(No Model.) 3 Sheets—Sheet 1.

T. H. SAVERY.

PAPER WINDING DEVICE.

No. 423,448. Patented Mar. 18, 1890.

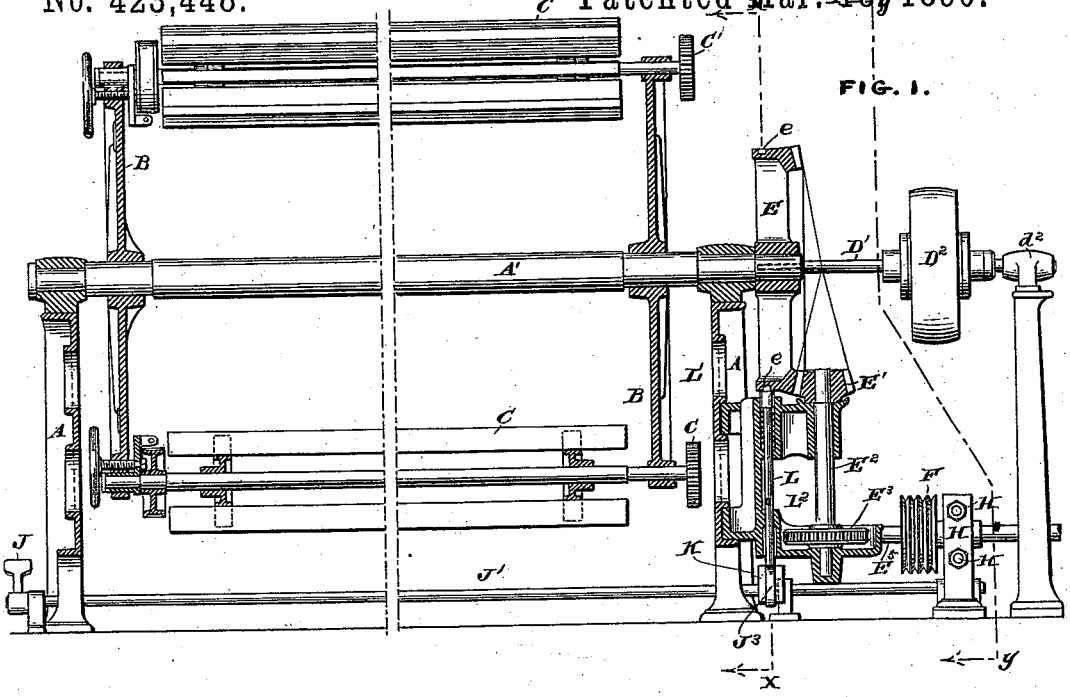

FIG. 1.

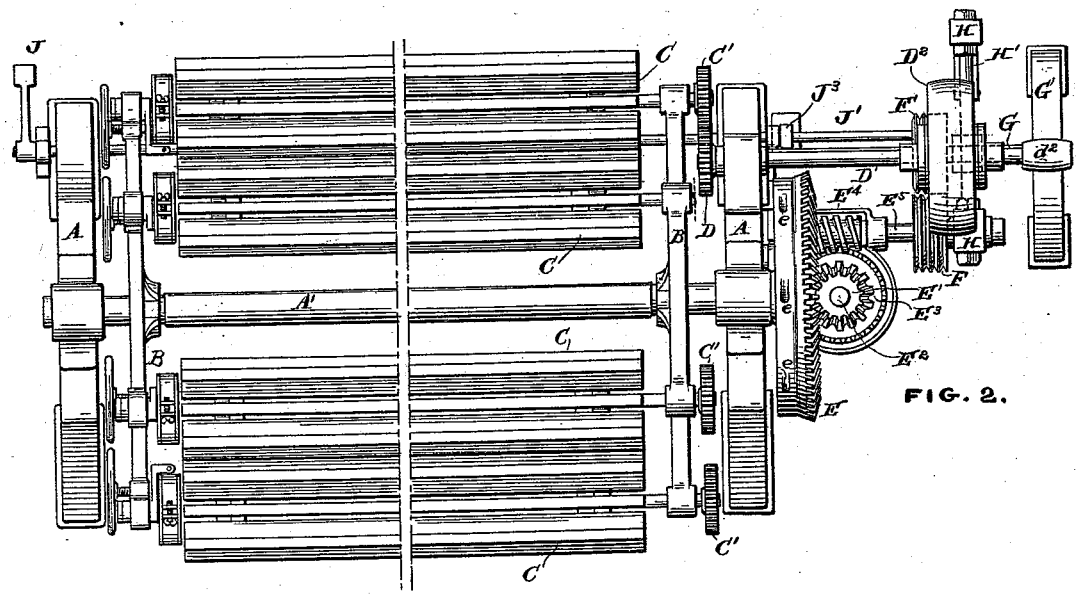

FIG. 2.

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INVENTOR:
Thomas H. Savery
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Francis T. Chambers

(No Model.) 3 Sheets—Sheet 2.

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FIG. 3.

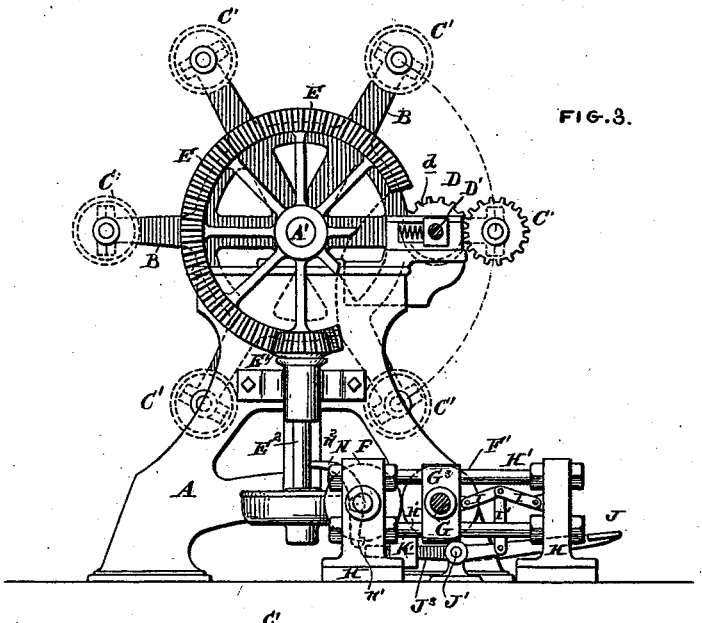
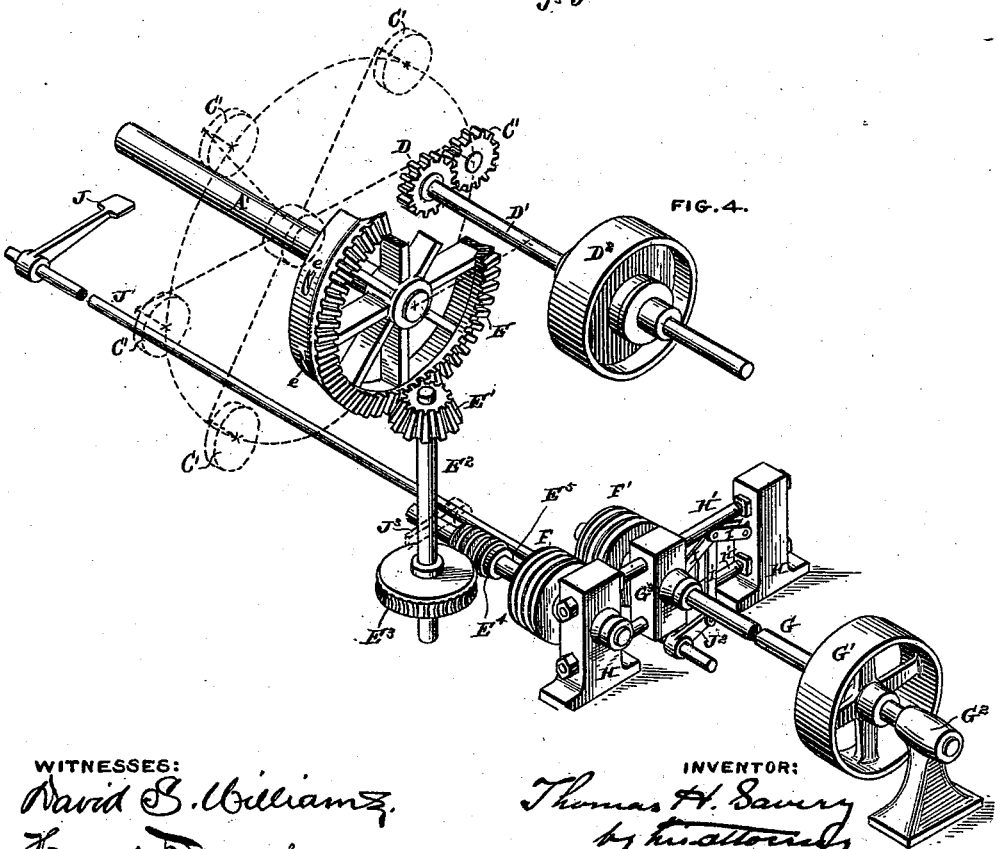


FIG. 4.



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(No Model.) 3 Sheets—Sheet 3.

T. H. SAVERY.

PAPER WINDING DEVICE.

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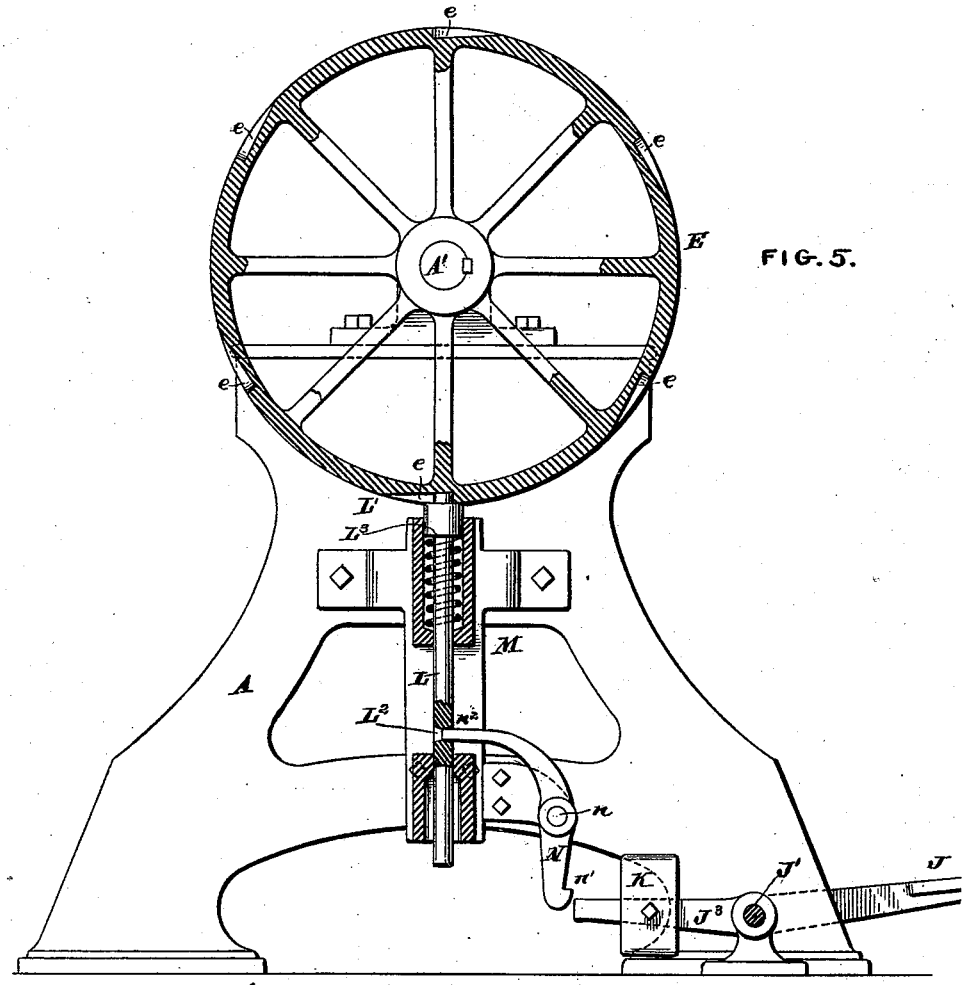

FIG. 5.

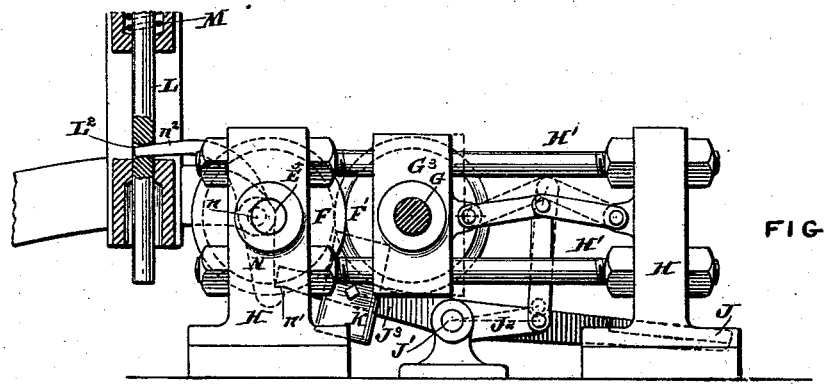

FIG. 6.

WITNESSES:
David S. Williams,
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INVENTOR:
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by his attorney
Francis T. Chambers

UNITED STATES PATENT OFFICE.

THOMAS H. SAVERY, OF WILMINGTON, DELAWARE.

PAPER-WINDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 423,448, dated March 18, 1890.

Application filed June 18, 1889. Serial No. 314,731. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. SAVERY, of Wilmington, county of Newcastle, State of Delaware, have invented a new and useful Improved Paper-Winding Device, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the device used to wind up the web of paper as it comes from the paper-making machinery. In mechanism used for this purpose it is usual to have a number of rolls journaled in a large revoluble frame, so that the rolls can be brought into position to wind up the paper one after the other, and filled rolls removed while others are being filled. Trouble, delay, and waste occur in changing the web from one roll to the other, and my invention has for its object to facilitate the change of the web from one roll to the other and to render the operation more nearly automatic than heretofore. This I accomplish by combining a revolving frame with a number of winding-drums secured around its periphery, and having spur-wheels attached to their shafts, a spur-wheel arranged to engage and drive the gears on the rolls as they come into proper position, a system of gearing arranged to actuate and rotate the frame, a driving-shaft, a clutch arranged to connect the said driving-shaft with the mechanism for actuating the frame, and mechanism for actuating the clutch at will. Preferably, I employ in addition a stop or catch to hold the clutch engaged and a disengaging device actuated by the mechanism for rotating the frame, as will be hereinafter described, and in the drawings I have illustrated my improved device as embodied in the most simple and effective form and the one I believe to be the best.

Reference being had to the drawings in which my invention is illustrated as aforesaid, Figure 1 is a front elevation, partly in section; Fig. 2, a plan view; Fig. 3, an end view on the section-line *y y* of Fig. 1; Fig. 4, a perspective view illustrating the system of gearing, the clutch, and the mechanism employed for actuating the clutch. Fig. 5 is an end view on the section-line *x x* of Fig. 1 and not including the frame and paper-rolls supported upon it, and Fig. 6 is a side elevation of the clutch and mechanism immediately controlling and affecting it.

A is the frame of the machine; A′, the central shaft or axle supporting revolving frame B.

C C, &c., are the rolls on which the paper is wound, C′ C′, &c., being spur-wheels attached to the shafts of these rolls.

D is a spur-pinion secured on a shaft D′ and driven by a pulley D^2, situated on said shaft. This is the system of gearing for driving the paper-rolls as they come into position. To facilitate the engagement of the pinion D with the pinion C′, the shaft D is represented as sustained at one end on a pivotal bearing d^2, while at the other end it is secured in a slot supported on the frame A and held in position by a spring *d*, which permits it to yield in case the teeth of the spur-wheels do not engage properly when they come together.

E is a wheel secured on the supporting-shaft A′ of the frame. As shown, it is provided with beveled teeth, which engage with a bevel-wheel E′, secured on the end of a shaft E^2, on which shaft a worm-wheel E^3 is also secured, so as to engage with the worm E^4 on counter-shaft E^5.

G is a driving-shaft, and G′ a driving-pulley situated on said shaft, F and F′ representing the two parts of a clutch arranged to connect the driving-shaft G with the counter-shaft E^5. As shown, the clutch is of the familiar type of frictional gearing, and the shaft G is secured at one end in a pivotal bearing G^2, and at its other end in a sliding block G^3, supported on parallel bars H′ H′, the ends of which are secured in strong supporting-blocks H H. By this construction the part F′ of the clutch can be moved to engage with or disengage from the part F.

The mechanism for actuating the clutch illustrated in the drawings is simple, and I have found it in practice very efficient. It consists of a toggle-joint made up of links I I, pivoted together at the center with one of the free ends pivoted to the block G^3 and the other end to a support H, as shown. An actuating-link I′ is attached to the center of the toggle and its other end connected with a lever

J^2, attached to an actuating-rod J', J being an actuating-lever also being connected with the said rod or shaft J', and by which it is actuated. It is of course evident that by moving the lever J the clutch F F' will be engaged or disengaged in accordance with the direction in which the lever is moved, and it is also evident from a glance at the drawings that whenever the clutch F F' is engaged the motion of the driving-shaft G is communicated to the counter-shaft F and through the system of gearing described to the revolving frame B, so as to bring the paper-rolls into engagement with the driving-pinion D' in turn.

In order to relieve the operator of the necessity of manipulating the clutch so as to bring each paper-roll to proper position and then stop the motion of the frame, I employ mechanism consisting of a catch, which holds the clutch together, and a disengaging device, which releases the said catch and throws the clutch out of gear as soon as the desired motion of the frame has been accomplished. As shown in the drawings, a lever J^3 is attached to the shaft J', and provided with a counter-weight K, the lever and weight being so arranged as to act normally to keep the clutch disengaged. In the surface of the wheel E, I form a cam-path consisting of the plain cylindrical surface of the wheel and a number of holes *e*, having abrupt faces in the direction in which the wheel turns and tapered faces in the direction from which the wheel turns. In proper guides attached to the frame of the machine I secure a rod L, the upper end L' of which travels in the cam-path before referred to, on the wheel E, being of a size which permits it to pass into the holes formed on the wheel, and which holes I should state are equal in number to and symmetrical in arrangement with the winding-drums secured upon the frame. A spring M is employed to hold the rod L in contact with the cam-path of the surface of the wheel E. Pivoted at *n*, on the frame of the machine, is secured a bent lever N, having a catch or hook *n'* at one end, while its other end n^2 is engaged by the rod L by passing through a perforation in it at L^2, so that as the rod moves up and down the bent lever turns on its pivotal support *n* and its hooked end is made to move toward and away from the end of the lever J with which it is in line.

The operation of the device is as follows: The operator desiring to bring a new roll into position moves the clutch-actuating shaft J'—as, for instance, by placing his foot upon the lever J. The shaft J' in rotating causes the lever J^2 to move down and through the link I' straightening out the toggle-links I I, pressing the clutch F F' together, and connecting the driving-shaft G with the mechanism described for rotating the frame. The lever J^3, with its counter-weight, is of course thrown upward as the shaft rotates. As the motion of the driving-shaft is communicated to the revolving frame, the wheel E, of course, revolves, and in revolving presses the rod L downward, the sloping side of the hole *e* acting upon it gradually until it is pressed out and rests upon the cylindrical periphery of the wheel. As the rod is pressed down, it causes the bent lever N to move upon its pivot *n*, as before described, and the hooked end *n'* of said lever passes beneath the end of the lever J^3, so as to engage and retain it in its upward position. All this takes place in a very short space of time, and the operator can now remove his foot from the lever J without releasing the clutch, which is held in position by the clutch on lever N acting through the mechanism by which the clutch is actuated. When the wheel E is rotated so that another hole *e* in its cam-path registers with the end of the rod L, said rod will spring over the abrupt edge of the hole, moving rapidly upward and causing the bent lever end to move with it, so as to release the end of the weighted lever J^3, which immediately falls down, rotating the shaft J', and through the lever J^2 and link I' causing the toggle to move upward and pull the two parts of the clutch apart, thus disengaging the driving-shaft G from the mechanism for driving the frame.

The mechanism shown and above described is, as I have already said, the simplest and best which I have devised for carrying my invention into effect. I do not, however, wish to be understood as limiting my claim to the specific arrangements of mechanism shown, except where such limitations are clearly expressed in the claims.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for winding paper, a revolving frame having a number of rolls for paper or winding-drums secured around its periphery, and having spur-wheels attached to their shafts, in combination with a spur-wheel arranged to engage and drive the spur-wheels on the rolls as each comes into proper position, a system of gearing arranged to rotate the frame, a driving-shaft, a clutch arranged to connect the driving-shaft and the system of gearing arranged to rotate the frame, and mechanism for actuating the clutch at will, substantially as and for the purpose specified.

2. In a machine for winding paper, a revolving frame having a number of rolls for paper or winding-drums secured around its periphery, and having spur-wheels attached to their shafts, in combination with a spur-wheel arranged to engage and drive the spur-wheels on the rolls as each comes into proper position, a system of gearing arranged to rotate the frame, a driving-shaft, a clutch arranged to connect the driving-shaft and the system of gearing arranged to rotate the frame, mechanism for engaging the clutch, a stop to hold the clutch engaged, and a device for disengaging the clutch actuated by the mechanism for rotating the frame, substantially as and for the purpose specified.

3. In a machine for winding paper, a revolving frame having a number of rolls for paper secured around its periphery, and having spur-wheels attached to their shafts, in combination with a spur-wheel arranged to engage and drive the spur-wheels on the rolls as they come into proper position, a wheel E, secured upon the central shaft of the frame and having cam-surfaces *e e*, &c., formed on its surface and arranged to correspond in number and arrangement with the paper-rolls or winding-drums on the frame, a system of gearing arranged to rotate the frame and having a friction-wheel F on its main shaft, a movable driving-shaft G, having a friction-wheel F′, secured upon it so as to engage the corresponding wheel F when moved toward it, a system of levers for moving the friction-wheel F′, a catch-lever J^3, secured to a shaft for actuating the lever system, a stop-rod L, secured in bearings, so as to have its head in the cam-path on wheel E, a spring M to hold the rod in contact with wheel E, a catch-lever N, arranged so as to be actuated by rod L and engage the catch-lever J^3 when thrown up, and a weight or its equivalent arranged on the lever system aforesaid and acting to force the friction-wheels apart when the stop-lever J^3 is disengaged from catch N, all substantially as and for the purpose specified.

THOS. H. SAVERY.

Witnesses:
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S. P. SAVERY.