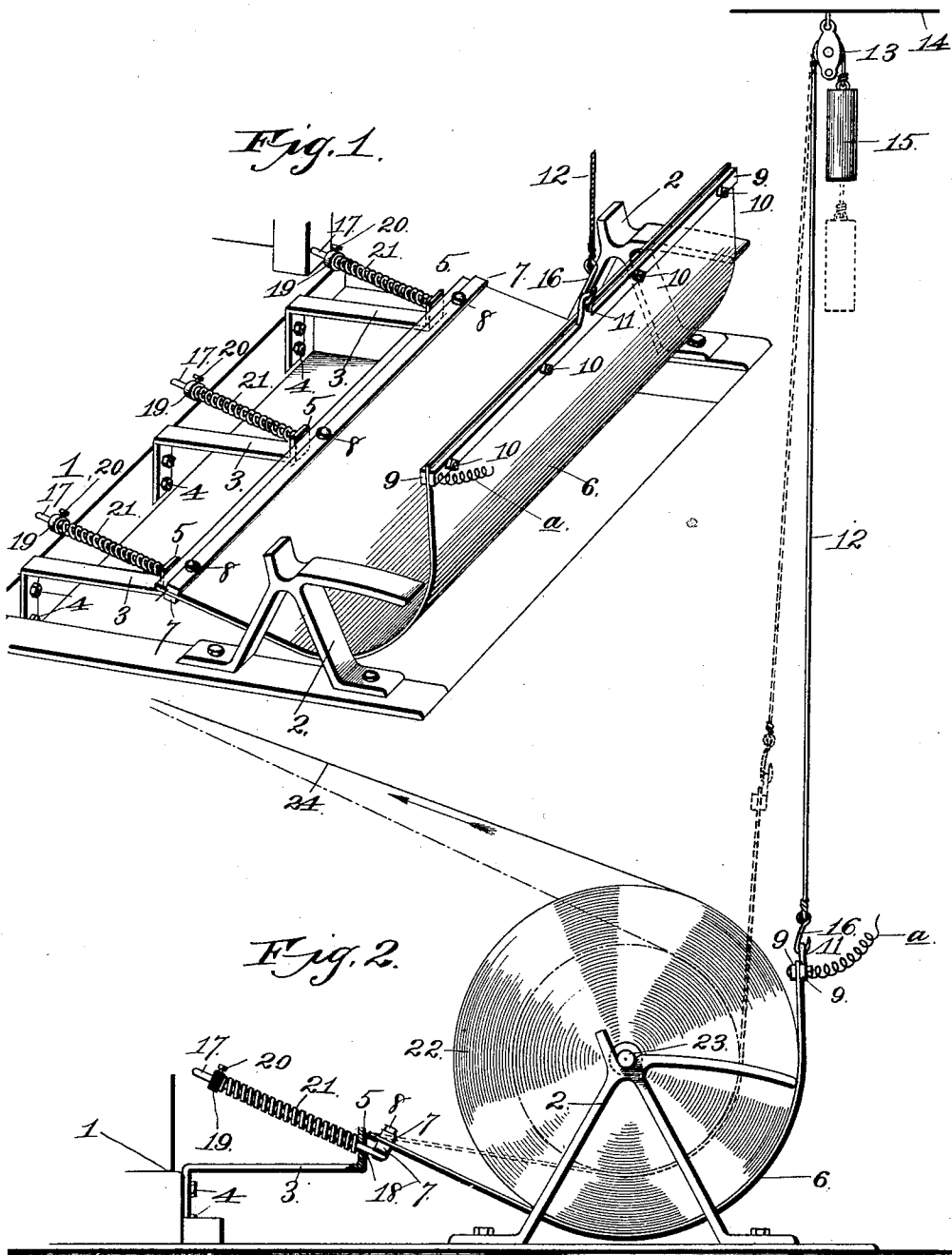


(No Model.)

W. BLACK.
TENSION DEVICE FOR PAPER ROLLS.

No. 520,874.

Patented June 5, 1894.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM BLACK, OF KANSAS CITY, MISSOURI.

TENSION DEVICE FOR PAPER-ROLLS.

SPECIFICATION forming part of Letters Patent No. 520,874, dated June 5, 1894.

Application filed December 29, 1893. Serial No. 495,151. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BLACK, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Self-Adjusting Tension Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in tension devices, and more particularly to that class of tension devices used to regulate the speed of revolution of paper-rolls, and the primary object of my invention is to produce a device of this character which will automatically lessen the frictional contact or resistance, proportionately to the diminishing size of the roll.

A further object of the invention is to produce a self-adjustable tension device, which will yield to any irregularities in the surface of the roll, so as not to tear the same, as the rolls are sometimes diametrically larger at some points, than at others; and which is simple, durable, and inexpensive of construction.

With these objects in view, my invention consists in certain novel and peculiar features of construction and combination of parts as will be hereinafter described and explained.

In order that my invention may be fully understood I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a tension device constructed in accordance with my invention, and showing it attached to one end of a printing-press. Fig. 2 is a side elevation of the same, and showing it applied in operative position to a paper roll.

When a roll is first mounted in position, being large and heavy, the momentum it acquires in rotation, (on the principle of a balance-wheel) is considerable, and therefore said rotation must be resisted sufficiently to always keep taut, the web leading from the roll to the printing-press. Previous to my invention, in feeding paper from the roll to the printing-press, attention was required of an operator, every few minutes, to lessen the resistance to the revolution of the continuously diminishing roll; the momentum of the roll being gradually diminished in a proportion-

ate degree. To obviate the necessity of an attendant for this purpose, my invention is ordained, and the construction is such that it will automatically diminish the frictional contact between the tension device and the diminishing roll in a proportionate degree, and thereby hold the web taut, leading from the roll to the printing-press at all times.

Referring to the drawings, 1 designates the bed-plate of a printing-press.

2 designates the oppositely disposed bearing-brackets which support the roll in operative position.

3 designates a number of supporting brackets, which are secured by bolts, 4, to the bed-plate, at one end of the printing-press. These brackets, 3, project longitudinally outward from the bed-plate, and are provided at their outer ends with the upwardly projecting arms, 5.

6 designates a flexible sheet of metal, either zinc, copper or any other suitable material, and this flexible sheet or plate, 6, is arranged transversely of the printing-press, and between the supporting brackets, 2. The margin of this plate, 6, adjacent to the printing-press, is strengthened by the metallic strips, 7; these strips, being arranged, one at the upper and the other at the lower side of said plate, and secured permanently in said position by bolts, 8. The opposite margin of the flexible plate, 6, is strengthened by the metallic strips, 9, and these strips, being arranged against opposite sides of the plate, are secured in such position, by the bolts, 10. One of these strips, 9, is provided about midway its length, with an upwardly projecting eye or loop, 11.

A cable, 12, preferably of wire, is guided over a pulley, 13, suspended from the ceiling, 14, or any other position at a suitable elevation above the roll, and this cable carries a weight, 15, at one end, and a hook, 16, at its opposite end which engages with the eye or loop, 11, of the strip, 9. Rods, 17, corresponding in number to the supporting brackets, 3, pass through holes or apertures, 18, in the upwardly projecting arms, 5, of the brackets, 3, and are secured to the strip, 7, at the lower side of the flexible plate, 6. A collar, 19, is mounted adjustably upon each rod, 17, by means of the set-screws, 20, and spirally en-

circling each rod, 17, and bearing at its opposite ends against the collar, 19, and the upwardly projecting arm, 5, is a spring, 21. By this construction it will be seen that the tendency of the springs, 21, is to draw and hold the flexible plate, 6, toward the printing-press. The roll, 22, has its spindles, 23, mounted revolvably in the supporting brackets, 2, and the web 24, from the roll, leads and is operatively connected to the printing-press in the usual manner. By mounting the roll in operative position, the flexible plate, 6, is caused by the weight, 15, to bear against and conform to the curved surface of the roll for about one-third of its entire area and is held yieldingly in that position by the springs, 21.

When the printing-press is put in operation, and draws the paper from the roll in the direction of the arrow, Fig. 2, and thereby gradually diminishes diametrically the size of the roll, it will be seen that the weight 15, by gravity descends, so as to always hold the flexible plate, 6, in frictional contact with the surface of the roll, and it will be further apparent that as the roll diminishes in size, the frictional contact of the plate, 6, with the roll, will be reduced in a proportionate degree, as shown by dotted lines, Fig. 2. It will be seen furthermore, that should the roll be diametrically larger at some points, than at others, the spring or springs, 21, opposite the point or points, will yield sufficiently to such irregularities in the surface of the roll, that the same will not be torn.

It has been difficult to turn out good work with large printing-presses, such for instance, as print sixteen to twenty-four pages at a time, owing to the great amount of electricity in the paper, when used perfectly dry, but this difficulty has been removed in the use of my invention, by employing a wire α which leads from the flexible plate, 6, to a gas-pipe, (not shown) or to any other suitable conductor leading to the ground. By this method, the electricity, generated by the frictional contact between the flexible plate, 6, and the rotating roll, and also the inherent electricity extracted thus, from said paper, is conducted away from the flexible plate, 6, by said wire,

which forms a part of an electrical circuit. The amount of electricity thus extracted from the paper, is not of course of sufficient voltage to be of any practical use, but by conducting it away from the plate, 6, the printing operation can be much more successfully accomplished. If desirable, the wire, α may be connected to the metallic block carrying the pulley, 13, and thence lead to the ground, so as to be entirely out of the way of the printing-press attendants.

From the above description it will be seen that I have produced a tension device to regulate the speed of revolution of paper rolls automatically, and which is simple, strong, durable and inexpensive of construction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a self-adjustable tension device, the combination with a number of supporting brackets carried by a paper-employing machine, and a number of spring-retracted rods carried by said brackets, of a weight, a cable suitably guided and attached to said weight, and a flexible plate secured at its opposite ends to the spring-retracted rods, and the cable, substantially as set forth.

2. In a self-adjustable tension device, the combination with supporting brackets secured to a printing-press, and a suitably guided cable, having a weight at one end, of a flexible plate bearing against a paper roll, and connected to the opposite end of said cable, a series of rods passing through and supported by said supporting brackets, and connected to the adjacent end of the flexible plate, collars mounted adjustably upon said rods, the springs spirally encircling said rods and bearing at their opposite ends against the said collars and the said supporting brackets, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM BLACK.

Witnesses:

E. L. STEPHENSON,
G. Y. THORPE.