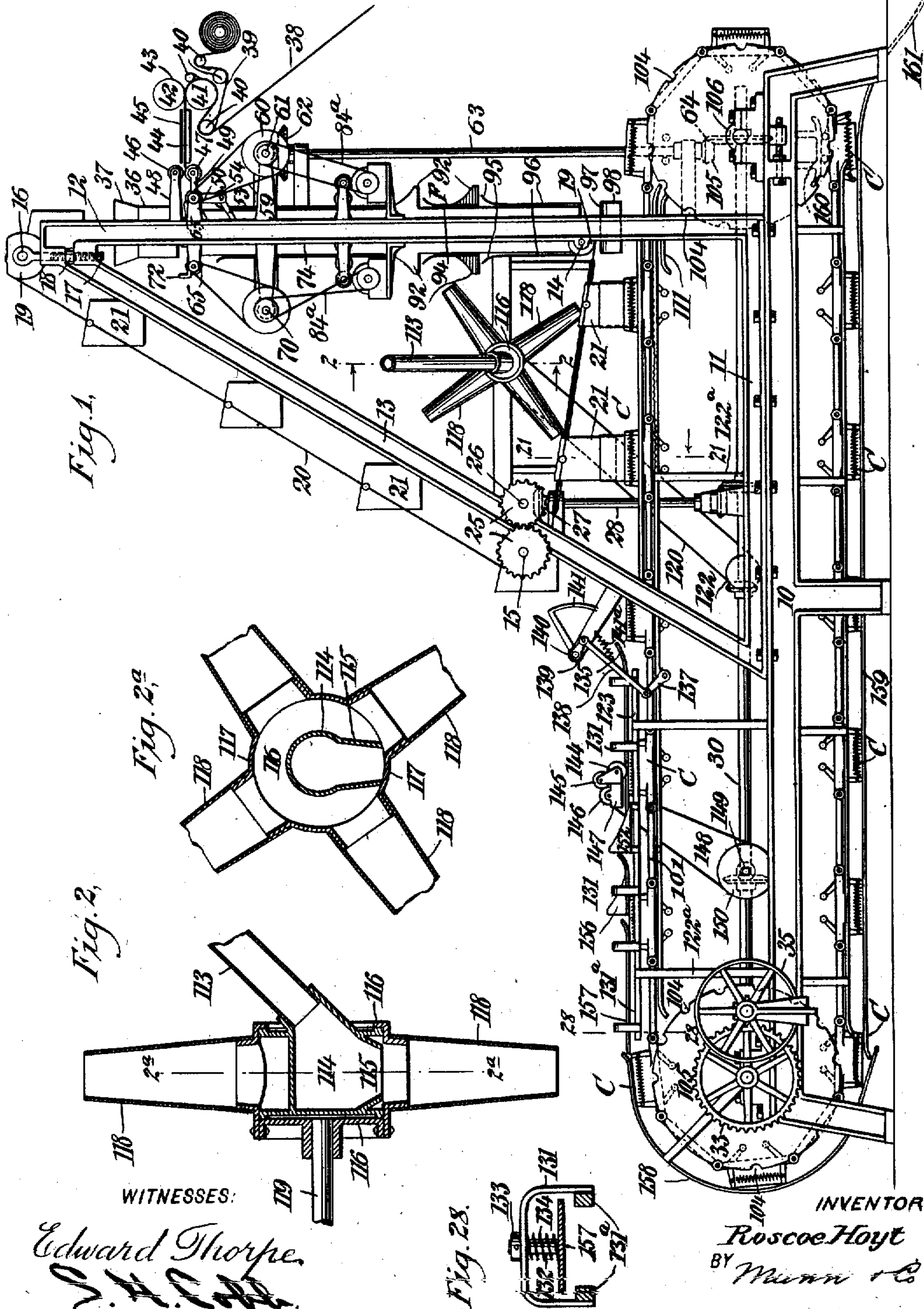


R. HOYT.
PACKAGING MACHINE.
APPLICATION FILED AUG. 3, 1904.

952,331.

Patented Mar. 15, 1910.

6 SHEETS—SHEET 1.



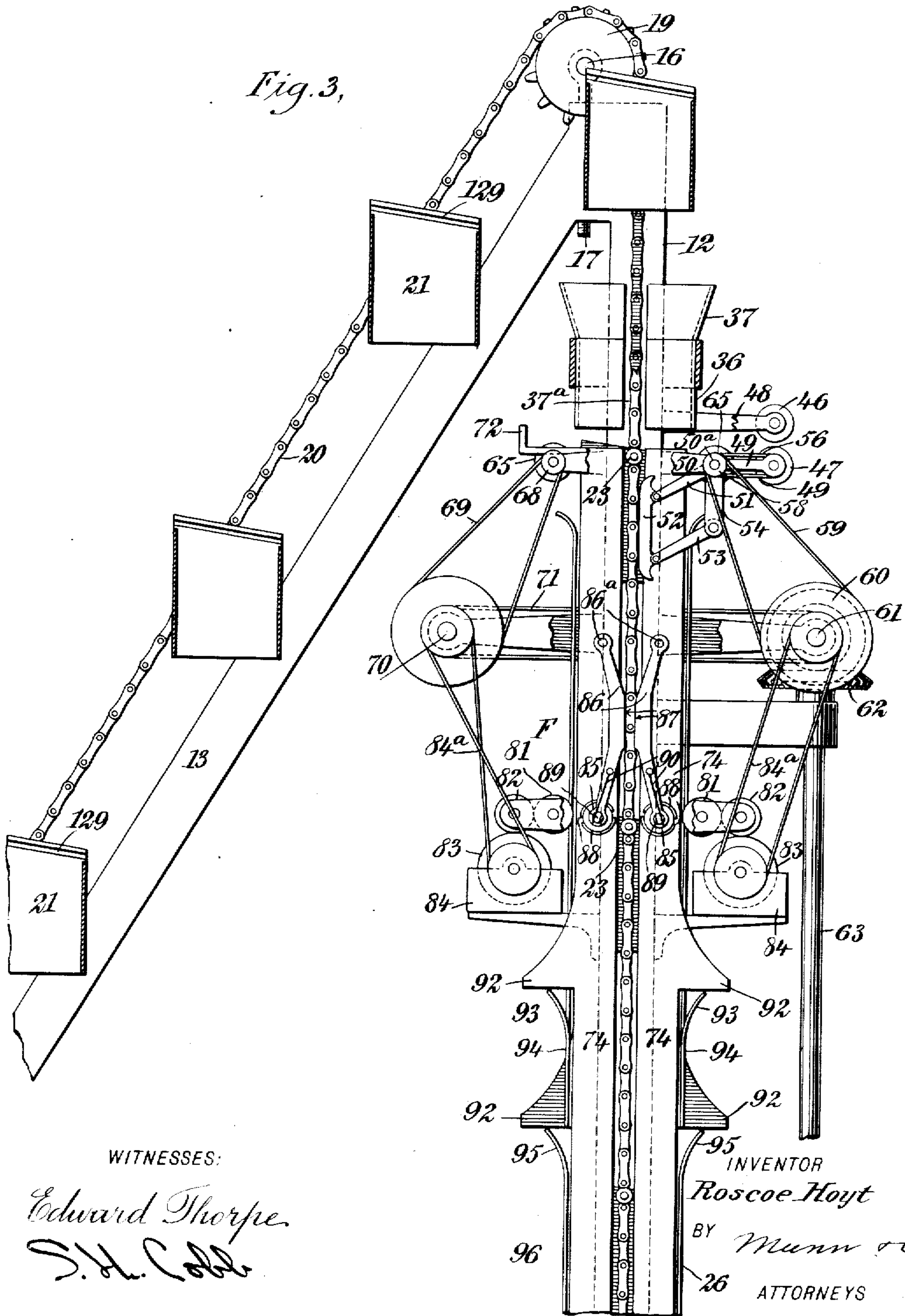
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6 SHEETS—SHEET 2.

Fig. 3,



WITNESSES:

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S. H. Cobb

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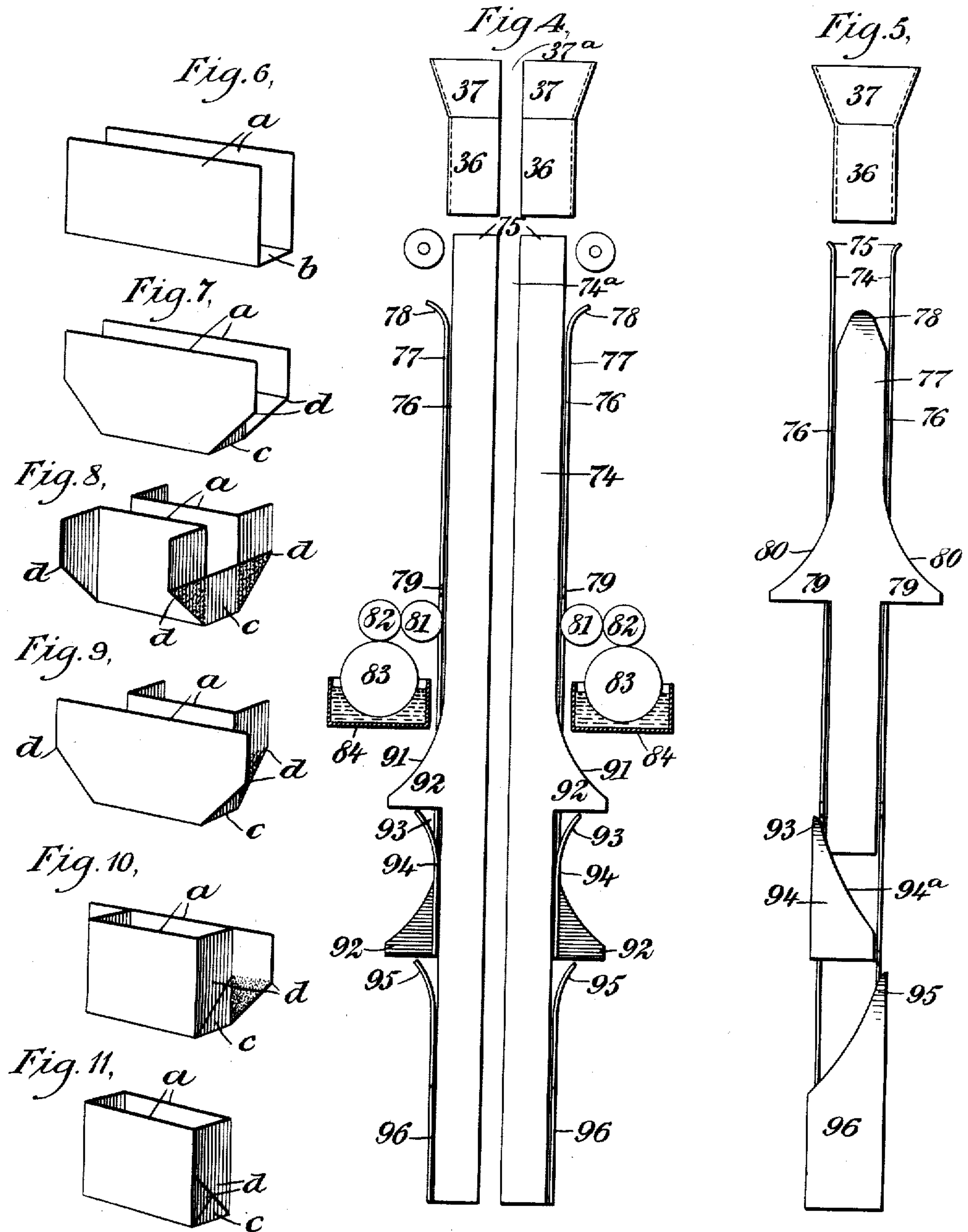
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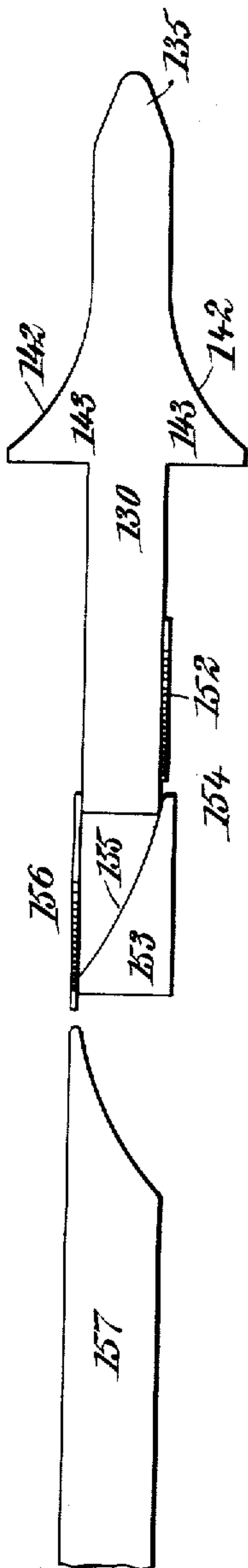
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6 SHEETS—SHEET 4.

Fig. 12,



WITNESSES:

Edward Thorpe
S. H. Cobb.

Fig. 19,

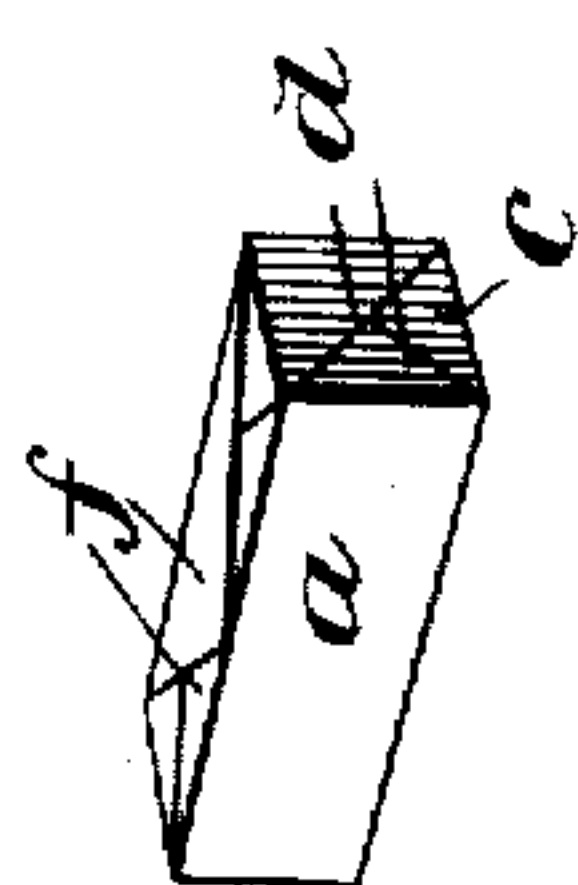


Fig. 18,

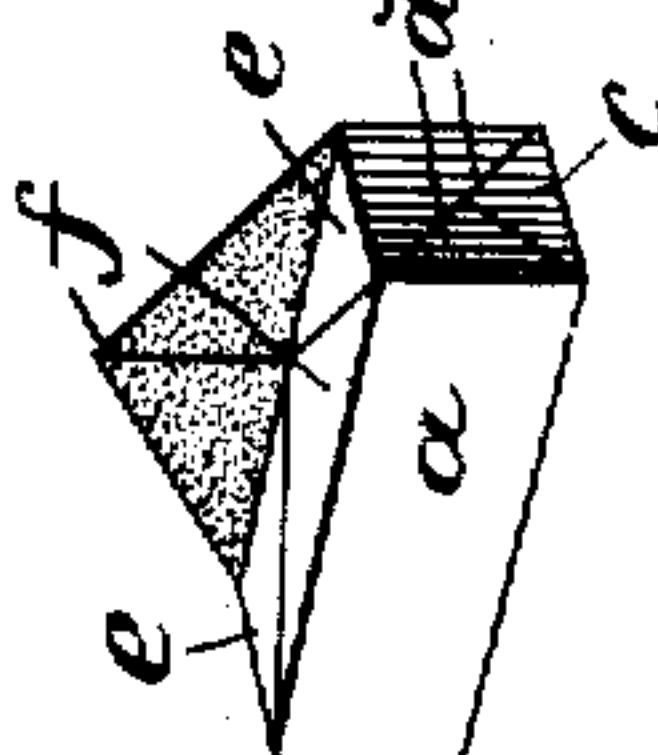


Fig. 17,

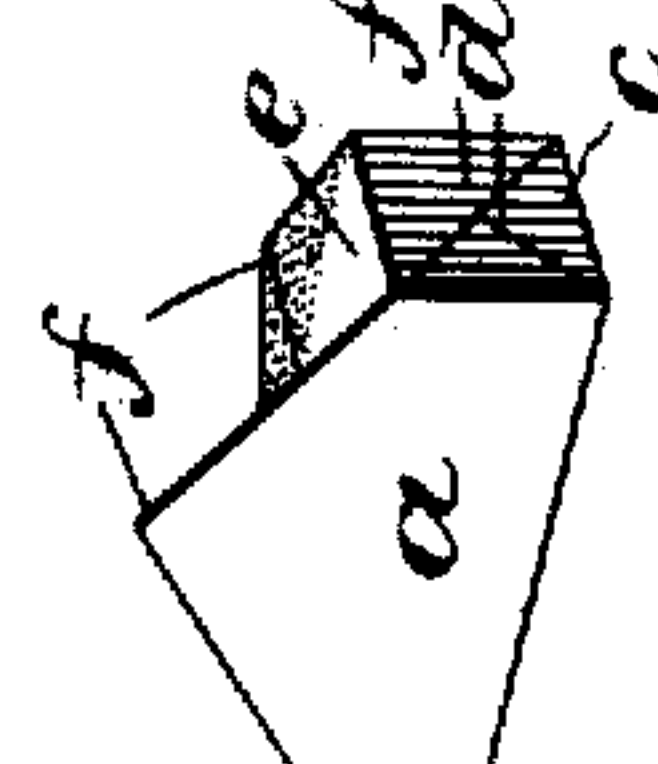


Fig. 16,

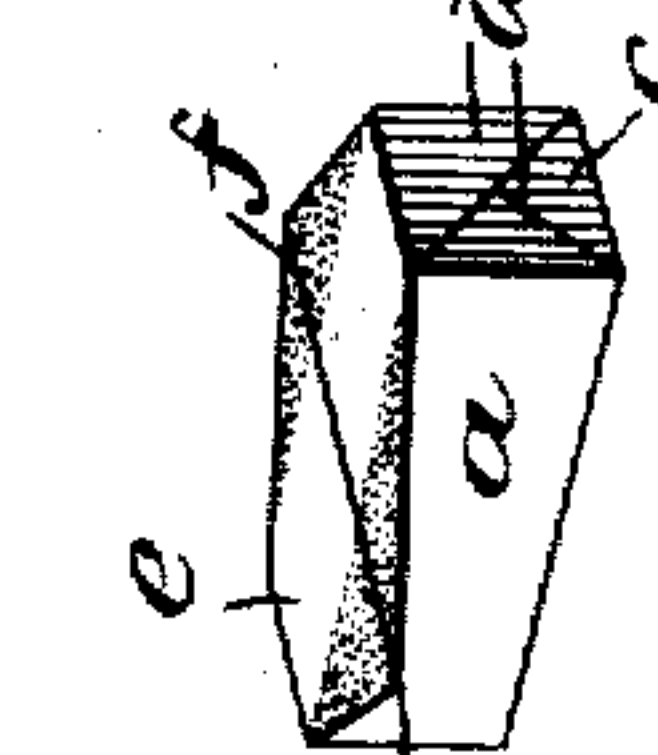


Fig. 15,

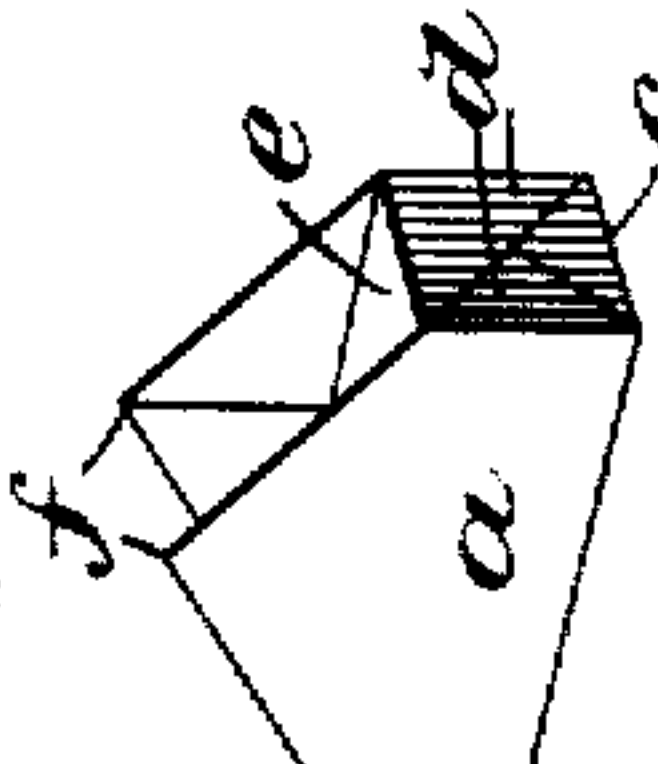


Fig. 14,

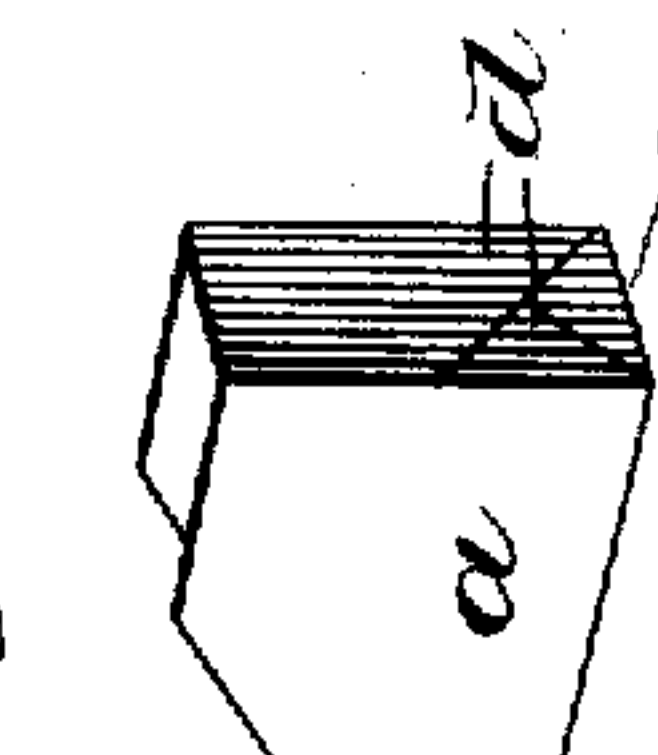
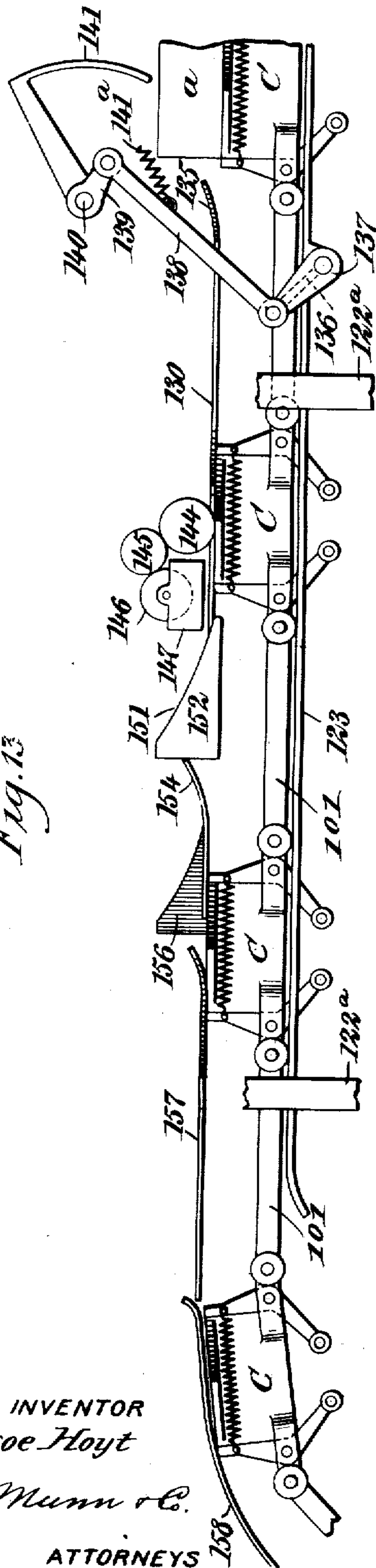


Fig. 13



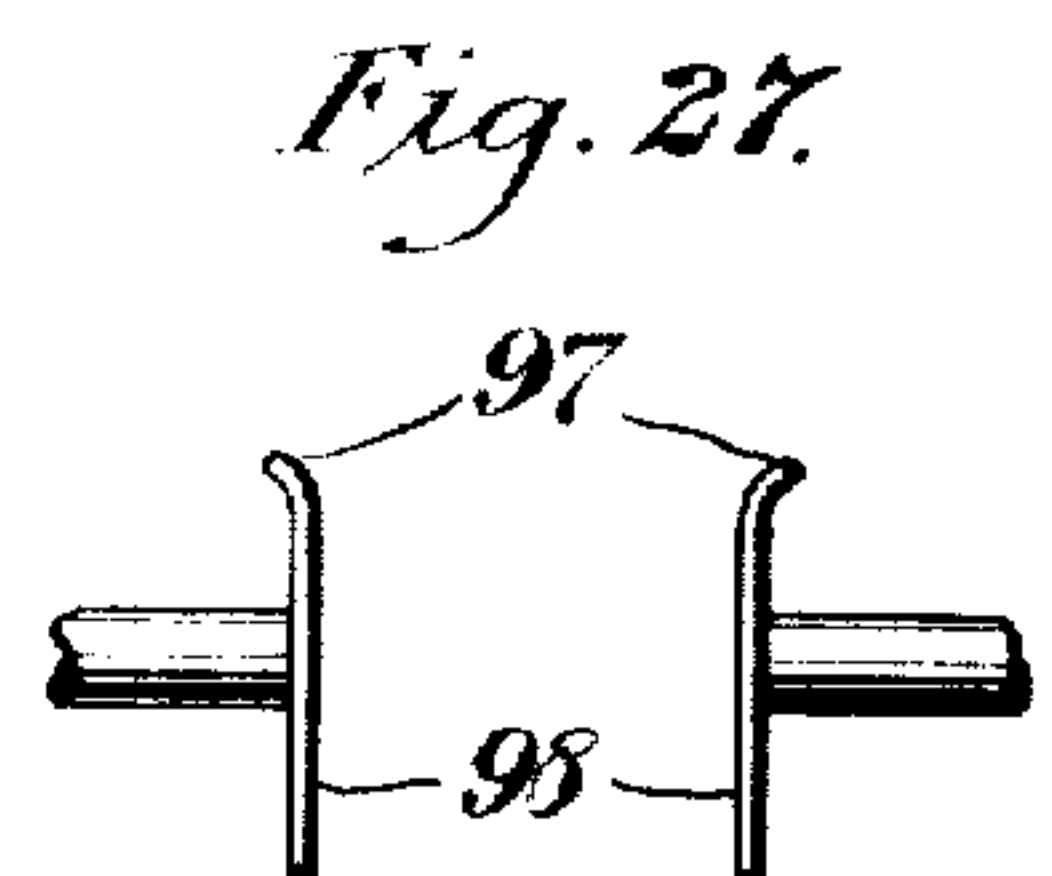
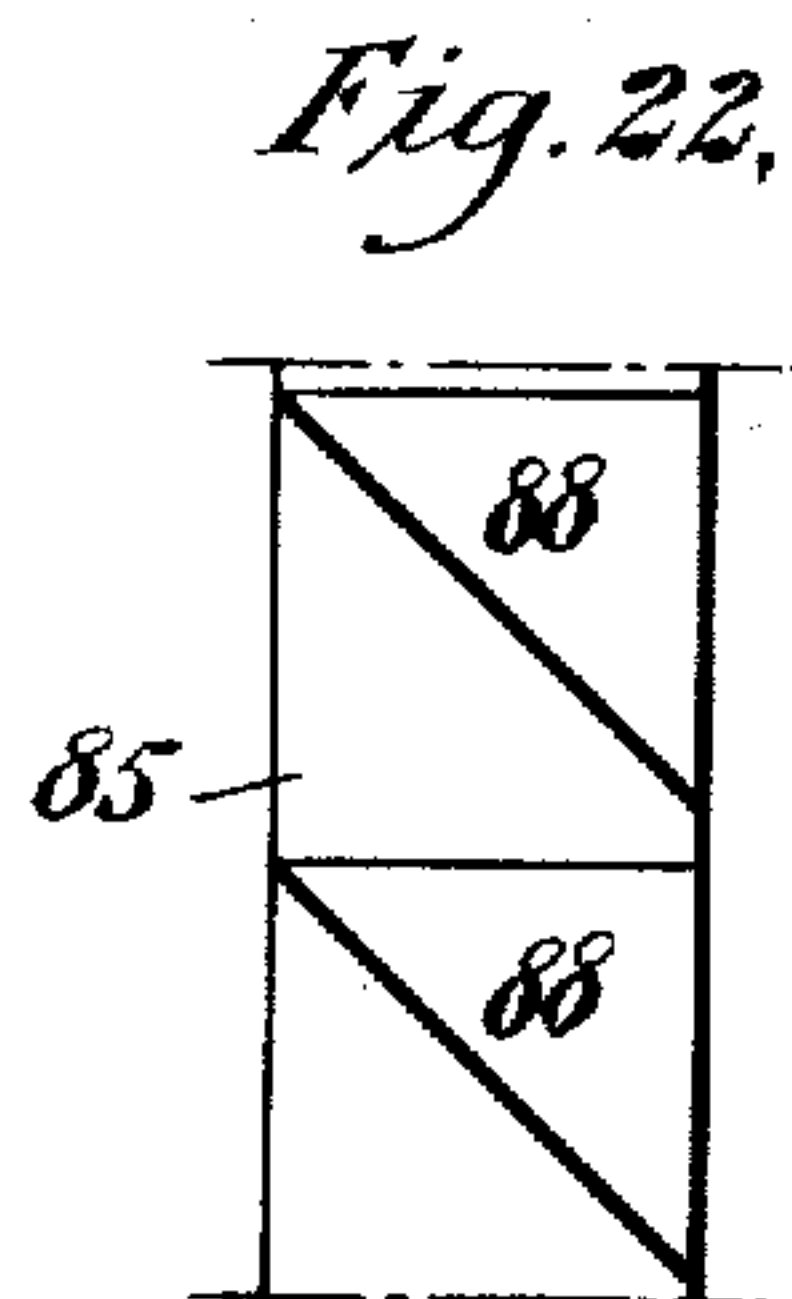
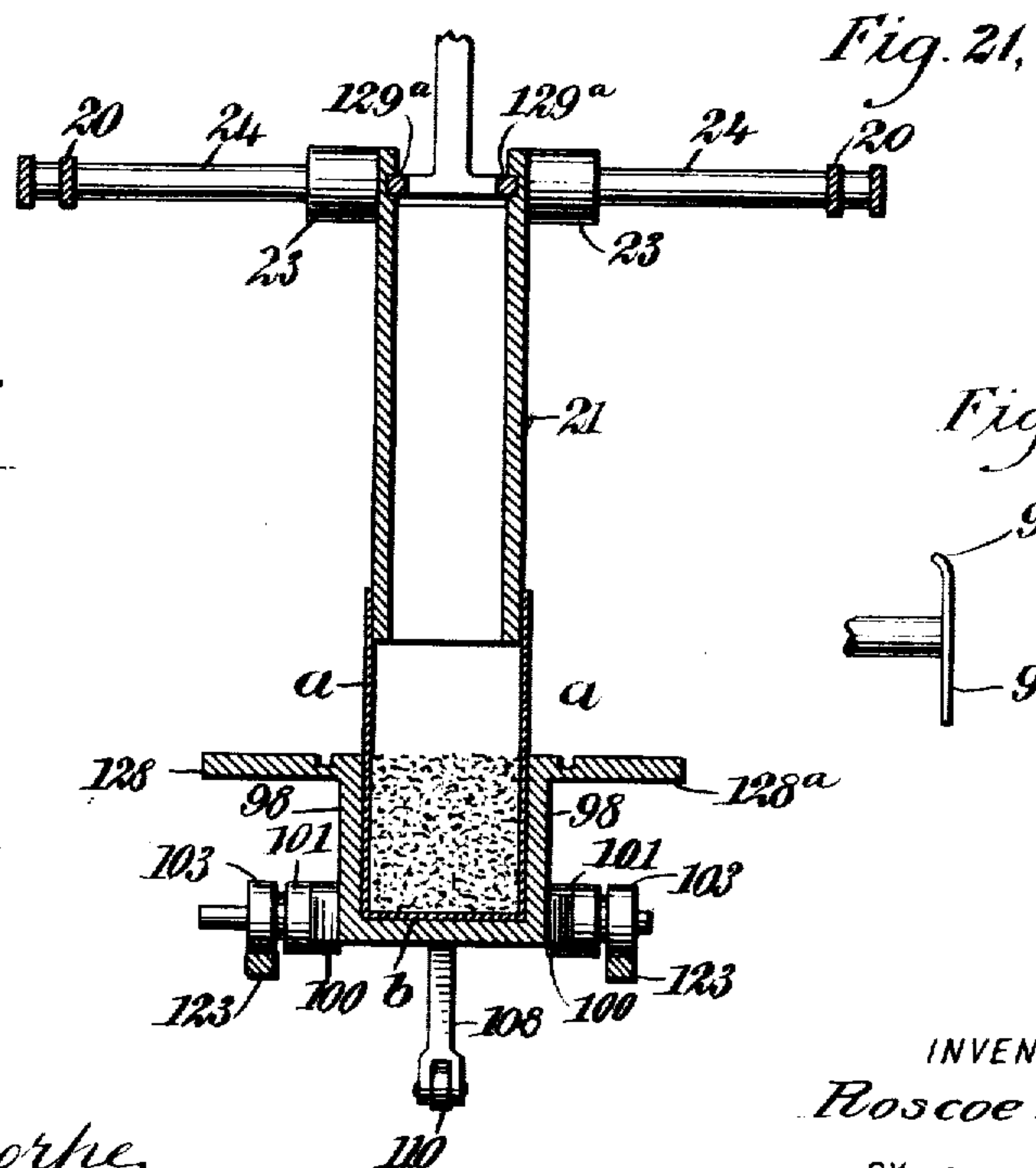
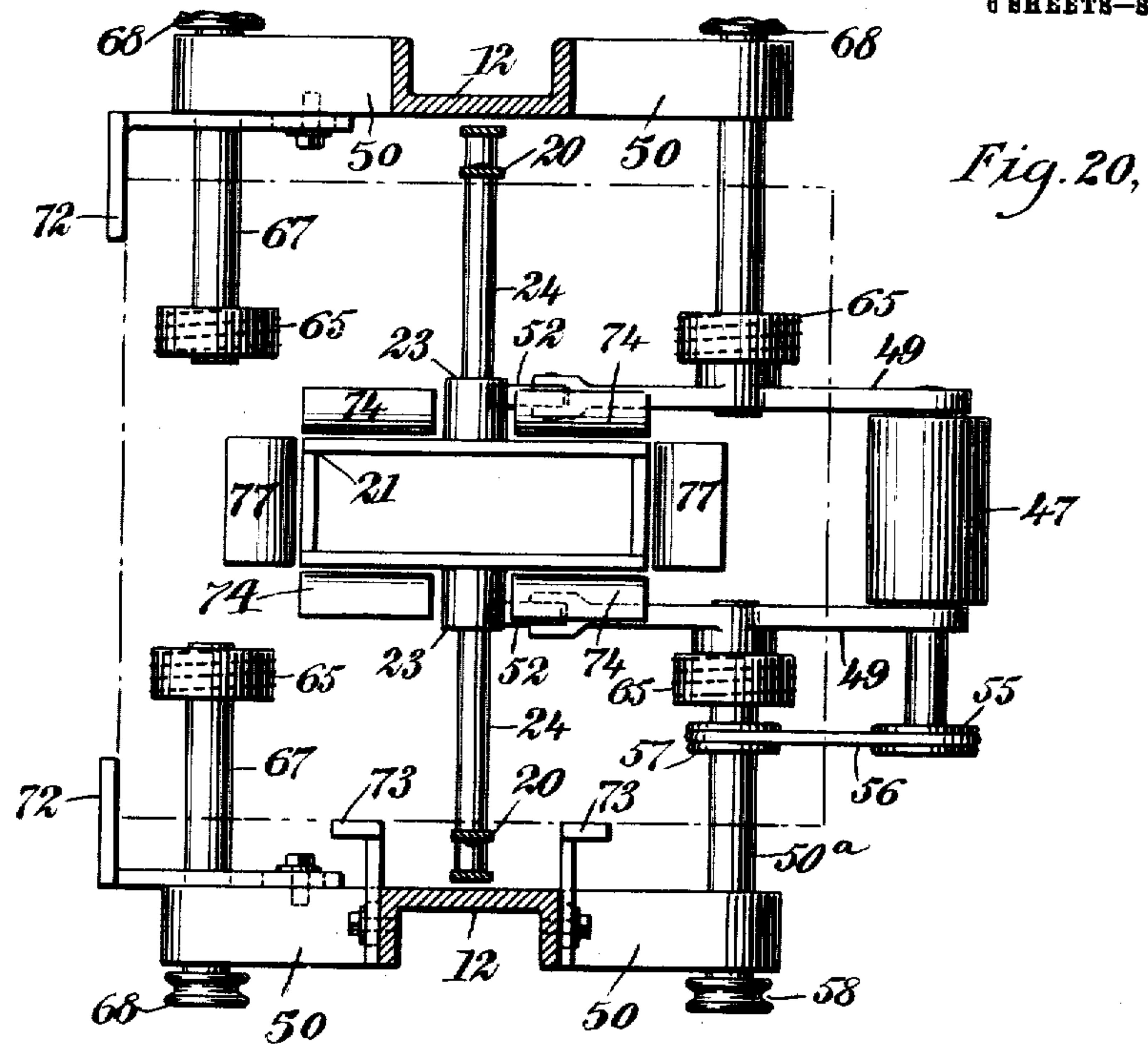
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APPLICATION FILED AUG. 3, 1904.

Patented Mar. 15, 1910.

6 SHEETS—SHEET 5.



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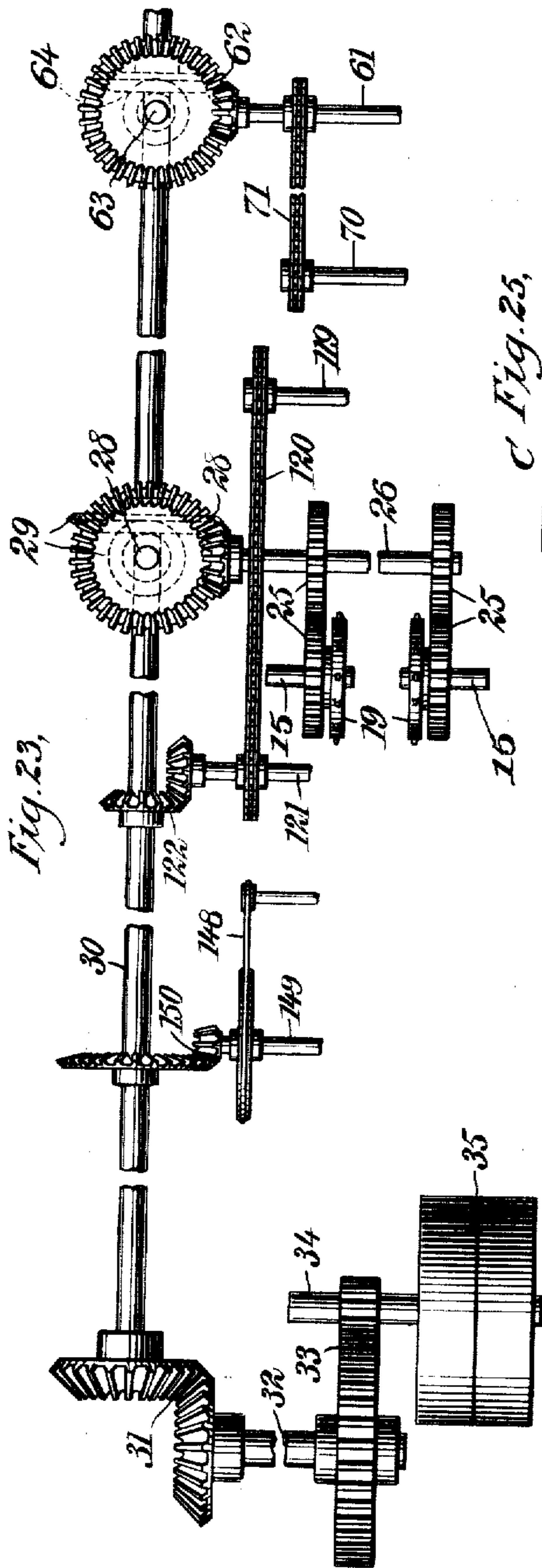
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APPLICATION FILED AUG. 3, 1904.

Patented Mar. 15, 1910.

6 SHEETS—SHEET 6.



WITNESSES:

Edward Thorpe,
J. H. Cole.

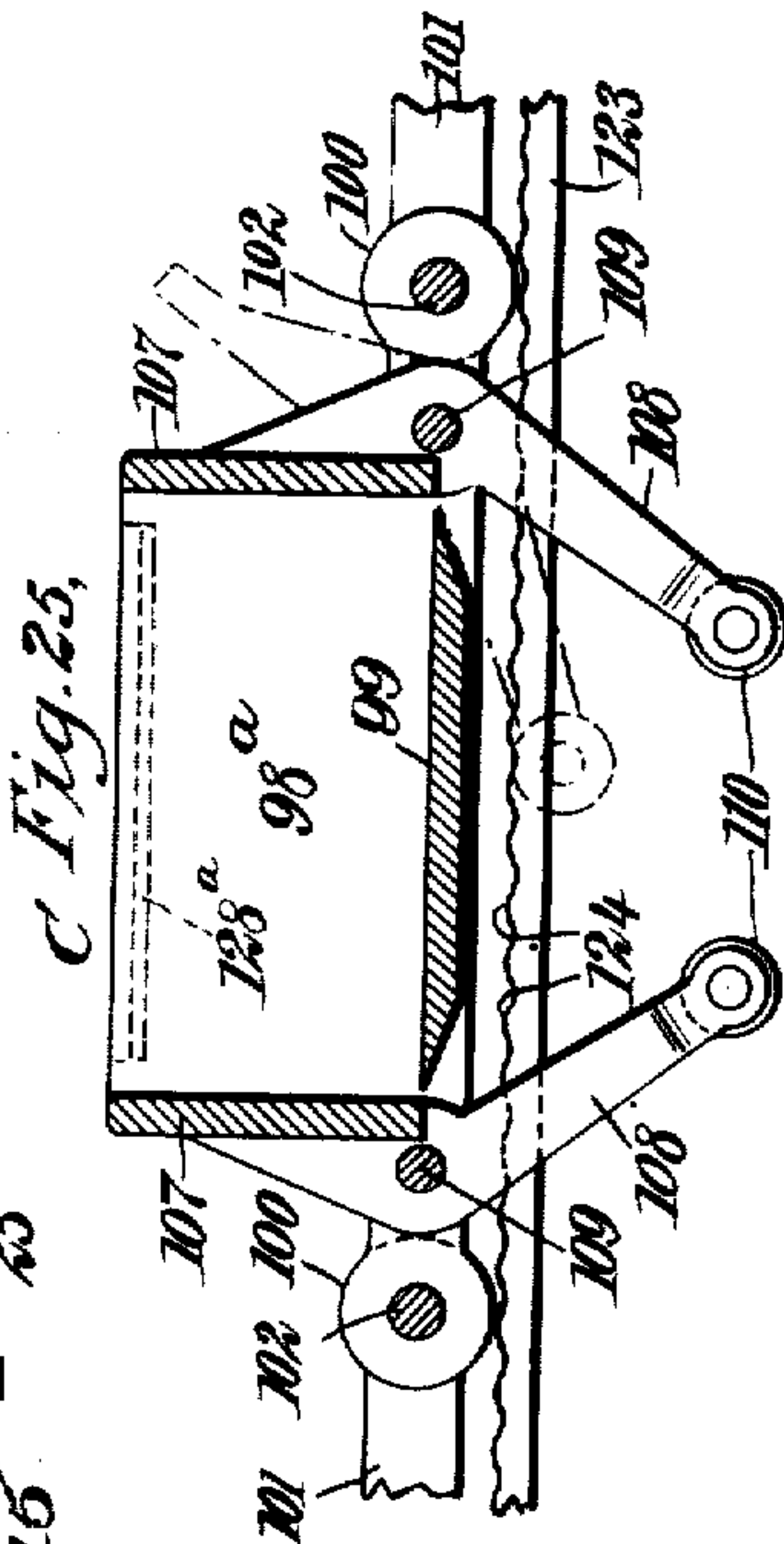
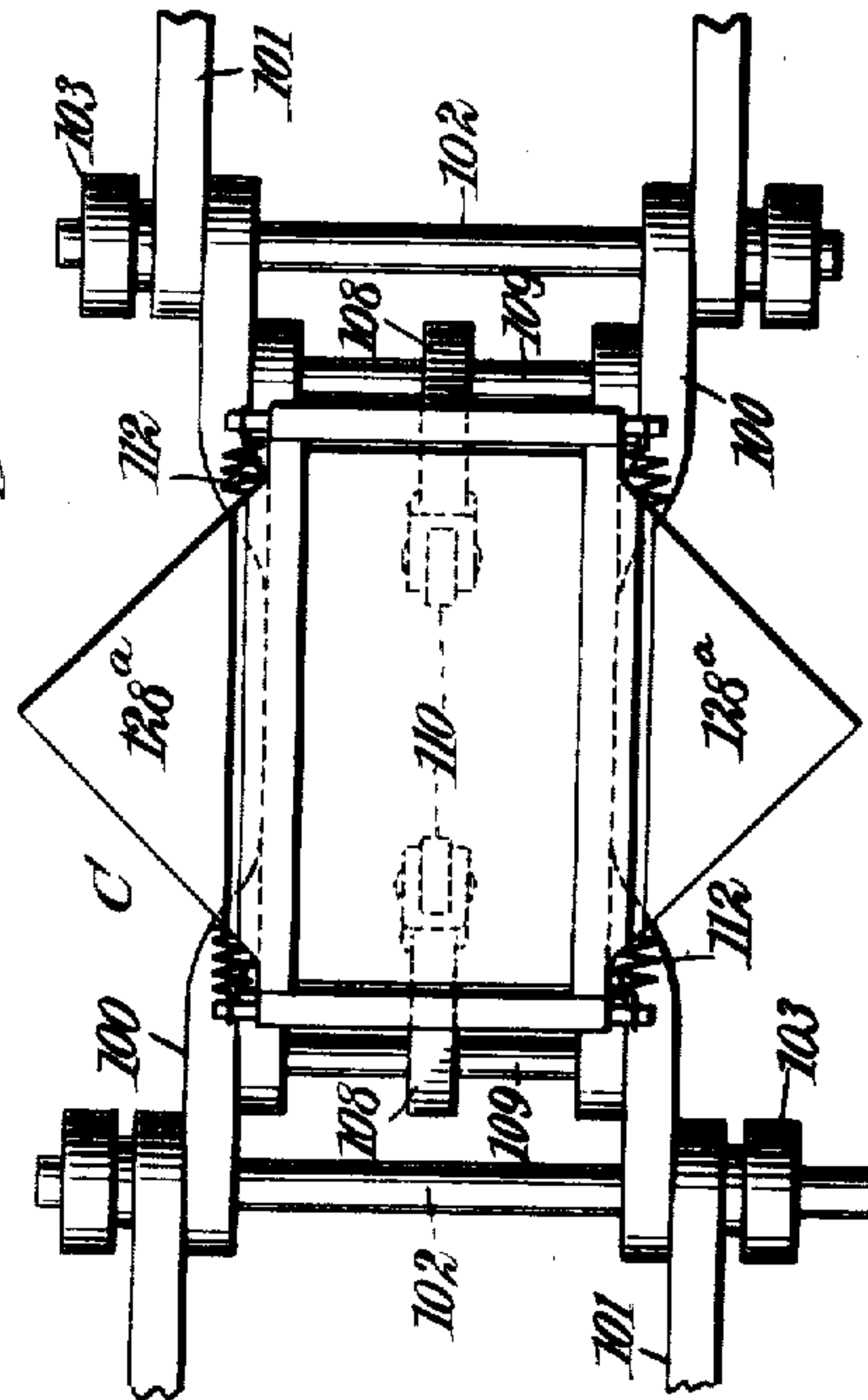


Fig. 24,



UNITED STATES PATENT OFFICE.

ROSCOE HOYT, OF NEW YORK, N. Y.

PACKAGING-MACHINE.

952,831.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed August 3, 1904. Serial No. 219,306.

To all whom it may concern:

Be it known that I, ROSCOE HOYT, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Packaging-Machine, of which the following is a full, clear, and exact description.

My invention relates to machines for packaging more or less finely divided materials, its principal objects being to provide such an apparatus in which the operations of forming an envelop or wrapper, supplying the contents, and closing and delivering the package are continuously and automatically carried out.

It consists in the various features and combinations hereinafter described and more particularly claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of one embodiment of my invention; Fig. 2 is a transverse sectional detail on the line 2—2 of Fig. 1; Fig. 2^a is a longitudinal sectional detail on the line 2^a—2^a of Fig. 2; Fig. 3 is an enlarged broken side elevation of the upper portion of the machine; Fig. 4 shows, in side elevation, the vertical folding-channel; Fig. 5 is an end elevation thereof; Figs. 6 to 11, inclusive, illustrate successive steps in the folding of a blank to form the envelop preparatory to receiving the contents; Fig. 12 is a top plan view of the folding members for closing the package; Fig. 13 is a broken side elevation of this portion of the machine; Figs. 14 to 19, inclusive, show successive steps in the folding of the top of the envelop to form the closure; Fig. 20 is a horizontal sectional detail, taken above the end of the folding-tube; Fig. 21 is a vertical sectional detail on the line 21—21 of Fig. 1; Fig. 22 shows a development of the surface of one of the platen-rolls; Fig. 23 is a diagrammatic top plan view of the more essential portions of the driving gear for the machine; Fig. 24 is a top plan view of one of the package-carriers; Fig. 25 is a central vertical longitudinal section therethrough; Fig. 26 is a similar view of another form of the carrier; Fig. 27 shows in end elevation

the guide members for directing the form into the package-carrier; and Fig. 28 is a transverse sectional detail on the line 28—28 of Fig. 1.

The numeral 10 designates a main frame, near one end of which, at each side, rise standards 11, 11, these being shown as of open triangular form and comprising, above the base, a vertical member 12 and an inclined member 13. In the member 12 are journaled a pair of alined shafts 14, and in the member 13 shafts 15, these latter shafts lying in a plane somewhat above that of the former. At the top of the standards are shafts 16, preferably journaled in arms 17 which are threaded and engaged by nuts 18, permitting a vertical adjustment of these shafts to secure a variation in the tension of the members which travel over them. Upon each of these shafts are fixed pairs of sprocket-wheels 19, 19 upon which operate chains or flexible supports 20, 20, the runs of which correspond in a general way to the form of the triangular standards, except that the base or lower portion is inclined upwardly from the shafts 14 to the shafts 15. These chains carry between them a continuous series of forms 21, which have rectangular side-walls corresponding to the cross-sectional area of the package-envelop and being open at the top and bottom. These forms have, at their opposite sides, cylindrical bosses 23, from which project rods 24 journaled in links in the chain so that the forms may always hang vertically as they travel therewith. The chains are conveniently driven by spur gearing 25 connecting the shafts 15 with a parallel shaft 26, which is rotated by means of intermeshing bevel gearing 27 from a vertical shaft 28 journaled upon the main frame and one of the standards, this latter shaft being in turn driven through bevel gearing 29 from a main shaft 30 extending longitudinally of the main frame. At the forward end of this shaft 30 it is connected by bevel gearing 31 with a transverse shaft 32 journaled at the end of the main frame and having spur gearing 33, permitting it to be rotated from a short shaft 34. This latter shaft preferably carries fast and loose pulleys 35, to which power is applied by a belt from any suitable source.

Between the standards, near their tops, is

mounted a tubular guide 36 having a flaring top 37 and being formed in separated sections with an intermediate space 37^a through which the bosses of the chains may travel.

5 This guide is of such dimensions as to receive the forms as they are lowered into it by the travel of the chains, which is right-handed as seen in Fig. 1 of the drawings, and to direct them to a tubular folding system F which is supported between the vertical portions 12 of the standards. To the upper end of this folding system below the guides, in a position to coact with the forms as they descend, are delivered blanks of paper or other flexible material, which are

10 preferably two in number, superimposed upon one another. These blanks are supplied from suitably supported webs 38 and 39, the former furnishing the outer portion of the envelop and the latter preferably providing a moisture-resisting lining, as coated or paraffin-paper. The ends of the webs pass over guide-rolls 40 and then together over a bed-roll 41 with which coöperates a

15 cutter-roll 42 having a longitudinal blade 43. The circumference of this cutter-roll is preferably such that a single rotation will permit the passage of a blank of the proper length, which will then be severed by the blade.

20 From the rolls 41 and 42 the double blank is delivered over a supporting-table 44, above which may be a directing plate 45, to delivery-rolls 46 and 47. The former of these is shown as journaled in fixed arms 48 projecting from the standards, while the lower

25 47 is mounted to rotate in a pair of arms 49, 49 pivoted upon brackets 50 by means of alined shafts 50^a, 50^a. Each arm 49 is preferably provided with an arm 51 extending inwardly and downwardly and having pivoted upon it an extended contact-shoe or member

30 52. The lower end of this shoe may be joined by a link 53 to a depending portion 54 of the bracket, thus completing a parallel motion. Normally the weight of the roll 47 holds it separated from its companion roll and the contact-shoe extending into the path of the form-bosses 23. As each of the forms descends, its opposite bosses will simultane-

35 ously coact with the shoes and, pressing them outward, raise the lower roll into coaction with the paper, pressing the latter against the upper roll. The roll 47 is rotated at a considerable speed by a pulley 55, over which a belt 56 passes to a pulley 57 upon one of the shafts 50^a, which also has fast upon it a pulley 58 connected by a belt

40 59 with a pulley 60 upon a transverse shaft 61, conveniently journaled in an arm extending from one of the standards. This latter shaft may be driven through bevel gearing 62 from a vertical shaft 63 mounted to rotate in arms extending from the member 12 and being connected, at its lower extremity

45 64 by bevel gearing 64 with the main shaft.

As the rolls 46 and 47 are brought together, as has just been described, their rapid rotation will quickly deliver a cut blank across the end of the folding-tube into the path of the succeeding form. Here the

50 blank rests upon supporting and positioning-rolls 65, which are preferably four in number, two of them being shown as secured upon the shafts 50^a, while the two at the inner side are mounted upon corresponding

55 opposite shafts 67, 67. Upon each of these shafts 67 are pulleys 68 connected by belts 69 with a shaft 70, driven from the shaft 61 by a belt 71 operating over suitable pulleys. Each of the rolls 65 is shown as provided

60 with a spiral toothed or roughened projection, the pitch of which not only advances the blank against end-stops 72, 72, but also moves it laterally against side-stops 73, 73, placing it in the proper position over the end

65 of the folding-tube. This folding system or channel, as here illustrated, consists of side-walls 74, 74, each of which has a longitudinal opening 74^a, through which the bosses 23 may project and move. The upper ends

70 of these walls have curved ends 75 which contact with the side portions of the blank as it is pressed down between them by the advance of the form and bends these upward at *a, a*, forming an intermediate bottom por-

75 tion *b* beneath the form, as is illustrated in Fig. 6. Lying at right angles to the walls 74, 74 and extending between them, but leaving vertical openings 76 at their junctures, are walls or folding members 77 hav-

80 ing curved end portions 78. These strike against the ends of the bottom portion of the envelop as it descends, turning it up to form end portions *c, c*, at each side of which project flaps *d, d* extending through the

85 openings 76 and thus lying outside the tube. At each side of each of the walls 77 is a lateral projection 79 having its edge 80 at the side from which the form and envelop carried thereby advances, curved, as shown in

90 Fig. 5. These curved edges coact with the flaps *d* as the form moves by them, bending them outward at right angles to the top of the envelop at both ends, as indicated in

95 Fig. 8.

The envelop is now ready to receive an adhesive for securing its ends, and, journaled at each side of the stationary member 12 in arms extending therefrom, are applying-

100 rolls 81, against which operate intermediate rolls 82, conveniently journaled in the arms with the rolls 81, and with which contact supply-rolls 83 operating in tanks 84 of glue or other suitable adhesive. The sup-

105 ply-rolls are shown as driven by belts 84^a operating over pulleys upon their shafts and upon the shafts 61 and 70. At the outer side of each of the walls 74, situated opposite the applying-rolls 81, are platen-rolls 85, rotatably mounted in the ends of arms 86 piv-

110 115 120 125 130

oted at 86^a and having opposed contact-faces 87, with which the bosses 23 may coact to press them apart. Each of these platen-rolls serves to effect the application of glue to the flaps over a limited area, it preferably having two raised contact-surfaces 88 of triangular form corresponding to the double portion of the flap. The platen-rolls may be rotated by the advance of the envelop, and to determine the position of their raised portions so that they may coincide with the desired area of the envelop, the ends of the journals may be provided with flattened portions 89, against which rest springs 90, conveniently of the leaf type and fixed to the arms. As the arms of the platen-rolls are forced apart by the bosses, said rolls are brought into contact with the inner sides of the flaps *d* as they project through the openings between the tube-walls and press triangular portions of them against the applying-rolls, causing these portions to take on a film of the adhesive.

After the application of the adhesive, one flap at each end is turned into the plane of the side of the envelop by a curved edge 91 of a projection 92 from the wall 72 (Fig. 9). Upon the further descent of the form each straightened flap strikes an outwardly-curved end 93 upon a folding member 94 lying below the member 77. This curved end has its edge inclined downwardly at 94^a, and the result of this contact is to flatten the flap against the end-wall *c*, they being secured together by the adhesive. Upon further progress of the form, the other pair of flaps will be brought against opposite projections 92, similar to those previously described, which will straighten them into the plane of the sides, the effect of these two operations just described being illustrated in Fig. 10. A curved, inclined end 95 of a wall 96 below 92 now bends the remaining flap at each end across its companion, the adhesive securing it thereto and rendering the envelop ready to receive the contents. From this vertical folding system the forms pass between the curved directing edges 97 of guide members 98, which may be supported at each side of the standards and serve to direct the forms into carriers C. The size of these carriers is such that the forms and the encircling envelops will fit snugly within them, they preferably consisting of side-walls 98^a and a bottom 99. From the sides project pairs of oppositely-extending arms 100, 100, which may be connected by links 101 to form a continuous series. The joint between the arms and links may be made by cross-rods 102 which extend beyond the links at each side and carry rolls 103, which may coact with recesses 104 in pairs of wheels 105, 105, supported, respectively, upon the shaft 32 at one end of the main frame and a shaft 106 at the opposite end, the chain of carriers being con-

tinuously advanced during the operation of the machine by the rotation of the shaft 32. The carriers are preferably provided with opposite movable end-walls 107 carried by levers 108 fulcrumed upon rods 109 extending between the arms 100. The lower ends of these levers may carry rolls 110 for coaction with a relatively fixed contact member 111 situated beneath the guide 98 and acting to press the lower ends of the levers inwardly and upwardly to separate the end-walls of the carriers, these being normally maintained in a vertical position adjacent to the side-walls by springs 112 extending between them. This separation of the end-walls occurs at the time when a form descends with the completed envelop and enables the carrier which is then passing beneath the vertical run of the chain to readily receive it, when, upon its further advance, the walls close and contact with the envelop.

Situated above the upper run of the carriers adjacent to the vertical folding-tube, is filling or supply mechanism, which is here shown as consisting of a conduit 113 leading from some source of the material to be packaged, and delivering to a fixed head 114 which opens in a downwardly-extending throat 115. Rotatable about this head is a delivery member having end-walls 116, between which are cylindrical wall-sections 117 and intermediate radiating delivery-spouts 118, conveniently four in number and separated by equal angles. This rotatable member is mounted upon a shaft 119, which may be driven at a constant speed and in a definite relation to the movement of the carriers by a chain 120 operating over sprocket-wheels thereon and on a transverse shaft 121, which in turn may be driven by bevel gearing 122 from the main shaft. The end of the throat 115 contacts with the cylindrical sections 117 to form a closure for the conduit, checking the delivery of material when these are in coöperation. When, however, the openings of the spouts are opposite the throat-openings, a flow will be permitted, this occurring through the spout which is directed into and traveling with the open end of the form which has just delivered its envelop to the package-carrier.

Supported upon suitable uprights 122^a at each side of the main frame are tracks 123, over which the rolls 103 may operate, these causing the carriers to move in a true horizontal plane. The portions of the tracks beneath the supply mechanism are preferably provided with sinusoidal projections 124, over which the rolls 103 will ride. This will jar the carriers to settle the material properly within the envelop and at the same time loosen said envelop from the form to permit the latter to be more readily withdrawn. Instead of vibrating the entire carrier, it may have an inner or false

bottom 125, from which depend arms 126 carrying rolls 127 which operate over ways 128 having wave-like projections similar to 124, the rolls 103, however, operating upon the track 123, which is smooth throughout its entire length. In either form of carrier the upper edge of each of the side-walls preferably carries a table or contact-surface 128^a, which is shown as of triangular form and performs the function which will be hereinafter explained.

Each of the forms has, in the inner face of a portion of its side-walls projecting above the end-walls, grooves 129 which receive relatively fixed ways 129^a, these being located in an inclined position between the chains carrying the forms and corresponding in direction to the lower runs thereof. After a form has passed beneath the guide members 98 and been received by a carrier, these grooves 129 coact with the ways which, by virtue of their inclination, gradually withdraw the form from the envelop, the latter being retained within the carrier by the weight of the inflowing material and by the engagement of the carrier-walls. After the filling operation has been completed, the carrier will have attained such position that the form will have been completely withdrawn from the envelop, which now passes on to be operated upon to close the package. For this purpose a wall or folding member 130 is placed above the path of the carriers, it being conveniently mounted upon supports 131 extending between horizontal members 131^a carried by the uprights 122^a. Through these supports project rods 132 fixed to the upper side of the folding member and being limited as to downward movement by collars 133 secured thereon. Between the supports and the folding member are situated springs 134, normally forcing the folding member into coaction with the package and allowing, by its yield, for variations in the level of the material therein, always insuring a firm but not excessive pressure. The member 130 has, at the side from which the carrier and filled envelop advances, a curved end 135 which strikes against the forward end-wall of the envelop, depressing it into a horizontal plane across the contained material at *e* (Fig. 14). As the package-carrier advances beneath this curved end, one of the rolls 103 contacts with a web 136 upon an arm 137, which is shown as pivoted upon one of the tracks and connected by a link 138 with a crank-arm 139. This crank-arm is fixed upon a shaft 140, which also has fast upon it an arm having a curved depressing member 141 held normally raised by a spring 141^a. This depressing member is brought down against the opposite end of the upstanding portion of the envelop, lowering it into such a position that it readily enters beneath the curved

end of the wall 130, which forces it into a horizontal position at *e*, as is shown in Fig. 15. These two operations leave side-flaps *f*, *f*, which are then bent down into a horizontal plane by the contact of curved edges 142 of lateral projections 143 from the folding member 130, this position being indicated in Fig. 16 of the drawings. Here the flaps coincide with the tables 128^a and are ready to receive a coating of adhesive. To effect this, a glue-applying roll 144 is journaled above the path of the carriers beyond the projections 143 and is supplied by an intermediate roll 145 from a feed-roll 146 operating within a tank 147 containing the adhesive.

The applying system may be driven by a belt 148 extending over pulleys upon the shaft of the feed-roll and a shaft 149, which is driven by bevel gearing 150 from the main shaft. As the carrier passes beneath the applying-roll the lateral tables will force the triangular flaps against it so that they will receive a coating of the adhesive. One of the flaps *f* now contacts with an inclined edge 151 of a side-wall 152 and is straightened thereby into a vertical position in alignment with the side of the package, as is shown in Fig. 17. Beyond this folding member 152 is a top-wall or member 153 having a curved end 154 inclined at 155. This bends over the flap which has just been raised into contact with the top-walls *e* and presses it against them. While this is being done, the opposite flap strikes a side-wall similar to 152, which straightens it, the parts assuming the position illustrated in Fig. 18. A top-wall 157 similar to 155 but extending to a greater distance in the direction of advance of the carriers, coacts with the remaining vertical flap and forces it down upon the companion flap to complete the closure of the package, which now appears as in Fig. 19. The folding members 155 and 157 are yieldably mounted in the same manner as the member 130, previously described. Beyond this folding system for effecting the closure is a curved end-wall 158, which retains the packages within the carriers as they pass over the wheels, and at the lower side of said wheels the upper or folded faces of the packages come into contact with a straight bottom-wall 159, against which they rest as they travel back toward the rear of the machine, the pressure secured holding the flaps in proper contact to allow the adhesive to set. At the end of the bottom-wall the carrier-arms coact with a contact member 160, which forces them downwardly to separate the end-walls of the carrier, thus releasing the package, which passes down an incline 161 leading to any desired point, where the packages may be received and packed.

In using my improved machine, a double

blank of the proper size is fed from the web-rolls through the cutter-rolls and moved across the end of the folding-tube by the delivery-rolls into the path of the descending forms, the advance of each blank being effected by the contact of the bosses of the preceding form, which act for a time proportionate to the length of the blank, this being controlled by the length of the contact-shoes 52. This blank is now carried through the tube or channel by the form and its ends folded to furnish the envelop or container, the folding operations all being effected by stationary members and the necessary adhesive applied only over the desired area by the pressure of the platen-rolls, which are automatically actuated by the forms in their travel. Upon the completion of the container it is deposited within the traveling carrier, which retains its form, and the material is supplied during the advance of the carrier toward the folding mechanism, the form at the same time being withdrawn and the material settled within the envelop to allow this next operation to be performed. The open top is then folded and secured during horizontal travel, in a manner similar to that employed in the first folding during vertical movement, and the completed package is finally carried for a considerable space under a suitable pressure to insure the setting of the adhesive prior to its delivery. It should be noted that all these operations are not only performed without manual intervention, but while a continuous advance of the envelop is taking place.

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

1. In a packaging-machine, the combination with a tubular folding element, of a flexible support traveling at each side of said element, a form connected with both supports and being movable through the folding element, and means for moving a blank between the supports across the end of the folding element.

2. In a packaging-machine, the combination with a tubular folding element having a wall formed in separated sections, of a flexible support traveling outside the folding element, a form movable through the folding element, and connections between the support and form extending between the sections.

3. In a packaging-machine, the combination with a traveling form, of means for moving a blank into the path of the form, means for transmitting motion from the form to the first-mentioned means, and means for folding said blank over the form.

4. In a packaging-machine, the combination with a traveling form, of means for moving a blank into the path of the form,

means for transmitting motion from the form to the first-named means for a time proportionate to the length of the blank, and means for folding said blank over the form.

5. In a packaging-machine, the combination with an endless series of traveling forms, of means for successively moving blanks between the forms, stops for the blank at the end and inner side thereof, rotary means for supporting the blank and moving it longitudinally and laterally against the stops, and means for folding said blank over the form.

6. In a packaging-machine, the combination with a traveling form, of walls forming a channel for the passage of the form, and folding members furnishing the extended sides of the channel and having projections extending outwardly from the channel on the opposite sides thereof.

7. In a packaging-machine, the combination with a traveling form, of walls forming channels for the passage of the form, and folding members furnishing the sides of the channels and having lateral folding projections extending outwardly from the channels on opposite sides thereof, said projections being provided with curved edges at the sides on which the form advances.

8. In a packaging-machine, the combination with two folding systems arranged at an angle to one another, of a form traveling through one of said systems, a traveling package carrier by which the form is received, and means for gradually withdrawing the form from the package-carrier between the folding systems.

9. In a packaging-machine, the combination with two folding systems arranged at an angle to one another, of a form traveling in said systems, a traveling package-carrier by which the form is received in each system, and a guide for the form situated between the folding systems.

10. In a packaging-machine, the combination with a traveling form, of a tubular folding element through which the form passes, a guide for the form situated at the entrance of the tubular element and separated therefrom, and blank feeding mechanism situated between the guide and the folding element.

11. In a packaging-machine, the combination with a traveling form, of means for folding a blank over the form, means for applying an adhesive to the blank as it is advanced by the form, said adhesive-applying means including a platen, and means for moving the platen by the movement of the form.

12. The combination with blank-folding mechanism, of an adhesive-applying member, and means for forcing a limited area of the blank into contact with said member, said

means having a surface for coaction with the blank in the form of the area to which the adhesive is to be applied.

13. The combination with a continuously-traveling form, of a receptacle carrier to receive the form moving therewith, and means for filling the receptacle during its travel.

14. The combination with a traveling form, of a receptacle carrier to receive the form, means for withdrawing the form from the receptacle carrier during its travel, and means for filling the receptacle during its travel.

15. The combination with a traveling form, of a receptacle carrier to receive the form, means for gradually withdrawing the form from the receptacle carrier during its travel, and means for closing said receptacle after said withdrawal.

16. The combination with a traveling form, of a traveling receptacle carrier to receive the form, and relatively fixed means for withdrawing the form from the carrier, said form serving as means for directing a filling material to the receptacle.

17. The combination with a series of flexibly connected forms over which receptacles can be folded, of a series of carriers which may receive the forms, means movable with the forms and carriers for delivering material to the receptacles, and means for withdrawing the forms from the carriers during the delivery of the material.

18. The combination with a continuously-moving series of flexibly-connected forms over which envelopes are folded, of a continuously-moving series of flexibly-connected carriers which may receive the forms, and means movable with the forms and carriers for delivering material to the envelopes.

19. The combination with a continuously-moving series of flexibly-connected forms, over which envelopes are folded, of a continuously-moving series of flexibly-connected carriers which may receive the forms, means movable with the forms and carriers for delivering material to the envelopes, and means for withdrawing the forms from the carriers during the delivery of material.

20. The combination with a traveling series of flexibly-connected package-carriers, of substantially horizontal folding members situated above the path of the package-carriers, and substantially vertical folding members at each side of the horizontal members, there being spaces between them through which a portion of the package may pass.

21. The combination with a traveling package-carrier, of folding members lying above the path of the package-carrier, and adhesive-applying mechanism situated adjacent to the folding members, the carrier having a surface projecting from its side and with which the applying mechanism may coöperate.

22. The combination with a package-carrier having movable walls, of means for separating the walls to receive a package-envelop, means for closing the walls to hold the package-envelop, and means for separating the walls to release the package.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROSCOE HOYT.

Witnesses:

SYLVANUS H. COBB,
JNO. M. RITTER.