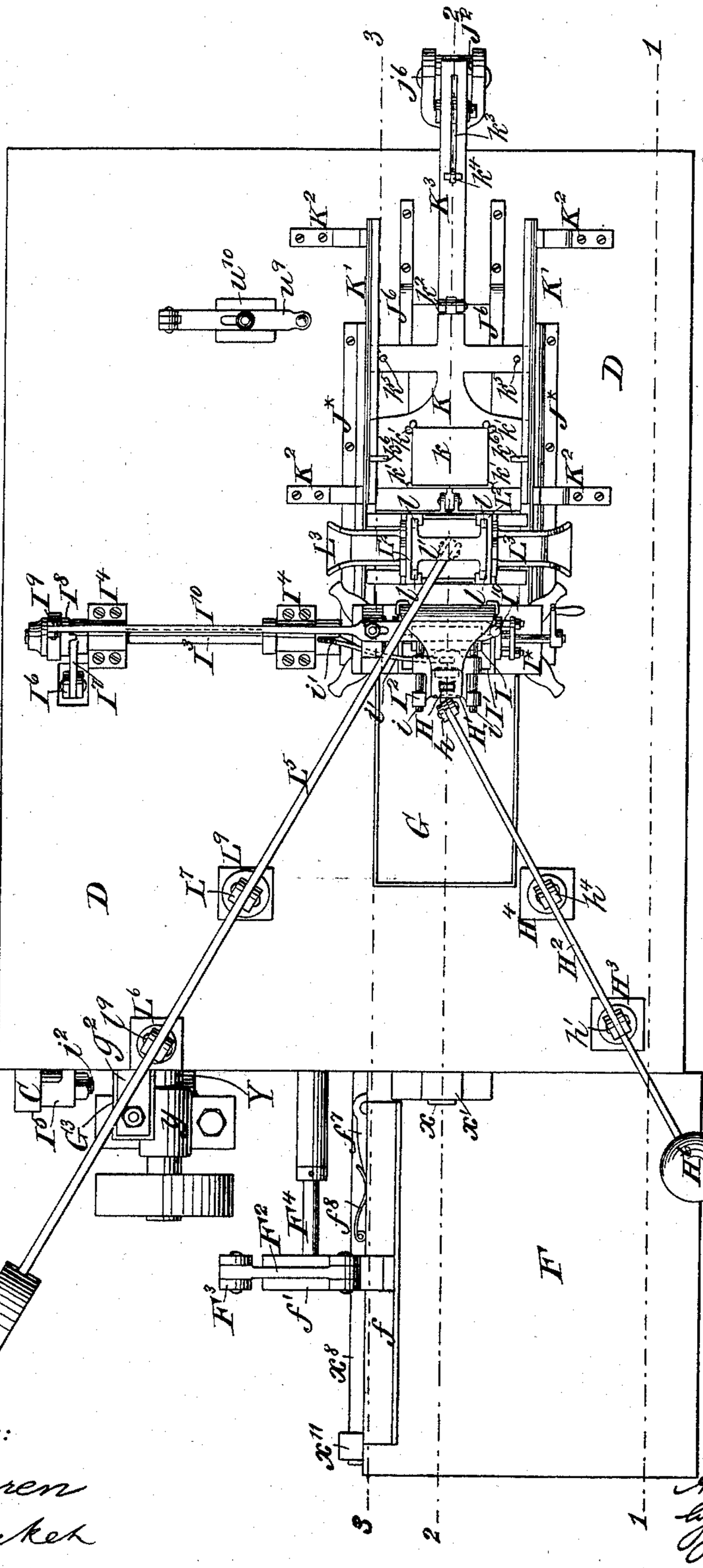
(No Model.) 12 Sheets—Sheet 1.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 1.



Witnesses:
C. Lundgren
J. Schuricker

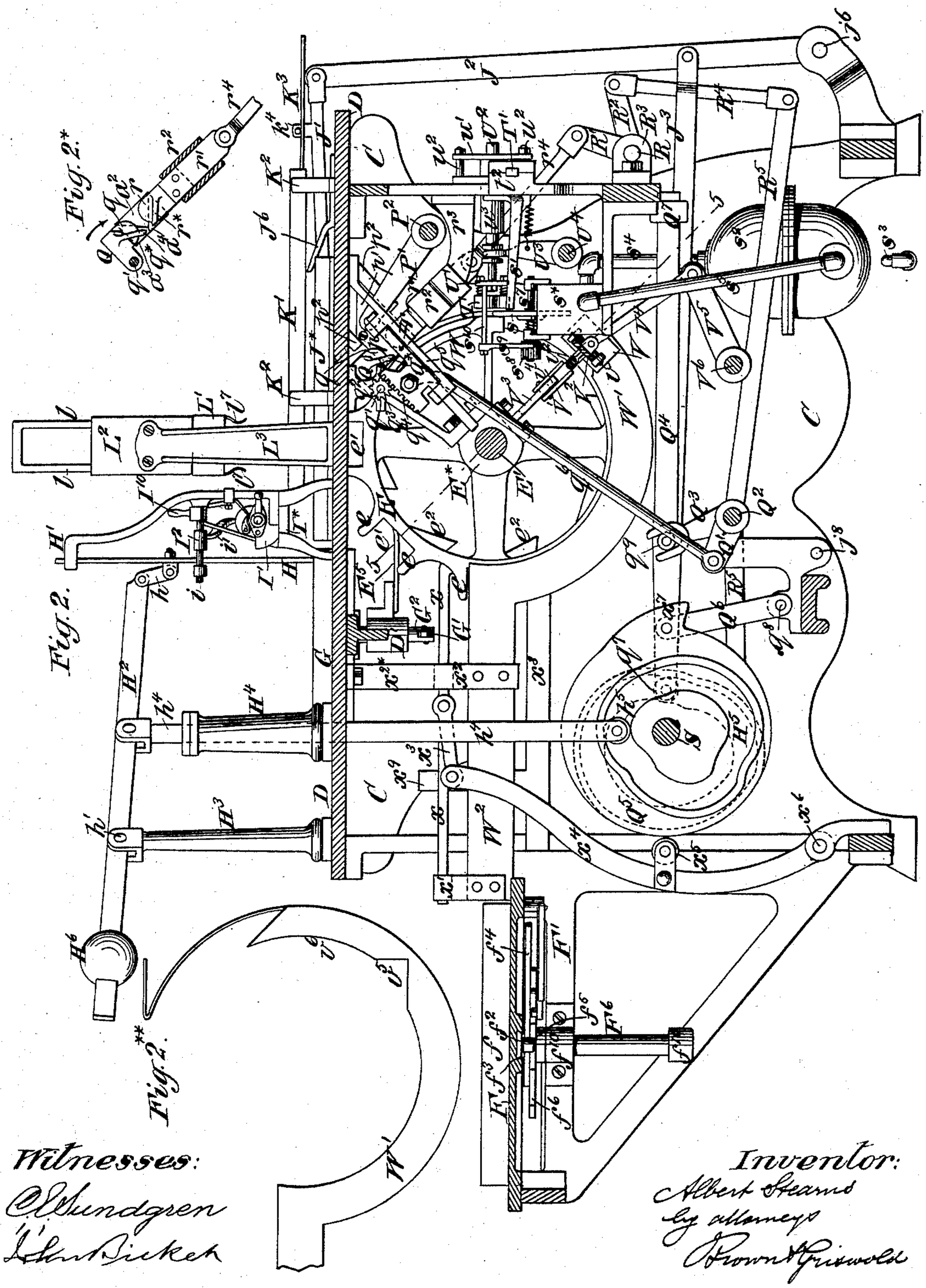
Inventor:
Albert Stearns
by his attorneys
Brown & Griswold

(No Model.) 12 Sheets—Sheet 2.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.



Witnesses:
C. Sundgren
L. Dickerson

Inventor:
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(No Model.) 12 Sheets—Sheet 3.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

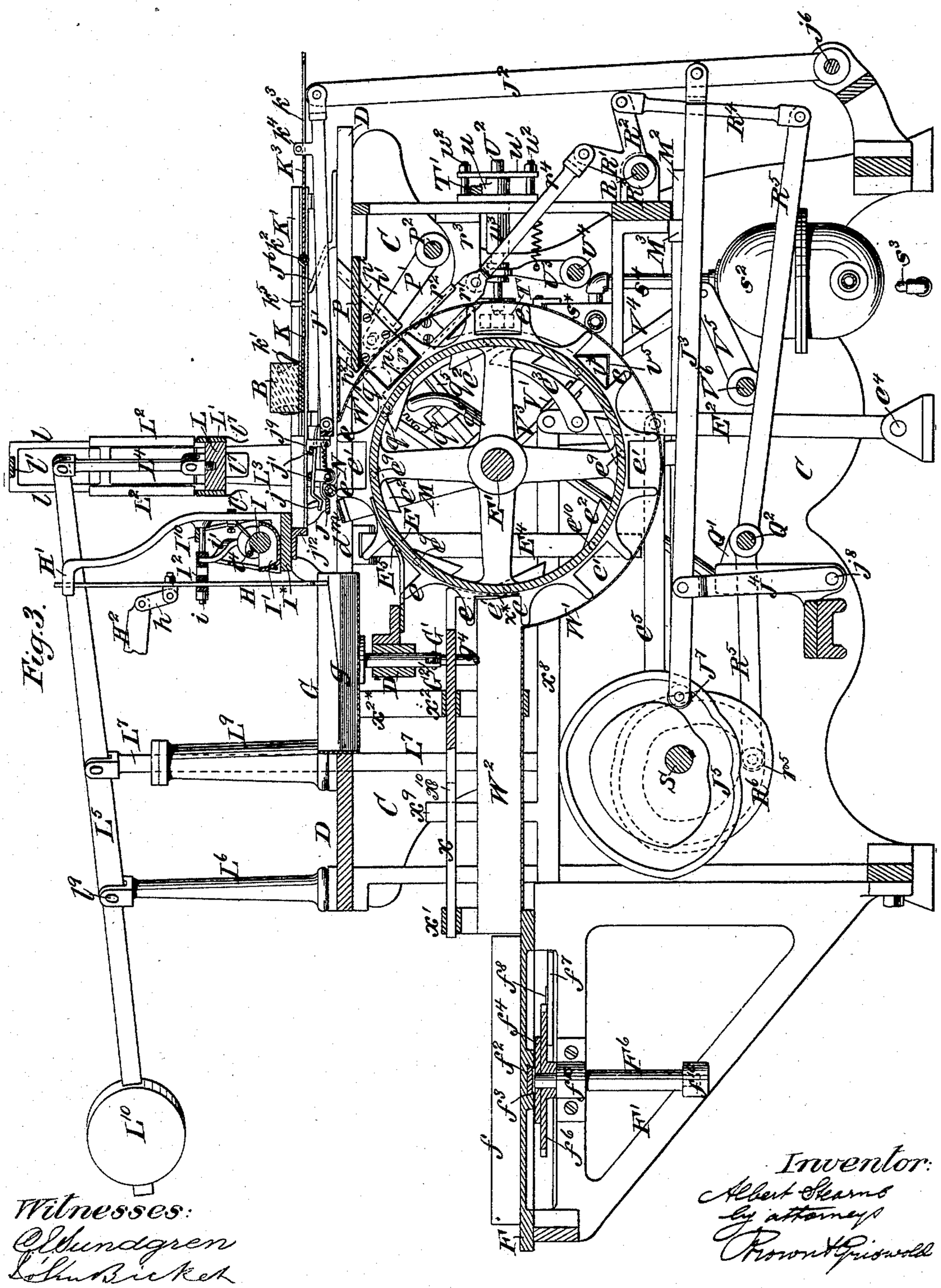

Fig. 3.

Witnesses:
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L. C. Burdick

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(No Model.) 12 Sheets—Sheet 4.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10. 1894.

Fig. 4.

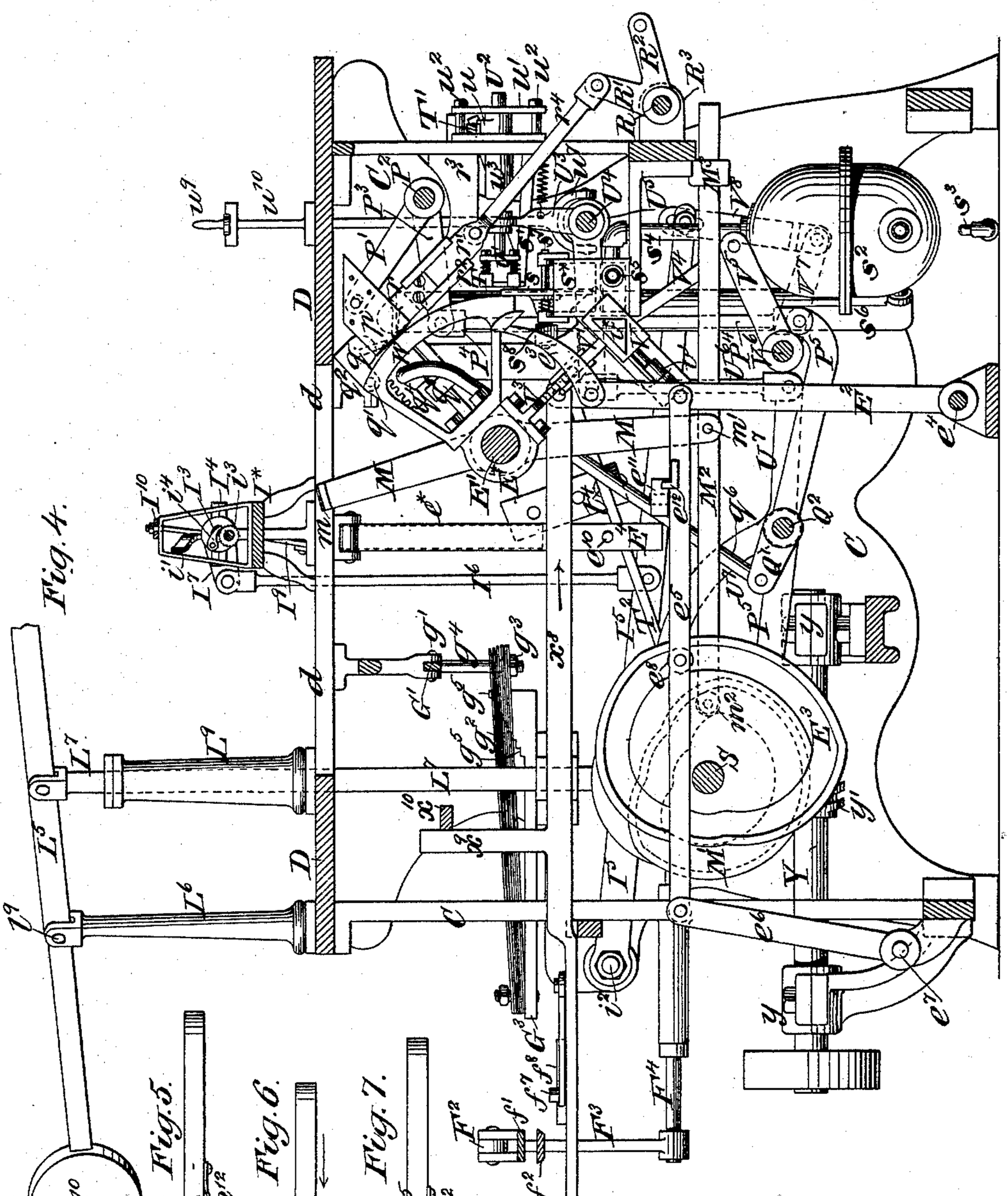
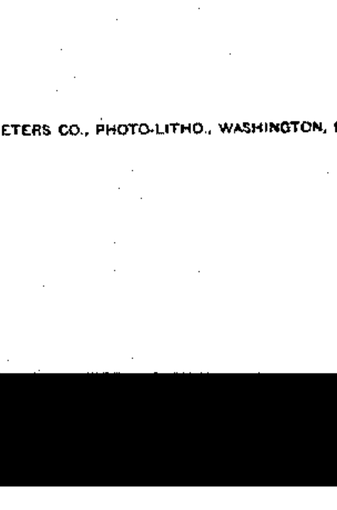


Fig. 5.

Fig. 6.

Fig. 7.



Witnesses:
C. L. Sundgren
L. Chas. Bicket

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Brown & Griswold

(No Model.) 12 Sheets—Sheet 5.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

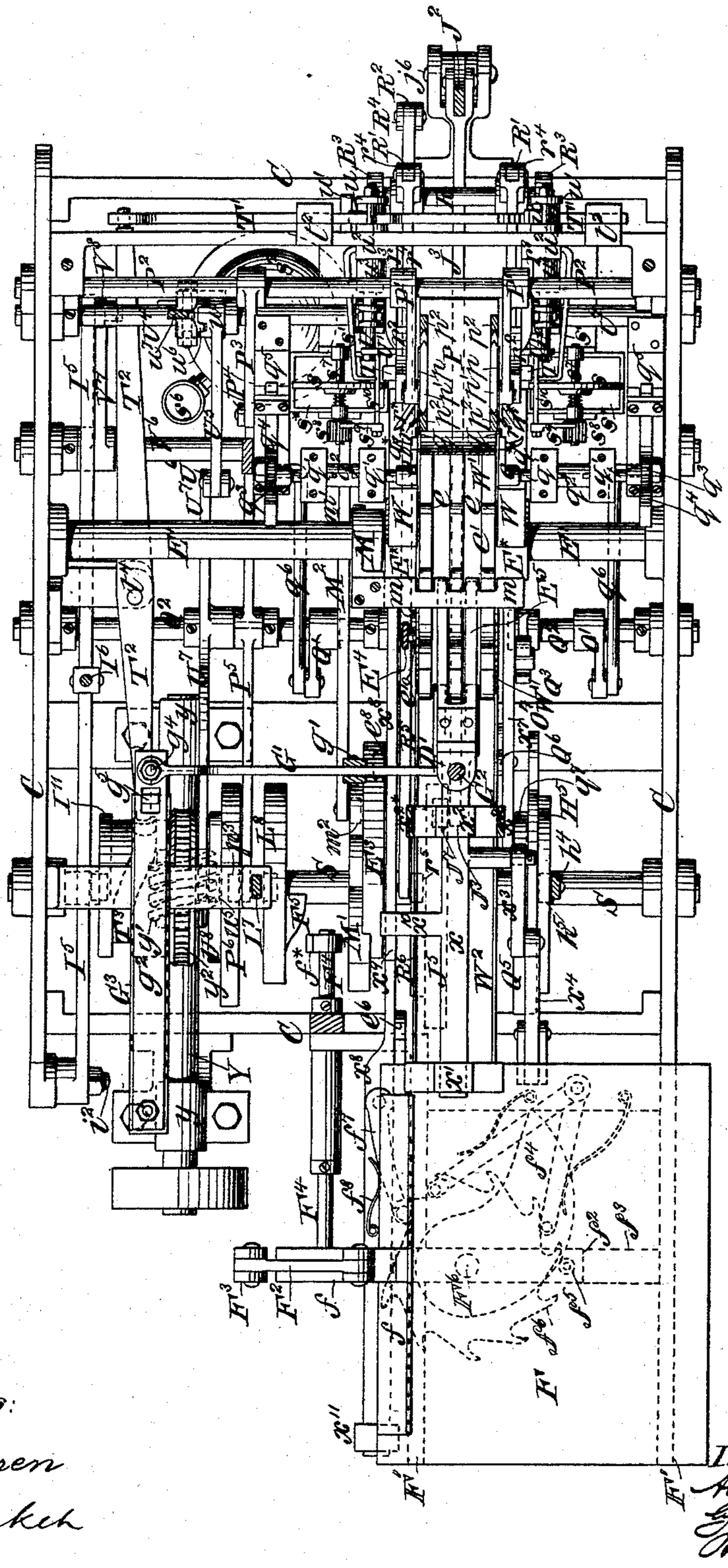

Fig. 8.

Witnesses:
C. Lundgren
Arthur Bickel

Inventor:
Albert Stearns
by attorneys
Brown & Seward

(No Model.) 12 Sheets—Sheet 6.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

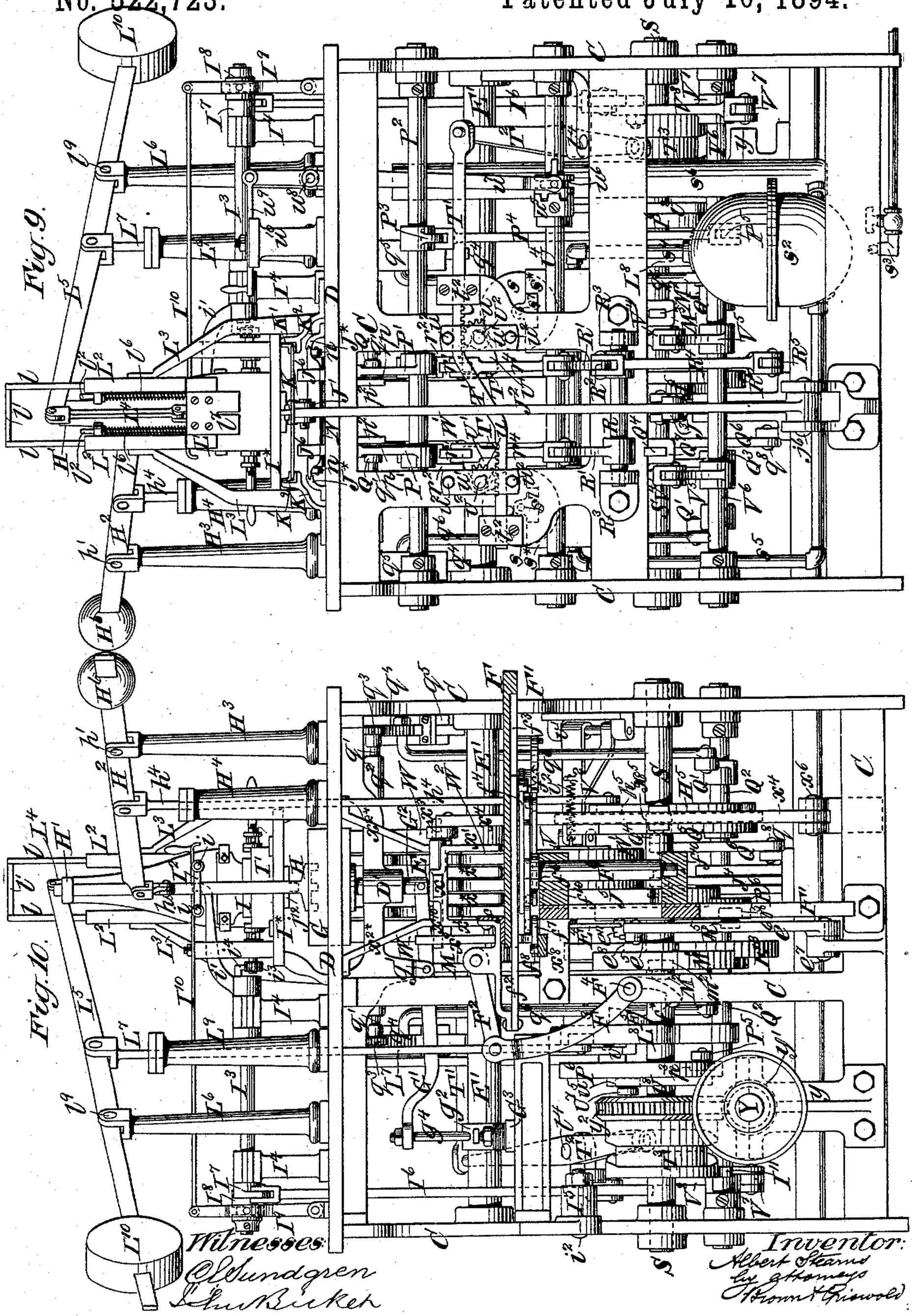

Fig. 9.

Fig. 10.

Witnesses:
O. Sundgren
L. Burdett

Inventor:
Albert Stearns
by Attorneys
Brown & Brinsmead

(No Model.) 12 Sheets—Sheet 7.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 11.

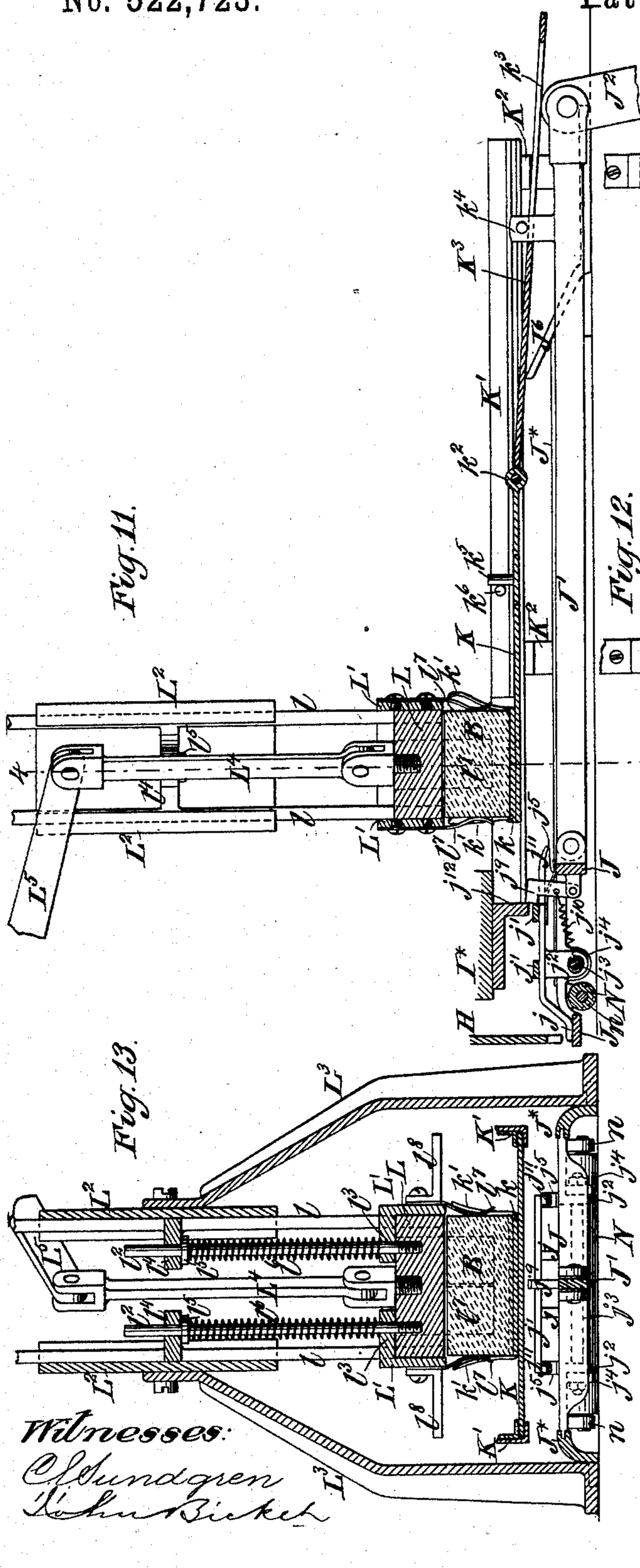

Fig. 12.

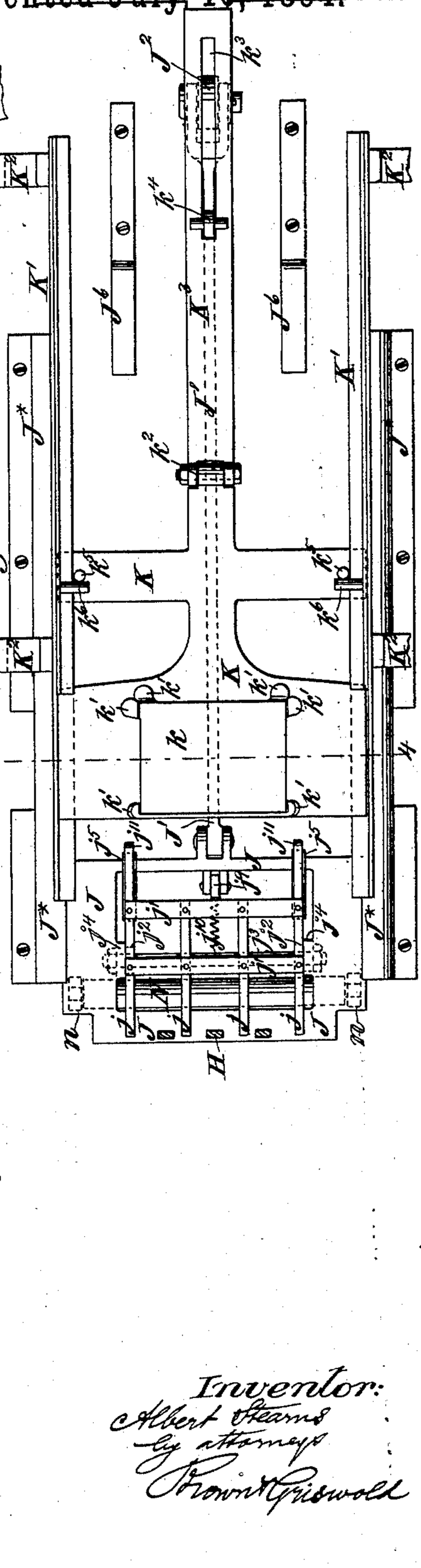

Fig. 13.

Witnesses:
C. Sundgren
John Bickel

Inventor:
Albert Stearns
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Brown & Griswold

(No Model.) 12 Sheets—Sheet 8.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

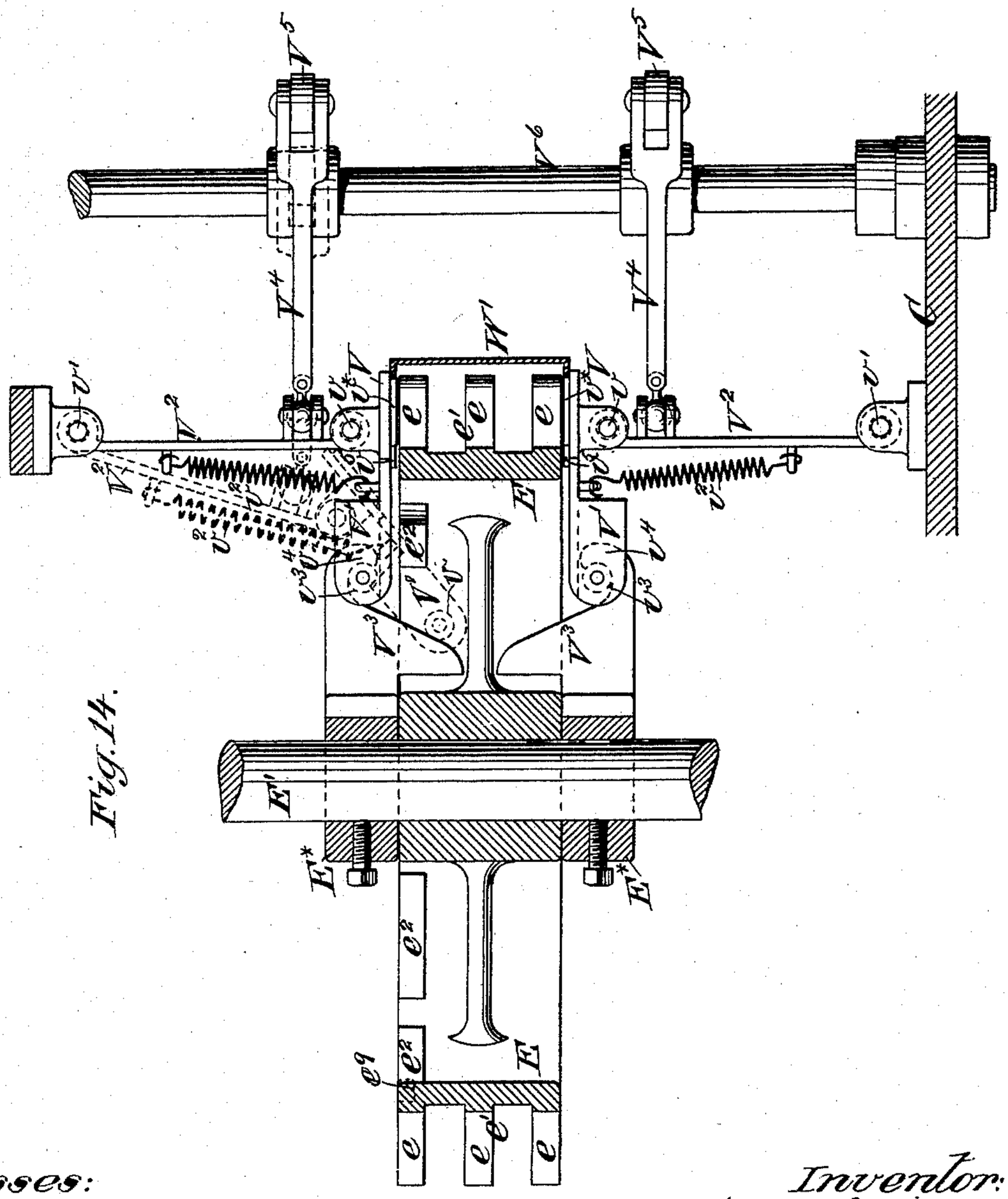

Fig. 14.

Witnesses:
C. L. Sundgren
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Brown & Griswold

(No Model.) 12 Sheets—Sheet 9.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 15.

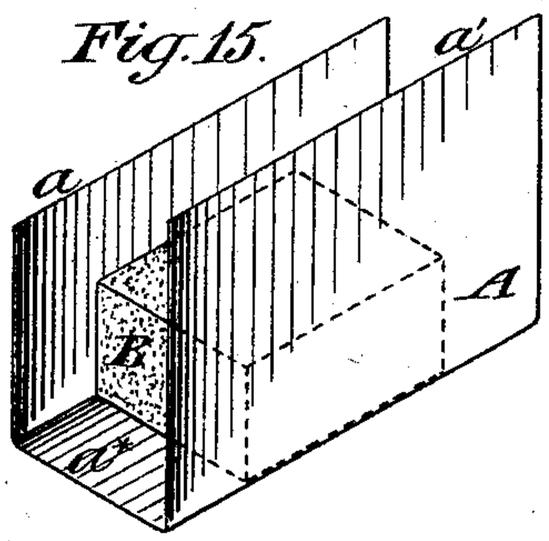


Fig. 16.

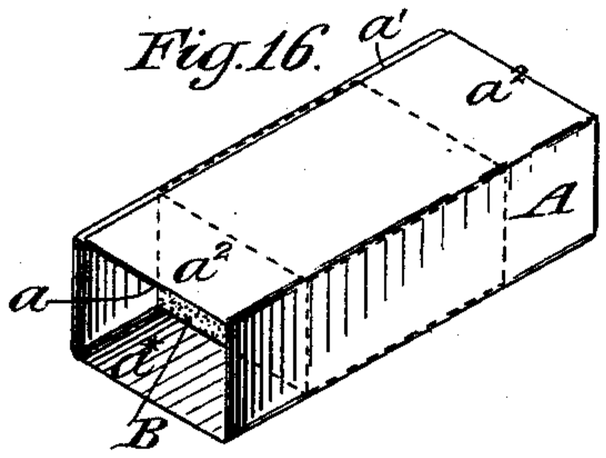


Fig. 17.

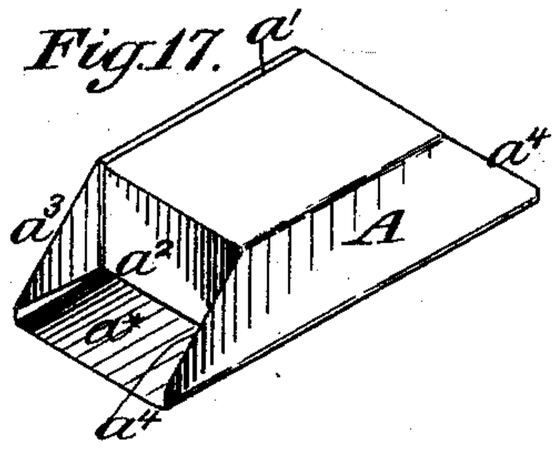


Fig. 18.

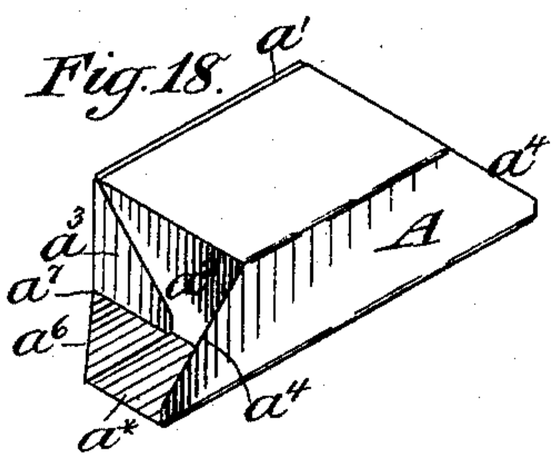


Fig. 19.

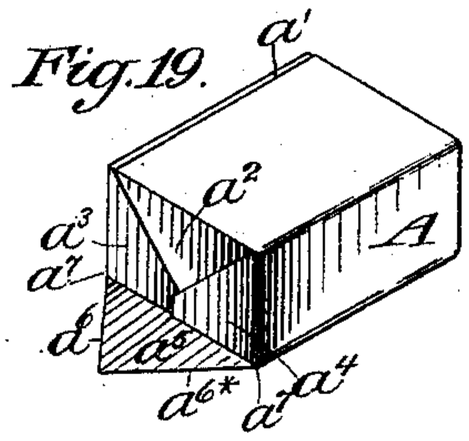
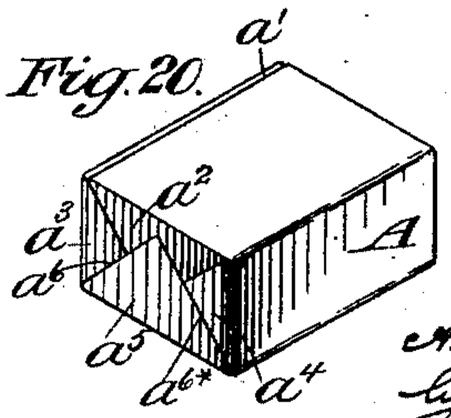


Fig. 20.



Witnesses:
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(No Model.) 12 Sheets—Sheet 10.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 24.

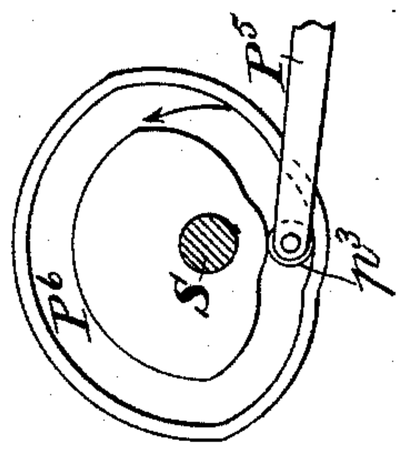


Fig. 23.

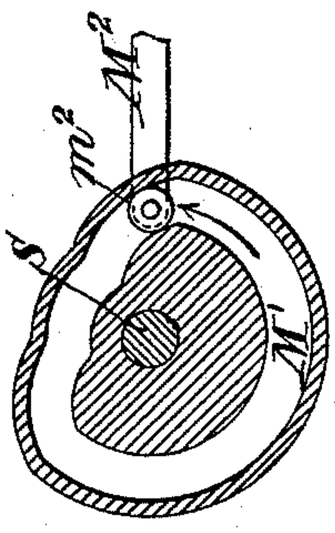


Fig. 22.

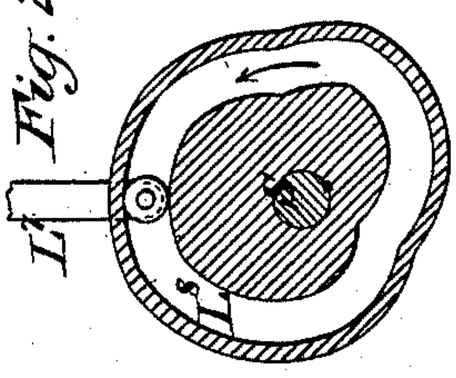


Fig. 21.

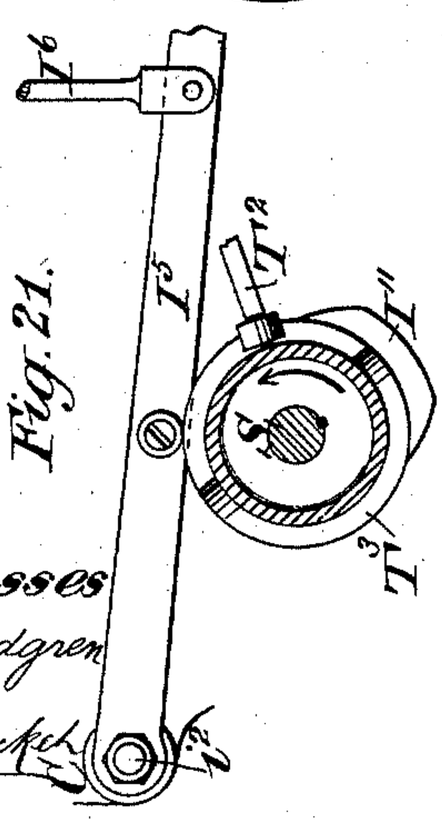


Fig. 28.

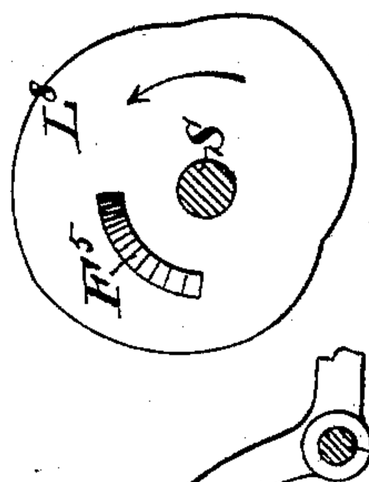


Fig. 27.

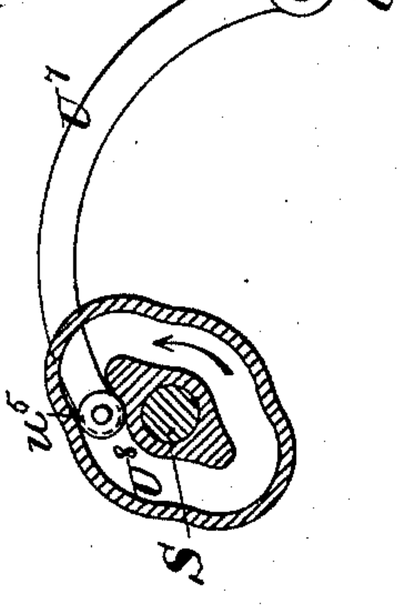


Fig. 26.

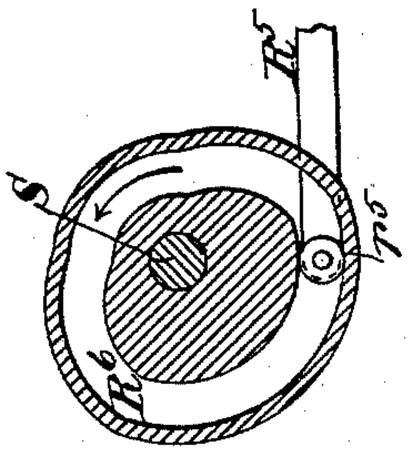
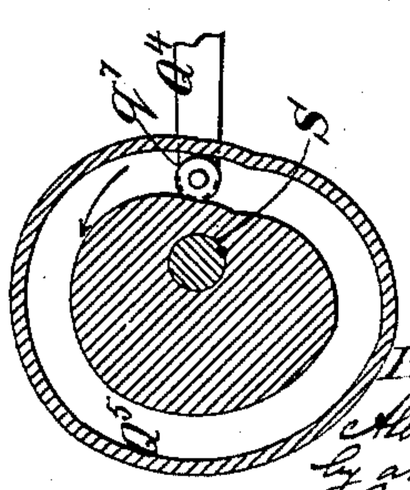


Fig. 25.



Witnesses
C. Lundgren
Edw. Dickey

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(No Model.) 12 Sheets—Sheet 11.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 29.

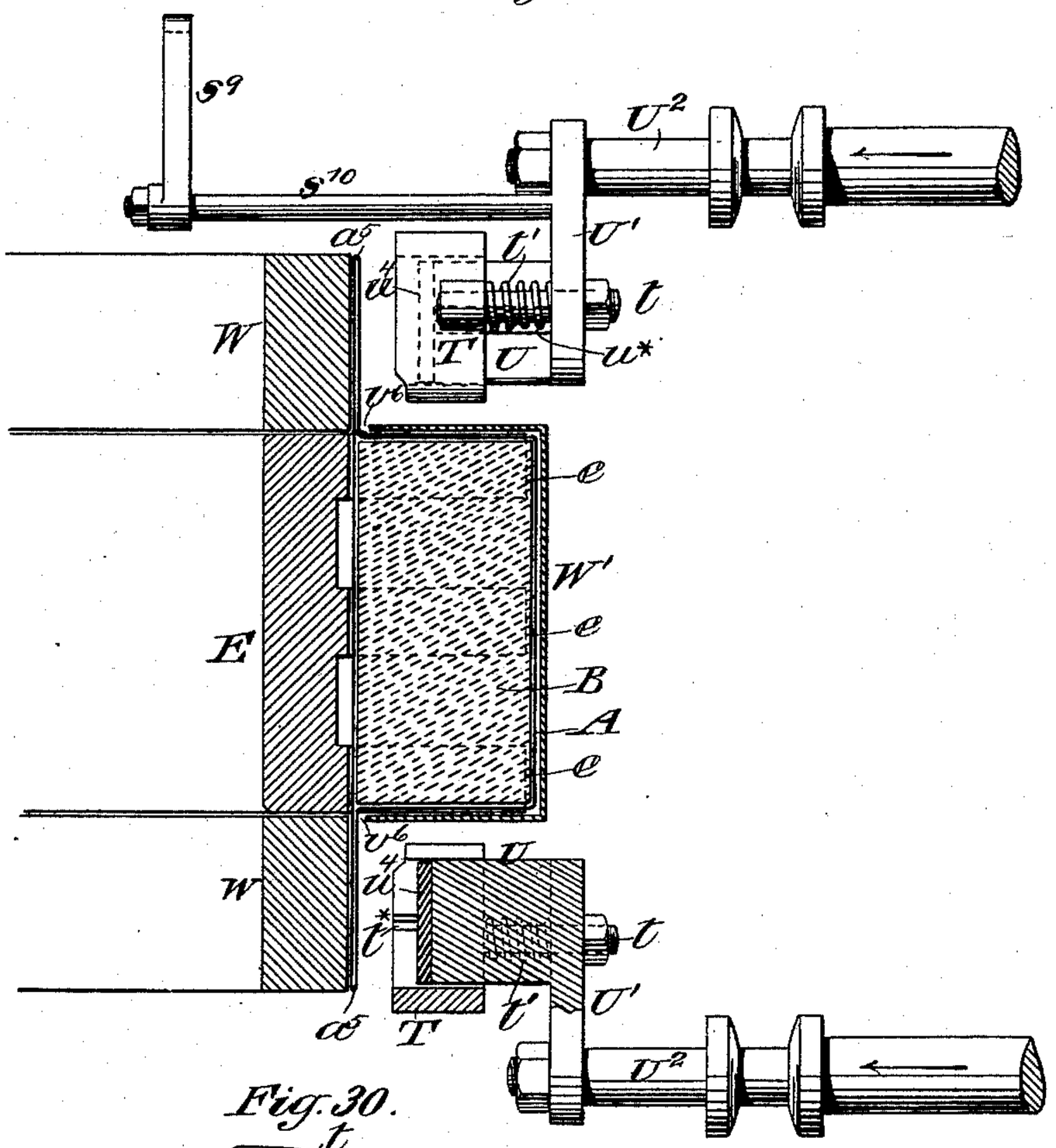
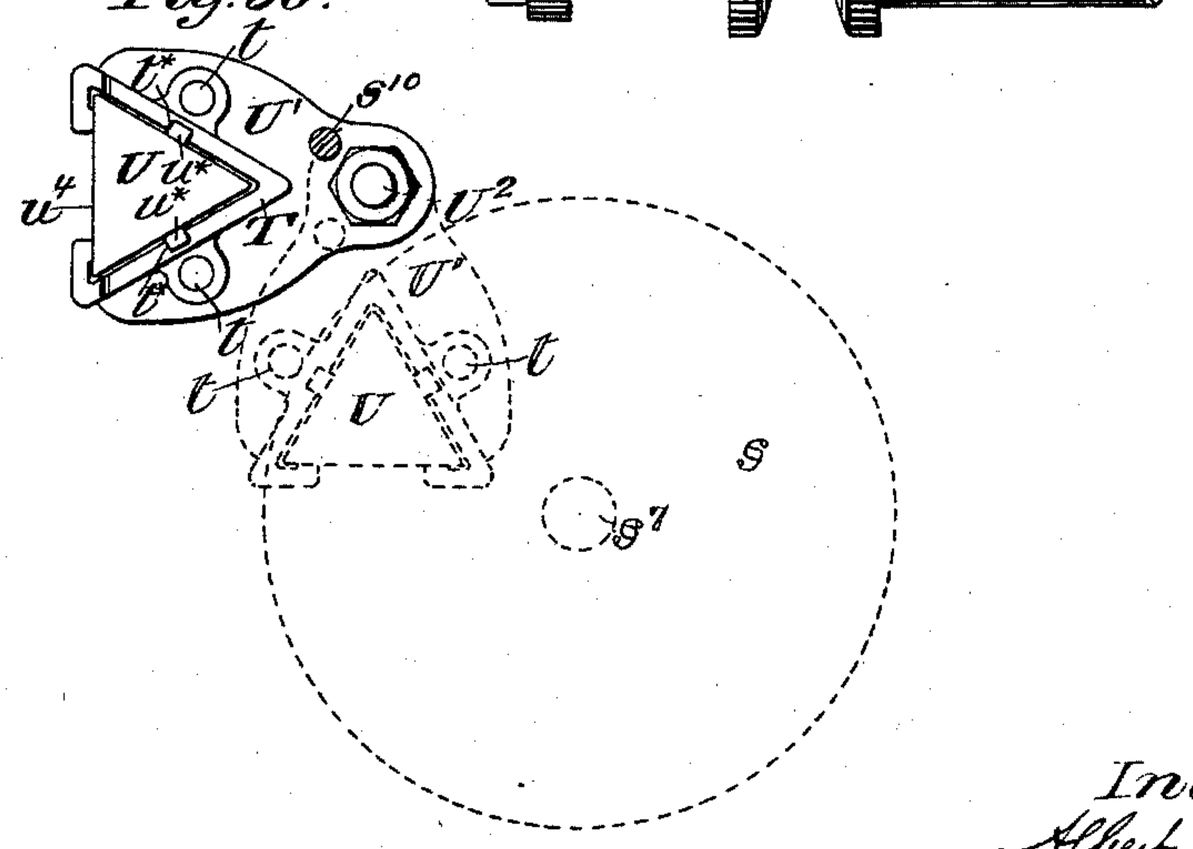


Fig. 30.



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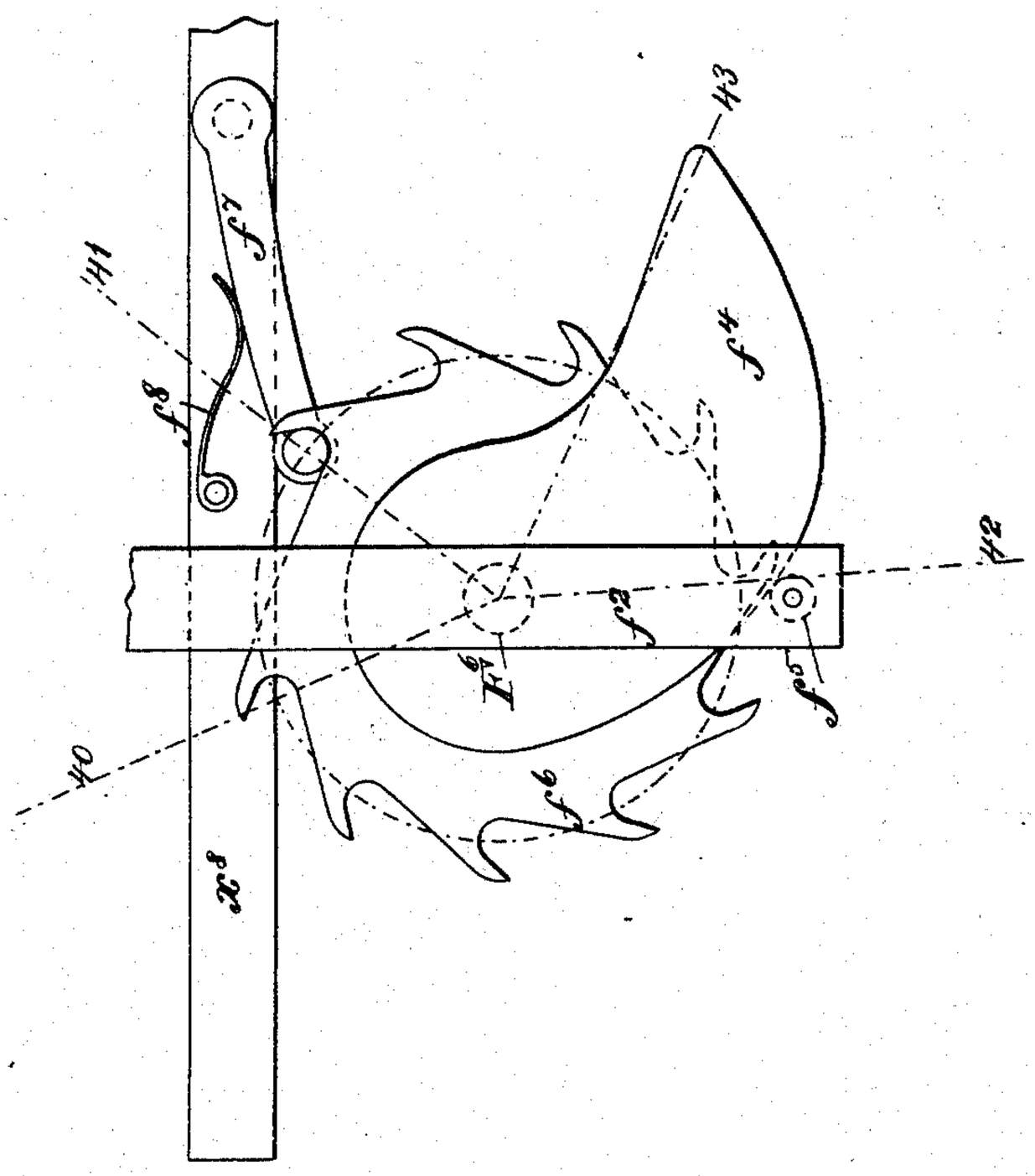
(No Model.) 12 Sheets—Sheet 12.

A. STEARNS.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

No. 522,723. Patented July 10, 1894.

Fig. 31.



Witnesses:
L. M. Egbert.
K. C. Pembleton,

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UNITED STATES PATENT OFFICE.

ALBERT STEARNS, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO JAMES A. CHURCH AND E. DWIGHT CHURCH, OF SAME PLACE.

MACHINERY FOR SECURING WRAPPERS OR LABELS AROUND BOXES, CAKES, &c.

SPECIFICATION forming part of Letters Patent No. 522,723, dated July 10, 1894.

Application filed June 20, 1889. Serial No. 314,931. (No model.)

To all whom it may concern:

Be it known that I, ALBERT STEARNS, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Machinery for Wrapping and Securing Wrappers or Labels Around Boxes, Cakes, Packages, or other Articles of Merchandise, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings.

This invention is intended for applying wrappers to boxes, cakes, packages or other articles of parallelopiped, prismatic or other approximate form in such manner as to inclose them completely by the wrapper being first wrapped around the sides of the boxes, cakes, packages or other article and afterward folded and turned over the ends thereof.

The invention also provides for pasting or applying adhesive material to such parts of the edges and folds as may be necessary to secure the wrapper in a closed condition.

To enable others skilled in the art to make and use my invention I will first explain in a general way the figures of the accompanying drawings which represent a machine embodying the whole of my invention and illustrate the process performed by said machine. I will next briefly explain the several acts which constitute the operation of the said machine, referring briefly to some of the principal parts of the machine itself. I will afterward describe the construction and operation of the machine in detail and I will finally point out the novelty of my invention in claims.

Figure 1 of the drawings represents a plan of the machine. Fig. 2 represents a longitudinal vertical section taken in about the plane indicated by the line 1, 1, in Fig. 1. Fig. 2* represents an end view of the package and wrapper with back view of the side tuckers on one side of the machine. Fig. 2** is a side view of the curb in which what is called the receiving-wheel works. Fig. 3 is a longitudinal vertical section taken in about the plane indicated by the line 2, 2, in Fig. 1. Fig. 4 represents a longitudinal vertical section taken in about the plane indicated by the line 3, 3, in Fig. 1. Figs. 5, 6, and 7 are plan views partly in section representing in different positions certain details which are only imperfectly shown in Fig. 4. Fig. 8 is a horizontal sectional view taken immediately below the upper stationary table of the machine. Fig. 9 is an elevation of that end of the machine which appears at the right hand of Figs. 1, 2, 3, 4, and 8. Fig. 10 represents an elevation of that end of the machine which appears at the left hand of Figs. 1, 2, 3, 4 and 8, but shows the delivery table of the machine in section. Fig. 11 represents a longitudinal section corresponding with Fig. 3 but showing the parts in a different position. Fig. 12 is a plan corresponding with Fig. 11. Fig. 13 represents a transverse section corresponding with Figs. 11 and 12 in the line 4, 4, of those figures. Fig. 14 represents a transverse sectional view of some of the parts of the machine in the oblique line 5, 5, shown in Fig. 2. Figs. 15, 16, 17, 18, 19 and 20 are perspective views of a package and wrapper illustrating the work performed by the machine. Figs. 21 to 28 inclusive are separate profile views of some of the cams which are not distinctly visible in the figures representing the machine. Fig. 29 represents a horizontal sectional view of part of the carrying wheel and of the pressing-dies for flattening and gluing the end flaps. Fig. 30 is a front view of the pressing-die and glue-die. Fig. 31 represents a plan view of part of the mechanism for operating what is called the row-dresser.

Figs. 1, 2, 3, 4, 8, 9 and 10 and the figures of the cams are on one scale and the other figures are on a larger scale.

Similar letters of reference designate corresponding parts in all the figures.

The several acts which constitute the operation of wrapping and securing the wrapper by paste or adhesive material are in this machine almost entirely performed while the package or other article is contained in a rotary carrier such as I have hereinafter termed a receiving-wheel, the only part of the operation not wholly performed in said carrier or wheel, namely, the first placing of the wrapper or label against the sides of the package or article, being performed by the act of inserting the package and the wrapper together into the said carrier or wheel. This wheel

which has an intermittent rotary motion, has in its periphery a series of pockets open at the sides. The wrappers are supplied to the said wheel from a pile or box in front thereof and the packages or articles to be wrapped are supplied thereto from the rear thereof. The rear edge of the wrapper is pasted by a paste-die while in the pile or box and lifted by the said die from the pile to be delivered to the grippers of what I term a wrapper-placer which carries the wrapper to the position over the top of the receiving-wheel while the latter is at rest. One of the packages or other articles to be wrapped is then brought by what I term a package-feeder over the wrapper which is then liberated from the wrapper-placer and the box is pushed down into one of the pockets of the receiving-wheel by what I call the package-placer, carrying the wrapper with it and so placing the wrapper against three of its sides or its bottom and two of its sides as shown in Fig. 15 of the drawings in which A designates the wrapper and B the package. A folding blade carried by a lever pivoted on the shaft of the receiving-wheel then turns one edge a of the wrapper over the top of the package and over this edge a the pasted edge a' is turned by the return of the wrapper placer. The wrapper is now wrapped around four sides of the package or article and there secured by paste. The receiving-wheel then turns far enough to bring the package and wrapper between what I call top tuckers and side tuckers and stops there while all the said tuckers operate. The top tuckers turn the edges a^2 of the wrapper over the ends of the package or article as shown in Fig. 17, and at the same time form the side tucks a^3, a^4, and the side tuckers turn in first, as shown in Fig. 18, one of the side tucks a^3 and afterward as shown in Fig. 19, the other of the said side tucks a^4. By the act of turning in these tucks a^3, a^4 the flaps a^*, (see Figs. 17 and 18) are folded diagonally as shown at a^6 and a^{6*}, (see Figs. 18 and 19) to form the bottom tuck a^5 and the sharp creases a^7 are formed between the side and bottom tucks. After the said side tuckers have done their work, the said wheel moves again and carries the folded and tucked portions a^3, a^4, a^5, of the wrapper between glue-dies from which the said portions receive a suitable quantity of glue or strong adhesive material.

The receiving-wheel moves to and stops between what I call bottom tuck closers which turn in the glued bottom end tucks a^5 over the turned in side tucks a^3, a^4, and so completes the wrapping. The wheel then carries the wrapped package or article to a table whereon it is delivered and placed in rows to be removed for storage or transportation.

I will now proceed to describe the machine in detail.

C C C designate an upright framing on the top of which is supported a horizontal table D, and in the sides of which at some distance below the said table are firmly secured the ends of the stationary horizontal shaft E′, upon which the receiving-wheel E is fitted to rotate. The upper part of this wheel projects into an opening d in said table and to a level with the upper surface of the latter as shown in Fig. 3. The said table will be hereinafter spoken of as the receiving-table to distinguish it from a lower stationary table F, which I term the delivery-table and which is shown at the left hand of Figs. 1, 2, 3 and 8, supported upon brackets F′, secured to the main framing at that end of the machine which is to the left hand of those figures. The said delivery-table is also shown in section in Fig. 10.

The opening d, before mentioned in the receiving-table D is of a width, taken in the direction crosswise of the table and parallel with the shaft E′, slightly greater than the width of the wrappers which are to be applied in the machine and of a length sufficient to expose through it a considerable portion of the upper part of the wheel and to allow the passage within it of a box G, in which a number of wrappers g, are placed one upon another.

The receiving-wheel E is of a width across its face equal to the length of the package to be wrapped and hence considerable less than that of the opening d in the table. The said wheel, the construction of which is best shown in Figs. 3 and 14, consists of a cylindrical drum connected by arms with a hub which is fitted to turn on the shaft E′, and has on the outside of the said drum a series of horns e, which form skeleton pockets e' for the reception of the packages to be wrapped and the wrappers, the said pockets being of a width and depth corresponding with the width and thickness of the packages. The pockets e' are equally spaced around the circumference of the wheel. Their exact number is not material. In the example represented, the wheel has eight pockets. To provide for the intermittent rotation of the said wheel, it is furnished internally near one side with a series of ratchet teeth e^2, shown in Figs. 3 and 14 to be engaged by a hooked pawl e^3 carried by a lever E^2, which works on a fulcrum e^4, near the bottom of the machine. To this lever is connected one end of a rod e^5, the other end of which is supported by a rocker e^6, pivoted at e^7 to the framing and the said rod carries an anti-friction roller e^8 which works in a groove of a cam E^3 on a shaft S, which also carries several other cams to be hereinafter described for operating the different members of the machine. By the operation of this cam on the roller e^8, the rod e^5 is caused to operate the hooked-pawl e^3, engaging with the ratchet teeth e^2, and the carrying-wheel is caused to make an eighth of a revolution and then to stop for some time during each revolution of the cam shaft S so that one of the pockets of the carrying wheel will be presented upward within the opening d of the table as shown in Fig. 3 and held there for

some time during each revolution of the said cam shaft and cam.

To provide for locking the receiving wheel every time it arrives in the position above mentioned, there are provided in one side of the said wheel a series of holes, or stop notches e^9 corresponding in number with the pockets and arranged at equal distances apart in a circle concentric to the wheel and one of which, when the wheel is in such position, is engaged by a stop e^{10} which projects from the face of a bar E^4, which is suspended at its upper end by a hinge from the receiving-table D and to which a spring e^* shown dotted in Fig. 4 is applied to press it toward the wheel. This bar E^4 is pushed aside to withdraw the stop e^{10} from the wheel and unlock it before each new movement of the wheel to present a new pocket through the opening in the table D, by means of a little switch consisting of a lever e^{11} which is pivoted on the rod e^5 as shown in Figs. 5, 6, and 7, which are plan views showing the parts above referred to in different positions. The said switch lever, e^{11} has applied to it a spring e^{12} which holds it against a stop e^{13} on the rod e^5. In order to effect this unlocking, the rod e^5 and the pawl e^3 have a longer motion than is necessary for the movement of the receiving-wheel, the pawl being thus made to pass beyond the teeth e^2, of the ratchet-wheel a considerable distance as shown in Fig. 3 before returning to take hold of the teeth to turn the wheel. As the said rod e^5 returns and before it engages a ratchet tooth, its movement being then in the direction of the arrows in Figs. 5 and 6, it brings one end of the switch lever between the bar E^4 and the wheel, and as the rod e^5 moves on it presses aside the said bar and so withdraws the stop e^{10} from the hole e^9 in the wheel to leave the latter free to be moved by the pawl as the last mentioned movement of the rod e^5 is further continued. This movement is continued until the switch lever passes by the bar E^4, so that as the rod e^5 returns the switch lever passes as shown in Fig. 7 outside of the bar e^4, which has resumed its position to produce the engagement of its stop e^{10} with the wheel. In order to prevent the wheel from being carried by its momentum after the action of the pawl e^3 ceases, beyond the position for the pin e^{10} to lock it, there is applied to it a friction brake E^5 consisting of a plate of metal bolted to a lug on the guide D′ hereinafter described. This plate is forked to pass between the horns e, e of the cylinder.

The box G in which is placed a pile of sheets g, of proper size for the wrappers is of horizontal sectional form and dimensions corresponding with the wrapper sheets. It is open at the top and on the whole of the side which is toward the receiving-wheel. It is supported on one end of a lever G′ (see Fig. 10) by a rod G^2 which works in the guide D′ fixed under the receiving-table D. The said guide also contains the fulcrum g' for the said lever G′ on the other end of which there bear a pile of counterbalance weights g^2 (see Figs. 4, 8 and 10) which consist of a number of thin plates piled one on another. These weights are not entirely suspended from the said lever but one end of the pile rests on a fixed supporting table G^3 and the other end of the lowest one of the pile always hangs on a nut g^3 on a rod g^4 dependent from the lever. On the table G^3 is a series of steps g^5 (see Fig. 4) corresponding with the number of plates or weights g^2 and in the said plates are holes, one in each, the hole in the lowest one being long enough to take in all the steps, the one in the next above being long enough to take in all the steps but one, and so on, the hole in the topmost plate being only long enough to take in the top step. When the box G, is full of wrapper sheets the weight of the said sheets causes the lever G′ to lift all the weights from the table G^3 and its steps but as the wrapping sheets are taken from the box and the box and its contents become lighter the other end of the lever is depressed by the weights and the box is raised. As this goes on the weights severally and successively drop on the steps immediately below them and their load is taken from the lever, and in this way the box and the wrapper sheets are always counterbalanced and the top sheet in the box is kept at about the level of the top of the receiving-table as shown in Fig. 3.

H (Figs. 2, 3 and 10) designates the paste die by which paste is taken from a roller I (shown best in Fig. 3) and deposited on the top sheet g in the box G close to that edge which is toward the receiving-wheel, that is to say the edge of the sheet which is marked a' in Fig. 15. The roller I works in a stationary paste trough I′ which is supported in a small stand I* on the table G. The paste-die consists of a rod which is broadened at its lower end and which may have a straight flat lower face but is represented (see Fig. 10) as having a series of flattened points on which the paste is taken from the roller and by which the paste so taken is deposited on the sheet in a series of small patches. The upper end of the rod of the die works in the fixed guide H′, which permits it to have a longitudinal reciprocating movement and to swing between the paste roller I and the box G. At some distance below the said guide, the said rod is suspended by a short link h from a lever H^2 which works on a fulcrum h', in a post H^3 erected on the table D. Between the said link h and the fulcrum, the said lever has connected with it a rod h^4 which works through a guide standard H^4 and passes through the table D. At the lower end of this rod h^4, is a roller h^5 which works in a groove on a cam H^5 on the shaft S, shown best in Fig. 2, which operates on the said roller h^5, rod h^4 and lever H^2 to produce an upward and downward movement of the paste die. The lever H^2 is

furnished with an adjustable counterbalance H^6 to counterbalance the weight of the paste die H and of the rod h^4.

Besides the upward and downward movement hereinabove described as given to the paste-die, the said die has a swinging movement which with the said upward and downward movements enables it to take the paste from the roller I and deposit it on the wrapper sheet. I will now describe the means of producing this swinging movement.

I^2 designates a cross-head (Figs. 1, 2 and 3) which I term the paste-die shifter and which slides on two small fixed horizontal guide-rods i secured to the standard of the guide H'. The rod of the paste-die passes through this cross-head and the reciprocating motion given to the said cross-head on the said guide-rods produces a swinging movement of the paste-die. This reciprocating motion of the cross-head, which is transverse to the longitudinal reciprocating movement of the paste die H, is produced by an arm i' (see Figs. 1, 2, 3, 4, and 10) on a horizontal rock-shaft I^3, which works in bearings in standards I^4 erected on the table D. The said rock-shaft derives rocking movement to operate the cross-head I^2 from a cam I^{11} on the rock-shaft S. This cam is shown in profile in Fig. 21 with a part of the lever upon which it operates. The said lever and all its connections with the rock-shaft are shown in Fig. 4. The said cam operates upon the rock-shaft through a lever I^5, which works on a fixed fulcrum i^2, and which is connected by a rod I^6 with an arm I^7 upon the rock-shaft. The joint action of the cams H^5 and I^{11} on the paste-die is first to raise the die, then swing it toward the paste-roller I, and press it against said roller to take paste therefrom, then swing it back to a position over the sheets in the box, G, then depress it upon the top sheet, afterward to rise a short distance and then stop. In this last mentioned part of the operation, the die by means of the adhesion of the sheet to it from the paste, picks up the front edge of the sheet a little way from the pile to permit it to be taken hold of by what I call the wrapper-placer which has been referred to in the introductory portion of this specification and which I will presently describe.

In order that the carrying-wheel and other parts of the machine may be kept in operation for the delivery of any boxes remaining in the machine without operating the paste-die-shifter I^2 which would thus be not only unnecessary but objectionable, the arm I^7 of the rock-shaft is fitted loosely to the said shaft and capable of being thrown into gear therewith and out of gear therefrom by means of a clutch I^8, operated by a lever I^9 and rod I^{10}, the said clutch being capable of sliding upon the rock-shaft to engage and disengage the hub of the arm I^7, but being compelled to turn with the said shaft. As there is nothing peculiar about the method of throwing the arm I^7 into and out of gear any further description of it is unnecessary.

For the purpose of turning the paste-roller I in the trough I' to keep its surface constantly supplied with paste, there is provided on the shaft of the said roller a ratchet-wheel i^3 (see Fig. 4) which is turned by a pawl i^4 of the rock-shaft which operates the cross-head I^2.

I will now describe the wrapper-placer which takes the wrapper sheet from the paste-die H, after it has been lifted by the latter as hereinbefore described, and places it over the uppermost pocket e' of the receiving-wheel. This placer consists of a pair of grippers J, j, (see Figs. 3, 11, 12 and 13.) The lower part of these grippers consists of a plate or carriage J which is fitted to slide in fixed horizontal guides J*, arranged upon the table D on opposite sides of the opening d. The upper part of these grippers is composed of a series of fingers j, which are secured together by cross-bars j' so as to constitute a frame-like structure which is provided with lugs j^2 which are pivoted to the plate J, by a pin j^3 passing through said lugs and through corresponding lugs j^4 on the bottom of the plate J. Between the said grippers J, j, are placed springs j^5 for the purpose of closing them. The movement of this wrapper-placer toward and from the box and over the receiving-wheel E, is produced through a rod J', lever J^2 and rod J^3 by a cam J^5, as best shown in Fig. 3, but partly shown in Fig. 11. The rod J' is connected with the upper end of the lever J^2, which is fulcrumed at its lower end on a fixed-fulcrum j^6 and has connected with it one end of the rod J^3, the other end of which is furnished with an anti-friction-roller J^7, running in a groove in the cam J^5. The rod J^3 is supported by a rocker J^4 (see Fig. 3) working on a fixed pivot j^8 in the framing of the machine. Besides the spring j^5 for closing them, the grippers are furnished with a hooked-catch j^9 (see Figs. 3 and 11) which is pivoted to the plate J, and which is connected by a spring j^{10} which is suitably applied between it and the said plate for the purpose of throwing its hook over one of the bars j' of the upper gripper member as shown in Fig. 3 for the purpose of holding the grippers open. At a distance beyond the opening d, in the table there are placed upon the table two stationary plates which constitute gripper-openers J^6, the said plates having inclined projections as shown in Figs. 2, 3 and 11. As the grippers run from the wrapper box G, over and beyond the receiving-cylinder, the projections j^{11} on the upper member of the grippers run under these gripper-openers J^6 and the grippers are thereby opened. The hooked catch j^9 is then drawn by the spring j^{10} over its respective cross-bar j' of its member and the grippers are thereby held in an open condition while they are returning toward the box G to fetch a wrapper-sheet and

as they arrive at the position over the edge of the box G in which they receive within them the edge of the sheet raised by the paste-die H, the hooked-catch j^9 strikes a fixed stop j^{12} under the paste-trough stand as shown in Fig. 11, and is thereby thrown off the cross-bar j' leaving the grippers free to be closed by the springs j^5 to take a sheet, which, when they again move away from the box and over the receiving cylinder, they deposit in a substantially flat condition over the uppermost pocket e' of the cylinder.

In taking a sheet the extremities of the grippers J, j, pass under the paste-die H, as shown in Fig. 11, and it is to permit the fingers of the upper gripper J, to pass the paste-die that the said die is made with a series of points instead of with a continuous straight edge, the spaces between the points allowing room for the fingers of the upper gripper J to pass through the said die.

K designates the package-feeder. This consists of a plate which is fitted to slide within horizontal guides K′ supported on small standards K^2 on the table D, and on this plate is secured a second plate k of a size and form corresponding with that of one of the sides of the package B to which the wrapper is to be applied. This plate k is made with or has attached to it corner pieces k', k', to receive within them and hold a package. To the plate K is connected by a hinged joint k^2 a rod K^3 in which is a slot k^3 which receives an upward projection k^4 provided on the rod J′ which operates the wrapper placer. The movement of the rod J′ back and forth produces the operation of the package-feeder by its coming in contact with the ends of the slot k^3, but gives the package-placer a shorter movement than that of the wrapper-placer. In completing the movement of the wrapper-placer from the box G over the receiving-cylinder, the projection k^4 striking the end of the slot which is toward the right, brings the package-feeder to a position to where the package B, may be deposited on the part k of the wrapper-placer within the corner-pieces k' by an attendant conveniently stationed for the purpose. When the wrapper-placer returns toward the box G for a new wrapper-sheet, the projection k^4 coming in contact with the left hand end of the slot k^3 in the rod K^3 brings the package-feeder to a position directly over the uppermost pocket e' of the receiving-cylinder and under what I call the package-placer L L′ (see Figs. 3, 11 and 13) which will be presently described and which picks up the package from the feeder K to place it in the pocket of the cylinder after the feeder K has again moved to the right. In order to prevent the package-feeder from being carried too far by the momentum which it acquires when the left hand end of the slide k^3 is moved by the projection k^4, it is provided with stop projections k^5 which are arrested by fixed stops k^6 provided on the guides K′.

The package-placer L L′ consists of a plunger or block L and a box L′ open at the top and bottom within which the said block is snugly fitted, the said block conforming substantially in its horizontal section to the shape of the box to be wrapped. The box L′ is furnished with rods l united at the top by a cross-head l' working in upright guides L^2 carried by standards L^3 erected on the table D. The position of these standards and guides is such that the package-placer L L′ is always directly over the position occupied by the uppermost pocket e' of the receiving-cylinder. The block L has firmly secured to it upright rods l^2 which pass through lugs l^3 provided on the box L′ and overlapping the block, the said rods also passing through laterally-extending lugs l^4 provided on the rods l. The said rods l^2 are provided with collars or shoulders l^5 between which and the lugs l^3 on the box L′ coil-springs l^6 are placed upon the said rods. These springs tend to hold up the block L within the box L′ and against the lugs l^3 on the latter, the lower face of the block L then being nearly flush with the face of the box. To the outside of the box L′ are attached spring-elastic-grippers l^7 which project below the said box for the purpose of taking hold of the package placed by the package-feeder as shown in Figs. 11 and 13. There are also rigidly attached to the sides of the box L′ wing pieces l^8 which project laterally far enough to come in contact with the fixed-guides K′ of the package-feeder when the box is depressed sufficiently as will be hereinafter explained.

The package-placer is operated through a a rod L^4, by which the box L is suspended from a lever L^5, the said lever being supported on a fulcrum l^9 in a post L^6 erected upon the table D, and being connected by a rod L^7 with a cam L^8 on the cam shaft S. A side view of this cam is given in Fig. 22, and an edge view in Fig. 10. The rod L^7 and all the connections between it and the rod L^4 are shown in Figs. 3 and 4 and parts of these connections are also shown in Figs. 9 and 10. The rod L^7 passes through the table D and a guide L^9 erected thereon. The lever L^5 is furnished with an adjustable-counterbalance L^{10} for the purpose of balancing the weight of the package-placer and rod L^7.

The operations of the package-placer produced by the cam L^8 are as follows: The first operation is that of taking a package B from the package-feeder K. To do this the package-placer descends bodily, that is to say, the block L and the frame L′ descend together, the block L being depressed by the lever L^5 and rod L^4 carrying the box L′ with it by the pressure of the springs l^6 upon the lugs l^3. This descent brings the grippers l^7 over the sides of the package B as shown in Figs. 11 and 13 and is continued until the lower face of the block is in contact or nearly so with the top of the package. The grippers l^7 now hold the package with sufficient firmness to pick

it up on the ascent of the package-placer which immediately follows. While the package-placer is thus raised the wrapper-placer brings a wrapper-sheet over the pocket of the cylinder which is stationary under the package-placer and takes the package-feeder out of the way and after that has been done the package-placer again descends bodily as before but is continued much farther, the box L′ descending until it is arrested by its wing pieces l^8 coming in contact with the guides K′ of the package-feeder, and the block being carried down still farther to push the package out of the grippers l^7 and push it and the wrapper sheet with it into the pocket e' of the cylinder.

By the above described operation of the package-placer, the back and front ends $a\,a'$, of the wrapper are turned up over the sides of the package as shown in Fig. 15. The lever M (see Figs. 3 and 4) which carries the folder consisting of a blade m (see Figs. 3, 4 and 8) for turning in the edge a, (see Fig. 15) of the wrapper is pivoted loosely upon the cylinder shaft E′ at a short distance from one side of the cylinder. The said blade may be flat or arc-formed to conform to a circle circumscribing the outside of the wheel, that is to say, the points of the horns e. It projects laterally from the lever M and is as long as the wrapper is wide and consequently extends all across the face of the cylinder and some distance on each side thereof. Its operating edge, that is to say, the edge presented to the right hand in Figs. 3, 4 and 8 of the drawings, is forked as shown in Fig. 8 to pass between the patches of paste which have been applied to the wrapper by the paste-die and so avoid taking up any paste from the wrapper. The said lever after the package and the label have been placed in the pocket of the receiving-wheel and brought to the condition, as shown in Fig. 15 as just described, sweeps over the pocket and in so doing turns the edge a, over to the position shown in Fig. 16, stopping for a short time after said movement. The movement of the said lever is produced by a cam M′ on the shaft S, acting through a rod M^2 connected at m' with the lower end of the lever, the said rod having at one end a roller m^2 which runs in a groove of the cam and its other end which is prolonged some distance beyond the connection m' working through a fixed guide M^3, on the framing.

To provide for the turning of the pasted edge a' over the edge a of the wrapper, as shown in Fig. 16, there is provided on the wrapper-placer J, j, a folder consisting of a transversely-arranged horizontal roller N (see Figs. 3, 11 and 13). The shaft or journals of this roller are supported in lugs n on the plate J just beyond that end of the plate which constitutes the lower member of the grippers. As the wrapper-placer moves forward with the wrapper this roller has nothing to do, but on the return of the wrapper-placer which takes place after the deposit of the package and the wrapper in the wheel by the package-placer and the subsequent movement of the folding blade m which has just been described, the said roller encounters the turned-up portion of the wrapper having the pasted edge a', and as the roller passes over the package it turns the said edge over the edge a to the position shown in Fig. 16, the blade m having remained over the turned-over edge a, until the edge a' has been turned over far enough to prevent the said edge a from rising. The roller passing over the edge a' presses the pasted portion of it down upon the portion of the wrapper below it and so secures the edge a' in the position in which it is shown in Fig. 16. As the roller N moves over the edge a' to turn it over, the folding blade m returns while the cylinder remains stationary.

I will now describe the top tuckers which turn in the edges a^2 of the wrapper over the ends of the package, as shown in Fig. 17, and at the same time form the side tucks a^3, a^4. These tuckers consist of two very thin plates p, the form of the face of which is very clearly shown in Fig. 4. The lower or operative portions of these plates are rectangular as shown in the last mentioned figure, and of a width very slightly less than the width of the pockets e' of the receiving-wheel, and they are so situated that they may, as shown in Fig. 3, come opposite the open ends of the pocket containing the wrapper and the package, when the wheel has moved such a distance as to bring a new pocket to the uppermost position in which the turning up and turning over of the edges a, a' of the wrapper are performed, such distance in the example represented being one-eighth of a revolution. The two plates constituting the tuckers are arranged in vertical planes parallel with the planes of rotation of the wheel with their inner faces flush with the sides of the wheel, and are carried by two heavier sliding-plates p', represented of triangular form in Fig. 3, which are fitted to slide in stationary inclined ways p^2 (see Fig. 8) secured to a horizontal plate P, (see Fig. 3) which is bolted to the bottom of the table D. The tuckers p are arranged on the outer faces of the said plates d' and are secured thereto by any suitable means. In Fig. 3 there are plainly visible three screws which serve the purpose of securing the tuckers. Opposite to the top tuckers p, and extending some distance above and below them, as shown in Fig. 4, there are two stationary sector-shaped plates W, the arcs of which conform to the periphery of the cylindrical portion of the receiving wheel E. These plates are also shown in Fig. 8, and are close to the cylinder. Their thickness is equal to the width of the portions of the wrapper which project beyond the cylinder on opposite sides thereof, so that they will constitute bearings for and support the so projecting portions of the bottom of the wrapper in the pocket of the cylinder which is opposite the top-tuckers. The said plates are represented as bolted to the hub E*, (see Figs. 2, and 4) which is

fast upon the stationary cylinder shaft E'. The movement of the top-tucker slides p' in the ways p^2, is radial to the receiving-cylinder. This movement is imparted to them by their connection with the two arms P' (see Figs. 3, 4, 8 and 9) of a rock shaft P^2, which extends all across the machine, and is supported in bearings in the side frames. This rock shaft P^2 derives its motion from a cam P^6 (see Fig. 24) on the cam shaft S, through a lever P^5 which works loosely on a rock shaft Q^2, (see Figs. 2, 3, 4 and 10) other purposes of which will be hereinafter described, the said lever working on the rock shaft merely as a fulcrum and having at one end a roller p^3 which works in a groove in the cam P^6 and having its other end connected by a rod P^4, with an arm P^3 of the rock shaft P^2. The radial movement of the tuckers p thus given while the wrapper and the package are thus held in the wheel and the wrapper is supported at the bottom on the plates W, tucks in the top of the wrapper at each side as shown at a^2, and at the same time produces the side tucks a^3, a^4. While the foregoing operation is performed, the package is under or within a stationary cylindrical curb W', of thin metal which surrounds the wheel for about three-fourths of its circumference. This curb W' is open at the sides in that part of it where the plates p operate.

The side tuckers are of two kinds of which, to distinguish them, I term one kind the "wing" tuckers designated by the letter q, and I term the other kind "slide" tuckers, designated by the letter r, these terms "wing" and "slide" being selected because they express the character of the tuckers themselves. There are one of each kind on each side of the machine. The wing tuckers are for tucking or folding in the side tucks a^3, and the slide tuckers for turning in the side tucks a^4. The relation of these tuckers to each other and their action on the wrapper are best illustrated in Fig. 2*, which represents one of each of said tuckers with the end of a package in the condition illustrated by Fig. 19. The said tuckers and their appurtenances, however, are shown with more or less distinctness in Figs. 2, 4, 8 and 10.

I will first describe the wing tuckers q, which turn in the side tucks a^3 to the position shown in Fig. 18. These tuckers have their inner faces which are presented toward the sides of the wheels and the ends of the package flat. They consist of thin plates of metal and are secured to what I call wings Q or they may be made of the same piece with the wings. These wings are fast to two small short rock shafts q', which are arranged on opposite sides of the machine in line with each other and parallel with the cylinder, in stationary journal boxes q^2, (Figs. 2, 4, 8 and 10) which are fastened under the table D, the axial line of the centers of said shafts being a little behind the position of the top tuckers p, and the distance between the faces of the tuckers q is such that they will allow room between them for the package, the top tucks a^2, the top tuckers p, and the turned in side tucks a^3, room being required for the top tuckers p because the said wing tuckers q must operate before the top tuckers p are withdrawn. On the backs of the wings Q are downwardly projecting fingers q^*. The purpose of these fingers is to assist the tuckers q to make the diagonal fold a^6 in the bottom flap a^*.

The operation performed by the wing tuckers q and their fingers q^*, is as follows: The movement in the direction of the arrow shown in Fig. 2*, carries in the tucks a^3 and these tucks necessarily carry in with them a portion of each bottom flap a^*. This portion of each bottom flap thus turned in is folded by the finger q^*, which presses it downward and by the time the wing tucker has arrived at the position shown in Fig. 2*, in which it has carried the tuck a^3 close to the turned-over flap a^2, the finger brings the turned in portion of the bottom flap down upon the central portion of the bottom flap which is supported by the sector plate W. The lower edge of the tucker q forms the sharp crease a^7 at the time the portion turned over from the diagonal line a^6 is brought down by the finger q^*. The finger q^*, does not, however, press down and flatten the edge of the fold at a^6. That remains to be done by means hereinafter described, after the completion of the formation of the bottom tuck a^5 by the slide tucker r has been effected. The turning of the rock shaft q' to give the wing tuckers q the swinging motion by which they are caused to turn in the side tucks a^3 and lie outside of the said tucks after having turned them in is produced by sliding rack bars q^4, which are best shown in Fig. 2, gearing with pinions q^3, on the rock shafts q' the said rack bars sliding in slanting fixed guides q^5, secured under the table D, deriving their sliding motion from a cam Q^5, (see Figs. 2 and 25) on the cam shaft S, the said cam acting through a rod Q^4, a rock shaft Q^2, having arms Q', Q^3, and rods q^6. The said rod Q^4 is supported partly on a rocker Q^6 rocking on a fixed pivot q^8, and partly in a guide Q^7 secured to the framing, and is furnished with a friction roller q^7 which works in the groove of the cam. The rock shaft Q^2 is supported in fixed bearings in the side framing. One, Q^3, of its arms is forked to receive a roller q^9 on the rod Q^4 and two other arms Q', are each connected by a rod q^6 with one of the rack bars q^4.

The slide tuckers consist of straight flat metal plates r of a width slightly less than the thickness of the package and for the purpose of giving them stability, they are attached to the slides r' which work in slanting fixed guides r^2 carried by brackets r^3 secured to the framing of the machine. The ends of the said tuckers are rounded merely for the purpose of preventing them from catching in the paper. Their position (see Figs. 2 and 4) is such that their movements

back and forth will be directly opposite and across the ends of the package which is in the pocket of the wheel in which the turning in of the top edge of the wrapper and the turning in of the tucks a^2 by the tuckers p, and the turning in of the side tucks a^3, by the wing tuckers q have just been performed the tops being nearly even with the lines of the top and bottom of the package. On the backs of the tuckers r are downwardly projecting fingers r^*, which resemble the fingers q^*, of the wing tuckers and the purpose of which is to assist the slide tuckers r to make a second diagonal fold at a^{6*} in the bottom flap a^*, at the time that the said tuckers turn in the said tuck a^4.

The operation performed by the slide tuckers r and fingers r^*, is as follows: The upward movement of each slide r', carries its respective tucker r far enough across its respective end of the package for it to carry in the tuck a^4, and this tuck necessarily carries in with it a portion of the bottom flap a^*, which is thus bent diagonally on the line a^{6*}, and pressed down by the finger r^*, until it is brought down close upon the portion of the bottom flap a^*, which rests upon the segment plate W. By the time the slide tucker has completed its movement, the finger brings the turned-over portion down upon the flat portion of the bottom flap a^*, and the lower edge of the slide tuckers has formed the sharp crease a^7. The finger r^*, like that q^*, attached to the wing-tucker, leaves a portion of the bottom tuck turned in from the line a^{6*}, to be flattened down by devices which operate subsequently.

The movement of the slide-tuckers r is effected by means of a cam R^6 on the cam shaft S, acting through a lever R^5, a rod R^4, a rock shaft R, having arms R', R^2, and rods r^4, connecting the slides r' and the arms R', R^2 with the rock-shaft R. The lever R^5 turns loosely on the shaft Q^2, which constitutes its fulcrum and one end carries a friction-roller r^5, which turns in the groove of the cam. The rock-shaft R is journaled in fixed bearings in brackets R^3, attached to the framing. It has two arms R', one for each slide and one R^2 with which the rod R^4 connects the lever R^5. In Figs. 3 and 4, the arm R^2 is represented as made in the same piece with one of the arms R'. After the said tucks have been folded in and the portions of the flap have been turned in diagonally to form the bottom tuck a^5, the receiving-wheel makes another movement which brings the pocket in which the preceding operations have been performed to the position in which the flattening of the folds of the bottom tuck on the lines a^6 a^{6*} is completed and the glue is applied to the tuck. This last mentioned position in the example represented in which the wheel makes eight movements to complete a revolution, is directly to the right of the shaft E which presents the bottom of the package in a vertical position and presents the bottom flap a^5 of the wrapper in a vertical position against the lower part of the sector-shaped plates W. These parts of the sector-plates may be flattened to form better bearings for the pressing and gluing of the bottom tuck.

The devices which perform the flattening of the bottom flap and apply the glue thereto consist in what I call the pressing-dies T and the glue-dies U which are shown separately in detail in Figs. 29 and 30 and shown with more or less distinctness in some of the other figures as will be hereinafter pointed out. I term the die U the glue-die and the die H hereinbefore described the paste-die because I propose generally to use paste with the die H for securing the edge a', that being sufficiently adhesive and I propose generally to use glue with the die U because a stronger adhesive material is required for securing the bottom flap.

The glue-dies U of which there is one for each end of the package consist each of a plunger-like block the end of which as shown in Fig. 30 is of a triangular form corresponding with but not quite so large as the bottom flap a^5. These dies are faced with india-rubber as shown at u^4 in Fig. 29. The pressing dies T as shown in Figs. 29 and 30 consist each of a box in which the said dies U work, the said box being provided with grooves t^*, to form guides for fins u^*, on the dies. The exterior of the box corresponds with the dies and consequently with the bottom flap as shown in Fig. 20 and is of about the same size of the flap. Each block U is affixed to or formed integral with or as a projection on the face of a plate U' the form of which is shown in Fig. 9 but better in Fig. 30. These plates are carried by two shafts U^2 which are parallel with the planes of revolution of the receiving-wheel and capable both of an oscillating motion and a longitudinal movement in a fixed bearing w^3 secured to the machine framing, the oscillating movement being to carry the glue-dies to and fro between positions projecting doward from their shafts U^2 in which they are opposite glue-feeders represented as consisting of rotary disks s (see Fig. 9) to a position projecting laterally from their shaft shown in Figs. 9, 29 and 30 in which they are opposite the ends of the package in the pocket last mentioned. The longitudinal movements of the said shafts U^2 are to press the glue-dies against the faces of the glue-feeding disks s to take the glue therefrom and to deposit the said glue on the side flaps a^3, a^4 of the wrapper. The longitudinal movements therefore require to take place while the die-plates U' are in each of the positions to which they are brought by the oscillation of their rock-shafts. In their forward movements in the direction of the arrows shown on their shafts U^2 in Fig. 29, the glue-dies are accompanied a part of the way by the pressing dies T which are each connected with its respective plates U' by two short rods on bolts t provided with nuts on their ends and

having coil springs t' upon them between the pressing die and the plate, U'. These springs tend to project the face of the pressing die beyond the face of the glue die as shown in Fig. 29, so that as the shafts U^2 move forward toward the package to apply the glue, the pressing dies first strike the flaps a^3, a^4 and press and flatten them and after the said dies have been stopped by the package, the continued movement of the shafts U^2 brings the glue dies against the flaps. In the forward movement of the shafts U^2 to take the glue from the disks *s*, the pressing-dies are arrested before the glue-dies come in contact with the glue-feeding-disks *s* and so prevented from taking any glue, by striking against the turned in ends of fixed stops s' (see Figs. 2, 4 and 8) secured to the framing. The pressing-dies T besides pressing the end tucks also serve the purpose of stripping off the said tucks from the glue-dies to which the said tucks are liable to adhere.

The oscillating movement of the shafts U^2 to bring the glue-dies from the feeding position to the gluing position and vice versa is produced by means of a horizontally moving rack bar T', which is fully shown in Fig. 9, and shown in section in Figs. 2, 3 and 4. This rack bar slides in fixed-guides t^2 on the framing. It has a toothed rack on its upper side gearing with a toothed sector *u* on one of the shafts U^2 and similar toothed sector *u* on the other of said shafts. The movement of the said rack-bar is effected by a grooved drum-cam T^3 on the cam shaft S through a lever T^2 (see Figs. 8 and 9) which works on a fixed fulcrum t^4, in a bracket attached to the framing. It may be here mentioned that this cam T^3 is in one with the cam I^{11} hereinbefore described which produces the shifting or swinging movement of the paste-die, the said cam I^{11} being a mere peripherical projection on the drum of the said cam T^3.

The longitudinal movements of the shafts U^2 are produced by a grooved cam U^8 on the cam shaft S, acting on a roller u^5 on one end of a lever U^7 which is loosely fitted to the rock shaft Q^2 as a fulcrum and the other end of which is connected by a rod U^6 with one arm U^5 of a rock shaft U^4 which works in fixed bearings on the framing and on which are two other arms U^3 which are connected with the shafts U^2 by forks at their own ends embracing the said shafts between pairs of collars provided thereon as shown in Figs. 2, 3, 4, 8 and 29.

In order to provide for retaining the sectors *u* in gear with the racks on the sliding-bar T', the said sectors are fitted to their shafts with feathers which permit the said shafts to slide through them but causes the said shafts to turn with them, and the said sectors are confined longitudinally within small frames consisting of plates u' and bolts u^2 secured to the framing.

The glue disks *s* run in troughs S^*, in which the glue is kept melted by hot water jackets in which water heated in a small boiler s^2 by a lamp or gas burner s^3, is caused to circulate through pipes s^4, s^5, the said boiler being provided with an open stand pipe s^6.

The glue disks *s* require to be turned in the melted glue to keep their faces properly supplied. For this purpose the shafts s^7 of the said disks are each furnished with a ratchet-wheel s^8 (see Figs. 2, 4 and 8) which is engaged by a pawl s^9 carried by a pin s^{10} secured in the respective plate U'. The oscillation of the plate U' with the shaft U^2, causes the pawl to turn the ratchet-wheel and with it the glue-disk a short distance, once for each oscillation of the shaft U^2, back and forth. For the same reason hereinabove explained that means are provided for throwing the paste-die shifter I^2, in and out of gear by hand without stopping the receiving-wheel on the cam shaft S, I also provide means of similarly throwing the glue-die-operating-mechanism in and out of gear. These means consist mainly of a clutch u^5, u^6 (Fig. 9) one member u^5 of which is formed on the arm U^5 which is loose on the rock shaft U^4 and capable of oscillating thereon, and the other member u^6 of which being fitted to a feather on the rock shaft must turn with it though it is capable of sliding upon it. The member u^6 is engaged by a forked lever u^7 working on a fixed fulcrum u^8 (see Fig. 9) and has connected with its upper end a handle-bar u^9 which slides in a guide in a post u^{10} on the top of the table D.

At a distance from where the pressing-dies T and glue-dies U are located corresponding with one of the movements of the receiving-cylinder, are located the bottom tuck closers V which turn in the bottom tucks a^5 and press and close them against the side tucks a^3, a^4 thus completing the wrapping of the package. These bottom tuck closers and the parts of their operating mechanism immediately connected with them are best shown in section Fig. 14. They are also visible in Fig. 2 in which line 5 indicates the plane in which said section is taken and they are partly shown in Figs. 4 and 10. The said tuck closers consist each of a plate V which is connected by a hinge *v* with the inner end of a horizontally-swinging-frame V^2 which is connected by a hinge v' with one of the side frames of the machine. The plates V are outside of the stationary curb W' which has been hereinbefore described as partly inclosing the pockets of the receiving-wheel, except that each of the said plates has on its inner face a projection v^*, constituting a die and the profile of which as shown in Fig. 4 is triangular corresponding in size and form with the bottom tucks a^5 of the package, the thickness or prominence of the said dies being sufficient for their faces to protrude slightly into the curb W' through openings v^5 (see Figs. 2^{**}, 3, and 14) of corresponding form provided for them in the sides of the said curb as shown in Fig. 14. The said plates V have provided on or connected with them arms V' which carry each

a roller v^3 which is arranged to run upon the oblique edge of one of two stationary guide-plates V^3 which are firmly secured on the fixed shaft E′ of the receiving-wheel. The forward ends of these guide-plates are turned inward in hooked form as shown at v^4 in Fig. 14, to serve as stops to the rollers. The said arms V′ are also connected with the swinging-frames V^2 by pulling springs v^2. The movement of these bottom tuck-closers which like all the folding movements takes place while the cylinder is stationary, is illustrated in Fig. 14 where one of the said folders is shown at each end of its movement, the position at the end of its operative movement being shown in bold outline and the position at the end of the return movement being shown in dotted outline. The operating movements bring the dies v^*, against the bottom tucks a^5 which have been projecting from the receiving-wheel through the curb W′ and cause the said dies to turn the said tucks inward through the openings v^5 in the sides of the curb W′ and finally carries the said dies through the said openings as shown in bold outline in Fig. 14, and presses them against the glued faces of the side tucks a^3, a^4. The return movement simply carries back the said folders out of the way of the bottom flaps of the wrapper of the next package which is brought between the said folders by the next movement of the carrying-wheel. The movement of these bottom-tuck-closers is given to them through the swinging-frames V^2, and is derived from the same lever I^5 before described which operates the paste-die-shifter I^2 by which the paste-die H is taken from the paste-roller to a position over the pile of wrappers. The said movement is transmitted from the said lever through a rod V^8 to the arm V^7 of a rock-shaft V^6 which works in fixed bearings in the frames; thence through the said rock-shaft and arms V^5 thereon to the swinging-frames V^2 by means of rods V^4, connecting the said arms V^5 with said swinging-frames. The parts V, V, V^2, V^4 and their accessories remain in the position shown in bold outline in Fig. 14 at all times but when they are required to operate. Just before the receiving-wheel turns to bring a package between them, they are thrown to the position shown in dotted outline by the movement of the arms of the rock-shaft V^6 toward the axis of the receiving-wheel. This causes the rods V^4 to move the swinging-frames in the same direction and these frames by the arcs described by the hinges v draw away the die-plates V and their dies v^*, from the sides of the receiving-wheel and curb and at the same time move their arms V along the inclined edges of the guide-plates V^3. After the wheel has moved to bring a package between the said dies, the rock-shaft returns and its arms V^5 carry with them the die-plates V, the arms V′ of which are at the same time caused by the springs v^2 to run outward on the guides V^3 as far as their hooked ends v^4, permit the rollers v^3 to go. On coming to the position shown in bold outline in Fig. 14, the two swinging-frames come to or nearly to a line with each other in such manner as to exert a very powerful pressure on the end tucks and press them forcibly against the glue on the side-tucks so as to perfectly seal them up.

x (Figs. 2, 3, 4, and 8) designates what I term the package-expeller by which the packages having wrappers applied, closed and sealed are taken from the receiving-cylinder. This consists of a horizontal forked sliding-bar arranged in fixed guides x', x^2, under the table D and wrapper sheet box G, and between the receiving-wheel and the delivery table. The forked end of this bar is turned downward like a rake as shown at x^*, in Figs. 3 and 10, and conforms, as shown in Fig. 3 to the periphery of the cylindrical position of the said wheel which constitutes the bottoms of its pockets e'. The prongs of the said end are thin and sharp so that they may enter easily between the bottom of the packages and the wheel as the packages are successively brought to them by the rotation of the wheel while the fork is held against the wheel as it always is while the wheel rotates. Beneath this bar x, and opposite its turned down fork, the curb W′ opens into a horizontal exit trough W^2 which forms an outwardly directed continuation of the channel formed within the said curb and into which the packages are expelled from the pockets of the wheel. This trough is on the side of the receiving-wheel shaft opposite to the end pressing dies and glue dies and so far from the glue dies U, that the glued and closed bottom tucks may be nearly dry before they reach the said trough, the said tucks having been held closed and pressed after leaving the bottom-tuck-closers by the closed sides of the curb W′ and being still held by the sides of the trough W^2, after they have been drawn thereinto by the forked end of the expeller x. The guide x^2 is suspended in hangers x^{2*} as shown in Figs. 2 and 10, and its lower part is forked as shown in Fig. 10, to embrace and assist in suspending the trough W^2.

The means by which the movement of the package-expeller x away from the wheel to carry the packages into the trough W^2 are produced, which are best shown in Fig. 2, consist of a short rod or link x^3, a lever x^4 and a cam x^7. The said cam x^7 consists simply of an offset from the periphery of the cam Q^5 which operates the wing tuckers. The said lever x^4 has its lower end on a fixed fulcrum x^6; its upper end is connected with the bar x by the rod x^3, and it is furnished with a roller x^5 against which the cam works.

The means for producing the return movement of the package-expeller may be understood by general reference to Figs. 2, 3, 4 and 8, the movement being derived from the same cam E^3 (see Fig. 4) which works the pawl lever E^2, for turning the cylinder, the said movement being derived from the said lever through

a bar x^8 which is connected with the said lever and on which there is an upward projection x^9, which, as the said rod moves in the direction of the arrow shown on it in Fig. 4, comes against a lateral projection x^{10} (best shown in Fig. 8) on the expeller x, and pushes it up to the cylinder. The said bar x^8 works in a guide x^{11} secured under the delivery table F.

As wrapped and sealed packages are pulled by the expeller x from the pockets of the receiving-wheel, the trough W^2 becomes filled up and all those previously pulled out and still in the trough are driven along the trough until they arrive on the delivery table F, in a row. To provide for their easy removal from this table, I have applied upon the delivery table what I term a row dresser consisting of a straight bar f, shown in Figs. 2, 3, 8, and 10 and represented in the last mentioned figure where it appers in section as made of angle-iron. This row dresser is parallel with the sides of the trough W^2, and remains with its face on a line with one side of the said trough so that the packages expelled from said trough are arranged against it in a row until they reach nearly the whole length of the delivery table when the row dresser moves laterally across the mouth of the trough W^2 and pushes the row out of the way to make room for another and then moves back again preparatory to repeating the operation at a proper time. The mechanism for operating this row dresser is represented in Figs. 8 and 10, but parts of it are also shown in Figs. 2, 3, 4 and 31. The principal parts of this mechanism which serve to produce the movement from the position shown in Figs. 8 and 10, forward across the mouth of the trough W^2 are a cam f^4, the shape of which is shown in dotted outline in Fig. 8, and in full outline in Fig. 31 an upright shaft F^6, a ratchet wheel f^6 on said shaft and a pawl f^7 for operating the said ratchet wheel, the said pawl being carried by the bar x^8 hereinbefore described through which the package-expeller is returned to the cylinder. The upright shaft F^6 works in bearings in brackets f^{10}, supported in the framing and its cam f^4 acts against a roller f^5 and a horizontal slide f^2, which is fitted with a dovetail to a slideway f^3, provided with the bottom of the delivery table, the said slide being connected with the row dresser f by a bracket arm f' rigidly fastened to both. The pawl f^7 is held in contact with the ratchet wheel by a spring f^8. Two spring-pressed stop-pawls are also applied to the ratchet wheel to prevent its backward movement. The ratchet wheel f^6 which is imperfectly shown in Fig. 8 but more plainly in Fig. 31, has a number of teeth equal to the number of packages which are allowed to accumulate to form a row in front of the row-dresser to be pushed away by the latter but the cam is only required to operate after that number has been so accumulated and hence the cam is of such form that its complete operation on the row-dresser is produced during the time occupied by one backward movement of the bar x^8, that is to say, if there are to be ten packages in a row there will be ten teeth on the ratchet wheel as shown in Figs. 8 and 31, but the cam will only operate during every tenth movement of the ratchet wheel. To provide for this the teeth are not all equally spaced but one is longer than all the rest which are equally spaced. The length of the long tooth is slightly less than twice the length of the short ones, the short ones being of such length that the pawl in its movement cannot pass over two of them and the length of the longer one being less than the length of the movement of the pawl so that the pawl in its stroke may move over and pass it. The operating portion of the cam should be equal or very nearly so measured in degrees of a circle, to the degrees of a circle included in the long ratchet tooth. This is illustrated in Fig. 31, in which the circle in alternate dots and dashes represents the pitch line of the ratchet teeth and the arcs of said circle included respectively between the two radial lines 40, 41, and between the two radial lines 42, 43, represent the degrees of a circle included in the long tooth and those included in the operative portion of the cam. The cam and the ratchet wheel being secured in proper relation to each other upon their common shaft F^6, the pawl will engage a tooth and turn the cam at every return stroke of the bar x^8, a distance corresponding with the length of the tooth on which it operates as it never passes over two teeth. While it acts on the short teeth the inoperative parts of the cam are opposite the roller f^5, and the row-dresser is not moved but while it acts on the longer tooth the operative part of the cam is opposite the said roller and the row-dresser operates to push the row forward. It may be remarked with reference to Fig. 31 that the operative portion of the cam is only between the radial line 42 on which the roller f^8 is represented and the extreme point of the offset of the cam on the radial line 43 because the roller f^8 is prevented from approaching nearer the center of the cam by the action on the slide f^2, of a cam F^5 (see Figs. 8, 10, and 28) which produces the return movement of the row-dresser. This cam F^5 is represented as a lateral projection from the cam L^8 which operates the package-placer. The said cam F^5 operates upon the downwardly projecting arm f^*, (shown dotted in Fig. 10 and shown also in Fig. 8) of a horizontal rock shaft F^4 which is arranged in fixed bearings on the framing, and the upwardly projecting arm F^3 of which is connected by a rod F^2 with the bracket arm f' which secures the row dresser and its cam slide f^2 together.

It will be observed that all the operative parts of the machine derive their motion from the cam shaft S. This may have its rotary motion given to it by any suitable means. I have represented it as driven from a driving shaft Y, arranged at right angles to it in fixed bearings y, y, on the framing, through a worm

wheel y^2 on itself and an endless screw y' on the said driving shaft.

Having described the construction and operation of the several parts of the machine separately and in detail, I will now briefly recapitulate the successive operations by which the wrapping and securing of the wrapper are effected.

The paste and glue troughs having been filled with suitable paste and glue and the boiler having been filled with water and the water heated and a number of wrapper sheets having been piled upon the table or platform G, I will first assume the machine to be at rest with the paste-die-shift F^2, and the mechanism for producing the longitudinal movement of the pressing die T and glue die U toward and from the ends of the package to be thrown out of gear by their respective clutch levers I^9 and u^7. The operator will first turn down the paste roller and glue disks by hand until they are well covered with paste and glue. He will start the machine by throwing the driving power on the main shaft and will throw the paste-die-shifter into gear. The paste die then applies paste to the top wrapper sheet and picks it up. The wrapper placer then moves toward this wrapper and seizes it between its grippers and in its return deposits the said wrapper over the receiving-wheel, the grippers being loosened at the proper time when the wrapper is in the proper place to receive the package to be wrapped. While the previous operation is taking place, a package to be wrapped is placed by an attendant upon the package-feeder, by which it is moved to a position over the top of the receiving wheel. The package-placer then descends and takes the package in its grippers l^7, and lifts it from the package-feeder which is then withdrawn. The package-placer then descends and forces the package down along with the wrapper into the uppermost pocket of the receiving-wheel bringing the wrapper to the condition shown in Fig. 15. While the package and wrapper are in this position, the folding blade m, is thrown over the wheel, folding the short end a of the label down over the package, after which the wrapper-placer returning for a second wrapper, folds the long end a' down by means of its roller N causing the paste on said end to adhere to the short end a of the wrapper, the folding blade m meanwhile having been withdrawn. The package and wrapper are now in the condition shown in Fig. 16. The receiving-wheel now makes one-eighth of a revolution bringing the package and its wrapper to the position for tucking the wrappers at both ends. The top tuckers now descend bringing the wrapper into the condition shown in Fig. 17. The wing tuckers are thrown around carrying in the sides of the wrapper and forming the first side tucks and parts of the bottom tucks as shown in Fig. 18. The slide tuckers are then moved forward to meet the wing tuckers forming the second side tucks and the other parts of the bottom tucks as shown in Fig. 19. The top tuckers are next withdrawn, and afterward the wing tuckers. The receiving-wheel now makes a second movement carrying the box and its wrapper to the next position, the slide tuckers moving along with the wheel but slower to keep the side tucks in place until the package and wrapper pass in between the sides of the curb of the receiving wheel, leaving the bottom tucks protruding beyond the said sides which are cut away for the purpose as shown at v^6 Figs. 2** and 29. When the wheel has made the second movement which brings it to its third position, the clutch lever u^7 is thrown in and the glue dies are moved against the glue disks and withdrawn with charges of glue, the said dies and the pressing dies T are then swung over opposite the bottom tucks of the wrapper and pressed against the said tucks, the said dies T being pressed with sufficient force to give a smooth crease to the wrapper and to press it off from the glue-die, as the latter is withdrawn. The receiving wheel now makes a third movement bringing the package and wrapper to the fourth position and the bottom tuck closers are then closed downward folding the glued bottom tucks in upon the package and completing the wrapping. The bottom tuck closers remain closed until the wheel has begun to make a fourth movement which carries the package to the fifth position which is at the bottom of the wheel. The package remains in the wheel for the glue to harden, until the sixth movement of the wheel has been made which brings the package to where it is thrown out by the expeller into the trough W^2 where the glued points are still held in upon the box for the glue to harden until the succeeding boxes force it out upon the delivery table and several packages are formed in a line when the row dresser pushes them toward the front to make room for more to follow.

I have thus recapitulated the movements for wrapping one package, it remains to be said that after each movement of the receiving wheel one package is received into the wheel to be wrapped and glued and one package is expelled completely wrapped and glued ready for market, the operations at the several successive positions of the wheel being carried on simultaneously. It will be seen that the number of packages that can be wrapped and sealed in a given time is practically limited, only by the speed at which an operator can place the packages upon the package feeder all the rest being done automatically.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the intermittently moving rotary carrier constructed with pockets and a plunger or block for depositing a package and wrapper together into each of the said pockets in succession and thereby

turning out the ends of the wrapper on two sides of the package, of a reciprocating folding blade moving across one of the said pockets which is in the position in which it received the package and wrapper, for the purpose of turning one of the turned out ends of the said wrapper over the package in the said pocket while it remains stationary in that position; substantially as herein set forth.

2. The combination with the intermittently moving rotary carrier constructed with pockets and a plunger or block for depositing a package and wrapper together into each of the said pockets in succession and thereby turning out the ends of the wrapper on two sides of the package, of two folders both having reciprocating movements and both being in position to move across that one of the said pockets which is in the position in which it received the package and wrapper, for the purpose of turning first one and then the other of said turned-out ends over the package while the latter remains stationary after having had the ends of the wrapper turned out at its sides; substantially as herein described.

3. The combination of an intermittently moving rotary carrier constructed with pockets, a plunger or block for forcing a wrapper and package together into one of said pockets and thereby turning out the ends of the wrapper at the sides of the package, folders for turning the said turned out ends over the package, tuckers for tucking in the edges of the so turned-over ends over the ends of the package and simultaneously forming side tucks, and tuckers for tucking in said side tucks over the said tucked-in turned-over ends and simultaneously forming bottom tucks, and mechanism for applying adhesive to said bottom tucks substantially as and for the purpose herein set forth.

4. The combination of an intermittently moving rotary carrier constructed with pockets, a plunger or block for forcing a package and wrapper together into one of said pockets and thereby turning the ends of the wrapper against the sides of the package, folders moving across the pocket for turning over the so turned ends, tuckers for tucking in the edges of the so turned over ends over the ends of the package, and simultaneously forming side tucks, tuckers for tucking in said side tucks over said tucked-in turned-over ends and simultaneously forming bottom tucks means for applying adhesive to the bottom tucks and bottom tuck-closers for turning in and closing said bottom tucks, substantially as and for the purpose herein set forth.

5. In a machine for wrapping a previously shaped article of merchandise, the combination of a receiver for receiving the article and wrapper, a plunger for simultaneously forcing the article, to be wrapped and the wrapper into said receiver, mechanism for simultaneously folding both ends of the wrapper onto the article, and a device constructed to apply adhesive to both the triangularly shaped portions, prior to their being folded against the ends of the package, substantially as specified.

6. In a machine for wrapping packages, the combination of folders for folding the wrapper about the article to be wrapped, and a feeding and carrying plunger provided with grippers for holding the article, whereby it is carried by the plunger and deposited upon the wrapper, substantially as specified.

7. The combination with a rotary carrier constructed with pockets, a plunger or block for forcing a package and a wrapper together into one of said pockets and thereby turning up the ends of the wrapper, folders for turning the said ends over the package, tuckers for tucking the edges of the so turned over ends over the ends of the package and simultaneously forming side tucks, and tuckers for turning in the so formed side-tucks and simultaneously forming bottom tucks, of dies for applying glue or adhesive material to the bottom-tucks, and bottom-tuck-closers for turning in and closing the so glued bottom tucks and pressing them against the side tucks, substantially as and for the purpose herein set forth.

8. The combination of an intermittently moving rotary carrier constructed with pockets, a wrapper-placer and a package feeder, a plunger for forcing a package and a wrapper together into one of said pockets and thereby turning out the ends of the wrapper against the package, and folders for turning the so turned out ends over the package all arranged to operate in connection with a pocket brought to one position by the movement of the carrier; tuckers for turning the edges of the so turned over ends over the ends of the package and simultaneously forming side tucks, tuckers for tucking in the so formed side tucks and forming bottom tucks, all arranged to operate relatively to the same pocket when brought to another position by said movement, glue dies for applying adhesive material to the so formed bottom tucks arranged to operate relatively to the same pocket when brought to a further position by said movement and a bottom tuck-closer arranged to operate relatively to the same pocket when brought to a still further position by said movement; all substantially as and for the purpose herein set forth.

9. The combination in a machine for wrapping packages of a wheel constructed with pockets, a shaft for said wheel and a plunger or block for forcing a package and wrapper together into one of said pockets and turning out the ends of the wrapper against the sides of the package, and a lever having its fulcrum on the said shaft and a blade carried by said lever for folding over one of the so turned-out ends of the wrapper, substantially as and for the purpose herein set forth.

10. The combination in a machine for wrapping packages of a receiving wheel constructed with open-sided pockets for the reception of wrappers and packages, and a curb partly

surrounding said wheel and having parts of its sides open for the protrusion of the unfolded and incompletely folded and tucked sides of the wrappers and parts closed to confine the completed tucks thereof, substantially as and for the purpose herein set forth.

11. In a machine for wrapping packages the combination with a receiving-wheel constructed with pockets, a curb partly surrounding said wheel and containing a channel, an exit forming an outward continuation of said channel and an expeller consisting of a reciprocating rake which fits the said wheel and works into said exit, substantially as and for the purpose herein set forth.

12. The combination with a paste receptacle, of a longitudinally reciprocating paste die H, a fixed guide H′, through which said die is capable both of a longitudinal reciprocating movement and a swinging movement, a paste-die shifter I^2 through which said longitudinally reciprocating movement takes place and which itself has a reciprocating movement transverse to said longitudinally reciprocating movement for the purpose of giving the said paste-die its swinging movement, and means of giving the said die shifters their reciprocating movement; all substantially as and for the purpose herein set forth.

13. The combination with a rotary carrier constructed with pockets for the reception in each of a package and a wrapper together, of a wrapper-placer consisting of a reciprocating carriage and grippers for placing a wrapper over a pocket in said carrier during the movement of said carriage in one direction, and a folder attached to said carriage for turning the end of the wrapper over a package in the pocket during the movement of said carriage in the opposite direction substantially as and for the purpose herein set forth.

14. The combination with the rotary carrier constructed with pockets for the reception in each of a package and wrapper together, of a package-placer consisting of a box L′ open at the bottom, grippers l^7 attached to said box and a plunger or block L fitted to said box and capable of working therein and of passing thereout opposite the pocket of the carrier to push a package and wrapper into the said pocket substantially as herein described.

15. The combination with the intermittently-moving rotary carrier constructed with pockets open at the ends, of the top-tuckers consisting of plates *p* supported outside of the carrier, having their profiles conforming to the profiles of the pockets and having a direct reciprocating movement radial to the carrier and with their side edges parallel with the sides of the pockets, substantially as and for the purpose herein set forth.

16. The combination with the intermittently-moving rotary carrier constructed with pockets open at the ends, of the wing-tuckers supported outside of the carrier and provided with fingers *q** on their backs and arranged to swing to and fro parallel with the movement of the carrier toward and from the open ends of the pockets for the purpose of turning in one of the side tucks at each end of the wrapper and forming the bottom tucks thereof; substantially as herein set forth.

17. The combination with the intermittently-moving rotary carrier constructed with pockets open at the ends, of the slide-tuckers *r* having fingers *r** on their backs, supported outside of the carrier in a position at which the pockets of the carrier stop in the intermissions of its movement and having a reciprocating movement across the open end of the pocket for the purpose of turning in one of the side tucks at each end of the wrapper and completing the formation of the bottom tucks thereof; substantially as and for the purpose herein described.

18. The combination with the rotary carrier and the side tuckers, of fixed bearings at the sides of said carrier for the bottom flaps of the wrapper during the operations of the side tuckers, substantially as and for the purpose herein set forth.

19. The combination with the rotary carrier the pressing dies for pressing the end tucks and the glue-dies for applying adhesive material to the bottom tucks, or fixed bearings at the sides of the carrier to support the bottom tucks of the wrapper against the pressure of said pressing dies and gluing-dies, substantially as and for the purpose herein set forth.

20. The combination with the rotary carrier containing pockets for receiving-wrappers and packages said pockets being open at the ends for the protrusion of the bottom tucks of the partly closed wrappers and stationary-bearings outside of said carrier for the protruding bottom tucks, of glue-feeders arranged near the sides of said carrier and glue-dies having a swinging movement to and fro between said feeders and pockets and rectilinear reciprocating movements toward and from the glue-feeders and the said bearings, substantially as and for the purpose herein set forth.

21. The combination of the oscillating and reciprocating shafts U^2, the plates U′ carried by said shafts, the glue-dies U and pressing and stripping-dies T carried by said plates, the toothed sectors *u* for turning said shafts while permitting the longitudinal movement of the latter, and the reciprocating rack-bar T′ having two toothed racks for turning said sectors; all substantially as and for the purpose herein described.

22. The combination with the receiving-wheel, the fixed shaft on which the said wheel rotates and the pressing and glue-dies for pressing and applying adhesive material to the bottom-tucks of the wrapper, of the bearing plates W, secured to said shaft at the sides of the wheel for supporting the said bottom-

tuck against the pressure of said pressing and glue-dies, substantially as and for the purpose herein set forth.

23. The combination with the rotary carrier containing open ended pockets for the reception of wrappers and packages together, of the bottom-tuck closers consisting of plates V and dies v^* supported outside of the carrier and having a lateral swinging movement toward and from said carrier, substantially as and for the purpose herein set forth.

24. The combination with the rotary carrier containing open-ended pockets for the reception of packages and wrappers together and a stationary curb partly inclosing the open ends of said pockets, of the bottom-tuck-closers consisting of plates V supported outside of the carrier and having a lateral swinging movement toward and from the carrier and dies v^* attached to said plates V and passing through openings in said stationary curb, substantially as and for the purpose herein set forth.

25. The combination with the end tuck closers V, v^*, the swinging frames V^2 hinged at one of their ends to the framing at fixed points and at their other ends to the said tuck-closers, the arms V′ to which said tuck-closers are attached, the stationary oblique-edged guide-plates V^3 for guiding said arms, and the springs v^2 connecting the tuck-closers with the swinging frames, substantially as and for the purpose herein described.

26. The combination with the receiving-wheel and a curb partly surrounding the same and forming a channel, and an exit channel forming a continuation of the channel of the curb, and an expeller working in said exit channel, of a delivery-table arranged at the mouth of said channel and a row dresser consisting of a straight bar arranged on said table parallel with the exit channel and having a reciprocating motion across the mouth of said channel substantially as and for the purpose herein set forth.

27. The combination with the intermittently-moving receiving-wheel constructed with pockets for the reception of wrappers and packages together and provided with ratchet teeth and stop-holes or notches, a reciprocating pawl-carrier and a pawl attached thereto for operating on said ratchet teeth to turn the wheel, a locking stop for engaging with the said stop-holes or notches to lock the wheel, and a switch connected with said reciprocating pawl-carrier substantially as herein described for the purpose of throwing the locking stops out of gear during that movement of the pawl which turns the wheel but leaving the said locking-stop to engage with and lock the wheel at other times as herein set forth.

28. The combination with the row dresser of the slide f^2, connected therewith, the cam f^4 for operating said slide, the upright shaft F^6 carrying said cam, the ratchet wheel on said shaft having one tooth longer than its others, the pawl f^7 for acting on said ratchet wheel, the reciprocating bar x^8 carrying said pawl, the horizontal rock-shaft F^4 carrying the arms F^3, and f^*, and the rotary cam F^5 for operating on said arm f^*; all substantially as herein described.

ALBERT STEARNS.

Witnesses:
FREDK. HAYNES,
GEO. BARRY.