Aug. 30, 1932. C. S. CRAFTS 1,874,904

WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 6 Sheets-Sheet 1

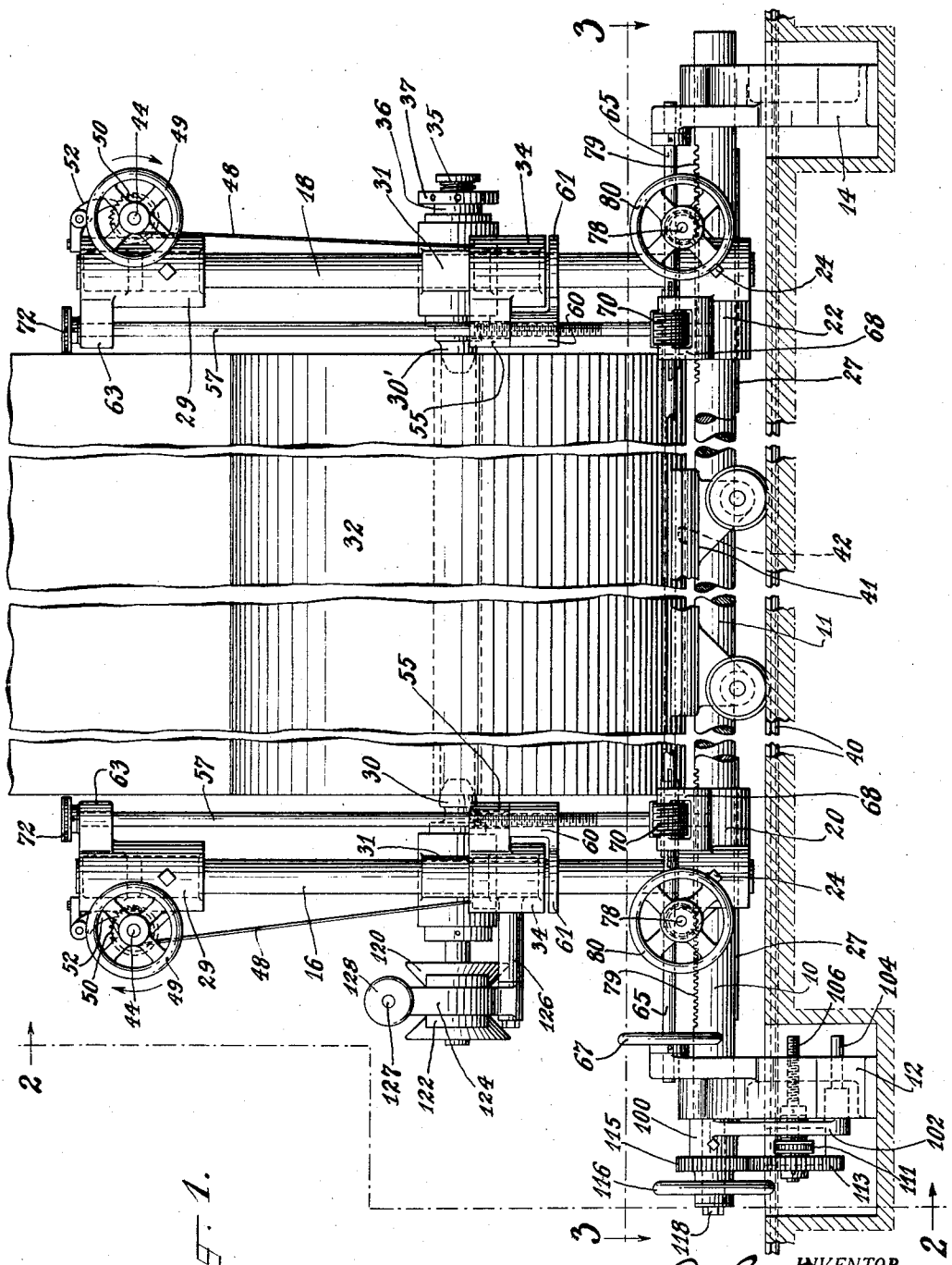


Fig. 1.

INVENTOR
C. S. Crafts
BY
John D. Morgan
ATTORNEY

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WEB ROLL SUPPORTING MECHANISM

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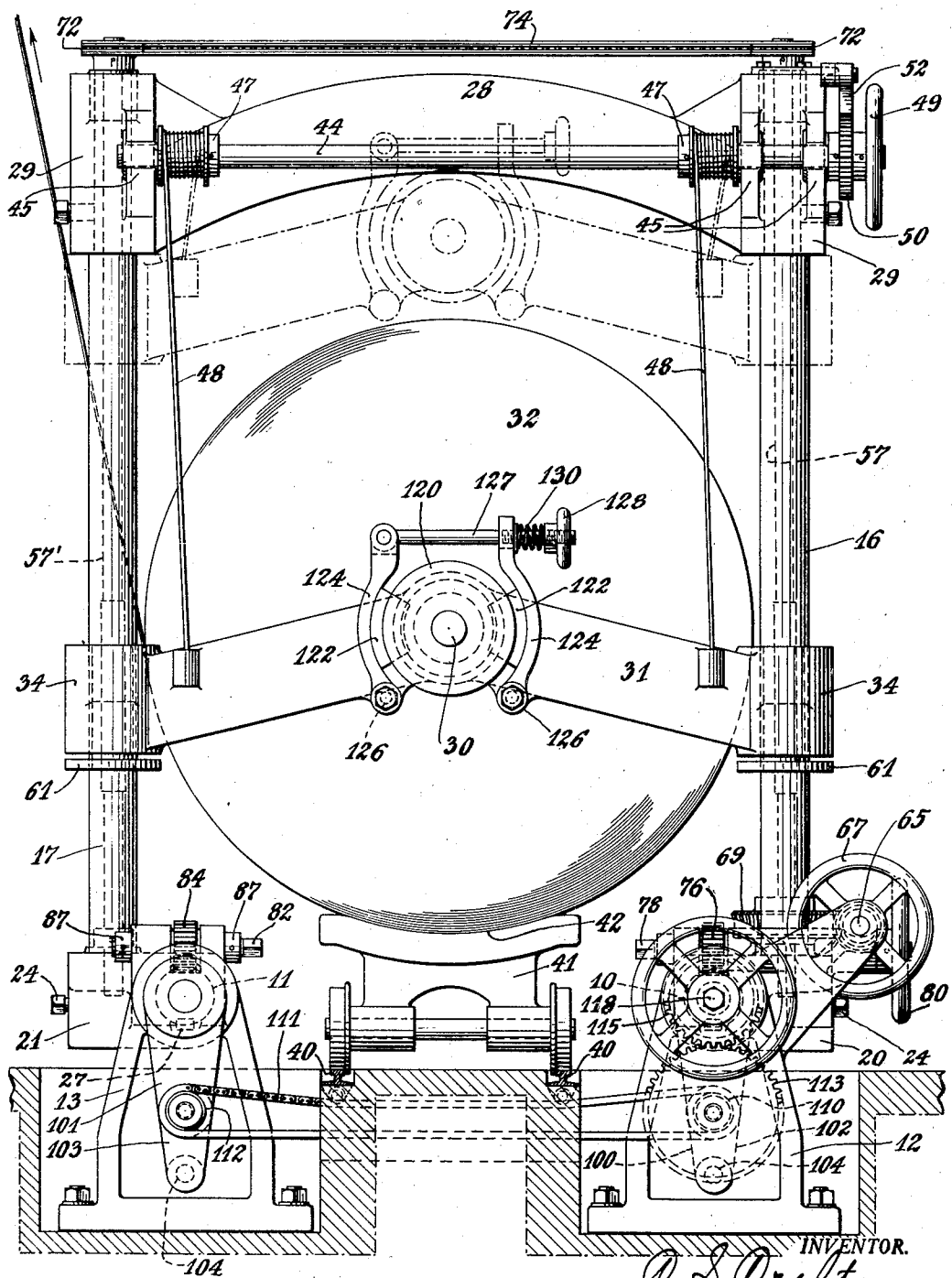


Fig. 2.

INVENTOR.
C. S. Crafts
BY
John D. Morgan
ATTORNEY

Aug. 30, 1932. C. S. CRAFTS 1,874,904

WEB ROLL SUPPORTING MECHANISM

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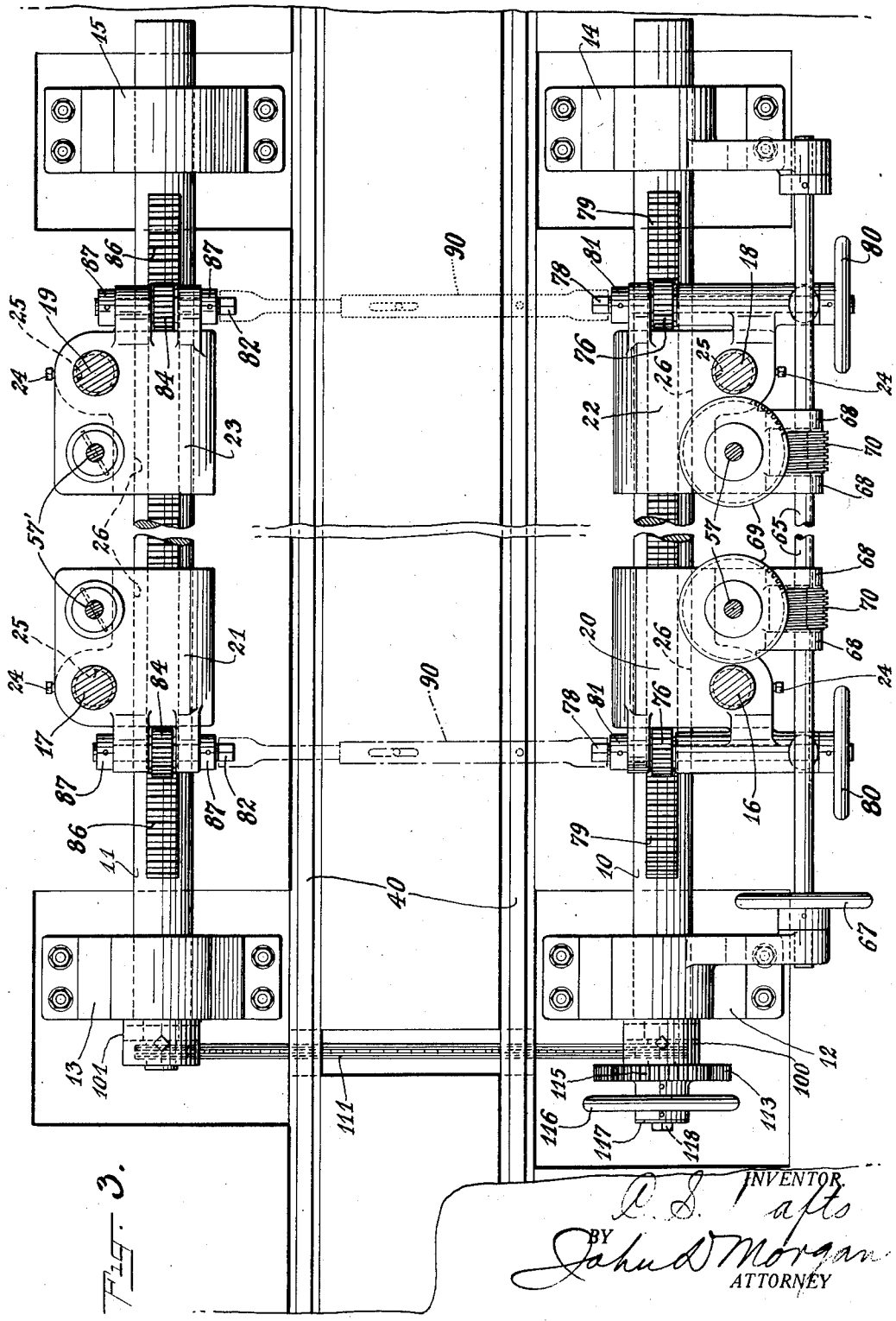


FIG. 3.

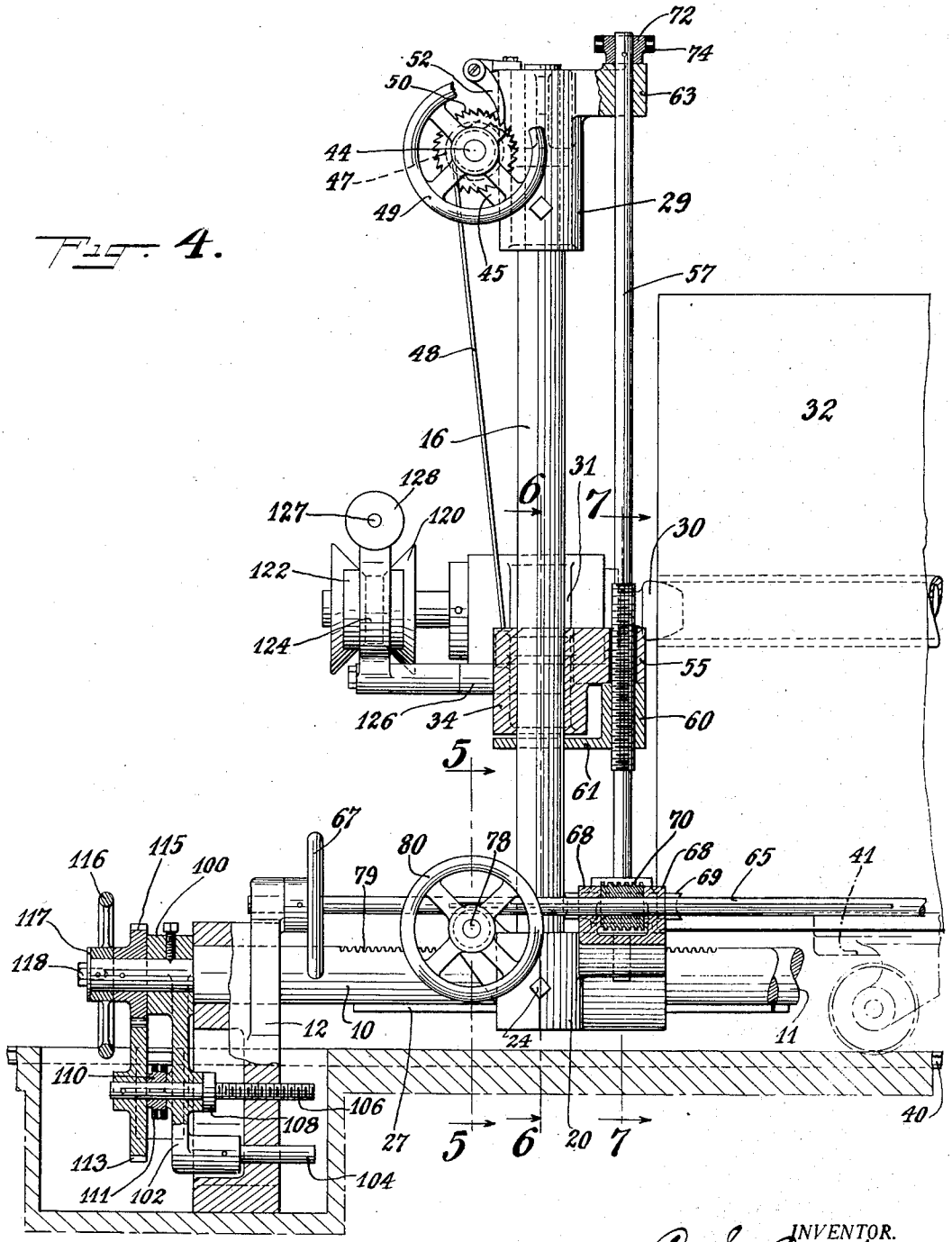
INVENTOR.
C. S. Crafts
BY
John D Morgan
ATTORNEY

Aug. 30, 1932. C. S. CRAFTS 1,874,904

WEB ROLL SUPPORTING MECHANISM

Filed April 22, 1929 6 Sheets-Sheet 4

Fig. 4.



INVENTOR.
C. S. Crafts
BY
Edwin D. Morgan
ATTORNEY

Aug. 30, 1932. C. S. CRAFTS 1,874,904

WEB ROLL SUPPORTING MECHANISM

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Fig. 5.

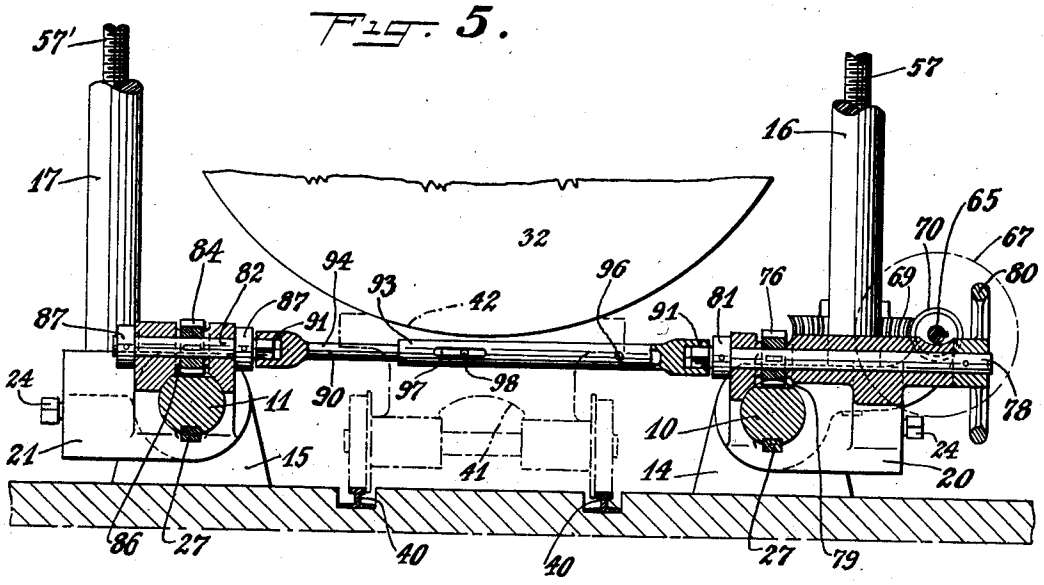
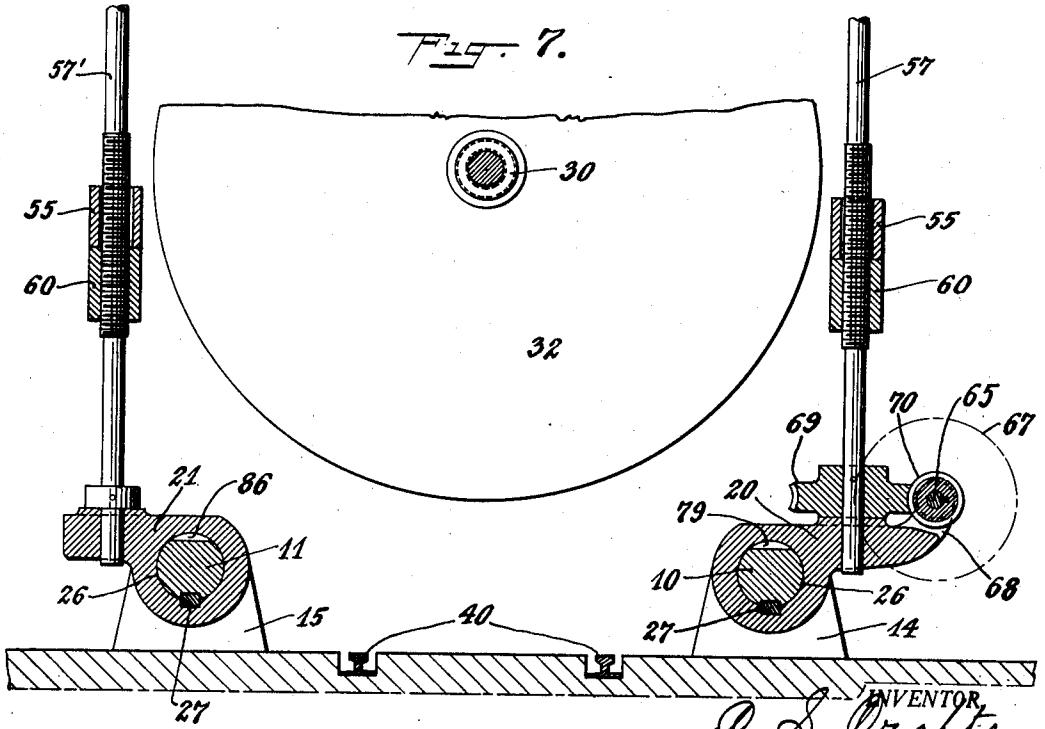


Fig. 7.



INVENTOR
C. S. Crafts
BY
John D. Morgan
ATTORNEY

Aug. 30, 1932. C. S. CRAFTS 1,874,904

WEB ROLL SUPPORTING MECHANISM

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Fig. 6.

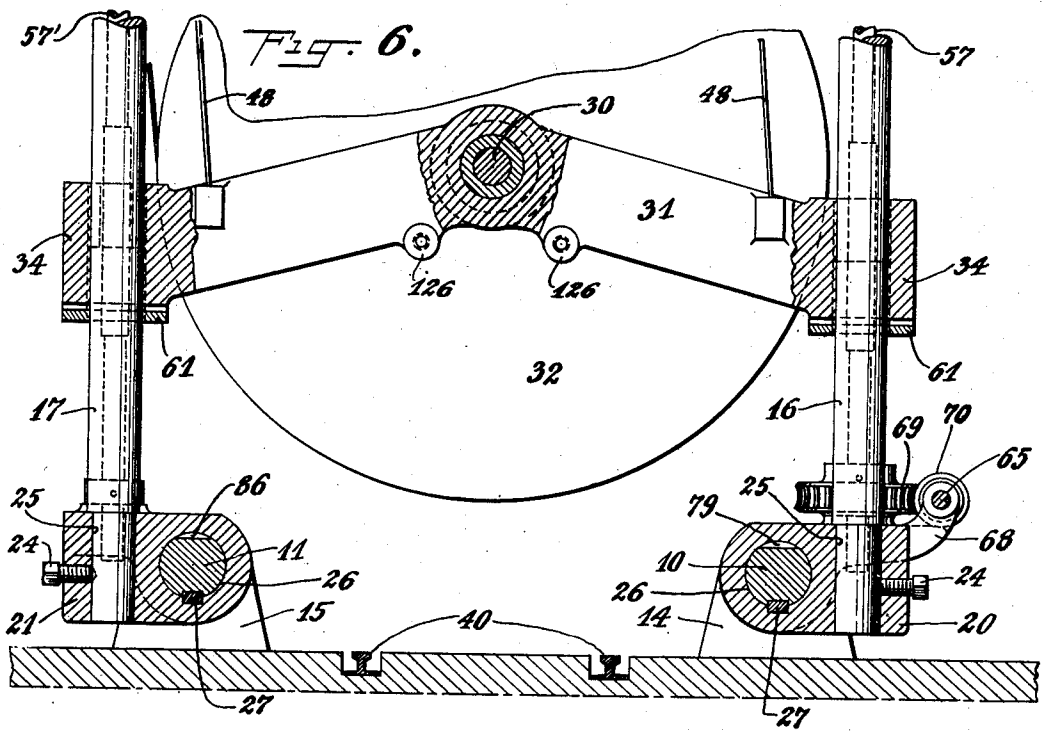


Fig. 8.

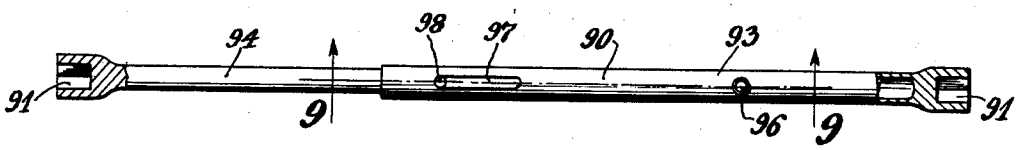
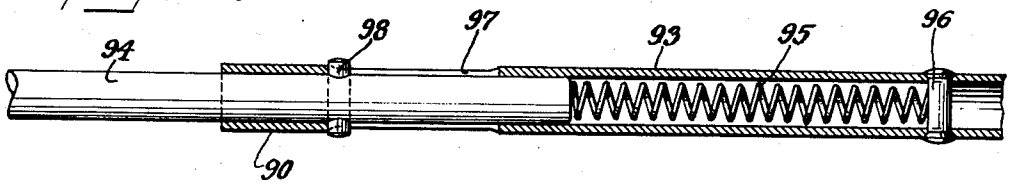


Fig. 9.



INVENTOR.
C. S. Crafts
BY
John D Morgan
ATTORNEY

Patented Aug. 30, 1932 1,874,904

UNITED STATES PATENT OFFICE

CURTIS S. CRAFTS, OF OAK PARK, ILLINOIS, ASSIGNOR TO GOSS PRINTING PRESS COMPANY, A CORPORATION OF ILLINOIS

WEB ROLL SUPPORTING MECHANISM

Application filed April 22, 1929. Serial No. 357,126.

The invention relates to a novel and useful web roll supporting devices and more especially to means for handling and supporting web rolls including rolls of different widths, for registering the web fed from the web roll with the printing press or other web consuming machine, for tensioning the web fed from the web roll, at the same time permitting a new web roll to be brought into position with a minimum of time and effort, and finds a broad field of usefulness in high-speed, rotary printing presses and other web using machines which employ heavy web 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 an elevation of the web roll supporting mechanism in accordance with my invention;

Fig. 2 is an end view looking from the left of Fig. 1;

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

Fig. 4 is a detail elevation, certain parts being shown in section of one end of the web roll supporting mechanism shown in Fig. 1;

Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 4;

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 4;

Fig. 8 is an enlarged detail view of the removable shafts employed with the present form of web roll supporting mechanism and

Fig. 9 is a detail sectional view taken on the line 9—9 of Fig. 8.

The invention has for its primary object the handling, supporting, alining, registering and braking of web rolls of paper, or other similar material, and the effecting of the various operations with web rolls of greatly different widths, the web being drawn from the web roll at high and different speeds and under tension, which tension may be varied to suit the various conditions at hand. The invention is also directed to the provision of such a mechanism which is unusually efficient and can be operated easily and quickly for performing all of these functions separately or conjointly and without necessitating readjustment of one mechanism by reason of the adjustment of the others.

A further object of the present invention is the provision of such a mechanism whereby the usual web-roll supporting spindle or mandrel is rendered unnecessary, thereby facilitating the replenishing of the web roll by dispensing with the unfastening and refastening of the brake mechanism to the spindle, bringing the brake pulley into proper relation with the brake mechanism of the press and the subsequent adjustment of the brake mechanism. By the present invention the web roll is moved endwise into the web handling mechanism, accurately positioned with respect to the mechanism, is quickly operatively mounted on its rotatable supports, is quickly and accurately registered with respect to the printing press or other web-using machine, is quickly and accurately changed to support web rolls of different widths, and an exhausted web roll is removed with a minimum of time and trouble.

Other features of the invention will be initially pointed out in connection with the following detailed descriptions of the present preferred embodiment of the invention; and it will be understood that the foregoing general description and the following detailed description are both exemplary and explanatory but not restricted to the invention.

Referring now in detail to the present preferred embodiment, illustrated by the accompanying drawings, the general framework of

the web roll handling and supporting mechanism comprises a pair of spaced-apart parallel horizontal guiding and supporting members 10, 11, preferably of generally circular cross-section, which are slidably journalled in upstanding end frames 12, 13, 14 and 15 securely bolted within recesses formed in the floor. On these guiding and supporting members, vertical members 16, 17, 18 and 19 are slidably mounted by means of sleeve members 20, 21, 22, and 23 respectively, having offset sleeves at right angles to each other. Each of these sleeve members supports, in its vertically extending sleeve 25, one of the vertical supporting members 16 to 19 and is fastened to it by means of set screws 24, while the other sleeves 26, are slidably keyed to the guiding members 10, 11, by means of keys 27. For increasing the rigidity of these vertical supporting members 16, 17, 18 and 19 and holding them upright, a header 28 is provided with sleeves 29 at each end, fits over the upper ends of the vertical supports 16, 17, 18 and 19, and extends across the longitudinal guides 10, 11 to connect pairs of vertical members together. For rigidly securing the headers 28, to the vertical supports, set screws may be screwed into engagement with the vertical supports, thus holding the headers against movement thereon.

The embodied means for engaging the ends of the axial orifice of the web roll and rotatably supporting the web roll between the vertical supporting members, comprise a pair of inwardly extending spindles 30, 30′, journalled in the central or hub portion of spanners 31 extending between the vertical supports at each end of the web roll 32. As here shown spanners 31 extend transversely of the guide members 10, 11 and at the ends of each spanner are sleeve portions 34, fitting over the vertical members 16, 17, 18 and 19, by which the spanners 31 are permitted to slide up and down on upright supports.

Means are provided for moving one spindle longitudinally of its axis so that the cone of an exhausted web roll can be removed and a new web roll inserted in its place, and for this purpose, spindle 30′ is rotatably journalled in a threaded sleeve 35, in engagement with a second threaded member 36, which second member can be turned in the hub portion of the spanner 31, by rotation of disc 37, to move the threaded sleeve 35 in and out. The spindle-moving mechanism shown is similar to that more fully shown and described in an application of Martin W. Brueshaber, Ser. No. 310,571, filed October 5, 1928, and need not be set forth in greater detail.

For the purpose of facilitating introduction of a new web roll to replace a web roll which has become exhausted, means are provided whereby the new web roll may be moved endwise into position, while it is supported on a small easily moved truck. As embodied, a track, comprising suitable spaced-apart rails 40 anchored within recesses in the floor, extends longitudinally of the machine and centrally of the space between guiding members 10, 11. These guiding members, and the upright supporting members 16, 17, 18 and 19 slidably mounted thereon are spaced apart a sufficient distance to allow the roll and its truck 41 to be moved endwise between them. Truck 41 is movable on rails 40 and is formed with a concave tap 42 to provide a depression for holding the web roll 32 so it will position itself centrally of the machine to clear the upright members.

For quickly moving either of the spanners 31 in a vertical direction to clear one end of the machine and allow the endwise movement of the roll between the supporting members, there is provided, on each of the headers 28 and above spanners 31, a shaft 44, journalled in brackets 45 extending outwardly from each end of the headers 28. On these shafts are mounted a pair of drums 47 and cables 48, securely fastened to the shaft 44 and on these drums 47, are connected at their lower ends to the spanners 31. For turning the shaft to wind the cables on their respective drums and hold the spanners in raised position, a hand wheel 49 and ratchet 50 are mounted on one end of each shaft 44. Pawl 52, pivoted on bracket normally engages with the teeth of ratchet 50 and as the hand wheel is turned to raise the spanner 31, clearing the end for the endwise movement of the roll, pawl 52 holds shaft 44 against the retrograde movement, thereby freeing the operator, who may then move the truck and web roll between the supports and into the web roll handling mechanism. As soon as the web roll has been moved into position, pawl 52 may be released allowing the spanner to descend into its normal position.

In the present preferred embodied form of the invention, the spanners at each end of the web roll may be raised after the ends of the axial orifice of the web roll have been engaged by the spindles 30, 30′, mounted centrally of the spanners 31, and for this purpose means are provided for raising or lowering each end of each spanner 31 to raise the web roll from its supporting truck 41 and lift it into running position or to lower the spanners into position so the spindles 30, 30′ can engage a new web roll. As embodied, each of the sleeves 34, at the ends of the spanners, are provided with apertured lugs 55 fitting loosely over vertically extending shafts 57, parallel to the upright supporting members 16, 17, 18 and 19. Shafts 57, 57′ are threaded for a portion of their length, and engage with threaded collars 60 having a laterally extending apertured plate 61 fitting over the

adjacent upright supporting member to keep the collar 60 from turning with the shafts. Shafts 57 are rotatably journalled in and supported by sleeve members 20, 21, 22 and 23 at their bottoms, and the upper ends of the shafts 57 are journalled in lugs 63, on headers 28. As these shafts are turned, the threaded collars 60 are moved vertically, raising or lowering the ends of the spanners 31 together with the spindles 30, 30'.

Means are provided for raising and lowering the ends of the spanners uniformly and by operation of a single means and as embodied in the present form of the invention, a longitudinally extending shaft 65 is rotatable journalled in end frames, parallel with the guiding and supporting members 10, 11, and extends for substantially the length of the machine. At one end of this shaft is fixed a hand wheel 67, where it can be conveniently reached by the operator when it is desired to raise or lower the web-roll-engaging spindles 30, 30'. In addition, shaft 65 is journalled in the slidable bifurcated arms 68 extending from sleeve members 20 and 22, and worms 70, slidable on shaft 65 and keyed to it, are mounted between the forks of these bifurcated arms 68. For transmitting motion from the worms to shafts 57, gears 69, in mesh with the worms, are pinned to the lower end of shafts 57. At the upper end of shafts 57 and 57' are sprocket wheels 72 and chains 74 connect the sprocket wheels at the opposite sides of the machine, and consequently, movement of the hand wheel 67, turns shafts 57 by reason of the worms and worm gears and these shafts drive shafts 57' through sprocket chains 74. All of the ends of the spanners are thus kept level and movement of one shaft necessitates an equal movement of the rest.

The embodied form of means for moving the supporting members toward and from each other to accommodate web rolls of greatly different sizes comprises gears 76 keyed to shafts 78 journalled in the slidable sleeve members 20 and 22, and held directly over the supporting and guiding rod 10. Gears 76 mesh with gear teeth 79 cut in the upper portion of the supporting and guiding rod 10. At the outer end of shafts 78, are fixed hand wheels 80 and the shafts 78 are held against endwise movement by collars 81. Each of the two shafts 82, at the other side of the web roll handling and supporting mechanism is alined with the corresponding shaft 78, and is similarly journalled in the slidable sleeve members 21 or 23. Shafts 82 carry gears 84, meshing with teeth 86 cut in the upper surface of the guiding and supporting member 11 and collars 87 prevent endwise movement of the shafts. Shafts 78 and 82, are squared at their inner ends and are connected together by a removable shaft 90 having square sockets 91 at its end to fit over the squared ends of the alined shafts on opposite sides of the machine. By turning hand wheel 80, gears 76 and 84 are rotated together and the two supporting sleeve members 20 and 21 or 22 and 23 for the corresponding supporting members are moved an equal amount along the guiding rods 10 and 11.

Removable shafts 90 are preferably so constructed that they may be extended and contracted, allowing them to be readily removed from the end of the machine used for the introduction of the web roll, and in the present embodiment comprises a tubular member 93, having a square socket 91 at one end, and within this tubular member is fitted a rod 94, of slightly smaller diameter also provided at one end with a square socket 91. To keep the removable shaft in place, and in engagement with the squared ends of the shaft 78 and 82, the rod 94 and tube 93 are yieldingly extended by a spring 95, fitted within the tubular member 93 and compressed between the inner end of rod 94 and a pin 96 driven through the tubular member. On opposite sides of the tubular member are provided longitudinally extending slots 97 in which slide a pin 98, passing through rod 94, thereby serving to limit the extension of the removable shaft and at the same time prevent turning of the rod 94 with respect to the tubular member 93.

Means are also provided for laterally registering the web roll with respect to the printing press or other web using machine and as embodied in the present mechanism comprise means for simultaneously and longitudinally moving the guiding and supporting rods 10 and 11 with the web roll supporting members, 16, 17, 18 and 19 spanners 31 and spindles 30 and 30'. As previously described, guiding and supporting rods 10 and 11 are slidably mounted in end frames 12, 13, 14 and 15 at the ends of the mechanism and these rods carry the upright supporting members between which the web roll is rotatably supported. To one end of these rods 10 and 11, and at the outside of the ends frames, are secured brackets 100 and 101 having depending arms 102, 103 from which guiding pins 104 extend inwardly and through apertures in the end frames 12 and 13. Threaded shafts 106 engaging with a corresponding threaded opening in the end frames are rotatably journalled in the depending arms 102 and 103 and are held against endwise movement by collars 108 and sprocket wheel 110 and 112. For turning threaded shaft 106 in unison, a sprocket chain 111 runs between sprocket wheels 110 and 112 and beneath the rails 40. On shaft 106, adjacent sprocket wheel 110, is fixed gear 113, meshing with a smaller gear 115, journalled on the reduced end of guiding and supporting rod 10. Hand wheel 116, rigidly secured to gear 115 is provided for turning gears 115 and 113 and sprocket wheels 110 and 112, and is held on the reduced end portion of rod 10

by disc 117 and cap screw 118. As hand wheel 116 is turned, gear 113 rotates, turns the threaded members 106, moving the arms 102, 103 and brackets 100, 101 toward or from end frames 12, 13 and thereby moves the guiding and supporting members 10 and 11 and the web roll supported thereby to register the web, fed from the web roll, with the printing plates on the cylinders of the printing press or with some other part of the web using machine. By reason of this mechanism, the side register of the web can be quickly, easily and accurately corrected without disturbing any of the adjustments effected by the other elements of the mechanism.

Web tension controlling means are provided and in this embodiment comprise a brake mechanism operable on a spindle engaging one of the ends of the axial orifice of the rotatably mounted web roll. Preferably, and as here shown, the brake mechanism is mounted on the spindle which is not longitudinally movable with respect to the spanner in which it is mounted. A brake drum 120, fixed on the outer end of spindle 30, is provided with a deep V-shaped peripheral groove, with which cooperate corresponding arcuate brake shoes 122, of V-shaped cross-section, mounted on brake arms 124, which in turn are pivoted on shafts 126 outwardly extending from the central portion of spanner 31. The upper ends of brake arms 124 are yieldingly pressed together, to obtain the desired brake pressure for properly tensioning the web drawn off from the web roll, by means of rod 127, pivoted in the upper end of one brake arm 124 and passing through the upper end of the other brake arm. Hand wheel 128, threaded on the free end of rod 127 compresses spring 130 to force the brake shoes together and tension the web, which tension can be controlled, as desired, by movement of the hand wheel 128.

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 handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for moving said supporting means toward or from each other to accommodate web rolls of different widths and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

2. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position and means for uniformly raising each of the supporting means to lift the web roll into running position.

3. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position and means for uniformly raising each of the supporting means to lift the web roll into running position.

4. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position and means for moving said supporting means toward or from each other to accommodate web rolls of different widths.

5. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

6. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for uniformly raising each of the supporting means to lift the web roll into running position, means for moving said supporting means toward or from each other to accommodate web rolls of different widths and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

7. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position, means for moving said supporting means toward or

from each other to accommodate web rolls of different widths and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

8. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position, means for uniformly raising each of the supporting means to lift the web roll into running position and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

9. A web roll handling and supporting apparatus including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for releasably holding the supporting means in raised position, means for moving said supporting means toward and from each other to accommodate web rolls of different widths, means for uniformly raising each of the supporting means to lift the web roll into running position and means for laterally moving the supporting means to register the web with a printing press or other web using machine.

10. A web roll handling mechanism including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising supporting means for either end out of the path of a web roll moved endwise into position, means for moving said supporting means toward or from each other to accommodate web rolls of different widths and means for uniformly raising each of the supporting means to lift the web roll into running position.

11. A web roll handling mechanism including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for raising the supporting means for either end out of the path of a web roll moved endwise into position, means for moving said supporting means toward or from each other to accommodate web rolls of different widths, means for laterally moving the supporting means to register the web with a printing press or other web using machine and means uniformly raising each of the supporting means to lift the web roll into running position.

12. A web roll handling mechanism including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for releasably holding the supporting means for either end out of the path of a web roll moved endwise into position and means for uniformly raising each of the supporting means to lift the web roll into running position.

13. A web roll handling mechanism including in combination means for engaging and supporting the ends of the axial orifice of a web roll, means for releasably holding the supporting means for either end out of the path of a web roll moved endwise into position, means for moving said supporting means toward or from each other to accommodate web rolls of different widths and means for uniformly raising each of the supporting means to lift the web roll into running position.

14. A web roll handling mechanism including in combination means for rotatably supporting the web roll, means for independently moving a portion only of the supporting means out of the path of a web roll moved endwise into position and other means for raising the web roll into running position.

15. A web roll handling mechanism including in combination means for rotatably supporting the web roll by engagement with either end of the axial orifice of the web roll, means for independently moving a portion only of the supporting means out of the path of a web roll moved endwise into position and other means for raising the web roll into running position.

16. A web roll handling mechanism including in combination means for rotatably supporting the web roll, means for independently raising a portion only of the supporting means out of the path of a web roll moved endwise into position and releasably holding it in raised position and other means for raising the web roll into running position.

17. A web roll handling mechanism including in combination means for rotatably supporting the web roll by engagement with either end of the axial orifice of the web roll, means for quickly independently raising a portion only of the supporting means out of the path of a web roll moved endwise into position and releasably holding it in raised position and other means for raising the web roll into running position.

18. A web roll handling mechanism including in combination means for rotatably supporting the web roll, means for independently moving a portion only of the supporting means out of the path of a web roll moved endwise into position and other means for raising both ends of the web roll in unison to lift the web roll into running position.

19. A web roll handling mechanism including in combination means for rotatably supporting the web roll by engagement with either end of the axial orifice of the web roll, means for independently raising a portion only of the supporting means out of the path of a web roll moved endwise into position and

other means for raising both ends of the web roll in unison to lift the web roll into running position.

20. A web roll handling mechanism including in combination means for rotatably supporting the web roll by engagement with either end of the axial orifice of the web roll for raising a portion only of the supporting means out of the path of a web roll moved endwise into position and releasably holding it in raised position and other means for raising both ends of the web roll in unison to lift the web roll into running position.

21. Web roll handling and supporting mechanism including in combination spaced apart vertical supports at the ends of the web roll, web roll engaging spindles vertically movable freely and independently of each other on said supports, means for holding said spindles in raised position and means for raising said spindles in unison to lift the web roll to running position.

22. Web roll handling and supporting mechanism including in combination vertical supports at the ends of the web roll, web roll engaging spindles supported by said supports and freely movable thereon independently of each other, means for releasably holding said spindles in raised position, variably positionable lugs on said supports for maintaining said spindles in web roll supporting position, and means for raising and lowering said lugs in unison.

23. In combination, a head, means thereon to support a revoluble spool in horizontally offset relation thereto, an upright including an upright guide shaft on which said head is movable up or down, and means to move said head up or down including a screw shaft coacting with the guide shaft to guide the head, said screw and guide shaft being parallel to each other and offset one with relation to the other in the same lateral direction as the spool and head are offset one with relation to the other.

24. In combination a head, means thereon to support a revoluble spool in horizontally offset relation thereto, an upright including an upright guide shaft on which said head is movable up or down and having a guide surface for said head parallel with said shaft and means to move said head up or down including a screw shaft coacting with the guide shaft to guide the head, said screw and guide shaft being parallel to each other and offset one with relation to the other in the same lateral direction as the spool and head are offset one with relation to the other.

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

CURTIS S. CRAFTS.