June 30, 1942. W. T. GOLLWITZER 2,288,350

SUPPORTING DEVICE

Filed Nov. 8, 1938 4 Sheets-Sheet 1

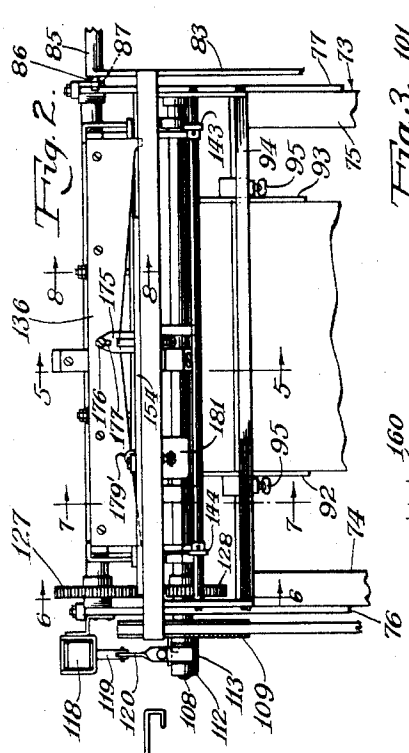


Fig. 2.

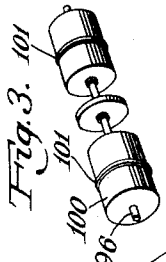


Fig. 3.

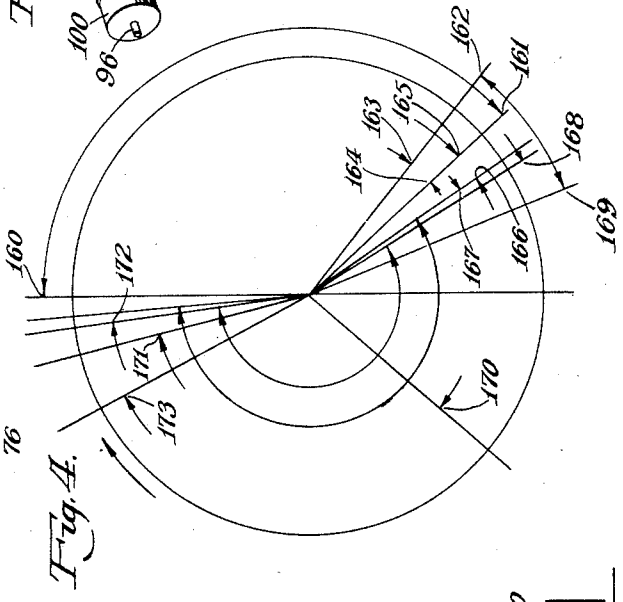


Fig. 4.

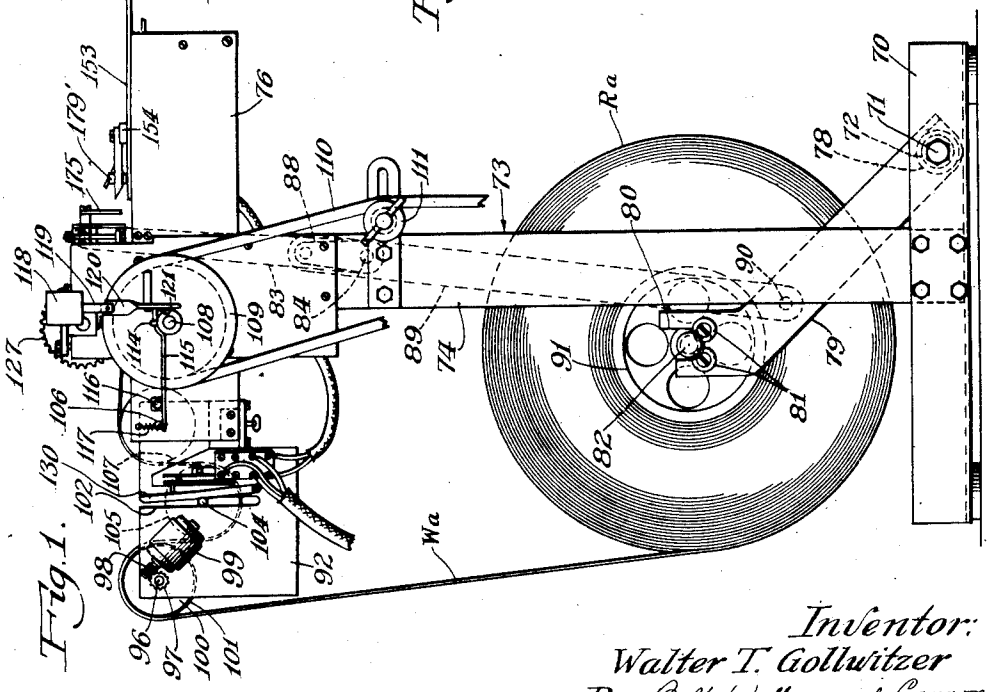


Fig. 1.

Inventor:
Walter T. Gollwitzer
By Belt, Wallace and Cannon
Attorneys

June 30, 1942. W. T. GOLLWITZER 2,288,350

SUPPORTING DEVICE

Filed Nov. 8, 1938 4 Sheets-Sheet 2

Fig. 5.

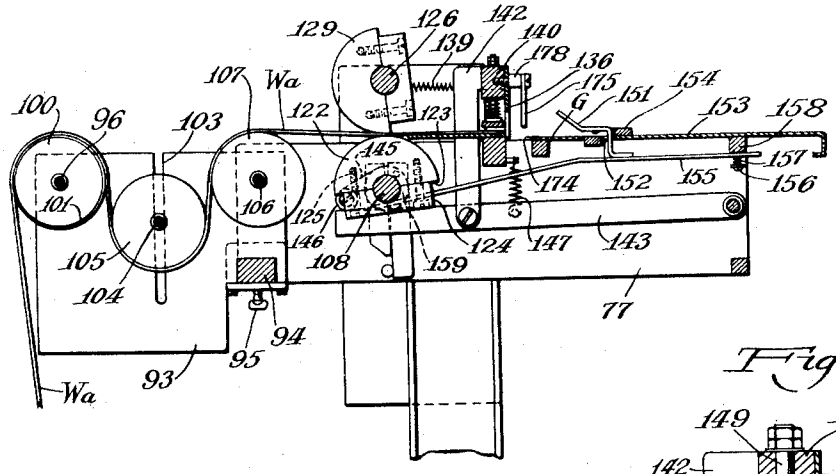


Fig. 8.

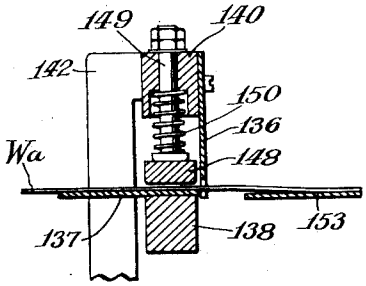


Fig. 6.

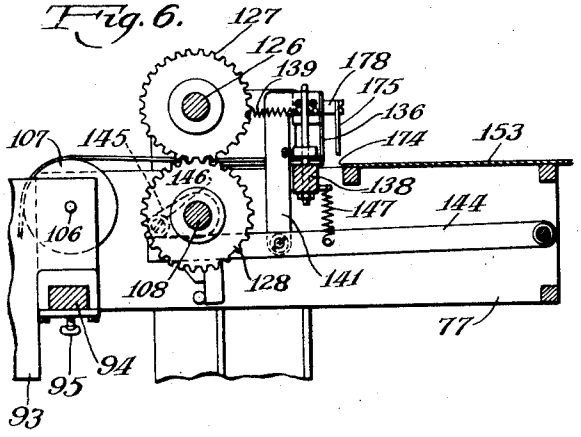


Fig. 9.

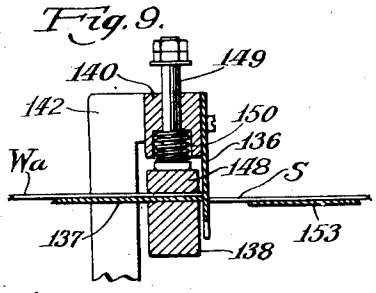
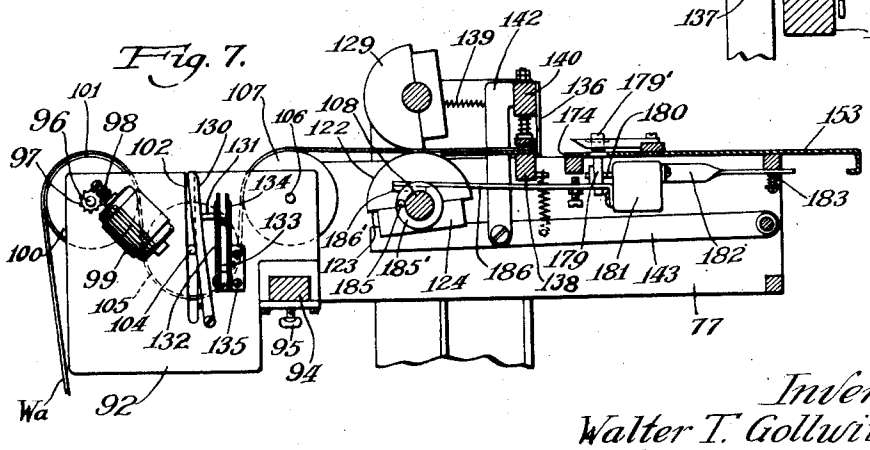


Fig. 7.



Inventor:
Walter T. Gollwitzer
By Belt, Wallace and Cannon
Attorneys

June 30, 1942. W. T. GOLLWITZER 2,288,350

SUPPORTING DEVICE

Filed Nov. 8, 1938 4 Sheets-Sheet 3

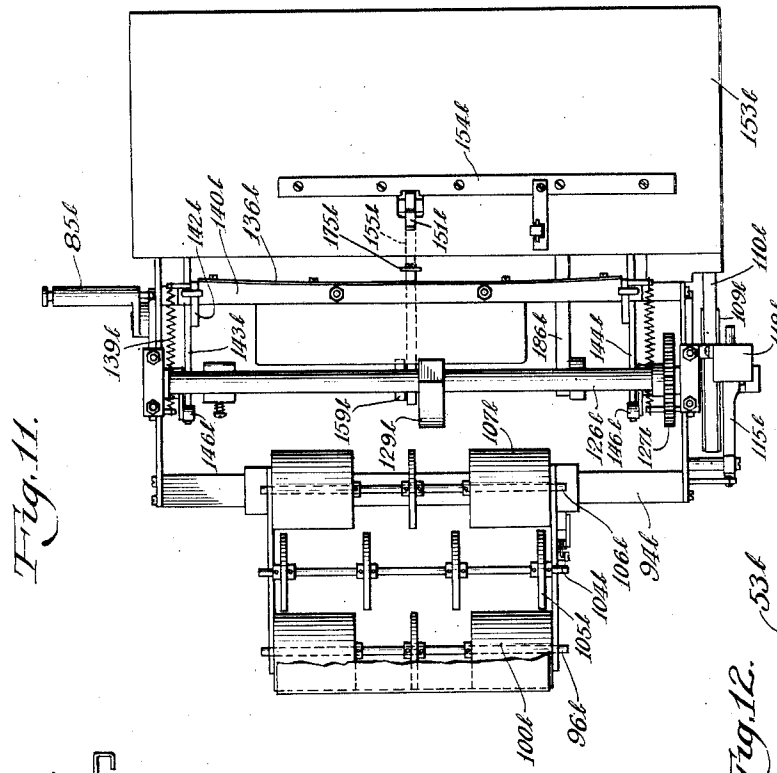


Fig. 11.

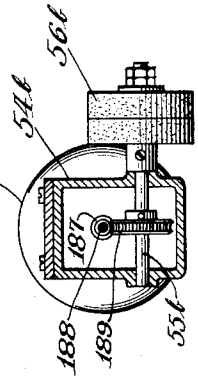


Fig. 12.

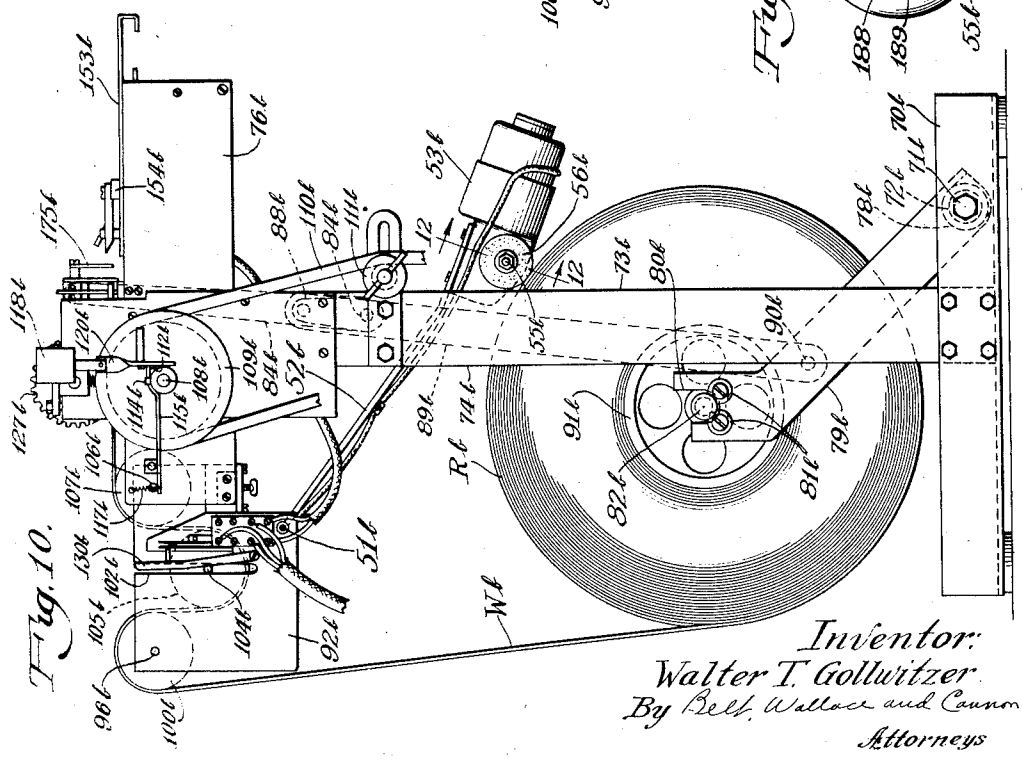


Fig. 10.

Inventor:
Walter T. Gollwitzer
By Bell, Wallace and Cannon
Attorneys

June 30, 1942. W. T. GOLLWITZER 2,288,350

SUPPORTING DEVICE

Filed Nov. 8, 1938 4 Sheets-Sheet 4

Fig. 13.

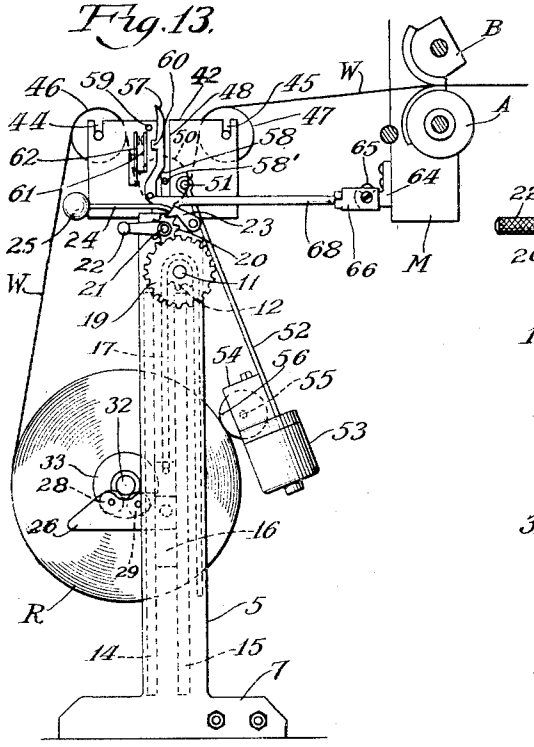


Fig. 14.

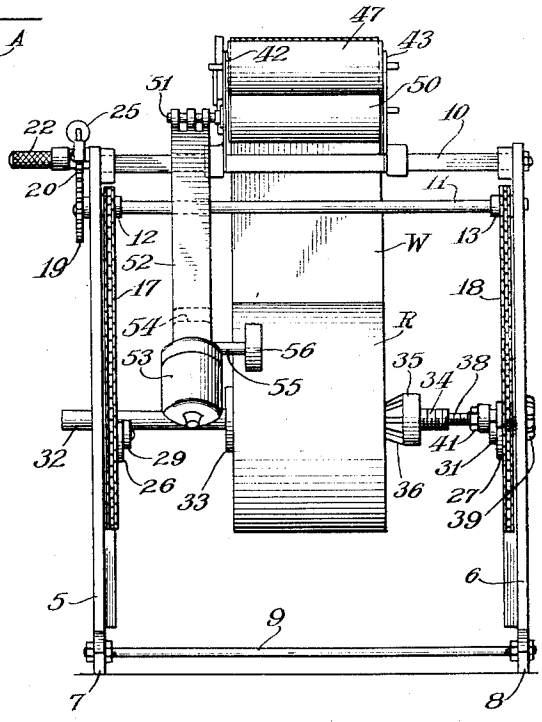


Fig. 15.

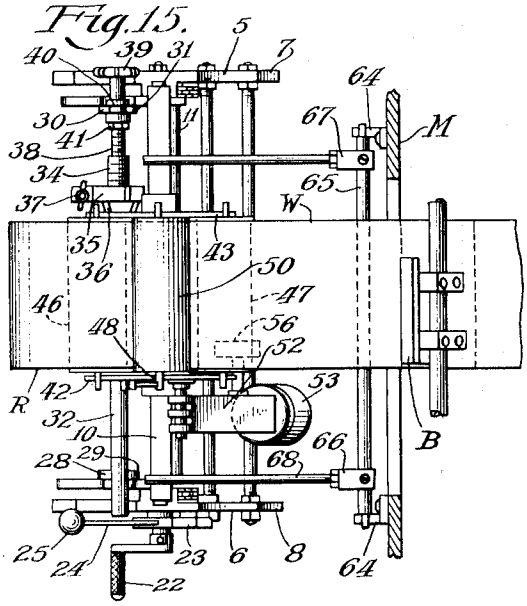
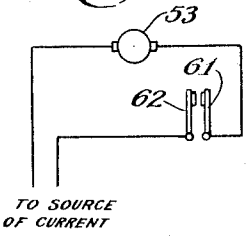


Fig. 16.



Inventor:
Walter T. Gollwitzer
By Belt, Wallace and Connor
Attorneys

Patented June 30, 1942 2,288,350

UNITED STATES PATENT OFFICE

2,288,350

SUPPORTING DEVICE

Walter T. Gollwitzer, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Wilmington, Del., a corporation of Delaware

Application November 8, 1938, Serial No. 239,562

11 Claims. (Cl. 271—2.3)

This application is in part a continuation of my application, Serial No. 78,681, filed May 8, 1936, and also in part a continuation of my application, Serial No. 221,841, filed July 28, 1938.

This invention relates to supporting devices especially adapted for use with printing or other machines to which a paper web or the like is supplied to have impressions made thereon, to be divided into sheets, or to have other operations performed thereon. The machines of Patent No. 1,955,806, patented April 24, 1934, or Patent No. 2,041,183, patented May 19, 1936, are typical of such machines.

The primary objects of the invention are to support a roll of paper or the like so that a web may be withdrawn therefrom and supplied to a machine of the kind above identified or other machine utilizing a web; to maintain uniform tension on a web as it passes into a machine; to facilitate mounting of a roll in web withdrawing position; and to impart an unwinding movement to a roll and thereby expedite withdrawal of a web therefrom.

Other objects are to prevent unwinding of a web from a roll more rapidly than the web can be utilized in the machine to which it is supplied; to detachably and adjustably associate a support for a roll in such relation with a machine utilizing a web that proper feeding of a web withdrawn from the roll into the machine will be insured; to enable adjustment of the position of a roll in the support therefor; and to provide a novel supporting device of simple and economical construction and efficient and positive operation.

Selected embodiments of my invention are illustrated in the accompanying drawing wherein

Fig. 1 is a side elevation of an apparatus embodying one form of my invention;

Fig. 2 is a fragmentary front elevation of the apparatus illustrated in Fig. 1;

Fig. 3 is a perspective detail view of a feed roller employed in the apparatus;

Fig. 4 is a timing chart;

Figs. 5, 6, 7 and 8 are sectional detail views taken substantially and respectively on the lines 5—5, 6—6, 7—7 and 8—8 on Fig. 2;

Fig. 9 is a view, similar to Fig. 8, showing the parts in a different operative position;

Fig. 10 is a view, similar to Fig. 1, showing another form of my invention;

Fig. 11 is a top plan view of the form of the apparatus shown in Fig. 10;

Fig. 12 is a sectional detail view taken substantially on the line 12—12 on Fig. 10;

Fig. 13 is still another view, similar to Fig. 1, and showing a further modified form of my invention;

Fig. 14 is a front elevation of the apparatus illustrated in Fig. 13, while Fig. 15 is a top plan view; and

Fig. 16 is a wiring diagram.

The form of my invention shown in Figs. 13 to 16 is illustrated in association with a fragmentally illustrated machine M which, in the present instance, embodies a printing couple including a printing cylinder A and a platen cylinder B to which a rotary movement is imparted in the operation of the machine whereby impressions may be made on a web W withdrawn from a roll R and passed between the cylinders A and B. The particular type and construction of the machine and the mechanism to which a web is fed form no part of my invention which particularly relates to supporting the roll R and the withdrawal of the web W therefrom, the printing couple shown merely being illustrative of a mechanism to which a web is supplied.

My novel supporting device, as illustrated in the accompanying drawing, embodies a pair of stands 5 and 6 preferably provided with substantial base portions 7 and 8 that are adapted to be rested on a floor or other suitable support. Tie rods, such as 9, interconnect the base portions 7 and 8; a bar 10 extends between and interconnects the upper ends of the stands 5 and 6; and these stands and tie rods and the bar provide the frame of my supporting device.

A shaft 11 extends between and is journaled in the stands 5 and 6 near the upper ends thereof. A sprocket 12 is fast on the shaft 11 inwardly of and adjacent the stand 5 and a sprocket 13 is fast on the shaft 11 inwardly of and adjacent the stand 6. Two strips 14 and 15 are secured to the inner side of the stand 5 in spaced apart relation and the adjacent sides thereof are undercut. A block 16 has the side edges thereof shaped complementary to the undercut edges of the strips 14 and 15 and is mounted between the strips 14 and 15 for sliding movement. One end of a chain 17 is secured to the block 16 and this chain is directed about the sprocket 12 and that portion thereof opposite the end secured to the block 16 freely depends from the sprocket in spaced relation with the strip 15. A chain 18 is directed about the sprocket 13 and is connected to a block similar to the block 16 that is mounted for sliding movement between strips, similar to the strips 14 and 15, fast on the inner side of the stand 6.

A gear 19 is fast on the shaft 11 outwardly of the stand 5. A pinion 20 is mounted on a stub shaft 21 fast in the stand 5 and meshes with the gear 19. A handle 22 is suitably connected to the pinion 20 and by grasping this handle a rotative movement may be imparted to the pinion to thereby rotate the gear 19 and consequently the shaft 11. Inasmuch as the sprockets 12 and 13 are fast on the shaft 11 the rotative movement imparted to this shaft causes the chains 17 and 18 to be moved whereby the blocks, as 16, slide relative to the strips, as 14 and 15, the direction of movement of said blocks being dependent upon the direction of rotation of the shaft 11.

A pawl 23 is pivotally mounted on the stand 5 and is engageable with the teeth of the pinion 20 to prevent rotation of said pinion. A rod 24 extends outwardly from the free end of the pawl 23 and a ball 25 is provided at the free end of this rod. The ball 25 may be grasped to pivot the pawl 23 from engagement with the pinion 20 but normally this ball urges the pawl into engagement with the teeth of said pinion.

A plate 26 is secured to the block 16 and projects rearwardly therefrom and beyond the stand 5. A similar plate 27 is connected to the block mounted on the stand 6. A pair of rollers 28 and 29 are rotatably mounted on the inner side of the plate 26 and the adjacent portions of the peripheries thereof are arranged in spaced relation whereby a shaft, axle or the like may be rested on said rollers. A pair of rollers 30 and 31 are similarly mounted on the plate 27 for a like purpose, the rearwardly and forwardly disposed rollers of each pair being in alignment transversely of the device. The pairs of rollers afford an anti-friction support for a shaft, axle or the like rested thereon.

The roll R includes a spool and a shaft or axle 32 is passed through the opening in this spool and provides a support for the roll. A collar 33 is fast on the axle 32 inwardly of one end thereof and one end of the spool of the roll R is engaged with this collar. That part of the axle 32 on the side of the roll opposite the collar 33 is screw-threaded, as indicated at 34, and a split nut 35 is mounted on the screw-threaded part 34. The split nut 35 includes a conical portion 36 and the nut 35 is adapted to be run along the part 34 to wedge the conical portion 36 in the adjacent end of the opening of the spool of the roll R whereby the roll is firmly clamped between the collar 33 and the portion 36 to be held against rotation on the axle 32. When the portion 36 is in position to tightly clamp the roll, the wing nut 37 (Fig. 15) on the split nut 35 is tightened to thereby secure the nut in position and maintain the clamping of the roll R.

That part of the axle 32 beyond the screw-threaded part 34 is of reduced diameter and this part, indicated by 38, is also screw-threaded. A hand nut 39 is mounted on the screw-threaded part 38 and has a bifurcation 40 therein. The rollers 30 and 31 are adapted to be fitted in the bifurcation 40 when that part of the axle 32 outwardly of the collar 33 is rested on the rollers 28 and 29. Then by turning the hand nut 39 relative to the screw-threaded part 38 the axle 32 may be moved axially whereby the transverse position of the roll R intermediate the stands 5 and 6 may be adjusted. When the roll R is in the desired transverse position the lock nut 41 on the screw-threaded part 38 is engaged with the hand nut 39 to lock the hand nut against rotation relative to the screw-threaded part 38 and thereby retain the roll in the desired transverse position.

A pair of plates 42 and 43 are adjustably mounted on the bar 10 in spaced relation with each other. Slots 44 and 45 extend downwardly from the top edge of the plate 42 for a short distance and are located near each end of the plate. Similar slots are provided in similar locations in the plate 43. A roller 46 has pins at opposite ends thereof and one of these pins is mounted in the slot 44 and the other pin is mounted in the similarly located slot in the plate 43. Another roller 47 has pins at opposite ends thereof and one of these pins is mounted in the slot 45 and the other pin is mounted in the aligned slot in the plate 43. Thus, the rollers 46 and 47 are supported for rotative movement between the plates 42 and 43.

A slot 48 is provided in the plate 42 midway between the ends thereof and a similarly located slot 49 is provided in the plate 43. The slots 48 and 49 extend substantially throughout the height of the plates 42 and 43 and receive the pins at opposite ends of a roller 50 whereby this roller is mounted for vertical movement relative to the plates 42 and 43.

The web W is withdrawn from the roll R and passed over the roller 46 under the roller 50 and over the roller 47 and then to the printing couple comprising the cylinders A and B or other web feeding means in the machine with which my supporting device is associated. The roller 50 therefore acts as a diabolo and forms a loop in the web intermediate the rollers 46 and 47.

A stud 51 extends outwardly from the plate 42 and one end of an arm 52 is pivotally mounted on this stud. A motor 53 is mounted at the other end of the arm 52 and a gear box 54 is associated therewith. A shaft 55 extends from the gear box 54 and a roller 56 is mounted thereon. The weight of the motor 53 and the gear box 54 holds the roller 56 in engagement with the periphery of the roll R and when the motor 53 is set in operation it rotates the roller 56 in such a direction that an unwinding movement is imparted to the roll R. By reason of the pivotal mounting of the arm 52 it may pivot inwardly and therefore the roller 56 will remain in engagement with the periphery of the roll R as the diameter of this roll decreases by reason of the withdrawal of the web therefrom.

As will be explained more fully hereinafter in connection with Fig. 12, the shaft 55 preferably has a worm wheel thereon that receives power from a worm gear on a shaft of the motor 53. By reason of such gearing the shaft 55 and therefore the roller 56 are prevented from turning in a reverse direction, and in view of this when the motor 53 is at rest and the roller 56 is in engagement with the periphery of the roll R, this roller 56 serves as a brake on the roll R to prevent undesired unwinding of such roll.

When the device is initially set in operation the web is arranged in the manner shown in Fig. 13, that is to say, the diabolo 50 draws a substantial loop between the rollers 46 and 47. However, as soon as the cylinders A and B or other similar means start to operate the web is withdrawn from the loop between the rollers 46 and 47 wherefore the roller or diabolo 50 moves upwardly, and when this occurs circuit is closed to the motor 53 and the roller 56 is set in operation to impart the unwinding movement to the roll R to cause an additional length of

web to be unwound. This additional length of web is taken up by descent of the roller 50 and when this roller has descended in a predetermined amount circuit to the motor 53 is opened to stop operation of the roller 56. Thus when the loop in the web between the rollers 46 and 47 decreases it is desirable to operate the roller 56, and when the loop between said rollers increases it is desirable to interrupt operation of said roller.

To this end an arm 57 is mounted on the plate 42 adjacent the slot 48 and this arm has a cam surface 58 thereon engageable by the pin 58' on the roller 50 disposed in the slot 48. When the roller 50 moves upwardly from a predetermined low position the cam surface 58 is engaged by the pin 58' whereupon the arm 57 is pivoted counterclockwise, as viewed in Fig. 13, movement of said arm in this direction being limited by a stop 59 on the plate 42. When the arm 57 moves in this direction, a lug 60 thereon engages the contact 61 and forces it into engagement with the contact 62 and this closes circuit to the motor 53, said contacts being in the circuit with said motor, as illustrated in Fig. 4. Hence as long as the roller 50 is out of a predetermined down or lowered position the contacts 61 and 62 remain closed and the motor 53 remains in operation, driving the roller 56, but when a sufficient quantity of web has been unrolled from the roll R by the action of the roller 56 to permit the roller 50 to move into its predetermined down or lowered position, the pin 58' disengages cam surface 58 whereupon the lug 60 disengages the contact 61 and circuit to the motor 53 is opened and the action of the roller 56 is interrupted.

The cylinders A and B or other similar means in the machine always withdraw the web against the action of the roller 50 and therefore uniform tension is maintained on the web W which insures accurate feeding of the web by the cylinders A and B or other similar web feeding means in the machine. The roller 56 is operated to unwind the web from the roll R at a speed faster than the withdrawal of the web by the cylinders A and B or other similar means, and this enables the roller 50 to effect its uniform tensioning action.

It is essential that the web be fed accurately to the cylinders A and B or other means and I therefore provide means for connecting my novel supporting device to the frame of the machine with which it is used whereby predetermined relation between the supporting device and machine may be maintained and therefore once accurate feeding of the web to the machine has been established it may be maintained. In the present instance suitable brackets 63 and 64 are fast on the frame of the machine M and a rod 65 is detachably connected thereto. Blocks 66 and 67 are mounted on the rod 65. One end of a rod 68 is secured to the bar 10 and the other end of this rod is adjustably connected to the block 66. One end of another rod 69 is secured to the bar 10 and the other end of this rod is adjustably connected to the block 67. The adjustable connections of the rods 68 and 69 to the blocks 66 and 67 enable adjustment of my supporting device relative to the frame of the machine M whereby feeding of the web W in a straight line between the cylinders A and B or other web withdrawing means in the machine may be established.

The plates 42 and 43 are adjustable on the bar 10 so that they may be disposed in the proper position relative to the means in the machine to receive the web. The rollers carried by these plates are preferably of a width substantially equal to the width of the web and this promotes accurate feeding of the web. The adjustability of the roll R afforded by the hand nut 39 also promotes proper alignment of the web.

Rolls of varied width may be clamped on the axle 32 and the adjustability of the plates 42 and 43 permits these plates to be positioned so as to receive rollers as 46, 47 and 50 of a length corresponding to the width of the web. The mounting of the rollers as 46, 47 and 50 facilitates installation and removal of these rollers which are changed each time a roll of different width is mounted on the axle 32.

The roll R is usually rather heavy but mounting thereof for rotative movement in my supporting device is facilitated inasmuch as the pawl 23 may be disengaged from the pinion 20 whereupon the shaft 11 may be rotated so as to lower the blocks, as 16, into a position such that the arms 26 and 27 are disposed below the axle 32. Then the roll R may be rolled on its periphery into position to align the axle 32 and the bifurcation 40 with the rollers 28 and 29 and 30 and 31. Then the shaft 11 may be rotated to elevate the blocks, as 16, which raises the roll R into proper position. The devices for so raising the roll R embody a substantial mechanical advantage wherefore the roll may be raised without substantial effort. When the roll R is in proper elevated position relative to the roller 56 the pawl 23 is again engaged with the teeth of the pinion 20 to lock the parts in position.

A modified form of my invention is illustrated in Figs. 1 to 9, the mechanism there shown being particularly adapted for use in a machine such as that shown in my above referred to application, Serial No. 221,841, but, of course, being susceptible of other usage.

The just referred to form of my invention includes a pair of elongated substantially L-shaped foot members as 70 which are provided at the lower end of the frame of the mechanism to provide a base, the foot members as 70 being interconnected by a tie rod 71. A sleeve 72 is disposed about the tire rod 71 that extends between upstanding portions of the members as 70 and this sleeve and tie rod serve to maintain these members in properly spaced relation.

The frame 73 comprises two uprights 74 and 75 which respectively extend upwardly from the members as 70 and side plates 76 and 77 are suitably secured at the upper ends of these uprights. These plates project forwardly and rearwardly of the uprights 74 and 75 and constitute the side frame members of the unit consisting of the web withdrawing and feeding means, sheet severing means, and the printing means associated therewith.

A support for a roll Ra of paper is so arranged that a roll may be expeditiously arranged in position to have a web Wa withdrawn therefrom. To this end a sleeve 78 is disposed about the sleeve 72 and is supported for rotating movement thereon. A pair of arms as 79 have the lower ends thereof slotted to pass about the sleeve 78, and these lower ends of these arms are welded or otherwise suitably joined to the sleeve 78. Thus the arms as 79 are supported for pivotal movement about the sleeve 72. The ends of the arms as 79 opposite those connected to the sleeve 78 are bifurcated as at 80 and as best shown in

Fig. 1 rollers 81 are mounted on each of the arms as 79 near the bottom of the bifurcations therein and in such relation that a shaft 82 passed into the bifurcations will rest on these rollers to be rotatable thereon.

The arms as 79, therefore, afford a support for a roll *Ra* mounted on the shaft 82 and to dispose such a roll in web withdrawing position a crank 83, Fig. 2, is provided, the lower end of which crank 83 is fast to the outer end of a shaft 84 journaled in the upright 75. The crank has a handle 85 at the upper end thereof in which a spring pressed plunger 86 is mounted, the spring acting on this plunger to urge it toward the side plate 77. An opening 87, Fig. 2, is provided in the side plate 77 and when the crank 83 is in its operative position the inner end of the spring pressed plunger 86 seats in the opening 87. An arm 88, Fig. 1, is fast to the inner end of the shaft 84 and one end of a link 89 is pivotally connected to the free end of the arm 88, the other end of this link 89 being pivotally connected to an arm 79 as indicated at 90. The length of the link 89 is such that when the plunger 86 is seated in the opening 87 the roll support including the arms as 79 and shaft 82 is maintained in an upper operative position, which is to say, in a position to support the roll *Ra* clear of the floor or the like on which the members as 70 rest.

When a roll *Ra* is to be introduced into the machine the plunger 86 is retracted from the opening 87 and the crank 83 is pivoted so as to lower the arms as 79. The shaft 82 will previously have been passed through the core 91 of the roll *Ra* and when the arms as 79 are in their lower position they lie well below the plane in which the shaft 82 will lie when passed through the core 91. Therefore, the roll *Ra* may be rolled up into position to align the shaft 82 with the bifurcations as 80 in the arms as 79 and when this has been done the crank 83 is grasped and pivoted to its upper position, which is to say, the position in which the plunger 86 may enter the opening 87 and in this pivotal movement the shaft 82 is caused to seat on the rollers as 81 and in the upward movement of the crank 83 the roll *Ra* is lifted clear of the floor to be supported for free rotation in the roll support when the plunger 86 is seated in the opening 87.

The core 91 of the roll *Ra* in the present instance is slidably supported on the shaft 82 and when the web *Wa* is withdrawn from the roll and passed to the web withdrawing means now to be described, the movement of the web through these devices causes the core of the roll to move axially along the shaft 82 until the roll *Ra* attains its proper aligned position with respect to the web withdrawing and feeding means. This is quite an advantageous arrangement inasmuch as it avoids the necessity of providing devices for accurately aligning the roll *Ra* with the web withdrawing means.

The web withdrawing means are carried by plates 92 and 93 with are respectively connected to the side plates 76 and 77 in such a manner as to permit adjustment of the plates 92 and 93 along the plates 76 and 77 to thereby vary the position of the web withdrawing means with respect to the web feeding means, described hereinafter, that is carried by the side plates 76 and 77. The plates 92 and 93 preferably fit close to the side edges of a web passed to the web withdrawing means, and to this end these plates are supported for adjustment transversely of the line of movement of the web, such support including a bar 94 carried by the plates 76 and 77, and the plates 92 and 93 are fast to this bar by suitable clamping means as 95.

A shaft 96 is journaled in and extends between the plates 92 and 93 near the rear ends and upper edges thereof. A worm wheel 97 is fast to the shaft 96 outwardly of the plate 92 and meshes with a worm gear 98 on the shaft of the motor 99 that is mounted on the outer face of the plate 92. Closure of circuit to the motor 99 is under control of a switch arrangement to be described presently. The pitch of the teeth on the gear 98 and the wheel 97 is such that movement can be imparted thereby only from the motor 99.

As best shown in Fig. 3, a discontinuous roller 100 is fast on the shaft 96, this roller being made discontinuous to enable the sections thereof to be adjusted along this shaft to be disposed in the positions which best effect withdrawal of a web from the roll *Ra* for the discontinuous roller 100, when in rotation, serves to withdraw a web *Wa* from such roll *Ra*. In order to insure that the frictional contact of this roller with the web will be sufficient to insure such withdrawing, which is to say, to insure that the inertia of the roll *Ra* will be overcome when the roller 100 is rotating, it is preferable to provide one or more friction surfaces on the periphery of the roller 100 and to this end rubber rings 101 may be disposed about the periphery of the discontinuous roller at suitable intervals to have contact with the web and afford the desired frictional contact between the web and the roller 100.

The rubber rings 101 insure the presence of sufficient tension on the web that it is prevented from slipping rearwardly relative to the roller 100, the pitch of the teeth on the worm gear 98 and worm wheel 97 insuring against rearward turning of the roller 100, so that once the web is advanced it does not slip rearwardly.

Aligned slots 102 and 103 are provided in the plates 92 and 93, and a shaft 104 is mounted in these slots for vertical movement therein. A plurality of discs 105 are mounted at spaced intervals along the shaft 104 to afford adjustment upon variations in the width of the web. Still another shaft 106 is journaled in the plates 92 and 93 in horizontal alignment with the shaft 96 but this shaft is mounted near the forward edge of the plates 92 and 93. This shaft carries discs 107 similar to the discs 105 on the shaft 104.

As the web is withdrawn from the roll *Ra* it is passed over the discontinuous roller 100 and under the roller afforded by the discs 105 and then over the roller afforded by the discs 107 on the shaft 106 so that the roller afforded by the discs 105 forms a loop in the web intermediate the roller 100 and the discs 107.

The web *Wa* passes from the just described web withdrawing and looping means to the web feeding means which include a shaft 108 journaled in the plates 76 and 77 and which has a pulley 109 rotatably mounted thereon outwardly of the plate 76. A belt 110, Fig. 1, is passed about the pulley 109 to a suitable source of power (not shown) which operates to constantly rotate the pulley 109. A belt tightener 111, Fig. 1, acts on a pass of the belt 110 between the pulley 109 and the source of power.

The pulley 109 is part of a clutch, such as is disclosed in my co-pending application, Serial No. 239,561, filed November 8, 1938. This clutch

also includes a fixed part 112 that is fast on the shaft 108 and a slidable part 113 which is constantly connected to the fixed part 112 and which has clutch teeth th .eon engageable with clutch teeth on the hub of the pulley 109, springs acting between the fixed part 112 and the slidable part 113 to urge the clutch teeth on the part 113 toward the clutch teeth on the hub of the pulley 109. A pin 114, Fig. 1, extends from the periphery of the part 113 and, when the clutch is disengaged, this pin is engaged with a cam surface on the plate 115. The plate 115 is pivotally mounted, as indicated at 116, and a spring 117 acts thereon to urge it toward the periphery of the part 113. A solenoid 118 is supported on the plate 76 and includes a core 119 to which a plate 120 is pivotally connected, the plate 120 including a shoulder 121 that is adapted to seat under the free end of the plate 115.

When the solenoid 118 is energized in a manner to be explained hereinafter the core 119 thereof is attracted upwardly whereupon the plate 120 moves upwardly to retract the cam surface on the plate 115 from engagement with the pin 114 whereupon the clutch teeth on the part 113 engage the clutch teeth on the hub of the pulley 109 to thereby connect the pulley 109 to the shaft 108 and thereupon the shaft 108 starts to rotate. The pin 114, soon after the shaft 108 starts to rotate with the pulley 109, pivots the plate 120 from engagement with the plate 115 whereupon the spring 117 returns this plate into engagement with the periphery of the part 113 so that near the end of the revolution initiated by energization of the solenoid 118 the pin 114 will reengage the cam surface on the plate 115 and disconnect the clutch teeth on the part 113 from the clutch teeth on the hub of the pulley 109. It will therefore be apparent that the shaft 108 makes but a single revolution each time the solenoid 118 is energized to set this shaft in rotation.

It is rotation of the shaft 108 that causes the web W*a* to be advanced past the severing means, to be described presently. The web feeding means is afforded by a segmental feeding roller 122, Fig. 5, that is fast to the shaft 108, the roller 122 being provided with a flat diametrically extending face 123 toward which a face of a clamping block 124 is disposed, the face 123 being recessed, as well as the cooperating face of the block 124, to fit about the shaft 108. Clamp bolts 125 freely pass through the block 124 and are threaded into the roller 122 and serve to clamp the roller 122 and in this way an adjustable connection of the roller to the shaft is afforded for a purpose to be made apparent presently.

Another shaft 126 is journaled in the plates 76 and 77 in vertical alignment with the shaft 108. A gear 127 is fast on the shaft 126 adjacent the side plate 77, and this gear meshes with a gear 128 fast on the shaft 108, these gears having a one-to-one ratio so that the shafts 108 and 126 will rotate synchronously. A segmental roller 129 is fast on the shaft 126 in the same manner as that in which the roller 122 is fast to the shaft 108, the roller 129 being in vertical alignment with the roller 122.

Inasmuch as the shafts 108 and 126 rotate synchronously it is possible to so adjust the rollers 122 and 129 with respect to each other that the leading edges thereof will move into cooperating relation to clamp the web therebetween during but a selected portion of the rotation of the shafts 108 and 126 for the web is advanced or fed only when the peripheries of the rollers 122 and 129 are rolling over each other with the web clamped therebetween. The length of this rolling engagement of these two rollers with the web determines the amount of web that will be fed during a single rotation of the shaft 108 and therefore determines the amount of web fed past the severing means.

Each time the shaft 108 is set in operation to feed a portion of the web past the severing means, the web is withdrawn by the rollers 122 and 129 from the loop created by the discs 105 on the shaft 104 and therefore the actual web feeding means, which is to say, the rollers 122 and 129, need not overcome the inertia of the roll R*a* and consequently the likelihood of slippage which might be attendant to direct withdrawal of the web W*a* from the roll R*a* by the feed rollers 122 and 129 is overcome, which, as will be explained, insures accurate feeding of the web beyond the severing means and accurate sizing of the sheets severed from the web. However, each time the rollers 122 and 129 act to withdraw the web from the loop formed therein by the discs 105 on the shaft 104, this loop is reduced in size. Hence, to insure that an ample supply of web will always be present in the loop, means are provided under control of the shaft 104 for setting the motor 99 in operation to effect withdrawal of the web W*a* from the roll R*a*.

In the present instance such means includes a pivotally mounted lever 130, Figs. 1 and 7, which carries a pin 131 of insulating material that bears on the blade 132 of a switch 133 and which carries a contact that is engageable with a contact on the other blade 134, of this switch. The blades 132 and 134 are suitably supported on a block 135 of insulating material mounted on the outer face of the plate 92. The contacts on the blades 132 and 134 are in circuit with the motor 99 and whenever these contacts are engaged circuit is closed to the motor to set it in operation. Whenever the motor 99 is in operation the discontinuous roller 100 acts to withdraw the web W*a* from the roll R*a*, and the web so withdrawn is fed into the loop created by the discs 105. As soon as this loop attains a predetermined size the shaft 104 disengages the cam surface on the lever 130 with which it cooperates and thereupon the pin 131 moves away from the blade 132 to disengage the contacts on the blades 132 and 134 which opens circuit to the motor 99 and thereupon withdrawal of the web W*a* from the roll R*a* is interrupted.

The severing means to which reference has been made includes a movable knife 136 and a stationary cooperating cutting member 137 on the bar 138, which bar extends between the side plates 76 and 77 forwardly of the shaft 108. It is essential that there be a shear action between the movable knife 136 and the stationary cooperating cutting member 137 and this is attained first of all by tapering the cutting edges of the knife 136 inwardly and upwardly from the outer edges thereof, as shown best in Fig. 2. Moreover, this enables the outer ends of the knife 136 to serve as a stop to maintain the knife 136 and member 137 in cooperating relation under the influence of the spring 139 that urges the knife 136 toward the member 137. The knife 136 consists of a thin strip, preferably of saw steel, and to further augment the shear action above referred to this knife 136 is secured to the concave forwardly disposed face of a bar 140 by screws 94 or the like as in Fig. 8 and the knife 136 therefore assumes the configuration of this concave face. Inas-

much as the cutting edge on the stationary cooperating cutting member 137 is straight it will be apparent that the shear action of the inclined edges of the knife 136 is augmented by the movement of the concavo-convex knife over the straight cutting edge on the member 137 and hence a neat shearing action results. This construction has several advantages for it enables the knife to be made in one piece and thereby eliminates the necessity of accurately aligning two different sections, and it also insures permanent and accurate alignment of the movable knife blade with the stationary cutting edge and avoids the necessity of making fine adjustments.

The bar 140 is connected at its ends with upstanding arms 141 and 142 which, at their lower ends, are pivotally connected to, and carried by, links 143 and 144 which have their forward ends respectively pivotally connected to the side plates 76 and 77. Arms as 145 are fast to the shaft 108 near opposite ends thereof, and these arms respectively carry rollers as 146 which, in the course of rotation of the shaft 108, engage the links 143 and 144, that are urged toward the shaft 108 by springs as 147, to pivot the inner ends of these links downwardly whereupon the movable knife 136 is moved into cooperating relation with a stationary cutting edge 137 to sever the sheet. The arms as 145 are so positioned on the shaft 108 that the rollers as 146 thereon engage the links 143 and 144 after the sheet has been fed past the knife 136 by the cooperation of the rollers 122 and 129.

It is necessary that the web be tightly clamped during the severing operation and during at least part of the time the rollers 122 and 129 are disengaged therefrom so as to prevent the web from undesirably slipping rearwardly. To this end a clamping bar 148 is provided above the member 137. This clamping bar 148 is carried by bolts as 149 that have the lower ends thereof fixedly connected to the clamping bar 148, but which bolts are freely passed through the knife bar 140. Springs, as 150, are disposed about the bolts 149 between the bars 140 and 148. During the time the web is being fed forwardly by the rollers 122 and 129 the bar 148 is in the position shown in Fig. 3, but, as will be explained presently, shortly after the rollers 122 and 129 disengage the web the rollers as 146 on the arms as 145 engage the links 143 and 144 whereupon the bar 140 starts to move downwardly and this causes the clamping bar 148 to tightly clamp the web against the member 137 during continued downward movement of the bar 140. During the severing operation the springs as 150 are compressed and exert effective force on the bar 148 to insure against rearward slippage of the web. The bar 148 remains in the aforesaid clamping engagement with the web until the rollers 122 and 129 have again clamped the web therebetween but by the time these rollers have imparted any material advancing to the web, the clamping bar will be retracted from the clamping position shown in Fig. 9 into the free position shown in Fig. 3.

Prior to the time that part of the web extended beyond the knife 136 is clamped by the bar 148, this portion of the web is clamped by a clamping finger 151, Fig. 5, which projects through an opening 152 in the bed plate 153. A guide bar 154 is provided on the upper surface of the bed plate 153 and affords one side of a guideway G through which sheets severed from a web are adapted to be passed. That part of the bar 154 that is aligned with the knife 136 serves as an abutment for the end of the web when it is fed forwardly beyond said knife. Moreover, the bar 154 is spaced from the knife 136 in the amount desired for the width of the sheet S, for a purpose to be explained presently. The clamping finger 151 is mounted adjacent the bar 154 and is carried by a bar 155 which has a pin 156 passed through an opening in the forward end thereof, said opening neatly fitting about said pin. A spring 157 between the head of the pin and the bar 155 tightly urges the bar into engagement with a cross bar 158 that extends between the side plates 76 and 77. A cam 159 is fast on the shaft 108 and the free end of the bar 155 extends beneath this cam. Subsequent to the time the end of the web engages the bar 154 a rise on the cam 159 engages the bar 155 and pivots it downwardly to thereby engage the finger 151 with that portion of the web that is extended beyond the knife 136 wherefore this portion of the web is tightly clamped against the bottom of the sheet guideway G and held against displacement from the bar 154.

It is of course advantageous to feed the web and sever the sheet rapidly and to this end the various mechanisms entering into this are timed to operate in close relation, as will now be explained, reference being made to the timing chart, Fig. 4.

At the point 160, Fig. 4, the solenoid 118 will have been energized and the clutch under control thereof will have been engaged so that the shaft 108 will at the point 160 start rotating. At this time the rollers 122 and 129 will be in clamping engagement with the web and therefore at the point 160 the web will start to feed forwardly beyond the knife 136 and this feeding movement continues until the point 161 is attained at which point the rollers 122 and 129 disengage the web. However, it will be noted that prior to the time the point 161 is attained and by the time the point 162 is attained the rise on the cam 159 will have engaged the bar 155 so that at the point 162 the finger 151 will be clamping the sheet in the manner above described.

It will be noted that the finger 151 in clamping the sheet at the point 162 does so prior to the time the rollers 122 and 129 have disengaged the web and interrupted feed thereof at the point 161 with the result that between the points 163 and 164 the feed of the web will be continued notwithstanding the clamping thereof by the finger 151. The result of this is that the web buckles because the end thereof is, by this time, engaged with the bar 154, and in each feeding operation the rollers 122 and 129 act to advance past the knife 136 more web than is required to afford a sheet of the desired width. This avoids the necessity of causing the rollers 122 and 129 in each operation thereof to feed the precise width of sheet required. Thus, when the feed of the web is interrupted at the point 161 by reason of the disengagement of the rollers 122 and 129 therefrom, the web is freed to the action of the looper afforded by the shaft 104 and the discs 105 thereon so that between the point 165 and the point 166 this looper pulls the web rearwardly and renders it taut between the discs 105 and the clamping finger 151, which finger prevents the end of the web from disengaging the bar 154. The leading edge of the web will be, therefore, engaged with the abutment afforded by the bar 154 and since this bar is

spaced from the knife 136 and the stationary cutting edge on the member 137 the precise width of the desired sheet and, further, since the web will by this time be taut, it is clear that the precise desired width of the sheet is disposed beyond the knife 136 and the cooperating stationary cutting edge.

Therefore, at this time when the desired width of sheet is disposed beyond the knife 136, this knife may and does start to move toward its cooperating stationary cutting edge and this is initiated at the point 167. Hence, the bar 140 will start to move downwardly at the point 167, and at the point 168 the bar 148 will attain the position shown in Fig. 9, which is to say, clamping engagement with the web. This occurs prior to the time the knife 136 actually starts severing the sheet so that the sheet is firmly clamped along its leading edge by the finger 151 and it is also clamped rearwardly of the knife by the bar 148 and in this way the sheet is firmly held during the severing operation which begins shortly after the sheet is so held.

Prior to the time the knife 136 has completed its severing operation and at the point 169 the rise on the cam 159 moves from cooperation with the plate 155 and, therefore, at the point 169 the clamp 151 moves from clamping association with that part of the web that is to constitute the sheet S.

By the time the point 170 is attained the severing operation of the knife 136 is completed and the sheet has been severed from the web. The shaft 108 is still rotating and at the point 171 the rollers 122 and 129 move back into engagement with the web Wa and clamp it therebetween so that since the web is now again clamped by the rollers 122 and 129 the clamping effected by the bar 148 may now be released and this occurs at the point 172. Thereafter the point 160 is re-attained so that the parts are in position to start a new cycle of operation.

Upon its severance from the web Wa at point 170, the sheet S is free to drop into a collector, in the event that no more machine operations are to be performed on it. If additional machine operations, such as printing, are to be performed on the sheet S, suitable sheet feeding means can be provided to move the sheet away from the station at which it was severed, such sheet feeding means becoming operative, say, at point 173. In this event it will be recognized that the sheet is completely severed from the web prior to the time the feeding means therefor become operative and in view of this it is of course essential that the sheet be prevented from catching on the knife 136 at the time it is to be fed forwardly, for the knife will be in its lower position at the time the sheet is fed away, and this is accomplished in the following manner.

As best shown in Figs. 1 and 5, the bed plate 153 is terminated along the line 174 in spaced relation with the knife 136 and its cooperating stationary cutting member 137. The cutting edge of the cutting member 137, as best shown in Fig. 5, lies in a horizontal plane slightly above the top plane of the bed plate 153. It will also be remembered that the knife 136 is bowed longitudinally so that the ends thereof project forwardly of the medial portion thereof. However, it is the ends of the sheet that are severed first, the medial portion being severed as the final step in the severing operation.

Now bearing in mind that it is essential that the sheet be free to the action of the sheet feeding means, to be described, it is desirable to bend the sheet away from the knife 89 and it is because of this that the bed plate 108 is terminated along the line 125 as explained above. However, when the web is fed forwardly to engage the leading edge thereof with the bar 109, most of the part of the web that is to afford the sheet is disposed upon the bed plate 108 but the rear portion thereof overhangs the termination of the bed plate 108 along the line 125. It is this portion of the sheet, when it is severed from the web, that is bent down away from the knife 89 in a manner now to be described.

A plate 175, Figs. 1, 2, 5 and 6, is connected to the knife 136 above the point where the upwardly and inwardly inclined edges of this knife merge and to this end a pin 176 is passed through a slot 177, Fig. 2, in the upper end of the plate 175, and through the knife into the bar 140, a spacing sleeve 178 being provided between the face of the knife 136 and the plate 175.

The operation of the plate 175 is as follows. In the course of downward movement of the knife 136 the lower edge of the plate 175 comes into engagement with the sheet being severed from the web, this plate so engaging the sheet prior to the time the knife 136 has attained its lowermost position. The plate comes to rest as soon as it engages the sheet but movement of the knife of course continues and during this continued movement the pin 176 moves through the slot 177. When, however, the severing of the sheet from the web is completed, no support is afforded for that portion of the sheet extending beyond the point of termination of the bed plate 153 along the line 174, and the weight of the plate 175 is then impressed on the sheet and this will be sufficient to bend the sheet down away from the knife 136 particularly in view of the fact that the cutting edge of the stationary cutting member 137 lies in a horizontal plane above the top plane of the bed plate 153. Therefore, the sheet is bent down away from the knife 136 and all portions thereof are clear of the knife prior to the time the sheet feeding means start to move the sheet away from the position which it occupies upon severance thereof from the web.

The timing of the operation is such that the sheet starts to move, say, at point 173 prior to the time the knife 136 has moved upwardly under the influence of the spring 147 sufficiently to disengage the plate 175 from the sheet. In any event, however, the leading marginal portion of the sheet will always be beyond the left-hand end of the knife as it is viewed in Fig. 2 prior to the time the plate 175 disengages the sheet. The foregoing arrangement therefore enables the sheet to be fed prior to the time the knife 136 has attained its uppermost position for it is obvious that if feeding of the sheet awaited the knife 136 attaining its uppermost position the knife at this time would be entirely out of the path of movement of the sheet and hence could not interfere with advancing thereof and in such an event the just described devices could be eliminated. To await the knife 136 attaining its upper position is undesirable, however, for so to do would slow down the operative speed of the machine.

The sheet feeding means hereinabove referred to and which is rendered effective at the point 173, as just described, includes a roller 179 on the shaft 180 of a motor 181 carried by the arm

182 that is mounted as indicated at 183 on the bed plate 153. A pin 185 on the collar 185' that is fast to the shaft 108 acts on a pad 186' on the arm 186, that is fast to the frame of the motor 181, just prior to the time the aforesaid point 173 is attained to raise the motor 181 and therefore the roller 179 which thereupon extends through the bed plate 153 and cooperates with a roller 179' to clamp the severed sheet between the rollers. Since the motor 181 is constantly rotating the roller 179, such clamping of the severed sheet causes it to be fed through the sheet guideway G to a point of use, such as a printing position or the like along the sheet guideway, the roller 179 starting to so feed such severed sheet at the aforesaid point 173 and causing the sheet to be fed in a direction that is in right angular relation with the line of alliance of the web.

The form of the invention shown in Figs. 10 to 12 is similar to that shown in Figs. 1 to 9 except that means similar to that employed in the form of the invention shown in Figs. 13 to 16 are utilized to withdraw the web from the roll in place of the motor 99 and associated parts. In view of such similarity of mechanism, the parts shown in Figs. 10 to 12 which correspond to parts already described are indicated by the same reference character except that the suffix b is added to the reference character where it appears in Figs. 10 to 12.

Heretofore reference has been made to Fig. 12 and by referring thereto it will be seen that a worm gear 187 is fast on the shaft 188 of the motor 53b and that this worm gear meshes with a worm wheel 189 fast on the shaft 55b. The pitch of the meshing teeth on the worm gear 187 and the worm wheel 189 is such that the worm wheel wedges rather than drives the worm gear and it is this that prevents the roller 56b from rotating reversely wherefore, when the motor 53b is at rest, the roller 56b acts as a brake to prevent undesired unwinding of the roll Rb.

It will be manifest from the foregoing description that I have provided an arrangement which maintains uniform tension on a web so as to insure accurate feeding thereof, this being further insured by avoiding the necessity of the web withdrawing overcoming the inertia of the roll from which the web is withdrawn. This latter is accomplished by imparting movement to the roll from which the web is withdrawn at a rate more rapid than the utilization of the web and according to my invention excessive withdrawal of the web is avoided even where the utilization of the web is intermittent.

Furthermore, my invention facilitates positioning the roll from which a web is to be withdrawn in position where the web can be withdrawn therefrom; it insures accurate feed of the web and prevents tearing or wrinkling of the web; and devices that may be used with my invention insure neat the accurate division of the web into sheets.

Thus, while I have illustrated and described selected embodiments of my invention it is to be understood that these are capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, means for imparting unwinding movement to the roll, a pair of rollers mounted in spaced apart relation and having a web passed thereover, another roller mounted intermediate said spaced apart rollers and having the web passed thereunder whereby the intermediate roller may form a loop in the web intermediate said spaced apart rollers, the last-named roller having an extension thereon, supporting means in which said rollers are mounted, and control means including a pivotally mounted arm having a cam surface thereon and normally spaced resilient contacts, said arm and said contacts being mounted on said supporting means, said contacts being positioned relative to said arm and the cam surface thereon to be urged into engagement with each other upon cooperation of said extension with said cam surface when the loop in the web is diminished in a predetermined amount to thereby set in operation the means for imparting unwinding movement to the roll whereby the magnitude of the loop formed in the web may be increased, said extension cooperating with said cam surface to enable separation of said contacts when the loop in the web attains a predetermined size.

2. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, electrically operated means swingingly mounted upon said supporting means for imparting unwinding movement to the roll, a roller looping the web and applying tension thereon as it passes to the machine, guiding means for said roller, and control means mounted on the guiding means and engageable by said roller and including a pair of contacts in circuit with said electrically operated means, said roller acting on the control means to close said contacts to set said electrically operated means in operation when the loop formed in the web by said roller is diminished in a predetermined amount, said roller also acting on the control means to effect separation of said contacts and interruption of operation of the electrically operated means when said roller forms a loop in the web of predetermined size whereby the magnitude of the loop formed in the web by said roller may be maintained within predetermined limits.

3. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine wherein operations are performed on the web, electrically operated means for imparting unwinding movement to the roll, a pair of rollers mounted in spaced apart relation and having a web passed thereover, another roller mounted intermediate said spaced apart rollers and having the web passed thereunder whereby the intermediate roller may form a loop in the web intermediate said spaced apart rollers, supporting means in which said rollers are mounted, control means mounted on said supporting means and positioned to be acted on by the intermediate roller to regulate operation of the means imparting unwinding movement to the roll whereby the magnitude of the loop formed

in the web may be maintained within predetermined limits, the control means including a rockably mounted arm having a cam surface thereon that is acted on by the intermediate roller, and a pair of normally spaced resilient contacts in circuit with said electrically operated means, the intermediate roller acting on the cam surface on said arm to move said contacts into engagement with each other when the loop formed in the web by the intermediate roller is diminished in a predetermined amount and to open said contacts when the loop formed in the web by the intermediate roller attains a predetermined size whereby the magnitude of the loop formed in the web may be maintained within predetermined limits.

4. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, electrically operated means for imparting unwinding movement to the roll, a roller for looping the web and applying tension thereon as it passes to the machine, guiding means for said roller, an arm means mounted on the guiding means and having a cam surface thereon engageable by said roller, a pair of contacts in circuit with said electrically operated means and under control of said arm and operable to interrupt operation of the means imparting unwinding movement to the roll when said roller forms a loop of predetermined size in the web and also operable to set the means for imparting unwinding movement to the web when the loop formed therein by said roller is reduced in a predetermined amount, the means for imparting unwinding movement to the web including as part of the driving means thereof a worm gear and a worm wheel, said gear and wheel having the pitch of the teeth thereof formed to prevent rearward movement of the member of the unwinding movement imparting means that engages the web so as to prevent rearward movement of the web when the means for imparting unwinding movement are at rest, and means on the member engaging the web for insuring good frictional engagement thereof with the web.

5. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, an arm pendulously mounted on the supporting means and depending therefrom and movable as a pendulum relative thereto, an electric motor mounted at the free end of said arm, and a roller carried by said arm and driven by said motor and engageable with the periphery of the roll to impart unwinding movement to the roll, said arm being of such a length that the pendulous mounting of said arm enabling said roller to remain in engagement with the periphery of the roll as the diameter of the roll decreases as the web is withdrawn therefrom and until the roll is completely used.

6. In a device of the class described, a supporting frame including a pair of spaced and vertically extending guide plates each having a guide slot formed therein, a pair of web-guiding rollers carried by said guide plates and a web-tensioning roller arranged between said guide rollers and having a projecting portion at each end thereof and said projecting portions extending into said guide slots, a member pendulously mounted upon said supporting frame and depending therefrom and adapted to move as a pendulum relative thereto, a member rotatably mounted upon the lower end portion of said pendulum member and adapted to engage a roll of paper or the like carried by said supporting frame for imparting unwinding movement thereto, means carried by said pendulum member for operating said rotatably mounted member, and means actuated by one of the said projecting portions for controlling the operation of said operating means.

7. In a device of the class described, a supporting frame including a pair of spaced and vertically extending guide plates each having a guide slot formed therein, a pair of web-guiding rollers carried by said guide plates and a web-tensioning roller arranged between said guide rollers and having a projecting portion at each end thereof and said projecting portions extending into said guide slots, a member pendulously mounted upon said supporting frame and depending therefrom and adapted to move as a pendulum relative thereto, a member rotatably mounted upon the lower end portion of said pendulum member and adapted to engage a roll of paper or the like carried by said supporting frame for imparting unwinding movement thereto, means including an electric motor carried by said pendulum member for operating said rotatably mounted member, and means actuated by one of said projecting portions for controlling the operation of said electric motor.

8. In a device of the class described, a supporting frame including a pair of spaced and vertically extending guide plates each having a guide slot formed therein, a pair of web-guiding rollers carried by said guide plates and a web-tensioning roller arranged between said guide rollers and having a projecting portion at each end thereof and said projecting portions extending into said guide slots, a member pendulously mounted upon said supporting frame and depending therefrom and adapted to move as a pendulum relative thereto, a member rotatably mounted upon the lower end portion of said pendulum member and adapted to engage a roll of paper or the like carried by said supporting frame for imparting unwinding movement thereto, means including an electric motor carried by said pendulum member for operating said rotatably mounted member, and means actuated by one of said projecting portions for controlling the operation of said electric motor, said last-named and motor controlling means including a pair of normally spaced resilient contacts in circuit with said motor, and a member pivotally mounted upon one of said guide plates and adapted to move said contacts into engagement with each other so as to close circuit to said motor.

9. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, an arm pendulously mounted on the supporting means and depending therefrom and movable as a pendulum relative thereto, an electric motor mounted at the free end of said arm, a roller carried by said arm and driven by said motor and engageable with the periphery of the roll to impart unwinding movement to the roll,

the pendulous mounting of said arm enabling said roller to remain in engagement with the periphery of the roll as the diameter of the roll decreases as the web is withdrawn therefrom, means for looping the web and applying tension thereon as it passes to the machine or the like, guiding means for the looping means, and control means mounted on the guiding means and engageable by the looping means and including a pair of normally spaced resilient contacts in circuit with said motor, the looping means acting on the control means to close said contacts to set said motor in operation to drive said roller when the loop formed in the web by the looping means is diminished in a predetermined amount, the looping means moving out of effective or circuit-closing position relative to said contacts and permitting separation of said contacts and interruption of operation of said motor when the looping means forms a loop in the web of predetermined size whereby the magnitude of the loop formed in the web by the looping means may be maintained within predetermined limits.

10. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, an arm pendulously mounted on the supporting means and depending therefrom and movable as a pendulum relative thereto, an electric motor mounted at the free end of said arm, a roller carried by said arm and driven by said motor and engageable with the periphery of the roll to impart unwinding movement to the roll, the pendulous mounting of said arm enabling said roller to remain in engagement with the periphery of the roll as the diameter of the roll decreases as the web is withdrawn therefrom, means for looping the web and applying tension thereon as it passes to the machine or the like, guiding means for the looping means, control means mounted on the guiding means and engageable by the looping means and including a pair of normally spaced resilient contacts in circuit with said motor, the looping means acting on the control means to close said contacts to set said motor in operation to drive said roller when the loop formed in the web by the looping means is diminished in a predetermined amount, the looping means moving out of effective or circuit-closing position relative to said contacts and permitting separation of said contacts and interruption of operation of said motor when the looping means forms a loop in the web of predetermined size whereby the magnitude of the loop formed in the web by the looping means may be maintained within predetermined limits, and driving means intermediate said motor and said roller operative to impart rotation to said roller from said motor and to hold said roller against rotation when said motor is at rest whereby when the motor is at rest said roller acts as a brake to prevent movement of the roll of paper.

11. In a device of the class described, means supporting a roll of paper or the like for unwinding movement whereby a web withdrawn therefrom may be supplied to a machine or the like wherein operations are performed on the web, a pair of rollers mounted in spaced apart relation and having the web passed thereover, another roller mounted intermediate said spaced apart rollers and having the web passed thereunder whereby the intermediate roller may form a loop in the web intermediate said spaced apart rollers, supporting means in which said rollers are mounted, an electric motor on said supporting means operative to drive the one of said spaced apart rollers over which the web is first passed to thereby withdraw the web from the roll into the loop formed therein, and control means including normally spaced resilient contacts mounted on said supporting means and positioned to be urged into engagement with each other by the intermediate roller to close circuit to said motor to impart unwinding movement to the roll when the loop in the roll decreases in size and adapted to separate when the loop increases in size whereby the magnitude of the loop formed in the web may be maintained within predetermined limits.

WALTER T. GOLLWITZER.