March 26, 1940. H. A. W. WOOD ET AL 2,195,141

WEB ROLL STAND

Original Filed Dec. 7, 1936 5 Sheets-Sheet 1

Fig. 2.

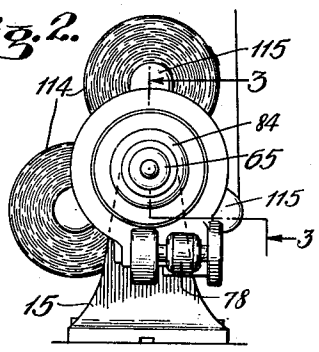


Fig. 1.

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Fig. 3.

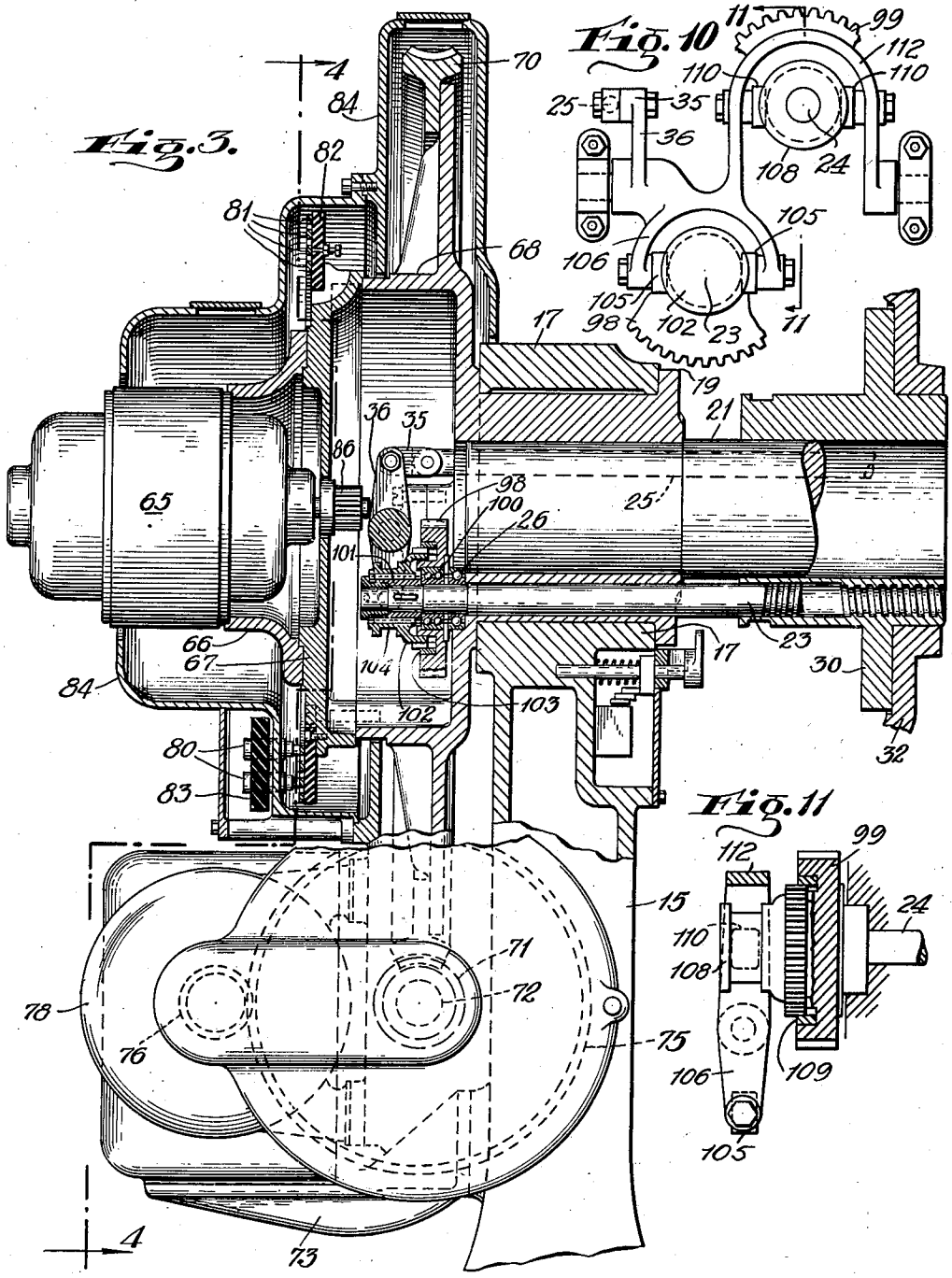


Fig. 10

Fig. 11

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Fig. 4.

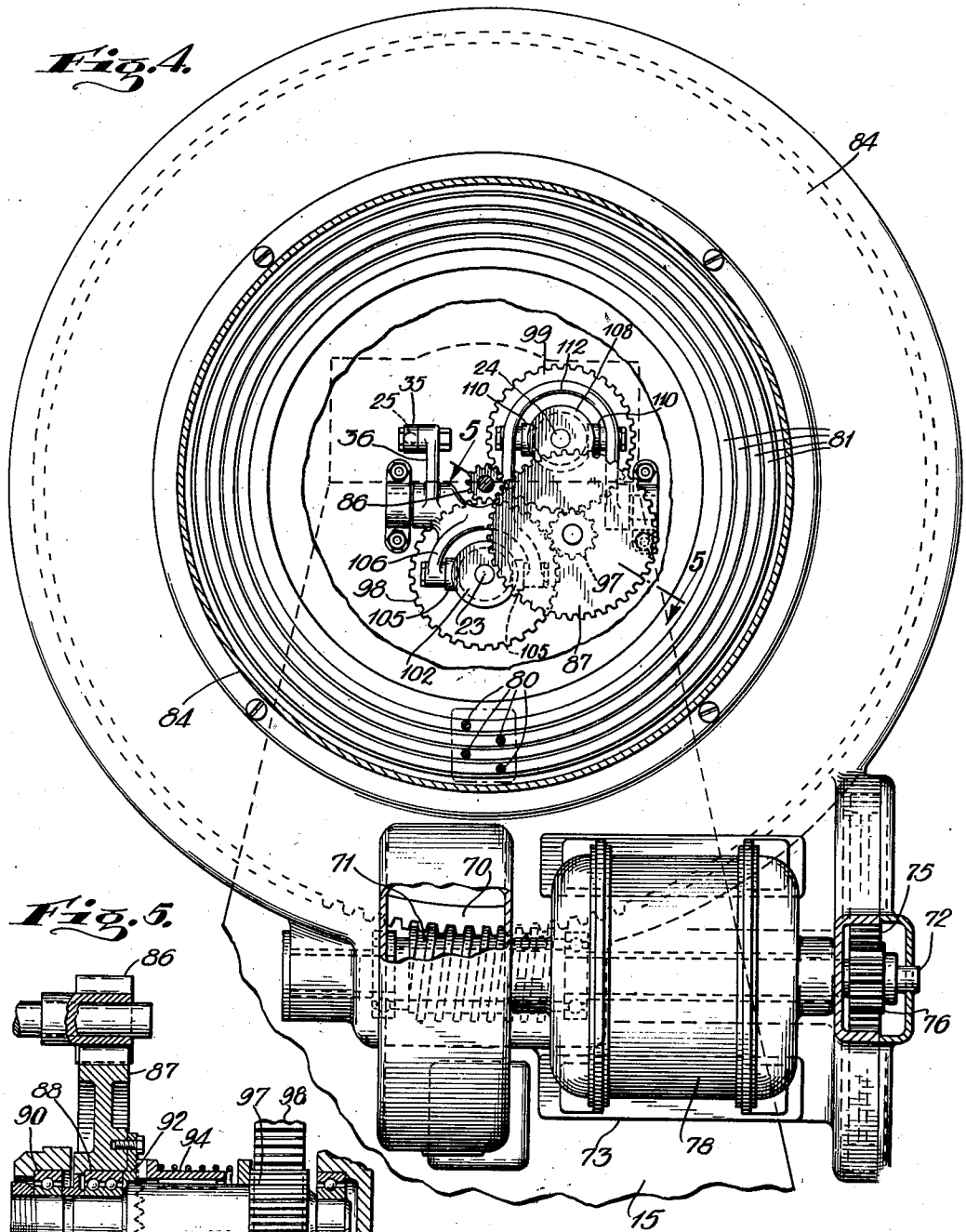


Fig. 5.

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Fig. 6.

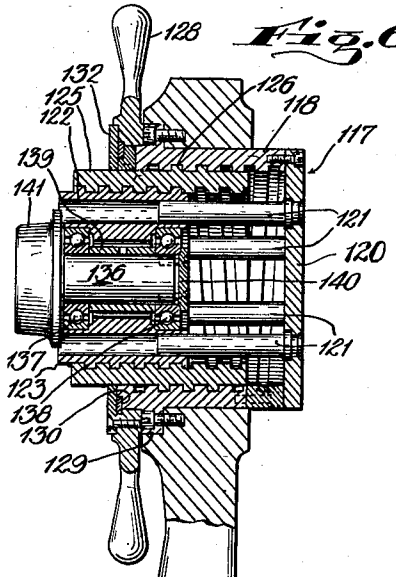
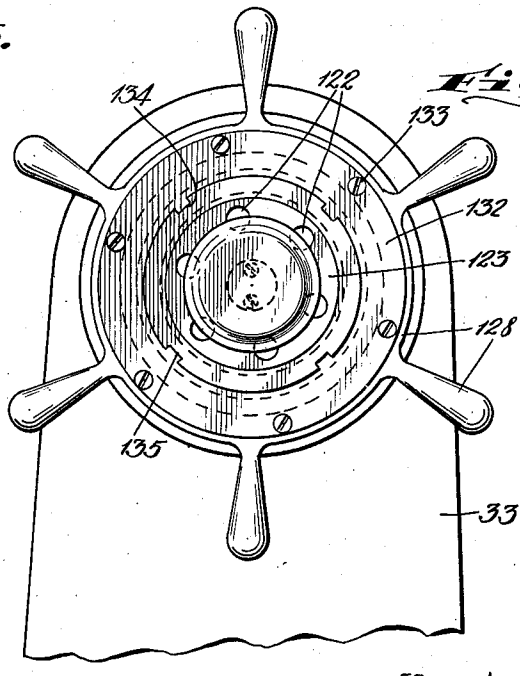
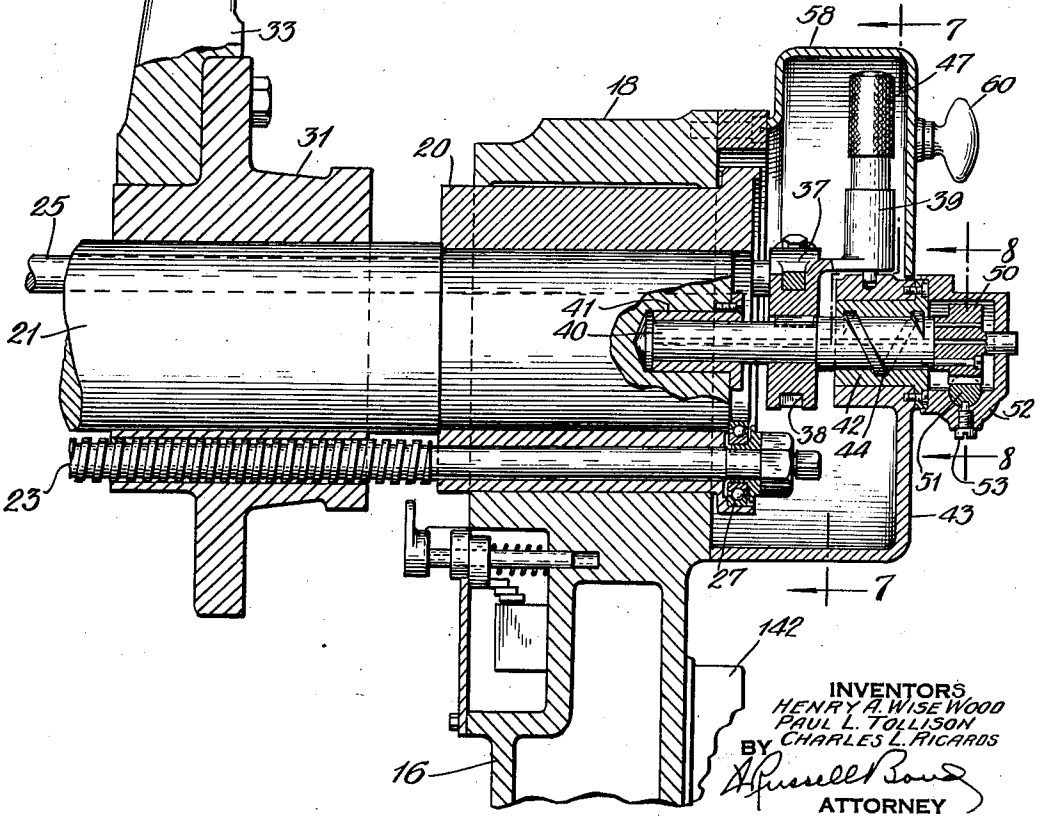


Fig. 9.





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Fig. 7.

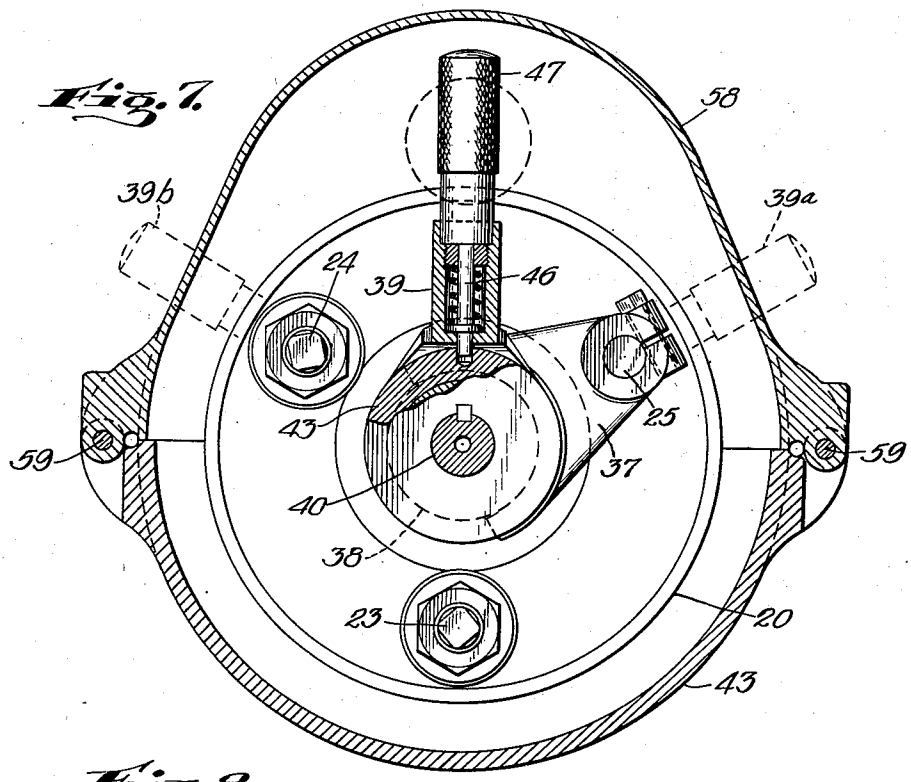
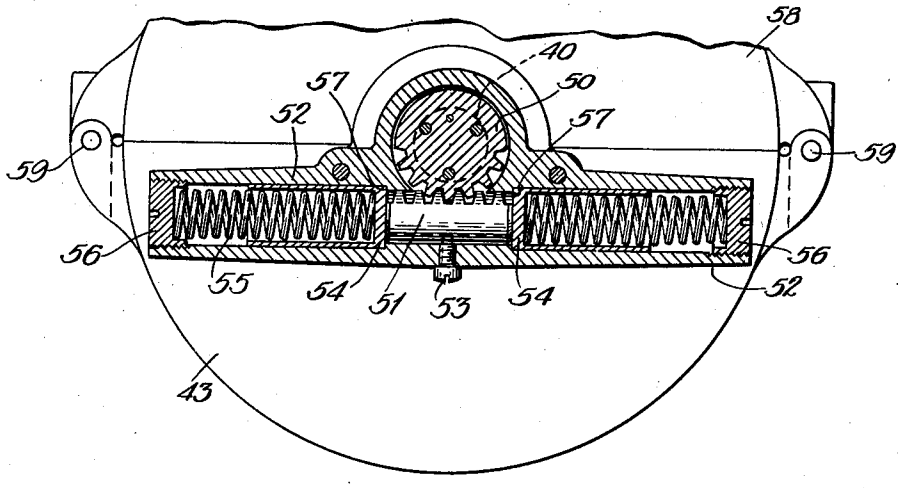


Fig. 8.



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Patented Mar. 26, 1940 2,195,141

UNITED STATES PATENT OFFICE

2,195,141

WEB ROLL STAND

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Application December 7, 1936, Serial No. 114,546
Renewed July 21, 1939

15 Claims. (Cl. 242—64)

Our invention relates to improvements in means for supporting heavy web rolls, such, for instance, as the web rolls used in the printing of newspapers,

For this purpose it is common practice to use a rotary reel adapted to support a plurality of web rolls which may be brought successively to running position and be spliced to the running web of the press, so as to insure a continuous supply. It is desirable to shift the web supports in unison in order to obtain side register and to shift the supports relatively to each other in order to mount either fractional width web rolls, or full width web rolls. As the web rolls used in newspaper printing are very heavy, power driven mechanism is employed to shift the web supports. Paper roll stands or reels of this general type are disclosed in Patents Nos. 1,957,121 and 1,957,122, issued May 1, 1934. The reel disclosed in Patent No. 1,957,121 has two opposed web supports or spiders, each provided with a side register feed screw driven by its own motor, and the motors may be operated separately or simultaneously to effect adjustment of the spiders individually or in unison along the main shaft of the reel. In the other of said patents a single feed screw and motor are employed for both spiders, and a clutch is provided on each spider for connecting the same to or disconnecting the same from the feed screw.

An object of the present invention is to provide improvements over both of these previously patented reel constructions. To this end our invention provides for the use of a single motor for adjusting the spiders and means at a single control station for controlling the operative connection of the spiders to the motor, whereby both spiders may be adjusted in unison or either of the spiders may be adjusted individually with respect to the other.

Another object of our invention is to provide safety means for automatically disconnecting either or both of spiders from the power drive in case of a jam, so as to prevent damage.

In a preferred form of our invention, two side register feed screws are employed, one for each spider, with a clutch normally connecting each screw to power, and a controller at one end of the reel for disengaging either of the clutches.

A further object of the invention is to provide a clutch controller normally held in neutral position with both feed screw clutches engaged, said controller being manually movable in one direction from neutral to disengage one of the clutches and in the opposite direction from neutral to disengage the other of said clutches.

Another object of our invention is to provide means for automatically restoring the controller to neutral position when released, so that both of the feed screw clutches will be engaged.

Other objects and advantages of our invention will appear in the following description of a preferred embodiment and thereafter the novelty and scope of our invention will be set forth in the claims.

In the accompanying drawings:

Figure 1 is a side elevation showing the opposite ends of our improved rotatable magazine reel with the intermediate portion of the reel broken away;

Fig. 2 is an end view of the same;

Fig. 3 is an enlarged view, largely in section, of the driving mechanism at one end of the reel, the section being taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a view in section taken on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmental view in section taken on the line 5—5 of Fig. 4;

Fig. 6 is a fragmental view in vertical section of the mechanism at the right hand end of the reel, as viewed in Fig. 1, showing, also, details of our improved latching clutch;

Fig. 7 is an enlarged view in section taken substantially on the line 7—7 of Fig. 6;

Fig. 8 is an enlarged view in section taken on the line 8—8 of Fig. 6;

Fig. 9 is a face view of the chuck shown in Fig. 6;

Fig. 10 is a vertical sectional view on the axis of the shaft 24, and

Fig. 11 is a sectional view on the line 11—11 of Fig. 10.

Our improved reel comprises a pair of pedestals 15 and 16 which carry bearings 17 and 18. Mounted to rotate in these bearings are bearing members 19 and 20 (Figs. 3 and 6) which are fixed to the opposite ends of a reel shaft 21. The bearing members 19 and 20 are longitudinally bored to receive a pair of side register screws 23 and 24, respectively, and also a shifter rod 25. The screw 23 is mounted at opposite ends thereof in ball bearings 26 and 27 carried by the bearing members 19 and 20, respectively. The screw 24 is similarly mounted in ball bearings, not shown. Mounted to slide on the reel shaft 21 are two hubs 30 and 31, to which are bolted spiders 32 and 33, respectively. The screws pass through these hubs, screw 23 having threaded engagement with the

spider hub 30 and hence controlling adjustment of the spider 32 along the shaft 21, while screw 24 has threaded engagement with hub 31 and hence controls axial adjustment of spider 33. The shifter rod also passes through both hubs, and this rod together with the screws compels the spiders to rotate with the shaft 21.

The shifter rod 25 is connected at one end by a link 35 to a yoke lever 36, as shown in Fig. 3. The other end of the shifter rod, as shown in Fig. 6, has a yoke 37 clamped thereto which engages a groove 38 in the hub of a control handle 39 keyed to a short shaft 40. This shaft is coaxial with the shaft 21 and its inner end is slidable in a bushing 41 let into a socket formed in the adjacent end of the shaft 21. The shaft passes through a bushing 42 which is fixed to a housing 43 carried by the pedestal 16. A thread 44 on the shaft 40 cooperates with a groove formed in the bushing 42, so that by swinging the handle 39 from its normal position, shown in full lines in Fig. 7, to the dotted line position 39a, the shaft will be fed inwardly or to the left, as viewed in Fig. 6, and conversely if the handle is swung to the position 39b the shaft will be fed outwardly. By reason of the connection between the yoke 37 and handle 39 there will be a corresponding axial adjustment of the shifter rod 25 which, as will be explained hereinafter, controls a pair of clutches adapted respectively to connect or disconnect each of the side register screws 23 and 24 to power.

It is desirable to maintain the handle in its normal position, in which position both of the side register screws are connected to power. To this end, the handle is provided with a spring-pressed dowel pin 46 which is adapted to enter an aperture in the housing 43 to hold the handle in normal upright position. The pin has a knurled projecting end 47 which may be lifted to unlock the handle whenever it is desired to swing the handle out of normal position.

It is also desirable to have the handle return automatically to its normal position when released and to this end a pinion 50 is fixed to the outer end of the shaft 40. This pinion meshes with a rack 51 which is slidable in a tubular casing 52 fixed to the housing 43 and disposed transversely to the axis of the shaft 40. A guide screw 53 in the housing engages a keyway in the rack and prevents rotation of the rack. When in the normal position, illustrated in Fig. 8, each end of the rack abuts a thimble 54 fitted to slide in the casing and partly enclosing a compression spring 55. The opposite end of each spring bears against a plug 56 screwed into the casing 52. When the handle 39 is swung to the right or left the rack will be moved axially, thereby causing one or the other of the springs to be compressed, and on release of the handle it will be swung back to normal position by the compressed spring. In the normal position of the handle each thimble abuts a shoulder 57 in the casing so that neither thimble may move past normal position when the rack is pressing back the opposite thimble. This obviates the necessity of carefully balancing the springs to hold the handle in normal position. It will be understood, of course, that as soon as the handle reaches normal position the dowel pin will snap into the aperture of the housing 43 and lock the handle in such normal position.

A cover 58 is provided which is normally fitted over the handle. This cover is connected to the housing by a pair of pins 59. Either of the pins may be withdrawn and the cover may then be swung open on the other pin as a fulcrum. A knob 60 provides a convenient handle for the cover. It will be observed from an inspection of Fig. 7 that the handle 39 cannot be swung to either of the dotted line positions so long as the cover is closed. This arrangement of parts is purposely provided as an additional safeguard against inadvertent adjustment of one spider without simultaneous adjustment of the other.

The side register screws are arranged to be driven either separately or simultaneously, depending upon the setting of the shifted rod, by means of a reversible motor 65. This motor is mounted on a ring 66 bolted to a disk 67 and the latter in turn is bolted to a cup shaped hub 68 of a worm wheel 70, this hub being an integral extension of the bearing member 19. The worm wheel 70 meshes with a worm 71 on a shaft 72. The latter is journaled in bearings carried by a bracket 73 bolted to the pedestal 15. Keyed to the shaft 72 is a gear 75 which is driven by a pinion 76 fixed upon the armature shaft of a reel motor 78. The latter is also mounted on the bracket 73. The motor may be operated to rotate the reel shaft 21 through the gearing just described, while the motor 65 which is fixed to the worm wheel 70 will rotate bodily with the reel shaft.

Electric power is supplied to motor 65 through pencil electrodes 80 which engage contact rings 81 mounted on an annulus 82 of insulating material fixed to the rotary disk 67. The electrodes 80 are mounted in an insulating block 83 fixed to a stationary housing 84 carried by the bracket 73. Current is supplied to the electrodes through leads, not shown and the circuit to the motor is completed through wires, not shown, which run to the motor from the rings 81.

The armature of motor 65 has a pinion 86 fixed thereon which meshes with a gear 87 (see Fig. 5). The latter is carried by a double row ball bearing 88 mounted on a short shaft 89. This shaft in turn is mounted in ball bearings 90 and 91 carried respectively in the motor supporting disk 67 and the worm wheel hub 68. A clutch plate 92 is secured to the gear 87 and is formed with V-shaped radial teeth which mesh with complementary V-shaped teeth formed on the adjacent end of a clutch sleeve 94 splined upon the shaft 89. The clutch sleeve is normally urged into engagement with the clutch plate by a spring 95 which is compressed between a flange on the clutch sleeve and a washer 96 on the shaft 89. This washer abuts a pinion 97 fixed to the shaft 89 which meshes with two gears 98 and 99.

As shown in Fig. 3, the gear 98 is mounted on a double row ball bearing 100 carried by the side register screw 23 and the gear 99 is similarly mounted to turn on the side register screw 24. A collar 101 is keyed to the end of the screw 23 and splined on this collar is a clutch gear 102. An internal gear ring 103 fixed to the gear 98 meshes with the clutch gear. A groove 104 formed in the hub of the clutch gear is engaged by a pair of opposed blocks 105. (Fig. 4). These blocks are carried by yoke arms 106 of the yoke lever 36 which is journaled in suitable bearings fixed to the worm wheel hub 68. Similarly, a clutch gear 108 has splined connection with a collar fixed on the end of the screw 24 and is adapted to mesh with an internal gear ring 109 (see Fig. 11) on gear 99. The hub of the clutch gear 108 is formed with a groove engaged

by a pair of blocks 110 carried by a yoke 112 forming part of the yoke lever 36.

Since the blocks 105 and 110 are disposed respectively on opposite sides of the axis of the yoke lever it will be manifest that the clutch gears 102 and 108 will move in opposite directions as the yoke lever is rocked by endwise movement of the shifter rod 25. The teeth of the clutch gears are normally in half-mesh with the gear rings and the screws 23 and 24 are both clutched to their driving gears 98 and 99, respectively, so that should the motor 65 be started while the parts are in such normal position both screws will be driven simultaneously and the spiders 32 and 33 will both be fed to the right or left depending upon the direction of rotation of the motor. When the handle 39 is swung out of normal position it will move the shifter rod axially in one direction or the other. Such motion will rock the yoke lever, causing one or other of the clutch gears 102 and 108 to be disengaged from power. The motor 65 will then turn only the screw which is clutched thereto and will adjust the position of the spider controlled by said screw while the other spider remains at rest.

It will be recalled that the gear train from motor 65 to the two side register screws includes a safety clutch 92—94 formed with V-shaped teeth. Should a jam occur or an obstacle be encountered which materially hinders movement of the spiders, the V-shaped teeth will cause the clutch member 94 to slide away from member 92, against the pressure of spring 95, until the teeth clear each other. The motor can then continue to rotate while the spiders are arrested without doing any damage. It will be noted that this safety clutch is effective to prevent damage when either of the spiders is being adjusted independently or when the spiders are being adjusted in unison.

The reel spiders 32 and 33 are each formed with three arms so as to mount three paper rolls 114 simultaneously. Each roll is supported between a pair of chucks. The chucks 115 carried by the arms of spider 32 have limited axial adjustment under control of a handwheel 116. These chucks may be of the construction disclosed in copending application Serial No. 737,201, filed July 27, 1934, now Patent No. 2,095,019 of October 5, 1937. The latching chucks 117 which are carried by the other spiders 33 are capable of considerable axial adjustment to permit of engaging or disengaging a roll 114. Despite the extended adjustment provided in each latching chuck the construction is such that the clutch may be collapsed to a very small axial dimension.

Details of the latching clutch are shown in Figs. 6 and 9. The clutch comprises an outer sleeve 118 fixed in an arm of the spider 33. The sleeve is formed internally with a right hand thread. A cover plate 120 is fixed to and closes the outer end of the sleeve 118. Six guide pins 121 are carried by the plate 120 and project within the sleeve 118. These pins enter holes 122 formed in an inner sleeve 123, thereby preventing the latter from rotating but permitting axial adjustment thereof. The sleeve 123 is formed with an external left hand thread. Between the sleeves 118 and 122 there is an intermediate sleeve 125 which is internally threaded to engage the left hand threads of sleeve 123 and is also formed externally with a short thread 126 adapted to engage the right hand thread of the outer sleeve 118. Thus, if the intermediate sleeve is turned clockwise, as viewed in Fig. 9, it will be retracted or fed toward the right, as viewed in Fig. 6, and at the same time the inner sleeve will also be retracted to a greater extent.

A hand wheel 128 is provided to rotate the intermediate sleeve. This wheel is mounted to turn on a projecting end of the outer sleeve 118 and is held against axial displacement by a retaining ring 130 secured to the adjacent end of the sleeve 118 and engaging a shoulder on the outer side of the wheel. An outer ring 132 is secured by screws 133 (Fig. 9) to the exposed face of the reel and has projections 134 which cooperate with keyways 135 in the intermediate sleeve 125. The inner sleeve carries a short chuck shaft 136 mounted in ball bearings 137 and 138 secured in position by a spacer 139 and a washer 140. The chuck shaft 136 is formed with a nose 141 adapted to enter the usual socket formed in the core of the paper roll.

In operation, when a roll 114 is to be mounted in the spiders the latching chuck is retracted by turning handle 128 clockwise, as viewed in Fig. 9. One end of the roll is mounted on the chuck 115, and then the nose 141 of the other chuck is projected into engagement with the opposite end of the core of the roll by turning the hand wheel counterclockwise, as viewed in Fig. 9. It will be observed that the chuck nose 141 may be very quickly retracted and projected because of the multiplying movement provided by the interthreaded sleeves, and also that such adjustment is obtained with mechanism that is very compact and collapsible to a very small longitudinal dimension. A slight adjustment of each roll with respect to the spiders is obtained by operating the hand wheels 116 and 128 to adjust the chucks 115 and 117.

If it be desired to shift the rolls 114 on the reel shaft so as to adjust for side register, a switch 142, which may be conveniently located on the pedestal 16, is operated to control the motor 65. As stated above, the motor is reversible, and the switch may be operated not only to start the motor but also to control its direction of rotation. As long as the shifter control handle 39 remains in its normal position both of the screws 23 and 24 will be driven simultaneously by the motor 65 and the spiders will be adjusted in unison along the reel shaft. In order to adjust the reel for rolls of different width, such, for instance, as half web rolls, one or other of the spiders must be adjusted to vary the spacing therebetween. If, for instance, it be desired to adjust spider 33 the handle 39 is turned to the position 39*b*, in Fig. 7, thereby pulling the shifter rod 25 and declutching the screw 23 from its driving gear 98. While holding the handle 39 in the position 39*b* the operator then starts the motor in desired direction by means of a reversing switch 142. This causes screw 24 to feed spider 33 along the shaft 21 while the screw 23 and spider 32 remain at rest. If the handle 39 is swung to the position 39*a* the shifter rod 25 will be pushed endwise and screw 24 will be declutched from its driving gear 99 so that spider 33 will remain at rest while the screw 23 adjusts the position of spider 32. As soon as the handle 39 is released it swings automatically to normal position and is latched automatically in such position.

It will be observed that the mechanism just described provides convenient means for effecting adjustment of the spiders individually or in unison and of controlling the direction of such adjustment, such means being all under control of a station at one end of the reel.

While we have described a preferred embodiment of our invention it will be understood that this is merely illustrative and not limitative of our invention and that we reserve the right to make various changes in form, construction and arrangement of parts without departing from the spirit and scope of our claims.

We claim:

1. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are axially adjustable, and power means for axially adjusting the bearings comprising a motor, a manual controller, and means controlled thereby for operatively connecting either or both of the bearings to the motor, whereby either bearing may be adjusted individually or both of the bearings may be adjusted in unison as desired.

2. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are axially adjustable, a motor, driving means operable by the motor for axially adjusting each support, and control means at one end of the stand for operatively connecting either or both of said driving means to the motor.

3. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are axially adjustable, and power means for axially adjusting the bearings comprising a reversible motor, a manual controller at one end of the support, means controlled thereby for operatively connecting either or both of the bearings to the motor whereby either bearing may be adjusted individually or both of the bearings may be adjusted in unison as desired, and means including a second controller adjacent the first-named controller for controlling the operation and direction of rotation of the motor.

4. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are axially adjustable, and a power drive for adjusting the bearings comprising a reversible motor, a manual controller, means controlled thereby for operatively connecting either or both of the bearings to the motor, and a safety clutch between the motor and said means adapted to disengage automatically at a predetermined maximum load.

5. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are mounted to slide axially, and power gear for sliding the bearings comprising a motor and means including a manual controller adapted when the controller is in neutral position to operatively connect both of the bearings to the motor, but when the controller is moved in one direction from neutral to disconnect one of the bearings from the motor and when moved in opposite direction from neutral to disconnect the other of the bearings from the motor.

6. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are mounted to slide axially, power gear for sliding the bearings comprising a motor and means including a manual controller adapted when the controller is in neutral position to operatively connect both of the bearings to the motor, but when the controller is moved in one direction from neutral to disconnect one of the bearings from the motor and when moved in opposite direction from neutral to disconnect the other of the bearings from the motor, and means adapted to restore the controller to said neutral position when released.

7. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are mounted to slide axially, power gear for sliding the bearings comprising a motor and means including a manual controller adapted when the controller is in neutral position to operatively connect both of the bearings to the motor, but when the controller is moved in one direction from neutral to disconnect one of the bearings from the motor and when moved in opposite direction from neutral to disconnect the other of the bearings from the motor, means tending to restore the controller to said neutral position, and a latch adapted to hold the controller in the neutral position.

8. A stand for a web roll comprising a bearing for each end of the roll, a support on which the bearings are mounted to slide axially, power means for sliding the bearings comprising a motor and means including a manual controller adapted when the controller is in neutral position to operatively connect both of the bearings to the motor, but when the controller is moved in one direction from neutral to disconnect one of the bearings from the motor and when moved in opposite direction from neutral to disconnect the other of the bearings from the motor, and a removable housing for the controller adapted when in housing position to maintain the controller in said neutral position.

9. A rotary reel for a plurality of rolls, said reel comprising a rotary shaft, a pair of supports for the rolls rotatable with but adjustable along the shaft, a motor rotatable with the shaft, separate driving means normally connected to the motor for adjusting each of the supports, and a controller at one end of the shaft for alternatively disconnecting said means from the motor.

10. A rotary reel for a plurality of rolls, said reel comprising a rotary shaft, a pair of supports for the rolls mounted to rotate with but adjustable along the shaft, a motor mounted to rotate with the shaft, separate driving means normally connected to the motor for adjusting each of the supports along the shaft, and control means at one end of the reel for selectively disconnecting the driving means from the motor.

11. A rotary reel for a plurality of rolls, said reel comprising a rotary shaft, a pair of spiders adapted to support the rolls, said spiders being mounted to rotate with but axially adjustable on the shaft, a motor mounted to rotate with the shaft, feed gear individually connected to each spider for adjusting the same, a clutch normally operatively connecting each feed gear to the motor, and means interconnecting the clutches and operable to disengage the clutches alternatively but not both at the same time.

12. A rotary reel for a plurality of rolls, said reel comprising a rotary shaft, a pair of spiders adapted to support the rolls, said spiders being mounted to rotate with but axially adjustable on the shaft, a motor mounted to rotate with the shaft, feed gear individually connected to each spider for adjusting the same, a clutch normally operatively connecting each feed gear to the motor, means interconnecting the clutches and operable to disengage the clutches alternatively but not both at the same time, and a manual controller for said interconnecting means at one end of the reel.

13. A rotary reel for a plurality of rolls, said reel comprising a rotary shaft, a pair of spiders adapted to support the rolls, said spiders being mounted to rotate with but axially adjustable on the shaft, a reversible motor mounted to rotate

with the shaft, feed gear individually connected to each spider for adjusting the same along the shaft, a clutch normally operatively connecting each feed gear to the motor, means interconnecting the clutches and operable to disengage the clutches alternatively but not both at the same time, a controller at one end of the reel for operating the interconnecting means, and means adjacent said controller for controlling the operation and direction of rotation of the motor.

14. A rotary reel for a plurality of rolls, said reel comprising a pair of pedestals, a rotary shaft journaled at opposite ends thereof in the pedestals, a pair of spiders mounted to rotate with but axially adjustable on the shaft, said spiders providing supports for opposite ends of the rolls, a motor mounted on one end of the shaft and rotatable therewith, a pair of feed screws carried by the shaft and having threaded connection with the spiders respectively, a clutch for each screw normally operatively connecting the screw to the motor, means interconnecting the clutches and shiftable to disengage the clutches alternatively but not both at the same time, a controller on the pedestal remote from said motor, and means operable thereby for shifting the clutch interconnecting means.

15. A rotary reel for a plurality of rolls, said reel comprising a pair of pedestals, a rotary shaft journaled at opposite ends thereof in the pedestals, a pair of spiders mounted to rotate with but axially adjustable on the shaft, said spiders providing supports for opposite ends of the rolls, a reversible electric motor mounted on one end of the shaft and rotatable therewith, a pair of feed screws carried by the shaft and having threaded connection with the spiders respectively, a clutch for each screw normally operatively connecting the screw to the motor, means interconnecting the clutches and shiftable to disengage the clutches alternatively but not both at the same time, a controller on the pedestal remote from said motor, means operable thereby for shifting the clutch interconnecting means, and switch means adjacent said controller for controlling the operation and direction of rotation of said motor.

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