May 9, 1933. C. S. CRAFTS 1,908,121

WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 5 Sheets-Sheet 1

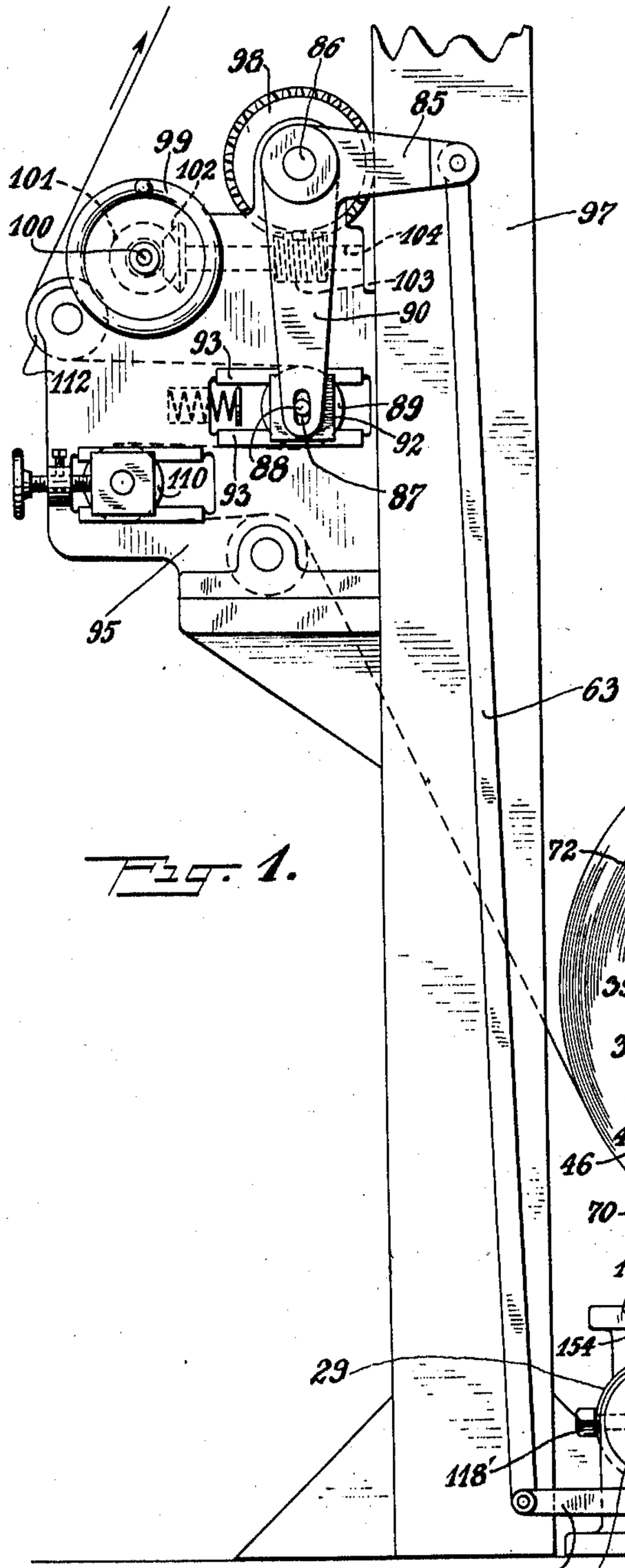
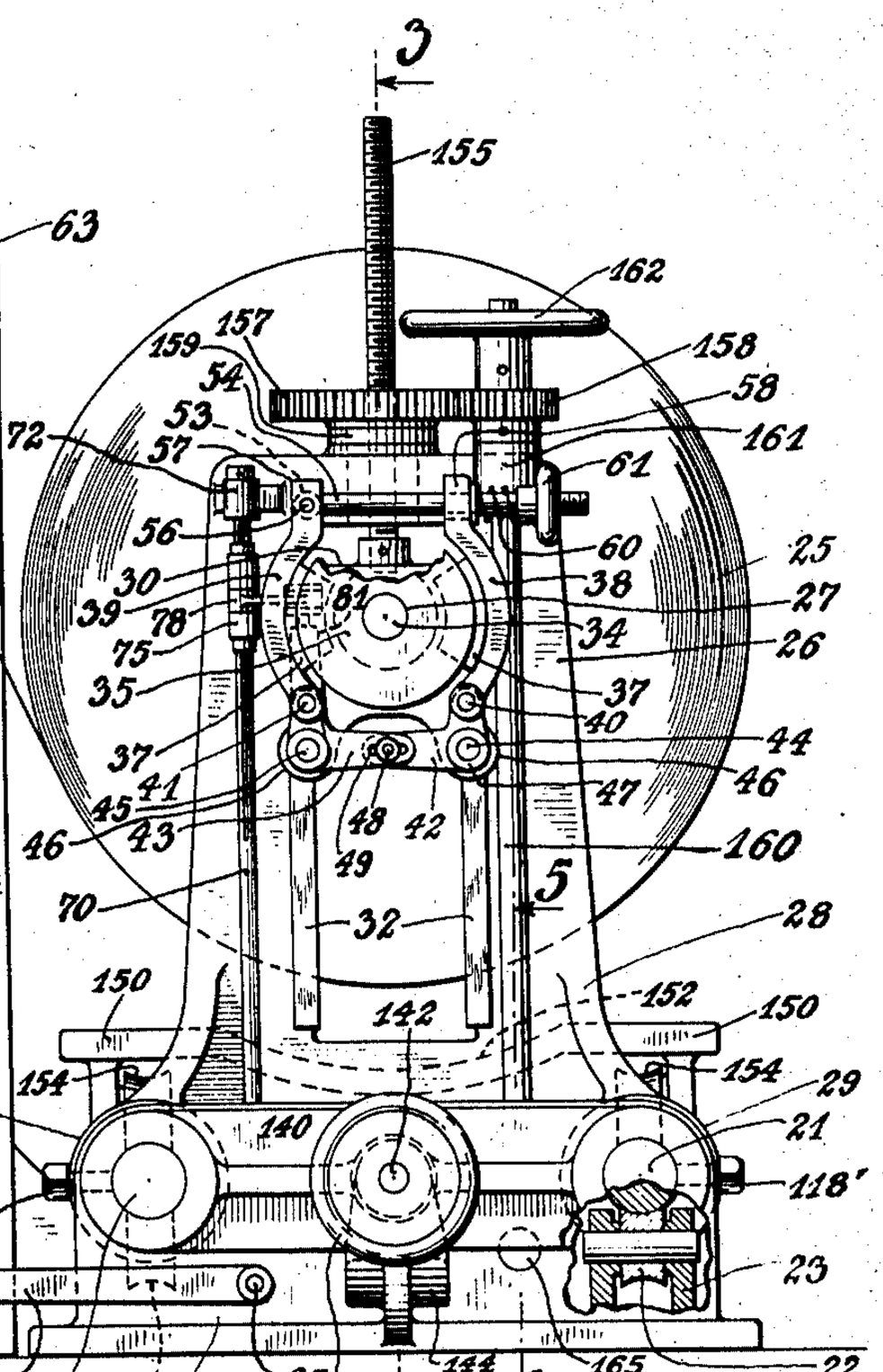


Fig. 1.



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WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 5 Sheets-Sheet 2

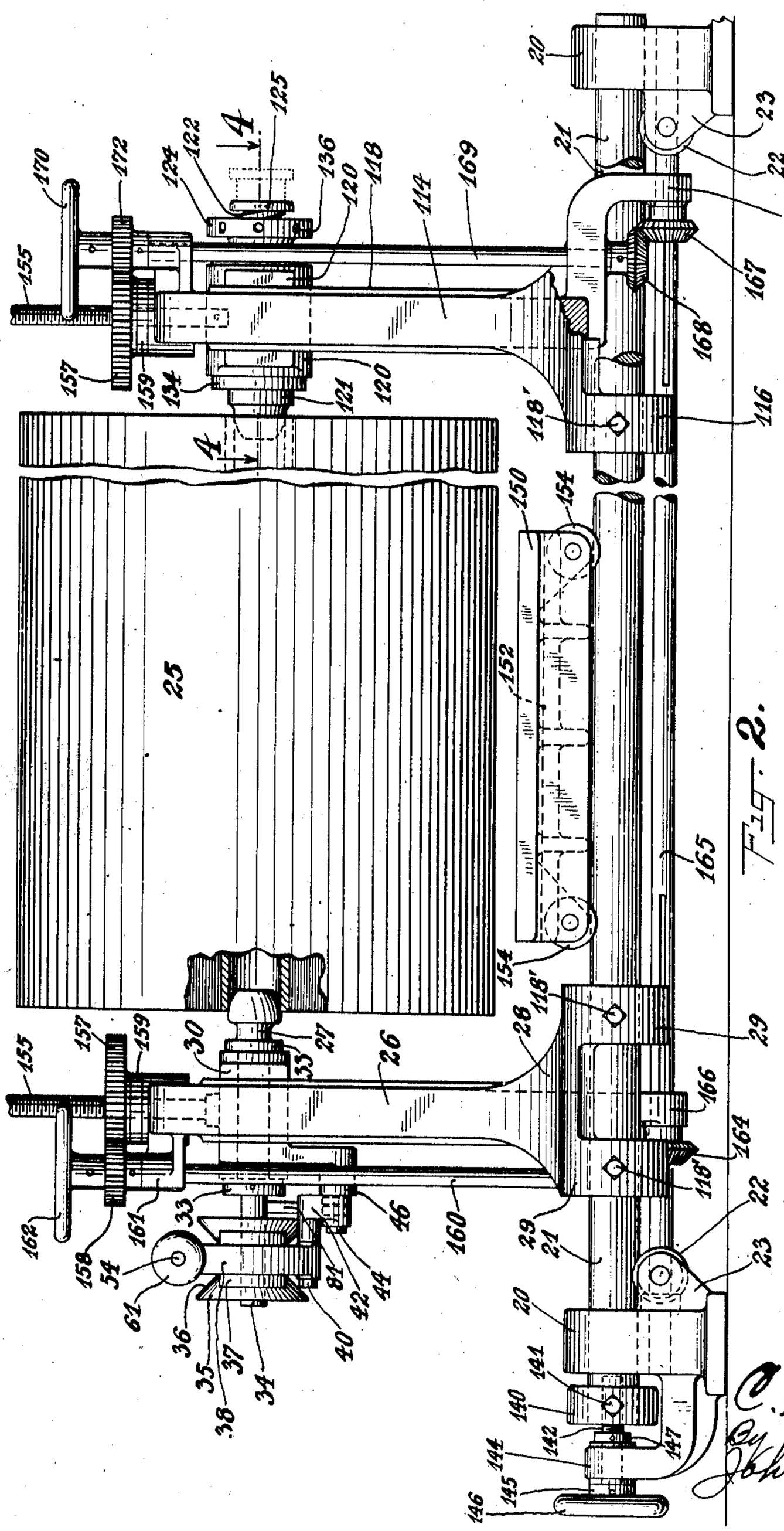

Fig. 2.

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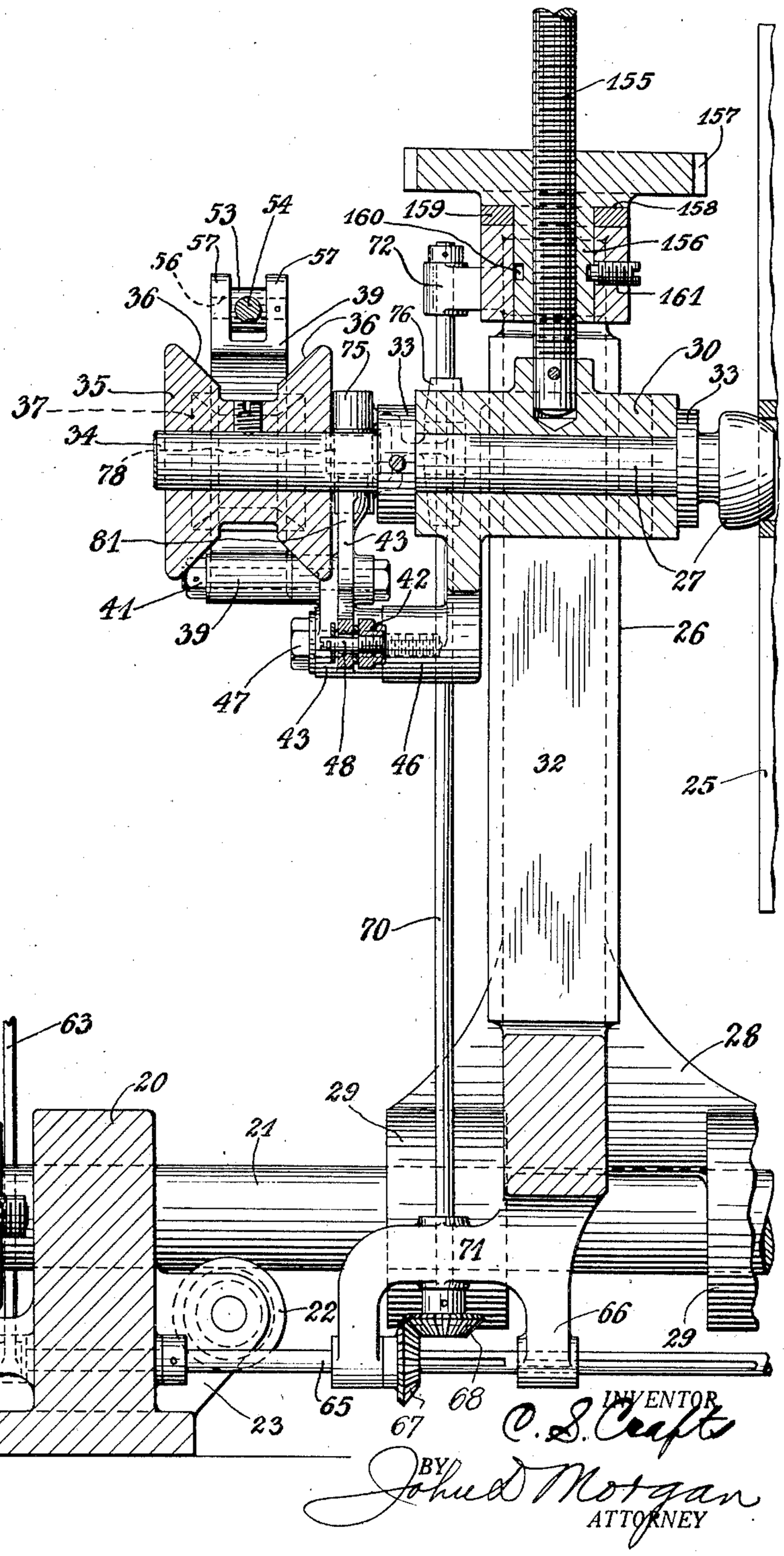
May 9, 1933. C. S. CRAFTS 1,908,121

WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 5 Sheets-Sheet 3

Fig. 3.



May 9, 1933. C. S. CRAFTS 1,908,121

WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 5 Sheets-Sheet 4

Fig. 4.

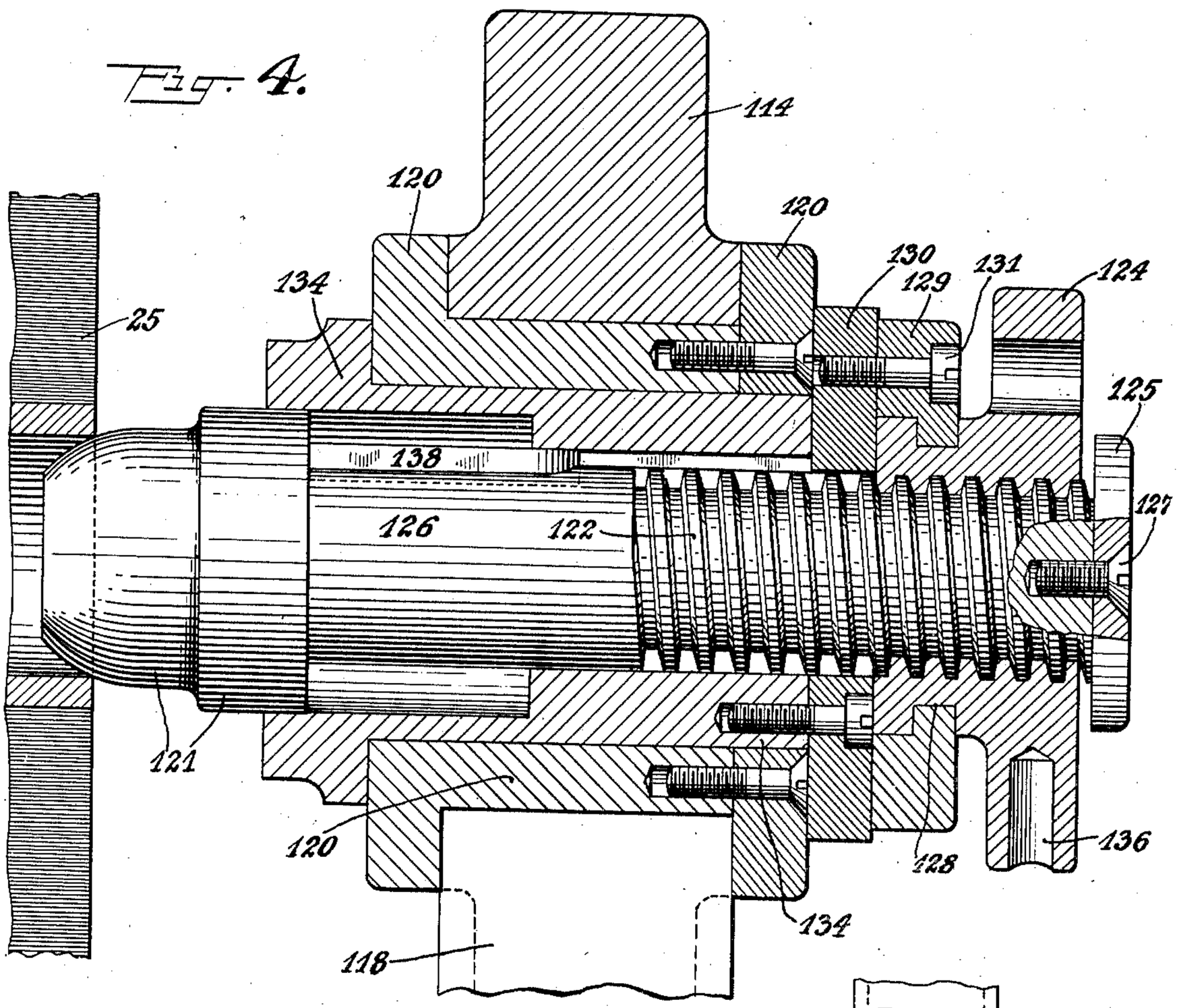
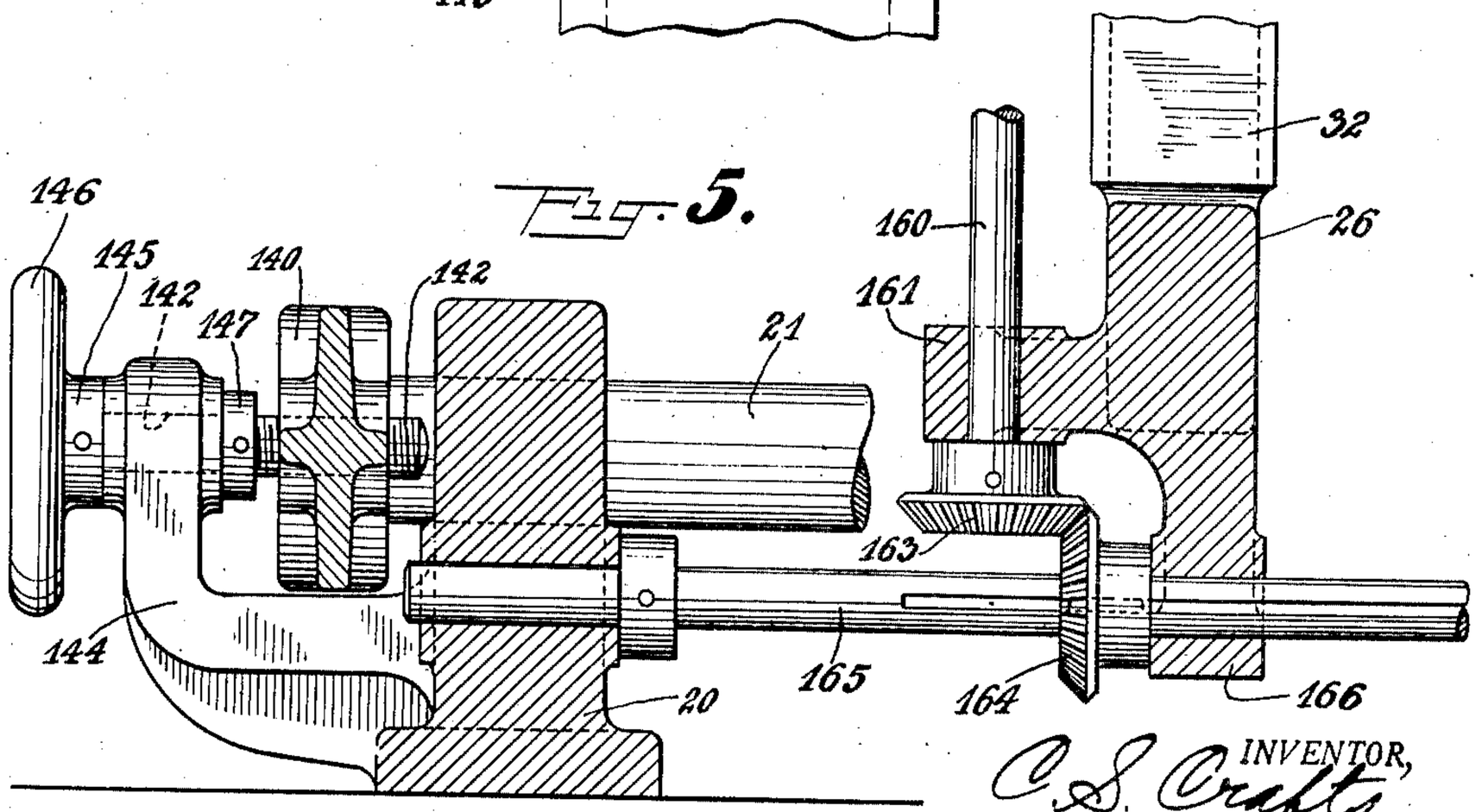


Fig. 5.



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WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 5 Sheets-Sheet 5

Fig. 7.

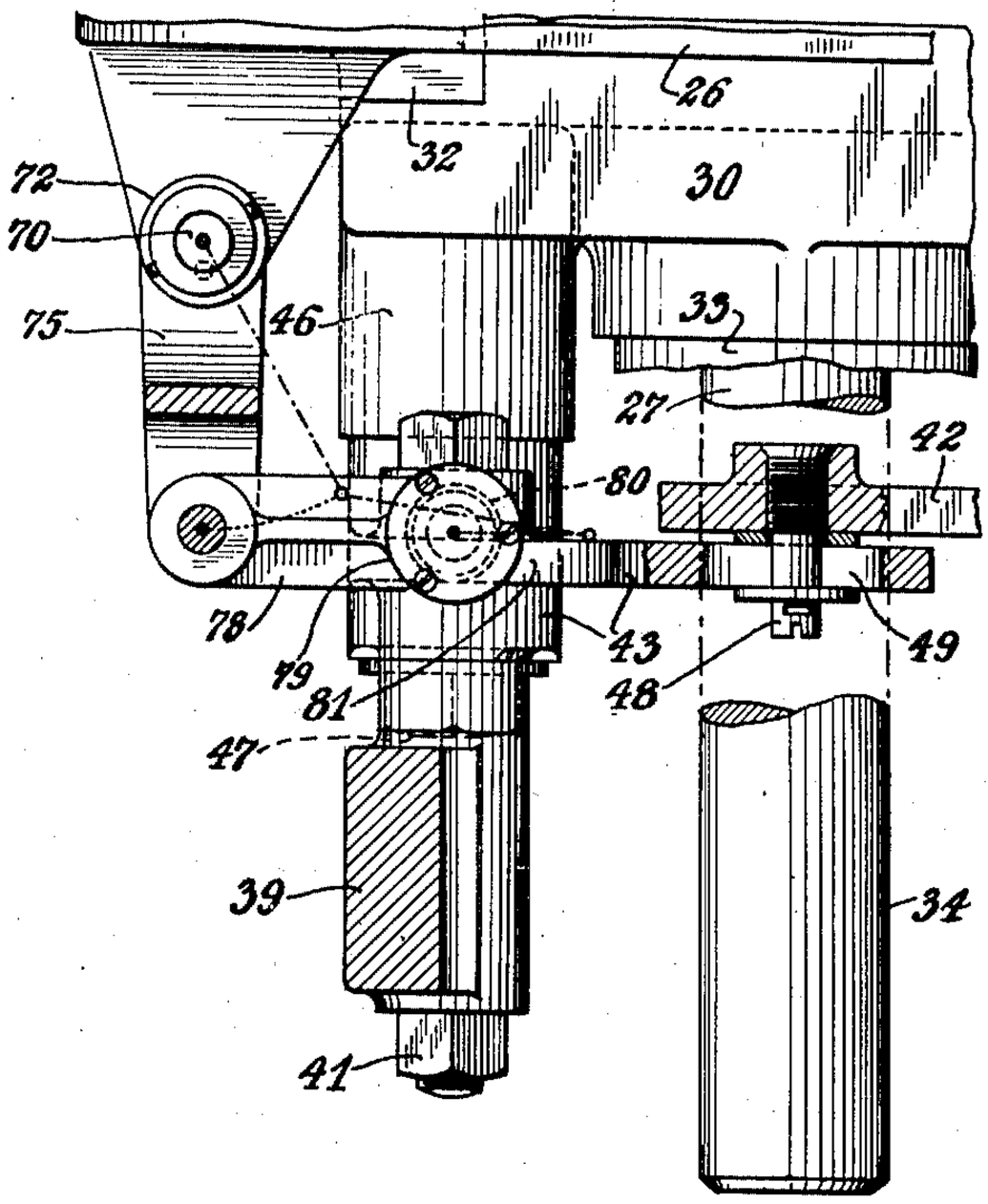
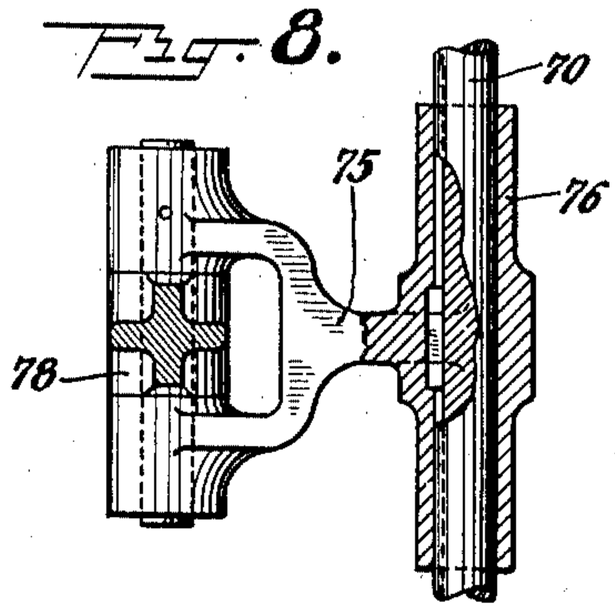


Fig. 8.



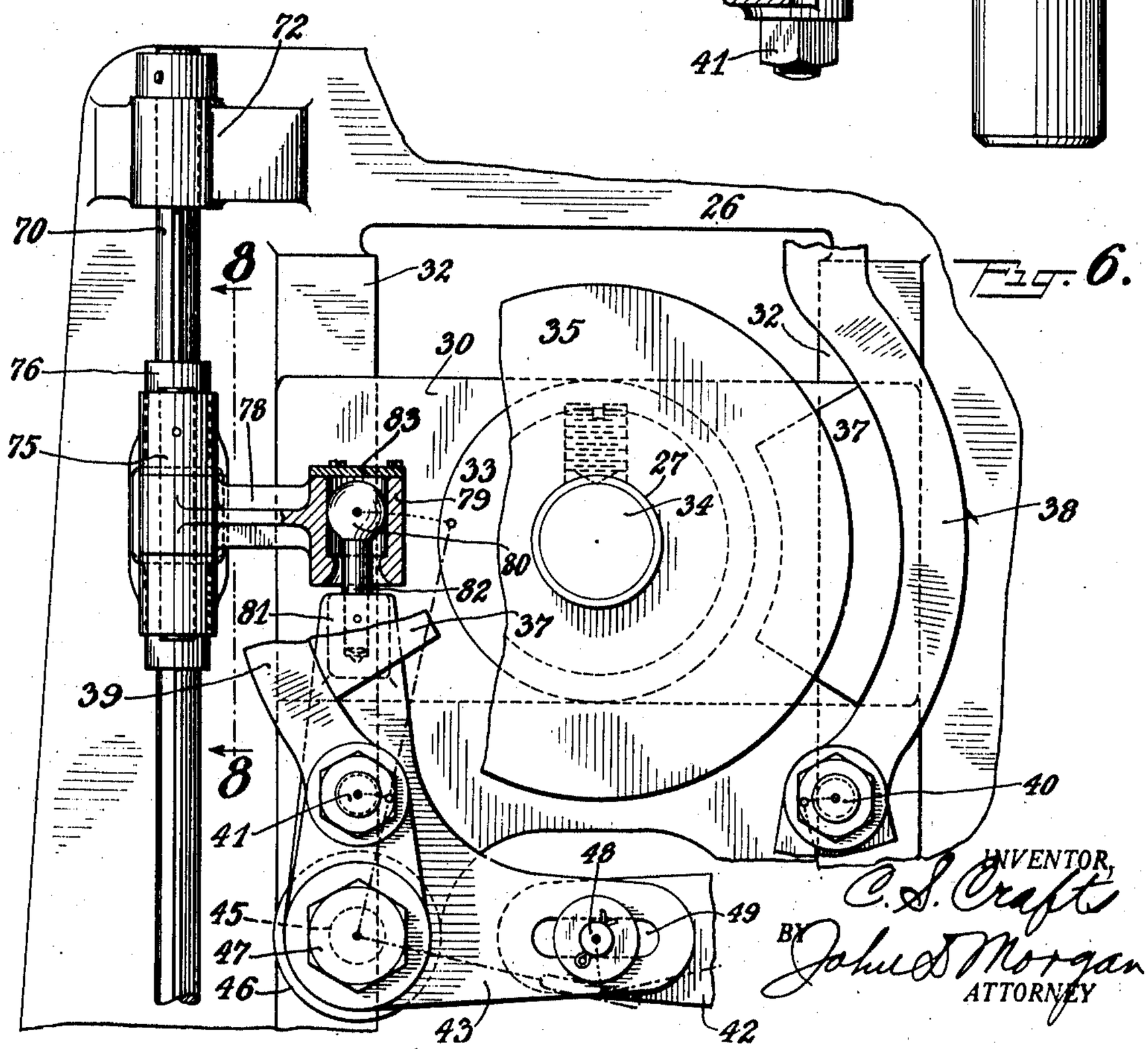


Fig. 6.

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Patented May 9, 1933 1,908,121

UNITED STATES PATENT OFFICE

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WEB ROLL SUPPORTING MECHANISM

Application filed April 22, 1929, Serial No. 357,125, and in Great Britain September 24, 1929.

The invention relates to new and useful improvements in web roll mechanisms and more especially to means for handling and rotatably supporting web rolls, including rolls of different widths, for registering the roll with respect to a web using machine and for governing the feeding of the drawn-off webs, and finds a broad field of usefulness in rapid rotary printing presses and other web-using machines, which employ heavy rolls and run at high speeds.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, construction, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a fragmentary elevation with parts broken away, of a mechanism embodying the invention;

Fig. 2 is a side elevation of the mechanism shown in Fig. 1, with other parts broken away;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary cross section taken on the line 4—4 of Fig. 2;

Fig. 5 is a fragmentary section on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary detail elevation, partly in section of the web roll brake and actuating means therefor;

Fig. 7 is a plan, with certain parts broken away and in section of the parts shown in Fig. 6; and

Fig. 8 is a fragmentary section taken on line 8—8 of Fig. 6.

The invention is directed to novel and useful means for handling, alining, rotatably supporting, laterally registering and braking web rolls of paper and other material, and for effecting these functions with web rolls of various widths, the web being usually drawn off under tension and also usually at high and varying speeds by the web-consuming machine. The invention is further directed to providing such a mechanism which is unusually adequate and efficient for performing all of these functions separately and conjointly, and without causing disturbance or necessity for adjustment of one mechanism by reason of the operation or adjustment of other of the mechanisms or means.

A further object of the invention is to provide such a mechanism which renders unnecessary the ordinary web roll supporting spindle or mandrel, with the necessity of fastening thereto a brake pulley, bringing said pulley into proper relation with the brake mechanism of the press, and later removing the brake pulley from the spindle or mandrel of the exhausted roll. By my invention a web roll is automatically and positively positioned with respect to the mechanism, is quickly operatively mounted in its journal supports, is very quickly and readily brought into lateral registration with the printing press cylinders of other web-using machines, for web rolls of all widths, and is immediately in proper relation with the braking or tension controlling mechanism, and an exhausted roll is removed from the press or other web-using machine with a minimum of time and trouble.

The invention in its entirety comprises means for rotatably supporting a fresh web roll which has no spindle but is provided only with the usual axial orifice or tube, and bringing it with certainty to an initial position with respect to the mechanism. A pair of rotatable spindles are provided for receiving, and engaging in, the ends of the axial orifice of the web roll after they have been moved into alinement with the axial orifice or tube, which spindles are vertically movable to lift the web roll into running position, where it is supported by and rotat-

able with the spindles. At least one of the spindles is longitudinally movable to clamp the roll and spindles together, and the carriers for the spindles are movable toward and from each other, to accommodate rolls of web of various widths.

The supports for these spindles are very accurately movable axially of the web roll, so as to readily and nicely bring a web roll into transverse registry with the plates on a printing press cylinder, or into like relation with any other kind of web-using machine with which the invention may be used. Braking and tension-controlling means, which may be automatically and continuously controlled by the web in running from the web roll to the printing press, are provided in connection with one of the spindles, to control the drawing-off of the web in harmony with the varying speed or other requirements and conditions of the printing press or other web-using machine, and the braking and tension means are quickly settable to positively regulate the tension for full width or narrow width rolls. The removal of the core of an exhausted web roll is effected by a simple axial movement of one of the supporting spindles.

It will be understood that the foregoing general description, and the following detailed description as well, are exemplary and explanatory of the invention, but are not restrictive thereof.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawings, the invention is shown applied to a web roll positioning, hoisting, supporting, registering and controlling mechanism, such as is used on rapid, rotary printing presses and elsewhere.

In said exemplary embodiment, the general base structure, on which the web roll supporting structure is mounted, comprises a pair of end frames 20 supported on the floor, and through which the spaced-apart transverse web roll supporting members pass. These supporting members preferably comprise a pair of heavy rods 21 extending from one side of the machine to the other, and supported on end frame members 20.

Referring now to the embodied mechanism for supporting and registering the web supply roll 25, a movable pedestal-like supporting member, 26, on which a web-roll engaging rotatable spindle 27 is provided. These supporting members have a comparatively wide base 28 slidably supported on the two supporting and guiding members 21 to give rigidity to the machine. As so embodied, the transversely-disposed guiding and supporting members in the form of heavy rods 21 are mounted at either end in apertures formed in end plates or frames 20 and are supported by rollers 22 journaled in brackets 23, inwardly extending from said end plates. These rods 21 are longitudinally movable, however, to effect transverse registration of the web, or web roll, with respect to the printing press or other web-using machine by axial movement of the web roll, as will be more fully described.

A supporting and spindle carrying frame member, of the general form previously described, for one end of the web roll, is mounted on the rods 21 to slide them along to accommodate web-rolls of widely different widths. This supporting or carrying member 26 is formed at each of its lower sides with two separated and alined sleeves 29 mounted on and slidable along the rods 21.

The alined sleeves at each side of the supporting and carrying members are comparatively widely spaced apart and thereby give a long bearing on the supporting and guiding members. This cooperates with the widely-spaced sleeves 29 at the other side of the supporting and carrying member to produce a very firm, rigid and precise bearing and support in all directions.

For supporting and engaging one end of the axial orifice of the web roll, the pedestal-like carrying member, slidably mounted on the rods, is provided with a short inwardly projecting spindle 27, journaled in block 30 vertically movable in the carrying member 26. This carrying member is formed with vertically extending parallel guides 32, suitably spaced apart on which block 30 can slide up and down. Block 30 carries the short spindle 27 rotatably journaled therein for engaging and rotatably supporting the web roll. Preferably one spindle is longitudinally stationary with respect to the carrying member, and for this purpose spindle 27 is provided with a fixed collar 33 at each side of the block 30.

Braking or tension controlling means are also provided and preferably, but not necessarily, include means for regulating the tension automatically in harmony with the operating conditions of the printing press or other web using machine, in addition to manually operated means for controlling the braking or tensioning means. Preferably the braking or tension controlling means is applied to web-roll engaging and supporting spindle 27.

As embodied, the spindle has fixed on its outer end 34 a brake pulley 35, having a V-shaped peripheral groove 36 with which cooperate the V-shaped shoes 37 of the brake mechanism. Manual and automatically operating means controlled by the web in running from the web roll to the printing press or other web using machine are provided to operate the brake mechanism.

In the embodied form of brake mech-

anism, the two arcuate V-shaped shoes 37 are rigidly secured to the central portions of brake arms 38, 39, the brake arms, respectively, being pivotally connected at 40 and 41 to supporting and actuating bell cranks 42, 43. These bell cranks are journalled on stub shafts 44, 45 outwardly projecting from downwardly extending portion 46 of block 30 and are retained thereon by head 47. Bell cranks 42, 43 are connected for conjoint operation, by pin 48, threaded into one end of bell crank 42 and passing through an elongated slot 49, at one end of bell-crank 43.

For adjusting the brake, to compensate for wear on the V-shaped brake shoes 37 or for varying the effect of the brake, means are provided for maintaining the upper ends of the brake arms, a variable distance apart. As embodied brake arm 39, at its upper end is forked to receive eye 53, formed at one end of link 54, the eye being pivoted within the fork 57 by pin 56. The upper end of the other brake arm 38, is similarly forked, at 58 to receive the link 54, the two brake arms being held together by the pressure of spring 60, coiled around link 54, between the forked end 58 of brake arm 38 and adjustable hand wheel 61 movable on the link. The brake arms may be laid open from the top by loosening the hand wheel and turning the pivoted link upwardly.

For automatically regulating the web tension, or retarding the rotation of the web roll, in harmony with the operation of the printing press or other web using machine, there is provided brake actuating means, operated by the web in passing from the web roll to the printing press or other web-using machine. This automatic brake-actuating mechanism in many of its essentials is similar to that described and claimed in the application of C. S. Crafts, Serial No. 302,460, filed August 28, 1928, and assigned to my assignee. As embodied, in the present illustrative form, a connecting rod 63 is pivotally connected at its lower end to a lever 64, fixed to shaft 65, which is journaled in end frame 20. Shaft 65 is slidably journaled in a depending sleeve 66, formed as an extension of the carrying member 26, and on this shaft 65, is mounted a bevel gear 67, slidably keyed to shaft 65. Gear 67 meshes with a second bevel gear 68, on shaft 70, journaled in sleeves 71, 72, extending perpendicular to shaft 65. For maintaining gears 67 and 68 in mesh, a collar 73, formed integral with gear 67 bears against one face of sleeve 66.

For transmitting the movement of shaft 65 to the brake arms and shoes to control the tension of the drawn-off web, there is provided an arm 75, keyed to and slidably mounted on the upwardly extending shaft 70 by means of an elongated sleeve 76. At the other end of arm 75, is pivotally connected link 78, provided with a socket 79, at its other end, to receive ball 80, mounted on the elongated upwardly-extending end 81 of bell crank 43.

Ball 80 is carried by pin 82 which is threaded into a tapped hole in the upper end of the bell crank and forms with socket 79, a ball and socket joint. On its upper side, socket 79 is preferably provided with a removable plate 83 which serves to support the arm 75 and link 78 and at the same time allows the ready removal of the ball 80 from the socket 79. By reason of the sliding engagement of arm 75 on shaft 70, arm 75 and link 78 move vertically with the brake, spindle 27 and supporting block 30 for a purpose later to be described.

Connecting rod 63, at its upper end is pivotally connected to a bell-crank 85 mounted for swinging movement on shaft 86, and bell-crank 85, at its lower end is provided with a slot 87 to fit over and engage one pintle 88 of the web tension roller 89. At the opposite end of shaft 86 is mounted a depending lever, parallel with the depending arm 90 of bell crank 85, and has a similar slot at its lower end to fit over the other pintle of the web tension roller 89. By this means the roller is always parallel to the other rollers and to shaft 86, and bell crank 85 and the coresponding lever always move together under control of the web tension.

A roller is preferably employed for the web engaging member, although other forms of such members may be employed if desired. As described, pintle 87 of this roller is mounted in the elongated slot of the depending arm and in addition, is journaled in a slidable box 92, which is slidably mounted in guideway 93 formed in the bracket plate 95, fixed to and extending from the side frames 97 of the machine. At the opposite side of the machine is provided a similar sliding support (not shown) for the other pintle of roller 89.

Means are provided for tensioning the web-tension roller and holding it in engagement with the running web, and for varying the tension exerted on this roller, whereby it may be easily and rapidly adjusted for the brake-regulation of different widths of web rolls. Variably tensionable spring means act on the web engaging roller 89 and maintain the spring tension practically uniform throughout the range of movement of the roller. Cooperating with the spring tension means are manually regulable means for varying the spring tension of the roller 89 against the web, this means being capable of regulation while the web is running. In the embodied form, more fully shown and described in application Ser. No. 302,460, filed August 28, 1928, the spring tension means comprises a spring, coiled about shaft

86, one end of the spring being made fast to the shaft 86, while the other end is attached to the rear face of gear 98 also mounted on shaft 86. For manually regulating the tension of this spring, a hand wheel 99 is fixed on the exterior of a shaft 100 journaled in bracket 95, and on the inner end of this shaft 100 is secured a bevel gear 101 meshing with bevel gear 102, which in turn drives worm wheel 103 through shaft 104. As the hand wheel 99 is turned, the worm wheel drives worm gear 103 to wind up or loosen the spring, thereby varying the tension exerted by the spring on the web-engaging and brake regulating roller 89.

In Figs. 6 and 7, there is shown diagrammatically and in dotted lines, the position assumed by bell cranks 42, 43, ball and socket 79, 80, link 78 and arm 75 when the brake is applied to tension or stop the web.

Web-directing means of any suitable form is provided, and as embodied, the web is led from the web roll 25 over a plurality of web guiding rollers 110, looped over web-engaging and brake regulating roller 89, and thence over web guiding roller 112 and out to the printing press or other web using mechanism.

The supporting and journaling means for the other end of the web roll are generally similar, but the web roll supporting spindle is longitudinally movable, being retractable to receive the web roll therebetween, and then reversely movable to engage the axial orifice and to clamp the web roll between and to the two spindles. As embodied, a movable pedestal-like supporting or carrying member 114 is formed with a comparatively wide base, at each side of which are formed a pair of longitudinally-alined, spaced-apart sleeves 116, slidably supporting the pedestal-like carrying member 114 on the longitudinally extending guiding members or rods 21. Set screws 118′ are provided for releasably securing the carrying members 26 and 114 to the guide members 21, thereby maintaining the pedestal carrying members 26 and 114 at any desired distance apart.

Centrally and vertically disposed with respect to this carrying member 114 is a guideway, having parallel guides 118 at its sides, similar to the guides 32 on carrying member 26, on which the block 120 may slide vertically. Within this block 120 is journaled a second spindle shaft 126 for supporting the web roll 25 by engagement with its axial orifice.

Means are provided for longitudinally moving the spindle 126 in one direction to receive a web roll 25 and thereafter in the opposite direction to force the web roll firmly onto both supporting spindles and thereby to rotatably clamp them together. As embodied, spindle shaft 126 is provided, at its outer end with screw threads 122, and threaded thereon is a disc-like wheel 124, the wheel and its inwardly-extending hub being internally screw-threaded for this purpose. A retaining disc 125 is fastened to the outer end of spindle shaft 126, by a screw 127, to hold the turning disc on the threaded shaft 126.

The embodied means for holding the turning disc 124, against longitudinal movement, comprises an annular groove 128 formed in the hub thereof, and a split collar 129 having an annular groove. The collar 129 is fastened to the plate 130 by screws 131, the plate being screwed to the outer flat annular end of the rotatable sleeve 134. The screw threaded disc 124 is provided with any suitable form of turning means, such as holes 136 for a hand-bar. By turning the disc 124, which is rotatable, but is held against longitudinal movement, the shaft 126 and therewith the chuck 121 may be moved longitudinally with respect to the end of the web roll. Sleeve and all the mechanism carried thereby are journalled to rotate with the web-roll, and spindle shaft 126 is prevented from rotating relative to the sleeve 134 by key 138 slidable in a key-way in sleeve 134.

Means are also provided whereby each of the pedestal-like carrying members may be moved longitudinally to accommodate web rolls of greatly different widths, and is particularly adapted for supporting full width, three-quarter width, half and quarter-width rolls. As embodied, each of the two carrying members 26 and 114 are slidably mounted on supporting and guiding rods 21, by means of sleeves 29 and 116. For holding the carrying members in position and preventing their movement, once they have been positioned for a definite size of web roll, set screws 118 are provided which firmly hold the carrying members against movement. Thus the longitudinal position of the carrying members 26 and 114 need be changed only when a web-roll of different size is to be fed to the printing press or other web-using machine.

For registering the rotatably-mounted web rolls with respect to the plates on the printing press, or with respect to some other web-using machine, means are provided for moving the web roll, and its supporting mechanism, laterally, or axially of the web roll. As here embodied, guide rods 21, on which the carrying members are supported, and on which they are held against movement by set screws 118, are slidably mounted in end frames 20, being supported by rollers 22, journaled in brackets 23, at each side of each end frame 20. A header 140 is fitted over the guide rods 21 at one end, and just outside the end frame 20, being secured to the guide rods by set screws 141. For mov-

ing this header 140, and the two rods 21 simultaneously and laterally of the frame, a threaded member 142 is journaled in an upstanding bracket 144, formed integral with end frame 20 and held against longitudinal movement therein by hub 145 of hand-wheel 146 and collar 147.

Threaded member 142 engages with a threaded aperture in header 140 and by rotation of the hand wheel 146 the guide rods 21 and the web roll supporting mechanism mounted thereon is easily and accurately moved to one side or the other, to effect the desired registration of the web.

For receiving and supporting a new web roll on the mechanism and in a position from which it can easily be raised into running position, there is provided a truck 150, positioned between the carrying members 26 and 114 and movable therebetween. Truck 150 has formed on its upper surface a concave trough 152, into which the web roll is rolled, and which holds the web roll in position to be engaged by the spindles 121 and 27. The truck is also provided with small wheels 154 at each corner, for movably supporting the truck on guiding rods 21.

Means are also provided for lifting the web roll from the truck or other temporary supporting means, into running position and as here embodied, the web roll engaging spindles can be raised to lift the roll, or can be lowered into alinement with the axial orifice of the web roll As previously described, each of the web roll engaging and supporting spindles 27 and 121 is rotatably journaled in a block 30 or 120, vertically slidable in guideways in its pedestal-like carrying member. To the top of each of these blocks 30 and 120 is securely fastened an upwardly-extending threaded member 155, and at the upper end of each carrying member is rotatably journaled a sleeve 156, threaded on its interior to engage with the threaded member 155.

Sleeve 156 has formed integrally therewith a gear 157, of a diameter larger than that of the sleeve, and finished on one side to provide an annular bearing face 158 supporting the weight of the spindle mechanism and the web roll carried thereby. An annular bearing 159 is placed between the gear 157 and the top face of the carrying member 26 or 114. Sleeve 156 is formed with an annular groove 160 into which the smooth end of screw 161 projects to hold the sleeve and gear 157 in place.

For vertically moving the spindles in unison and lifting both ends of the web roll simultaneously and to the same extent, whereby the web roll is maintained in alinement with the guide rollers, the threaded sleeves are connected by suitable gearing to move them simultaneously from a single source. As shown in the present illustrative embodiment, one gear 157 meshes with pinion 158, mounted on vertical shaft 160, journaled in sleeves 161 on the carrying means 26. At the upper end of shaft 160 is mounted hand-wheel 162, and at the lower end of the shaft is bevel gear 163, meshing with bevel gear 164 slidably keyed to longitudinally extending shaft 165, journaled in depending sleeves 166, formed integrally with the carrying members.

At the other side of the machine, is provided a similar bevel gear 167 slidably keyed on shaft 166, meshing with a bevel gear 168 on shaft 169, journaled in carrying member. Shaft 169, at is upper end, has fixed thereto hand wheel 170 and pinion 172 meshing with gear 157. By reason of this construction, when either hand wheel 162 or 170 is turned, both gears are moved an equal amount by pinions 158 and 172 and effect an equal raising of the web roll 25.

When the web roll has become exhausted, and it is desired to lower the spindles into alinement with the axial orifice of a new web roll, this can be accomplished by a reverse movement of the hand wheel 162 or 170, whereby each of the sleeves is rotated on its threaded member and lowers the spindles.

The illustrated mechanism operates in substantially the following manner:—

Assuming that the web roll has become exhausted and it is desired to insert a new web roll and that the carrying members are adjusted for the proper width of web roll, disc 124 is turned counter-clockwise to withdraw the spindle 121 from engagement with the end of the axial orifice of the web and when it has been moved to a sufficient extent, the tube or core of the exhausted roll can be removed. A new roll is moved alongside the machine and rolled on to truck 150. where the concave portion 152 of the truck top centers the web roll. Hand wheel 170 or 162 is now turned to lower the spindles 27 and 121 into alinement with the axial orifice of the web roll, and when so alined, disc 124 is turned to move spindle 121 into the axial orifice and then push the web roll on spindle 27. As soon as the spindles have been firmly engaged with the orifice of the web roll, hand wheel 162 or 170 is reversely turned to raise the roll from truck 150 and into running position. The end of the new web may now be joined to the tail end of the exhausted web roll and thus threaded through the press. Once the press, or other web-using machine, is running, the brake mechanism is adjusted to give the desired tension by turning hand wheel 61 to increase or decrease the braking force and adjust for any wear on brake shoes 37, and hand wheel 99 is turned to set the spring at the proper tension for the width of web roll employed. If necessary, hand wheel 146

may be turned to move the web roll laterally and register the web with the printing press or other web using machine.

As the web is drawn from the roll, by the web using machine, it loops over roller 89 and holds arm 90 away from the position it tends to assume by reason of the spring tension. As the tension on the web increases, the roller 89 and arm 90 move to the left (Fig. 1) and push connecting rod 63 downwardly to reduce the braking action on the web roll. As the braking action diminishes, the tension of the web is reduced, moving connecting rod upwardly and increasing the braking force until an equilibrium is attained, which may be departed from by movement of hand wheel 99 or 61. As the size of the web roll diminishes, the tension of the web is maintained constant by reason of the control effected by roller 89 and the mechanism linking this roller with the brake.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A web roll mechanism including in combination means for temporarily receiving a web roll, devices for engaging either end of the axial orifice of a web roll, means for raising said devices to lift the roll into running position, guides in which said devices are vertically movable, means for imparting relative movement to said devices for engaging and disengaging the axial orifice of the web roll, and means whereby said devices are laterally movable with respect to each other to accommodate web rolls of different widths.

2. A web roll mechanism including in combination a pair of carriers, devices mounted on said carriers for engaging either end of the axial orifice of a web roll, a plurality of supports on which each of said carriers are mounted, and means for raising or lowering said devices.

3. A web roll mechanism including in combination a pair of carriers, devices mounted on said carriers for engaging either end of the axial orifice of a web roll, a plurality of supports on which each of said carriers are mounted, means for raising or lowering said devices, and means for moving said engaging devices for engaging and disengaging either end of the axial orifice of a web roll.

4. A web roll mechanism including in combination a pair of carriers, devices mounted on said carriers for engaging either end of the axial orifice of a web roll, a plurality of supports on which each of said carriers are mounted, means for raising or lowering said devices, and means for effecting relative movement of said carriers for accommodating web rolls of different widths.

5. A web roll mechanism including in combination a pair of spaced-apart carriers, means between said carriers for temporarily supporting a web roll, devices inwardly projecting from said carriers for engaging either end of the axial orifice of the web roll, means for vertically moving said devices, upright guards for vertically guiding said carriers and means for moving said engaging devices and carriers for engaging and disengaging either end of the axial orifice of the web roll and for accommodating web rolls of different sizes.

6. A web roll mechanism including in combination vertically movable devices for engaging either end of the axial orifice of a web roll, a plurality of spaced-apart guiding supports on which said devices are mounted and are vertically slidable, means for raising and lowering said devices, and means for transversely moving said supports to effect transverse registration of the web roll with respect to the web-using machine.

7. A web roll mechanism including in combination a pair of spaced apart carriers, means for temporarily receiving and supporting a web roll between said carriers, vertically movable devices mounted on said carriers for engaging either end of the axial orifice of a web roll, a plurality of spaced-apart supports on which said carriers are mounted, means for raising and lowering said devices and means for transversely moving said supports to effect transverse registration of the web roll with respect to the web-using machine.

8. A web roll mechanism including in combination a pair of spaced apart carriers, means for temporarily receiving and supporting a web roll between said carriers, vertically movable devices mounted on said carriers for engaging either end of the axial orifice of a web roll, a plurality of spaced-apart supports on which said carriers are mounted, means for raising and lowering said devices, means for transversely moving said supports to effect transverse registration of the web roll with respect to the web-using machine, and means for effecting relative movement of said carriers for accommodating web rolls of different widths.

9. Web roll supporting mechanism including in combination a pair of axially and vertically movable spindles for engaging the ends of the axial orifice of the web roll, carriers in which said spindles are rotatably mounted, a pair of horizontally extending, spaced apart frame members on which said carriers are mounted, and a web roll receiving truck slidably mounted on said members between said carriers for temporarily sup-

porting a web roll while the spindles are alined with its axial orifice.

10. Web roll supporting mechanism including in combination a pair of rotatable spindles for engaging the ends of the axial orifice of the web roll, carriers at the ends of the web roll in which said spindles are vertically movable, a plurality of supports on which each of said carriers are mounted and means for raising and lowering said spindles in unison.

11. Web roll supporting mechanism including in combination a pair of rotatable spindles for engaging the ends of the axial orifice of the web roll, carriers at the ends of the web roll in which said spindles are vertically movable, supports on which said carriers are laterally movable to accommodate web rolls of different widths and means for raising and lowering said spindles in unison.

12. Web roll supporting mechanism including in combination a pair of rotatable spindles for engaging the ends of the axial orifice of the web roll, carriers at the ends of the web roll in which said spindles are vertically movable, supports on which said carriers are laterally movable to rotatably support web rolls of different widths, means for raising and lowering said spindles and means for laterally moving said supports and carriers in unison to effect lateral registration of the web.

13. Web roll mechanism including in combination a pair of rotatable spindles for engaging the ends of the axial orifice of a web roll, supporting members in which said spindles are vertically movable, a brake mounted on one spindle, a pilot roller moved by the tension of the web and connecting means between the pilot roller and brake for controlling the brake in any of the vertical positions of the spindles.

14. Web roll mechanism including in combination a pair of rotatable spindles for engaging the ends of the axial orifice of the web roll, supporting members in which said spindles are vertically movable, a brake mounted on one spindle, a pilot roller moved by the tension of the web and connecting means between the pilot roller and brake for controlling the brake in any of the vertical positions of the spindles and including a shaft turned by movement of the pilot roller and a lever movable by the shaft and slidable thereon and fixed to the brake.

15. Web roll mechanism including in combination devices for engaging either end of the axial orifice of a web roll movable in a straight line, a plurality of spaced-apart supports on which said devices are mounted, and means for controlling the tension of the web in any position of the web roll including a web roll brake, a pilot roller moved by changes in the tension of the web and a sliding connection for operating the brake by the pilot roller.

16. Web roll mechanism including in combination devices for engaging either end of the axial orifice of a web roll movable in a straight line, a plurality of spaced-apart supports on which said devices are mounted, means for controlling the tension of the web in any position of the web roll including a web roll brake, a pilot roller moved by changes in the tension of the web, a shaft rotated by the pilot roller and extending parallel to the path of movement of the web roll, and a connector between the brake and shaft and slidable on said shaft for transmitting movements of the pilot roller to the brake.

17. Web roll mechanism including in combination devices for engaging either end of the axial orifice of a web roll movable in a straight line, a plurality of spaced-apart supports on which said devices are mounted, means for controlling the tension of the web in any position of the web roll including a web roll brake, a pilot roller moved by changes in the tension of the web, a vertical shaft rotated by the pilot roller and an arm slidable on said shaft connecting the shaft and brake.

18. Web roll mechanism including in combination means for rotatably supporting a web roll, means for raising and lowering said supporting means and means for controlling the tension of the web fed from the web roll in any of its positions including a brake operatively connected with the web roll, a pilot roller moved by changes in the tension of the web, and a positive mechanical connection between the pilot roller and brake for applying or releasing the brake.

19. Web roll mechanism including in combination means for rotatably supporting a web roll, means for raising and lowering said supporting means and means for controlling the tension of the web fed from the web roll in any of its positions including a brake operatively connected with the web roll, a pilot roller moved by changes in the tension of the web and means for connecting the pilot roller and brake including an arm slidable on a shaft rotated by the pilot roller.

In testimony whereof, I have signed my name to this specification.

CURTIS S. CRAFTS.