

(No Model.)

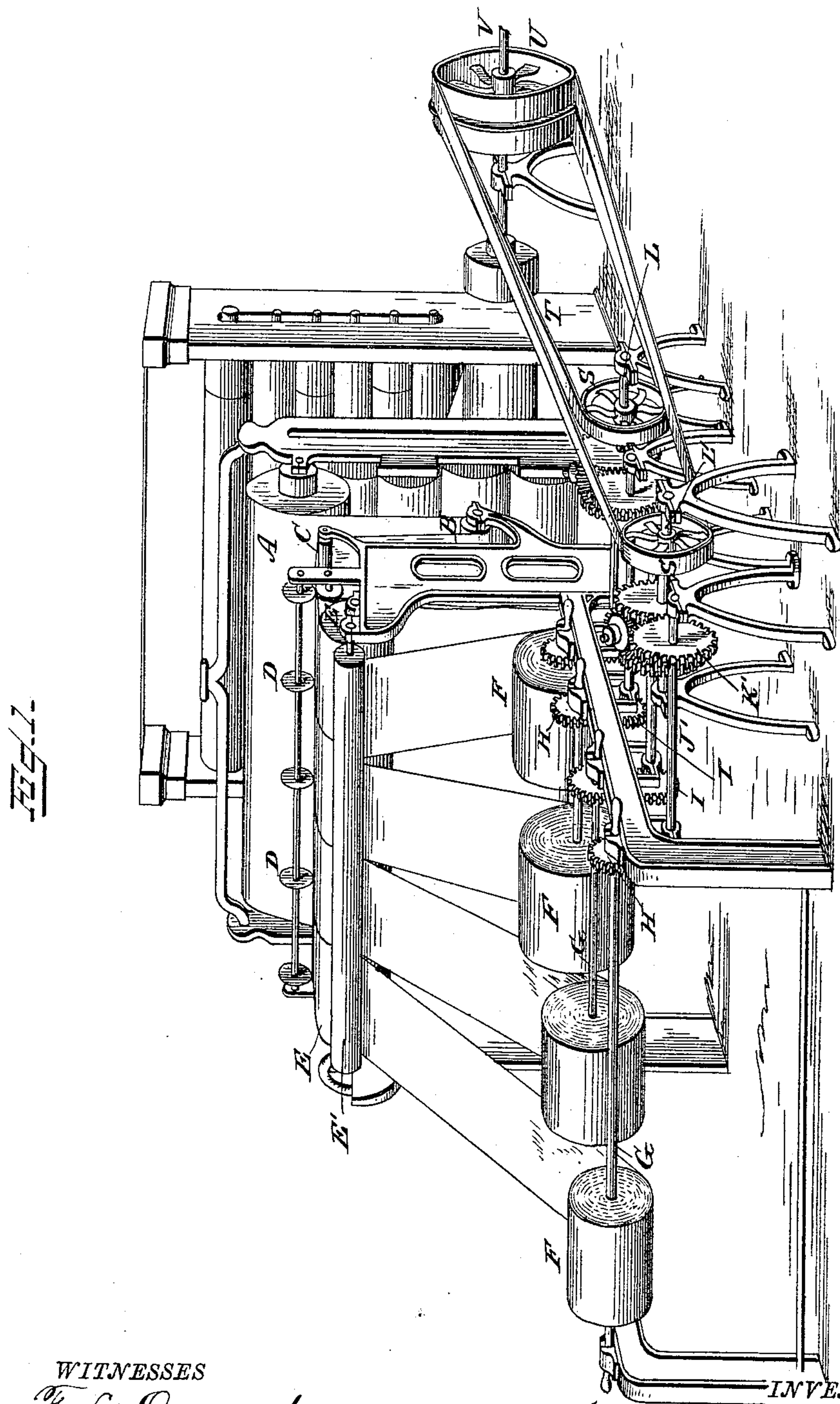
2 Sheets—Sheet 1.

J. J. MANNING.

APPARATUS FOR WINDING PAPER WEBS INTO ROLLS.

No. 344,187.

Patented June 22, 1886.



WITNESSES

F. L. Ourand.

Maurice Delmar.

INVENTOR

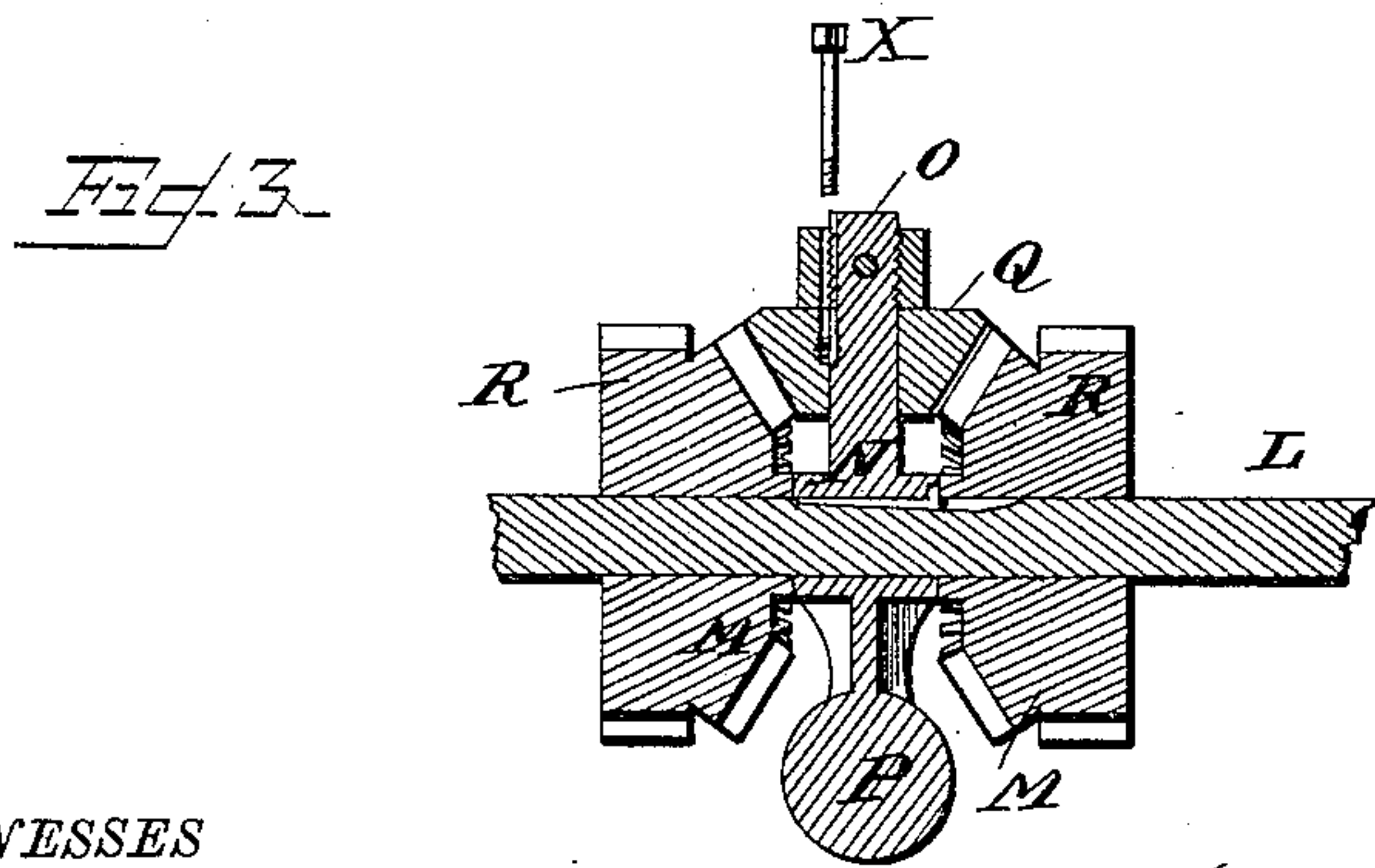
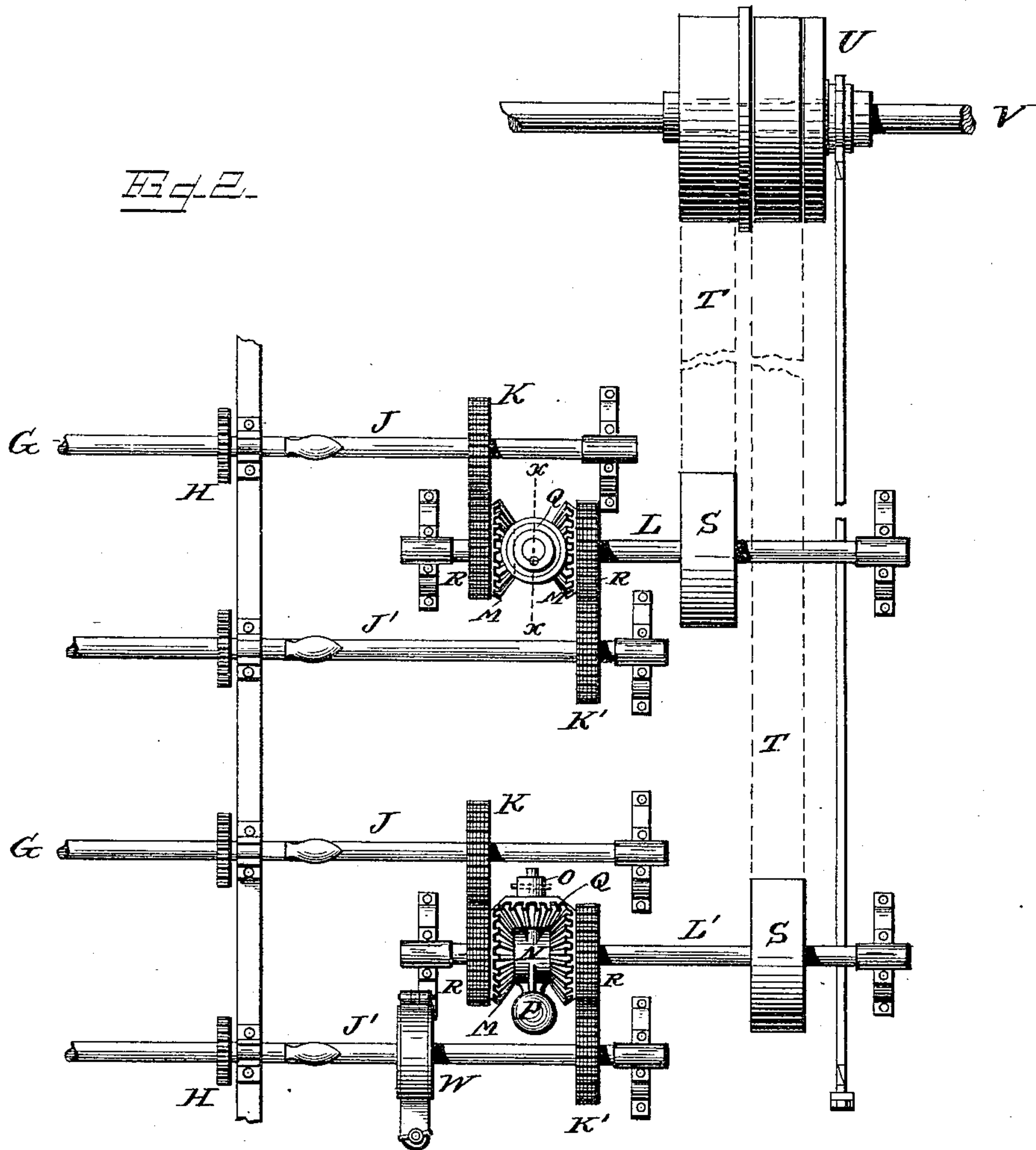
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UNITED STATES PATENT OFFICE.

JOHN J. MANNING, OF GREAT BARRINGTON, MASSACHUSETTS.

APPARATUS FOR WINDING PAPER WEBS INTO ROLLS.

SPECIFICATION forming part of Letters Patent No. 344,187, dated June 22, 1886.

Application filed November 12, 1885. Serial No. 182,518. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. MANNING, a citizen of the United States, and a resident of Great Barrington, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Winding Paper Webs into Rolls; and I do hereby declare that the following is a full, clear, and exact description of the invention

which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, My invention has relation to that part or

portion of paper-making machines in which the web of made paper as it leaves the paper-making machine proper is cut into strips longitudinally and the said strips wound upon spools into rolls of suitable size adapted for newspaper work, book-work, and any class of paper where a continuous web is required.

In this "spooling" or winding apparatus it is very desirable, where more than one spool is used, to equalize the speed of the several spools and their rolls of web in such a manner that rolls of different diameters can be revolved at different speeds, corresponding to their respective diameters, and still be driven from the same main shaft, so that the several strips of paper into which the web is cut may all be wound simultaneously and evenly upon their respective spools regardless of their diameters.

By my method of equalizing the speed of the several rolls I effect a great saving in material as well as labor, because I can remove damaged paper from any one of the rolls without breaking the web of paper on the other rolls, or without removing a corresponding quantity of good paper from the other rolls; and, again, I can start a fresh roll at any time during the operation of the machine, regardless of the status of the rolls which are in process of being wound, and without stoppage of the same.

In the Letters Patent of the United States No. 320,375, granted to me June 16, 1885, I have described and claimed a certain mechanism for accomplishing this result; and my present invention, which has the same object in view, consists in another means or mechanism in which I have simplified the construction and combination of the various co-oper-

ating parts, as will be hereinafter more fully described.

In the accompanying two sheets of drawings, Figure 1 is a perspective view of so much of a paper-machine as is necessary to illustrate my invention. Fig. 2 is a plan of the gearing mechanism of the same; and Fig. 3 is a vertical sectional view on line $x\bar{x}$ in Fig. 2 on an enlarged scale.

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

In the present illustration of my invention I have shown a machine running four spools, or what is known in the trade as a "four-winder;" but any even or uneven number of spools may be used, as may be desired, according to the capacity of the machine. The web of paper after it leaves the roll A passes under the usual roller, B, and then in an upward direction over a small roller, C, and between the revolving cutters D, which are properly spaced to cut the web into strips of the desired widths. These strips then pass over a roller or cylinder, E, and after leaving the latter pass under the roll E' and diverge to their separate spools (shown at F) upon which the paper is wound into rolls.

The spool-shafts G are provided with pinions H, which mesh into cog-wheels I upon shafts J J', which have cog-wheels K K' at their other ends. The cog-wheels K and K' are so arranged upon their respective shafts J and J', that there shall be sufficient room between them for the equalizing mechanism mounted upon the drive-shafts L and L'. This equalizing mechanism consists of two beveled cog-wheels, M M, running loosely upon the shafts L L', on opposite sides of a hub, N, which is keyed upon the shaft and provided on one side with an arm, O, and on the other side with a counterpoise, P. Upon the arm O is journaled a cone-pinion, Q, which meshes with the two bevel-wheels M M. Upon each of the shafts J and J' is also placed a cog-wheel, R, which is concentric to and revolves with the bevel-wheels M. If desired, these wheels R may be cast in one piece with the wheels M, as shown in Fig. 3, or they may be made separately and keyed upon the hubs of the latter, or fastened to them in any suitable way, so that they will run with the said wheels M loosely upon their shafts. The shafts L L'

are revolved by pulleys S and belts T, which pass round the pulley-rims of an equalizing-pulley, U, on the main drive-shaft V. I prefer to use for this purpose the equalizing-pulley shown and described in my Letters Patent No. 320,375, hereinbefore referred to, but desire it to be understood that I do not limit myself to any particular form or construction of equalizing-pulley. By means of this pulley the belts and their pulleys S S will run at equal speed, and it follows that the shafts L and L', with the equalizing-hubs N fastened upon them, also revolve at the same speed. It will now be seen that as the hub is revolved the cone-pinion on arm O will engage the pair of intermeshing cog-wheels M M at diametrically-opposite places, and turn them and their concentric cog-wheels R around with it as it is revolved, so long as the tension on the intermeshing cog-wheels K and K' is even; but the moment the tension upon one of these wheels K or K' becomes greater than upon the other the wheel or wheels R M on that side will turn the cone-pinion Q, which, as it now revolves at a greater speed than the opposite cog-wheel M, will turn the latter, and with it its appropriate wheel R, and thus increase its speed by causing it to run ahead of the shaft upon which it is journaled until the equilibrium is restored and the wheels on both sides of the cone-pinion revolve at even speed. As the drive-wheels K and K', which, through the shafts J J' and gears H I, revolve the spools, depend for the speed of their motion upon the said wheels R M, it follows that the speed of all the spools will be equalized, regardless of the diameters of the rolls wound upon them.

By disposing the equalizing-gears between pairs of shafts J J', as shown, one of these equalizing devices answers for two spools, so that in a "four-winder," or a machine running four spools only, two of these devices are required, and as a pair of these devices are run by a single equalizing-pulley, it follows that only one of the latter will be required for a machine winding four spools simultaneously.

In a "three-winder," or a machine running any other uneven number of spools, the arrangement is substantially the same, only that in that case I lock or fix the cone-pinion upon its journal or arm by means of a pin, key, or any other suitable device (shown at X in Fig. 3) in such a manner that it will carry both of its intermeshing cog-wheels with it at an even rate of speed—in other words, the two cog-wheels M M on that shaft will practically operate as only a single wheel.

In order to prevent the shaft carrying the third or unevenly-numbered spool from running too fast, I apply a friction-clutch or clamp to the appropriate drive-shaft J or J', as shown at W, Fig. 2, by the proper adjustment of which I am enabled to so regulate the velocity of the said shaft that all the spools shall run at exactly the same rate of speed.

From the foregoing it will be seen that I

can start a fresh roll of paper at any time without stopping the machine, and without regard to the diameters of the spools or rolls already in process of winding. If a fault or flaw is discovered in the paper on any one of the rolls, the damaged portion of the paper may be removed without the necessity of removing a corresponding quantity of good paper from the other rolls, as in machines which are not provided with an equalizing device of this class; and by the simple arrangement of locking the cone-pinion upon its shaft by a key or pin, as described, any one of the equalizing devices may have its cog-wheels coupled in such a manner as to run only one spool-shaft instead of two, according to the capacity of the machine or the number of spools which it is desired to run at a given time.

In a "two-winder," or a machine running two spools only, I dispense with the differential or equalizing pulley, and employ in that case only the equalizing devices between the spool-shafts, and in a three-winder, or a machine running three spools, and not intended for a larger number, I, instead of using the brake mechanism hereinbefore described, make the pulley of the odd spool-shaft so much larger than the pulley of the other two shafts that it shall compensate for the decreased resistance—in other words, the pulley which runs the third or odd spool-shaft is of such a diameter relative to the diameter of the other pulley that this third or odd spool-shaft will run at even speed with the two former, notwithstanding the decreased resistance which it has to overcome.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In apparatus for winding or spooling rolls of paper, a device for equalizing the speed of the spools, consisting, essentially, of a hub fixed upon the drive-shaft, a cone-pinion with a counterpoise, and the compound cog-wheels engaging the cone-pinion and adapted also to engage the drive-wheels which impart rotary motion to the spool-shafts, combined with means, substantially as described, for locking or fixing said cone-pinion upon its journal, substantially as set forth.

2. In apparatus for winding or spooling rolls of paper, the combination of the shafts which impart rotary motion to the spools, the equalizing mechanism, constructed and arranged substantially as described, and the friction or brake mechanism, whereby the speed of any one of the said shafts may be retarded when it is desired to "lock out" one or more of the spools, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

JOHN J. MANNING.

Witnesses:

LOUIS BAGGER,
AUGUST PETERSON.