

No. 665,007.

Patented Jan. 1, 1901.

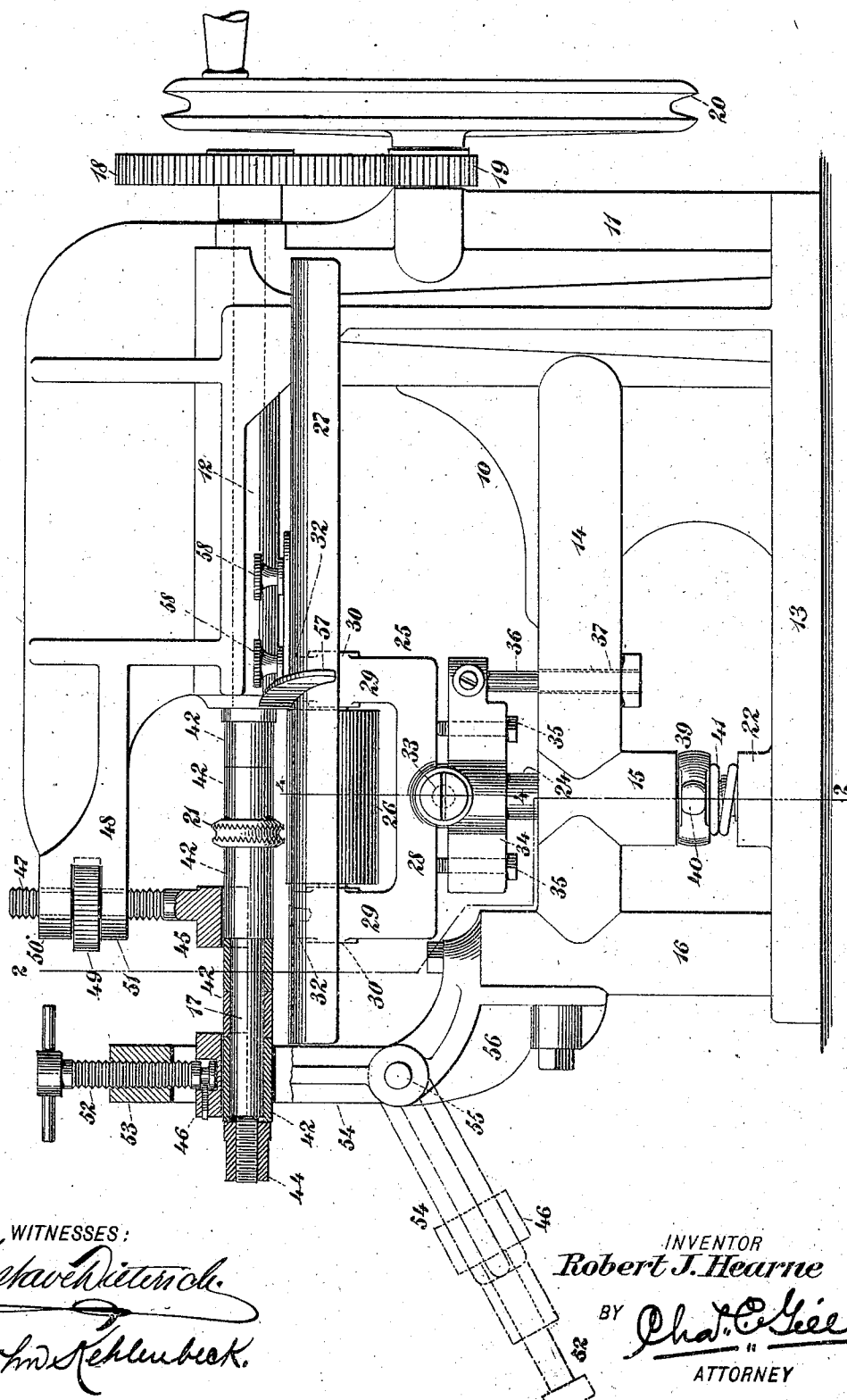
R. J. HEARNE.
ROTARY CUTTER MACHINE.

(Application filed Sept. 21, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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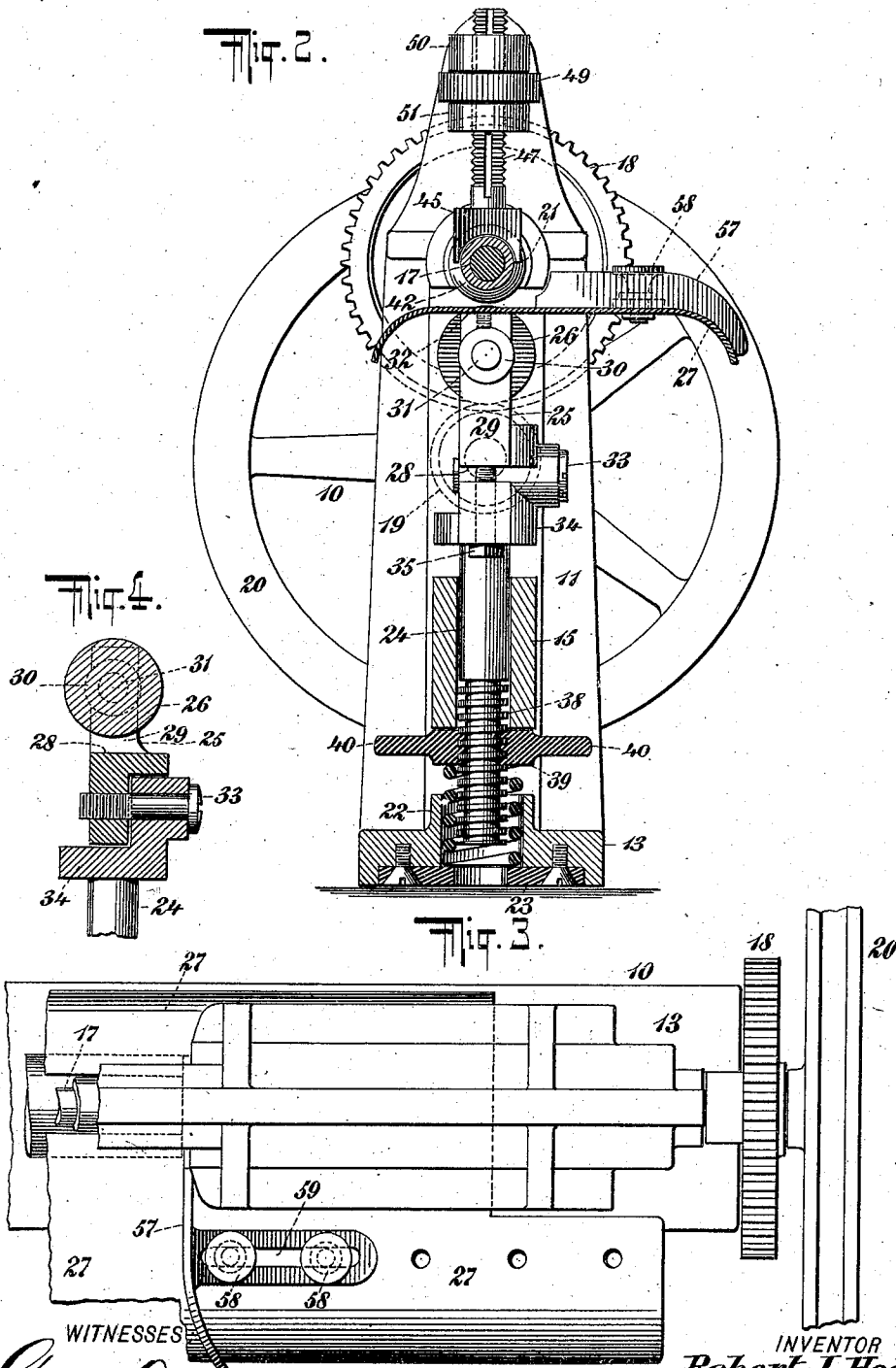
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UNITED STATES PATENT OFFICE.

ROBERT J. HEARNE, OF NEW YORK, N. Y.

ROTARY-CUTTER MACHINE.

SPECIFICATION forming part of Letters Patent No. 665,007, dated January 1, 1901.

Application filed September 21, 1900. Serial No. 30,670. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. HEARNE, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotary-Cutter Machines of which the following is a specification.

The invention relates to improvements in rotary-cutter machines; and it consists in the novel features of construction and combination of parts hereinafter described, and particularly pointed out in the claims.

I have embodied the invention in its presentation in this application in a pinking-machine comprising a cutting-wheel, an anvil-wheel, means for rotating the cutting-wheel, a frame sustaining the anvil-wheel and work-table, means yieldingly and pivotally supporting said frame, means for adjusting said table and anvil-wheel with relation to the cutting-wheel and affording an adjustable yielding pressure for said wheels with respect to one another, and means for rigidly maintaining the shaft for the cutting-wheel so that said shaft may be kept from springing upward during the employment of the machine.

The invention and satisfactory means for carrying the same into effect will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a pinking-machine constructed in accordance with and embodying the invention. Fig. 2 is a vertical transverse section of same on the dotted line 2 2 of Fig. 1. Fig. 3 is a top view, partly broken away, of the right-hand portion of the machine; and Fig. 4 is a vertical transverse section of a portion of the machine on the dotted line 4 4 of Fig. 1.

In the drawings the numeral 10 designates the general frame of the machine, said frame comprising the main standard 11, having at its upper end the bearing-sleeve 12, at its lower end the bed-plate 13, and at a suitable distance above said bed-plate the arm 14, carrying the vertical sleeve 15 and at the outer end connected with said bed-plate 13 by means of the standard 16.

Within the sleeve 12, extending centrally of the main frame 10, is mounted the shaft

17, supplied on one end with the gear-wheel 18, which, as usual, is in engagement with the pinion-wheel 19, secured upon the shaft of the power or driving wheel 20, the said wheels 18, 19, and 20 being usual in this art for imparting motion to the shaft carrying the cutting-wheel, which in the present case is designated by the numeral 21 and is removably secured upon the shaft 17.

The bed-plate 13 directly below the vertical sleeve 15 is formed with the hollow hub 22, which is partly closed at its lower end by the plate 23, (see Fig. 2,) which is fastened to the lower side of the bed-plate 13 by means of screws.

Within the vertical sleeve 15 and hub 22 is placed the vertical standard 24, having at its upper end the yoke 25, which supports the anvil-wheel 26 and work-table 27, and which yoke comprises the transverse base 28 and vertical arms 29 29, the latter having the bearing-sleeves 30 30 to receive the pin 31, upon which the anvil-wheel 26 has its movement. The vertical arms 29 29 extend upward above the bearing-sleeves 30 and above said sleeves form the supports 32, upon which the table 27 is fastened. The yoke 25 is pivotally mounted by means of the shaft 33 upon the cross-head 34 on the upper end of the vertical standard 24, and said cross-head 34 is provided at opposite sides of said standard 24 with the adjusting-screws 35 35, whose points are adapted to contact with the base 28 of the said yoke 25. In the absence of the screws 35 the yoke 25 would be free to have a liberal rocking or pivotal motion upon the shaft 33; but this motion may be limited and controlled by the adjustment of the screws 35, by which the downward tilting motion at either side of the yoke 25 may be either regulated at will or absolutely prevented, as circumstances may require. The standard 24 is guided in its vertical movement by means of the sleeve 15, and said standard, with its cross-head 34, is prevented from having any axial movement by means of a pin 36, which, as shown in Fig. 1, is secured to said cross-head 34 and passes freely within the vertical aperture 37, formed in the arm 14 of the machine-frame. During the vertical movement of the standard 24 the pin 36 simply has a sliding motion within the aperture 37 and by being confined

within said aperture prevents the standard 24 from turning axially. The vertical standard 24 supports the yoke or head 25, anvil-wheel 26, and work-table 27, and said standard 24 is in the form of a vertical shaft whose lower portion is threaded, as at 38, Fig. 2, and receives the nut 39, which has a bearing against the lower end of the sleeve 15 and is formed with the handles, wings, or finger-pieces 40 to facilitate its rotation upon the threaded portion of said standard 24.

Encircling the lower end of the vertical standard 24 is a firm coiled spring 41, which is seated within the hollow hub 22 and confined at its upper and lower ends by the nut 39 and plate 23, respectively, as illustrated in Fig. 2. It will be observed that the spring 41 furnishes a yielding seat for the standard 24 and the parts carried thereby.

The purpose of the nut 39 is primarily to enable the vertical adjustment of the standard 24, anvil-wheel 26, and table 27 with respect to the cutting-wheel 21, and it will be obvious that when the nut 39 is turned in one direction it will effect the elevation of the standard 24 and wheel 26 and that when said nut is turned in the reverse direction the said standard 24 and wheel 26 will be lowered. An important feature in the upward adjustment of the standard 24 in accordance with my invention is that the tension of the spring 41 remains normal until the cutting-wheel and anvil-wheel come into contact with one another and that thereafter the continued rotation of the nut 39 in the same direction results in the downward travel of said nut on the standard 24 and against the spring 41, whereby the force of said spring is brought under absolute control, and there is afforded an adjustable yielding pressure without regard to the special diameters of the wheels or the distances their centers may be apart.

The cutter-wheel 21 is held upon the shaft 17 between the adjoining ends of sleeves 42, which are slipped upon the outer end of the shaft 17 and are there held by means of the nut 44, screwed upon the outer extremity of said shaft 17, as shown in Fig. 1. The sleeves 42 and cutter 21 may be slipped from the shaft 17 upon the removal of the nut 44 from the latter. I make use of a series of sleeves 42, so as to readily adapt the shaft 17 for receiving the cutter-wheels 21, varying in width, and also to facilitate the securing of the cutter-wheel 21 at any desired point over the anvil-wheel 26. Cutter-wheels 21, varying in their patterns and widths to considerable degrees, are employed in this art, and by the employment of the sleeves 42 any of said wheels may be readily secured in the desired positions upon the shaft 17, said cutter-wheels being clamped by the pressure of the nut 44 between adjoining ends of the sleeves 42. The sleeve 12, receiving the shaft 17, is of considerable length and affords a long bearing for said shaft; but at its outer portion said shaft 17 may be liable to spring

upward slightly under the force exerted by the anvil-wheel 26 when the machine is in use, and to overcome any such result I provide the stirrup 45 and bearing-block 46 to engage the upper surface of the outer end of said shaft and hold the latter against any undue upward yielding. The stirrup 45 has a concaved lower surface to fit upon the shaft 17 or the sleeves thereon, which in effect form a part of said shaft, and said stirrup 45 is formed or secured upon the lower end of the vertical threaded stem or screw 47, which passes through apertures in the arm 48 of the machine-frame and is engaged by the internally-threaded nut 49, which has a milled periphery and is confined between the portions 50 51 of said arm 48, as shown in Fig. 1. The rotation of the nut 49 by means of the fingers will cause the screw 47 and stirrup 45 to have a vertical movement, and thus it is plain that the operator may upon observing any upward yielding of the outer end of the shaft 17 cause the stirrup 45 to move downward against said shaft. The bearing-block 46 is likewise concaved on its lower surface to engage the upper surface of the shaft 17, and said block 46 is carried on the lower end of an adjusting-screw 52, which engages a threaded aperture in the cross-bar 53 of a yoke 54, which is pivotally secured by a pin 55 to the bracket 56, the latter being securely fastened to the standard 16. The yoke 54 is shown in its operative position by full lines in Fig. 1, and by dotted lines in Fig. 1 the yoke 54 is shown in the position it will occupy when turned downward from its vertical position to entirely relieve the shaft 17 and completely open the space intermediate the lower surface of said shaft and the upper surface of the work-table 27. The bearing-block 46 is capable of vertical movement under the operation of the screw 52, and when moved downward against the shaft 17 will aid the stirrup 45 in preventing any upward yielding of said shaft. When it is desired to place the cutter-wheel 21 and sleeves 42 on the shaft 17, the stirrup will be elevated by means of the nut 49, and the bearing-block 46 will at such time also be elevated and the yoke 54 turned downward to the position in which it is shown in Fig. 1, thus leaving the shaft 17 entirely free to receive the cutter 21 and sleeves 42. After the cutter 21 and sleeves 42 have been placed upon the shaft 17 the stirrup 45 may be lowered and the yoke 54 returned to its vertical position, upon reaching which it will support the bearing-block 46 directly over the shaft 17, and thereupon the said block 46 will be lowered by the operation of the screw 52. The yoke 54 will remain in its vertical position during the operation of the machine except at such times as it may be necessary to treat fabrics or materials of considerable width, and under such conditions the yoke 54 will be turned to its lower position, so that the outer edges of the fabric may hang outward from the end of the work-

table 27 in an unobstructed manner while the inner edges of the fabric are passing between the cutter-wheel 21 and anvil-wheel 26. When narrower pieces of fabric or material are being treated, the yoke 54 will remain in its vertical position, since at such time there is sufficient space between said yoke and the gage 57 for the passage of the fabric. The gage 57 is secured upon the work-table 27 by means of screws 58, which pass through the elongated slot 59 in the longitudinal arm of said gage and which permits of the longitudinal adjustment of said gage on said work-table. The work-table 27 is provided with a number of screw-holes, as shown in Fig. 3, to receive the screws 58, and hence the gage 57 may be shifted along said work-table 27 to suit the varying conditions which may arise with respect to the fabric to be treated. It will be observed upon reference to Fig. 1 that the sleeve 12 is of considerable length and is above the right-hand portion of the work-table 27, and that hence a large amount of space in a longitudinal direction is provided above the work-table 27 to receive and permit the passage of the fabric to be treated.

The construction of the frame of the machine is such that I am permitted to employ a table 27 of extended surface area, said table extending from the yoke 54 to the standard 11 and affording convenient surfaces over which the fabric may be fed and guided. The table 27 is, as above described, secured upon the upper ends of the arms 29 of the yoke or frame 25, and, as shown in Fig. 2, the said table 27 projects forward toward the operator to a suitable extent to make it an easy matter to properly feed the fabric between the cutter-wheel 21 and anvil 26.

In the operation of the machine hereinbefore described power is applied to the wheel 20 and the fabric is fed upon the table 27 and between the cutting-wheel 21 and anvil-wheel 26, said cutting-wheel and anvil operating in a well-known manner. The relation of the anvil-wheel 26 and table 27 with respect to the cutting-wheel 21 is governed primarily by the nut 39, by which the said anvil-wheel 26 and table 27 may be moved toward or from the cutting-wheel 21 at will and without altering the relation of said anvil-wheel and table to one another. The yoke or head 25 carries both the anvil-wheel 26 and table 27, and hence said wheel and table move together. The adjustment upward of the standard 24 by means of the nut 39 will have no effect upon the spring 41 until the anvil-wheel commences to bear against or meets the resistance of the cutting-wheel, and then should the rotation of the nut 39 in the same direction be continued the compression of the spring 41 will take place and the yielding pressure of the anvil against the cutting-wheel will be increased. When the anvil-wheel is moved upward until it simply reaches the cutting-wheel, there exists a normal yielding support furnished by the spring 41 in its

initial condition; but any further rotation of the nut 39 in the same direction will increase the tension of the said spring, and consequently the force with which the anvil-wheel will press against or toward the cutting-wheel, the degree of its tension or force being subject to the manual movement of the nut 39, and consequently is adjustable to meet varying conditions and under the positive and convenient control of the operator. Thus the spring 39 affords when under pressure a yielding resistance to one of the wheels which cooperate to effect the cutting of the fabric, and the nut 39 may be utilized to first secure the primary adjustment of said wheels with respect to one another without regard to or affecting said spring and then to apply pressure to any extent desired against said spring, whereby the tension of the latter, and consequently the amount of its resistance, may be adjusted or regulated at will under the positive control of the operator. The spring 41 has no fixed connection with either the cutting-wheel or anvil-wheel or with the parts connected to move therewith, and consequently is not affected by any primary movement of one of said wheels toward the other thereof, and hence said spring may be independently adjusted to any extent desired and affords a very desirable adjustable yielding resistance for the wheel against which its force is exerted.

During the employment of the machine the yoke or head 25, table 27, and anvil-wheel 26 may be permitted to have a slight tilting motion on the shaft 33 in accordance with the special character of the cutting edges of the wheel 21, the fabric to be treated, and other circumstances, and thereby the machine is rendered more efficient and made capable of a wider range of employment. When the machine is in use, the outer end of the driving-shaft 17 is prevented from springing upward, as hereinbefore described, by means of the stirrup 45 and bearing-block 46. The cutting-wheel 21 (illustrated in Fig. 1) is a narrow wheel, and in many instances it will be found desirable to make use of a cutting-wheel much wider than the one shown in Fig. 1, and to accommodate the wider cutter-wheel on the shaft 17 it will be necessary to omit some one of the sleeves 42, so as to provide adequate space upon said shaft for the wider cutter-wheel. The sleeves 42 vary from one another in length, and this is for the purpose of permitting the shifting or transposition of said sleeves to accommodate the varying widths of cutters and to enable the operator to locate the cutter or cutters employed in proper relation to the anvil-wheel 26. In all cases, however, the nut 44 should press against the end of the outer sleeve 42 in order to cause the sleeves 42 to become clamped against the opposite sides of the cutter-wheel and bound to said shaft. The yoke 54, as above described, will be allowed to remain in its vertical position (shown in Fig. 1) and assist in

preventing the upward yielding of the outer end of the shaft 17, except when the width of fabric to be treated is such as to require the yoke 54 being left in its down position. (Indicated by dotted lines in Fig. 1.)

In many instances it is desirable to employ two cutter-wheels 21 on the shaft 17 for co-operation with the anvil-wheel 26, and owing to the impracticability of having the two cutting-wheels absolutely concentric with one another it is substantially impossible to attain the best results with a rigidly-mounted anvil-wheel 27, and hence I provide the tilting yoke 25 for supporting the anvil-wheel and in the use of the machine permit of the tilting or dipping motion of said yoke and anvil-wheel as the cutters pass over the same. When two cutters 21 are employed, they should be located as nearly as possible at equal distances from a vertical central line through the anvil-wheel 27.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rotary-cutter machine of the character described, the cutting-wheel, combined with the anvil-wheel, the threaded standard 24 supporting said anvil-wheel, the stationary sleeve 15 through which said standard passes, the exposed adjusting-nut 39 on said standard below said sleeve and adapted to engage the lower end of said sleeve as a bearing and also, after said anvil-wheel has reached the limit of its upward movement, to travel downward on said standard from said sleeve, and the spring 41 in vertical alinement with said anvil-wheel and encircling said standard below and pressing against said nut and yieldingly supporting said anvil-wheel, said nut being thus rendered capable, while against the lower end of said sleeve, of effecting the vertical movement of said standard and anvil-wheel toward and from said cutting-wheel and positively holding said standard and wheel in their adjusted position, and also, after the anvil-wheel has met the resistance offered by the cutter-wheel, of being screwed downward on said standard from said sleeve and against said spring to compress the latter; substantially as set forth.

2. In a rotary-cutter machine of the character described, the rotary cutting-wheel, and the rotary anvil-wheel, one of said wheels being directly above the other of said wheels and the lower of said wheels being movable toward and from the upper wheel, combined with the threaded standard 24 having at its upper end the yoke supporting said movable wheel, the stationary sleeve 15 through which said standard passes, the exposed adjusting-nut 39 on said standard below said sleeve and adapted to engage the lower end of said sleeve as a bearing and also, after said movable wheel has reached the limit of its upward movement, to travel downward on said standard from said sleeve, and the spring 41 in vertical alinement with said movable wheel and encircling said standard below and press-

ing against said nut and yieldingly supporting the said movable wheel, the said nut being thus rendered capable, while against the lower end of said sleeve, of effecting the vertical movement of said standard and its wheel toward and from the upper wheel and positively holding said standard and its wheel in their adjusted position, and also, after the said movable wheel has met the resistance offered by the upper wheel, of being screwed downward on said standard from said sleeve and against said spring to compress the latter; substantially as set forth.

3. In a rotary-cutter machine of the character described, the cutting-wheel, combined with the table, the anvil-wheel, the head or yoke supporting said anvil-wheel and table in fixed vertical relation to one another and movable with said anvil-wheel and table, the support for said head, table and anvil-wheel, the spring receiving said support and serving to resist the downward thrust of said support and anvil-wheel from said cutting-wheel, and means, engaging said spring and said support, for adjusting said anvil-wheel toward and from said cutting-wheel and maintaining said anvil-wheel in its adjusted relation to the cutting-wheel, and for adjusting the resistance to be offered by said spring; substantially as set forth.

4. In a rotary-cutter machine of the character described, the cutting-wheel, combined with the anvil-wheel, the head 25 having the sleeves 29 receiving the pin or axle for said anvil-wheel and also having integrally therewith the supports 32, 32, extending above said sleeves, the table 27 rigidly fastened upon said supports and having a fixed vertical relation at all times to said anvil-wheel, the standard 24 supporting said head and means for adjusting said head, whereby said table and anvil in their fixed vertical relation to one another are simultaneously adjusted with relation to the said cutting-wheel; substantially as and for the purposes set forth.

5. In a rotary-cutter machine of the character described, the cutting-wheel shaft, and the cutting-wheel thereon, combined with the anvil-wheel, the yoke supporting said anvil-wheel, means supporting said yoke and permitting the same to tilt with the tilting lengthwise of said anvil-wheel under the influence of said cutting-wheel, and means for pressing said anvil-wheel toward said cutting-wheel; substantially as set forth.

6. In a rotary-cutter machine of the character described, the cutting-wheel, combined with the anvil-wheel, the pivotally-mounted yoke supporting said anvil-wheel and adapted to have a tilting motion in line with the length of said anvil-wheel, the adjusting-screws at opposite sides of the support for said yoke to control the tilting action of the latter, and means for pressing said wheels toward one another, substantially as set forth.

7. In a rotary-cutter machine of the character described, the cutting-wheel shaft, and

the cutting-wheel thereon, combined with the anvil-wheel, the yoke supporting said anvil-wheel, the work-table also supported by said yoke, means supporting said yoke and permitting the same and said work-table to tilt with the tilting lengthwise of said anvil-wheel under the influence of said cutting-wheel, and means for pressing said anvil-wheel toward said cutting-wheel; substantially as set forth.

8. In a rotary-cutter machine of the character described, the cutting-wheel, combined with the anvil-wheel, the yoke supporting said anvil-wheel, the standard 24 having a head on its upper end, the pivot-shaft 33 securing said yoke to said head and normally allowing said yoke to tilt thereon, and the spring acting against said standard and yoke to press said anvil toward said cutting-wheel; substantially as set forth.

9. In a rotary-cutter machine of the character described, the cutter-wheel shaft, the cutter-wheel on said shaft, and adjustable means engaging the outer end portion of said shaft to prevent the same from yielding upward when the machine is in use, combined with the anvil-wheel, and means for pressing said anvil-wheel toward said cutting-wheel; substantially as set forth.

10. In a rotary-cutter machine of the character described, the cutter-wheel shaft, the cutter-wheel thereon, the movable yoke 54

carrying the adjustable bearing-block 46 to engage the upper surface of the outer end portion of said shaft, combined with the anvil-wheel, and means for pressing said anvil-wheel toward said cutting-wheel; substantially as set forth.

11. In a rotary-cutter machine of the character described, the main frame, the cutter-wheel shaft supported thereby, the cutter-wheel on said shaft, and the anvil-wheel to cooperate with said cutter-wheel, combined with the yoke 54 pivoted to the machine-frame below said shaft, and having the adjustable bearing-block to engage the upper surface of the outer end portion of said shaft.

12. In a rotary-cutter machine, the cutter-wheel shaft, the cutter-wheel thereon, the stirrup 45 engaging the upper surface of said shaft to prevent the latter from yielding upward, and movable means for supporting said stirrup and maintaining it against said shaft, combined with the anvil-wheel for cooperation with said cutter-wheel; substantially as set forth.

Signed at New York, in the county of New York and State New York, this 19th day of September, A. D. 1900.

ROBERT J. HEARNE.

Witnesses:

CHAS. C. GILL,
GUNDER GUNDERSON.