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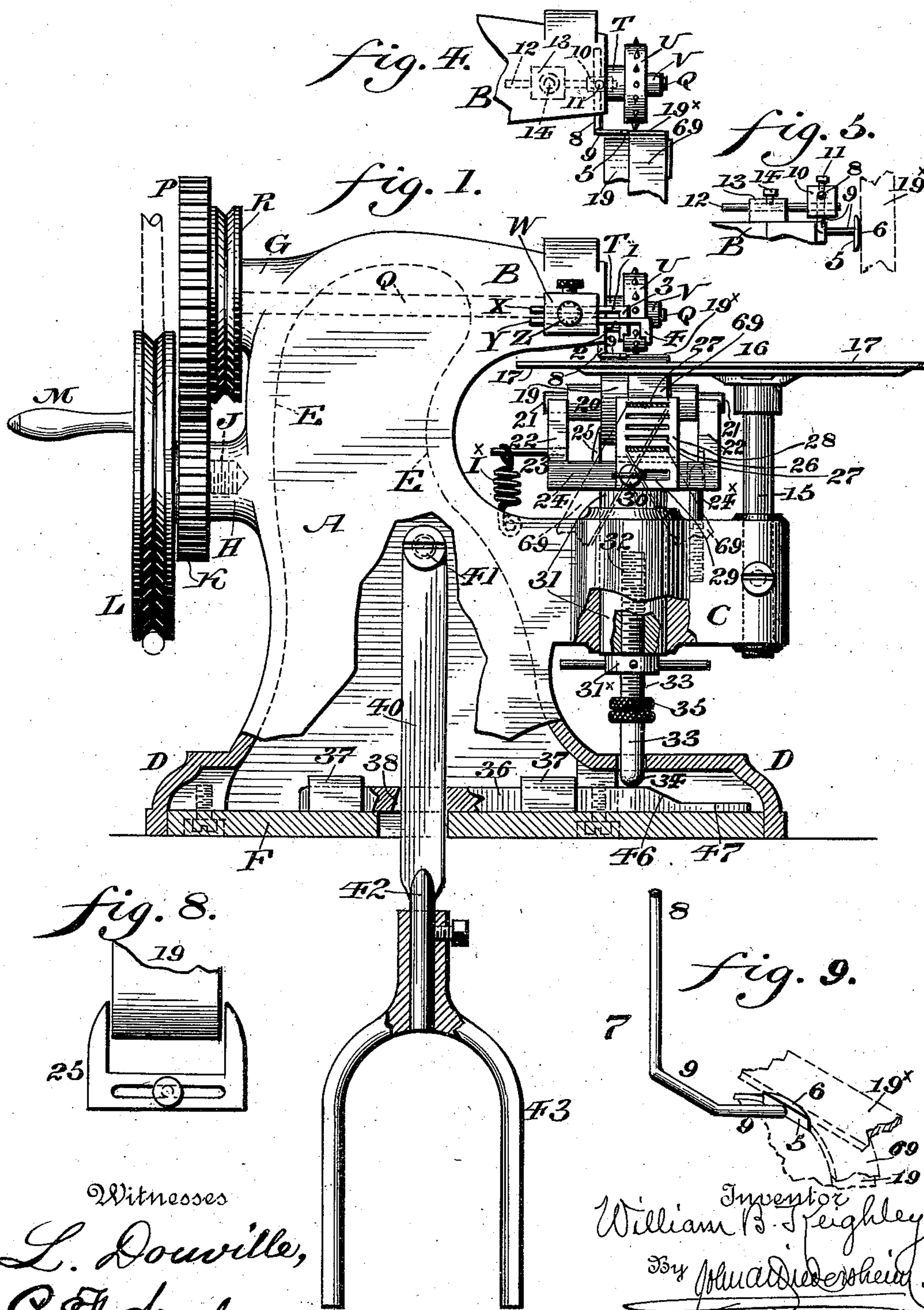
2 Sheets—Sheet 1.

W. B. KEIGHLEY.

# PERFORATING, PINKING, AND PUNCHING MACHINE.

No. 557,276.

Patented Mar. 31, 1896.



Witnesses

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(No Model.)

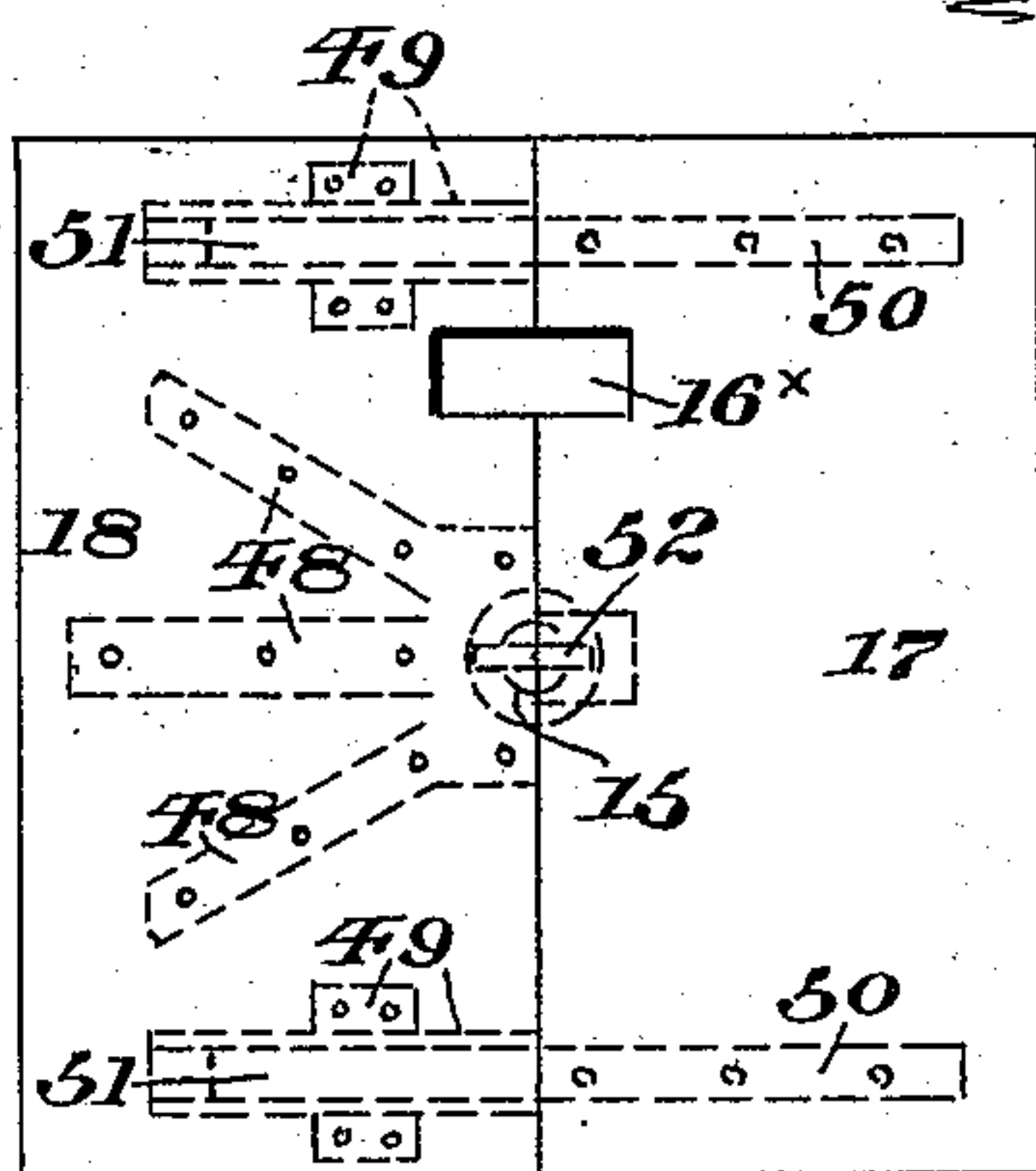
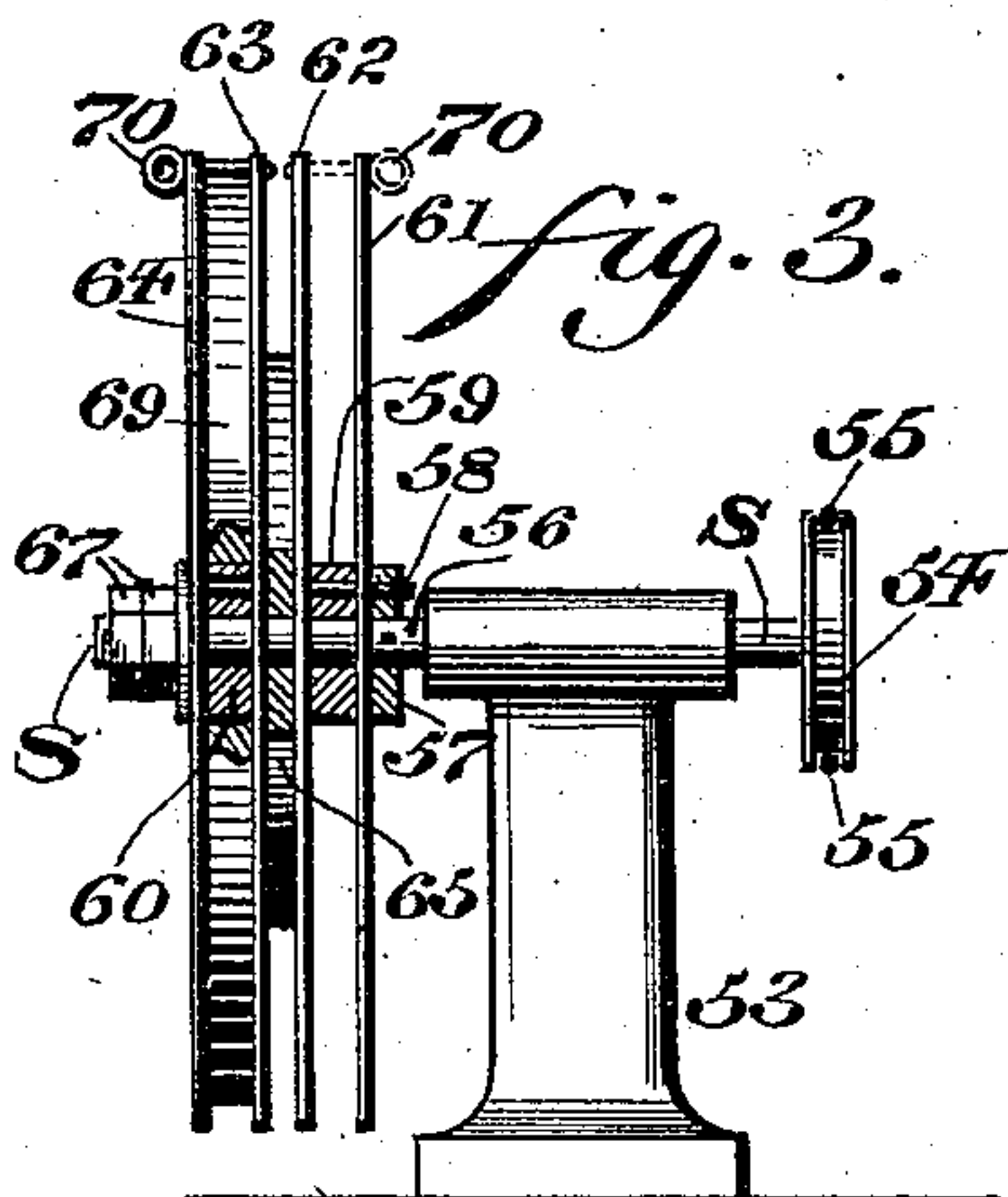
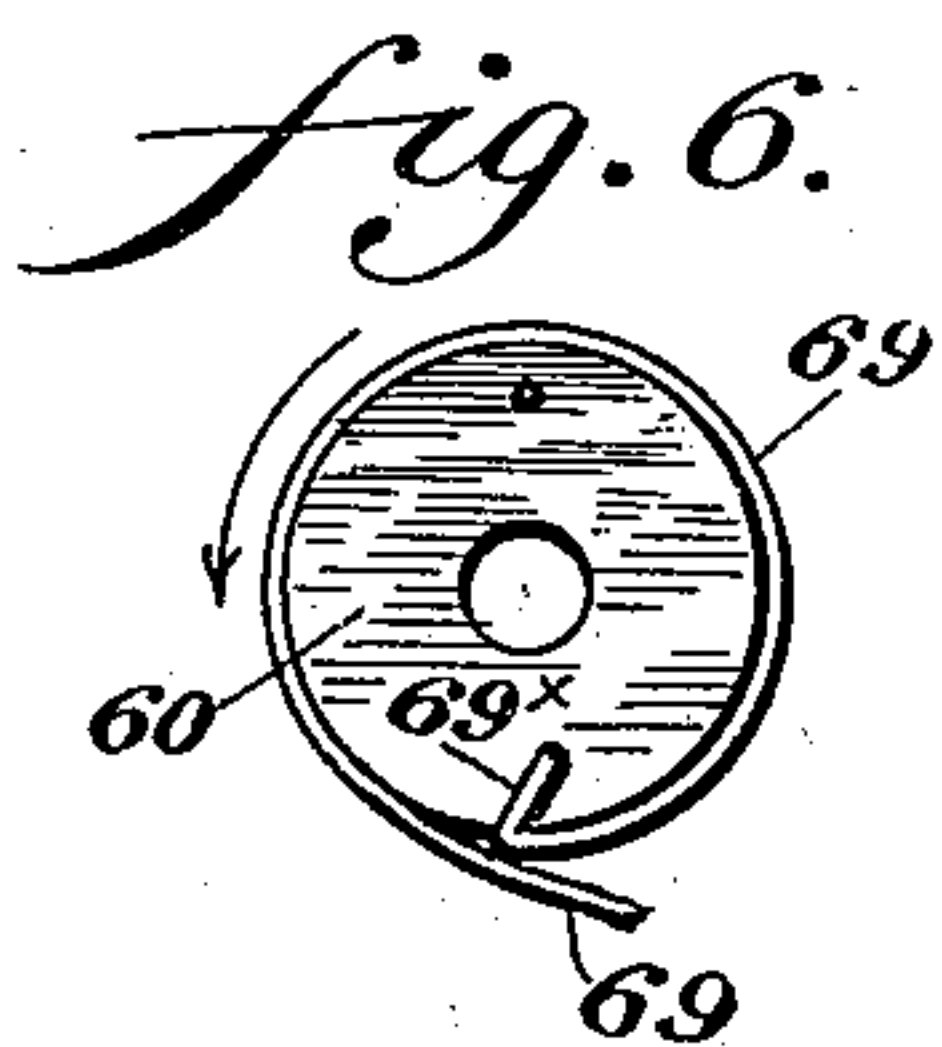
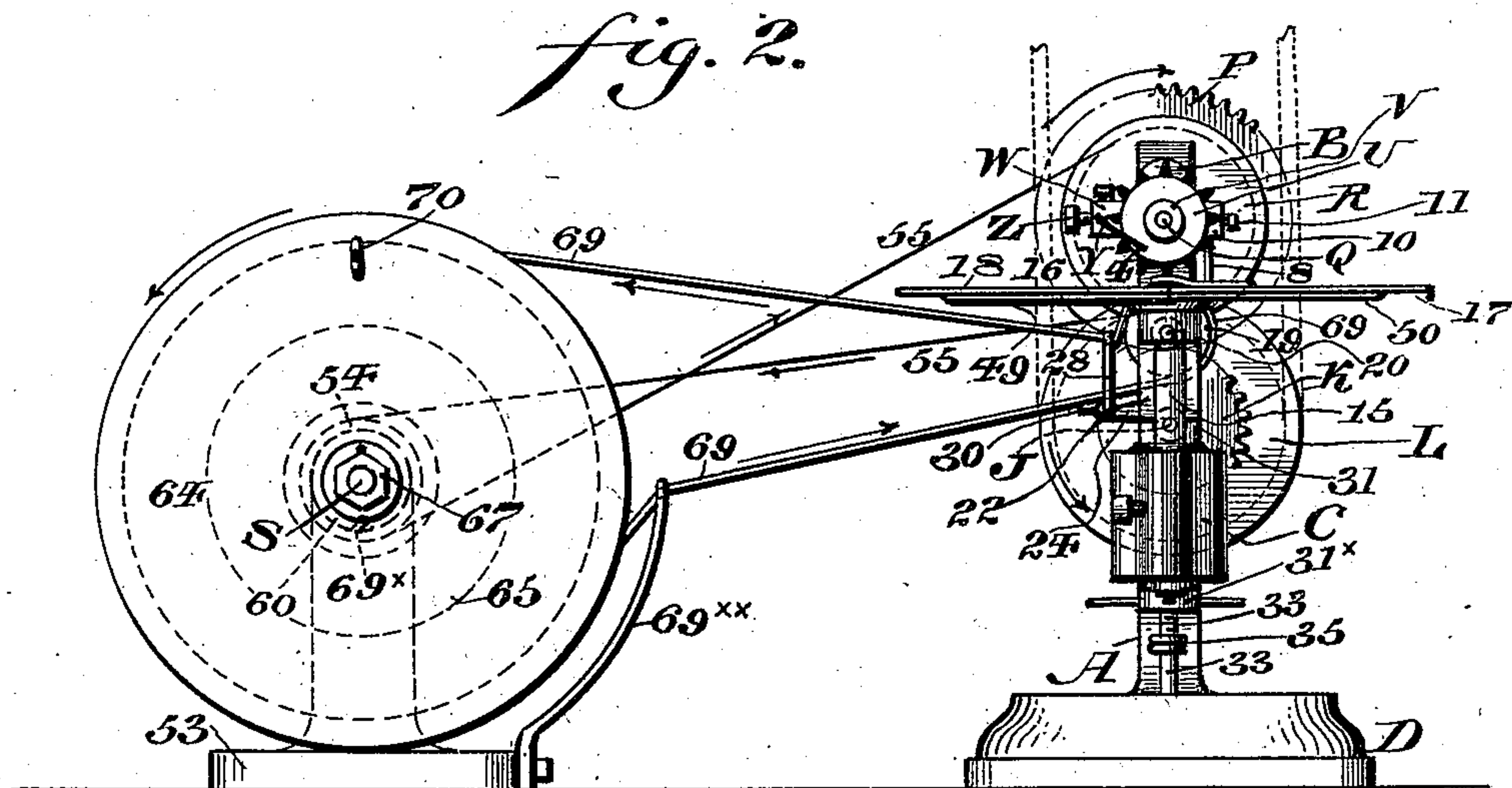
2 Sheets—Sheet 2.

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*fig. 7.*

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# UNITED STATES PATENT OFFICE.

WILLIAM B. KEIGHLEY, OF VINELAND, NEW JERSEY.

## PERFORATING, PINKING, AND PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 557,276, dated March 31, 1896.

Application filed March 25, 1895. Serial No. 543,032. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. KEIGHLEY, a citizen of the United States, residing at Vineland, in the county of Cumberland, State of New Jersey, have invented a new and useful Improvement in Perforating, Pinking, and Punching Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a novel construction of perforating, punching, and pinking machine in which the cost of manipulating the same is reduced to a minimum and the life of the various parts of the machine is greatly prolonged, provision being also made for readily guiding and supporting the work and for stripping the same from the pinking or punching roll.

It also consists of novel means for supporting, guiding, actuating, and adjusting a strip of paper or other material which is interposed between the work and its support, whereby much better results are attained than heretofore.

It also consists of novel means for instantly moving or depressing the work out of the path of the pinking, perforating, or punching roll when desired.

It further consists of novel details of construction whereby a machine of great practical utility is produced, all as will be hereinafter set forth.

Figure 1 represents a side elevation, partly in section, of a perforating, pinking, and punching machine and its adjuncts embodying my invention. Fig. 2 represents, on a reduced scale, an end elevation of the same, showing especially the mechanism for actuating the paper-roll to be hereinafter referred to. Fig. 3 represents a detail view showing the manner of mounting the paper-roll and its adjuncts. Figs. 4, 5, and 9 represent detail views showing especially the punching-roll, the work-guide, and means for adjusting the same. Fig. 6 represents a detail view showing the manner the end of the paper strip is primarily attached to its supporting-roll. Fig. 7 represents a plan view of the sectional table employed. Fig. 8 represents a detail view showing a portion of the lower roll and the guide for the same.

Similar letters and numerals of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the frame or body of the machine, the width and breadth of the same being apparent from Figs. 1 and 2. The said frame is provided with the laterally-projecting arms B and C and the base D, by which latter it is secured to a suitable table or other support, the frame being cored out, as indicated by the dotted lines, Fig. 1, and its lower portion being closed by means of the slotted plate F, whose function will be hereinafter referred to. The said frame A is provided with the bosses G and H, in which latter is secured the stud J, which has rotatably mounted thereon the pinion K and the grooved pulley L for the application of a belt, said pulley being also provided with a handle M, the stud J being in the present instance stationary, as is evident, and said pulley and pinion being held on the stud J in any suitable manner.

P designates a gear meshing with the pinion K, said gear being mounted on the rotatable spindle Q, which has its bearing in the upper portion of the frame A, said gear P having the grooved belt-pulley R attached thereto, by which power is transmitted to the shaft S, which carries the paper-roll seen in Fig. 3, as will be hereinafter explained. The spindle Q has a shoulder T thereon, one face of which abuts against the projection B of the frame A, while the other face of said shoulder is in substantial contact with the perforating, pinking, or punching roll U, which is held in said spindle Q by means of the nut V or other similar device.

W designates a boss attached to a suitable portion of the frame A, through which pass the inside and outside strippers X and Y, respectively, which may be held in place by a suitable set-screw Z, which is common to both, or a separate set-screw may be employed for each stripper, if desired. The said strippers are preferably constructed as seen in Figs. 1 and 2, each having a body portion 1 and 2, which projects from the boss W, from which body portion depend the feet 3 and 4, respectively, which are recessed so as to contact with the corners of the roll U, as will be understood from Fig. 1, thus effectively stripping the work from the said roll in every instance.

7 designates the work-guide, (best seen in Fig. 9,) which has an upright member 8 and a laterally-deflected member 9, to which is



attached the foot 5, the face 6 of the latter being smooth and preferably pointed or rounded at its ends to allow of any adjustment that may be necessary, the under side of said foot being also smooth to allow of the same being placed close upon the pinking-roll or upon the paper strip. The upright portion 8 of said foot passes through the head 10 and can be held in any desired position relative thereto by means of the set-screw 11. The said head 10 is secured to the rod 12, which latter passes freely through the boss 13, which is attached to the side of the frame A opposite the boss W, whereby it will be seen that the work-guide is capable of a rotary, vertical, or horizontal adjustment, according to requirements, the set-screw 14 holding the rod 12 in any desired position.

The arm C of the frame A has the rod 15 passing freely through it near its outer extremity, the said rod being held in position by a set-screw and supporting on its upper end the table 16, which is composed of the two front and rear sections 17 and 18, respectively, which construction will be hereinafter referred to.

19 designates a smooth-faced roller which has a portion of its upper face passing through the slot 16<sup>x</sup> in the table 16 and is located under the roller U and is mounted on the shaft 20, which has the journals 21, which rotate in suitable bearings in the upright arms 22 of the carriage 23, which latter consists of the horizontal bar or base portion 24 and the aforesaid arms 22, which rise therefrom, said carriage being prevented from turning or moving by the pin 24<sup>x</sup>, which enters the bar 24 and the arm C, so that the two rolls will always run parallel to each other.

25 designates a guide for said roller 19, both the guide and roller being adjustable laterally as the face of the roller becomes worn.

26 designates the paper-guide, which consists of the upright plate 28, provided with the small rollers or slots 27 therein, which latter have their edges rounded and smoothed, the lower portion of said plate having suitable ways, (indicated by the two parallel dotted lines,) which contact with the bar 24, and being provided also with the elongated slot 29, through which passes the thumb or set screw 30, by means of which latter the plate 28 is held in position and adjusted according to requirements.

31 designates a post which is attached to said bar 24 and passes downwardly through the arm C. The lower portion of said post 31 is internally threaded at 32 and is engaged by the upper portion of the threaded stem 33, the lower portion of the latter being unthreaded and rounded at its extremity 34, while its central portion 35 is enlarged and milled to allow said stem to be readily manipulated with the fingers, said stem being held in position by means of the lock-nut 31<sup>x</sup>. The rounded extremity 34 of the stem 33 passes freely through the top of the base D

and rests on the top of the slide-bar 36, which is guided by the straps 37 and is supported by the plate F, which in the present instance is removable and suitably attached to the frame A.

38 designates a slot in said slide-bar, which is wide enough to allow the lever 40 to pass freely therethrough, the upper end of said lever being pivoted at 41 to a suitable fixed point, while its lower end has the portion 42, which enters the upper portion of the knee-piece 43, which is actuated by the knee 43<sup>x</sup> of the operator, said knee-piece being U-shaped in the present instance and adjustable vertically, as is evident, and being locked in position by means of a set-screw, lock-nut or other similar device. The end of the slide-bar 36, which is under the stem 33, is provided with the inclined surface 46, which is further lengthened into the tongue 47, whereby it will be seen that if the lever 40 be actuated so as to move the bar 36 to the left the stem 33, the post 31, and consequently the carriage 23 and the roller 19 will drop by reason of their own weight when said incline 46 reaches the end 34 of the stem 33, or preferably the spring 1<sup>x</sup> may be employed, as is evident.

The construction and manner of supporting the front and rear sections 17 and 18 of the table 16 will now be described, reference being had to Fig. 7. The upper portion of the rod 15 has the arms 48 radiating therefrom, to which the rear section 18 is attached.

49 designates straps attached to the under side of the section 18, through which slide the ends 51 of the rods 50, which latter are attached to the front section 17 and are preferably square, the recesses in the straps 49 being, of course, also square, whereby it will be seen that the front section 17 can be readily removed when desired, and when the sections of the table are in the position seen they may be held rigid with respect to each other by means of the dowel-pin 52, which engages a lug attached to the section 17 and the upper portion of the rod 15.

The paper-actuating mechanism will now be described, reference being had to Figs. 2 and 3 especially.

53 designates a stand which is located adjacent the machine, the upper portion thereof having a suitable bearing for the shaft S, above referred to, said shaft having mounted on one extremity the belt-pulley 54, which is adapted to be actuated by the belt 55, which passes around the pulley R. The end 56 of the shaft S has the collar 57 secured thereon, through which is inserted the pin 58, which latter also enters the hub 59, to which is attached the guide plate or disk 61, the plate 62 fitting loosely on the shaft S and in contact with the hub 59, said pin 58 passing through said collar 57 and hub 59, so that they rotate in unison with the shaft S.

65 designates a leather or other washer intermediate the disks 62 and the adjacent disk



63, which also fits loosely upon the shaft S and close to the hub 60, the latter having the disk 64 attached thereto, both of said hubs and disks being held in position by means of suitable nuts. Each of the hubs 59 and 60 has a diagonal incision 69<sup>x</sup> therein, (see Fig. 6,) into which an end of the paper strip 69 is inserted when the operation of winding up said paper is begun, the paper being shown in Fig. 2 in the act of being unwound from one hub and wound on the other hub, the unwinding of the paper when a new roll is placed in position being prevented by the insertion of a pin or stud 70 through the disks 63 and 64, and said strip being supported in the present instance as it is unwound by the arm 69<sup>x</sup>, which latter may have an antifriction-roller journaled therein.

In commencing to operate the machine the free end of the paper strip 69 is unwound for a short distance, then passed through the guide 28 upwardly over the roller 19, then back through said guide 28, and its end is then inserted in the diagonal incision, substantially as seen in Fig. 6, either by the fingers or a suitable tool, and if now the shaft S is rotated it is evident that the paper will be unwound from one hub upon the other. When said paper has been used once—*e. g.*, has been unwound from the hub 60 upon the hub 59—the belt is changed from a cross to a straight belt, the pin 58 is removed, the hubs are shifted, the hub 60 occupying the position of the hub 59, the pin 58 is inserted in said hub 60, and the paper strip is again adjusted, as has been described, so that the same can be passed around the roller 19 several times until it is completely used up, said roller in the meantime being untouched and uninjured.

The operation is as follows: The stand 53 and the frame A are secured to a table or other support in the relative position seen in Fig. 2. Power having been applied to the belt-pulley L, the rotation of the pinion K will be imparted to the gear P, the pulley R and the spindle Q, and thence to the pinking, punching or perforating roll U. Motion will also be imparted to the paper strip 69 by means of the belt 55, which is crossed in the present instance, said strip passing from the supply-roll on one hub through the paper-guide 26, over and around the roll 19, and then back again to the other hub, upon which it is wound after being used, as has been explained. The material to be operated on is passed between the roll U and the upper surface of the paper strip 69, which rests on the roller 19, and it will thus be seen that in practice the cutting edge of the said upper roll U will not cut into and mar the roller 19, but will simply cut into the paper, which, being inexpensive, can be readily replaced, and a single strip can be used several times, as explained, thus reducing the cost of operating the machine to a minimum, the roller 19 being made

of hard rubber, or preferably hardened steel, and thus practically indestructible, since the punches or the projections of the roller U never contact with it, whereas in the machines heretofore employed the punches are continually in contact with the roller 19 and easily blunted, thus necessitating the replacement of the latter at frequent intervals at great expense, the work produced being also of an inferior quality.

The strippers X and Y, by their peculiar and novel construction and arrangement relative to the roll U, effectively strip the work from the punches on said roll, and they can be readily adjusted, as is evident, to rolls of different widths, it being ordinarily necessary to adjust only the outer stripper Y, the inner stripper X remaining stationary.

The work-guide 7 can be adjusted according to requirements, as has been explained, as will be evident from Figs. 4, 5 and 9.

When it is desired to suddenly take the work out of or away from the path of the roll U, the operator, by means of his knee, moves the bar 36 to the left (shown especially in Fig. 1) by means of the lever 40 and the knee-piece 43, as has been explained, whereupon when the inclined face 46 reaches the extremity 34 of the stem 33 the latter will drop by reason of its own weight, or carrying with it the spring 1<sup>x</sup>, the carriage 23, and the roller 19, the latter being thus instantly removed from the path of the said roll U, whereby the action of the latter on the work will cease, as is evident.

The height of the roller 19 relative to the roll U can be readily adjusted for different diameters of rollers by manipulating the stem 33, the latter being locked in position relative to the post 31 by the lock-nut 31<sup>x</sup>.

The roller 19 can be readily changed when desired, and its guide 25 and the paper-guide 26 can be laterally shifted according to requirements, both guides having a slot in their lower portion through which a set-screw passes, thus enabling the strip of paper to be used several times, as has been explained.

The position of the table 16 can be adjusted by raising or lowering the rod 15, and the front portion 17 of said table can be removed whenever desired, Fig. 7, as has been explained.

The manner of assembling and operating the paper-rolls, disks, &c., shown in Fig. 3 will, it is thought, now be apparent. The pulley L can be operated continuously by applying a belt thereto or intermittently, if desired, by means of the handle M, as is evident.

It will thus be apparent that by my invention the material is effectively stripped from the punches or rollers, it is always visible and readily manipulated and intelligently guided, and the continuous destruction and breaking up of the rollers avoided by the interposition of the paper strip. Clean and accurately-



punched work is produced. The whole of the paper strip can be used without waste by reason of the adjustable guide, and a positively vertical elevation and depression of the roller-carriage, when desired, is attained by the employment of the knee instead of the foot. The construction of the machine is simplified throughout, and the cost of maintenance is reduced to a minimum, and a much higher grade of work can be produced at a less expense than heretofore. It will further be seen that by the employment of the paper strip and the roller 19 journaled in the movable carriage, as described, the rotating cutter is enabled to be kept constantly rotating, the work and paper being carried through only when the operator raises said carriage and its adjuncts by means of the knee-piece, the construction of the machine, added to the fact that the under belt is comparatively loose, being such that the paper is not carried through only with the assistance of the rotary cutter.

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

1. In a machine of the character described, a perforating, punching or pinking roll, another roll adjacent thereto, a strip of paper or other material interposed between said rolls, and an apertured plate or guide through which said strip is adapted to be passed and supported, in combination with means for actuating said first-mentioned roll, substantially as described.

2. In a perforating, pinking and punching machine, a carriage, a roller mounted therein, and an adjustable slotted paper-guide adjacent thereto, substantially as described.

3. In a perforating, pinking and punching machine, a carriage, a roller mounted therein, and a slotted plate serving as a paper-guide, and means for holding said plate in position, substantially as described.

4. The adjustable work-guide 7, consisting of the upright member 8, the laterally-deflected member 9, having the foot 5 attached thereto, in combination with the head 10 adapted to support said work-guide, the rod 12 to which said head is attached and the boss 13, through which said rod passes, substantially as described.

5. The pulley L, pinion K, stud J on which the same are mounted, the gear P, the pulley R, the rotatable spindle Q, the pinking, perforating or punching roller U, mounted thereon, the roller 19 means for supporting and adjusting the same, in combination with the stand 53, the shaft S supported thereon, the pulley 54, belt 55, the paper strip and means for supporting and actuating the same, substantially as described.

6. In a machine of the character described, a shaft rotatably mounted, means for actuating the same, interchangeable hubs for supporting paper or other rolls, mounted on said shaft, guiding disks or plates therebetween,

and means for holding the same in position, substantially as described.

7. In combination with a roll of a machine of the character described, the strippers X and Y, having the projecting portions 1 and 2, and the feet 3 and 4, said feet being adapted to contact with said roll, and means for supporting and adjusting said strippers, substantially as described.

8. In a machine of the character described, the frame A, the plate F, having a slot therein, straps attached to said plate, a bar adapted to be supported on the latter, and guided in said straps, and means for actuating said bar substantially as described.

9. The combination of the rollers U and 19, an adjustable work-guide, the strippers X and Y, a paper strip intermediate of said rollers, and means for actuating the latter, substantially as described.

10. The rollers U and 19, the strippers X and Y, and the work-guide 7 all supported and constructed as shown, the paper strip 69, the adjustable carriage for supporting said roller 19, a suitable work-table through which the latter projects, and means for actuating said rolls, substantially as described.

11. In a machine of the character described, the frame A, the plate F having a slot therein, straps attached to said plate, a bar adapted to be supported on the latter, and guided in said straps, a lever pivotally mounted above said bar, and a knee-piece attached to said lever, substantially as described.

12. A shaft provided with a collar or shoulder having a hole therein, a hub mounted on said shaft and having a disk or guide-plate attached thereto, a hole in said hub, and a pin, the above parts being combined substantially as described.

13. In a machine of the character described, a shaft rotatably mounted and having a shoulder or collar thereon, means for attaching the same, interchangeable hubs having a diagonal slit or incision therein for supporting papers or other rolls mounted on said shaft, guiding-plates therebetween means for holding the same in position, said collar and hubs having holes therein adapted to be in alignment and pin for holding the same in position, substantially as described.

14. In combination with the frame A, the roller 19 the support therefor, and means for adjusting said support, the same consisting of the movable bar 36, having an inclined or depressed portion, a plate F on which said bar is supported, guiding devices for the latter, a pivoted lever 40 engaging said bar, and a knee-piece attached to said lever, whereby said bar can be reciprocated substantially as described.

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