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PATENTED JULY 11, 1905.

M. McCALLUM.

COUNTING MACHINE FOR PAPER CUTTING MACHINES.

APPLICATION FILED JAN. 7, 1905.

3 SHEETS—SHEET 1.

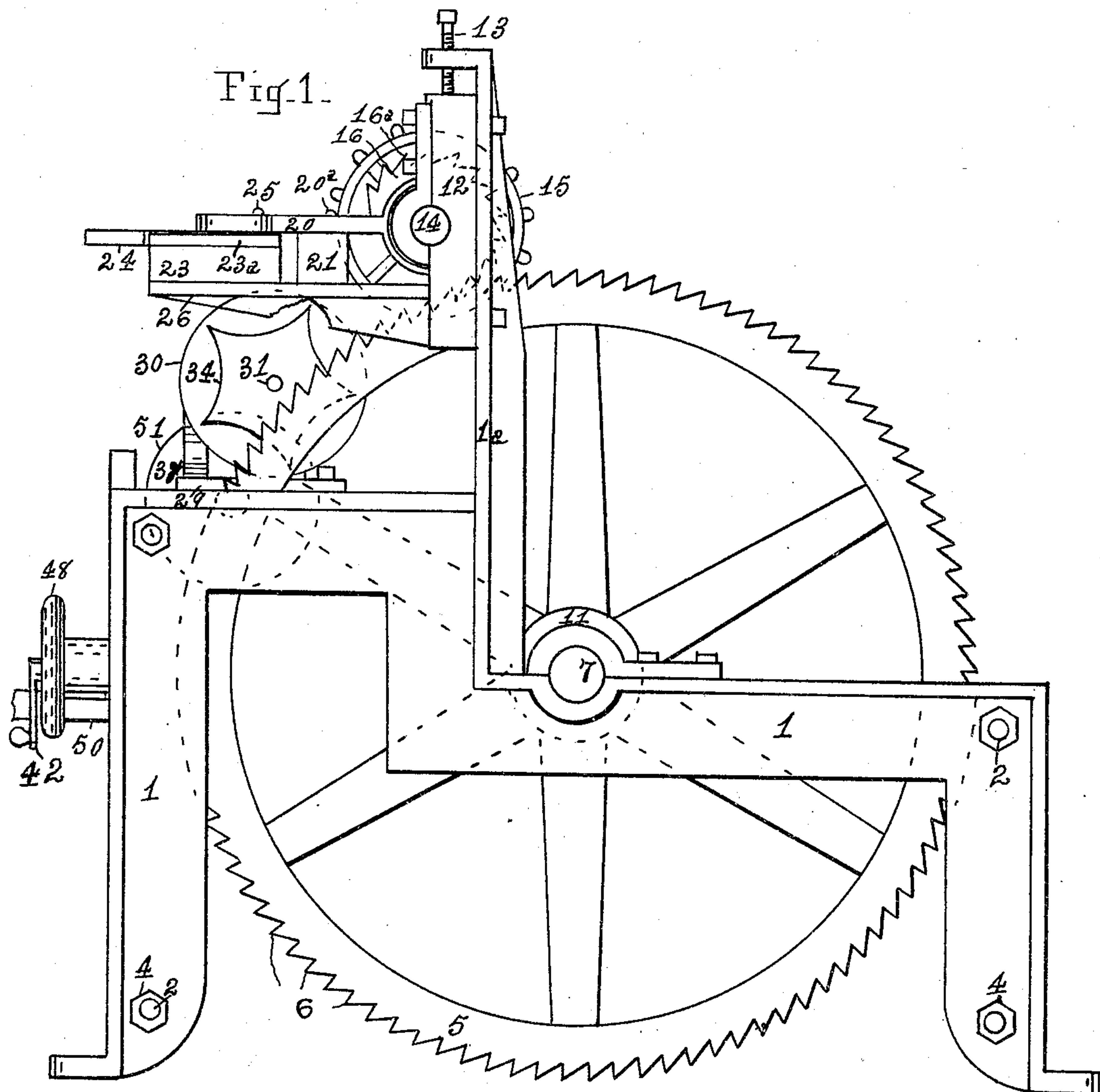
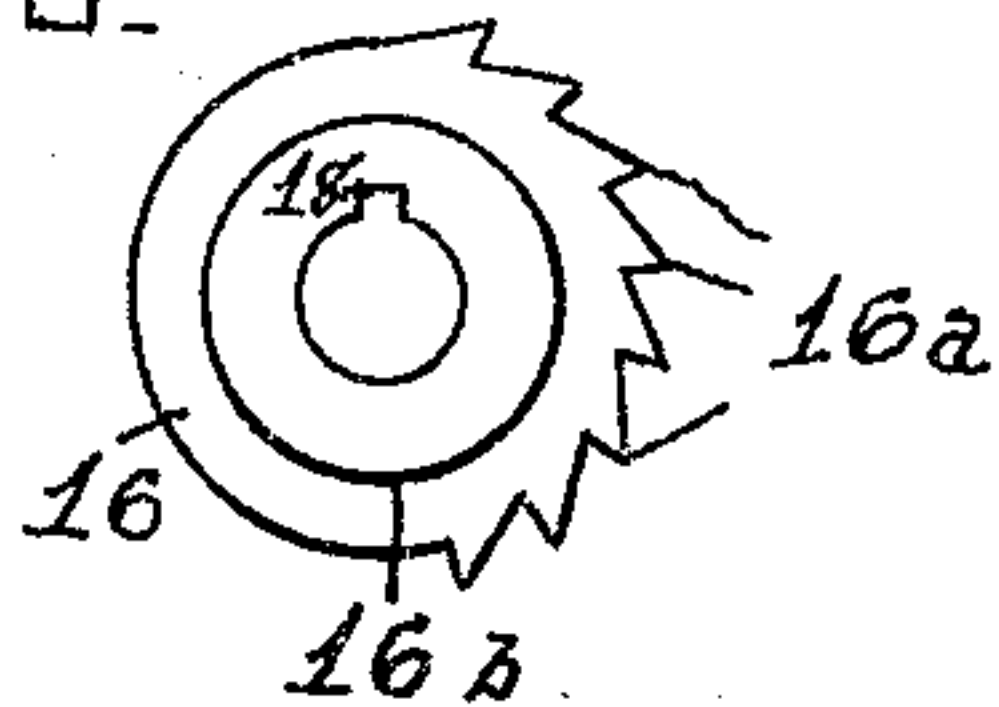


Fig. 2.



WITNESSES:

G. M. Albee.
Bernice Briggs

INVENTOR

Murray McCallum.
BY *G. H. Albee.*

ATTORNEY

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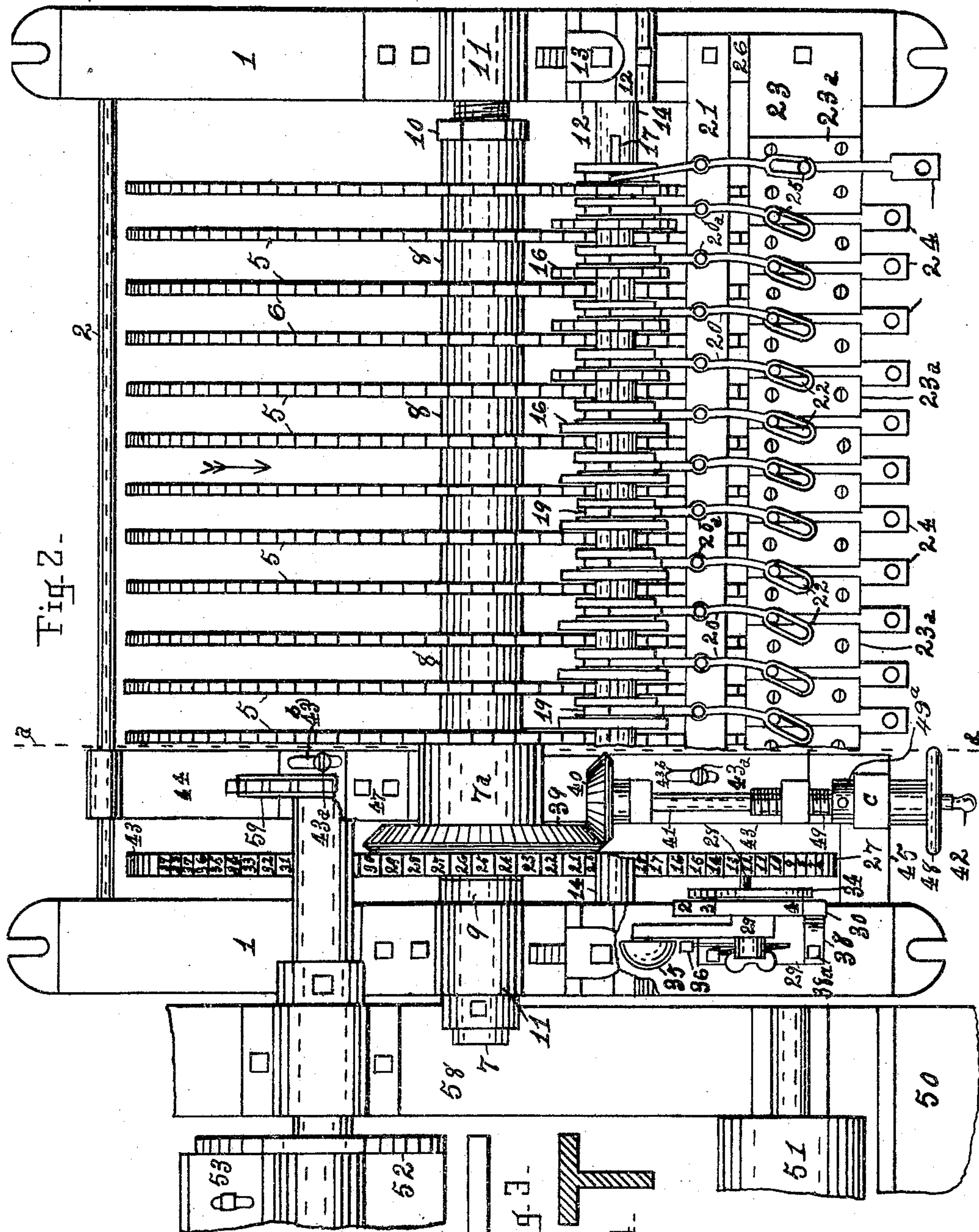
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Bernice Briggs

INVENTOR

Murray McCallum -
BY G. H. Albee.

ATTORNEY

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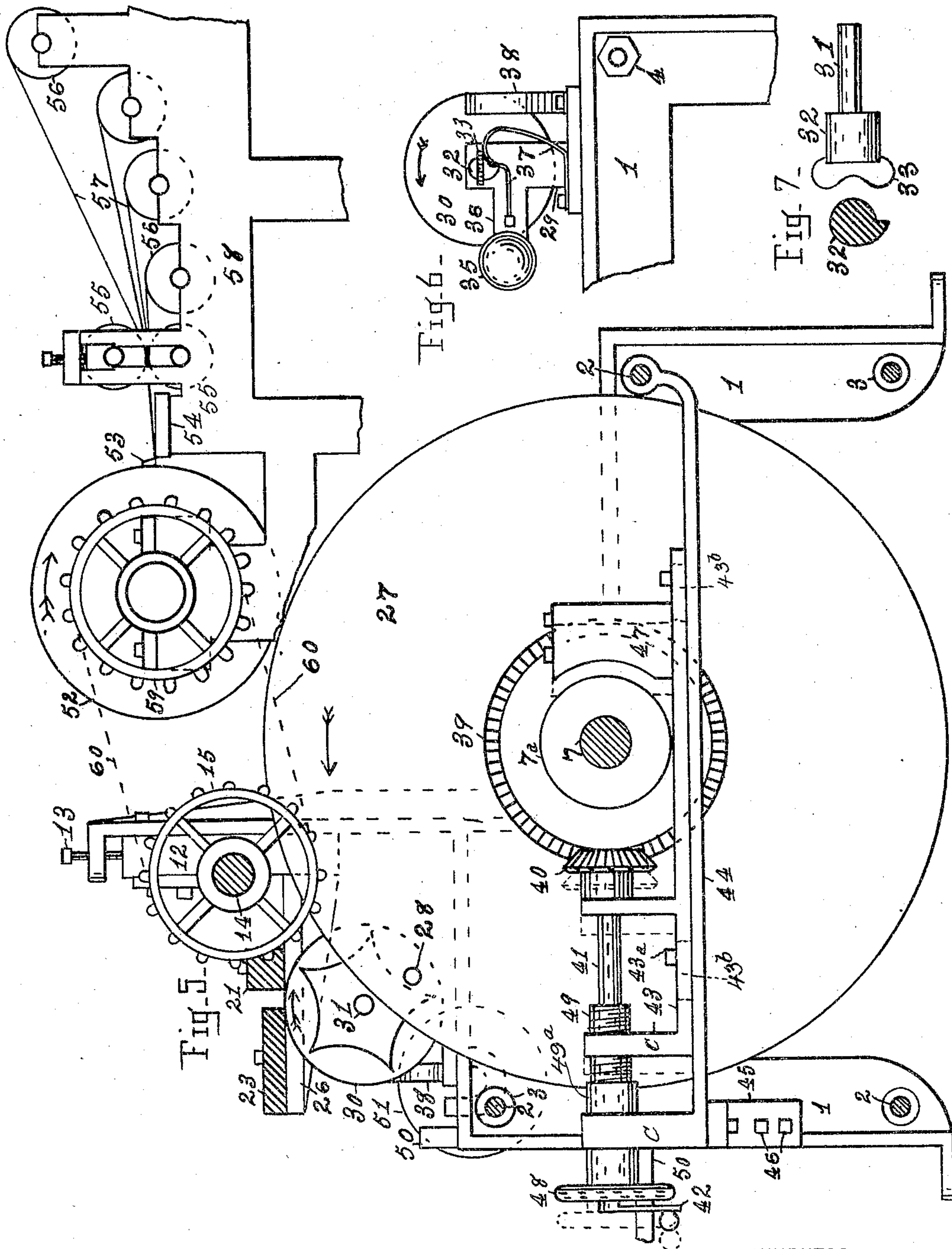
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3 SHEETS—SHEET 3.



WITNESSES:
E. M. Albee.
Bernice Briggs

INVENTOR
Murray McCallum.
BY E. M. Albee

ATTORNEY

UNITED STATES PATENT OFFICE.

MURRAY McCALLUM, OF NEENAH, WISCONSIN.

COUNTING-MACHINE FOR PAPER-CUTTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 794,374, dated July 11, 1905.

Application filed January 7, 1905. Serial No. 240,110.

To all whom it may concern:

Be it known that I, MURRAY McCALLUM, a citizen of the United States, and a resident of Neenah, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Counting-Machines for Paper-Cutting Machines, of which the following is a specification.

My invention is for application and use in connection with the usual rotary cutter in paper-making machines for counting and indicating upon two wheels having the necessary numerals thereon at any time during the cutting of a ream of paper the number of sheets cut, provision being made (which will be described farther along) for turning the figured wheels backward whenever imperfect sheets have been cut which the cutter operatives find necessary to throw out; and the counting device consists of mechanism which is driven from the rotary-cutter shaft and comprises a set of wheels having ratchet-like teeth upon their peripheries, each wheel having a like number and such number being an even fraction of the number of sheets in a ream—that is, if there are to be five hundred sheets to a ream a one-hundred-tooth wheel would be adapted for the purpose and if four hundred and eighty sheets to a ream then a wheel having ninety-six teeth would be suitable, as with five revolutions of the cutter-shaft the one hundred or ninety-six tooth wheels would result in the number of teeth passing a given point equal to the number of sheets in a ream of five hundred or four hundred and eighty. A five-pointed star-wheel is mounted for revolution in a suitable position for being engaged at one of said points at each revolution of the one hundred or ninety-six tooth wheels by a pin which is arranged in a suitable position upon some part which revolves in unison with the one hundred or ninety-six tooth wheels, so as to turn said star-wheel the distance of from one point to the next one, so that the five revolutions of the one hundred or ninety-six tooth wheels will indicate by the numerals "1," "2," "3," "4," and "5," representing the several points of the star, that number of revolutions of the one hundred or ninety-six tooth wheels and

when the star-wheel has made a complete revolution that a ream of paper has been cut.

The aforesaid wheels are to be revolved the distance of from one tooth to the next one for each sheet of paper cut. If it is being cut from eight rolls, they will turn the distance of eight teeth; if from twelve rolls they will turn the distance of twelve teeth. These wheels are turned by means of a set of pinions, one for each of the one hundred or ninety-six tooth wheels, they being mounted for revolution and splined upon a shaft which is arranged in a suitable position for the engagement of the teeth of the pinions with those of the aforesaid wheels. The pinions are driven from the cutter-shaft at the same speed by means of sprocket-wheels and chain or gearing, preferably the former, and are provided with teeth of a suitable form for engaging with the teeth of said wheels, the first pinion of the series at one end of their shaft having but one tooth, which pinion is for use when paper is to be cut from but one roll. The next pinion has two teeth, the next one three teeth, &c., up to the highest number of wheels, the pinion in use for turning the toothed wheels having the number of teeth which corresponds with the number of rolls from which paper is being cut. The pinions are arranged to be thrown into and out of gear with the wheels by sliding along upon the splined shaft.

Of the two numbered wheels for indicating the number of sheets cut the larger one is mounted upon the same shaft as the toothed wheels and is numbered to correspond with the number of teeth in said wheels, while the smaller one is mounted upon a suitable stand alongside of the larger one and revolves with the five-pointed star-wheel.

The toothed wheels having made five revolutions, the star-wheel and smaller numbered wheel will have made one, when, a ream of paper having been cut, an alarm is arranged to sound and attract the attention of the operator and the ream can be removed preparatory to cutting another ream.

At any time when imperfect sheets have been cut the operator can stop the cutter, disengage the pinion and wheel, and turn the

numbered wheels backward as many numbers as the operator has thrown out imperfect sheets.

Wheels having other numbers of teeth, which are even fractions of the number of sheets in a ream, may be used instead of those herein shown and described; but for use in this invention these have been selected as the most desirable.

The machines are required to be "rights" and "lefts," the one represented herewith being intended for use upon the right-hand end of the cutter-shaft as a person faces the cutter and sheet-receiving table.

The machines are intended to be operated by the persons who receive the sheet from the cutter, all parts of them being in reach of them as they sit at the table. By the use of these machines the sheet-counting operatives will be dispensed with and the cost of labor thereby lessened.

My invention is shown in the accompanying drawings, in which—

Figure 1 is an end elevation showing the right or outer end of the machine and a part of the sheet-receiving table. Fig. 2 is a plan of the machine, of a part of the rotary cutter, and of the sheet-receiving roll and table. Figs. 3 and 4 are details. Fig. 5 is a transverse section of the machine as seen in looking toward the left of the line *a a* in Fig. 2 and showing also an end elevation of the cutter and some rolls of paper from which paper is being fed to the cutter. Fig. 6 is an elevation of a part of the inner end of the machine-frame and the smaller of the two sheet-number-indicating wheels with an alarm-bell arranged for operation by it. Fig. 7 is a transverse section and plan, respectively, of a cam which is used in the ringing of said bell. Fig. 8 is a view of a pinion which is used in turning the toothed wheels. Fig. 7 is upon an enlarged scale.

Similar numerals and characters are used for indicating like parts.

1 indicates the frame of the machine, which is preferably formed of cast metal, each end in one piece and similar in form, (Fig. 4 being a transverse section of the legs and the larger portion of the top of the frame,) this form being well adapted for its use, the two end pieces being spaced apart and held firmly by means of the rods 2, having collars 3 and nuts 4 thereon. I make no claim to any design for the frame.

5 indicates wheels, of which there may be such number as the requirements of the paper-cutter to which it is to be applied may require, which will be the number of rolls from which it is desired to cut paper at any one time. The wheels are provided with a like number of teeth 6, such number being an even fraction of the number of sheets in a ream. The wheels are fitted to the shaft 7, are provided with hubs 8, and are secured

upon said shaft by being clamped between the fast collar 9 and nut 10, the shaft being mounted for revolution in the journal-boxes 11 of the frame.

Upon the vertical arm 1^a of the frame journal-boxes 12 are arranged, which are vertically adjustable by means of screws 13. A shaft 14 is journaled in said boxes and carries a sprocket-wheel 15, by which it is driven, and also pinions 16 of a like number as the aforesaid wheels. The pinions are provided with teeth 16^a, the first pinion at one end of the series having but one tooth, their number increasing by one tooth each pinion throughout the series. The pinions are held upon the shaft by the spline 17, which is fitted to the keyway 18, and are to be engaged and disengaged from the teeth of said wheels by sliding along upon the shaft 14. This sliding movement is effected by providing the hubs 16^b with a groove 19, into which is fitted the prongs of a common style of shipping-bar 20, the shipper-bars being fulcrumed at 20^a upon the longitudinally-arranged bar 21. The outer ends of the shipper-bars are provided with a slot 22, angularly arranged therein. Parallel with the bar 21 is a bar 23, upon which are arranged shipper-handles 24, which are fitted to slide in gibs 23^a transversely of and upon said bar. At the inner ends of the handles a pin 25 projects upward through the slot, and as said handles are slid out and in within their gibs said pins in sliding along the slot, owing to the angular position of it, will throw the inner ends of the shipper-bars 20 to the right or left, and consequently throw the pinions into or out of engagement with the toothed wheels 5. In Fig. 2 all of the pinions are out of engagement with the toothed wheels excepting the one at the right, this one being in gear.

The shipper-bars are supported upon bracket-arms 26, which arms are integral with the journal-boxes 12, and will therefore be raised and lowered in unison with the shaft 14.

Mounted upon the shaft 7 and revoluble therewith is a wheel 27, having numbers thereon from "1" up to the highest number of teeth in each of the wheels 5 and being provided with a pin 28, which extends outward a short distance from the outer end of the wheel. Upon the stand 29, which is supported upon the frame of the machine, a small numbered wheel is mounted for revolution by being secured to the shaft 31 of the cam 32, the cam being supplied with wings 33, by means of which the cam and said wheel can be revolved in either direction. Secured to or integral with the wheel 30 is a five-pointed star-wheel 34, one of the points of which are to be engaged by the pin 28 at each revolution of the wheels 5. At one side of the cam 32 a bell 35 is arranged to be sounded by means of the hammer 36, which is affixed to the free end of the wire 37. This wire is so

shaped that the lip 32^a of the cam when the cam is turned around in the direction indicated by the arrow in Fig. 6 will throw the wire away from the bell until the cam has become released from the wire, when, the wire springing backward, the hammer will strike the bell and sound an alarm; but upon turning the cam in the opposite direction the cam will slide over the wire easily without ringing the bell.

A spring 38 is applied to the end of the wheel 30 by means of a bolt 38^a, which fastens the stand upon the frame for acting as a brake upon said wheel, so that it does not turn too easily or too far for the proper engagement of the pin 28 with the points of the star-wheel.

Provision is made for turning the numbered wheel 27 backward, as follows: Secured upon the shaft 7 is a beveled gear-wheel 39, and suitably arranged for engaging therewith is a pinion 40, which is provided with a shaft 41 and crank 42, the shaft being arranged for revolution upon the sliding stand 43. This stand is carried upon a flat bar 44 and is held in a sliding position thereon with bolts 43^a and slots 43^b, the bar 44 being supported in position at the rear end upon the rod 2 of the frame and at the front end upon a bracket-arm 45, (see Fig. 3,) which is secured to a leg of the frame with bolts 46. The base of the stand 43 is extended backward under the shaft 7, and its collar 7^a and a brake-block 47 secured thereon. When the pinion is engaged with the beveled gear 39, the brake-block is not in contact with the collar 7^a; but upon sliding the stand toward the front of the machine the pinion will be released from the beveled gear and the brake-block brought into contact with said collar, as shown by dotted lines in Fig. 5. This sliding movement is effected by means of the hand-wheel 48, having the screw-shaft 49, threaded into one of the uprights of the stand 43. The screw-shaft 49 is provided with a set-collar 49^a, between which and the hub of the hand-wheel an arm *c* extends upward from the bar 44 and through which the screw-shaft revolves for moving the stand 43 longitudinally. The shaft 41 passes through the shaft 49 and is revoluble therein.

I do not confine my invention to the particular mechanism shown for causing the brake-block to press against the collar 7^a, as it will be evident that a coiled spring could be arranged in connection with the uprights of the stand 43 and bar 44. The purpose of this brake is to hold the teeth of the wheels 5 in the proper position for the engagement of the teeth of the pinions.

Of the parts connected with the paper-cutting apparatus 50 indicates the paper-receiving table; 51, a small roll over which the paper is carried in passing to the table; 52, the cutter-head having the cutting-knife 53; 54,

the companion knife; 55, rolls for feeding the sheets to the knives; 56, rolls of paper from which the paper web 57 is being fed between the rolls 55; 58, a part of the cutter and roll-supporting frames; 59, a sprocket-wheel upon the cutter-shaft for driving the counting-machine by means of a chain 50, running to the wheel 15 upon the shaft 14.

The horizontal part 50 is the table proper, upon which the sheets of paper drop as they fall from the cutter-knife 53, the sheets being carried there from said knife by gravity and the assistance of several tapes (not shown) which extend from just under the knife to near the vertical part 50 of the table, said vertical part being the rear side of the table against which the operator as she sits at the end of the table within reach of the counting-machine with one hand presses the pile of paper as the sheets accumulate while with the other hand she assists the sheets as they fall from the cutter to slide down the tapes upon the horizontal part of the table, the sheets being assisted also onto the table by the roller 51.

The operation of the device is as follows: Everything being in readiness the numbered wheel 27 is to be turned around by means of the crank 42 until the place for "0" upon the wheel is at the starting-point, which point may be anywhere in its circumference that is easiest to be seen by the operator, which would be, perhaps, at about the position upon the wheel 27 in looking at its right-hand end in Fig. 2 that the hour-hand of a clock would be on its dial at ten o'clock. A pinion 16, having as many teeth as it is desired to cut sheets from rolls of paper, is thrown into engagement with its toothed wheel 5. Supposing it is desired to cut from eight rolls, a pinion having eight teeth is engaged with its wheel 5 by means of the shipper bar or handle 24 and the cutter-wheel put in operation. At each revolution of the cutter eight sheets will be cut and the wheel 16 turned the distance of eight teeth, which cutting will be indicated upon the wheel 27. With sixty revolutions of the cutter four hundred and eighty sheets, or one ream, will have been cut, the wheels 5 and 27 having each made five revolutions and the wheel 30 one revolution when the bell will ring. If there have been, say, forty defective sheets thrown out, the wheel 27 must then be turned back from the number "480" to "440" and the cutter again started, making four cuts for cutting the forty sheets, when the bell again ringing the cutter can be stopped and the ream of paper removed from the table by another workman, leaving the table ready for the next ream. If in cutting the forty aforesaid sheets three or four have been thrown out, these can be added to the forty by taking five cuts instead of four and letting the six or seven remaining sheets remain upon the table for the

next ream, setting the wheel 27 at "6" or "7" instead of at "0" for the next ream.

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

1. In combination with the rotary cutter of a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably journaled and being provided with pinions splined thereon and corresponding in number with that of said wheels, the first pinion of the series from one end of said shaft having one tooth, the next one, two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and disengagement of said teeth with those of the aforesaid wheels by the sliding of the pinions, individually along said shaft, means for revolving said pinion-shaft from the aforesaid rotary-cutter shaft and at a speed corresponding therewith, a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having numbers thereon from one up to the highest number of teeth in each of said wheels, a second numbered wheel mounted for revolution near the perimeter of said first numbered wheel and having a star-wheel revoluble in unison therewith, a pin arranged in said first numbered wheel for engaging one point of the star at each revolution of said first numbered wheel and revolving the same the distance of from one point of the star to the next adjoining point, numbers on said second numbered wheel from one up to the number of points in said star-wheel, and an alarm arranged to be sounded at each revolution in their normal direction of said star and second numbered wheel, all arranged and operating for indicating upon said second numbered wheel upon a complete revolution thereof the cutting of a ream of paper, substantially as described.

2. In combination with the rotary cutter of a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably journaled and being provided with pinions splined thereon, and corresponding in number with that of said wheels, the first pinion of the series from one end of the shaft having one tooth, the next one, two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and

disengagement of said teeth with those of the aforesaid wheels by the sliding of the pinions, individually along said shaft, means for revolving said pinion-shaft from the aforesaid rotary-cutter shaft and at a speed corresponding therewith, a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having numbers thereon from one up to the highest number of teeth in each of said wheels, a second numbered wheel mounted for revolution near the perimeter of said first numbered wheel having a star-wheel revoluble in unison therewith, a pin arranged in said first numbered wheel for engaging one point of the star at each revolution of said first numbered wheel and revolving the same the distance of from one point of the star to the next adjoining point, numbers on said second numbered wheel from one up to the number of points in said star-wheel, and brakes arranged for holding both the first and second numbered wheels at the point to which they are carried by their revolving mechanism, all arranged and operating for indicating upon said second numbered wheel upon a complete revolution thereof, the cutting of a ream of paper, substantially as set forth.

3. In combination with the rotary cutter of a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably journaled and being provided with pinions splined thereon, and corresponding in number with that of said wheels, the first pinion of the series from one end of the shaft having one tooth, the next one, two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and disengagement of said teeth with those of the aforesaid wheels by the sliding of the pinions, individually along said shaft, means for revolving said pinion-shaft from the aforesaid rotary-cutter shaft and at a speed corresponding therewith, a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having numbers thereon from one up to the highest number of teeth in each of said wheels, a second numbered wheel mounted for revolution near the perimeter of said first numbered wheel and having a star-wheel revoluble in unison therewith, a pin arranged in said first numbered wheel for engaging one point of the star at each revolution of said first numbered wheel and revolving the same the distance of from one point of the star to the next adjoining point, and numbers on said second numbered wheel from one up to the number of points in said star-wheel, all arranged and operating for indicating upon said

second numbered wheel upon a complete revolution thereof, the cutting of a ream of paper, substantially as described.

4. In combination with the rotary cutter of
 5 a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth
 10 upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably journaled and being provided with pinions splined thereon, and corresponding in number with that of said
 15 wheels, the first pinion of the series from one end of the shaft having one tooth, the next one, two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and disengagement of said teeth with those of the aforesaid
 20 wheels by the sliding of the pinions, individually along said shaft, means for revolving said pinion-shaft from the aforesaid rotary-cutter shaft and at a speed corresponding
 25 therewith, a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having numbers thereon from one up to the highest number of teeth in each of said wheels, a second
 30 numbered wheel mounted for revolution near the perimeter of said first numbered wheel and having a star-wheel revoluble in unison therewith, a pin arranged in said first numbered wheel for engaging one point of
 35 the star at each revolution of said first numbered wheel and revolving the same the distance of from one point of the star to the next adjacent point, numbers on said second numbered wheel from one up to the number of
 40 points in said star-wheel, and mechanism for turning said first numbered wheel backward, comprising a beveled wheel and pinion suitably arranged, and means for turning the same, substantially as described.

5. In combination with the rotary cutter of
 45 a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth
 50 upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably journaled and being provided with pinions splined thereon, and corresponding in number with that of said
 55 wheels, the first pinion of the series from one end of the shaft having one tooth, the next one, two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and disengagement
 60 of said teeth with those of the aforesaid wheels by the sliding of the pinions, individually along said shaft, means for revolving said pinion-shaft from the aforesaid rotary-cutter shaft and at a speed corresponding therewith,

a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having numbers thereon, from one up to the highest number of teeth in each of said wheels, a second numbered wheel mounted for revolution near the
 70 perimeter of said first numbered wheel and having a star-wheel revoluble in unison therewith, a pin arranged in said first numbered wheel for engaging one point of the star at each revolution of said first numbered wheel and revolving the same the distance of from one point of the star to the next adjoining
 75 point, numbers on said second numbered wheel from one up to the number of points in said star-wheel, and a device for turning said first numbered wheel backward and applying a brake for retarding its movement, consisting of a beveled gear-wheel revoluble with
 80 said numbered wheel, a beveled gear-pinion mounted upon a shaft for revolution upon a suitably-supported stand which is arranged for a sliding movement on said support transversely of the shaft upon which said numbered wheel is mounted, the base of said stand
 85 extending backward for receiving a brake-block and supporting the same upon the opposite side of the last-named shaft from the pinion, means for turning said pinion, and means for sliding said pinion and brake-block by the same transverse movement of said
 90 stand and placing the former in position for engagement with said beveled wheel and the latter for its engagement with a part revolving with said shaft, and thereby acting as a brake upon said wheel, substantially as described.

6. In combination with the rotary cutter of
 a paper-cutting machine, mechanism for indicating the number of sheets of paper cut from
 105 one or more rolls of paper, comprising a plurality of wheels mounted upon a shaft for revolution therewith and having ratchet-like teeth upon their peripheries, to the number of some even fraction of the number of sheets in a ream, a second shaft suitably arranged in journals and being provided with pinions splined thereon, and corresponding in number with that of said wheels, the first pinion of the series from one end of the shaft having one
 110 tooth, the next one two teeth, the next three teeth, &c., up to the last pinion of the series, and being arranged for the engagement and disengagement of said teeth with those of the aforesaid wheels by the sliding of the pinions, individually, along said shaft, means for sliding each pinion consisting of a bar, one end of which is engaged with a pinion, is suitably fulcrumed intermediate its ends and is provided with a slot, angularly arranged in its
 120 other end, a shipper-handle arranged for sliding in a direction transversely of said pinion-shaft, a pin in said handle engaging the angularly-arranged slot aforesaid, means for revolving said pinion-shaft from the aforesaid
 130

cutter-shaft and at a speed corresponding therewith, a numbered wheel mounted for revolution in unison with, and upon the same shaft as the aforesaid toothed wheels having
5 numbers thereon from one up to the highest number of teeth in each of said wheels, a second numbered wheel mounted for revolution near the perimeter of said first numbered wheel and having a star-wheel revoluble in unison
10 therewith, a pin arranged in said first numbered wheel for engaging one point of the star at each revolution of said first numbered wheel and revolving the same the distance of from

one point of the star to the next adjoining point, and numbers on said second numbered
15 wheel from one up to the number of points in said star-wheel, all arranged and operating for indicating upon said second numbered wheel upon a complete revolution thereof, the cutting of a ream of paper, substantially as de-
20 scribed.

MURRAY McCALLUM.

Witnesses:

THEODOSIA McCALLUM,
W. H. HUTTESTHUR.