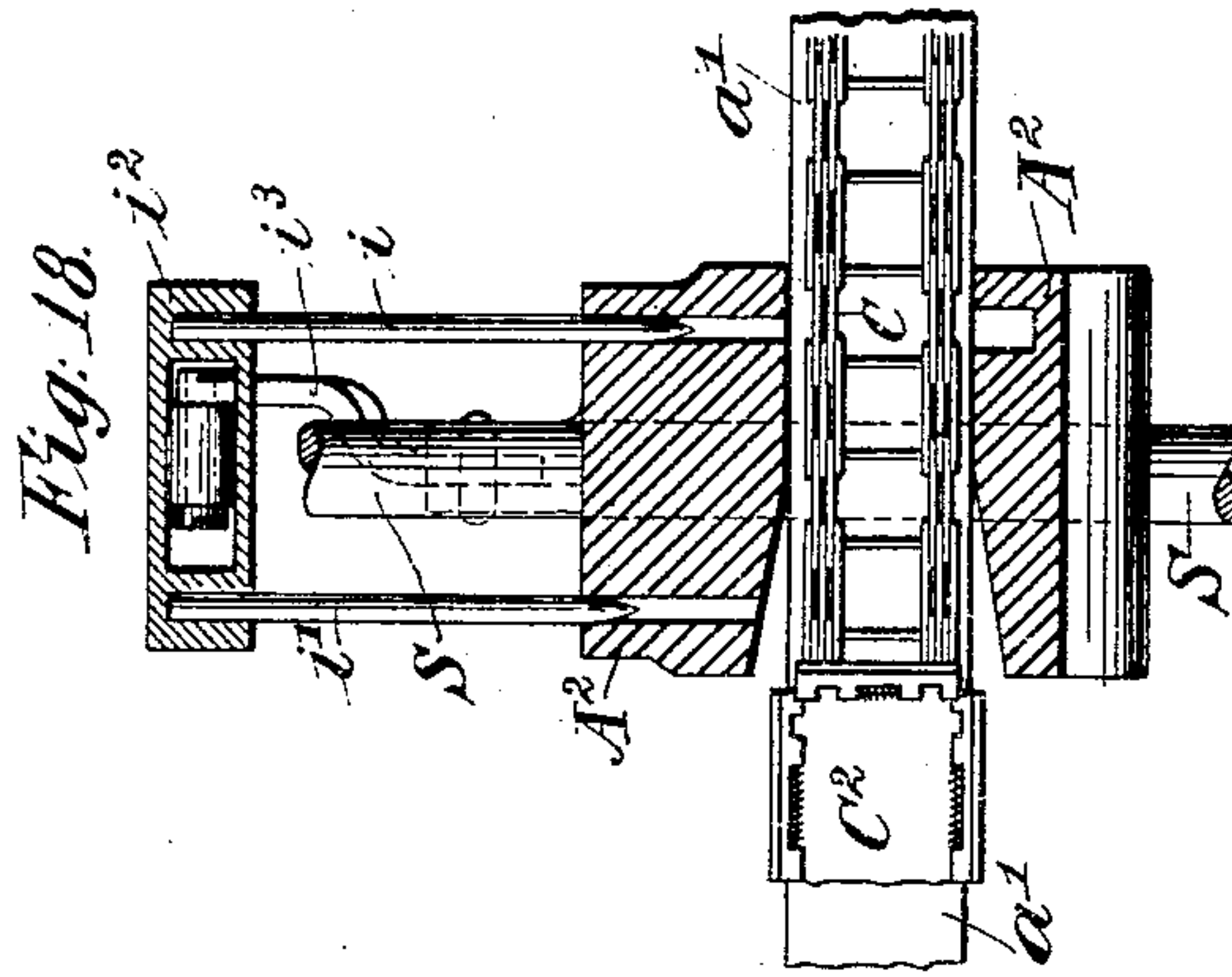
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(No Model.)

6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

CHARLES DE QUILLFELDT, OF AMITYVILLE, NEW YORK, ASSIGNOR OF ONE-HALF TO CHARLES G. PAINTER, OF BROOKLYN, NEW YORK.

MACHINE FOR FILLING AND CLOSING PAPER BOXES.

SPECIFICATION forming part of Letters Patent No. 713,491, dated November 11, 1902.

Application filed October 29, 1901. Serial No. 80,400. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DE QUILLFELDT, a citizen of the United States, residing in Amityville, in the county of Suffolk and State of New York, have invented certain new and useful Improvements in Machines for Filling and Closing Paper Boxes, of which the following is a specification.

The object of this invention is to furnish an improved machine for filling paper boxes with pulverulent or granulated substances, such as baking-powder, herb teas, &c., by which the manual labor of taking hold of the blanks, closing the lower ends of the same, filling the boxes, and then closing the upper ends of the same is dispensed with and the different operations performed automatically by machinery, so that the filling and closing of such boxes is accomplished at a considerable saving in time and expense; and the invention consists of a machine for filling and closing paper boxes which comprises mechanisms for receiving the paper blanks and exposing the flaps at one end of the same to the action of a rotary brush for supplying the glue to said flaps, means for folding and closing the glued flaps of said blanks, an endless belt provided with receiving-boxes, means for transmitting the thus-formed boxes to said receiving-boxes, means for charging one box after another with the required quantity of material from a suitable supply-hopper, means for supplying glue to the flaps at the open ends of the boxes after the same have been filled with the material, and means for folding and closing the glued flaps at the upper ends of the boxes.

The invention consists, further, of certain details in the construction of the individual parts of the machine, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my improved machine for filling and closing paper boxes with pulverulent material. Fig. 2 is a vertical longitudinal section. Fig. 3 is an end elevation, partly in section, on line 3 3, Fig. 2. Fig. 4 is a vertical transverse section on line 4 4, Fig. 1. Fig. 5 is a plan view of the same. Figs. 6 to 14 are details showing, respectively,

the mechanism for folding and closing the end flaps of the boxes of the delivery-chamber for the material, of the endless belt carrying the receiving-boxes for the paper boxes, of the mechanism for transmitting the bottom-closed boxes to the receiving-boxes and of the receiving-boxes themselves, Fig. 10 being a vertical section on line 10 10, Fig. 9. Figs. 15 and 16 are perspective views, on an enlarged scale, of the flap-folding devices. Fig. 17 is a perspective view of one of the receiving-boxes, and Fig. 18 is a horizontal section on line 18 18, Fig. 2.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-frame of my improved machine for filling and closing paper boxes. The supporting-frame is composed of three pairs of upright standards $A^1 A^2 A^3$, of which the first pair is connected with uprights A^4 , having suitable bearings for the shaft of a spider-frame B, that is provided with a number of radial slightly-tapering blocks for receiving the open ends of the blanks of the paper boxes to be closed. The second or middle pair of standards serves as a support for the hopper and the delivery-chamber, from which latter the material is delivered into the paper boxes by a plunger, by which the material is transferred from the delivery-chamber into the boxes and for a supply-hopper for the material to be packed. The third pair of upright standards A^3 has uprights A^5 , which support the upper end of the supply-hopper. The three pairs of standards $A^1 A^2 A^3$ are connected by longitudinal and transverse braces $a a'$, so as to impart the required strength to the supporting-frame. The first and third pairs of standards A^1 and A^3 are provided with bearings for the shafts of the guide-pulleys $C' C'$, over which an endless belt C, consisting of a number of pivot-links, is stretched, said guide-pulleys and endless belt receiving motion in the direction indicated by the arrows from a driving-shaft S, that is supported in bearings at the center standards A^2 of the frame A. The driving-shaft S is set in motion by a belt-and-pulley transmission from an overhead counter-shaft. A suitable clutch device operated in any suitable manner locks

the driving-pulley S' to the shaft S, so as to permit the starting or stopping of the machine at the will of the operator by the action of a foot-treadle in the usual manner, as shown in Figs. 3 and 4. The endless belt C is provided with receiving-boxes C², which will be hereinafter described and which serve for receiving the paper boxes after the flaps at the bottom ends of the same are closed preparatory to passing them below the delivery-chamber O and plunger P for filling the same. In line and approximately on a level with the block-carrying spider-frame B for receiving the blanks of the paper boxes is arranged a circular glue-brush D, together with its glue-pot D' and brush-box D². Below the glue-brush D is located an oscillating mechanism for folding the second bottom end flap, while the mechanism for closing the bottom side flaps is supported on the first pair of upright standards A'. A second glue-pot, glue-brush, and brush-box is arranged at the opposite end of the endless belt and below the same a bottom-flap folding and closing device similar in construction to the top-flap folding and closing device at the ingoing end of the machine. The motion-transmitting mechanisms required for the different parts of the machine are actuated from the driving-shaft S in connection with auxiliary transmitting-shafts, gearings, cams, &c., which will be described in detail in connection with the operative parts of the machine.

The blank-receiving spider-frame.—The spider-frame B, on which the blanks open at both ends are placed, consists of a ring-shaped rim b, provided with radial arms b', said arms carrying pins b². Tapering blocks b³, corresponding to the size of the blanks, extend radially from the rim b, five blocks being shown. It is obvious that any other number of blocks may be used. The tapering blocks b³ are attached equidistantly from each other to the circumference of the rim b and partly inclosed by angular guard-plates b⁴ at their opposite sides, the lower ends of the plates being attached to the rim b, as shown in Figs. 1 and 2, and said plates serving to maintain the box-blanks in straight condition and prevent any shifting of the same longitudinally upon the blocks, which would occur were the lower or inner flaps free to spread apart. The paper boxes that are to be filled and closed by the machine are of the well-known type and are made of a blank having a middle box-section and four flaps extending at the top and bottom ends of the same. One blank after another is placed with its open lower end on the radial blocks and the exterior guard-plates and retained by friction in position thereon. The placing of the blanks in position on the blocks is accomplished by a girl or other attendant and can also be done automatically by a suitable feed mechanism, if desired. Intermittent rotary motion is imparted to the shaft b⁵ of the blank-receiving spider-frame B by means of bevel-gears b⁶ b⁷ from an up-

right auxiliary shaft b⁸, supported in bearings of horizontal brackets b⁹, extending from the upright rear standard A⁴, as shown in Fig. 3, and by bevel-gears b¹⁰ b¹¹, of which the bevel-gear b¹¹ is applied to the shaft of the left-hand guide-pulley C' of the endless belt C. The shaft b¹² of the guide-pulley C' receives its motion from a horizontal shaft b¹³, that is supported in bracket-bearings of the upright standards A' A³, said shaft transmitting its motion by bevel-gears b¹⁴ b¹⁵ to the shaft of the guide-pulley, while it receives its motion by bevel-gears b¹⁶ b¹⁷ from the shaft of the right-hand guide-pulley C'. The right-hand guide-pulley C' receives intermittent motion from a cam C³ on the driving-shaft S, which cam is provided with a cam-groove, one portion of which is concentric with the driving-shaft, while the other portion of the groove is formed of two arc-shaped portions connecting the ends of the concentric groove, as shown in Fig. 1. The cam-groove engages an antifriction-roller at one end of an angular pusher-rod d, that is guided in suitable keepers of the main frame A and the opposite end of which is provided with a pivoted and spring-actuated pawl d', that engages pins d² on the arms of the right-hand guide-pulley C', said pawl d' being adapted to pass readily below the pins d² during the motion of the pusher-rod toward the right, but engage the pins by the motion of the pusher-rod toward the left, so as to impart thereby intermittent rotary motion to the right-hand guide-pulley C', the endless belt C, the left-hand guide-pulley C', and, by the intermittent bevel-gears described, to the spider-frame B. The intermediate rotary motion imparted to the spider-frame B moves the end flaps of the blanks projecting above the blocks b³ over the sides and circumference of the circular glue-brush D, the shaft of which is supported in bearings of the brush-box D², which partly covers the glue-brush D. The glue-brush D receives intermittent rotary motion by a belt-and-pulley transmission from the shaft of the spider-frame B and corresponds in width to the width of the paper blanks, so as to supply the required quantity of glue to the outer surface of one end flap, the two inner surfaces of the side flaps, and the inner surface of the opposite end flap as the projecting end of the blank passes over the same, the glue-brush D turning in direction opposite to the direction of movement of the box, as indicated by arrows in Figs. 1 and 2. The glue-brush being located in the path of the end flaps operates at the same time to turn back said flaps, the first or forward end flap e' being turned inwardly with reference to the body e of the box and the second or rear end flap e² being turned outwardly. The glue-box is provided at both ends with tapering edges, so that the boxes are permitted to pass freely over the lower part of the glue-box. Liquid glue is supplied to the glue box and brush by a glue-pot D', the bottom of which as well as the

bottom of the brush-box are kept warm by a water-bath D^3 , which is heated by gas or other suitable heating medium, so that the glue is kept in easily-flowing condition. It is supplied from the glue-pot D' to the brush-box and glue-brush D by a connecting-throat f , having a channel f' , with a transverse valve or stop-cock f^2 , so that the supply of glue to the brush can be accurately regulated. The glue-supplying device is supported on suitable legs f^4 and at a proper height relatively to the blank-receiving spider-frame.

The flap folding and closing devices.—Below the glue-brush is located an end-flap-folding device G , which is made of U shape and provided at its lower end with a flange or lip g . The folding device G is supported at the curved outer end of an elbow-lever g' , that is fulcrumed to a supporting-arm g^2 on the upright A^4 sidewise of and eccentrically to the spider-frame B . The shorter arm of the elbow-lever g' is connected by a helical spring g^3 with an arm extending from the arm g^2 and intermittently actuated by pins b^2 on the radial arms of the spider-frame B . The width of the flap-folding device G is narrower than the width of the box, so as to pass freely between the side flaps. The second end flap, to which glue has been supplied during its passage over the glue-brush, passes over the upper portion t of the U -shaped folder an instant before the pin b^2 on the radial arm of the spider-frame engages the shorter arm of the elbow-lever and moves the folding device G rapidly downward, allowing the end flap to pass into the space inclosed by the U -shaped portion of the folding device. As the folding device moves about three times faster than the spider-frame which actuates the same, the box is overtaken by the upper portion t of the folder, which acts as a folding member, and the second end flap is thereby folded over upon the first end flap. The flange or lip g supports and retains the first or forward end flap in folded position until the second or rear end flap is folded quickly over it by the folding member of the device. The pin b^2 then passes off the shorter arm of the elbow-lever, so that the folding device is returned to its former position by the action of the helical spring g^3 . The blank has then passed on to the side-flap-closing device G' , which is supported on the upright A^4 , as shown in Figs. 6 and 7. The side-flap-folding device H is composed of upwardly curved and tapering arms g^5 , attached to the uprights A^4 , and of a web g^6 , connecting the front ends of said arms, said web being provided with an inwardly-projecting angular recess g^7 , having inclines g^8 g^9 , one incline folding one side flap and the other incline the other, so that the glued end and side flaps being thus folded one over the other close the end of the blank which forms the bottom of the box, so that it is ready to be transferred to the receiving-boxes of the endless belt C .

The box-transferring mechanism.—During

the folding and closing of the end and side flaps of the box the block on which the box is placed has arrived in vertical position, as shown in Figs. 1 and 2. The box could then be readily delivered from the block by gravity into one of the receiving-boxes on the endless belt then below the same; but as the boxes sometimes adhere to the blocks, especially when not uniformly creased and bent, it is preferable to provide a positive mechanism for transferring the boxes. For this purpose a forked and spring-actuated stripping-lever H is arranged, which is fulcrumed to a downwardly-extending arm h , attached to the brace connecting the uprights A^4 with the second pair of upright standards A^2 . This lever is clearly shown in Figs. 1, 2, 11, and 12 and is provided with a forked end having spring-actuated swivel-pins h' , that engage frictionally the opposite sides of the paper box and slip the same off the block on the spider-frame into the receiving-box of the endless belt. Each pin h' depends from a shank p^3 , suitably supported in a socket of the lever H , said shank being loosely mounted in said socket and retained therein by a screw p^4 , entering an annular groove of the shank. Springs p^5 , one at each fork side, press the pins h' inwardly, so as to engage the paper box upon the downward movement of the lever H . The pins are sharpened at their engaging ends, so as reliably engage the box. By this pivot-and-swivel construction the pins are capable of two movements, one laterally under the actuation of the springs and the other an outward movement longitudinally of the lever to compensate for the swinging of the same, so that the points of the swivel-pins do not move to any appreciable extent upon the box while engaging the same. The spring-actuated lever H receives intermittent motion at the proper time from a pin p on the connecting-rod p' between the crank p^2 on the driving-shaft S and the plunger P . The pin p engages the forwardly-bent opposite end of the lever on the downward motion of the connecting-rod p' , so that the forked end with its engaging swivel-pins is moved in upward direction for engaging the body of the box and quickly moved in downward direction on the release of the pin p from the offset end of the fulcrumed and spring-actuated lever H , carrying the paper box along. The motion of the stripping-lever H is so timed that the box is transferred with its closed end downward from the block b on the spider-frame B into the receiving-box C^2 on the endless belt C vertically below the same, as shown in Figs. 1 and 2.

The receiving-boxes.—The receiving-boxes C^2 are attached by their bottoms to the links of the endless belt C and are formed of an upright end wall and three yielding walls. The upright rear end wall is rigidly attached to the bottom, which is extended for some distance rearward from the end wall, as shown in Figs. 13 and 14, so that by abutting with

the chain the extension t^3 prevents tilting of the rear wall t^4 , and thereby of the whole box, in backward direction, while the bottom t^8 of the box forward of the pivot t^9 , whereby the box is pivoted to the chain, also bears upon the chain, the box being maintained by its bottom and the extension in upright position. The two side and front end walls are spring-hinged, so as to have a certain play, while the rear end wall is affixed to the bottom of the receiving-box. The hinged side walls t^5 and front wall t^7 of the box are normally retained by their springs in slightly-open position, as shown in Fig. 18, and are in this position when the paper box is delivered into the receiving-box, thereby by providing a slight play, facilitating the transference of the paper box from the block of the spider-frame into the receiving-box. The receiving-boxes C^2 are arranged at such a distance from each other on the links of the endless belt and are so timed that they arrive below the blocks of the spider-frame whenever the blocks with their boxes are in vertical position above the receiving-boxes. The connecting-pivots of the links of the endless belt C are engaged by recessed lugs l on the circumference of the guide-pulleys, so that the intermittent motion of the guide-pulleys imparted thereto by the pusher-rod and cam on the driving-shaft is evenly transmitted to the endless belt and the receiving-boxes carried by the same. As soon as the receiving-box C^2 has received a paper box it is conducted with the same by the endless belt into the space between the central standards, which converge, as shown in Fig. 18, and thereby close the side walls of the receiving-boxes.

The box-filling mechanism.—When the receiving-box C^2 approaches filling position, its hinged front end wall abuts against a transverse pin i , which extends through guide-holes of the central standards, thereby closing said wall up against the paper box or in closer position thereto than before, so as to support the same during the act of charging the material therein, the endless belt coming then to rest in filling position. The hinged front-end wall is held by the pin i in vertical position, so as to give proper support to the paper box in the receiving-box, while the rear end wall is retained in position by a second pin i' , parallel with the pin i , which also extends transversely through guide-holes of the central standards. The forward pin i is slightly longer than the second pin, so as to enter first into the path of the receiving-box, the second pin entering behind the rear wall after the first pin has accomplished the inward moving of the front wall. Both pins are connected at their outer or rear ends by a grooved bar i^2 , which is engaged by the upper end of a fulcrumed lever i^3 , to which laterally-oscillating motion is imparted from a cam-groove on the circumference of the cam C^3 , as shown in Fig. 4, said groove engaging a pin i^4 on a transversely-guided rod i^5 , piv-

oted to the lower end of the lever i^3 . The paper box is now ready for being filled with material. This is accomplished by the delivery-chamber O descending into the paper box, the delivery-chamber being guided between the central standards A^2 and actuated by a slide-rod n , connected with the delivery-chamber, said rod being raised and lowered by a cam-groove on the opposite or rear side of the cam C^3 engaging a pin n' on the lower end of said rod, as shown in Fig. 4. As soon as the delivery-chamber is lowered the plunger P , which is guided in suitable ways, descends and opens the inclined spring-hinged gates O' at the lower end of the delivery-chamber, so that the material in the same is dropped into the box, which is held below it. The plunger on arriving at the lower end of its stroke imparts more or less pressure, according to the material dropped into the box, so as to press the same to such extent as to permit the closing of the top flaps of the box. The delivery-chamber communicates, when in raised position, by a side opening n^2 with the supply-hopper m , in which the material to be charged is placed, said supply-hopper being provided with an inclined feed-screw or other equivalent feed device m' for controlling the regular supply of material to the delivery-chamber. The feed device m' is operated by a vertical auxiliary shaft m^2 , having bevel-gears at its upper and lower ends, from the shaft of the right-hand guide-wheel C' , as shown in Fig. 1. As soon as the plunger P is returned into raised position the retaining-pins $i i'$ of the receiving-box C' are withdrawn by the action of the circumferential cam-groove, so as to clear the box and permit the next forward motion of the endless belt C , which is accomplished by the pusher mechanism heretofore described. This brings the next receiving-box in line with the delivery-chamber O , so that the paper box in the same is filled in the same manner as before described. The receiving-boxes, with the filled paper boxes, are then carried by the endless belt forward and around the right-hand guide-pulley, the material in the filled paper boxes being prevented from spilling, due to the jarring of the machine in its operation, by means of curved parallel guard-plates r , one above the other, which are attached to the central and end standards $A^2 A^3$, as shown clearly in Figs. 1 and 2, the upper or outer plate, with its depending arms, serving merely to support and stiffen the inner or lower plate. The side flaps of the filled boxes are moved alongside of the guard-plates r , while the end flaps are bent over as they pass under the lower guard-plate, as shown in Fig. 9. They are then passed on to and over the second intermittently-rotated glue-brush F at the right-hand end of the machine. This glue-brush F transfers the glue from the glue-pot F' to the upper surface of the front flap, the inner surfaces of the side flaps, and the under surface of the opposite or rear flap. The inwardly-bent flap closes

the upper end of the paper box and prevents the escape of the material in the same while it passes over the second glue-brush. Below the second glue-brush is arranged, at the end 5 of the machine, a second oscillating folding device G^3 , which, like the folder G , is composed of an inverted-U-shaped portion supported at the curved end by an oscillating elbow-lever in the same manner as the closing 10 device at the ingoing end of the machine, but with the difference that the curved portion is provided with projecting flanges or lips g^x at both ends, as shown in Figs. 1 and 2. The upper flange or lip serves to hold the already- 15 folded end flap in position while the box is passing over the same, the lower flange or lip engaging the folded flap when the box has passed beyond the upper flange to prevent any spilling of material from the box. The 20 folding of the second end flap is then accomplished in the same manner as before described for bottom flaps by the quick forward movement of the device, the folding member t^2 acting to fold the rear flap over the forward 25 flap. The lower flange or lip retains the two end flaps e^3 e^4 in folded-down position until the box reaches the side-flap-folding device. The side flaps are then conducted over a curved folder G^4 , which is arranged at the 30 lower end of the machine and supported on the main frame A, said folder being constructed in the same manner as the folding device G' at the ingoing end of the machine.

The elbow-lever g' of the folding device for 35 the top flaps of the boxes is actuated by pins on the arms of the right-hand guide-pulley C' in the same manner as the elbow-lever of the closing device of the bottom flaps, the right-hand pulley C' being made of the same diam- 40 eter and construction as the rim of the spider-frame B, the pins engaging the shorter arm of the elbow-lever G^5 and imparting intermittent oscillating motion to the closing device, so as to exert the required closing action of 45 the top flange of the filled paper boxes. The filled boxes being thus closed by the sealing of their upper flaps, pass, with the receiving-boxes C^2 , over a horizontal bottom shelf N at the lower part of the supporting-frame and 50 are conducted along the same shelf to an inclined chute N' at the left-hand end of the machine, as shown in Figs. 1 and 2. The filled and sealed paper boxes are delivered onto the inclined chute by the spreading 55 apart of the yielding walls of the receiving-boxes during the upward motion around the left-hand guide-pulley and conducted one after the other over the inclined chute to the delivery end of the same, where they are re- 60 moved for packing and shipping.

The operation of the machine was described to some extent in connection with the different actuating parts of the machine and can therefore be briefly recapitulated. The 65 blanks for the paper boxes are placed, with their flaps open, on the blocks of the spider-frame, to which intermittent motion is im-

parted. The blanks are placed, with the top end downward, on the blocks and then sub- 70 jected to the action of the intermittently-rotated glue-brush and the oscillating and stationary folding devices, whereby the bottom flaps are closed. The paper boxes are then successively transferred into the receiving- 75 boxes on the endless belt by the positive action of an oscillating transferring-lever and then conducted by the endless belt to the delivery-chamber and plunger for receiving the required quantity of material. From the 80 filling mechanism they are conducted along the guard-plates by the endless belt to a second glue-brush, which supplies the necessary glue to the top flaps of the box, so that the end flaps and then the side flaps can be 85 folded and closed in the same manner as the bottom flaps of the box. The box being thus filled and sealed is then conducted over the bottom shelf of the machine and delivered by the receiving-boxes to an inclined chute for 90 packing, storing, or shipping.

The advantages of my improved machine for filling and closing paper boxes are that the different operations instead of being per- 95 formed by hand are performed automatically by the operations of a machine, the machine requiring only one attendant, who places the box-blanks in position on the blocks of the spider-frame. The machine is specially adapt- 100 ed for the packing of pulverulent material of all kinds—such as baking-powder, borax, soda, and chemical substances—and for herb teas and other substances of a similar nature.

Having thus described my invention, I claim as new and desire to secure by Letters 105 Patent—

1. In a machine for filling and closing pa- 105 per boxes, the combination, with a glue-brush as wide as the box, of means for moving a box having projecting end and side flaps into contact at its end flaps with the face of said brush 110 and simultaneously at a side flap into contact with a side of the brush, substantially as set forth.

2. In a machine for filling and closing pa- 115 per boxes, the combination, with a glue-brush of like width as the distance between the side flaps of the box, of means for moving said box into contact at its end flaps with the face of the brush and simultaneously at both side 120 flaps into contact one with one side and the other with the opposite side of said brush, substantially as set forth.

3. In a machine for filling and closing pa- 125 per boxes having overlapping end flaps, a folding device comprising a folding member and a lip forward of and separated by an intermediate space from said member, said lip being located and adapted to support the for- 130 ward end flap of the box when the rear end flap is located in said intermediate space, and means for moving said lip out of the path of the overlapping rear end flap, substantially as set forth.

4. In a machine for filling and closing pa-

- per boxes, a folding device comprising a folding member, a lip forward of and separated by an intermediate space from said member, said lip being located and adapted to support the forward end flap of the box when the rear end flap is located in said intermediate space, and a flap-supporting lip projecting rearwardly from said folding member, substantially as set forth.
5. In a machine for filling and closing paper boxes, the combination, with a folding member and a flap-supporting lip forward of and separated by an intermediate space from said folding member, of means for imparting motion in forward direction simultaneously to said folding member and lip, substantially as set forth.
6. In a machine for filling and closing paper boxes, the combination, with a folding member and a flap-supporting lip forward of and separated by an intermediate space from said folding member, of means for moving the box into position with its forward end flap on the lip and its rear end flap in said space, and means for imparting forward movement simultaneously to said folding member and lip, substantially as set forth.
7. In a machine for filling and closing paper boxes, the combination, with a folding member and a flap-supporting lip forward of and separated by an intermediate space from said folding member, of means for imparting motion simultaneously to said folding member and lip alternately in forward and return directions, substantially as set forth.
8. In a machine for filling and closing paper boxes, the combination with a folding member and a flap-supporting lip forward of and separated by an intermediate space from said folding member, of means for imparting a constant forward motion in one direction to the box, and means for imparting to said folding member and lip simultaneously a more rapid motion at a predetermined point in the course of said box, substantially as set forth.
9. In a machine for filling and closing paper boxes, the combination, with a folding member, a flap-supporting lip forward of and separated by an intermediate space from said folding member and a flap-supporting lip extending rearwardly from said folding member, of means for imparting motion simultaneously to said folding member and lips alternately in forward and return directions, substantially as set forth.
10. In a machine for filling and closing paper boxes, the combination of a spider-frame provided with blocks for supporting the open box-blanks, means for rotating said spider-frame, a spring-actuated lever pivoted eccentrically to said spider-frame, pins on said spider-frame located to engage and release said lever during the rotation of the frame, and a folding device carried by said lever in the path of the end flaps of said box-blanks, substantially as set forth.
11. In a machine for filling and closing paper boxes, the combination of a spider-frame provided with blocks for supporting the open box-blanks, means for rotating said spider-frame, a spring-actuated elbow-lever pivoted eccentrically to said spider-frame, the longer arm of said lever projecting radially beyond said blocks, pins on said spider-frame located to engage and release the shorter arm of said lever during the rotation of the frame, and a folding device carried by said longer arm in the path of the end flaps of said box-blanks, substantially as set forth.
12. In a machine for filling and closing paper boxes, the combination, with a box-stripping lever provided at one end with a fork adapted to embrace the box, of swiveled fingers mounted one upon each fork side and spring-actuated toward the interior of the fork, substantially as set forth.
13. In a machine for filling and closing paper boxes, the combination, with a horizontal box-stripping lever provided at one end with a fork adapted to embrace the box, of depending fingers mounted one upon each fork side and pivoted to swing in the direction of said lever, and swiveled to swing toward the interior of the fork, and spring-actuated in the latter direction, substantially as set forth.
14. In a machine for filling and closing paper boxes, the combination, with an intermittently-rotating spider-frame provided with radial blocks for receiving the open box-blanks, of an intermittently-actuated endless belt provided with receiving-boxes, a fulcrumed and spring-actuated stripping-lever provided with swiveled fingers, and means for intermittently oscillating said stripping-lever, substantially as set forth.
15. In a machine for filling and closing paper boxes, the combination, with an intermittently-rotating spider-frame provided with radial blocks for receiving the open box-blanks, of an intermittently-actuated endless belt provided with receiving-boxes, an intermittently-actuated stripping-lever provided with swiveled spring-actuated fingers, and means for actuating said lever at the proper time so as to transfer the paper boxes from the radial blocks of the spider-frame into the receiving-boxes of the endless belt, substantially as set forth.
16. In a machine for filling and closing paper boxes, a receiving-box provided with a laterally-movable wall spring-actuated in the direction of one dimension and a second laterally-movable wall spring-actuated in the direction of a different dimension of said box, and means for moving said walls in succession in inward direction, substantially as set forth.
17. In a machine for filling and closing paper boxes, a receiving-box provided with a laterally-movable wall spring-actuated in the direction of one dimension and a second movable wall spring-actuated in the direction of a different dimension of said box, means for maintaining said walls separated slightly

beyond the dimensions of the paper box to be received therein, and means for moving said walls in succession in inward direction after receipt of the box, substantially as set forth.

5 18. In a machine for filling and closing paper boxes, a receiving-box provided with a laterally-movable wall spring-actuated in the direction of one dimension and a second
10 movable wall spring-actuated in the direction of a different dimension of said box, means for maintaining said walls separated slightly beyond the dimensions of the paper box to be received therein, means for moving said
15 walls in succession in inward direction after receipt of the box, and means for moving said walls in outward direction from inwardly-moved position, substantially as set forth.

19. In a machine for filling and closing paper boxes, a receiving-box composed of a bottom, a stationary wall, and walls hinged at
20 their lower ends to said bottom, and spring-actuated normally in slightly open position, substantially as set forth.

20. In a machine for filling and closing paper boxes, the combination, with a conveying-chain, of a receiving-box pivoted to and bearing at its bottom upon said chain at the forward side of its pivot, and an extension
25 projecting rearwardly from said box into contact with said chain at the rear side of said pivot, substantially as set forth.

21. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with laterally-movable side
35 walls, of mechanism for supplying a paper box therein, a filling mechanism, and means between said box-supplying mechanism and filling mechanism for moving said side walls in inward direction, substantially as set forth.

40 22. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with laterally-movable walls, of mechanism for applying a paper box therein, a filling mechanism, means for moving said
45 walls inwardly, and means for retaining said walls in inwardly-moved position during the act of filling by said filling mechanism, substantially as set forth.

23. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with a laterally-movable front wall, of means for moving said box in forward
50 direction, a pin, and means for moving said pin into the path of said box before the front wall, substantially as set forth.

24. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with a laterally-movable wall, of two pins located at the same distance apart
60 as the said wall and the opposed wall when the former is in inward position, and means for moving said pins into position adjacent the outer sides of said walls respectively, substantially as set forth.

65 25. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with laterally-movable side

walls and a laterally-movable front wall, of means for moving said box to filling position, means for moving said side walls in inward
70 direction during the passage of the box thereto, and means for moving said front wall in inward direction after said movement of the side walls, substantially as set forth.

26. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with a laterally-movable front wall, of means for moving said box to filling position, a pin, and means for moving said
75 pin into the path of said box before the front wall immediately before arrival in filling position, substantially as set forth.

27. In a machine for filling and closing paper boxes, the combination, with a receiving-box provided with a laterally-movable front wall, of means for moving said box to filling position, a pin, means for moving said pin
85 into the path of said box before the front wall immediately before arrival in filling position, a second pin, and means for moving the same into position adjacent the rear wall after arrival of the box in filling position, substantially as set forth.

28. In a machine for filling and closing paper boxes, the combination, with an intermittently-actuated endless belt provided with receiving-boxes, each having a stationary rear wall and hinged and yielding side and front walls, of means for holding said hinged and yielding walls firmly in position, a vertically-reciprocating delivery-chamber having
95 spring-actuated gates at its lower end, a supply-hopper communicating with an opening in the delivery-chamber, means for feeding the material from the supply-hopper into the chamber, and a vertically-reciprocating plunger adapted to deliver the material from said
100 delivery-chamber into a paper box within said receiving-box, substantially as set forth.

29. In a machine for filling and closing paper boxes, the combination, with an intermittently-actuated endless belt provided with receiving-boxes for the paper boxes to be filled, of a vertically-reciprocating delivery-chamber having spring-actuated gates at its lower
115 end, means for guiding said delivery-chamber into the box to be filled, a vertically-reciprocating plunger for transferring the material into the paper box, transverse retaining-pins adapted to hold the receiving-box in position for filling the paper box in the same, and means for actuating said transverse retaining-pins so as to engage or release the walls of the receiving-box at the proper time, substantially as set forth.

30. In a machine for filling and closing paper boxes, an intermittently-actuated endless belt provided with a plurality of receiving-boxes, each receiving-box being composed of a stationary rear wall and yielding side and front walls, and a bottom having an extension, substantially as set forth.

31. In a machine for filling and closing paper boxes, the combination, with an intermit-

tently-actuated endless belt provided with receiving-boxes for the bottom-closed paper boxes, of a vertically-reciprocating delivery-chamber provided at its lower end with spring-actuated gates, a vertically-reciprocating plunger adapted to compress the material into the paper box, and transverse retaining-pins for holding the receiving-box in position below said delivery-chamber, substantially as set forth.

32. In a machine for filling and closing paper boxes, the combination, with a filling mechanism, of a flap-folding device, means for transferring the filled box in open condition from the one to the other, and means for guarding the open end of said box in transit; substantially as set forth.

33. In a machine for filling and closing paper boxes, the combination, with a filling mechanism, of a flap-folding device, means for transferring the filled box in open condition from the one to the other, and a guard-plate located between said mechanism and device in proximity to the open end of the box when in transit; substantially as set forth.

34. In a machine for filling and closing pa-

per boxes, the combination, with a filling mechanism, of a flap-folding device, means for transferring the filled box in open condition from the one to the other, and a guard-plate between said mechanism and device of width adapted to permit a raised position of the side flaps when in transit, substantially as set forth.

35. In a machine for filling and closing paper boxes, the combination, with filling mechanism, of a flap-folding device, means for transferring the filled box in open condition from the one to the other, and a stationary guard-plate of less width than the paper box arranged between the paths of the side flaps and in position to close the open end of the box between said filling mechanism and flap-folding device, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CHARLES DE QUILLFELDT.

Witnesses:

PAUL GOEPEL,
HENRY SUHRBIER.