

No. 616,452.

Patented Dec. 27, 1898.

D. J. CAMPBELL.  
PACKAGE MAKING MACHINE.

(No Model.)

(Application filed Sept. 8, 1894.)

12 Sheets—Sheet 1.

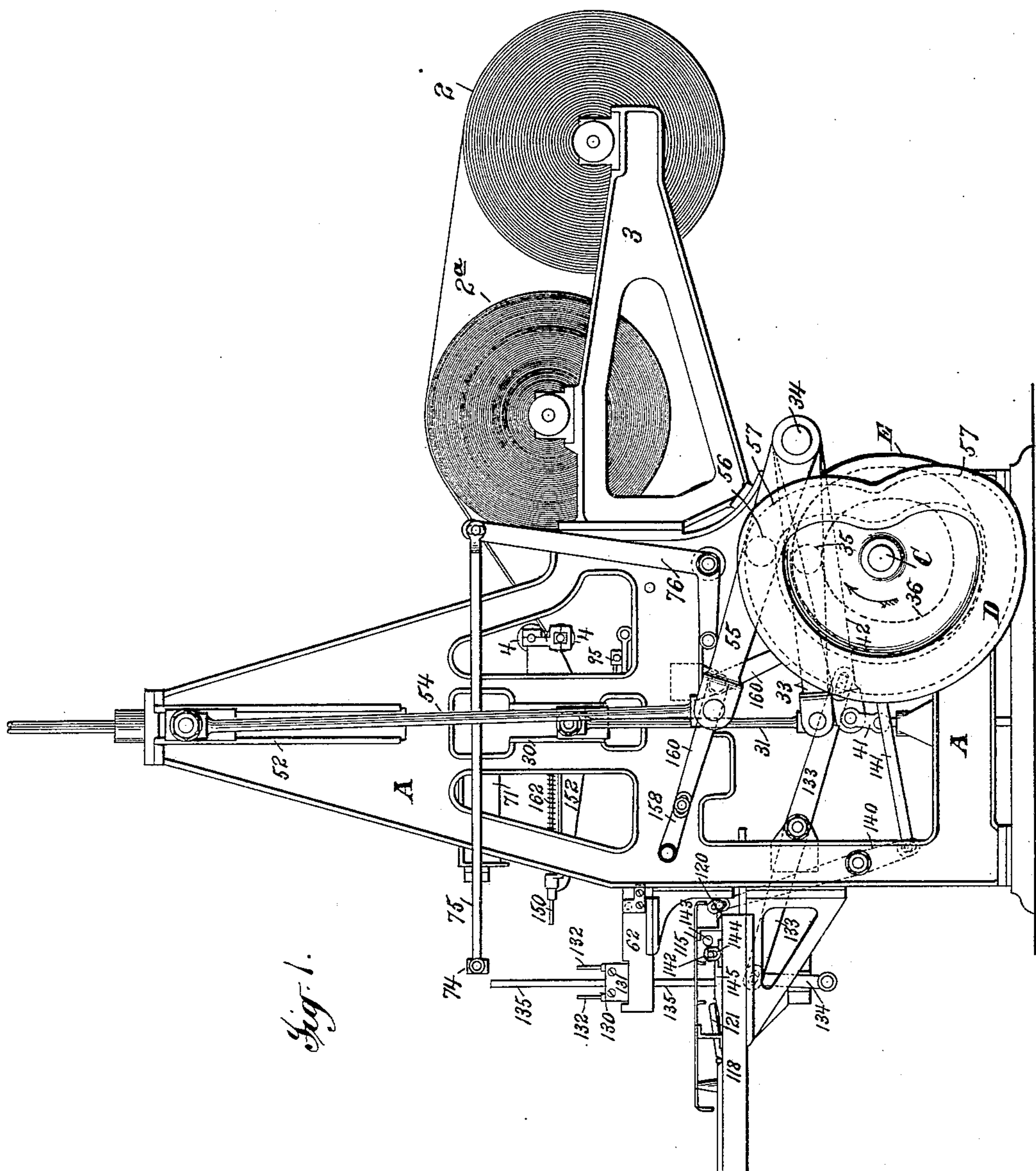


Fig. 1.

Attest:  
*J. M. Borat*  
*Geo. H. B. B.*

Inventor:  
*Daniel J. Campbell*  
*By Philip M. Munson Phelps*

*Atty.*

No. 616,452.

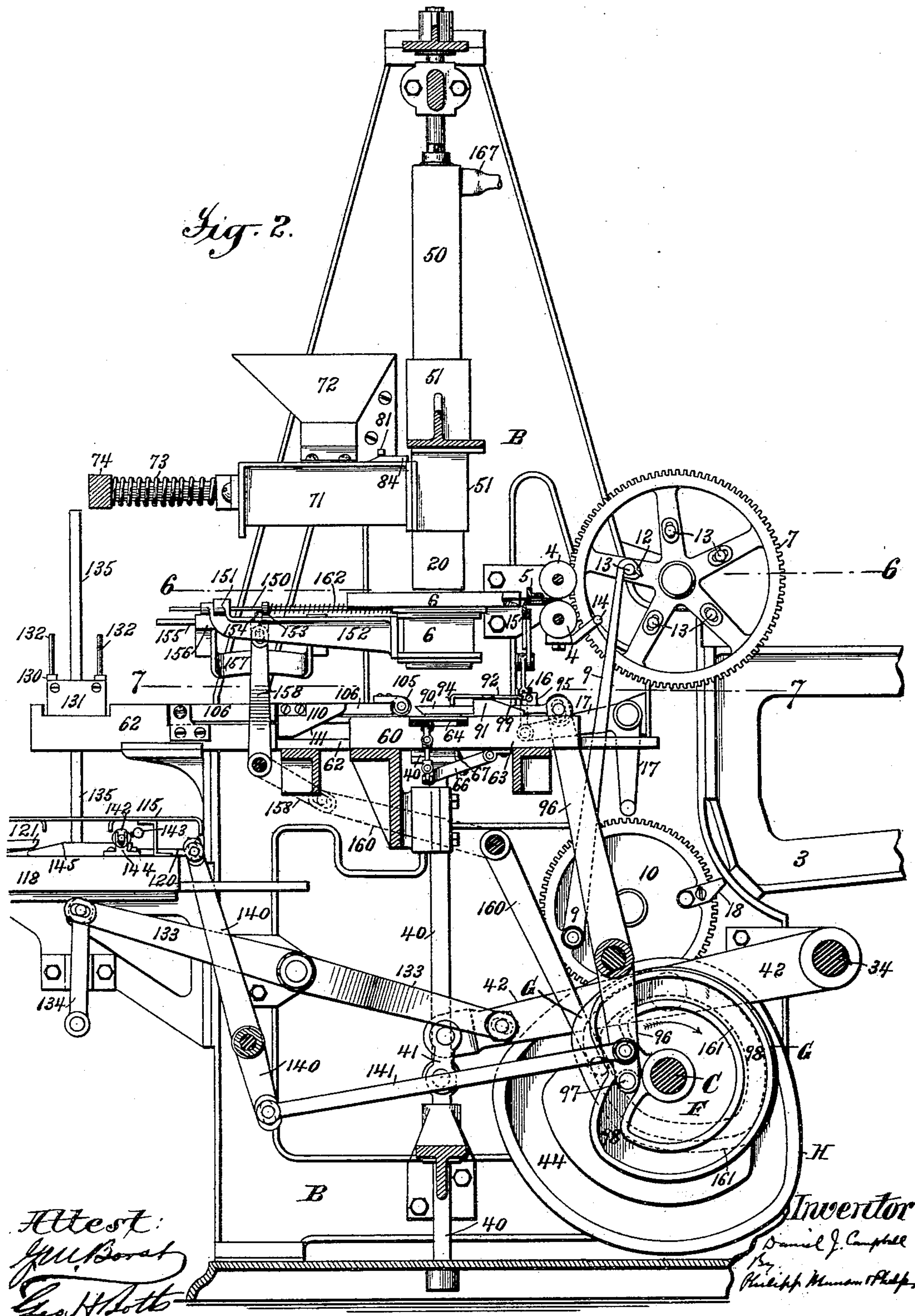
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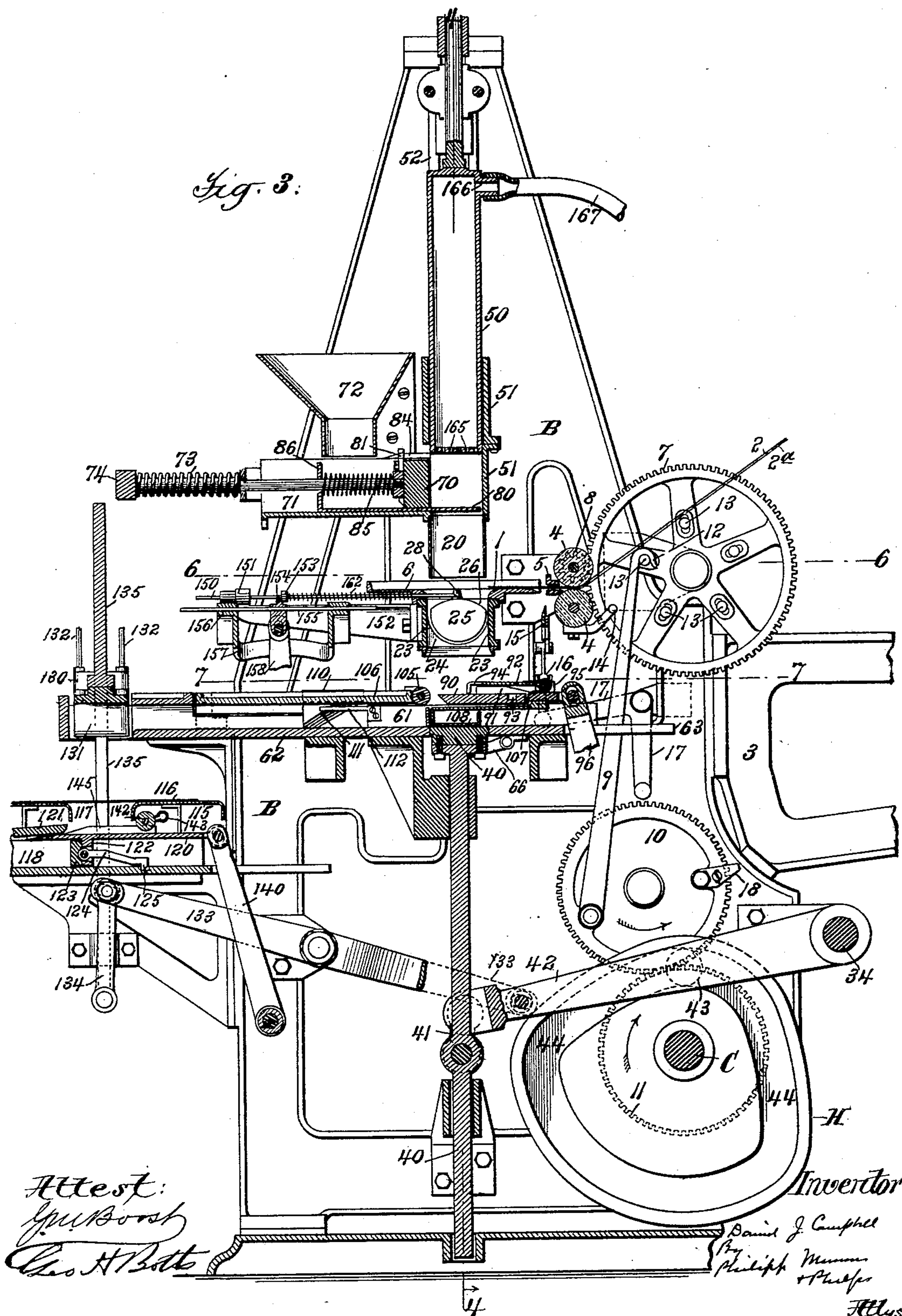
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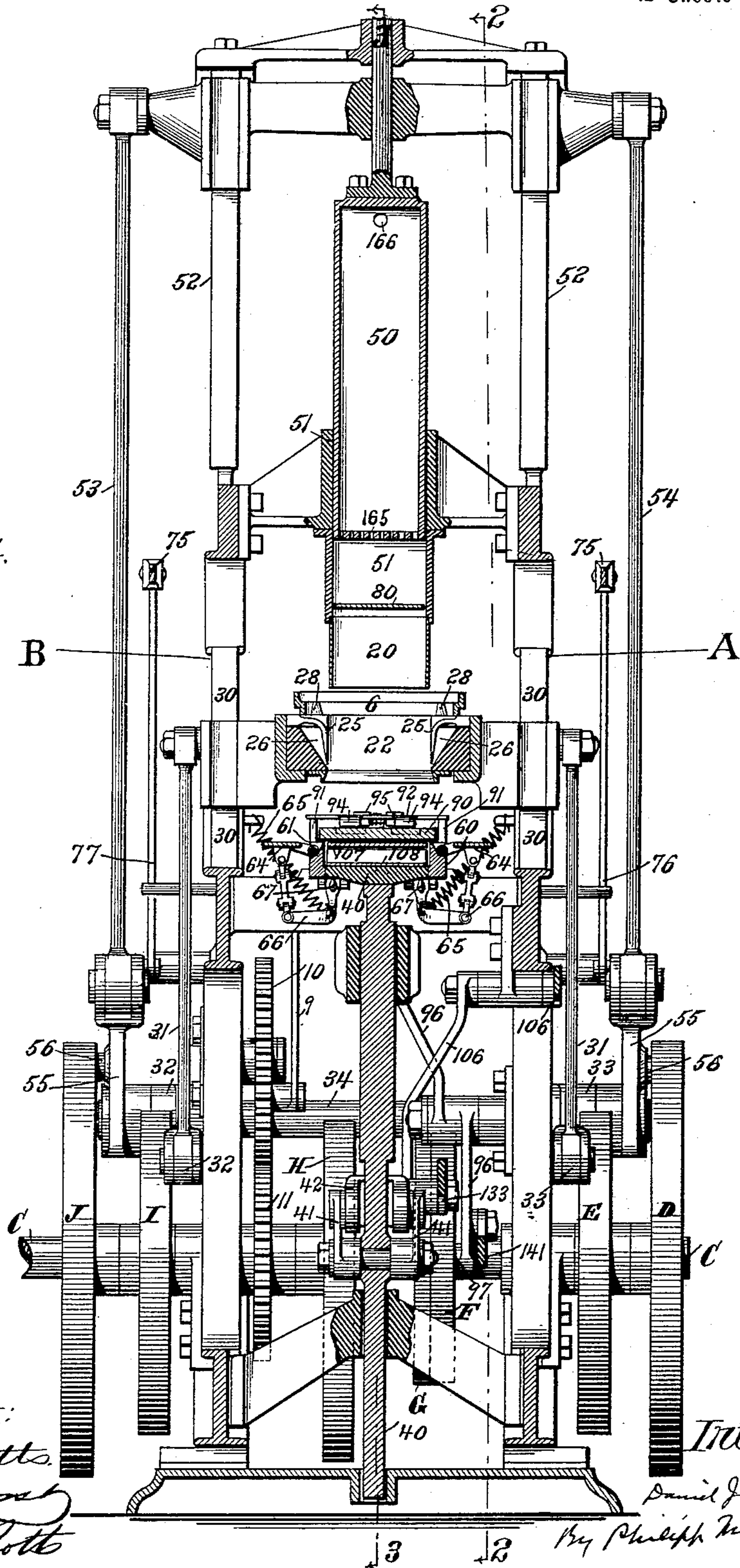
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Fig. 4.



Attest:  
Geo. H. Bots.  
Jm. Bots.  
Geo. H. Bots.

Inventor:

Daniel J. Campbell  
By Philip H. Heman & Phelps  
Attys.



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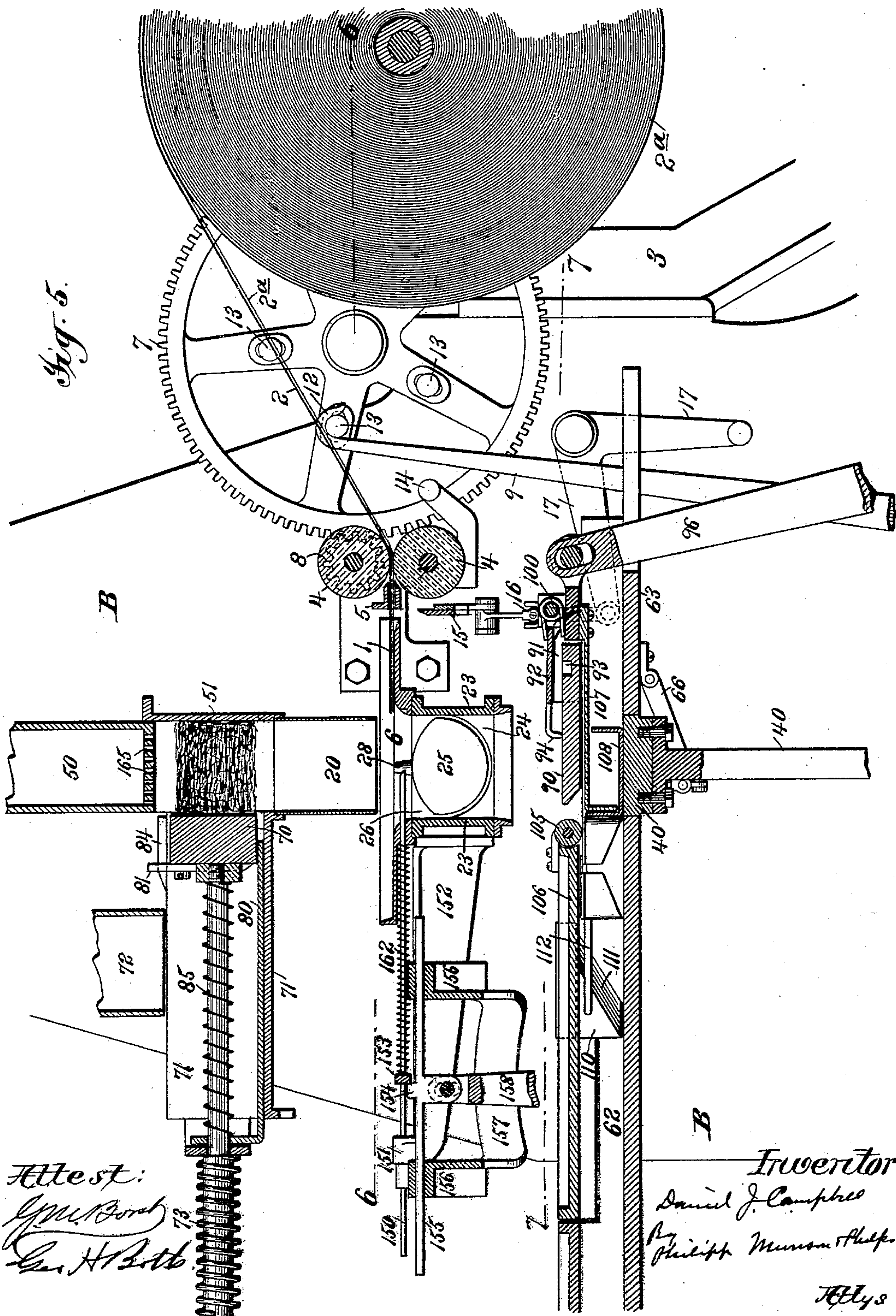
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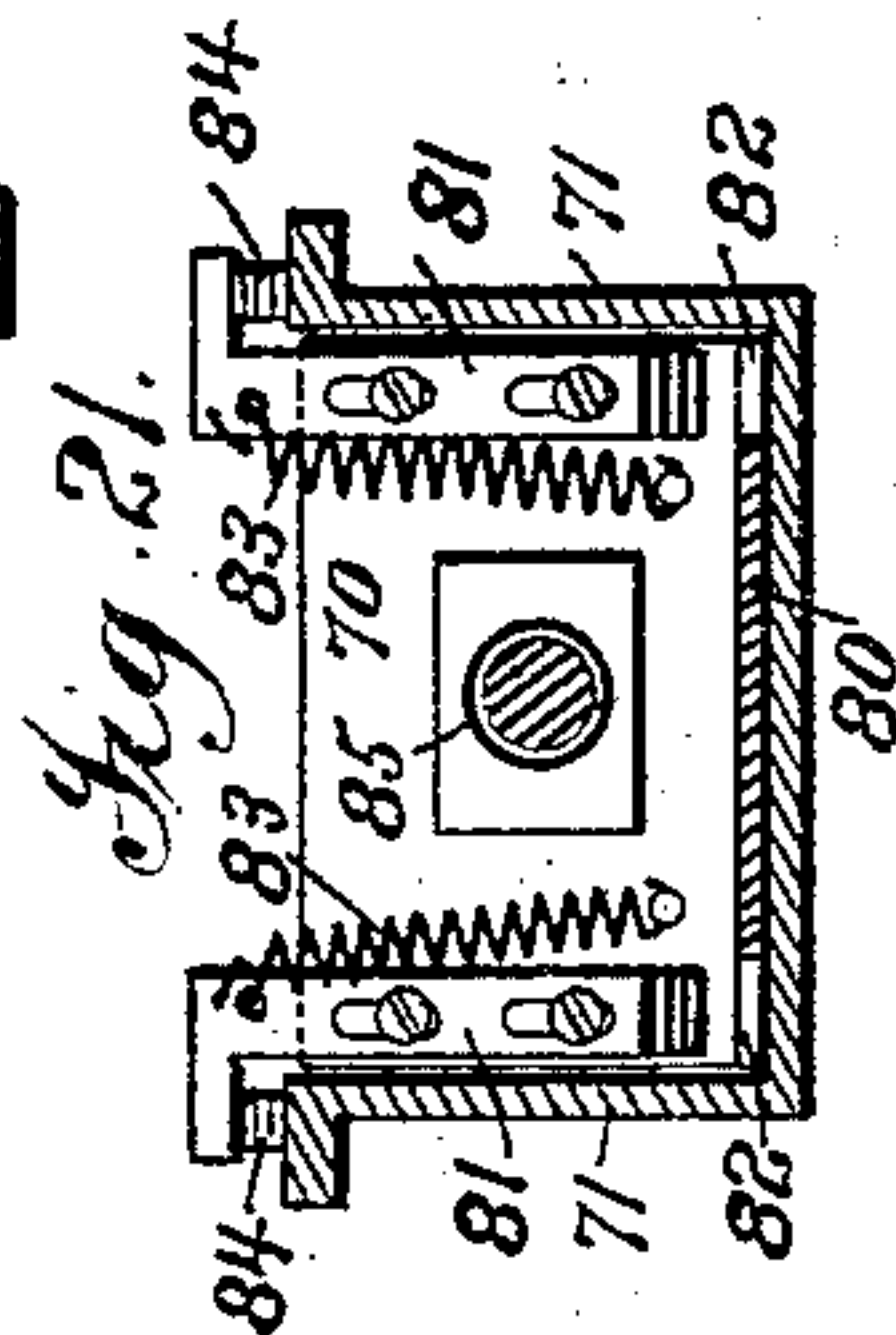
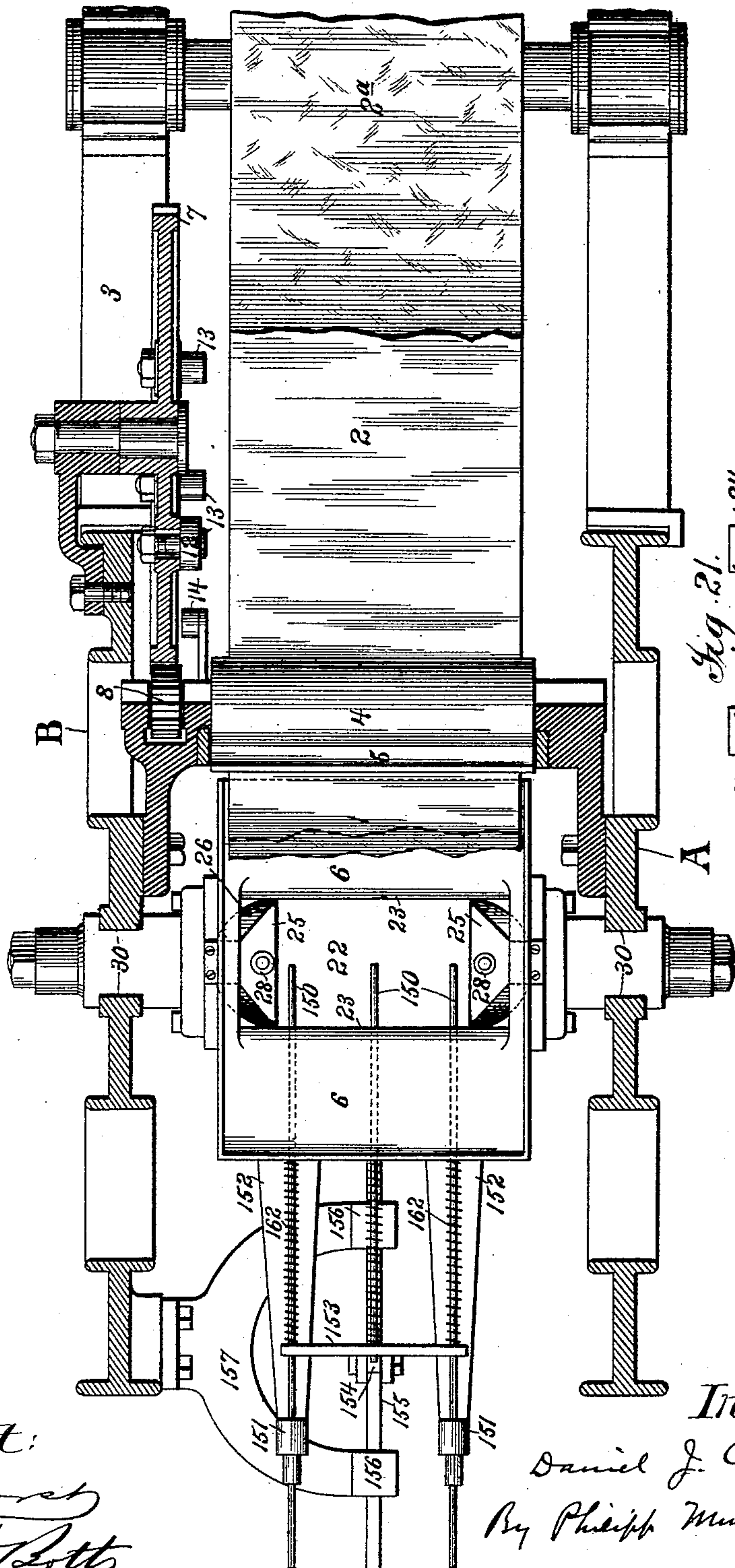
D. J. CAMPBELL.  
PACKAGE MAKING MACHINE.

(Application filed Sept. 8, 1894.)

(No Model.)

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Fig. 6.



Attest:

*Wm. Borch*  
*Chas. H. Borch*

Inventor:  
Daniel J. Campbell  
By *Philip Munn* Clerk

*Atty's*

**No. 616,452.**

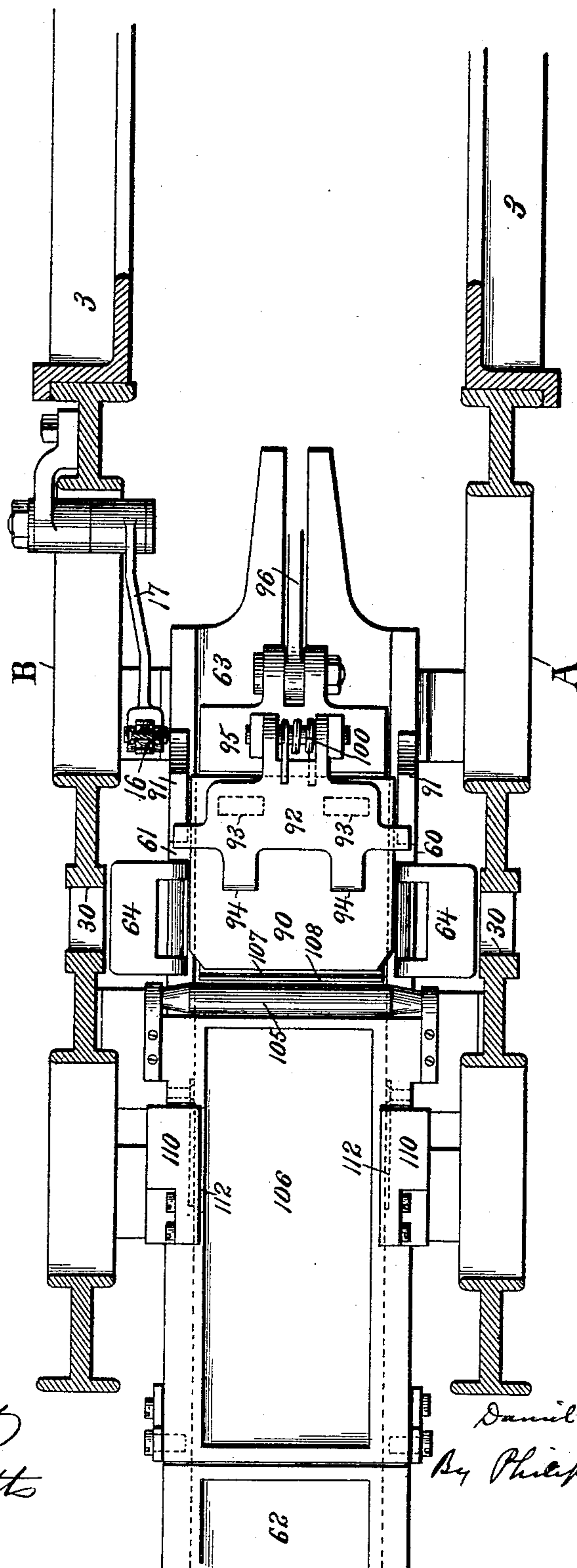
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(No Model.)

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Attest:  
Geo. Borch  
Chas. H. Borch

**L** *Inverton*  
Daniel J. Campbell  
By Philipp Munnich Phelps  
Htlys



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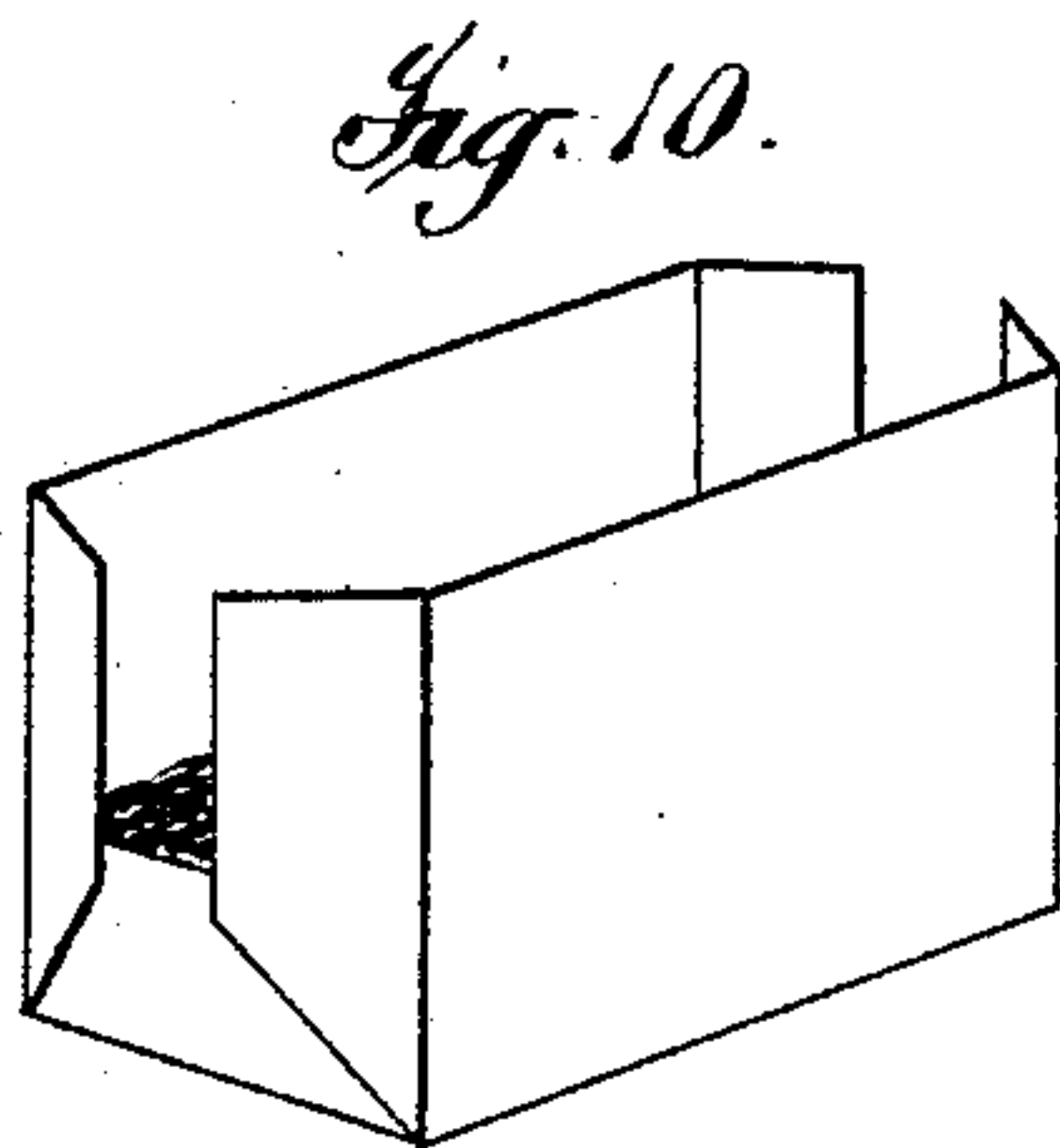
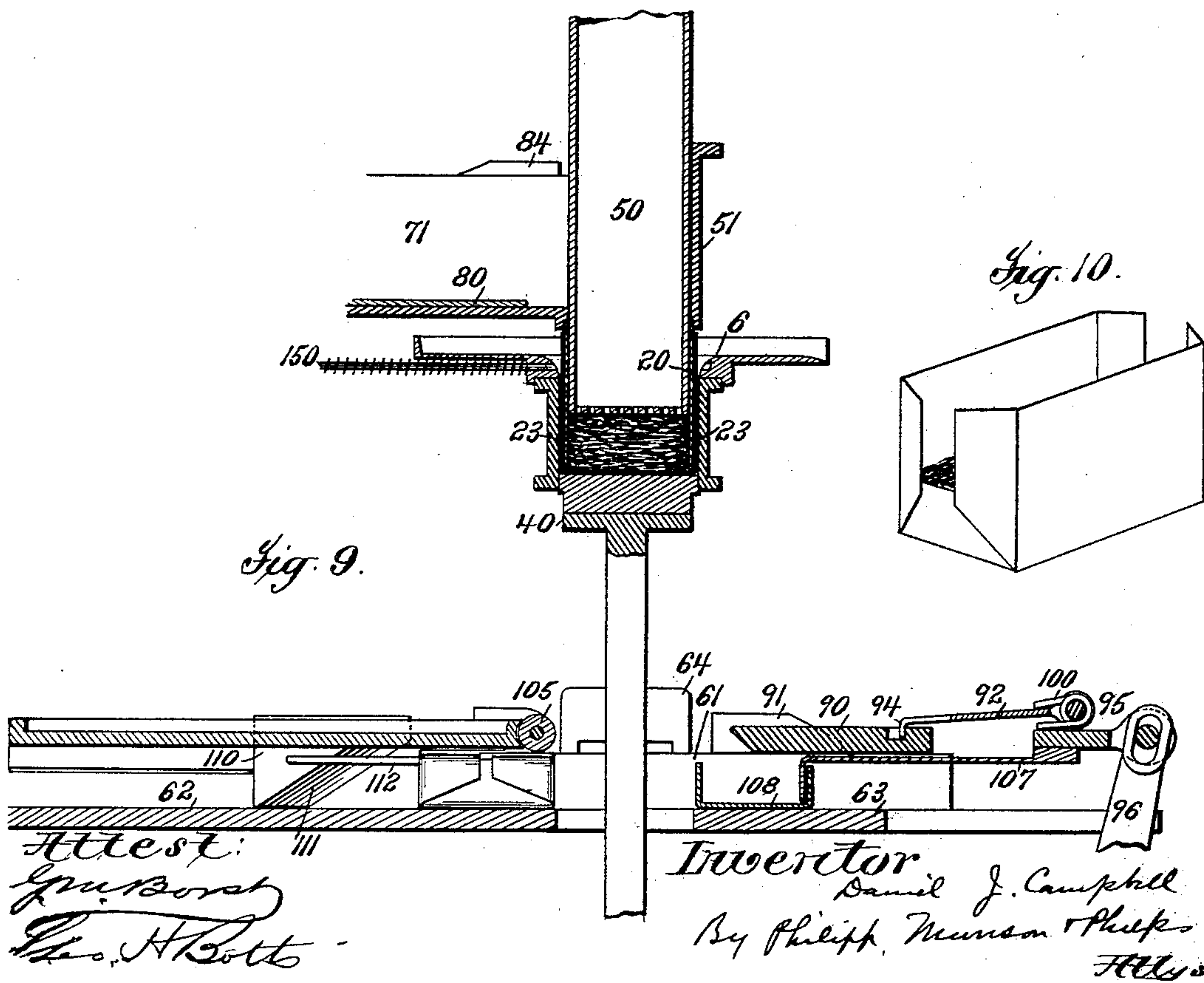
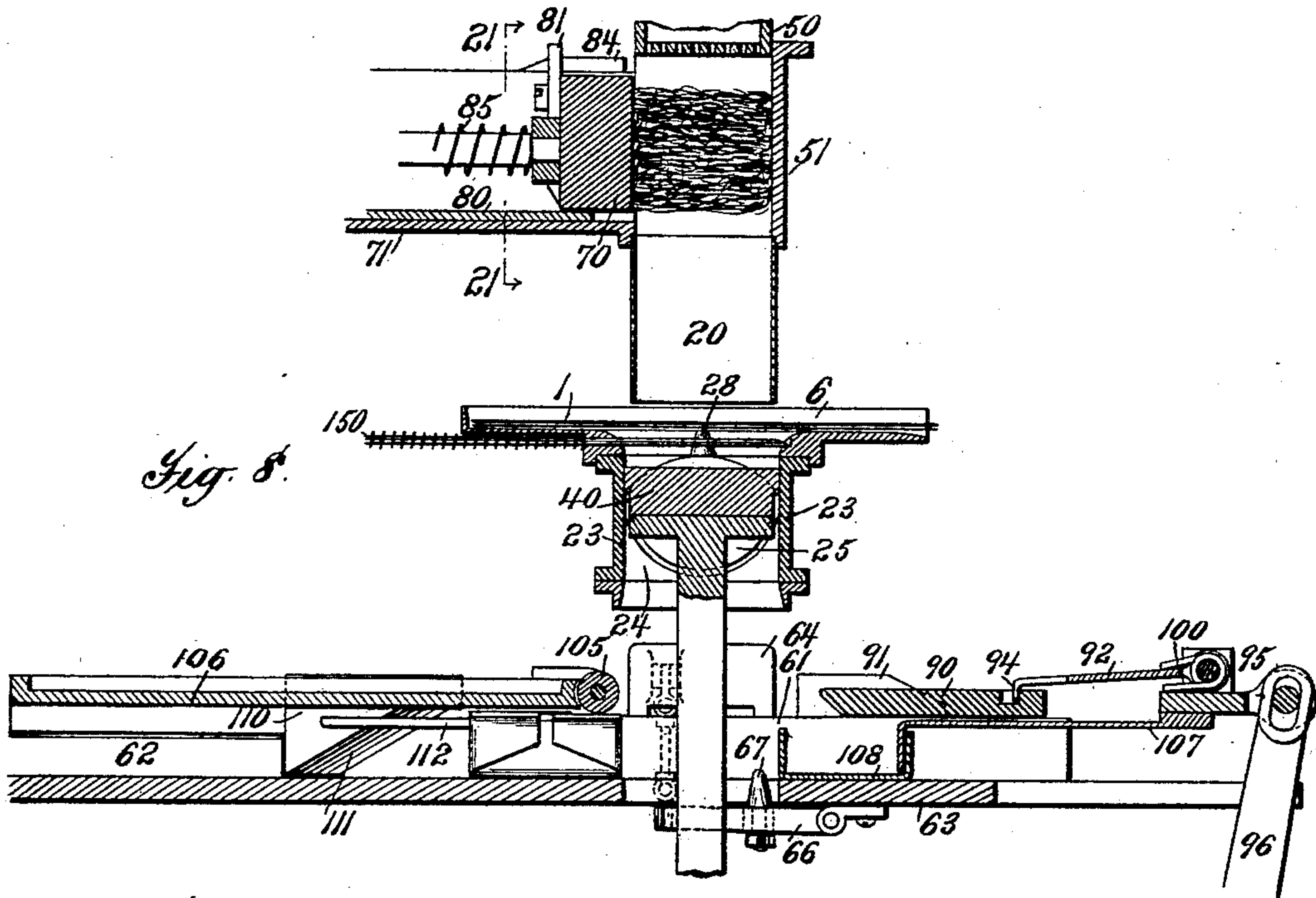
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D. J. CAMPBELL.  
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(Application filed Sept. 8, 1894.)

(No Model.)

12 Sheets—Sheet 8.



Attest:  
*Geo. H. Roth*

Inventor  
Daniel J. Campbell  
By *Philip M. Munson* *Phelps*



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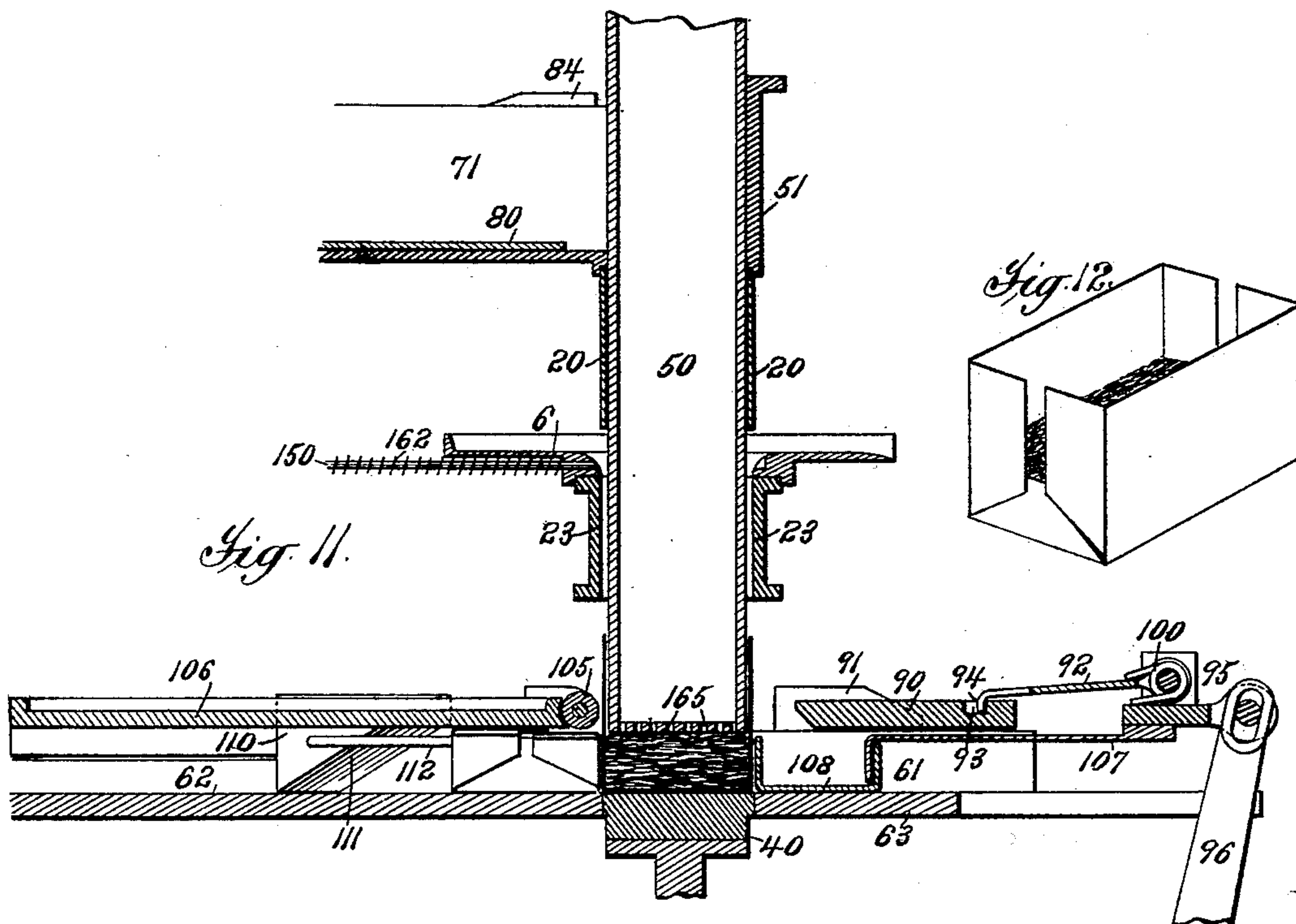


Fig. 11.

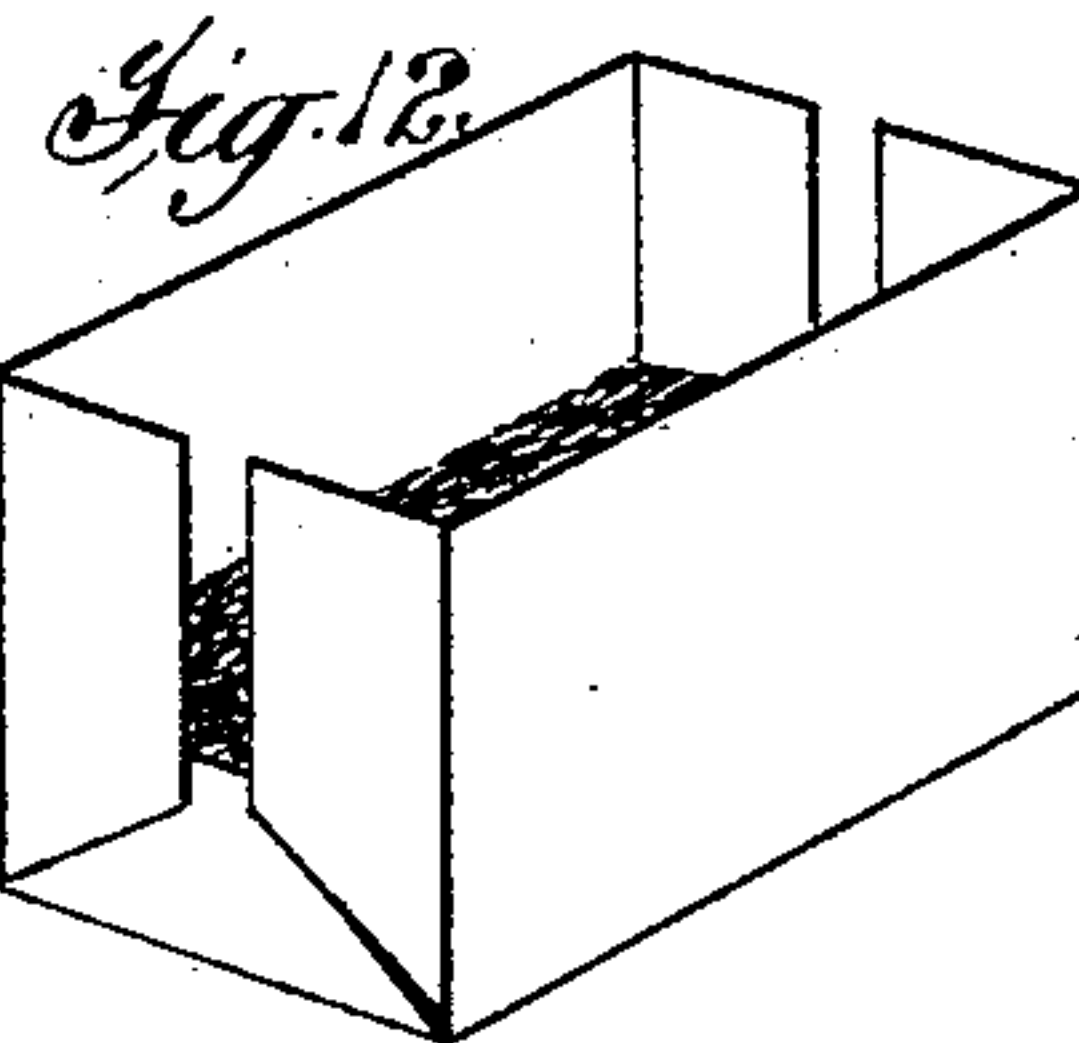


Fig. 12.

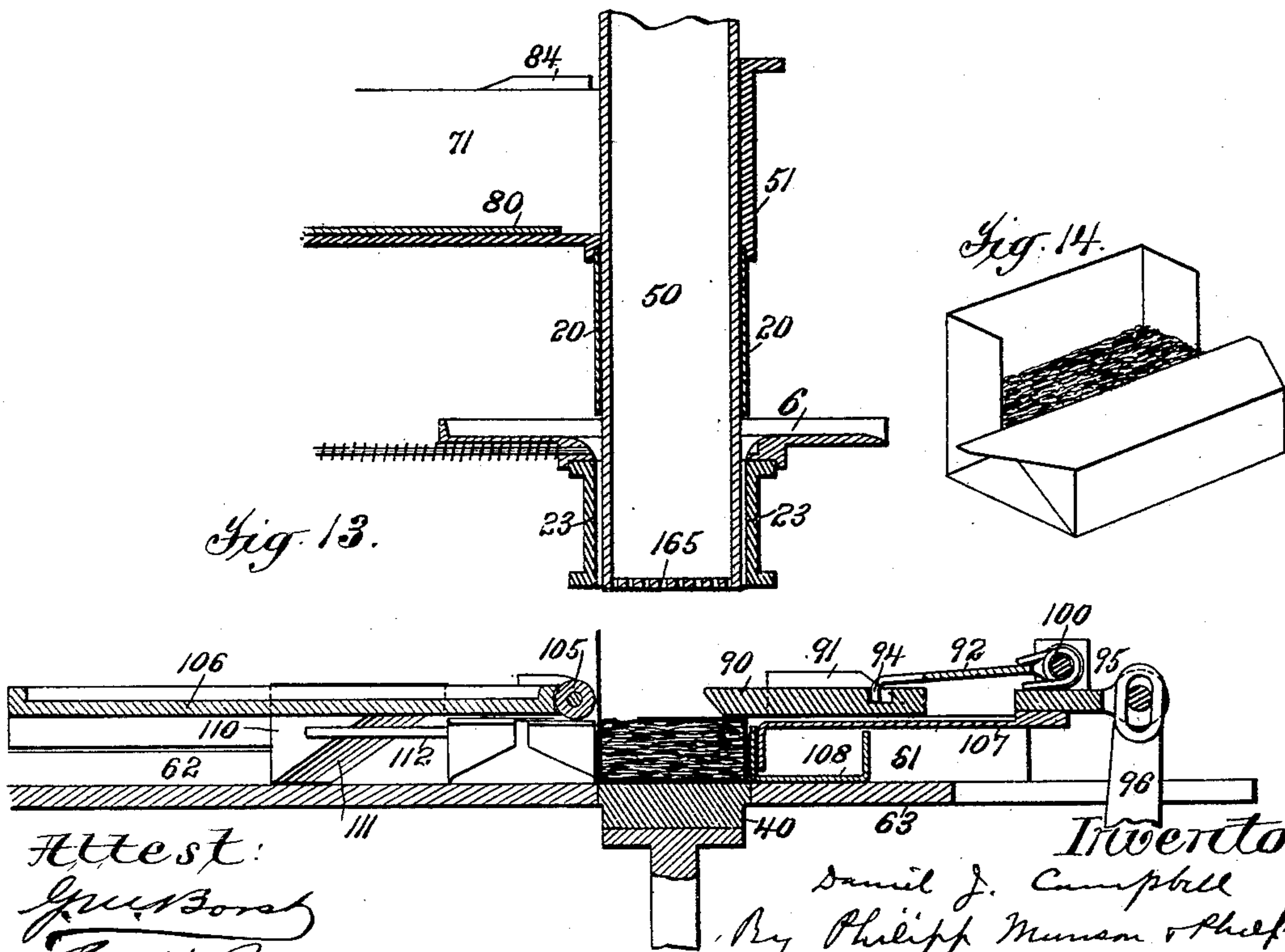


Fig. 13.

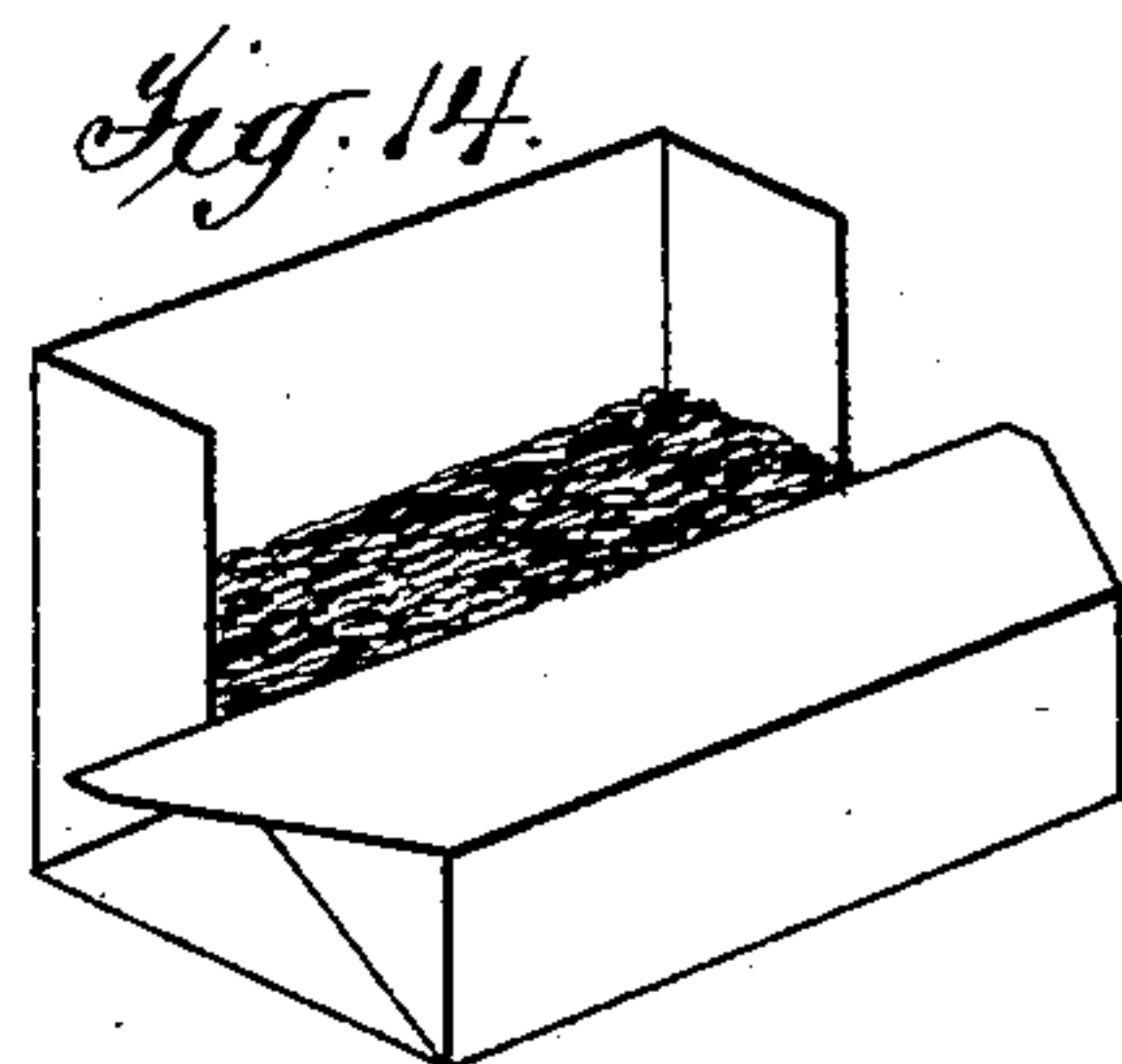


Fig. 14.

Attest:  
Gustavus  
Geo. H. Bott

Inventor  
Daniel J. Campbell  
By Philipp Munson Phelps

No. 616,452.

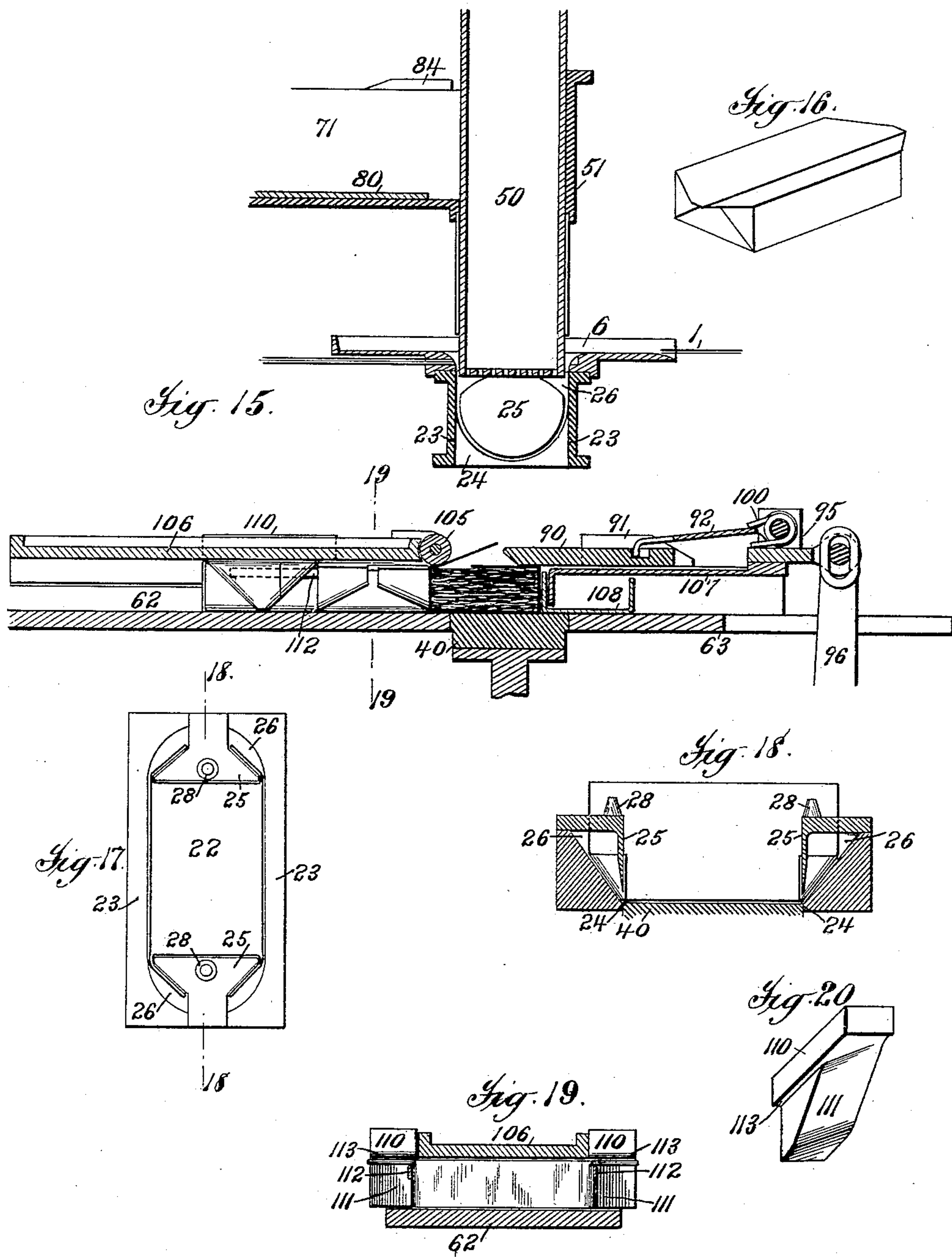
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Attest:  
Geo H. Bots  
L. M. Bots

Inventor:  
Daniel J. Campbell  
By Philipp Munson Phelps

Atty



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Fig. 22.

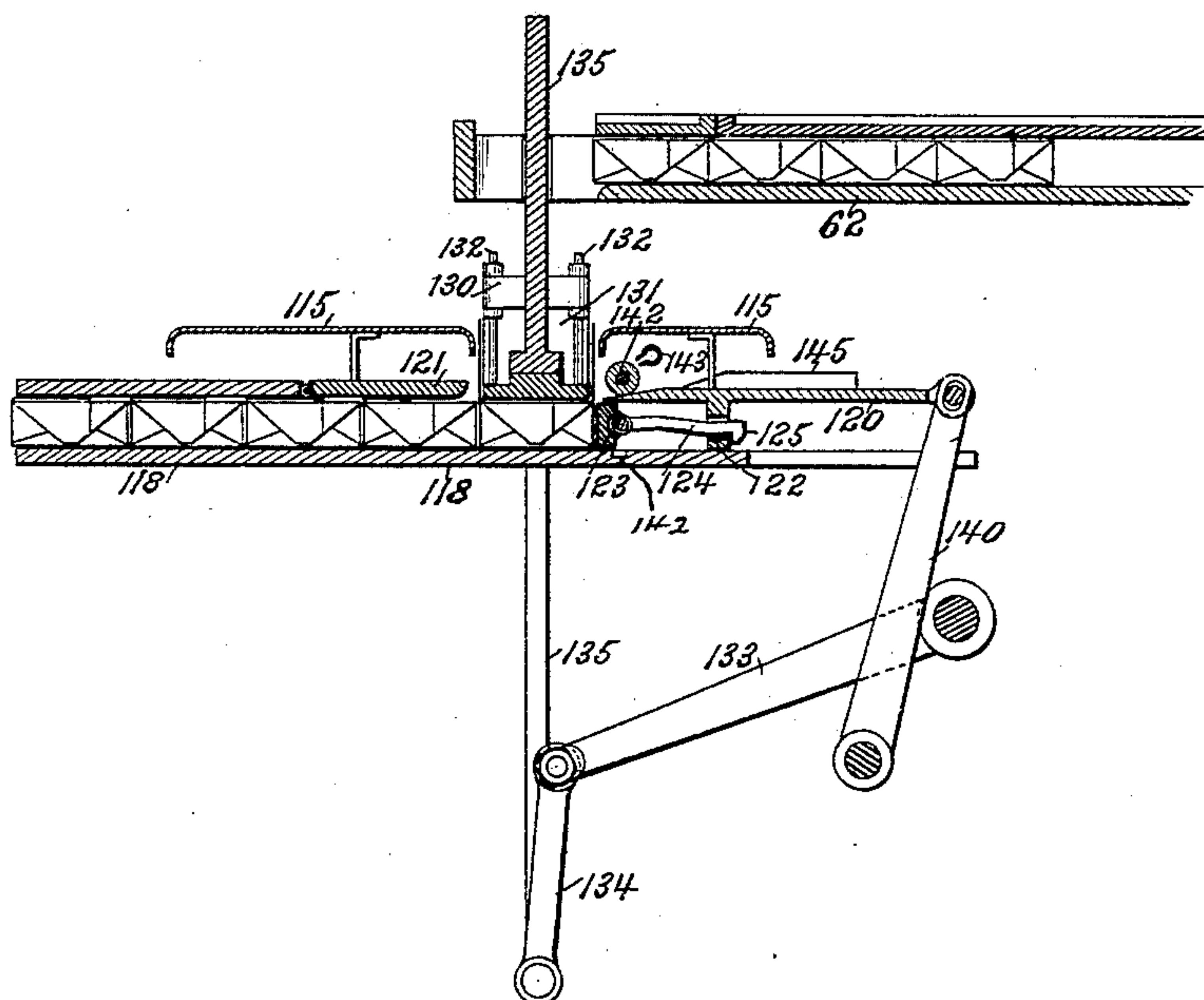
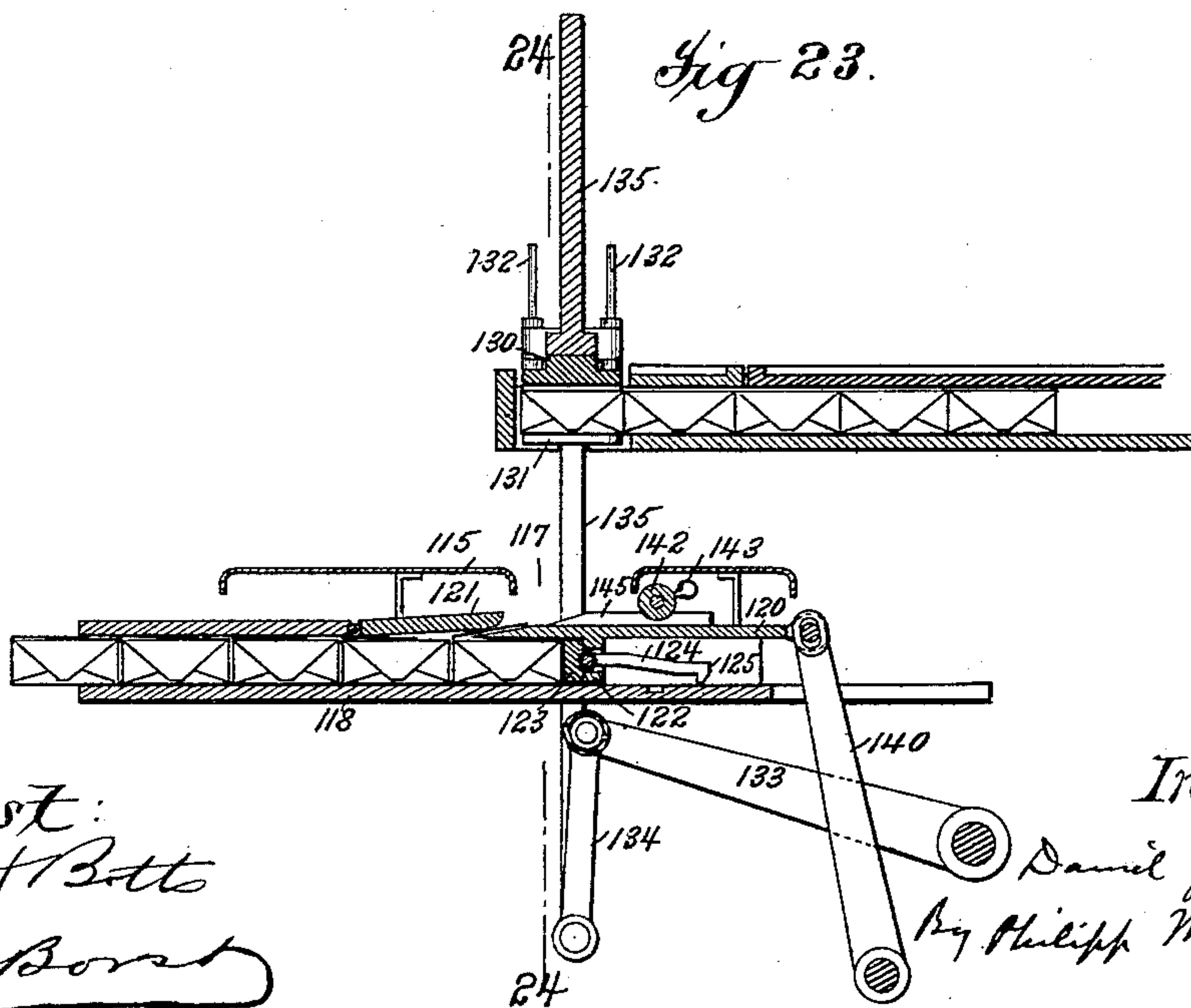


Fig. 23.



Attest:

Geo H Batts  
J. M. Borel

Inventor.

Daniel J. Campbell  
By Philipp Munn  
Phelps  
Attys

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Fig. 24.

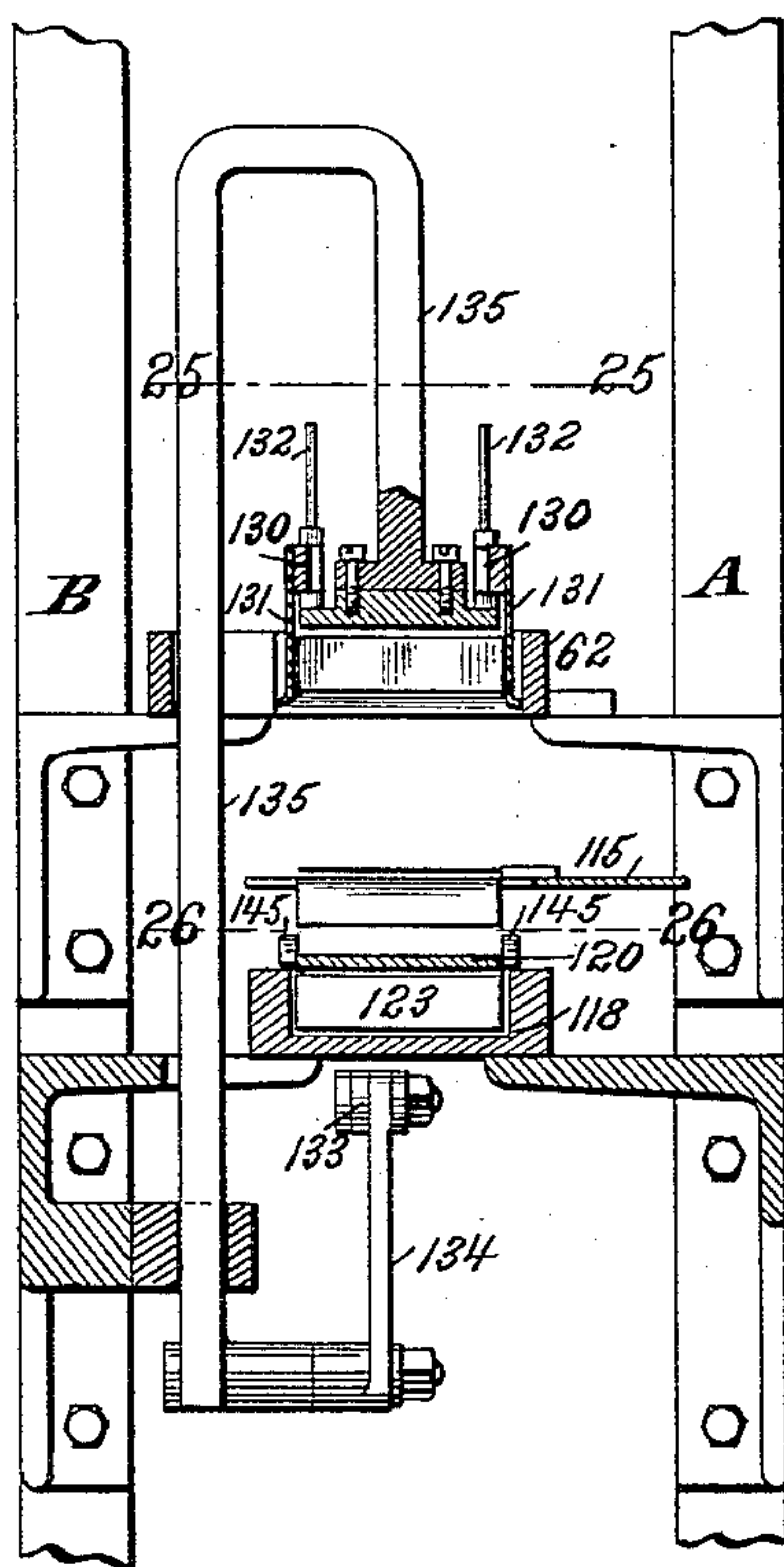


Fig. 25.

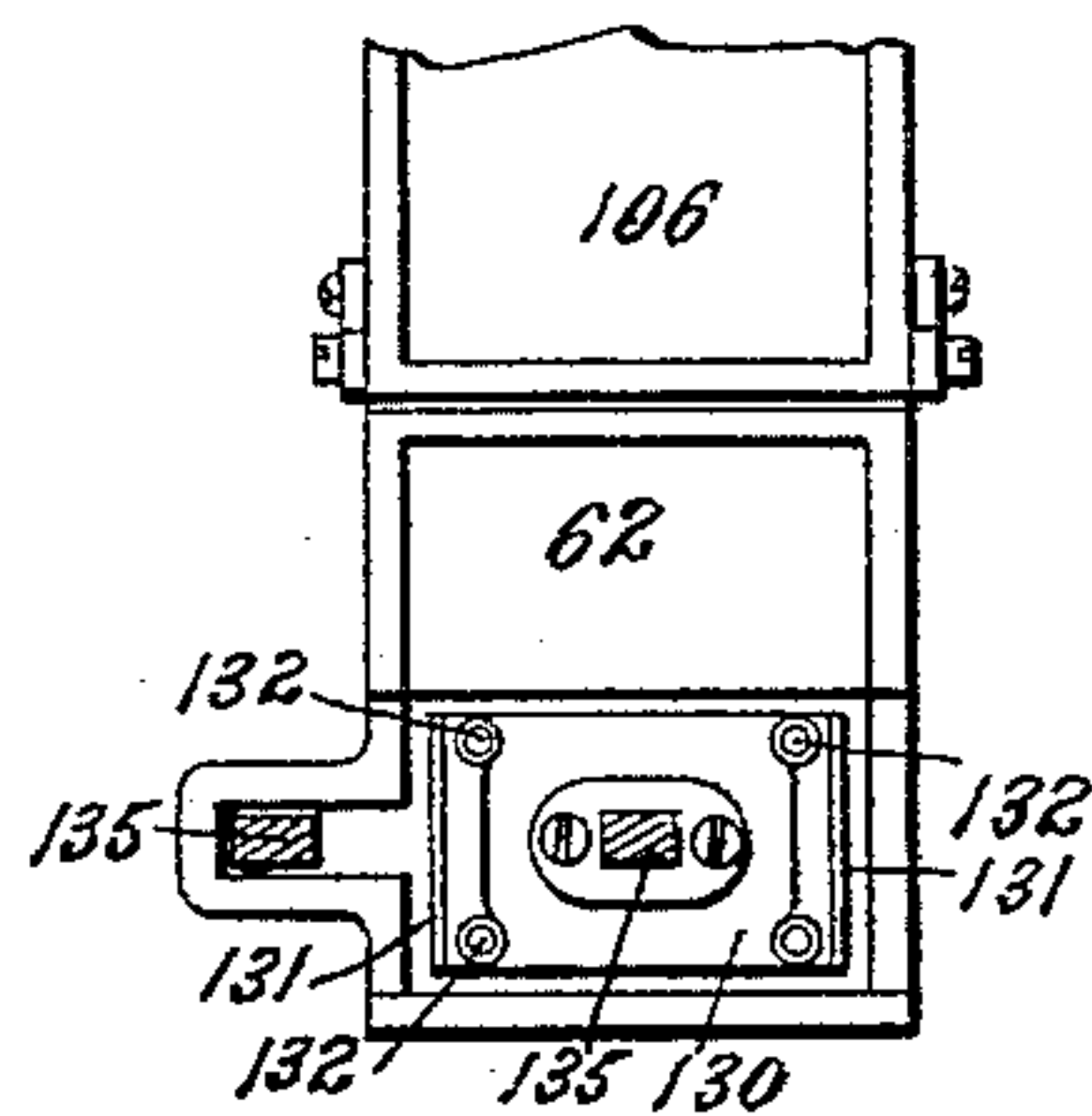
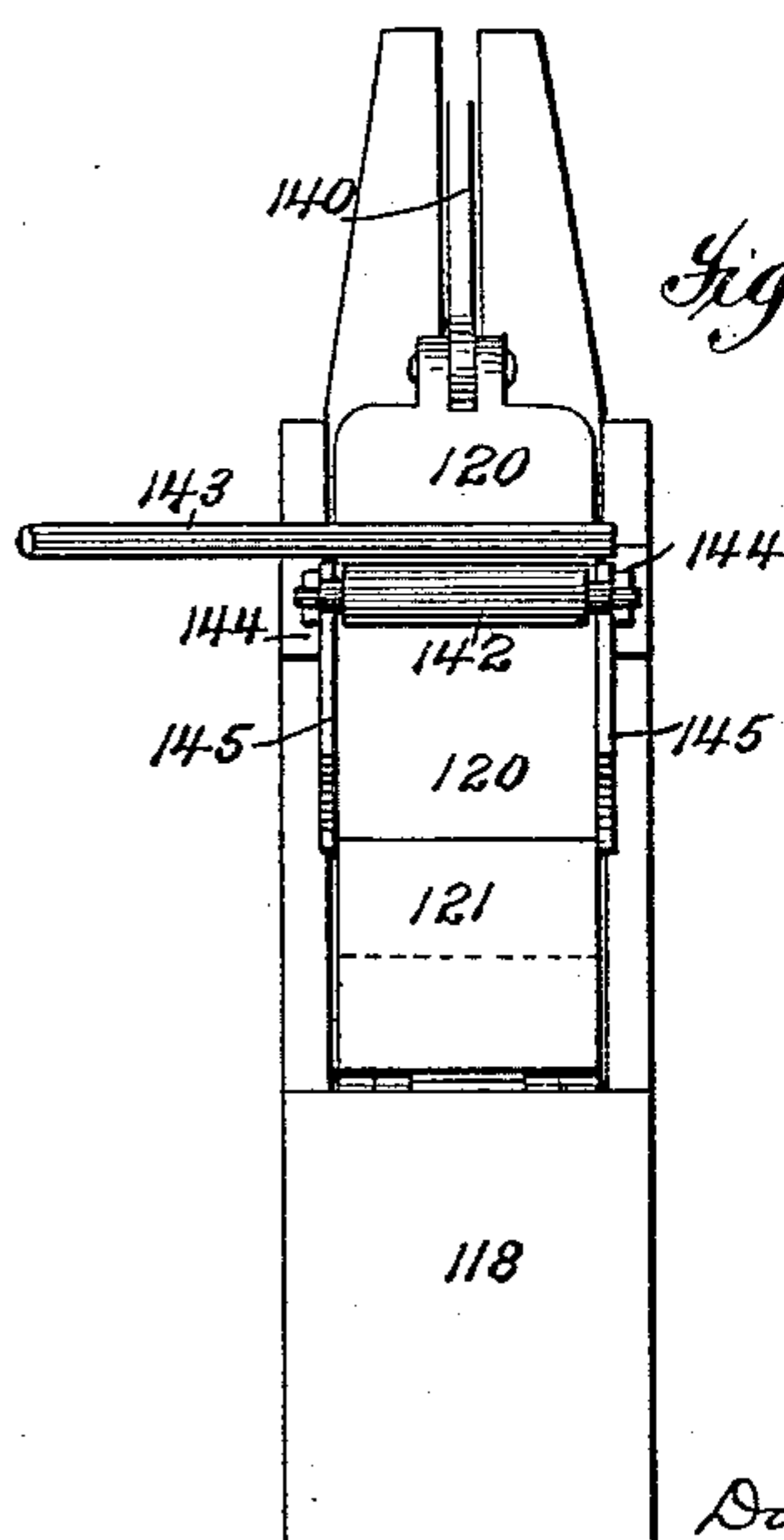


Fig. 26.



Attest:  
*Geo. H. Botta*

Inventor:  
Daniel J. Campbell  
By *Philip Munson Phelps*  
Attys



# UNITED STATES PATENT OFFICE.

DANIEL J. CAMPBELL, OF NEW YORK, N. Y.

## PACKAGE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,452, dated December 27, 1898.

Application filed September 8, 1894. Serial No. 522,511. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL J. CAMPBELL, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Packing or Packaging Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in packing or packaging machines, it being the object of the present invention to improve generally the construction of such machines and also the several mechanisms operating upon the wrapper-blank and material to be packaged and to provide a machine in which the several operations of feeding the wrapper-blanks, forming the wrapper-body, feeding the material to be packaged to the wrapper-body, and compressing it therein and completing the package will all be performed automatically.

In the machine which will be hereinafter particularly described and which embodies the improvements of the present invention in their preferred forms there are employed mechanism consisting of a stationary hollow casing or mandrel rectangular in cross-section, through which the material to be packaged is fed to the wrapper, and a vertically-reciprocating table on which the wrapper-blanks are supported and which is provided with a central wrapper-forming recess, adapted to embrace the mandrel, for forming the body of the wrapper; mechanism for feeding the wrapping material from a web or webs into the machine and onto the table; mechanism for severing the web or webs into wrapper-blanks; a vertically-reciprocating plunger adapted to pass through the mandrel and the wrapper-forming recess, which in its downward movement delivers the material to be packaged into the wrapper, compresses it therein, and then ejects the wrapper and its contents from the wrapper-forming recess; a vertically-reciprocating plunger beneath the mandrel adapted to enter the wrapper-forming recess and to engage the lower end of the mandrel and furnish a support for the under side of the wrapper-blank during the

formation of the wrapper and for the bottom of the wrapper during the compression of the material therein by the upper plunger and when the wrapper, with its contents, is ejected from the wrapper-forming recess by the upper plunger; folding mechanisms on opposite sides of a receptacle or channel to which in its lowermost position the lower plunger delivers the wrapper and its contents when thus ejected, one of said folding mechanisms folding down the upwardly-projecting portion of one side of the wrapper to partially form the cover and the second the upwardly-projecting portion of the opposite side of the wrapper to form the cover of the wrapper, the two folding mechanisms also folding down the other two sides of the wrapper, forming end flaps overhanging the body of the wrapper; a horizontal reciprocating plunger for delivering the wrapper and its contents from said first folding mechanism to the second folding mechanism and advancing it in the channel; inclined or tapered folding-guides on opposite sides of the channel which, as the wrapper is advanced through the channel, engage the overhanging end flaps of the wrapper and bend or fold them inwardly against the body of the wrapper to complete the package, and an outside-wrapper-applying mechanism and means for delivering the packages to it from the channel for applying to and folding and sealing about the package an outside wrapper or strip containing advertisements, or ornamented, or which may be a revenue-stamp, if the material packaged be tobacco.

In this machine are embodied also, among other things, mechanism for supporting the wrapper-blanks over the wrapper-forming recess until the lower plunger arrives in position to support the blank to prevent it from sagging into the recess, mechanism for feeding the material to the mandrel and partially compressing or compacting it therein before the descent of the upper plunger to deliver it to the wrapper, and a peculiar construction of upper plunger which prevents withdrawal of the compressed material from the wrapper by said plunger upon its return or upward movement.

The construction and operation of these



several mechanisms will now be described in detail in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of such machine. Fig. 2 is a longitudinal section of the machine, on a somewhat larger scale, taken on the line 2 2 of Fig. 4, looking to the left of that figure. Fig. 3 is a central longitudinal section on the line 3 3 of Fig. 4, looking also toward the left of that figure. Fig. 4 is a central transverse section on the line 4 4 of Fig. 3, looking to the right of that figure. Fig. 5 is a view similar to Fig. 3, but on a larger scale, illustrating the several mechanisms of the machine, with the exception of the mechanism for applying the outside wrapper and some of the operating connections from the main driving-shaft, which are omitted for the sake of clearness. Fig. 6 is a horizontal section taken on the line 6 6 of Figs. 2, 3, and 5, illustrating particularly the supporting-table with its wrapper-forming recess and the mechanism for feeding the wrapping material thereto. Fig. 7 is a horizontal section on the line 7 7 of Figs. 2, 3, and 5, illustrating particularly the mechanisms for folding down the upwardly-projecting portions of the sides of the wrapper to form the cover. Fig. 8 is a detail in section of the mechanisms for forming the wrapper-body and for feeding the material to the mandrel and delivering it thence to the wrapper and compressing it therein and the several folding mechanisms for forming the cover and turning in the end flaps, these several mechanisms being shown in the positions they occupy just before the operation of forming the wrapper is begun. Fig. 9 is a similar view of the same mechanisms in position after the formation of the wrapper-body and the compression therein of the material, Fig. 10 illustrating by a perspective view the product of the machine after these operations. Fig. 11 is a similar view of the same mechanisms after the delivery of the wrapper and its contents from the wrapper-forming mechanism to the folding mechanism for forming the first top fold to form the cover, Fig. 12 illustrating the product of this operation of the machine. Fig. 13 is a similar view after the operation of forming the first top fold, Fig. 14 illustrating the product. Fig. 15 is a similar view after the operation of forming the second top fold to complete the cover, illustrating also the operation of turning in the projecting end flaps of a wrapper, Fig. 16 illustrating the product after the completion of the cover of the wrapper. Fig. 17 is a plan view of the wrapper-forming recess. Fig. 18 is a section thereof on the line 18 18 of Fig. 17. Fig. 19 is a section on line 19 19 of Fig. 15, illustrating the channel to which the wrappers are delivered after the completion of the cover. Fig. 20 is a perspective view of one of the folding-guides in the sides of the channel for turning in the projecting end flaps of the wrapper upon the body of the wrapper.

Fig. 21 is a section on the line 21 21 of Fig. 8, illustrating the mechanism for delivering into the mandrel and partially compressing therein the material to be packaged. Figs. 22 and 23 are side elevations, partly in section, illustrating the mechanisms for applying to the package the outside wrapper. Fig. 24 is a section on line 24 of Fig. 23, showing the mechanism for delivering the packages from the channel to the outside-wrapper-applying mechanism. Fig. 25 is a section on the line 25 25 of Fig. 24. Fig. 26 is a plan view, partly in section, taken on line 26 of Fig. 24 of the pasting appliances of the outside-wrapper-applying mechanism.

Referring to said drawings, A B represent the side frames of the machine, C its driving-shaft, and D, E, F, G, H, I, and J cam-disks upon the driving-shaft from which the several mechanisms of the machine are driven.

The wrapper-blanks 1 are fed to the machine from a roll 2, of paper or other material, supported on brackets 3 in the rear of the machine by drawing-rolls 4, journaled between the side frames A B. From the drawing-rolls 4 the web of wrapping material passes between guides 5, and thence to a table 6 for supporting the wrapper-blanks. The rolls 4 are driven by a gear 7, mounted in the side frame B, which engages a pinion 8 upon the shaft of one of the rolls 4 and is itself engaged and rotated intermittently by an eccentric-rod 9, connected to a gear 10, meshing with a gear 11 on the driving-shaft C. The rod 9 is provided with a hooked end 12, which, during the downward movement of the rod 9, will engage one of a series of pins 13 upon the gear 7 and rotate the latter, and, through the connections described, the drawing-rolls 4. The rotation of gear 7 and the feed of the web into the machine cease with the downward movement of the rod 9, or, in other words, when it reaches its lower central position. As the gear 10 continues to rotate the rod 9 immediately upon leaving its lower central position will be thrown back out of operative position against a stop 14 and remain in contact with the stop until it passes its upper central position, when its hooked end will be thrown inward by the stop into engagement with the next higher pin 13, and so the operation will continue. The web thus fed into the machine is severed into wrapper-blanks by a knife 15, pivoted in the side frame A, and connected at its opposite end by a universal joint 16 to one end of a bell-crank lever 17, fulcrumed in the side frame B, the other end of which lies in the path of movement of and is actuated by a pin or projection 18 upon the gear 10, by which the bell-crank lever 17 is rocked and the knife 15 raised to severing position once in every complete revolution of the gear 10, the projection 18 being so located, as will be observed with reference to the rod 9, that it does not engage the bell-crank lever 17 until shortly after the rod 9 reaches its lower central position, when the



web is at rest. The knife 15 in severing co-acts with the edges of the guides 5, and after the severing operation is completed it is returned to normal position by its own weight and that of its operative connections.

If the machine be used for packaging tobacco or other material, the wrappers whereof are usually composed of an inner sheet of paper corresponding to the web 2 and an outer sheet of tin-foil or other material, a second roll 2<sup>a</sup> of such other material to form the second or outer sheet will be mounted in the brackets 3. If the second roll be of tin-foil or similar material incapable of standing the strain of drawing-rolls without breakage, it will be placed in advance of and project somewhat beyond the plane of rotation of the roll 2 of paper, so that the web of paper in passing to the drawing-rolls 4 will contact with the roll 20 of foil and assist the rotation of the latter and pass with the web of foil to the drawing-rolls, and thus relieve the latter web of the greater part of the strain of the drawing-rolls and prevent breakage. As shown in the drawings, the roll 2<sup>a</sup>, which is of foil, is mounted in advance of the roll 2 of paper and in a somewhat higher plane for this purpose.

The wrapper-forming mechanism, or that mechanism which forms the body or bottom and sides (two of which latter will for convenience be hereinafter termed the "ends") of the wrapper, consists of a stationary hollow casing or mandrel 20, rectangular in cross-section, around which the body of the wrapper is formed and through which also the material to be packaged is fed to the wrapper and a wrapper-forming recess 22 in the wrapper-supporting table 6. This wrapper-forming recess 22 consists of walls 23, which form the sides and end walls 24, above which are located shields 25, which, with the end walls 24, form the ends of the wrapper. The shield is set at a short distance from the side walls 23, so as to provide a space for receiving the corner-flaps of the wrapper when forced down. The recess and the upper portion of each of the end walls 24 is cut away to provide guides 26, inclined inwardly toward the recess 22 and converging toward each other for guiding the corner-flaps inwardly toward the end of the wrapper, the side edges of the shield also converging toward each other and forming internal guides engaging the inner sides of the corner-flaps, coacting with the inclined external guides 26 in bringing together the two sides of the flaps as the wrapper is entered between the end walls 24. At opposite ends of the wrapper-forming recess there are also provided projections 28 for engaging the ends of the wrapper-blank and bending them inwardly slightly toward the mandrel to assist the latter in entering the wrapper-blank into the recess without breakage.

The table 6 is adapted to be raised and lowered by the main driving-shaft C of the ma-

chine, and for that purpose is mounted in guides 30 in the side frames A B, and is provided with rods 31 on opposite sides of the machine connected to a pair of levers 32 33, fulcrumed on a shaft 34, extending across the machine between the side frames A B. The levers 32 33 are provided with bowls 35, running in cam-grooves 36, formed in the inner faces of the cam-disks E I, respectively, as best shown in Fig. 1. In the upward movement of the table 6, which takes place shortly after the wrapper-blank has been severed by the knife 15 from the web or webs, the wrapper-forming recess 22 embraces the mandrel 20, and the latter, engaging the wrapper-blank carried by the table 6, depresses it into the wrapper-forming recess, and thus forms the body of the wrapper, with the corner-flaps of the wrapper-blank projecting behind the shields 25 at the ends of the recess, as best shown in Figs. 9, 17, and 18, to be afterward, as will be hereinafter described, turned inwardly toward each other and folded against the ends of the wrapper as the wrapper is ejected from the wrapper-forming recess.

Beneath the table 6 and coincident with the wrapper-forming recess 22 the machine is provided with a vertically-reciprocating plunger 40, the face of which in its normal (depressed) position registers with a channel in the lower portion of the machine which contains the folding mechanisms for forming the cover and turning the end flaps left projecting over the ends of the wrapper after the formation of the cover inwardly against the body of the wrapper, as hereinafter described. The plunger 40 is connected by links 41 to the inner end of a lever 42, the opposite end of which is fulcrumed on the shaft 34 and which is provided with a bowl 43, running in a cam-groove 44, formed in the face of the cam-disk H, as best shown in Figs. 2 and 3. Through these connections the plunger 40 is adapted to be moved upwardly through the wrapper-forming recess 22 into engagement with the under side of the wrapper-blank carried by the table 6 and to support it against the end of the mandrel 20. The major part of the upward movement of the plunger 40 precedes the upward movement of the table 6, which latter remains at rest until the plunger about reaches the under side of the wrapper-blank supported by the table, when the table and plunger move upwardly together until the plunger, with the wrapper-blank supported upon it, reaches the lower end of the mandrel 20, when it comes to rest. The plunger 40 remains in this position during the further upward movement of the table 6, and thus acts as a support for the bottom of the blank during the formation of the wrapper and also, as will hereinafter appear, during the compression within the wrapper-body of the material to be packaged, and on its return movement, after the operation of compressing the material is finished, transfers the wrapper



and its contents from the wrapper-forming recess to the final folding mechanisms of the machine.

The mechanism for compressing the material in the wrapper consists of a reciprocating plunger 50, located within an extension 51 of the mandrel 20 opposite the lower plunger 40 and connected by a cross-head running in guides 52 in the said frames A B of the machine to a pair of rods 53 54, connected at their lower ends to levers 55, fulcrumed on the shaft 34 and provided with bowls 56, engaging cam-grooves 57 in the faces of the cam-disks D J, as shown in Fig. 1. The plunger 50 is not only adapted to compress the material within the wrapper, but also has a movement beyond the lower end of the mandrel 20 and through the wrapper-forming recess 22 with the lower plunger 40, and in the first part of this additional movement ejects the wrapper and its contents from the wrapper-forming recess 22, and during the balance of this movement, still engaging the wrapper and its contents, which are resting upon the lower plunger 40, aids the latter in presenting the wrapper in proper position to the final folding mechanisms which form the cover of the wrapper, as hereinafter described. In its normal position the lower end of the plunger 50 rests just above the opening in the mandrel, as in Fig. 3, and the connections for operating the plunger are so timed with reference to those which actuate the other mechanisms described that the downward movement of the plunger 50 is not begun until the upward movement of the table 6 is completed and the body of the wrapper formed. As soon as this takes place and while the table 6 and lower plunger 40 are still elevated the plunger 50 descends and compresses the material in the wrapper, as shown in Fig. 9, the lower plunger 40 and the table 6 remaining stationary during this operation. As it is completed, however, the cam-disk H will arrive in position to lower the plunger 40 to normal position, when the two plungers 40 50 will move downward together, the lower one, 40, still supporting the wrapper and its contents, and the upper one, 50, ejecting it from the recess 22. The downward movement of the two plungers, with the wrapper and its contents still between them, continues until the lower plunger 40 reaches its normal position, the cam-disks D J then reversing the movement of the upper plunger 50 and returning it to normal position, when the table 6, which has meanwhile descended to normal position, is ready to receive another wrapper-blank from the drawing-rolls 4.

The wrapper, with its contents, is deposited by the plunger 40 between the walls 60 61 of a channel 62, with the bottom of which the plunger 40 registers in its lowermost position. The walls 60 61 are of the same height, substantially, as the material in the package and are provided at the point where the plunger 40 enters with pivoted extensions or wings 64,

held in vertical position yieldingly by springs 65, so as to permit ready entrance of the wrapper between them and the walls 60 61, as shown in Figs. 8 and 9. These wings or extensions 64 are connected by levers 66 to the underside of the frame of the channel, which are provided with projections 67, engaged by the plunger 40 as it enters between the walls 60 61, and by which the wings 64 are swung outwardly from the wrapper into the position shown in Fig. 4, in which position they are retained by the plunger 40 during the operation of the folding mechanisms for forming the cover of the wrapper, for a purpose which will presently appear.

The material to be packaged may be fed into the mandrel 20 by hand, if desired, but it will preferably be fed thereto by feeding mechanism such as will now be described. The mechanism for this purpose shown in this case consists of a plunger 70, located in a chute 71, connected at right angles to casing 51 at the top of the mandrel 20 and just below the plunger 50, in the uppermost position of the latter. The material is fed to the chute 71 from a hopper 72, the mouth of which opens into the chute in advance of the plunger 70, in the retracted position of the latter, in which retracted position it is held normally by a spring 73, encircling the plunger-rod and engaging its cross-head 74 and the end wall of the chute. The plunger 70 is actuated toward the mandrel to feed the material by connections consisting of rods 75 on opposite ends of the cross-head 74, which are connected to bell-crank levers 76 77, fulcrumed in the side frames A B, and the free ends of which rest upon the levers 55, which actuate the plunger 50 and are raised by the latter to actuate the plunger 70 during the upward movement of the levers 55 to return the plunger 50 to normal or elevated position.

Where the material to be packaged is filamentous or damp, such as tobacco, it will as it is delivered to the mandrel 20 preferably be compressed by the plunger 70 before the plunger 50 begins to descend, instead of being permitted to fall down loosely into the mandrel. To enable this to be done, it is necessary that means be provided for supporting the material during the feeding movement of the plunger 70. The means provided for this purpose in the present case consist of a plate or tray 80, sliding in the bottom of the chute 71 and upon which the material fed to the chute is delivered by the hopper 72. The tray 80 is connected to the plunger 70 by a latch 81, carried by the plunger and engaging recesses 82 in the tray. (See Fig. 21.) When so connected, the tray projects beyond the plunger 81 a distance equal to the width of the mandrel 20, so that upon the forward movement of the plunger to the position shown in Fig. 3 the tray will be projected thereby entirely across the mandrel and support the material which is compressed by the plunger against the opposite wall of the cas-



ing 51. The latch 81 is held in engagement with the tray 80 by springs 83 and is disengaged therefrom by cams 84 upon the upper edges of the side walls of the chute 71, which, as the material is thus compressed by the plunger 70, raise the latch 81 out of the recesses 82 and disconnect the plunger 70 and tray 80, which latter is then retracted to normal position by a spring 85, between the head of the plunger 70 and a flange 86 at the rear end of the tray 80, the spring being put under tension by the plunger 70 when retracted. Upon the return to normal position of the plunger 70, which takes place as the levers 55 are moved down to lower the plunger 50, the latch 81 reengages the notches 82 of the tray 80 and reconnects it to the plunger 70.

The mechanism for forming the final folds to form the cover and fold the projecting end flaps inwardly against the ends of the wrapper will now be described.

The mechanism for forming the first top fold of the wrapper consists of a sliding plate 90, resting upon the upper edges of the walls 60 61 and between side guides 91 and adapted to be slid back and forth over the lower plunger 40 by an arm 92, resting on guides 91 and provided with fingers 94, engaging corresponding recesses 93 in the upper face of the folding-plate. The arm 92 is pivoted so as to be slid back and forth on guides 91 to a bracket 95, pivotally connected to the upper end of a lever 96, fulcrumed in the frame of the machine, the lower end of which is provided with a bowl 97, entering a cam-groove 98 in cam-disk F. The guides 91, upon which the arm 92 slides, are provided with upwardly-inclined portions or cams 99 for raising the arm 92 and disengaging its fingers 94 from the folding-plate 90 against the tension of a spring 100 upon the bracket 95 engaging the arm 92 and normally holding it in place for such engagement, as best shown in Fig. 5, the purpose of which will presently appear. As soon as the upper plunger begins its return movements to normal position after the delivery of the wrapper between the walls 60 61 of the channel 62, as just described, the cam-disk F will rock the lever 96 and slide the arm 92, and with it the folding-plate 90, inwardly over the wrapper, the folding-plate 90 when thus moved engaging the upwardly-projecting portion of the side of the wrapper next it, as shown in Fig. 13, and folding it down upon the material in the wrapper, as shown in Fig. 14, thus partially forming the cover of the wrapper. The wings or extensions 64 of the walls 60 61 being maintained in horizontal position by the plunger 40 out of engagement with the wrapper during this movement of the folding-plate 90, the latter, in addition to partially forming the cover, will also engage the upwardly-projecting portions of the ends of the wrapper at that side of the wrapper and fold them down into horizontal position upon the upper edges of the walls 60 61 into the position shown in Fig. 14.

The mechanism for forming the second top fold consists of a roller 105, resting upon the upper edges of the walls 60 61 and supported in the end of a plate 106, pivotally connected at the delivery end of the channel 62. The wrapper, after the formation of the first top fold, is brought into engagement with the roller 105 for the formation of the second top fold to complete the cover by a plunger 107, connected to the bracket 95, which engages a sliding plate 108, resting upon the table 63, normally in position to engage and support the side of the wrapper, as shown in Figs. 8, 9, 11, and 13. The plunger 107 in the normal position of folding-plate 90 lies some distance behind the forward edge of the folding-plate, and as a result, although during the movement of the folding-plate 90 to form the first top fold the plunger moves with it, it does not engage the plate 108 to move it until after the folding-plate 90 has laid the fold, when the disengagement of the arm 92 and plate 90 is effected by cams 99 and the latter comes to rest. The plunger continues its movement and moves the plate 108 forward, and with it the wrapper, from its position upon the plunger 40 in under the roller 105, the roller 105 as the wrapper passes under it engaging the upwardly-projecting portion of the side of the wrapper next it and folding it down upon the first fold, thus completing the cover and at the same time coacting with the upper edges of the walls 60 61, completing the downward and outward folding of the upwardly-projecting end portions of the wrapper begun by the folding-plate 90 and forming triangular end flaps projecting over the ends of the box, as shown in Fig. 16. During this movement of the plunger 107 the folding-plate 90 rests upon the fold it has laid and holds it down in position to receive upon it the second top fold laid by the roller 105. Upon the return movement of the plunger 107, which takes place instantly upon the delivery of the wrapper into the channel 62, the plunger 107 and arm 92 move together; but the folding-plate 90 and sliding plate 108 are not retracted until the arm 92 moves off the inclines 99 and the fingers 94 engage the recesses in the folding-plate 90 and the plunger 107 engages the rear end of the sliding plate 108, which latter is thus left for a short time in engagement with the side of the wrapper, holding it against rebound. Immediately upon the withdrawal of the plate 108 the cam-disk H begins to move the plunger 40 upwardly, as before described, thus releasing the wings 64, which are then returned by their springs 65 to vertical position.

The mechanism for folding the V-shaped end flaps (shown in Fig. 16) inwardly against the ends of the wrapper consists of a pair of guides 110 at opposite sides of the channel, having downwardly and inwardly inclined portions 111, which as the wrapper passes between them engage said flaps and bend them inwardly against the ends of the



wrapper, as shown in Fig. 15. Opposite the inclined portion of each guide there is provided a folding-blade 112, which engages the end of the wrapper near its top and the under side of the end flap and upon which the end flap is folded by the guide. Above each of the guides also a ledge 113 is preferably provided which engages the upper end edges of the wrapper as it leaves the guides.

As the packages accumulate in the channel 62 those in front are moved by those in the rear to the delivery end of the channel, whence they are delivered out of the machine for use or to mechanisms for further operating upon the package—such, for example, as that shown herein, which will now be described—for applying an outside wrapper, which may be a band or strip applied for ornamentation, advertisement, &c., or which may be, in the case of tobacco, an internal-revenue stamp.

The mechanism for applying the outside wrapper to the package consists of a table 115, which supports the outside wrapper 116, as shown in Fig. 3, and which is provided with an opening 117, registering with the delivery end of the channel, over which the outside wrapper is spread and through which the package passes from the delivery end of the channel, the package as it passes engaging the outside wrapper and forcing it through the opening, the ends of the wrapper being bent upwardly against the sides of the package by the edges of the opening, leaving upwardly-projecting portions to be afterward folded down and overlapped and pasted upon the top of the package by folding and pasting mechanisms located in a channel 118 beneath the table 115, to which the package descends after leaving the opening 117. This folding mechanism consists of a sliding plate 120 upon one side of the package as it is delivered into the channel 118 for folding down one end of the wrapper, and a hinged folding-plate 121 on the opposite side of the package for folding down the opposite end of the wrapper, the package being delivered from the first folding-plate 120 to the second 121 by a plunger 122 upon the under side of the folding-plate 120, which engages a sliding plate 123 after the folding-plate 120 has folded down its end of the wrapper and slides it and the package in under the hinged folding-plate 121. The sliding plate is provided with an arm 124, pivoted to its rear side, passing freely through an opening in the plunger 122, and having a hook 125, which during the latter part of the return movement of the sliding plate is engaged by the plunger and the sliding plate thus returned to normal position.

The packages are delivered from the channel 62 to the outside-wrapper-folding mechanism by a vertically-reciprocating carrier 130, provided with spring-fingers 131, which engage opposite ends of the package as it is ejected from the channel 62, which fingers

as the carrier approaches the channel 118 are engaged by the upper edges of the walls of the latter channel and forced upward on guide-rods 132, thus releasing the package, as shown in Fig. 22.

The connections for operating the carrier 130 consist of a lever 133, fulcrumed in the side-frame band, connected at one end to an arm 134, pivoted to the lower end of the carrier-rod 135 and at the other end to the lever 42, which actuates the lower plunger 40, so that as the plunger 40 is raised, which movement occurs, as before stated, shortly after the delivery of a wrapper into the channel 62, the carrier 130, with the package delivered between its spring-fingers 131, is simultaneously lowered, and vice versa.

The folding-plate 120 is actuated from the lever 96, which actuates the folding-plate 90, through connections consisting of a lever 140, fulcrumed in the side frame A and pivotally connected at one end to the folding-plate 120 and at the other by a connecting-rod 141 to the lever 96, so that the folding-plates 90 and 120 operate simultaneously, the former to lay the first top fold of the inside wrapper and the latter the first fold of the outside wrapper. During the operation of the latter to lay this fold the sliding plate 123 remains stationary in the position shown in Fig. 22, resting against the package. When the folding-plate 120 has moved sufficiently to lay its fold, however, the sliding plate 123 will be engaged by the plunger 122, and the movement of the plate 120 being continued will deliver the package under the hinged folding-plate 121, by which the second fold is then laid. In the forward position of the plate 123 the hook 125 of its arm 124 will engage a recess 142 behind the plate and lock the plate in supporting position against the side of the wrapper delivered during the first part of the return movement of folding-plate 120. During the latter part of the return movement of the folding-plate 120 the plunger 122, engaging the arm 124, raises its hooked end out of the recess 142 and then retracts the sliding plate 123 to normal position. (Shown in Fig. 22.)

Paste is applied to the upper surface of the folding-plate 120 at its forward end, which end is tapered, as shown, by a pasting-roll 142, supplied from a pipe 143, communicating with a source of supply, and the plate 120 is of such length that as the package is moved by the plunger 122 in under the hinged folding-plate 121 the under side of the opposite end of the outside wrapper will be folded down by the folding-plate 121 upon the tapered end of the plate 120, and as the package is advanced by the plunger 122 wipe the paste from the plate 120 and be then pressed down by plate 121 upon the other end of the wrapper, thus sealing it.

The paste-roller 142 is supported in journals 144, in which it is free to move vertically, and the sliding folding-plate is provided with



cam-shaped projections 145 just in rear of its tapered portion, which in the forward movement of the plate engage the paste-roll shaft and raise the paste-roll out of engagement with the plate.

The operation of the machine as thus far described is as follows: Assuming the several parts to be in the positions in which they are illustrated in Figs. 1 to 4 and it being understood that upon the movement of the several mechanisms to those positions the mechanism for feeding the material to the mandrel 20 has been operated by the lever 76 and has delivered into and compressed in the mandrel the material to be packaged, as shown in Fig. 5, upon the rotation of the driving-shaft and its several cam-disks the drawing-rolls 4 will be actuated, as before described, to feed the web or webs of material to form the wrapper-blank 1 onto the supporting-table 6. The feeding of the wrapper ceases, as before described, when the rod 9 reaches its lower central position. Shortly after this takes place the projection 18 on gear 10, engaging the bell-crank lever 17, rocks the latter upwardly and raises the knife 15 into engagement with the web or webs in front of the guides 5, thus severing that portion of the web or webs deposited upon the table 6 and forming a wrapper-blank. While these operations are proceeding the lower plunger 40 is raised by its cam from its lowermost position to about the position in which it is shown in Fig. 8, just below the blank, which position it reaches at or about the time the knife severs the blank from the web. The upward movement of the lower plunger 40 is continued until it engages the under side of the wrapper-blank supported upon the table 6, when the cam will begin to raise the table toward the mandrel 20. The lower plunger and the table then move together until the lower plunger comes into engagement with the lower end of the mandrel, with the wrapper between the two, in which position it is then arrested by its cam and retained during the operation of forming the wrapper and compressing therein the material to be packaged. The upward movement of the table continues, however, after the movement of the plunger ceases and until it embraces the mandrel 20, in which position it is retained by its cam during the operation of compressing the material in the wrapper. Upon the arrival in this position of the table the upper plunger 50 will be lowered by its cam toward the lower plunger 40 and into contact with the material, and, continuing its downward movement, will compress the material in the bottom of the wrapper, as shown in Fig. 9. As soon as the upper plunger has moved sufficiently to thus compress the material the cams will have arrived in position to simultaneously lower the upper plunger 50, the table 6, and the lower plunger 40. When the table 6 reaches its normal position, it will be arrested and held by its cam, and the upper and lower plungers

continuing their downward movement will eject the wrapper and its contents from the wrapper-forming recess 22, as shown in Fig. 11. The downward movement of the lower plunger is continued until it registers with the channel 62, the upper plunger still continuing its movement with it. As the lower plunger leaves the recess 22 the ends of the wrapper are engaged and guided by the pivoted wings 64, and then by the walls 60 61, as before described, and as the lower plunger 40 reaches its lowermost position said wings 64 are swung downwardly from vertical to horizontal position, as heretofore described. When the lower plunger 40 reaches this position, the cams D J will raise the upper plunger 50 and return it to normal position in the upper end of the mandrel 20. As soon as the upward movement of the upper plunger is begun the folding-plate 90 will be moved into engagement with the upwardly-projecting portion of the side next it of the wrapper and will fold that portion of the wrapper down upon the material, thus partially forming the cover. The wrapper is then moved by the plunger 107, as before described, into the channel 62 and under the roller 105, by which the upwardly-projecting portion of the opposite side of the wrapper is turned down upon the material to complete the cover. The wrapper is then in the position illustrated in Fig. 16. Upon the delivery of another wrapper into the channel this wrapper, in the condition illustrated in Fig. 16, is moved along the channel 62 between the guides 110, with the blades 112 against the ends of the wrapper on the under side of its end flaps. Upon the delivery into the channel of a third wrapper the first is advanced from between the guides toward the delivery end of the channel, and in passing between the guides its end flaps are bent inwardly over the blades 112 and against the ends of the wrapper by the tapered portions 111 of the guides, passing thence under the ledges 113, when the package is completed. During the descent of the plunger 50 the tray 80 and the plunger 70 are returned to normal position. Upon the ascent of the plunger 50 the plunger 70 and the tray 80, connected with it, with the material upon the latter to be packaged, are moved toward the mandrel 20, the plunger and tray moving together in this direction until the plunger registers with the inner face of the mandrel, in reaching which position it will have compressed the material tightly between it and the opposite wall of the extension 51 of the mandrel. The plunger 70 assumes this position as the plunger 50 reaches the limit of its upward movement, and simultaneously with its arrival at this position the latch is withdrawn by cams 84 from engagement with the tray, when the latter is withdrawn by its spring 85 from over the mandrel 20, leaving the material supported between the plunger and the opposite wall of the extension 51. The plun-



ger 70, however, is not retracted until the plunger 50 begins to descend, (after the formation of the wrapper,) so that the material is not released until the upper plunger begins its downward movement, and is then engaged by it and driven down into the wrapper.

In the foregoing description of the operation the mechanism for applying the outside wrapper has been omitted. Assuming now that the machine has operated a sufficient number of times to fill the channel 62 with wrappers and completed packages, upon the next operation of the machine and the delivery of another wrapper to the channel the foremost package will be delivered to the spring-fingers 131 of carrier 130. This delivery is shortly followed by the upward movement of lever 42 of plunger 40, and through the connections described the carrier 130 is simultaneously lowered to channel 118, which it reaches simultaneously with the arrival at the mandrel 20 of the lower plunger 40, and in which position it is retained until the latter plunger begins to descend, when it ascends to normal position, leaving the package (from which the fingers 131 have meanwhile been disengaged) in the channel 118. In descending the carrier 130 passes through the opening 117 in table 115, and the package, engaging a wrapper previously laid across the opening, carries it with it to the channel 118. Upon the operation of the folding-plate 90 to form the first top fold of the wrapper, following the return to normal position of the lower plunger 40, the folding-plate 120 and supporting-plate 122 through the connections described between the former and the lever 96 are simultaneously actuated to lay the first fold of the outside wrapper and deliver the package and its outside wrapper to the plate 121, by which the second fold is formed, the plate 120 and supporting-plate 122 being retracted simultaneously with folding-plate 90.

The machine described therefore at a single operation feeds the wrapping material, severs a blank therefrom, forms the wrapper-body, feeds the material thereto and compresses it, completes the package, and applies an outside wrapper to the package and ejects it from the machine in condition for the market.

In using some materials to form the wrapper, such as paper, which lacks stiffness, or heavy material, such as tin-foil, it may be found necessary to provide means for supporting that portion of the blank which lies above the opening in the table 6 until the lower plunger 40 arrives in position to furnish such support to prevent sagging of the blank into the recess 22. Means are provided for this purpose, in the present case consisting of rods 150, passing through one side of the table 6 and adapted to be projected across the recess 22 immediately beneath the blank. Three such rods are preferably employed, though the number may be increased or decreased, according to the size of the recess,

the rear ends of two of which are mounted so as to slide in guides 151 in a bracket 152, mounted on and moving with the table 6, the three being connected by a cross-piece 153, adapted to be engaged by a projection 154 upon a rod 155, mounted so as to slide longitudinally in guides 156 in a bracket 157, supported from the frame of the machine, and connected by bell-crank lever 158 to a bell-crank lever 160, fulcrumed in the side frame B, the free end of the crank 160 resting in a cam-groove 161 in cam-disk G, as shown in Fig. 2. Each of the rods 150 is provided with a spring 162, which when the projection 154 and cross-piece 153 are disengaged withdraws the rods 110 from the recess 22. As the wrapper-feeding mechanism begins to operate, the cam G, through the connections described, slides the rod 155 and its projection 154 inwardly toward the table 6, and the projection 154, engaging cross-piece 153, will project the rods 150 across the recess 22, so as to span the same and support the wrapper-blank and, if the opening of the table be so wide as to require it, support and guide the leading end of the web across the opening and onto the opposite end of the table. The rods 150 remain in this supporting position until the lower plunger 40 about reaches the under side of the blank, when, the table 6 rising, the cross-piece 153 will be disengaged from the projection 154 and the spring 162 withdraw the rods 150 from across the recess until the cross-piece 153 rests against the guides 151, which act as stops. Before the descent of the table 6 the cam G will have returned the projection 154 to normal position in rear of the normal retracted position of the cross-piece 153, so as to reengage it upon the next operation of the machine to feed a wrapper.

In packaging some materials, particularly tobacco and other materials which are moist or sticky, also, it frequently happens that the material while being compressed by the plunger will adhere to it, so that upon the withdrawal of the plunger the material or parts of it are withdrawn from the receptacle in which it is compressed. In compressing the material in a closed receptacle, also, without reference to the moisture or stickiness of the material, a partial vacuum being created in the receptacle upon the withdrawal of the plunger, parts of the material may follow the plunger out of the receptacle. To provide against this, the plunger 50 in the present case is made hollow, as shown, is provided with perforations 165 in its head, and at its upper end is also provided with an opening or openings 166, communicating with the outer atmosphere or with a source of air-supply under pressure. Upon the withdrawal of the plunger 50 from the wrapper, therefore, the air with which the plunger is filled from the atmosphere or from the source of supply of air under pressure will rush out through the perforations 165 in the head of the plunger and disengage any material which may adhere to it or destroy



the vacuum in the receptacle and prevent the material from following the plunger. If the plunger is to connect with a source of supply of air under pressure, the connection will preferably be made, as shown, by means of a flexible pipe 167. Such construction of plunger has the further advantage also that it enables the air confined between the plunger and the material before compression to escape as the plunger is moved toward the material.

As before stated, the improvements of the present invention are shown in the drawings in what is considered their preferred forms. Modifications may be made therein, therefore, without departing from the invention.

What I claim is—

1. The combination with wrapper-forming mechanism for receiving wrapper-blanks and including a wrapper-forming recess, of means movable through the recess and coacting therewith to form the wrapper and to eject it from the recess, folding mechanism for receiving the wrapper thus ejected and folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper to form a cover and complete the wrapper, means for moving the wrapper forward from the folding mechanism, mechanism arranged in the path of movement of the wrapper for applying an outside wrapper to the wrapper thus completed, and driving mechanism for operating said several mechanisms, substantially as described.

2. The combination with wrapper-forming mechanism for receiving wrapper-blanks and including a wrapper-forming recess, of means movable through the recess and coacting therewith to form the wrapper and to eject it from the recess, folding mechanism for receiving the wrapper thus ejected and folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper to form a cover and complete the wrapper, means for moving the wrapper forward from the folding mechanism, mechanism arranged in the path of movement of the wrapper for applying an outside wrapper to the wrapper thus completed, pasting mechanism for securing said outside wrapper, and driving mechanism for operating said several mechanisms, substantially as described.

3. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger for ejecting the wrapper and contents from the recess and folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, substantially as described.

4. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread; a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger for ejecting the wrapper and contents from the recess, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, and mechanism for applying an outside wrapper to the package, substantially as described.

5. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger for ejecting the wrapper and contents from the recess, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, mechanism for applying an outside wrapper to the package, and pasting mechanism for securing said outside wrapper, substantially as described.

6. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger movable longitudinally through the mandrel and wrapper-forming recess for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, and folding mechanisms to which the wrapper and its contents are thence delivered, for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, substantially as described.

7. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger



movable longitudinally through the mandrel and wrapper-forming recess for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms to which the wrapper and its contents are thence delivered, for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, and mechanism for applying an outside wrapper to the package, substantially as described.

8. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger movable longitudinally through the mandrel and wrapper-forming recess, for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms to which the wrapper and its contents are thence delivered, for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, mechanism for applying an outside wrapper to the package, and pasting mechanism for securing said outside wrapper, substantially as described.

9. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger movable longitudinally through the mandrel and wrapper-forming recess for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, and a second plunger opposed to said first plunger and movable through the wrapper-forming recess into engagement with the mandrel, for engaging the under side of the wrapper-blank and the bottom of the wrapper and supporting the same during the formation of the wrapper and the compression of the material therein and its ejection from the wrapper-forming recess and for delivering the wrapper and its contents thus ejected to said folding mechanisms, substantially as described.

10. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-

blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger movable longitudinally through the mandrel and wrapper-forming recess for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, a second plunger opposed to said first plunger and movable through the wrapper-forming recess into engagement with the mandrel, for engaging the under side of the wrapper-blank and the bottom of the wrapper and supporting the same during the formation of the wrapper and the compression of the material therein and its ejection from the wrapper-forming recess and for delivering the wrapper and its contents thus ejected to said folding mechanisms, and mechanism for applying an outside wrapper to the package, substantially as described.

11. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper and through which the material to be packaged is fed to the wrapper, a plunger movable longitudinally through the mandrel and wrapper-forming recess for compressing the material in the wrapper and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, a second plunger opposed to said first plunger and movable through the wrapper-forming recess into engagement with the mandrel, for engaging the under side of the wrapper-blank and the bottom of the wrapper and supporting the same during the formation of the wrapper and the compression of the material therein and its ejection from the wrapper-forming recess and for delivering the wrapper and its contents thus ejected to said folding mechanisms, mechanism for applying an outside wrapper to the package and pasting mechanism for securing said outside wrapper, substantially as described.

12. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-



forming recess to form the body of the wrapper, a plunger acting transversely to the mandrel for feeding the material to be packaged thereto and compressing it therein, a second  
 5 plunger movable longitudinally through the mandrel and wrapper-forming recess for delivering the material thus fed into the wrapper and compressing it therein and ejecting the wrapper and its contents from the wrapper-forming recess, and folding mechanisms  
 10 to which the wrapper and its contents are thence delivered, for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and  
 15 complete the package, substantially as described.

13. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper,  
 20 a plunger acting transversely to the mandrel for feeding the material to be packaged thereto and compressing it therein, a second plunger movable longitudinally through the mandrel and wrapper-forming recess for delivering the material thus fed into the wrapper and compressing it therein and ejecting the wrapper and its contents from the wrapper-forming recess, folding mechanisms for  
 30 folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, and a third plunger opposed to said second plunger and movable through the wrapper-forming recess into engagement with the  
 35 mandrel, for engaging the under side of the wrapper-blank and the bottom of the wrapper and supporting the same during the formation of the wrapper and the compression of the material therein and its ejection from the wrapper-forming recess and for delivering the wrapper and its contents thus ejected to said folding mechanisms, substantially as described.

14. The combination with mechanism for  
 50 feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks, provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper, a plunger acting transversely to the mandrel for feeding the material to be packaged thereto and compressing it therein, a second  
 60 plunger movable longitudinally through the mandrel and wrapper-forming recess for delivering the material thus fed into the wrapper and compressing it therein and ejecting the wrapper and its contents from the wrapper-forming recess, a tray for supporting the material as it is fed into and compressed in the mandrel and adapted to move out of the

way of said second plunger when such compression is completed, and folding mechanisms to which the wrapper and its contents  
 70 are thence delivered, for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper to form a cover and complete the package, substantially as described.

15. The combination with mechanism for feeding a web of wrapping material and mechanism for severing the web into wrapper-blanks, of a table for receiving the wrapper-blanks provided with a wrapper-forming recess over which the wrapper-blank is spread, a hollow mandrel coacting with the wrapper-forming recess to form the body of the wrapper a plunger acting transversely to the mandrel for feeding the material to be packaged  
 80 thereto and compressing it therein, a second plunger movable longitudinally through the mandrel and wrapper-forming recess delivering the material thus fed into the wrapper and compressing it therein and ejecting the wrapper and its contents from the wrapper-forming recess, a tray for supporting the material as it is fed and compressed in the mandrel and adapted to move out of the way of  
 90 said second plunger when such compression is completed, folding mechanisms for folding down upon the body of the wrapper the upwardly-projecting portions of the wrapper, to form a cover and complete the package, and a third plunger opposed to said first plunger, engaging the underside of the wrapper-blank and the bottom of the wrapper and supporting the same during the formation of the wrapper and the compression of the material therein and its ejection from the wrapper-forming recess and delivering the wrapper and its contents thus ejected to said folding mechanisms, substantially as described.

16. The combination with mechanism for forming the body of a wrapper and feeding  
 110 material thereto, of a receptacle for the wrapper provided with walls of the same height substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices overlapping the walls of the receptacle for folding down the upwardly-projecting portions of the sides of the wrapper upon the material therein and upon the edges of the walls to form a cover and two end flaps overhanging the body of the wrapper, one of said folding devices being stationary and the other movable toward it, and means for delivering the wrapper from the movable folder to the stationary folder as the movable folder completes its folding operation, substantially as described.

17. The combination with mechanism for forming the body of a wrapper and feeding material thereto, of a receptacle for the wrapper provided with walls of the same height  
 130 substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices overlapping the walls of the receptacle for folding down the upwardly-



projecting portions of the sides of the wrapper upon the material therein and upon the edges of the walls to form a cover and two end flaps overhanging the body of the wrapper, one of said folding devices being stationary and the other movable toward it, folding devices in the rear of said stationary folder for folding down the end flaps against the body of the wrapper, and means for delivering the wrapper from the movable folder to the stationary folder and to the end-flap folders as the movable folder completes its folding operation, substantially as described.

18. The combination with mechanism for forming the body of a wrapper and feeding material thereto, of a channel for the wrapper provided with walls of the same height substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices overlapping the walls of the channel for folding down the upwardly-projecting portions of the sides of the wrapper upon the material therein and upon the edges of the walls to form a cover and two end flaps overhanging the body of the wrapper, one of said folding devices being stationary and the other movable toward it, folding devices on opposite sides of the channel in the rear of said stationary folder for folding down the end flaps against the body of the wrapper, and means for delivering the wrapper from the movable folder to the stationary folder and advancing it in the channel to the end-flap folders as the movable folder completes its folding operation, substantially as described.

19. The combination with mechanism for forming the body of a wrapper and feeding material thereto, of a receptacle for the wrapper for engaging opposite sides of the wrapper, folding devices for folding the upwardly-projecting portions of the sides of the wrapper one of said folding devices being stationary and the other movable toward it, a plunger in the rear of the normal position of said movable folder for delivering the wrapper from the movable folder to the stationary folder as the movable folder completes its folding operation, mechanism for simultaneously actuating said movable folder and plunger, and means for disconnecting the former from said actuating mechanism upon the completion of its folding operation, substantially as described.

20. The combination with mechanism for forming the body of a wrapper and feeding material thereto, of a receptacle for the wrapper provided with walls of the same height substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices coacting with the walls to form a cover and two end flaps on the wrapper projecting over the walls, and a plunger for delivering the wrapper from the wrapper-forming mechanism to said receptacle and supporting it therein, substantially as described.

21. The combination with mechanism for forming the body of a wrapper and feeding

material thereto, of a receptacle for the wrapper provided with walls of the same height substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices coacting with the walls to form a cover and two end flaps on the wrapper projecting over the walls, a plunger for delivering the wrapper from the wrapper-forming mechanism to said receptacle and supporting it therein, and wings extending upwardly from the walls of the receptacle toward the wrapper-forming mechanism and adapted to be engaged and lowered by the plunger as it delivers the wrapper, substantially as described.

22. The combination with mechanism for forming the body of a wrapper and feeding material thereto, of a receptacle for the wrapper provided with walls of the same height substantially as the material in the wrapper, for engaging opposite sides of the wrapper, folding devices coacting with the walls to form a cover and two end flaps on the wrapper projecting over the walls, a plunger for delivering the wrapper from the wrapper-forming mechanism to said receptacle and supporting it therein, wings hinged to the walls and adapted to be engaged and swung downward by the plunger as it delivers the wrapper, and springs for holding said wings in vertical position, substantially as described.

23. The combination with walls 60, 61, of stationary folder 105, sliding folder 90, plate 108 provided with flanges at opposite ends, plunger 107 between the flanges, mechanism actuating the plunger 107, spring-pressed arm 92 connecting folder 90 to said actuating mechanism, and cams 91 for raising said arm and disconnecting it, substantially as described.

24. The combination with walls 60, 61, of folder 90, actuating mechanism therefor, arm 92 connecting said folder to the actuating mechanism, and cams 91 for raising the arm and disconnecting it, substantially as described.

25. The combination with table 6, its wrapper-forming recess and the plungers 40, 50, of the walls 60, 61 at opposite ends of the plunger, provided with hinged wings 64 approaching the recess, springs 65 for sustaining the wings in vertical position, and connections between the plunger 40 and the wings for swinging said wings outwardly toward horizontal position, substantially as described.

26. The combination with mandrel 20, wrapper-supporting table 6, with its wrapper-forming recess, channel 62 and its folding mechanisms, of the plunger 40 reciprocating between the channel and the end of the mandrel, and the upper reciprocating plunger 50 adapted to pass through the mandrel and recess and to follow the plunger 40 to channel 62, substantially as described.

27. The combination with mechanism for forming a package, of an outside-wrapper support, for applying a wrapper to the package, folding mechanism beyond said support



for folding the wrapper about the package, and a carrier for receiving the package from the package-forming mechanism and passing it through the wrapper-support and delivering it to said folding mechanism, substantially as described.

28. The combination with mechanism for forming a package, of an outside-wrapper support, for applying a wrapper to the package folding and pasting mechanisms beyond said support for folding and pasting the wrapper about the package, and a carrier for receiving the package from the package-forming mechanism and passing it through the wrapper-support and delivering it to said folding and pasting mechanisms, substantially as described.

29. The combination with mechanism for forming a package, a channel for holding the packages, and means for ejecting them therefrom, of an outside-wrapper support for applying a wrapper to the package, folding mechanism beyond said support for folding the wrapper about the package, a carrier having fingers engaging the packages as ejected from the channel, for passing the packages through the wrapper-support and delivering them to said folding mechanism, and means for disengaging said fingers as the carrier reaches said folding mechanism, substantially as described.

30. The combination with mechanism for forming a package, a channel for holding the packages, and means for ejecting them therefrom, of an outside-wrapper support for applying a wrapper to the package, folding mechanism beyond said support for folding the wrapper about the package, a carrier having spring-fingers engaging the packages as ejected from the channel, for passing the packages through the wrapper-support and delivering them to said folding mechanism, and means for disengaging said fingers as the carrier reaches said folding mechanism, substantially as described.

31. The combination with channel 62, of reciprocating carrier 130, having fingers 131, outside-wrapper-supporting table 115 provided with opening 117, lower channel 118, and folding mechanism therein for folding the outside wrapper, substantially as described.

32. The combination with channel 62, of reciprocating carrier 130, having fingers 131, outside-wrapper-supporting table 115, provided with opening 117, lower channel 118, and folding and pasting mechanisms therein for folding and pasting the outside wrapper, substantially as described.

33. The combination with channel 62, of reciprocating carrier 130, outside-wrapper-supporting table 115 provided with opening 117, lower channel 118, stationary folder 121, sliding folder 120, plunger 122, supporting-plate 123, and hooked arm 124 connecting said plate to the plunger, substantially as described.

34. The combination with channel 62, of

reciprocating carrier 130, outside-wrapper-supporting table 115 provided with opening 117, lower channel 118, stationary folder 121, sliding folder 120, plunger 122, supporting-plate 123, hooked arm 124 connecting said plate to the plunger, and pasting-roll 142, engaging the sliding folder, substantially as described.

35. The combination of channel 118, stationary folder 121, sliding folder 120, plunger 122, supporting-plate 123, hooked arm 124 connecting said plate to the plunger, and a recess in the channel engaged by the hooked end of the arm, substantially as described.

36. The combination with a pair of folders, one stationary and the other movable toward it, for folding opposite sides of a wrapper, of a plunger located in the rear of the normal position of the movable folder, a supporting-plate for engaging the side of the wrapper next the plunger and having a loose connection to the plunger so as to move therewith during the latter part only of its movement in both directions, and a latch for locking it against return in its forward position during the first part of the return movement, of the plunger, substantially as described.

37. The combination with a wrapper-supporting table, provided with a wrapper-forming recess, and a mandrel coacting with said recess to form the body of the wrapper, of a pair of projections, as 28, upon opposite sides of the recess for engaging opposite sides of the wrapper-blank to bend them inwardly, substantially as described.

38. The combination with a wrapper-supporting table, provided with a wrapper-forming recess, a mandrel upon one side of the table coacting with said recess to form the body of the wrapper, and a plunger upon the opposite side of the table adapted to enter the wrapper-forming recess and to support the wrapper-blank against the mandrel during the formation of the wrapper, of mechanism bridging the wrapper-forming recess for supporting the wrapper-blank while the plunger is out of the recess and adapted to move out of supporting position upon the arrival of the plunger in supporting position, and means for moving said table into engagement with said mandrel, substantially as described.

39. The combination with a wrapper-supporting table, provided with a wrapper-forming recess, a mandrel upon one side of the table coacting with said recess to form the body of the wrapper, folding mechanism for forming a cover for the wrapper, and a plunger upon the opposite side of the table adapted to enter the wrapper-forming recess and reciprocating between the mandrel and folding mechanism for supporting the wrapper-blank against the mandrel during the formation of the wrapper and delivering the wrapper to the folding mechanism, of mechanism bridging the wrapper-forming recess for supporting the wrapper-blank while the plunger is withdrawn from the recess and adapted to move



out of supporting position upon the arrival of the plunger in supporting position, substantially as described.

40. The combination with a reciprocating wrapper-supporting table, provided with a wrapper-forming recess, a stationary mandrel upon one side of the table coacting with said recess to form the body of the wrapper, and a plunger upon the opposite side of the table adapted to enter the wrapper-forming recess and to support the wrapper-blank against the mandrel during the formation of the wrapper, of mechanism carried by the table adapted to be projected across the wrapper-forming recess to support the wrapper-blank while the plunger is out of the recess and to be released and withdrawn during the movement of the table toward the mandrel and the arrival of the plunger in supporting position, substantially as described.

41. The combination with reciprocating ta-

ble 6, its wrapper-forming recess, mandrel 20, and plunger 40, of rods 150 and mechanism for projecting them across the recess, and spring, or springs 162 for withdrawing the rods upon the upward movement of the table, substantially as described.

42. The combination with reciprocating table 6, its wrapper-forming recess, mandrel 20, and plunger 40, of rods 150, projection 154 engaging the rods and projecting them across the recess, and spring or springs 162 for withdrawing the rods upon the upward movement of the table, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DANIEL J. CAMPBELL.

Witnesses:

CHRISTIAN A. HOPMAN,  
E. P. KEHOE.