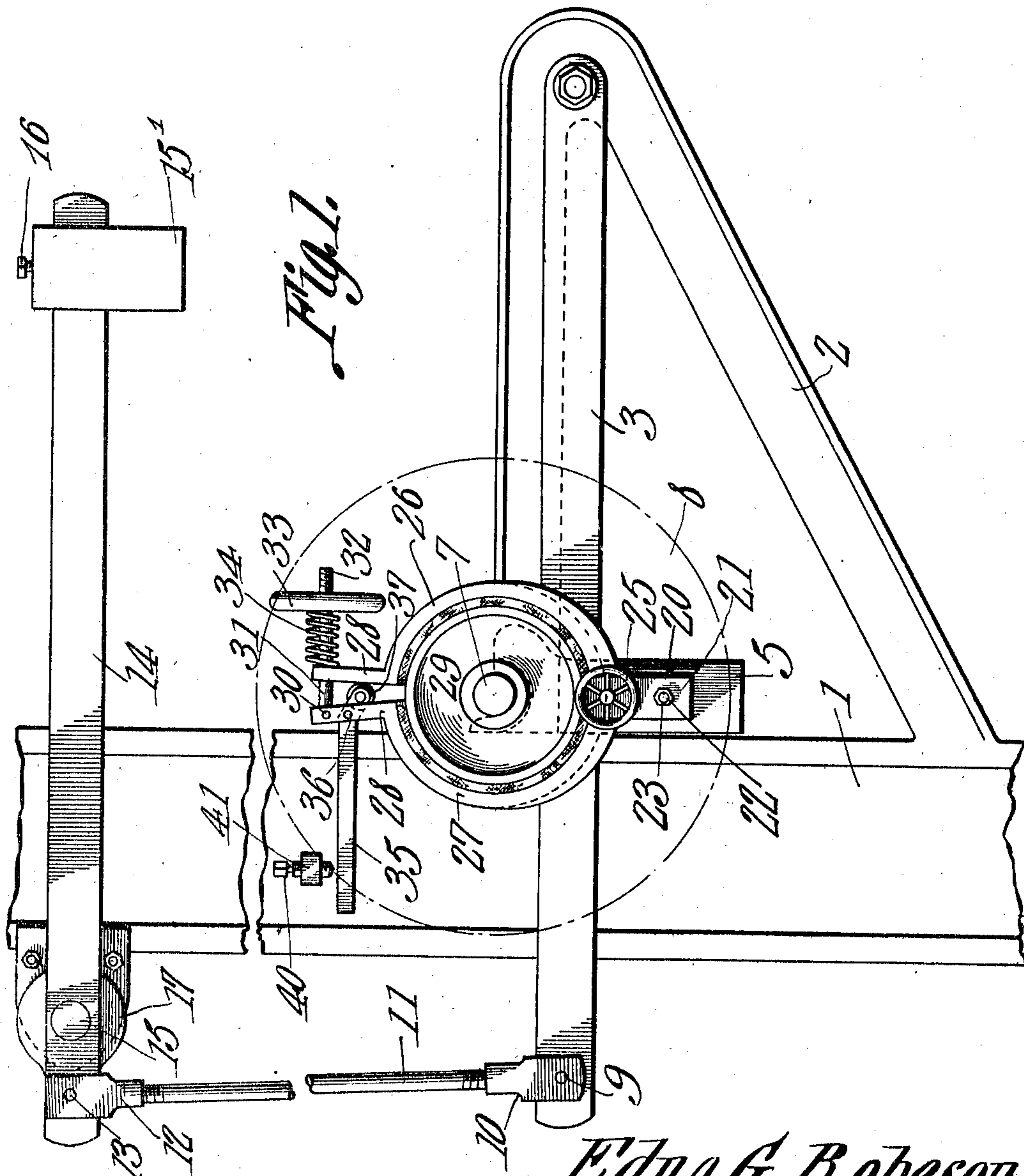


E. G. ROBESON.
TENSION MECHANISM.
APPLICATION FILED APR. 4, 1910.

993,550.

Patented May 30, 1911

2 SHEETS—SHEET 1.



Witnesses
J. R. Pomeroy
W. H. Clarke

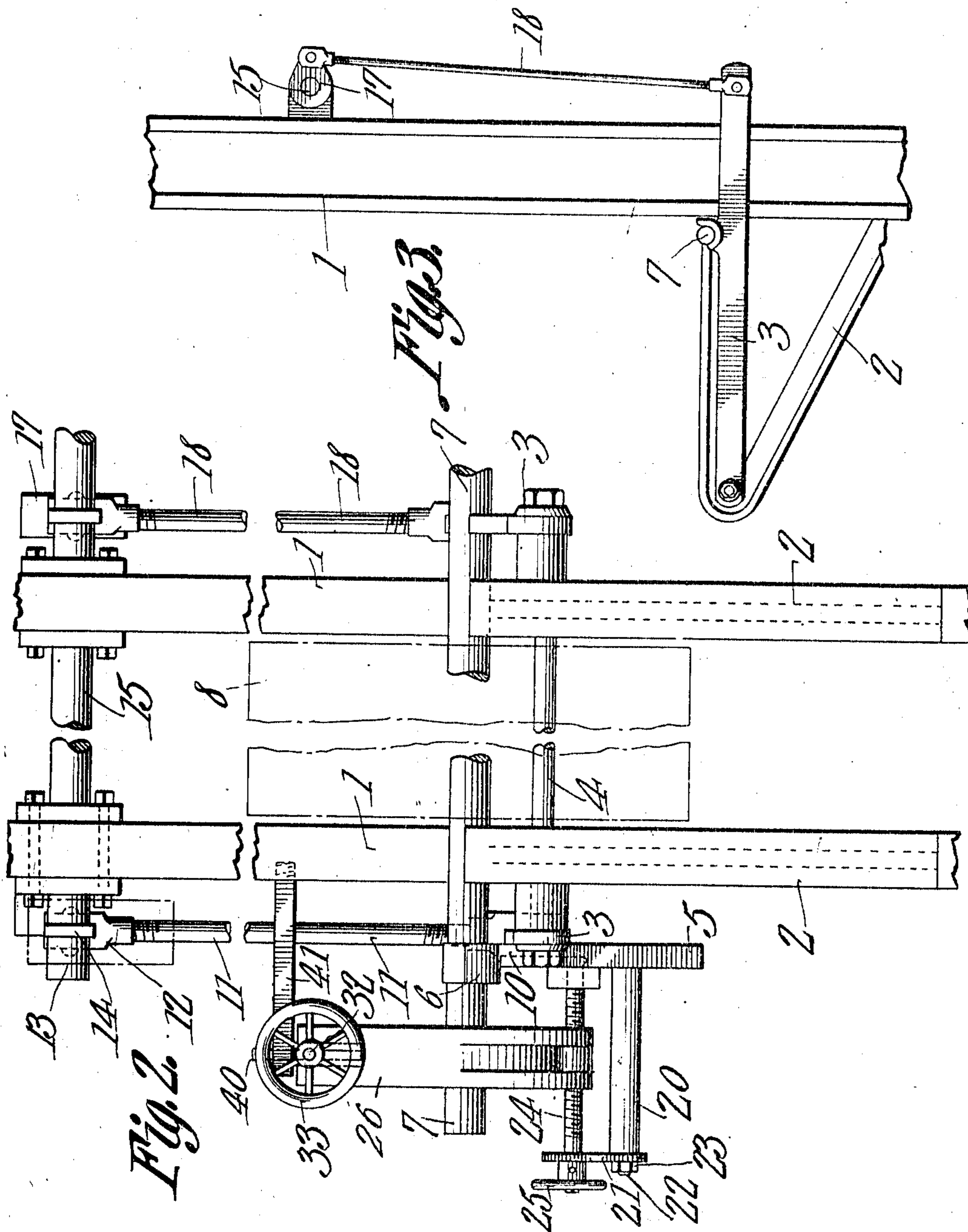
Edna G. Robeson,
Inventor
by *Cashnow & Co.*
Attorneys

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Witnesses
J. P. Miller
W. H. Clarke

Edna G. Robeson
Inventor,
by *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

EDNA G. ROBESON, OF ATLANTA, GEORGIA

TENSION MECHANISM.

993,550.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed April 4, 1910. Serial No. 553,234

To all whom it may concern:

Be it known that I, EDNA G. ROBESON, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Tension Mechanism, of which the following is a specification.

This invention relates to a form of tension mechanism which is adapted for use in handling webs of any suitable material which are wound on rolls.

The mechanism of the present invention is particularly adapted for use in tensioning rolls of paper on printing presses and the like, and it is also adapted for use in handling webs of cloth or other fabric or material.

The object of the present invention is to provide a form of tensioning mechanism, which is adapted to be used in any connection wherein a web of any kind or character of material is fed from a roll, and which is adapted to operate in a uniform manner under all the varying conditions of practice.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of the claims without departing from the spirit of the invention.

In the accompanying drawings forming part of this specification:—Figure 1 is a side elevation showing a form of tension mechanism constructed in accordance with the present invention. Fig. 2 is a view taken at a right angle to Fig. 1. Fig. 3 is a detail view.

Like reference numerals indicate corresponding parts in the different figures of the drawing.

The reference numeral 1 indicates a portion of the framework of any type of machine which is intended to be used for feeding fabric or other material from a roll.

The reference numeral 2 indicates a supporting arm which is connected with the frame work 1 and is intended, to carry the roll and the tensioning mechanism therefor. Pivotally connected with the supporting arms 2, on each side of the machine, is a lever 3. The fulcrum between the lever 3 and the supporting arm 2 is indicated by

the numeral 4. Fixed to the lever 3 in any suitable manner, intermediate its ends, is a depending member or plate 5 with the upper end of which is connected a boxing 6 into which is fitted the trunnion or shaft 7 of the roll 8 which carries the web to be placed under tension. Pivotally connected at 9 with the free end of the lever 3 is a socket member 10 into which is threaded a rod 11. The rod 11 at its upper end is threaded into a socket member 12 which is pivotally connected at 13 with a lever 14 fulcrumed at 15 upon any suitable bracket connected with the machine frame. The fulcrums 9 and 13 are so arranged as to produce as little friction as possible. The lever 14 is provided with an adjustable counter-balance or weight 15' adapted to be secured in position in any suitable manner such as by means of the set screw 16. The fulcrum or rod 15 of the lever 14, extends transversely across the machine and at its opposite end it has fixed thereon a crank arm 17 with which is connected a turn buckle arrangement 18, similar to the turn buckle arrangement consisting of the threaded rod 11 and the socket members 10 and 12. At its lower end, the turn buckle 18 is connected with the opposite lever 3 which carries the other trunnion or bearing of the roll 8 from which the web of material which is to be tensioned is being unwound. The transversely extending rod 15 and the turn buckles 18, serve to connect the opposite levers 3 properly with each other so as to equalize the action thereof. It will be apparent therefore that a single counter-balance weight 15 serves yieldingly to support both of the levers 3 and through said levers, to support both ends of the roll 8.

The tensioning means acting on the roll 1 preferably includes an arm 20 which is rigidly connected with the downward extension or plate 5 of the lever 3. Fixed in any suitable manner to the outer end of the arm 20 is an upright or standard 21 which is secured in position upon the arm 20 preferably by means of the bolt 22 and nut 23. Extending through the upper end of the standard or upright 21 and journaled at its inner end in any suitable manner in the plate 5 is a threaded rod 24 which is provided at its outer end with a hand wheel 25. It is to be understood that the threaded rod 24 is swiveled in the plate 5 and standard 21 so as to be capable of rotary but not endwise movement therein.

The reference numerals 26 and 27 indicate a pair of approximately semi-circular friction brake members, each of said members having a threaded connection at its lower end with the threaded rod 24, said members preferably being interfitted with each other as shown in Fig. 2 by forming one of said members with a pair of spaced threaded knuckles and the other of said members with a single knuckle fitted in between said spaced knuckles. At their upper ends, each of the brake members 26 and 27 is provided with an upstanding projection 28. The brake members 26 and 27 surround a band wheel 29 which is fixed in any suitable manner upon the shaft 7 of the roll 8. The pressure of the brake members 26 and 27 upon the periphery of the band wheel 29 places the proper tension upon the roll 1 so as to regulate the off-feeding of the web. Pivotaly connected at 30 with the extension 28 of the brake member 27 is a rod 31 which extends through an opening in the extension 28 of the brake member 26 and is threaded at its outer end as indicated at 32. Mounted upon the threaded portion 32 of the rod 31 is a hand wheel 33. Interposed between the hand wheel 33 and the extension 28 of the brake member 26 is a coil spring 34. The action of the coil spring 34 is to throw the two brake members 26 and 27 yieldingly together. The tension upon the roll or web of fabric is regulated by means of the hand wheel 33. In view of the fact that the tensioning devices or brakes 26 and 27 are carried by the plate 5 or lever 3 so as to always maintain the same relative position to the shaft 7 of the roll 1, it will be obvious that the question of gravity does not enter into the regulation of the friction on the band wheel 29. It is, however, intended to utilize the variations in the weight of the roll to regulate the tension of the members 26 and 27 so as to off-set the unavoidable variations in the friction between the shaft 7 of the roll and the bearing in which it is mounted. The means for accomplishing this result preferably consists of a lever 35 which is fulcrumed at 36 upon the extension 28 of the brake member 27. At its inner end the lever 35 is provided with an anti-friction roller 37 which bears against the inner face of the extension 28 of the brake member 26. At its outer or free end, the lever 35 lies in advance of, or in position to engage an adjusting screw 40 which is threaded through a stationary arm 41 connected with the machine frame in any suitable manner.

The operation of the device is as follows: The roll of material is placed in the machine in any suitable manner. If it is desired to adjust the shaft 7 of the roll longitudinally in order to bring the roll into proper position in the machine, the hand wheel 25 and threaded rod 24 are manipulated so as to

cause the brake members 26 and 27 always to register with the band wheel 29 upon the shaft 7. In this way the braking devices are laterally adjustable to permit lateral adjustment of the roll of fabric or other material. The hand wheel 33 is then adjusted so as to cause the members 26 and 27 to place the desired amount of tension upon the band wheel 29. The machine then operates to unwind the web from the roll until a sufficient amount of material has been unwound; to cause the counter-balance weight 15 to overbalance the weight of the roll, it being understood that said weight 15 has been previously adjusted, at the time the roll of material was placed in the machine to exactly counter-balance the same. As soon as the weight 15 over-balances the roll 8, said roll rises slightly and the result is that the lever 35 comes into engagement with the adjusting screw 40. The continued upward movement of the roll 8 together with the band wheel 29 and brake members 26 and 27 causes the lever 35 to be rocked upon the brake member 27, whereupon the anti-friction roller 35 is pressed in the manner of a cam against the extension 28 of the brake member 26. The result is that the two brake members are slightly separated against the tension of the spring 34. The friction upon the band wheel 29 is thus slightly decreased and the roll of fabric or other material is permitted to be fed off with greater facility.

It is found in practice that a machine equipped with the tension mechanism of the present invention operates in practically a uniform manner. One of the reasons for this is perhaps that when the roll is full and is thus large in diameter, that part of the web which is being drawn off of the roll is farther from the axis of the roll and thus acts on a greater leverage and turns the roll with greater facility than is the case when the roll is nearly empty and is thus small in diameter. It is thus found in practice that as the roll decreases, the web which is being pulled off of the periphery is acting constantly against a shorter leverage, and if the tension or friction on the roll remained uniform with the leverage constantly decreasing, the amount of power necessary to turn the roll would have to be increased. According to the present invention, as the roll decreases in diameter, so as to shorten the leverage on which the web acts, the tension of the friction devices is gradually decreased and thus the roll turns more easily as the leverage or diameter becomes smaller and uniform tension is thus secured on the web. In using the present invention, the counter-balance mechanism automatically adjusts the tension as the roll decreases in weight and thus causes a uniform action of the machine.

The device of the present invention is

strong, simple, durable and comparatively inexpensive in construction as well as thoroughly efficient and practical in use. It is adapted to be used in placing tension on webs of any kind or character of material, such as paper, cloth or any other fabric or substance.

What is claimed as new is:—

1. Tension mechanism for printing presses and the like comprising a counter-balanced roll support adapted to rise, tension devices movable with the roll support, and stationary means cooperating with the tension means on the rising movement of the roll support, for loosening the tension devices.

2. The combination of a movable counter-balance roll support, a roll carried thereby and having a band wheel, tension devices engaging the periphery of said wheel, and means operated by the movement of said roll support for controlling said tension devices.

3. The combination of a pair of levers having movable boxings, a roll carried by said boxings, means for counter-balancing said levers, a band wheel connected with said roll, tensioning devices engaging the periphery of said band wheel, and means operated by the movement of said levers for controlling said tension devices.

4. The combination of a roll, movable boxings therefor, means for counter-balancing the boxings, a band wheel carried by said boxings, tension devices engaging said band wheel, and means operated by the movement of said roll for controlling said tension devices.

5. The combination with a frame, a pair of parallel levers fulcrumed on said frame, boxings connected with said levers, a roll having journals mounted in said boxings, means for counter-balancing said levers, said levers and roll being adapted to rise under

the lightening of the roll, a pulley carried by said roll, a pair of brake members carried by one of said levers and engaging said pulley, means for yieldingly holding said brake members together, and means operated by the rising movement of said roll for separating said brake members.

6. The combination with a frame, of a pair of levers fulcrumed thereon, a pair of boxings carried by said levers, a roll journaled in said boxings, a plate connected with one of said levers and having an outwardly extending arm, an upright connected with said arm, a threaded rod swiveled in said upright, a pair of brake members connected at their lower ends with said threaded rod, a band wheel connected with said roll and being mounted between said brake members, a threaded rod connected with the upper end of one of said brake members and extending through the upper end of the other of said brake members, a hand wheel adjustably mounted on said threaded rod, a spring surrounding said threaded rod between the hand wheel and one of said brake members, a lever mounted on one of said brake members and having an anti-friction roller engaging the other of said brake members, an adjusting screw fixed in the path of said lever, a turn buckle connected with each of said first mentioned levers a transversely extending rod connected with both of said turn buckles, and a counter-weight lever connected with said transversely extending rod and having an adjustable counter-weight thereon.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDNA G. ROBESON.

Witnesses:

GRACE ROBERTSON,
WM. N. DU-VAL.