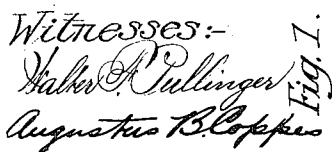


1,031,568.

3 SHEETS—SHEET 1.



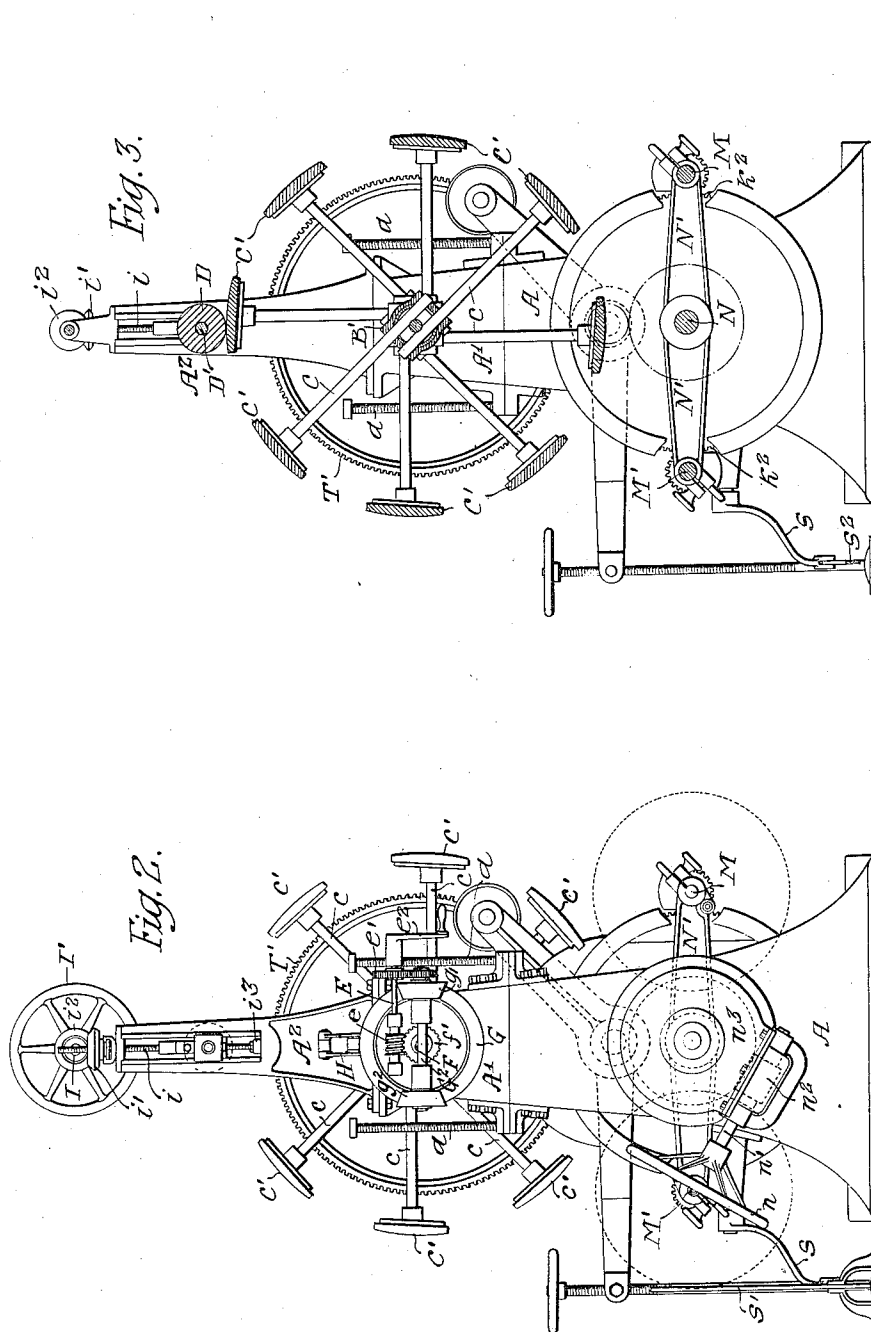
Inventor;
Guyon Miller
by his Attorneys
Johnson & Johnson.

G. MILLER.
 REEL FOR WINDING PAPER.
 APPLICATION FILED MAR. 6, 1911.

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Patented July 2, 1912.

3 SHEETS—SHEET 2.



Witnesses:-
 Walter P. Pullinger
 Augustus B. Clapp

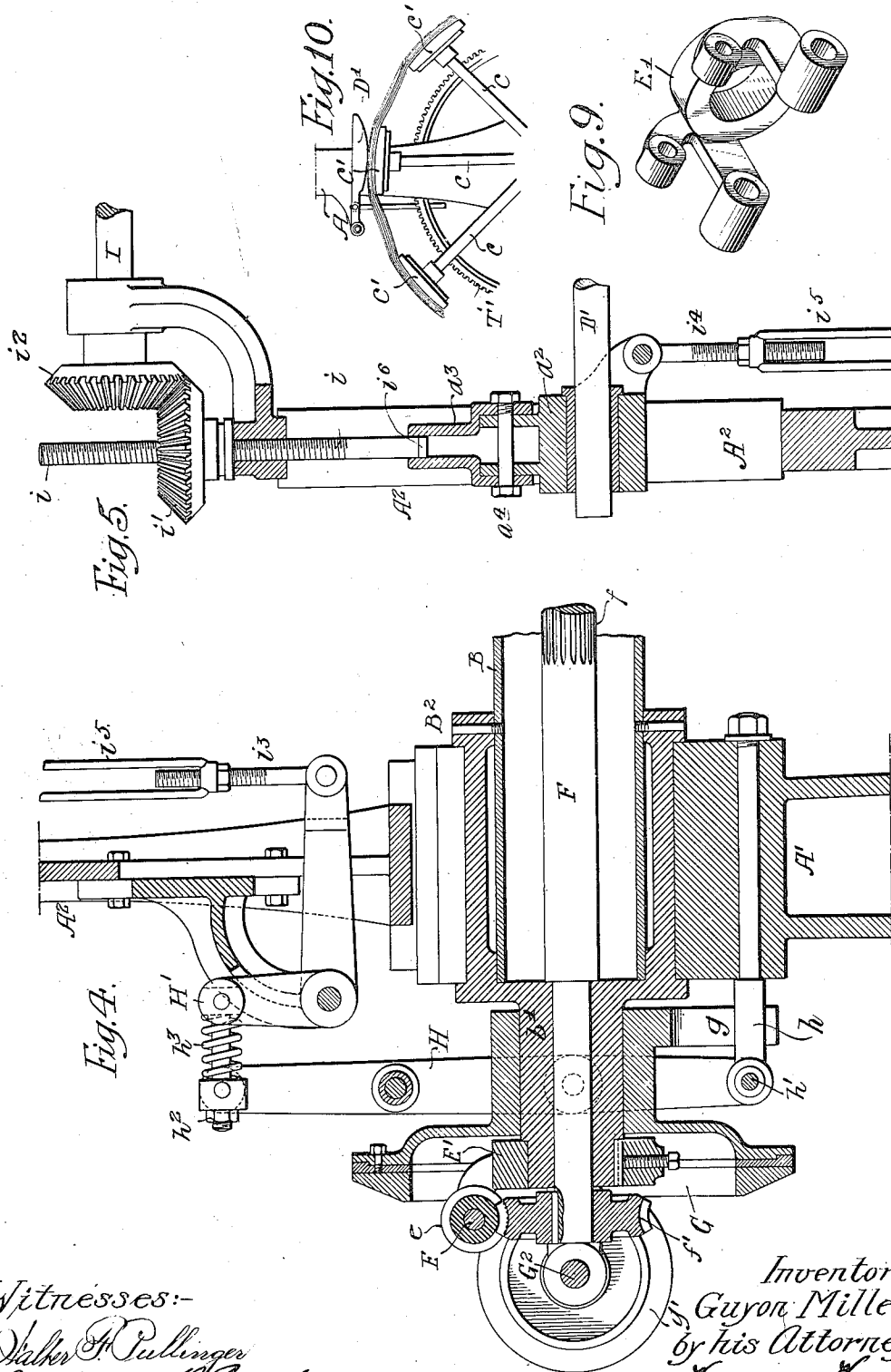
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3 SHEETS-SHEET 3.



Witnesses:-
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UNITED STATES PATENT OFFICE.

GUYON MILLER, OF DOWNINGTOWN, PENNSYLVANIA, ASSIGNOR TO DOWNINGTOWN MANUFACTURING COMPANY, OF DOWNINGTOWN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

REEL FOR WINDING PAPER.

1,031,568.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed March 6, 1911. Serial No. 612,476.

To all whom it may concern:

Be it known that I, GUYON MILLER, a citizen of the United States, residing in Downingtown, county of Chester, State of Pennsylvania, have invented certain Improvements in Reels for Winding Paper, of which the following is a specification.

This invention relates to certain improvements in machines for winding paper upon reels; the paper being afterwards cut from the reels into sheets.

This invention is particularly adapted for winding tissue paper, but it will be understood that any paper may be wound upon the machine without departing from the essential features of the invention.

The object of the invention is to provide automatic means for controlling the reel as it rotates so that the paper will be laid on the reel always at the same distance from the center of the reel and when the paper is cut from the reel the sheets will all be of the same length.

The invention also relates to certain details of construction which will be fully described hereafter.

In the present instance the reel is combined with mechanism for winding the paper on mandrels so that the machine can be used either for forming paper in rolls or in sheets.

In the accompanying drawings:—Figure 1, is a side elevation illustrating my improved machine for reeling paper; Fig. 2, is an end view; Fig. 3, is a transverse, sectional view on the line 3—3, Fig. 1; Fig. 4, is an enlarged sectional view of the clutch mechanism at one end of the machine; Fig. 5, is an enlarged sectional view of one of the bearings for the roller and its connections; Fig. 6, is a detached perspective view of one of the hubs; Fig. 7, is a detached perspective view illustrating one of the spoke sections; Fig. 8, is a detached perspective view of the pinion; Fig. 9, is a perspective view of the bearing collar, and Fig. 10, is a view of a modification of one feature of the invention.

A'—A' are bearing sections mounted on the frames A and having the bearings for the main shaft B of the winding reel C. The bearing sections A' are vertically adjustable on the frames A so that the reel can be raised a sufficient distance to allow for the opera-

tion of the mandrel winding mechanism when the paper is to be wound in the form of rolls.

a—a are screws which pass through the flanges one the bearing sections A' and are carried by the upper ends of the frames A and any suitable handle a' may be provided for the screws so that on turning the screws the bearings will be raised a sufficient distance to allow for the proper working of the roller winding mechanism under the reel. When the paper is being wound upon the reel C the bearing sections rest upon the frames A, as illustrated in Fig. 1.

The shaft B has heads B² at each end adapted to the bearing sections A', as clearly illustrated in Fig. 4, and the shaft is hollow, as shown. Secured to the shaft are hubs B', clearly illustrated in Fig. 6. These hubs have a series of transverse passages, each passage being located at one side of the center of the hub and the passages are spaced apart on a curved line, as shown in Fig. 6.

c—c is a series of spokes arranged to slide in the passages b and each pair of spokes carries a segmental rim section c'. These rim sections are spaced a given distance apart to allow the paper to bag inwardly as it is being rolled upon the drum. Extending through the shaft B is a long pinion F, as clearly shown in Fig. 8. The teeth f of this pinion mesh with the teeth c² of the spoke sections c, Fig. 7, so that on turning the pinion F in one direction the several spoke sections, with their rim sections, will be retracted, and when turned in the opposite direction the spoke sections will be projected.

The shaft B is driven by the main shaft L at one end of the machine and on this shaft is a pinion T, which meshes with a gear wheel T' on a spindle of the head B², which is secured to the shaft B.

D is a presser roller, which bears upon the paper as it is being wound upon the reel. The shaft D' of this presser roller is adapted to adjustable bearings a² mounted to slide in the standards A² carried by the bearing sections A'. The bearings are suspended from screws i—i and these screws pass through bevel gears i' mounted in bearings on the top of the standards A². The bevel gears i' mesh with the gears i² on a

hand operated shaft I having a hand wheel I'. On turning this hand wheel the bearings with the rollers D are raised and lowered.

5 The lever H is connected to a bell crank lever H' through a rod h^2 and on the rod between the lever H and the bell crank lever H' is a coiled spring h^3 . The long arm of this bell crank lever extends through the frame in the present instance and is attached to a threaded rod i^3 connected to a rod i^4 by a turn buckle i^5 . The rod i^4 is attached to a bracket on the bearing a^2 so that when the roller D is raised, as the paper accumulates on the reel, it will actuate the shifting lever H and will move the beveled friction disk G against the beveled driving disk g' , keyed to a shaft G^2 . On the shaft is a loose beveled disk g^2 , which is used for the purpose of balancing the disk g' . This shaft G^2 drives the pinion F through the gearing which will be described hereafter, so that when the roller D is raised by the accumulation of paper on the reel, it moves the friction disk G in contact with the disk g' which will drive the pinion F and as this pinion turns, it moves the segments of the reel toward the center of the reel and as soon as this is accomplished the friction disk is thrown out of contact until the accumulation of paper causes the reel to again contract. By this arrangement the surface of paper on the reel is always the same distance from the center of the reel.

35 The pinion F extends through the spindle b' and has at its outer end a worm wheel f' which meshes with a worm e on a transverse shaft E geared to the shaft G^2 , as shown in Fig. 1. The shafts E and G^2 are carried by bearings mounted on a sleeve E' secured to the projecting end of the spindle b' of the shaft B so that the two shafts and the gearing connected thereto rotate with the main reel shaft B and as the friction disk G has only a longitudinal movement when it is moved—in contact with the friction disk g' , it will cause the friction disk g' to rotate the shaft G^2 around its own axis and thus drive the pinion F.

50 On the shaft E is a handle e^2 by which the said shaft may be turned by hand to return the rim sections to the first position after the paper has been wound upon the drum and removed therefrom. It will be noticed that the roller D and its bearings a^2 can be raised without affecting the adjusting screws i , as these screws only limit the inward movement of the roller D. In the present instance, each screw i has a head i^6 , which is adapted to a strap a^3 and this strap is connected to the bearings a^2 by a bolt a^4 .

65 The roller D is not a presser roller, but is simply actuated by the paper to throw in the mechanism which retracts the segments

of the reel. This roller can be adjusted to any distance desired from the center of the reel by means of the hand wheel I'.

In Fig. 10, I have illustrated a modification in which a pivoted arm D' is used in place of the roller D. This arm rests on the paper as it is wound upon the reel and is connected to the lever which operates the friction mechanism for operating the pinion F.

I combine with the reel mechanism, mechanism for winding paper on mandrels to form plain rolls, so that if plain rolls are desired the reel need not be dismantled but is raised a sufficient distance to allow the mandrel carrying frames to be turned.

In the present instance, mounted in bearings in the end frames A is a shaft N having arms N' projecting at each side, as clearly shown in Fig. 3, and mounted in bearings in one pair of arms N' is a mandrel M and mounted in bearings in the other pair of arms is a mandrel M'. The shaft N can be turned in its bearings in the frames A by a hand wheel n or a diagonal shaft n' having, in the present instance, a worm n^2 which meshes with a worm wheel n^3 on the end of the shaft. This worm and worm wheel are inclosed in a suitable casing. By this arrangement, either of the mandrels M or M' can be shifted to a position to receive paper from a paper machine and the mandrel which is in position is clutched to driving mechanism so that when the mandrel is driven the paper will be wrapped around it. This construction is the ordinary type of a two mandrel winder. In the present instance the pinion T is loose on the driving shaft L and a clutch sleeve S is operated by a lever s connected to a hand lever s' at the opposite end of the machine by a rod s^2 so that the drum C can be thrown into gear with the driving shaft by operating the lever s' .

On the driving shaft L is a belt pulley L' and at the extreme inner end of the driving shaft is a pinion k which meshes with the gear wheel k' loose on the shaft N and connected to this gear wheel k' is a large gear wheel k^2 , which meshes with a pinion k^3 on a short shaft K, mounted in bearings secured in a fixed position and m is a hand operated coupling for connecting the shaft K with the mandrel M, which is in position to receive the paper.

When it is desired to shift the mandrel, then the coupling is withdrawn and the mandrel is free to be removed.

One advantage of combining the two winding machines in one machine is that if the reel is used in connection with a continuous paper making machine, after the reel has received the amount of paper desired the paper is cut or broken and the surplus paper is wound upon one of the man-

drels M and as soon as the paper is taken off of the reel and the reel re-set, and while the paper is being wound upon the reel from the machine, the surplus paper can be unwound
5 from the mandrel and fed on to the reel with the paper brought from the machine, thus avoiding all waste.

In the present instance, the gearing is so arranged that the paper is fed from the
10 paper making machine over the top of the reel and between it and the pressing roller and, in some instances, it may be desirable to feed the paper under the reel, in which case I insert an intermediate pinion between the
15 driving pinion and the gear wheel on the reel shaft.

I claim:

1. The combination in a machine for winding paper, of a reel made of a series of retractable segments; a device bearing upon
20 the paper wrapped upon the reel; retracting means for the segments directly connected to the device bearing upon the paper so that as the paper accumulates on the reel and the device is pushed away from the reel,
25 this motion will be communicated to the retracting means, which will automatically retract the segments, thus reducing the diameter of the reel.

2. The combination in a machine for winding paper, of a reel made of a series of retractable segments, a roller pressing upon
30 the paper as it is wound upon the reel, with means for retracting the sections of the reel and connections between said means and the roller so that as the roller is pushed away
35 from the reel by the paper, it will cause the means to operate to retract the segments and reduce the diameter of the reel.

3. The combination in a machine for winding paper, of a reel made up of a series of retractable segments spaced apart, means
40 for positively retracting said segments, a clutch for throwing said means into and out of gear with the driving mechanism, a roller mounted in bearings and means connecting
45 said clutch mechanism with one of the bearings so that as the pressure is applied to the roller to move it away from the reel the clutch mechanism will be moved so as to
50 cause the driving mechanism to retract the segments of the reel.

4. The combination in a machine for winding paper, of a reel consisting of a
55 shaft having hubs and spokes extending from the said hubs and having segments at their outer ends, means for retracting the said spokes to decrease the diameter of the reel, a roller, mechanism connecting the
60 roller with the retracting means so as to cause the spokes to retract and reduce the diameter of the reel as the paper is wound thereon.

5. The combination in a winding machine,
65 of a reel consisting of a shaft having hubs,

said hubs having transverse openings therein; segmental rim sections, spokes carrying
said sections and adapted to the openings in the hubs, each of said spokes having rack
teeth thereon, with an elongated pinion
70 mounted within the hubs, the teeth of said pinion meshing with the teeth of the spokes, with means for turning the pinion so as to cause the segments to move radially.

6. The combination in means for winding
75 paper, of a shaft, hubs on the shaft having openings therein spaced apart, one opening being in advance of the other, said openings extending through the hubs at one side of the center, spokes mounted in the openings,
80 segments secured to the spokes, said segments forming the rim of the reel, teeth on the spokes with a pinion extending through the hub and engaging the teeth so that when the pinion is turned the spokes will be re-
85 tracted or projected in unison.

7. The combination in a paper winding machine, of a shaft, means for rotating said shaft, two hubs on the shaft each hub hav-
ing a series of openings extending at one
90 side of the center and spaced apart, spokes mounted in the hubs, segments carried by the outer ends of the hubs and forming the rim of the drum upon which the paper is to be wound, teeth on the spokes, a pinion
95 within the shaft and engaging the teeth of all the spokes, with means for driving the pinion so as to retract all the segments in unison.

8. The combination in a winding machine,
100 of a shaft, hubs on the shaft, said hubs having openings, a series of spokes mounted in the openings, segments secured to the outer ends of the spokes, the whole forming a reel upon which the paper is wound, teeth on
105 the spokes, an elongated gear meshing with the teeth on all the spokes, a pressing device bearing upon the paper as it is wound and clutch mechanism for throwing the pinion into gear with the driving mechanism,
110 means connecting the clutch mechanism with the pressing device, so that as the pressing device is raised by the paper the clutch will be thrown into gear to retract the segments of the reel.
115

9. The combination in a machine for winding paper, of a reel having retractable sections, means for retracting said sections,
a roller, adjustable bearings for the roller, means for adjusting the bearings so as to
120 limit the movement of the roller toward the reel and allowing the roller and its bearings freedom to move away from the reel, mechanism connecting one end of the bearings with the means for retracting said sections
125 of the reel so that as the roller is forced away from the reel by the paper it automatically throws in the mechanism for retracting the sections.

10. The combination in a winding ma- 130

chine for paper, of a main shaft, a series of adjustable spokes thereon, segments on the spokes forming the rim of a reel, means for driving said shaft, a bearing sleeve secured to one end of the shaft, bearings thereon, a transverse shaft carried by said bearings, a beveled friction wheel secured to the shaft, a non-rotatable friction disk, means for moving the said disk to and from the first mentioned disk, a pinion extending through the main shaft and geared to the spokes, gearing between the shaft carrying the friction wheel and the pinion, a device actuated by the paper as it is wound upon the reel, and intermediate means between the said device and the non-rotatable friction disk so that when the said disk is moved into contact with the rotating friction disk, motion will be imparted to the pinion to retract the segments of the reel.

11. The combination in a machine for winding paper, of a main shaft, a reel carried thereby consisting of spokes and segments, a pinion extending through the shaft, teeth on the segments meshing with the teeth on the pinion so that when the pinion is turned in one direction the segments will be retracted, a bearing sleeve secured to one end of the said shaft, a transverse worm shaft mounted in the bearings in the said sleeve, a worm wheel on the end of the pinion, a second transverse shaft mounted in bearings on the said sleeve, a friction wheel secured thereto, a friction disk slidably mounted on the end of the main shaft, means for preventing said disk from turning, gearing between the friction shaft and the worm shaft by which the worm shaft is turned when the friction disk is moved against the friction wheel, a pivoted lever for moving the said friction disk, a roller arranged to be actuated by the paper as it is wound upon the reel, bearings for the roller,

a bell crank lever having one arm connected to a bearing for the roller, the other arm of the bell crank lever being connected to the operating lever, and a spring mounted between the two levers, the whole being so combined that when the paper increases in thickness on the reel the mechanism will be thrown into gear to reduce the diameter of the reel.

12. The combination in a machine for winding paper, of a main shaft; bearings therefor, a collapsible reel mounted on the main shaft, means within the shaft for collapsing said reel, friction mechanism for operating said means, a roller located in close proximity to the reel and arranged to be moved away from the reel as the paper accumulates thereon, bearings for the said roller, means for adjusting the bearings toward the main shaft, driving mechanism for the said main shaft, said friction mechanism being connected to one of the bearings of the reel for throwing the means for collapsing the reel into gear with the main shaft.

13. In a winding machine for paper, the combination of two end frames, means for winding paper in rolls mounted therein, bearing sections mounted above the main frame, a shaft carried thereby, a reel mounted on the shaft, a driving shaft common to both the reel shaft and the means for winding the paper in rolls, with means for vertically adjusting the bearing sections so as to raise the reel clear of the roll winding mechanism.

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

GUYON MILLER.

Witnesses:

WM. E. SHUPE,
WM. A. BARR.