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Patented Sept. 16, 1902.

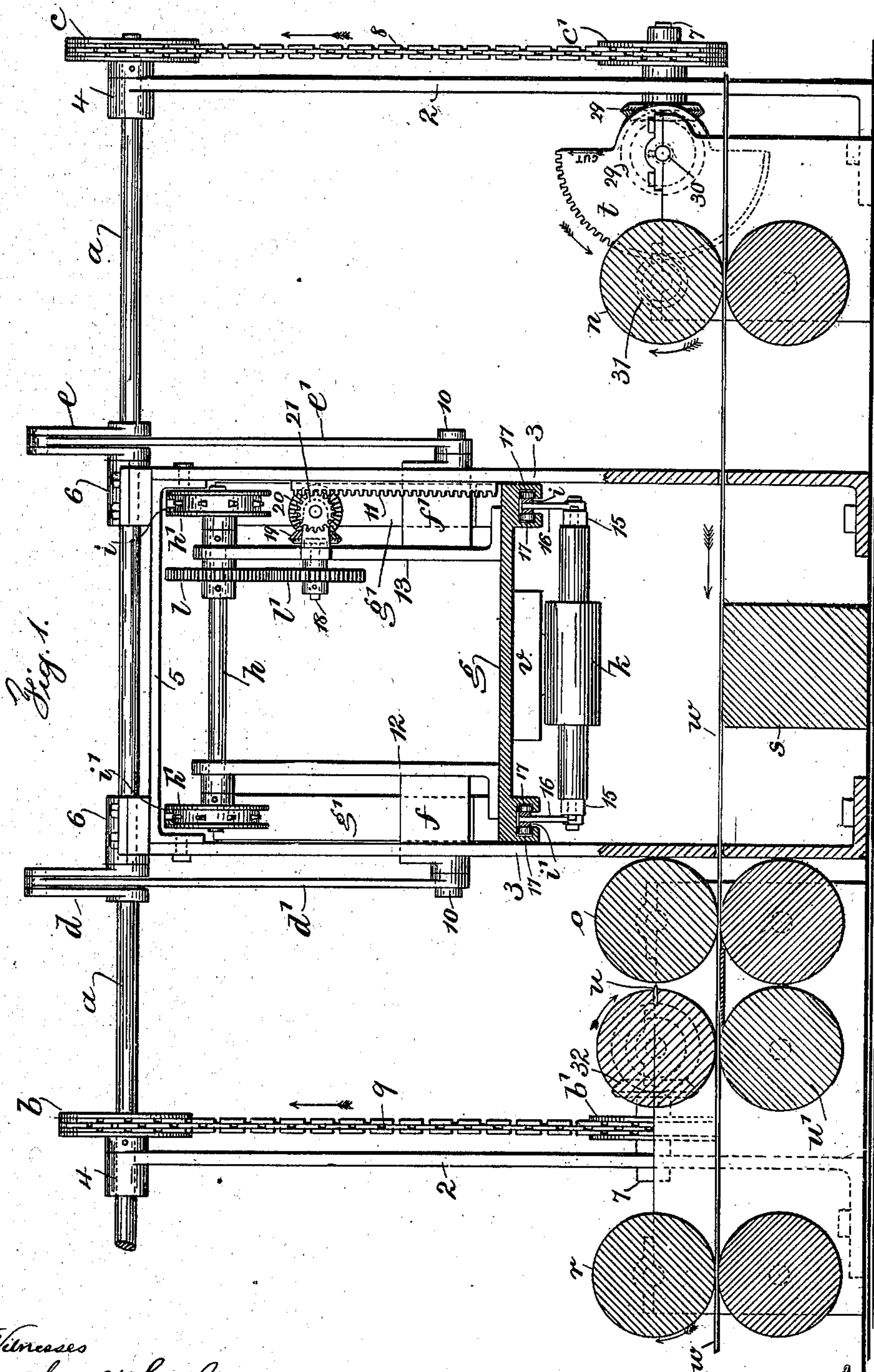
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MACHINE FOR FEEDING, PRINTING, AND CUTTING STRIPS OF MATERIAL.

(Application filed Jan. 29, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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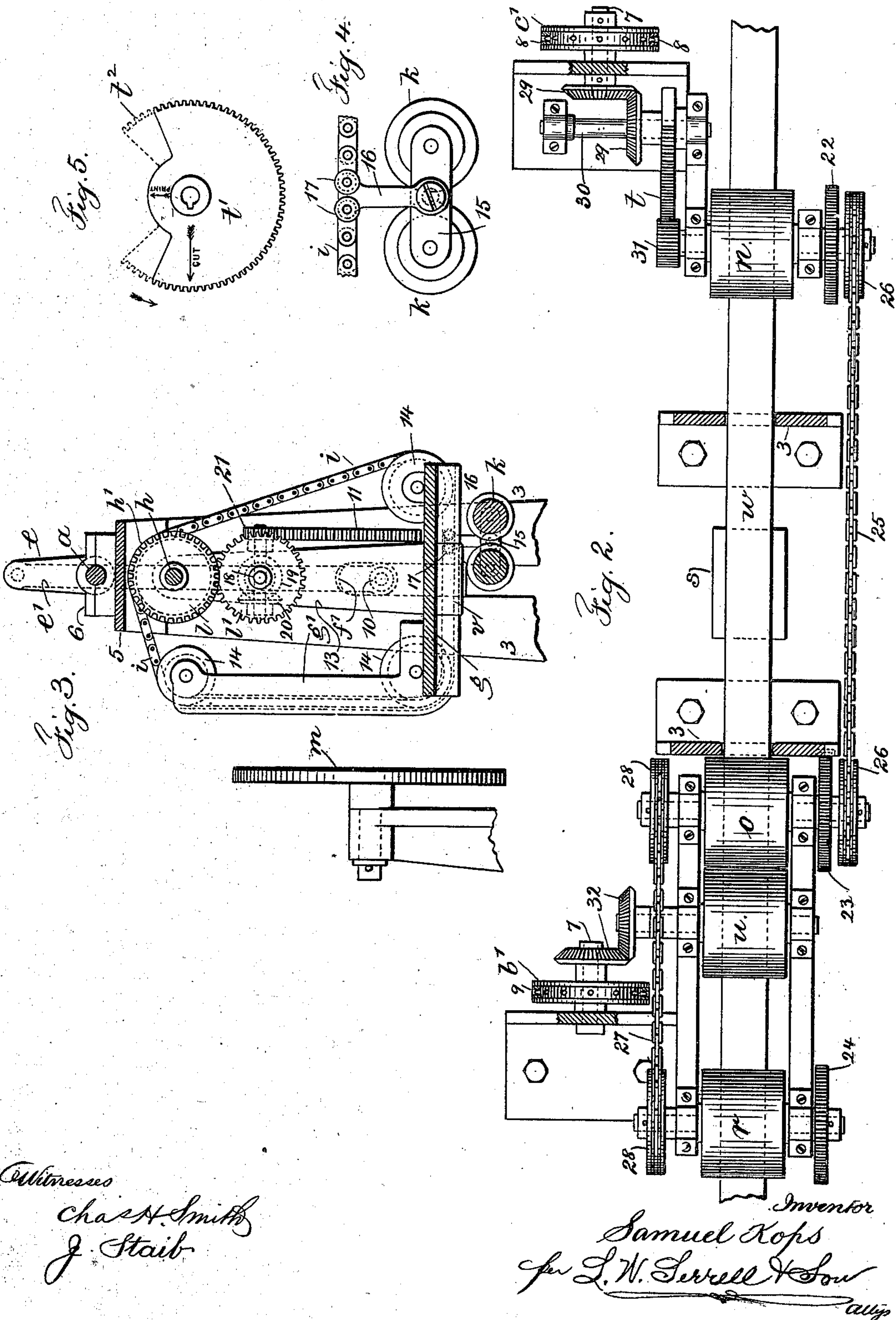
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

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MACHINE FOR FEEDING, PRINTING, AND CUTTING STRIPS OF MATERIAL.

SPECIFICATION forming part of Letters Patent No. 709,271, dated September 16, 1902.

Application filed January 29, 1902. Serial No. 91,685. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL KOPS, a citizen of the United States, residing at the borough of Manhattan, in the city, county, and State of New York, have invented an Improvement in Machines for Feeding, Printing, and Cutting Strips of Material, of which the following is a specification.

My invention relates to a device for feeding and printing upon strips of tape or other materials and cutting the same into predetermined lengths from rolls of considerable length.

My invention has special reference to printing upon fabric or tape employed as waistbands for corsets, said devices feeding the material through the machine and cutting the same into predetermined lengths, the material being arrested in its movement for the printing operation and cut with the progressive movement of the material, one of the objects of the invention being to print in the desired place of each strip of predetermined length. My invention, however, is not limited to the character of the material to be printed upon or the width of the same or the use to which the material printed upon is to be put, as it may develop that the uses to which this device can be applied will prove to be much more extensive than in present contemplation.

I employ a power-shaft, a vertically-movable platform actuated thereby, devices carried by the platform comprising an inking-roller and means for guiding and actuating the inking-roller. A cutting device for severing the material is also actuated from the driving-shaft, and pairs of feeding-rollers are connected to rotate in unison and are actuated or driven by the same power-shaft by means of a segment-gear. The segment-gear employed with the mechanism determines the length of the strip of tape or other material, as well as operating the mechanism to advance the material through the machine. There may be interchangeable segment-gears for use with the machine, or the segment-gears may be so constructed that their toothed surfaces may be increased or diminished for performing equivalent functions.

In the drawings, Figure 1 is an elevation and partial section representing my improve-

ments. Fig. 2 is a sectional plan of the same. Fig. 3 is an elevation and partial transverse section of the vertically-movable platform and devices for actuating the inking-rolls. Fig. 4 is an end elevation of the inking-rolls and their connection to an endless chain, and Fig. 5 is an elevation representing the segment-gear.

2 2 and 3 3 are series of similar frame-stands, with their bases secured to a suitable foundation. From Fig. 2 it will be seen that these standards are not in line and that the standards 3 3 are slotted, so that there is a groove or way between them, and the standards 2 2 are at their upper ends to be curved toward the line of the standards 3 3, so that the upper ends of all the standards are in line. The upper ends of the standards 2 2 are provided with bearings 4, and there is a cross-bar 5 connecting the upper ends of the standards 3 3, and bearings 6 are secured at the upper ends of the standards 3 3 in line with the bearings 4 4, and these bearings receive the power-shaft *a*, which may be driven by any convenient devices known in the art.

Adjacent to the respective ends of the power-shaft *a* are sprockets *b c*, and there are sprockets *b' c'* mounted upon short shafts 7, suitably journaled in the lower portions of the standards 2 2, and these sprockets are connected by chains 8 9, so that the rotation of the shaft *a* and sprockets *b c* is communicated to the sprockets *b' c'* and the shafts 7. Upon the power-shaft *a* there are cranks *d e* and therefrom connecting-rods *d' e'*, the lower ends of which are journaled to studs 10, secured upon blocks *f f'*, which blocks extend through and move vertically in slideways in the frame-standards 3 3, and a rack 11 is secured in position vertically upon the inner face of one of the frame-standards 3.

A platform *g* is provided with standards 12 13, placed vertically, secured thereto, and also secured to the blocks *f f'*. Secured to the platform *g* are vertically-placed uprights or arms *g' g'*, having internal grooved ways, and these ways are continued in the under side of the platform *g*, and I employ grooved rollers 14, pivoted to the upper ends of the arms *g' g'*, at the intersection of said arms, and the platform and near the opposite edge of the

platform, which rollers pass through the parts, so that their grooved peripheries project into the ways formed at these places. At the upper ends of the standards 12 13 I provide a cross-shaft *h*, upon the respective ends of which are mounted sprocket-wheels *h'*, and endless chains *i i'* pass around the sprocket-wheels and around the respective grooved rollers 14 and through the ways provided in the arms *g' g'* and under side of the platform *g*. Inking-rollers *k* are connected and suspended from these endless chains—that is, the respective ends of the rollers are journaled in plates 15, to the center of which plates arms 16 are centrally pivoted, the other ends of said arms being secured to the chains *i i'*, and at the intersection of the arms 16 and chains there are rollers 17, which run in the ways provided for the chains in the arms *g' g'* and under surface of the platform, and secured beneath the platform is a chase *v*, adapted to carry the type-form to be inked by the rollers *k*, and at one side of these devices, as shown in Fig. 3, I provide an inking-platen *m*, like similar devices well known in the arts and which is advantageously operated in the usual and well-known manner, the inking-rollers *k*, with the movement of the endless chains *i i'* in one direction, coming in contact with the surface of this inking-platen, receiving ink therefrom and moving back with the supply of ink over the surface of the type in the chase *v*.

Mounted in a suitable bearing in the standard 13 is a shaft 18 and connected thereto and to the shaft *h* are gears *l l'*. The shaft 18 carries a bevel-gear 19, and a short shaft connected to this standard 13 carries the bevel-gear 20 on one end and the pinion 21 on the other end. The bevel-gears 19 and 20 mesh and the pinion 21 meshes with the rack 11. The platform *g* and the parts hereinbefore described and connected thereto are given a vertical or up-and-down movement by the power-shaft *a*, the cranks *d e*, and the connecting-rods *d' e'*, and with this vertical movement the pinion 21, its shaft, and the bevel-gear 20 are rotated first in one direction and then in the other by the meshing of the pinion 21 with the rack 11. This actuates the bevel-gear 19, shaft 18, gears *l l'*, shaft *h*, sprocket-wheels *h'*, and endless chains *i i'* to impart a movement to the inking-rollers, and these devices are so placed and timed that the type is inked while the said devices are in an elevated position and the printing is effected upon the strip *w* of tape or other material above the printing-block *s* when said parts are brought into their lowermost position.

n, o, and *r* represent feeding-rollers in pairs mounted in suitable bearings upon the same foundation as the frame-standards. These feeding-rollers are connected by pairs of gears 22 23 24, which substantially agree in size with the rollers and connect the rollers of the pairs. On the shafts of the upper rollers of the pairs *n* and *o* are sprocket-wheels 26, con-

nected by a chain 25. On the shafts of the upper rollers *o* and *r* are sprocket-wheels 28, connected by a chain 27. On the shaft 7 of the sprocket-wheel *c'* there is a bevel-gear 29, and on a shaft 30, mounted in suitable bearings adjacent and at right angles to the said shaft 7, is a companion bevel-gear 29 and a segment-gear *t*. This segment-gear meshes with a pinion 31 on the shaft of the upper of the pair of rollers *n*, so that by means of the sprockets *c c'* and chain 8 the rotation of the power-shaft is communicated through the shafts 7 and 30, bevel-gears 29, segment-gear *t*, and pinion 31 to the respective pairs of feeding-rollers, their gears, sprockets, and connecting-chains to drive all of said rollers in unison and feed along the strip *w* of tape or other material which passes between the same. On the other side of the machine the sprocket-wheel *b'* actuates a pair of bevel-gears 32, one of which is on the shaft of the rotary cutter *u*, also mounted in suitable bearings and running above a circular cutter-block *u'*. The cutter and block agree in diameter with the feeding-rollers *n, o*, and *r*. The cutter is positively driven by the power-shaft and the relation of its movement to the movement of the printing devices is fixed, while the relation of the feeding devices through the segment-gear *t* and pairs of feeding-rollers both to the cutting and printing devices is changeable at pleasure, according to the size and form of the segment-gear.

Fig. 1 represents a semicircular segment-gear adapted to effect the feed of the tape or other material only during a half-rotation of the shaft 30. Fig. 5 represents in full lines a segment-gear of greater capacity, or, in other words, larger number of teeth, than the segment-gear, Fig. 1, and adapted in its rotation to feed a longer strip of tape or other material, while the dotted lines in Fig. 5 indicate a still further increase in the size and capacity for feeding of the segment-gear, the use of a gear of this size feeding a still longer strip of tape. A line at Fig. 2 marked with the word "Cut" indicates the point in the position of the gear and with reference to the devices actuated thereby at which the tape or other material is severed by the rotary cutter *u*. Another point indicated in Fig. 5 by the word "Print" represents the place at which the printing is effected with reference to the position of the segment-gear, it being a fact that the printing is effected midway in the projected circumference of the gear where there are no teeth, and this regardless of the number of teeth contained in the gear.

Referring particularly to Fig. 1 and considering the parts moving in the direction of the arrows, the strip *w* will continue its movement until the last tooth of the segment-gear *t* passes off from the pinion 31. At this moment the cutting will be effected, the segment-gear in its circumferential relation to the circumference of the rotary cutter being in the ratio of four to one. The series of feed-

ing-rollers *n o r* in pairs, the devices connecting the same, and the strip *w* now remain at rest until the first advancing tooth of the segment *t* comes into mesh with the pinion 31. The parts are so timed that midway of this movement the platform *g* descends and the impression of the type is given upon the strip *w*, effecting the printing. The surface measurement of the segment-gear *t*, as shown in Fig. 1, as communicated in the speeding-up movement to the pinion 31 is equal to the length of the strip *w* between the vertical centers of the pair of feeding-rollers *n* and the cutting-roller *u* and its block. Consequently when the full toothed surface of the gear, as shown, has been employed in feeding the now printed strip the surface that was directly between the feeding-rollers *n* now comes directly between the cutter *u* and its block and is cut or severed as the last tooth of the gear again runs off the pinion, so that the length of printed strips as cut by the precise devices shown in Fig. 1 agrees with the distance between the centers of the rollers *n* and cutter *u*, and the printing upon the strip is made exactly midway of its length. To increase the length of strip, the segment-gear *t* is substituted by the gear *t'*, Fig. 5, and it will be noticed in the operation of this extended toothed surface gear that the strip *w* is fed by the operation of the gear between the point marked "Cut" and where the gear runs off the pinion and that the period of rest is considerably shorter than is the case where the segment-gear *t* is employed, so that there is a portion of the strip fed before the rest period and before the printing is effected, and a greater length of material thereafter fed before the next cutting-point is reached. This condition is increased by the substitution of a gear of the size represented by the dotted lines, Fig. 5, *t''*, in which it will be noticed that the rest period is again shorter, a correspondingly-increased length being fed after the nut before the rest period and a correspondingly-increased length after the rest period before the material is again severed or cut. As illustrated and described it will be apparent that three appreciable different lengths of strip *w* may be fed and cut by the devices shown and in each of which the printing comes exactly in the middle of the length of the strip. There may be smaller differences in the toothed surfaces of the segment-gears than have been herein illustrated, or the segment-gears may be increased in circumference, so that the rest period is even smaller still, so as to provide for different lengths of strips, each of which is printed in the center. In connection with this mechanism it is to be observed that the series of feeding-rollers move with a much greater speed than that of the rotary cutter, there being sufficient looseness between the rotary cutter *u* and its circular block to permit a tape to be drawn through between the same without interfering with the movement of

the tape, as the cutter device is positively connected to the printing mechanism and is timed in strict accordance therewith, so that the period of cutting and printing bear a positive relation to one another, the features of adjustability bearing a progressive relation thereto.

I do not limit myself to printing the tapes or strips in the center or to the relations or proportions of the devices for actuating the feeding-rollers and regulating the speed thereof, as the same may be altered without departing from the spirit of my invention.

I claim as my invention—

1. In a machine for feeding, printing and cutting strips of material, the combination with a power-shaft, of printing devices and means for vertically moving the same and for actuating the same by said shaft, cutting devices and means for actuating the same by said shaft, devices for feeding along the strip of material and interchangeable gears and a suitable shaft therefor operated by said power-shaft for actuating the said feeding devices to a predetermined extent so as to regulate the cut lengths of the printed strips, substantially as set forth.

2. In a machine for feeding, printing and cutting strips of material, the combination with a power-shaft, of printing devices, means for actuating the same and connections therefrom to the power-shaft for imparting a vertical upward-and-downward movement to the printing devices, cutting devices and connections therefrom to said power-shaft whereby said cutting devices and said printing devices are positively actuated and a fixed relation maintained between the parts, devices for receiving and for feeding along a strip of material to be cut and printed, and gears interchangeable with one another actuated by said power-shaft for setting the feeding mechanism in motion whereby predetermined lengths of material may be fed and printed so as to provide different lengths of printed strips, substantially as set forth.

3. In a machine for feeding, printing and cutting strips, the combination with a power-shaft, means actuated thereby for severing the strips and other means actuated thereby for feedingsaid strips, of a platform carrying the type-form, and means connected therewith and to the power-shaft for imparting thereto a vertical downward-and-upward movement, an inking-roller, endless chains, connections from the ends of the inking-roller to the chains, and means substantially as shown and described and actuated by a fixed device through the medium of the vertical movement of the said platform for imparting to said chains and inking-roller a forward-and-backward movement, substantially as set forth.

4. In a machine for feeding, printing and cutting strips, the combination with a power-shaft, means actuated thereby for severing the strips and other means actuated thereby

for feeding said strips, of a platform carrying the type-form, and means connected therewith and to the power-shaft for imparting thereto a vertical downward-and-upward movement, an inking-roller, endless chains, connections from the ends of the inking-roller to the chains, a shaft and sprocket-wheels carried by said platform, a gear on said shaft, a second gear meshing therewith, a rack fixed on the frame of the machine, a pinion engaging the same and bevel-wheels actuated by the pinion for imparting movement to the gears, shaft, sprockets and chain with the up-and-down movement of the platform, substantially as set forth.

5. In a machine for feeding, printing and cutting strips of material into lengths, the combination with a power-shaft, printing devices and connections therefrom to the shaft for vertically moving said printing devices and printing the strip, and means actuated by said power-shaft for cutting the strip into lengths, of a series of feeding-rollers in pairs between which the strip is passed, means for connecting said series of rollers to cause them to move together, a shaft and connections therefrom to said power-shaft, a segment-gear mounted on said shaft and interchangeable with similar gears, and a pinion actuated thereby for effecting the movement of the feeding-rollers and the devices connecting the same, substantially as set forth.

6. In a machine for feeding, printing and cutting strips into lengths, the combination with a power-shaft, vertically-movable printing devices actuated by said power-shaft for printing upon the strip, cutting devices also directly actuated by the power-shaft for severing the material into lengths and feeding devices for progressively moving the strip along, of a segment-gear interchangeable with similar gears and so timed with the cutting and printing mechanism that the strip is fed and cut while the gear is operated and printed at a point intermediate of the rest period of the feeding mechanism during the revolution of said segment-gear, substantially as set forth.

7. In a machine for printing, feeding and cutting strips of material, the combination with a power-shaft, of printing devices, means for actuating the same with a vertical movement, cutting devices, means for actuating said cutting devices by said shaft, devices for feeding along a strip of material, interchangeable segmental gear-wheels and a suitable shaft for said gear-wheels operated by said power-shaft for actuating the said feeding devices to a predetermined extent so as to regulate the cut lengths of the printed strips, substantially as set forth.

8. In a machine for feeding, printing and cutting strips of material, the combination of feeding-rolls for moving the strip along, a cutter for cutting off the strip at predetermined lengths, a type form or block for printing upon the strip of material, and means for raising

and lowering and actuating said parts so that after a strip is cut off the next strip is moved forward and stopped the necessary distance for the type form or block to be brought down to print upon the exact center of the length of the strip, and then after the block is raised, the strip is moved forward exactly one-half of the length of the predetermined strip and is then cut off, substantially as specified.

9. In a machine for feeding, printing and cutting strips of material, the combination with a power-shaft, printing devices, means for actuating the same by the power-shaft, feeding devices and means for actuating said feeding devices from the power-shaft, of a rotary cutter, suitable shaft and bearings therefor, a cylindrical cutter-block, a shaft, a sprocket and bevel-gear on said shaft, a chain connecting said sprocket with the power-shaft, and a bevel-gear on the rotary-cutter shaft and meshing with the aforesaid gear whereby the rotary cutter is actuated by the power-shaft, substantially as specified.

10. In a printing-machine, the combination with a frame and a power-shaft, of a platform adapted to hold the type-forms, standards secured to the said platform, blocks connected to the said standards and received in vertical slots in said frame, connections between said blocks and power-shaft whereby a vertical up-and-down movement may be imparted to said standards and platform, inking-rollers and means for actuating the same by the up-and-down movement of the platform and standards, substantially as set forth.

11. In a printing-machine, the combination with a frame and a power-shaft, of a platform adapted to hold the type-form, devices secured to and extending under both sides of the said platform and having internal grooved ways, standards secured to the said platform, blocks connected to the said standards and received in vertical slots in said frame, connections between said blocks and power-shaft whereby a vertical up-and-down movement may be imparted to said standards and platform, a shaft secured in the upper end of said standards, rollers on the said shaft, other rollers secured to the said platform, endless chains passing over said rollers and within said internal grooved ways, inking-rollers secured to said chains, and means for actuating said inking-rollers by the up-and-down movement of the platform and standards to operate the said inking-rollers, substantially as specified.

12. In a printing-machine, the combination with a frame and a power-shaft, of a platform adapted to hold the type-form, devices secured to and extending under both sides of the said platform and having internal grooved ways, standards secured to the said platform, blocks connected to the said standards and received in vertical slots in said frame, connections between said blocks and power-shaft whereby a vertical up-and-down movement may be imparted to said standards and plat-

form, a shaft secured in the upper end of said standards, rollers on the said shaft, other rollers secured to the said platform, endless chains passing over said rollers and within
5 said internal grooved ways; inking-rollers secured to said chains, a gear-wheel on said shaft, a short shaft secured in one of said standards, a gear-wheel on said short shaft and meshing with the aforesaid gear-wheel,
10 a rack secured to said frame, a pinion meshing with said rack, a shaft for said pinion, and connections between the pinion, shaft

and said short shaft, whereby with the up-and-down movement of the platform and standards the said chain is actuated to im- 15 part a back-and-forward movement to the said inking-rollers, substantially as set forth.

Signed by me this 24th day of January, 1902.

SAMUEL KOPS.

Witnesses:

GEO. T. PINCKNEY,
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