

(No Model.)

2 Sheets—Sheet 1.

E. HUBBARD.
WINDER FOR MAKING FIBER PAILS.

No. 452,707.

Patented May 19, 1891.

Fig. 1.

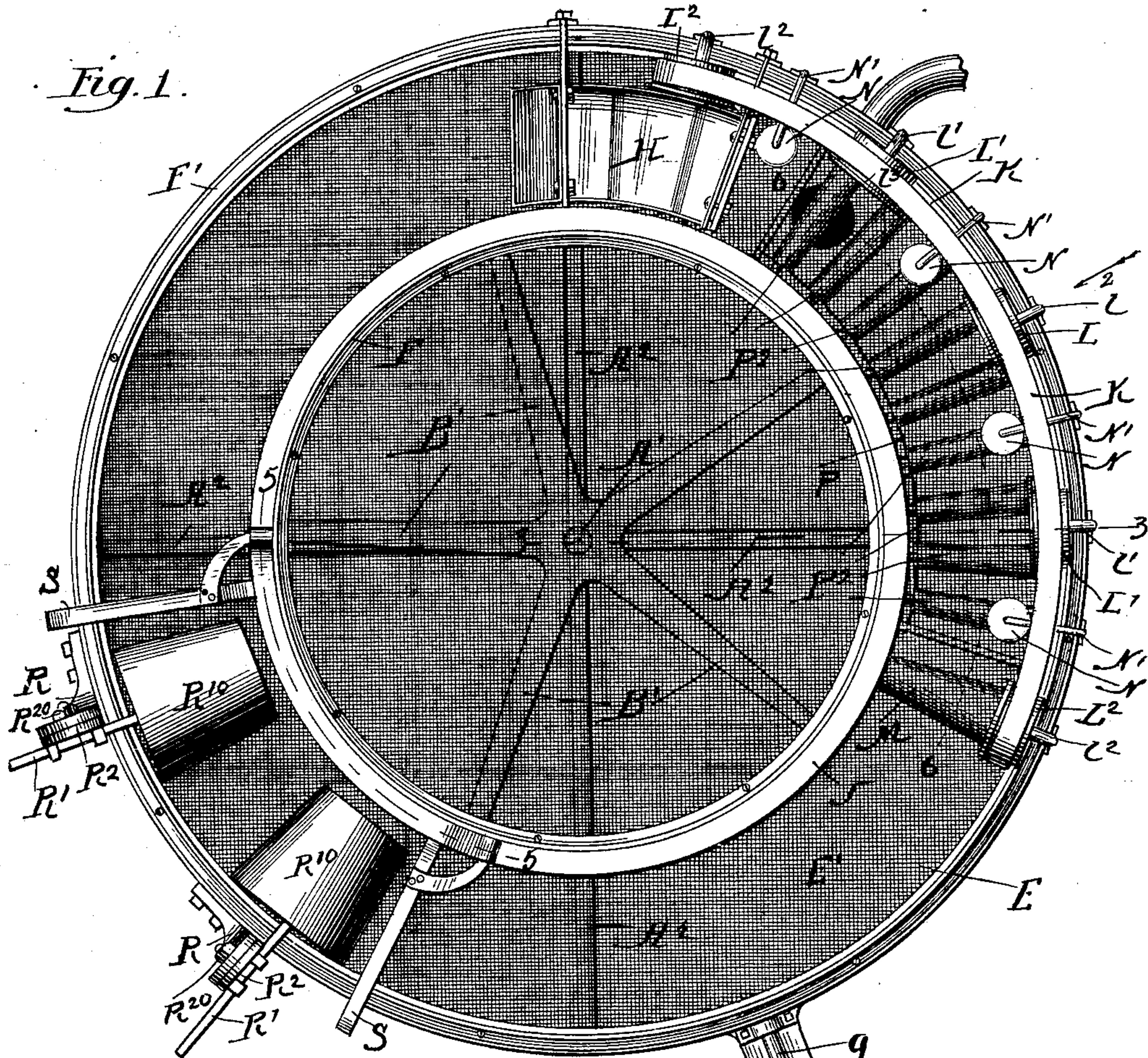
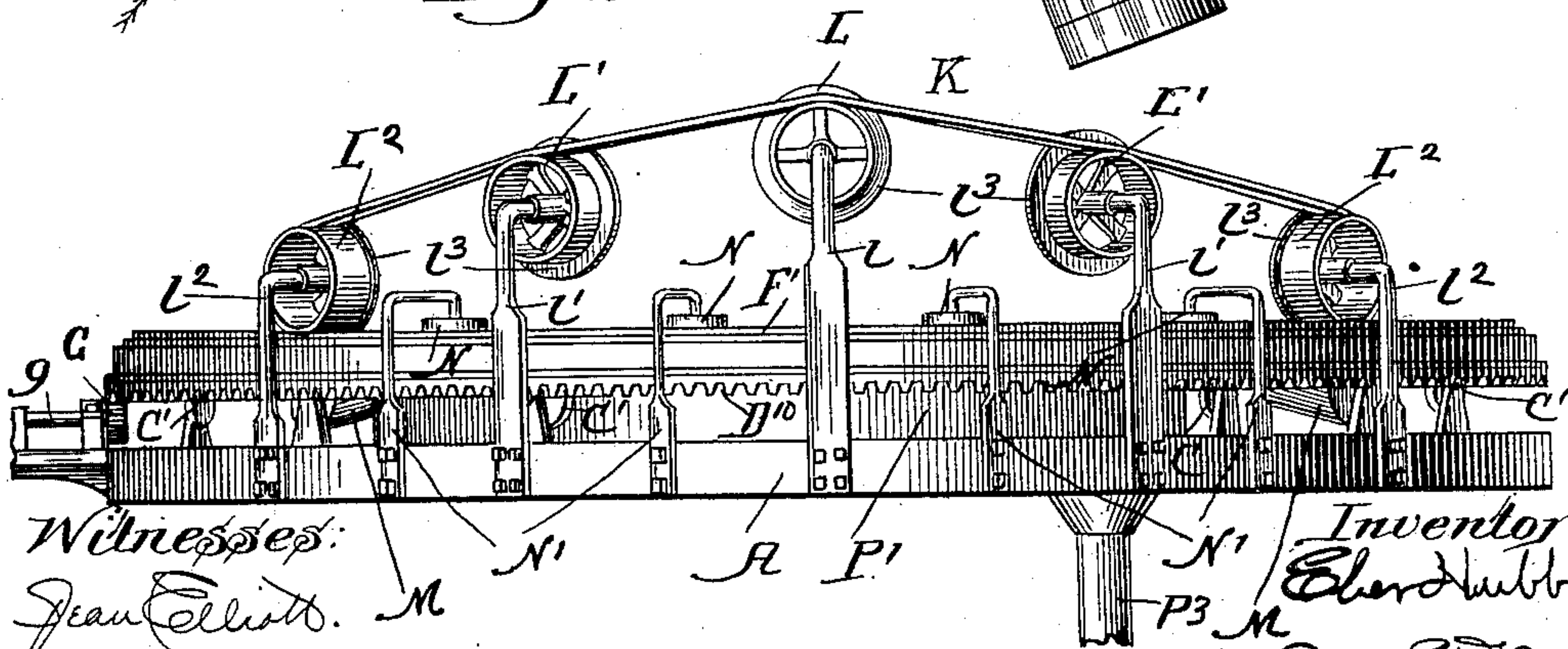


Fig. 2.



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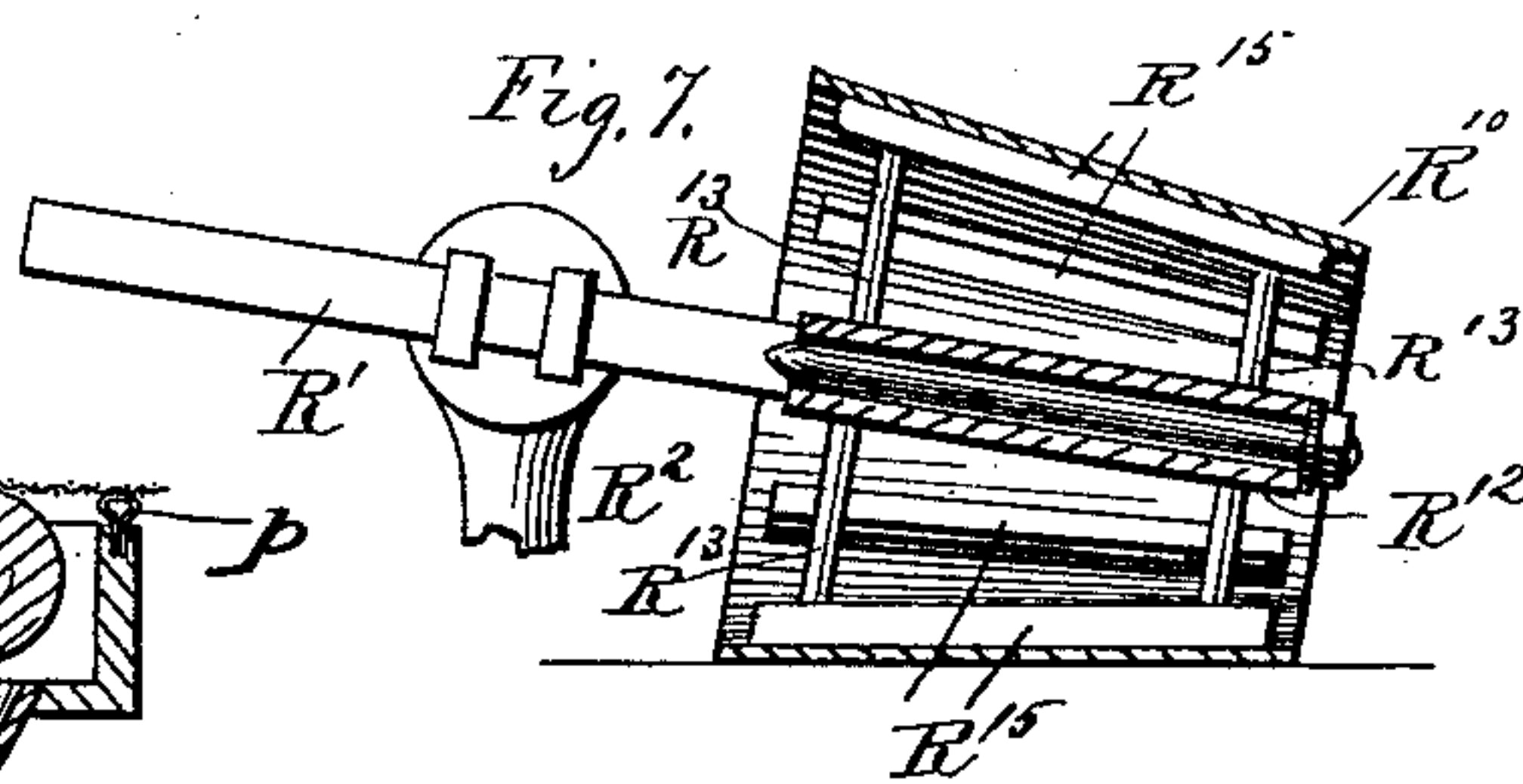
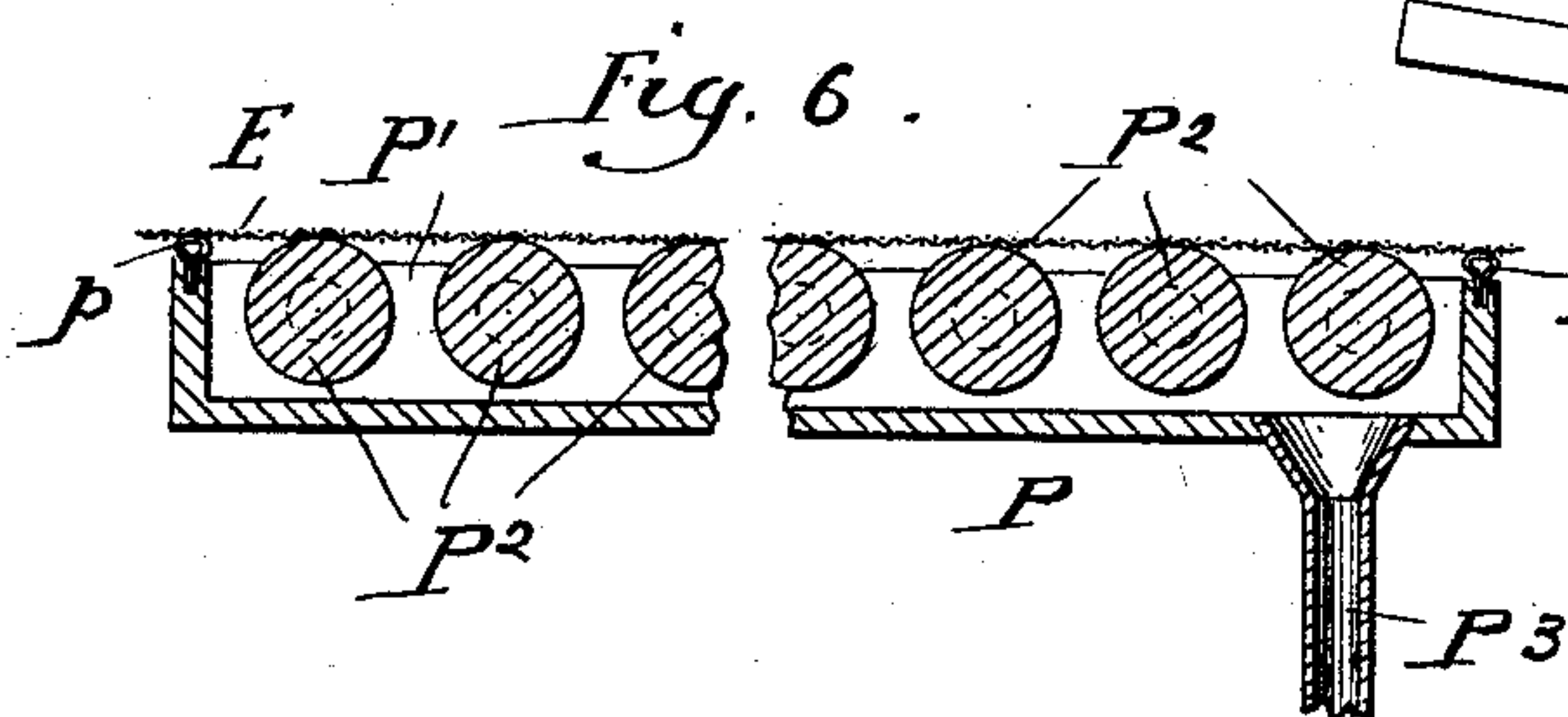
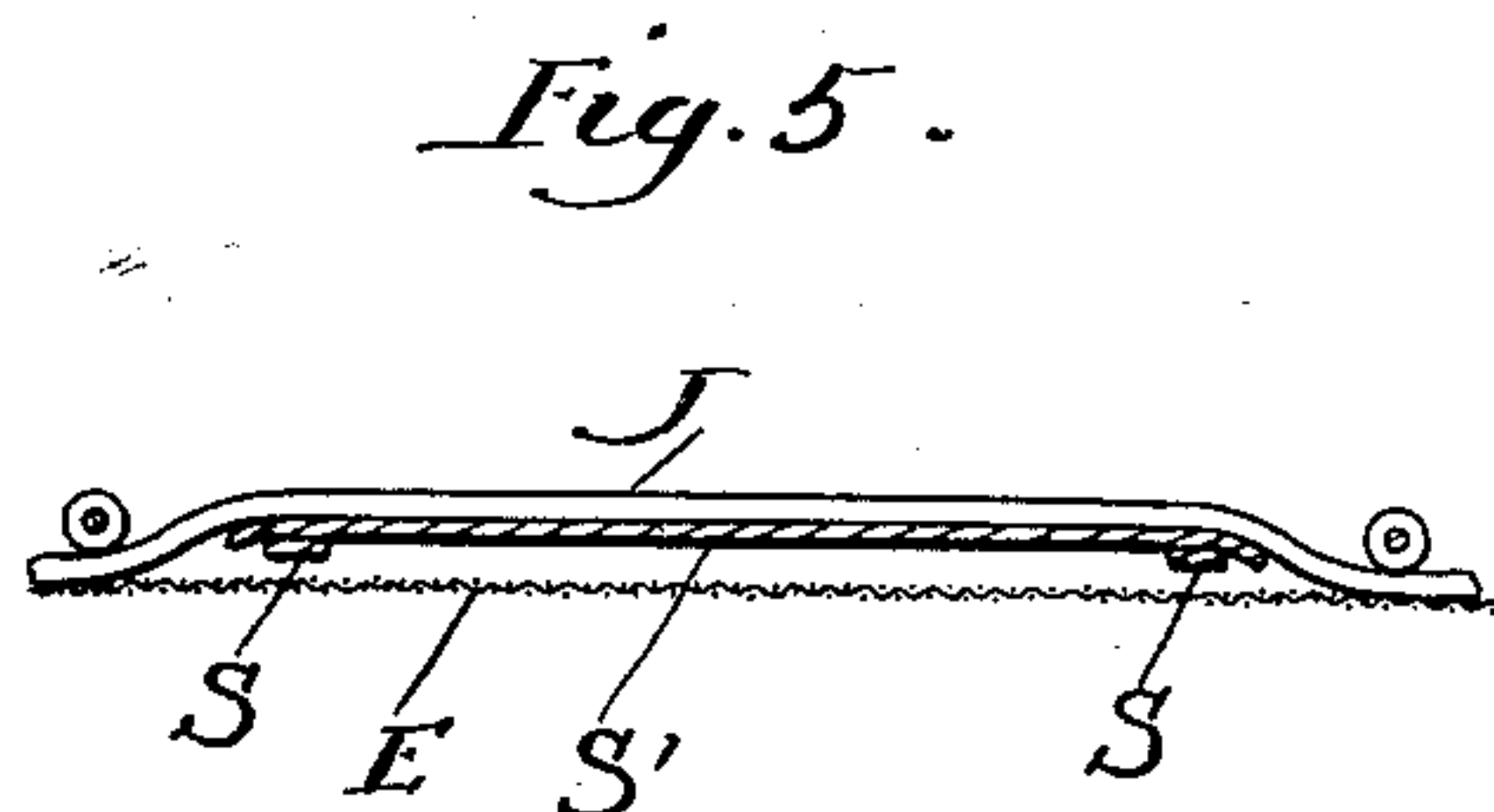
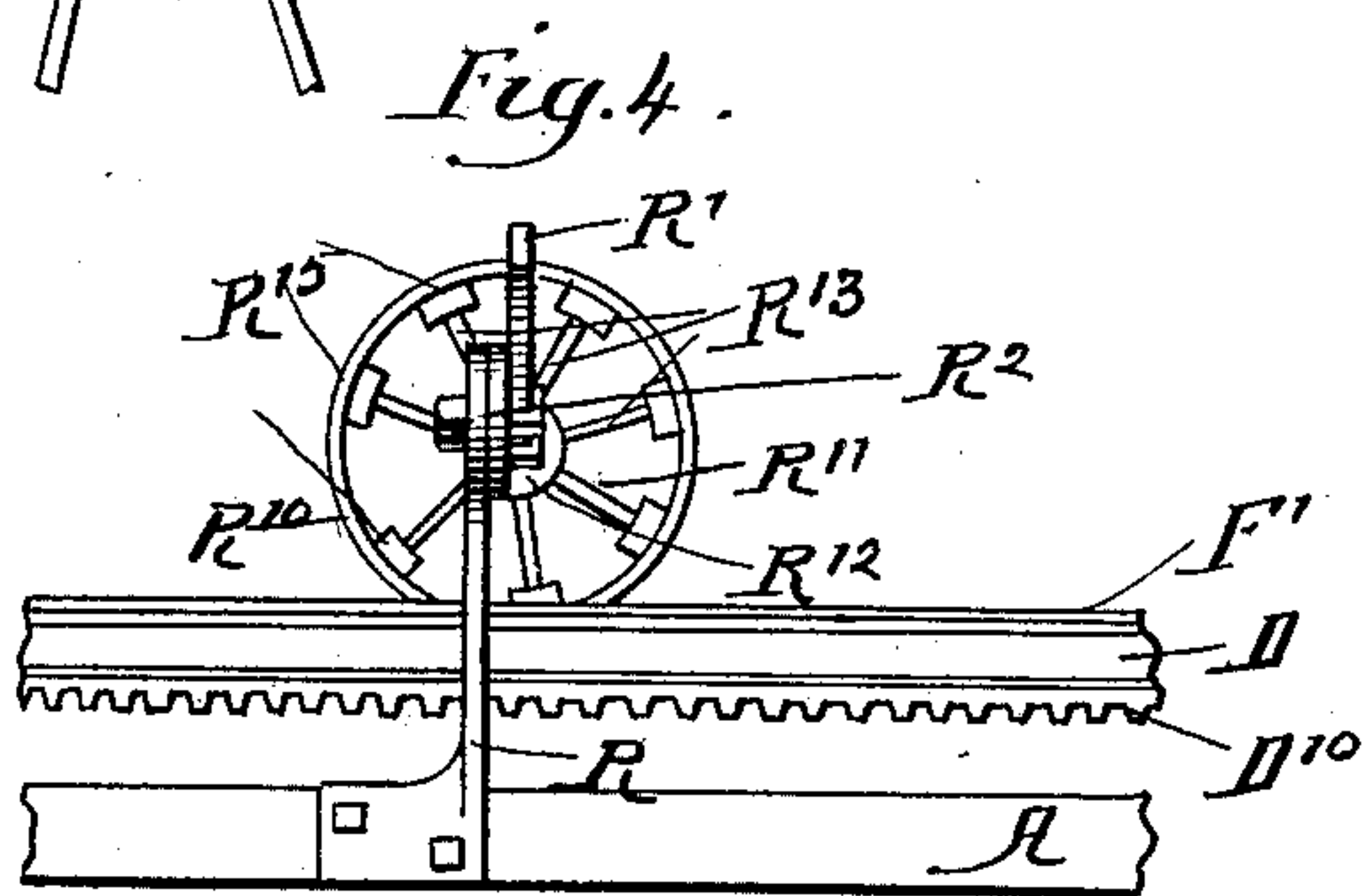
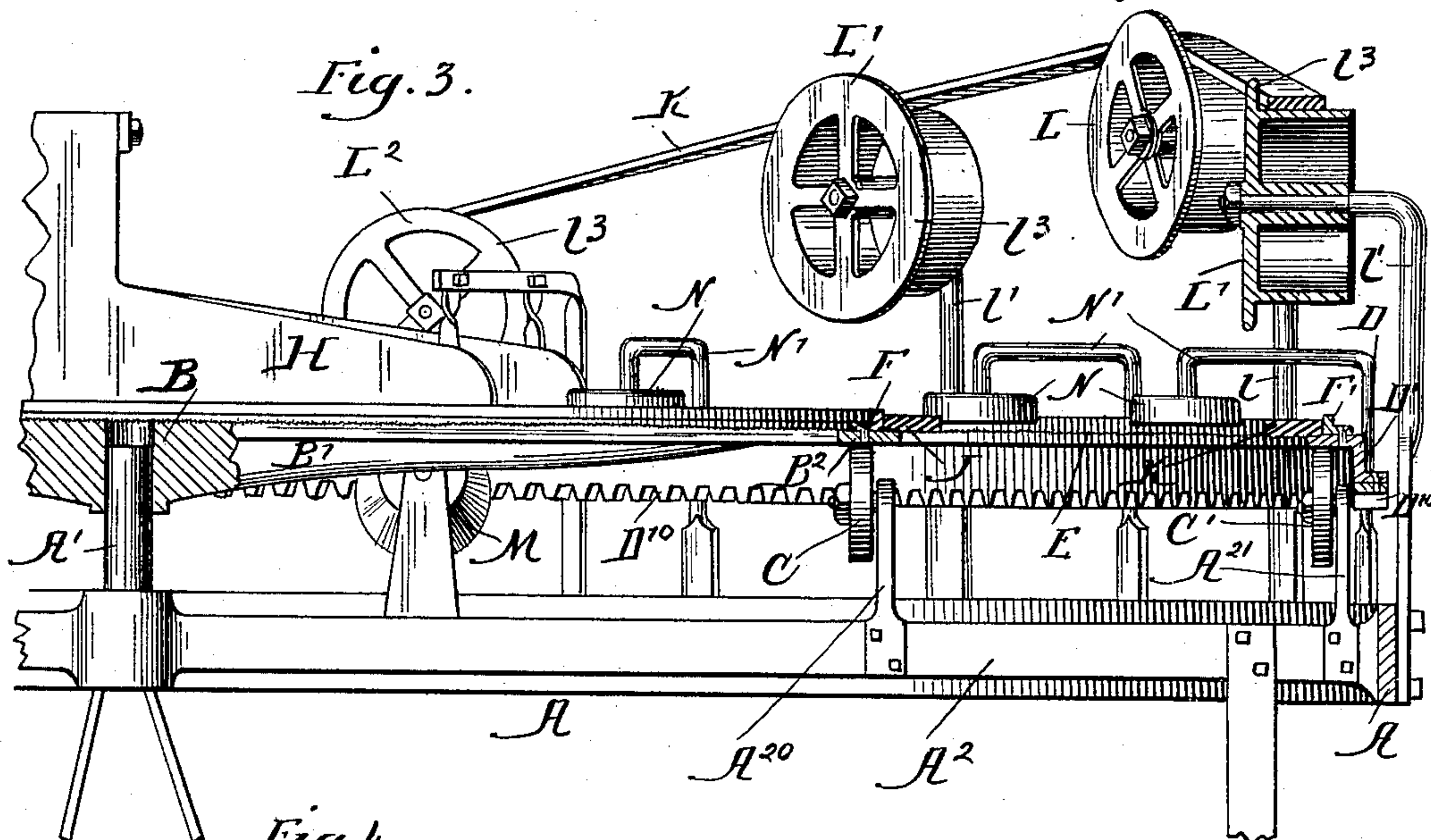
By

By Burton and Burton
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UNITED STATES PATENT OFFICE.

EBER HUBBARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE UNITED INDURATED FIBRE COMPANY, OF PORTLAND, MAINE.

WINDER FOR MAKING FIBER PAILS.

SPECIFICATION forming part of Letters Patent No. 452,707, dated May 19, 1891.

Application filed June 30, 1890. Serial No. 357,198. (No model.)

To all whom it may concern:

Be it known that I, EBER HUBBARD, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Winders for Making Fiber Pails, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

Figure 1 is a plan. Fig. 2 is a side elevation looking in the direction of the arrow 2 on Fig. 1. Fig. 3 is a section at the line 3 3 on Fig. 1. Fig. 4 is a detail elevation looking in the direction of the arrow 4 on Fig. 1. Fig. 5 is a section at the curved line 5 5 on Fig. 1, represented as if seen at all points looking radially toward the center of the curve. Fig. 6 is a similar curved section at the line 6 6 on Fig. 1. Fig. 7 is a sectional side elevation of one of the forms and its supporting-frame and bracket, section being made at a vertical plane through the axis of said form.

The purpose of this machine is to wind from fibrous pulp the body or sides of vessels of the nature of pails or other tapering forms to which bottoms are afterward to be applied to complete the vessel.

It comprises, in general, a horizontal revolving bed upon which the fibrous pulp is received and whereon it forms a film, the receiving-top of such bed being formed of wire-gauze of very fine mesh, so that the fiber or woody particles of the pulp cannot pass through it, but so that the water can drain or be forced through it, leaving the pulp sufficiently dry to be suitably wound upon forms, operated in a manner hereinafter described, to take up the film from the receiving-bed, and to wind it in successive layers to the desired thickness.

A is a fixed frame or support, upon which, at the center on a vertical stud-pin A' , there is journaled the horizontal spider or frame B, comprising in addition to the hub the arms B' and the peripheral annular flange B^2 . Upon the arms A^2 of the frame A are supported, by means of the upright brackets A^{20} , the pulleys C, journaled on horizontal stud-axes on said brackets A^{20} , and adapted to revolve in vertical planes in position to sup-

port the peripheral annular flange B^2 as the spider B revolves. Nearer the ends of the arms A^2 , upon similar upright brackets A^{21} , there are journaled similar pulleys C' , and upon said pulleys there is supported the annulus D, concentric with the annular flange B^2 and angle-shaped in radial section, having its horizontal flange in the same plane with the annular flange B^2 , said horizontal flange resting on the pulleys C' . The vertical flange D' is expanded at its lower edge and toothed, forming a horizontal circular rack D^{10} , by means of which rotary motion is communicated to the annulus, and thereby to the spider B and the annular flange B^2 , which are connected to the annulus D by the wire-gauze sheet E. This is a continuous integral sheet of very fine meshed wire-cloth which is secured on the upper surface of the annular flange B^2 and of the annulus D, and which may be secured, also, if found desirable, at the center to the hub of the spider B. The mode of securing this sheet E to the annular flange B^2 and annulus D is preferably by means of the angle-shaped annulus F, having its vertical flange at the outer edge, said annulus being placed above the annular flange B^2 and secured to said flange by suitable screws or rivets passing through it and through the flange B^2 , the sheet of the gauze being thereby clamped between the flange B^2 and the annulus F, and by a similar flange F' similarly placed above and secured to the horizontal flange of the annulus D, but having its vertical flange at the inner edge, whereby said vertical flanges of these annuli F F' face each other. By this means the wire-gauze sheet is kept perfectly smooth and stretched tight over the space intervening between the flange B^2 and the annulus D, no obstruction of any sort existing between said securing parts to prevent continuous contact of any fixed part with either the upper or lower surface of the wire-gauze, which extends between said annuli, while the entire bed, made up of the spider B, annulus D, and connecting gauze E, is revolved. Rotary motion is communicated to this bed B E D by means of the pinion G on the end of the shaft g, which meshes with the rack D^{10} , and

to which power is communicated by a belt over the pulley G' on the outer end of the shaft g.

H is a chute or spout, or sluiceway, through which the pulp in liquid is discharged onto the upper surface of the annular portion E' of the gauze sheet E, between the flange B² and the annulus D.

J is a rubber annulus of considerable thickness—that is, relatively to the thickness of the gauze—being preferably about half an inch in thickness, which is made of suitable size to fit snugly outside of the vertical flange of the annular clamp F, resting upon the upper surface of the gauze sheet E, completely encircling the clamp F and forming a guard or dam at the inner circumference of the annulus E', whereon the film is deposited.

K is a rubber belt, of material similar to the annulus J—that is, quite heavy—and made in the form of a horizontal annulus, whereby it is adapted to be carried as will now be described—to wit, upon the pulleys L² L³ L' L'² L'³, which are supported upon brackets l' l' l'² l'³, secured upon the outer surface of the frame A, extending up and overhanging the annulus E' of the bed, the extreme or most widely separated of said brackets and rollers being distant from a quarter to a third of the circumference of the bed. These pulleys have beside the cylindrical faces on which the belt K travels, vertical flanges or guards l³ at their inner edges to retain the belt on them. The belt K being, as stated, made in the original form of an annulus, is of such size that normally—that is, when spread out horizontally—it would fit within the angle-iron guard or clamp F'. So much of it as rests upon the gauze E, therefore, does fit within the corresponding portion of the clamp F'. The remainder of the annulus being folded for the purpose, passing up around the pulleys L² L³ L' L' L' mentioned, completes the circuit out of contact with the gauze. The extreme brackets l² l² are set in such position vertically that the pulleys L², which they support, are distant above the surface of the gauze E only sufficiently to admit the thickness of the belt between the gauze and pulleys—that is to say, so that the belt K rests upon the surface of the gauze at its outer margin, the flanges of these extreme wheels being not wide enough to prevent the belt from thus resting upon the gauze. Said flanges may be narrower than the thickness of the belt by as much as the thickness of the film of pulp to be deposited on the gauze without rendering the belt liable to slip off from the pulleys, because the disks N, hereinafter described, tend and are effective to hold the belt on these extreme pulleys. The belt K is held edgewise in contact with the vertical flange of the clamp F' and prevented from springing away from it, as it might otherwise do, by means of the horizontal disks or pulleys N, journaled upon the downwardly-extending and overhanging ends

of the brackets N', which are secured to the frame at the outer side in the same manner as the brackets l' l' l'², these pulleys N peripherally contacting the inner circumference of the belt K at its upper edge only, and not extending down far enough to contact the wire-gauze E, but leaving sufficient space for the greatest thickness of film which it is ever desirable to deposit on the bed. From this construction it will be observed that the belt K will be actuated by frictional contact with the gauze top E, and will be carried with it between the extreme pulleys L² L², returning from the last back to the first of said pulleys over the pulleys L' L' L'.

M M are tapering rollers suitably journaled on the frame A underneath the extreme pulleys L² and bearing upward against the under surface of the wire-gauze to insure the grasp of the latter on the belt K, so that the belt will certainly be driven as the bed revolves. This belt K thereby constitutes a dam or guard for the pulp delivered onto the annulus E', operating for this purpose in the same manner as the rubber annulus J at the inner margin of the annulus. The purpose of these dams J and K is to prevent the tearing or roughening of the edges of the film delivered onto the bed, which would happen if the guards were fixed while the bed revolved.

In order to support the gauze against the danger of sagging under the weight of the saturated fiber or pulp and the suction applied to extract the water from the pulp and so cause inequality in the thickness of the film and rapidly deteriorate the gauze, I prefer to provide the sectoral frame P, attached to the frame A, consisting of two curved sides P' P' in which are journaled rollers P², as closely together as they can be without actual contact, the upper periphery of said rollers being in the horizontal plane of the under surface of the gauze E, and thereby supporting it, but not in anywise preventing the drainage of water through it. This frame is most conveniently made to serve as the exhaust-chamber, by means of which the suction necessary to extract the water from the pulp is applied, and for this purpose it is made in the form of a pan with close sides and bottom and is provided at its upper margin with a rubber or leather lip p all around, which contacts closely the under surface of the gauze, and a suction-pipe P³ is connected into the bottom of said pan-frame P, and is thereby adapted for connection with the exhaust-pump.

To the frame A are secured the brackets R, extending up outside of the bed and supporting at their upper ends the spindles R', which extend radially with respect to the bed, and support the forms R¹⁰, upon which the bodies are wound in a position overhanging, and when in operation resting upon the annulus E'. The spindles R' are secured to vertical disks R², which are connected by the horizontal pivot-bolts R²⁰ to the brackets R,

by which said spindles are adapted to be adjusted by rocking them over said pivot-bolts to throw them to a vertical position for the purpose of applying the forms, and down to a horizontal or approximately horizontal position to bring the surface of the forms into position to take up the films from the annulus E'.

The forms R¹⁰ are made of sheet metal in the shape of conical frustums. The means by which they are supported upon the spindles R' consist of frames or skeleton forms R¹¹, which comprise each a hub R¹², which is journaled on the spindle and has secured to it or formed integral with it at each end a spider R¹³. The ends of the radial arms of said spiders being connected by longitudinal strips R¹⁴, upon which the forms R¹⁰ are applied and whereon they are held by friction, the taper of the forms and frame being sufficient to accomplish this result.

To the frame A are secured two arms S S, located at the remote sides of the brackets R R, respectively—that is, so that said brackets are between the arms. These brackets extend up outside the revolving bed and are thence bent inwardly and extended across above the annulus E', nearly to a point directly above the inner margin of said annulus, and are there connected by a segmental flange S', which stands just above the gauze in such position that the rubber dam J may be lifted off the gauze and rest upon them throughout so much of its extent as is radially inward from the space occupied by the winding forms. The purpose of this construction when it is employed is to receive the edge of the film deposited on the bed from the inner guard or dam J before such film is wound up on the form so that when thus wound the edge of the film will not be liable to be rendered ragged and torn by its tendency to cling to the dam J, as might otherwise be the case.

The mode of operating this construction will be understood by those familiar with the art, but may be briefly explained. The bed being set in motion through the pinion G, the pulp is admitted onto the annulus E' through the sluiceway H as the bed revolves. The film thus deposited is deprived of its water to as great an extent as necessary, partly by free drainage through the gauze top E, and further by suction applied by means of a pump at any convenient point and for any necessary distance along the under surface of the gauze, whereby the water is sucked out of the pulp, which is thus left in a very moist but no longer strictly liquid condition on the upper surface of the annulus E'. When the initial end of the film of pulp thus deposited and drained reaches the form R¹⁰, the operator will cause it to adhere to the latter, which, being revolved as the bed continues to revolve, will wind up the film onto it until the desired thickness for the article to be made is obtained. The operator will then by a stroke of the hand across the annulus E' sever

the film on the latter from that wound on the form and then rock the spindle R' up to a convenient position for removal of the form R¹⁰ from the frame R¹¹.

As illustrated, two spindles R' and associated parts are shown. This is to increase the capacity of the machine in operation and to prevent any loss of time while forms are being applied and removed. When one form has been removed from the frame on the first spindle in the manner described, and while the operator is attending to that form and preparing to apply another on the same frame, a body may be wound on a form on the frame on the other spindle, and when that is completed and while it is being removed a second form being placed on the frame on the first spindle the operation may be repeated there, thus alternating the use of the spindles and preventing any cessation or necessity for cessation of the rotation of the bed or the formation of the film thereon.

I claim—

1. In a winder, in combination with the supporting-frame, the horizontal supporting-bed comprising two concentric rings, and the fine-meshed wire-cloth secured to both said rings, the inner of said rings being connected to a hub and journaled at its center on the frame, and the outer ring being unconnected to the inner except by the wire-cloth, substantially as and for the purpose set forth.

2. In a winder, in combination with the frame, the horizontal revolving bed comprising the two rigid concentric rings, and the wire-cloth secured to and connecting them, the inner ring being journaled at its center on the frame, and the outer ring being supported by brackets projecting upwardly from the frame, and provided at their upper ends with suitable bearings on which the ring may rest and rotate, substantially as set forth.

3. In a winder, in combination with a frame, the revolving bed supported thereon, consisting of two concentric rigid rings and the wire-cloth secured to and connecting them, the inner of said rings being journaled at its center on the bed, and both said rings being supported upon brackets which project upward from the frame and are provided with anti-friction rollers at their inner ends to contact the rings, substantially as set forth.

4. In a winder, in combination with the revolving horizontal reticulated bed, the rubber ring J, resting upon said bed and constituting a wall for the pulp-receiving annulus thereof, the annular belt K, having one ply resting upon the bed at the outer margin thereof in an arc about the axis of the center of the bed, and the pulleys L² L², around which said belt travels, overhanging the margin of the bed and upholding the upper ply of the belt, substantially as set forth.

5. In combination with the horizontal rotating bed, comprising the concentric rigid rings and the web which connects them, the annular belt K and its supporting-pulleys, and the

tapering pulleys M M, journaled on the frame and located underneath the extreme supporting-pulleys of the belt K, whereby the belt is held firmly onto the revolving web and actuated thereby, substantially as set forth.

6. In combination with the revolving bed, the belt K and its supporting-pulleys arranged in the arc of a circle overhanging a portion of the margin of the revolving bed, and having the flanges ℓ^3 to retain the upper ply of the belt in its curvilinear path, substantially as set forth.

7. In combination with the revolving bed, the belt K, having its lower ply resting upon the upper surface of the revolving bed at the margin thereof, the pulleys which sustain said belt in its upper ply, the brackets N', secured to the frame and projecting up outside of the revolving bed, and thence inward and overhanging the margin thereof, and the horizontal pulleys N, journaled upon the overhanging ends of said brackets and peripherally contacting the inner edge of the lower ply of the belt K at the upper part of said edge to retain said lower ply of the belt in its proper curvilinear path, substantially as set forth.

8. In combination with the horizontal revolving bed, the tapering form R^{10} , having its axis in a vertical plane radial to the bed, and having its spindle or shaft supported on a horizontal pivot at right angles to such plane outside the margin of the bed, whereby such form may be raised out of and dropped into contact with the bed by rocking its shaft up

and down on such pivot, substantially as set forth.

9. In combination with the horizontal revolving bed and the fixed frame which supports it and the rubber ring which constitutes a pulp-dam at the inner margin of the pulp-carrying annulus of such bed, the winding-form R^{10} , overhanging such annulus, and the segmental dam-support S', overhanging the bed and supporting the dam at the vicinity of the winding-form, substantially as set forth.

10. In combination with the horizontal revolving bed and the fixed frame which supports it and the rubber ring which constitutes the pulp-dam at the inner margin of the pulp-carrying annulus of such bed, the winding-form R^{10} , overhanging the annulus, and the bracket S, supported by the fixed frame and extending up outside of the revolving bed and thence inward and overhanging the bed, and having the segment S' at its inner end, and the arms S^2 , extending from said brackets overhanging the dam at the ends of the segment S', and the anti-friction rolls S^3 , journaled on said arms S^2 , substantially as set forth.

In testimony whereof I have hereunto set my hand, at Chicago, this 20th day of June, 1890.

E. HUBBARD.

Witnesses:

CHAS. S. BURTON,
JEAN ELLIOTT.