

No. 868,361.

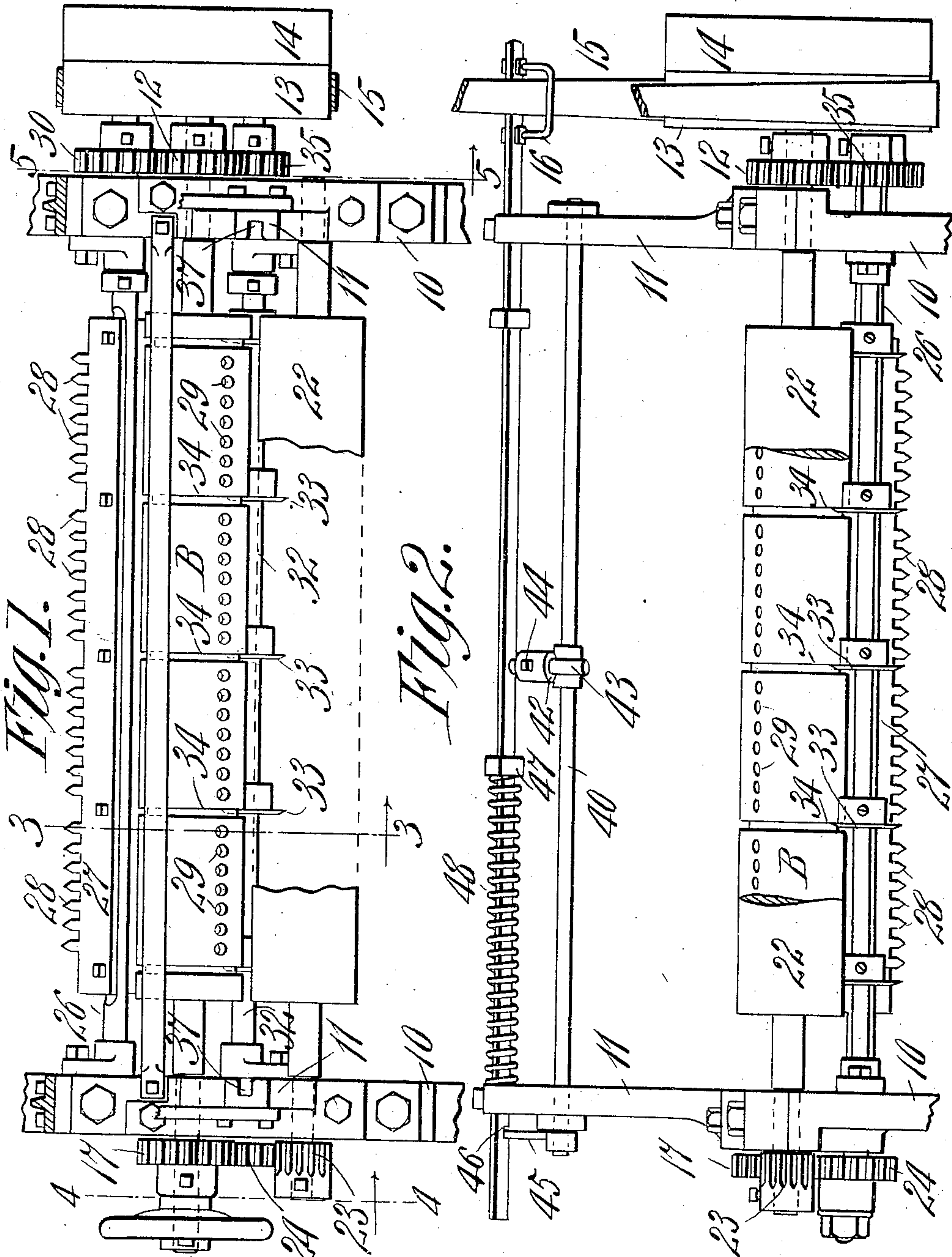
PATENTED OCT. 15, 1907.

C. E. POPE.

CUTTING, PERFORATING, AND ROLL FORMING MECHANISM.

APPLICATION FILED OCT. 13, 1906.

2 SHEETS—SHEET 1.



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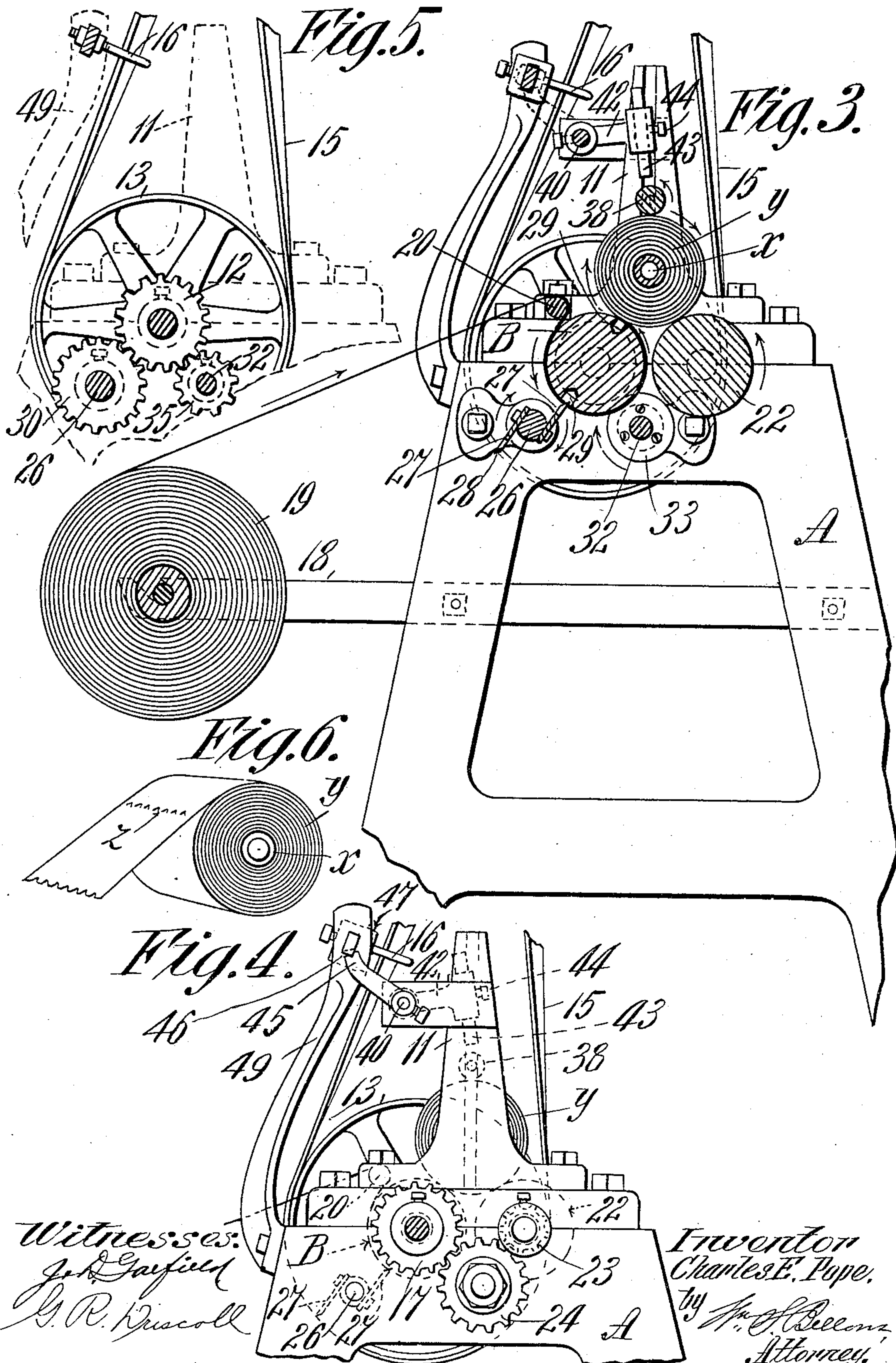
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UNITED STATES PATENT OFFICE.

CHARLES E. POPE, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO C. ELMER POPE PAPER COMPANY, OF HOLYOKE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CUTTING, PERFORATING, AND ROLL-FORMING MECHANISM.

No. 868,361.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed October 13, 1906. Serial No. 338,861.

To all whom it may concern:

Be it known that I, CHARLES E. POPE, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Cutting, Perforating, and Roll-Forming Mechanism, of which the following is a full, clear, and exact description.

The object of this invention is to produce a new and improved machine which will have individually and severally the capabilities of winding paper from a supply roll of large diameter and great width into smaller rolls, as suitable for toilet use; of longitudinally slitting the wide web running from the supply whereby the lengths of the several toilet paper rolls wound at one time are but fractional of the length of the supply web; of providing in the paper, preparatory to the reeling or winding thereof at suitable regular intervals in its length, transverse lines of incisions on which suitable lengths or portions of the rolled toilet paper may be torn from the roll; of insuring that the rolls of paper wound up in the machine will be all of uniform diametrical size, and consequently will each be constituted by a predetermined quantity of paper, and of insuring that the rolls of paper will have the convolutions thereof very tightly or quite loosely wound as may be preferred.

The invention consists in improved paper winding or roll forming means; in improved means for imparting transverse lines of incisions at intervals in the length of the paper; in automatic mechanism for stopping the roll-making machine so soon as the roll has been wound to a required diametrical size; in improved means for tensioning the paper while being wound; and in the general combination and arrangements or organization of the parts making the machine in its entirety as hereinafter set forth.

The improved machine is illustrated in the accompanying drawings in which

Figure 1 is substantially a plan view—upper portions of the machine comprising the automatic stop motion not being shown. Fig. 2 is a front elevation. Fig. 3 is a vertical cross sectional view of the machine as taken on line 3—3, Fig. 1. Fig. 4 is an end elevation of the machine as seen looking to the rightward from the plane indicated by line 4—4, Fig. 1. Fig. 5 is a sectional elevation as seen looking to the right from the plane indicated by the line 5—5, Fig. 1; and Fig. 6 is a perspective view of one of the round and incised rolls of paper for toilet or other use.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings A represents the frame of the machine comprising upright standards 10 10, between

which is mounted the axially horizontal cylinder B, herein to be termed the "bed roll," the shaft or arbor of said roll being extended through, and journal-supported in the said end standards of the frame and one end journal of each roll is provided with a spur gear wheel 12 and fast and loose pulleys 13 and 14, around either of which the belt 15 may be in driving engagement accordingly as it is positioned by the horizontally slidable belt shifter 16; and the other end journal of the bed-roll has the spur gear wheel 17 affixed thereon.

18 represents a support or bracket formed as part of the frame, for a comparatively long and heavy supply roll 19 of paper.

20 represents a small paper guide bar supported by the frame parallel with, and adjacent the upper rear peripheral portion of, the bed-roll, and 22 represents a cylinder, to be herein termed the "speed" or tensioning roll axially parallel with, forward of, and about on a level with, but slightly peripherally separated from, the bed-roll, and this roll at the left hand end of the machine is provided with a spur gear wheel or pinion 23 of smaller diameter than the bed roll gear wheel 17, and driven in the same direction as the bed roll by means of the intermediate or idler gear wheel 24, (see especially, Fig. 4). The "speed roll" therefore turns in the same direction as, but somewhat faster than, the bed-roll, and these two rolls, as perceived in Fig. 3 form a longitudinal cradle on which may rest the core *x* for the toilet paper roll, and as the winding progresses for the building roll *y*.

Suitably below and to the rear of the bed roll B is a horizontal shaft 26 axially parallel with the bed roll, carrying long blades, 27, 27, edgewise oppositely extended, and which blades are edgewise formed with V-shaped teeth 28 which in the revolutions of the blades on the said rotary shaft 26 may freely enter within, and pass from, the longitudinally arranged series of recesses 29 29 along opposite sides of the bed roll. These toothed revoluble blades form transverse rows of V-shaped incisions *z* Fig. 6, in the web, guided to and running partially around the bed roll to be wound on the core *x*.

The blade-carrying shaft 26 at the right hand end of the machine frame has a spur gear wheel 30 thereon equal in size to, and in mesh with, the bed-roll gear-wheel 12 so that the blades are caused to revolve in unison with the bed-roll.

Below and slightly forward of the bed-roll is a horizontal shaft 32 extending between and journaled in the ends of the frame and having suitably spaced slitter disks 33, 33, closely overlapping and co-acting with shear forming shoulders 34, 34, on the bed-roll.

The slitter shaft 32 extends through and beyond the right hand end frame standard only, and is thereat

provided with a spur pinion gear 35 in mesh with the spur gear 12 on the bed-roll,—as well as is the aforementioned gear 30 for the blade carrying shaft.

The main end standards 10 10 have supplemental 5 uprights or standards 11, 11 thereabove, having vertical grooves 37 in their inwardly facing sides in which may be engaged end gudgeons of a weight roll 38 which may be employed when an extremely dense and closely wound roll of toilet paper is to be produced, such roll 10 bearing on the upper side of the building paper roll and causing it to acquire a more positive frictional engagement with the rolls on which the building roll is supported,—and most effectively on the “speed” roll 22.

15 40 represents a rock-shaft, longitudinally supported and ranged above the bed-roll, having at or about its middle a forwardly extending arm—42, provided with a vertically adjustable bar 43 held confined in any given set position by the screw 44; and said rock-shaft 20 also has a rearwardly extending latch arm 45, which is normally in engagement with the notch 46 in the horizontally slidable bar comprised in the belt shifter 16. The belt shifter is held back, that is, to the leftward, with its spring 48 in compression between the shoulder 25 47 and a portion of the frame.

The web of paper from the supply roll is drawn in full width forwardly over the guide bar 20, under and partially around, and in contact with, the bed-roll and is engaged with a pasteboard core as long as the 30 web is wide, and the machine is set in motion by drawing the bar of the belt shifter to the left, latching it by the rock-bar-arm 45 and holding the driving belt 15 on the fast pulley. The core and paper engaged there-around will be rotated by the frictional engagement 35 of the periphery of the bed and speed rolls and will be very satisfactorily tensioned by the latter, whereby the formation of a loosely wound or flabby roll will be avoided; and the paper before coming to be wound on the core will have the transverse rows of V-cuts Z made 40 therein at proper intervals, by the toothed revoluble blades, and will be slitted by the disks for the making of toilet paper rolls of the proper length. When the paper has been wound on in sufficient quantity to make a roll of the size wanted the built roll directly, or 45 through the weight bar 38 thereon, will engage the bar 43, rocking shaft 40 and unlatching the belt shifter

16, so that the spring 48, appurtenant thereto, will react to automatically cause the positioning of the belt on the loose pulley 14, and to cause the stoppage of the machine so that the already wound paper may be 50 removed, and a repetition of the described operations performed.

I claim:—

1. The combination with a recessed rotary bed roll, having circular shoulders, of a revoluble toothed blade coacting 55 with the recessed portion of the roll, and means for rotating it, and a rotary shaft having slitter disks coacting with the shouldered portion of the roll, and means for rotating the disk shaft.

2. In a mechanism of the character described, the combination with the bed-roll having a driving pulley at one end, and having a spur gear wheel at each end thereof, of a slitter disk shaft and an incision blade shaft, below, axially parallel with, and respectively forward and to the rear of the axis of the bed roll, and having gear wheels at 65 one end of each, both in mesh with the gear wheel at the corresponding end of the bed-roll, and a speed roll, axially parallel with, adjacent and forward of the bed roll, having thereon a gear wheel smaller than the gear wheel at the other end of the bed roll, and an intermediate gear wheel 70 in mesh with the latter bed roll gear and the speed roll gear, for the purposes set forth.

3. The combination with an axially horizontal bed-roll and another roll located adjacent and at about the level of the bed roll, and a pulley having a driving connection 75 with said rolls, and having a driving belt therefor, of a slidable belt-shafter, engaging said belt, a spring for forcing the latter in one direction and a rock shaft having a latch arm engaging the belt shifter, and having another member extended over said rolls, and adapted to be engaged and swung by a roll of paper when wound to a required size. 80

4. The combination with an axially horizontal bed-roll, a speed roll located adjacent and at about the level of the bed roll, and a pulley fixed to the bed-roll, and a loose 85 pulley alongside the fixed pulley, a shiftable belt to run around either of said pulleys, a slidable shifter for said belt, having a spring for forcing it in one direction, and gear wheel connections between the bed and speed rolls, for driving the speed roll faster than the bed roll, of a rock 90 shaft having a latch arm engaging the belt shifter, and having another arm radially projected at a location above said rolls and provided with a vertically adjustable bar, for the purposes set forth.

Signed by me at Boston, Mass., in presence of two subscribing witnesses. 95

CHARLES E. POPE.

Witnesses:

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