

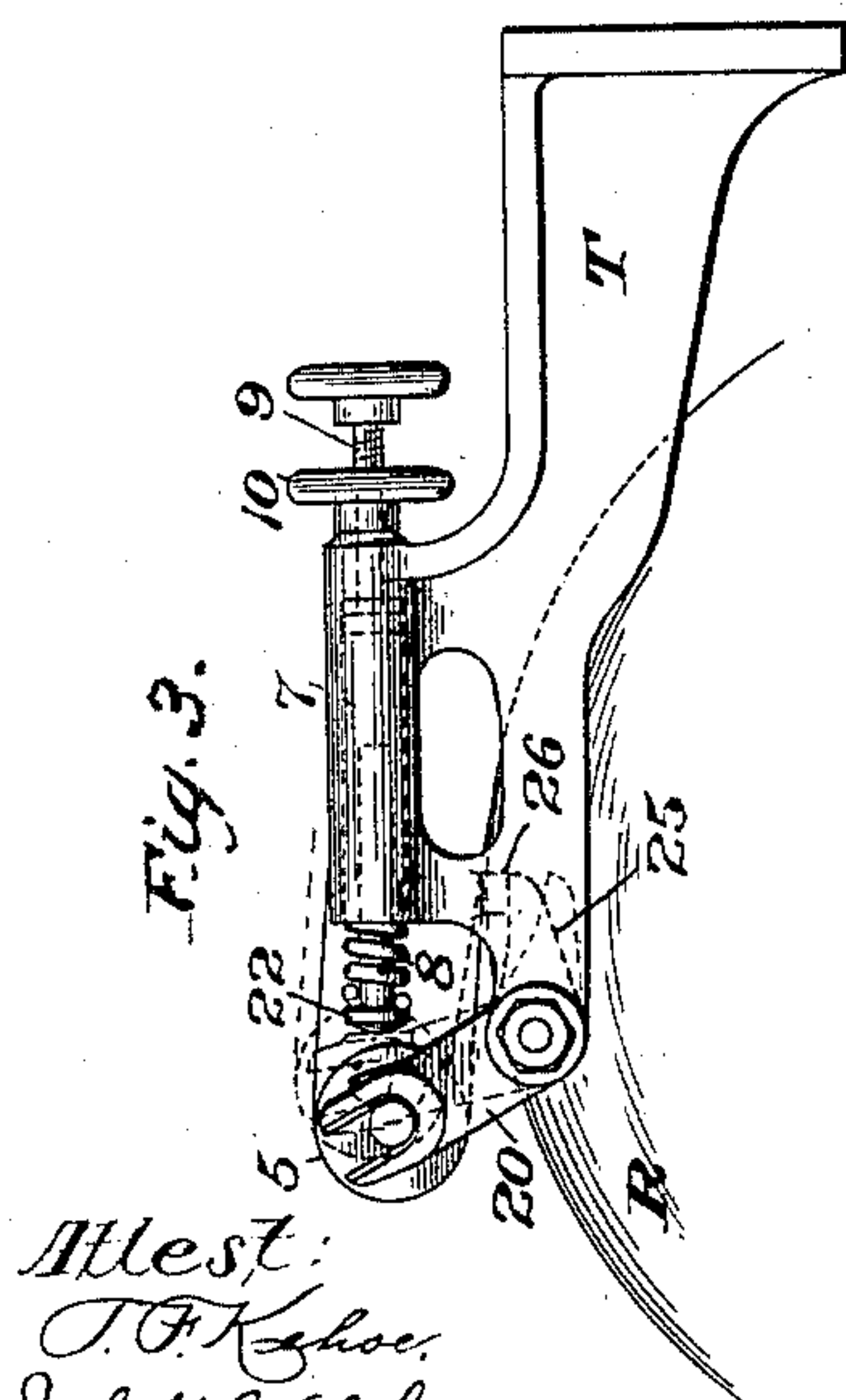
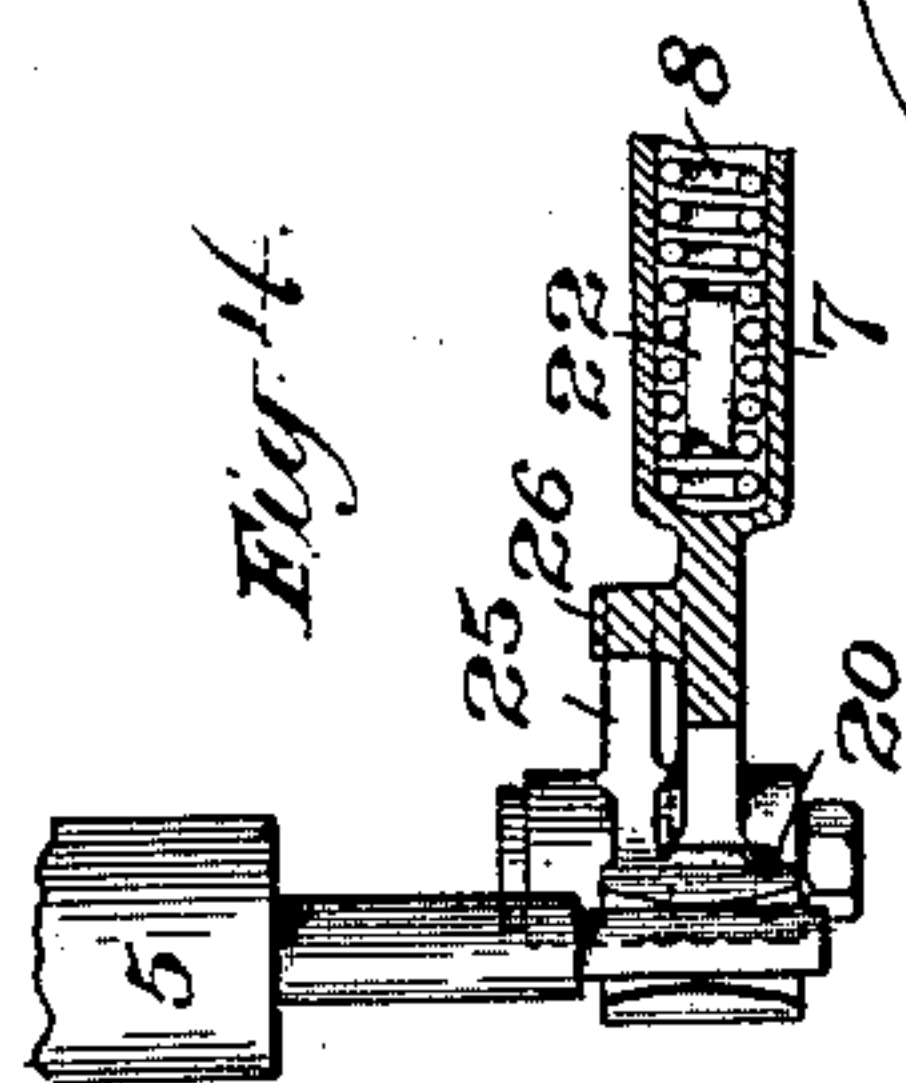
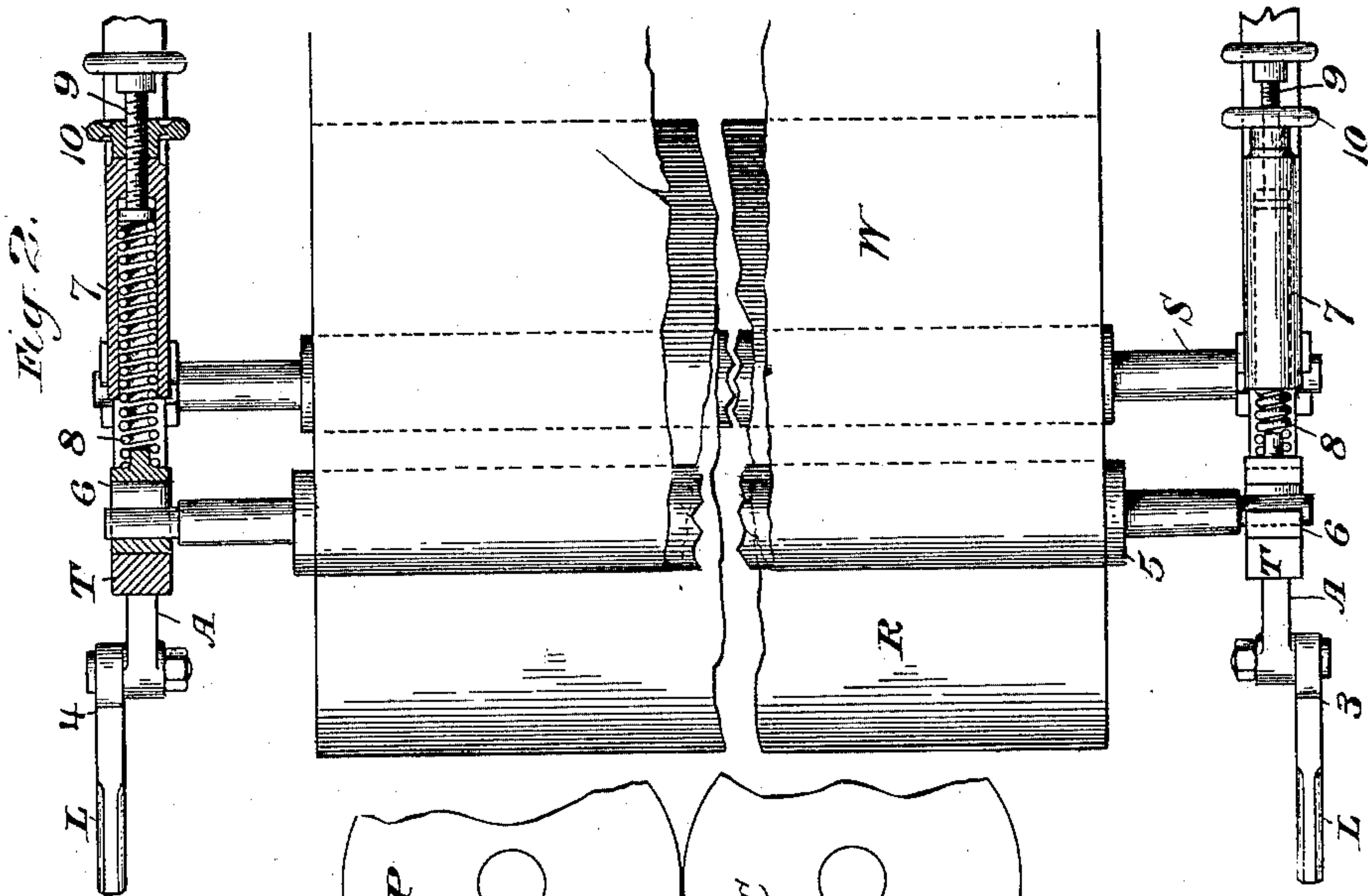
No. 612,958.

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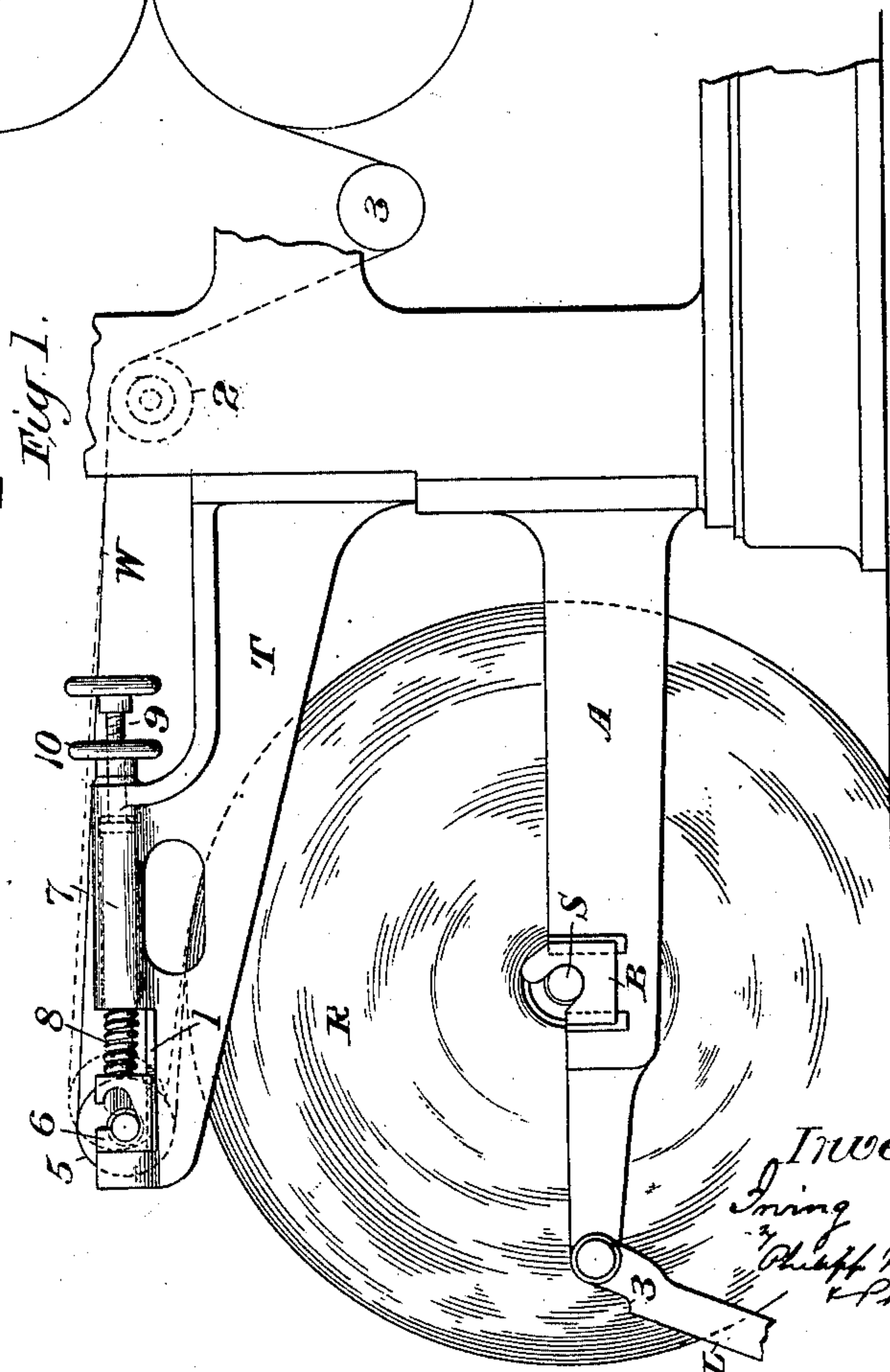
I. STONE.
WEB TENSION DEVICE.

(Application filed Jan. 4, 1897.)

(No Model.)



Attest:
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UNITED STATES PATENT OFFICE.

IRVING STONE, OF CHICAGO, ILLINOIS, ASSIGNOR TO ROBERT HOE,
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WEB TENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 612,958, dated October 25, 1898.

Application filed January 4, 1897. Serial No. 617,896. (No model.)

To all whom it may concern:

Be it known that I, IRVING STONE, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Web Tension Devices, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 The primary object of this invention is to cause a web of paper to be drawn from a roll and enter into the machine which is to operate upon it with an evenly-maintained tension; and it consists in providing the same
15 with a tension device of novel construction and operation, too fully hereinafter described and claimed to need further preliminary explanation.

20 In the present state of the art the custom is to use rolls of paper as they come from the mill—that is to say, they are not rewound. These rolls are frequently wound so as not to be uniform and being of great weight are during shipment, transit, delivery, and handling more or less damaged, so that their
25 circular formation is destroyed by dents and flattened portions, whereby the tension on the web as it is drawn from the roll for use varies and at times to a great extent, due to
30 the sudden changing of the length of web stretched between its roll and the tension-roller, which irregular variation has to be compensated for in order to preserve an even tension.

35 In the example shown of an embodiment of this invention it is illustrated as applied in connection with a rotary printing-machine; but, as will appear from the following detailed description of it and its operation in
40 connection with a rolled web that is printed upon, it is equally applicable to other machines operating upon a web led thereto from a roll and wherein the best results will be produced when the web is subjected to uniform tension.

45 The drawings illustrate in Figure 1 the web-receiving end of a rotary printing-machine supplied with this invention. Fig. 2 is a plan view of a portion of the same. Fig.
50 3 is a side elevation of a modification; and

Fig. 4 is a plan view thereof, partly in horizontal section.

Referring to Fig. 1, which shows a part of the receiving or web-entering end of a rotary printing-machine, it will be seen that the
55 web W of paper is led from a roll R thereof and passes over a tension-roller 5, guide-rolls 2 3, and enters between the cylinders P C, which represent form and impression cylinders that constitute the first printing couple.
60 The shaft S of this roll R turns in suitable bearings B, carried by arms A, projecting from the frame, and may have friction devices applied thereto to exert tension upon the
65 roll-shaft, as is common. These arms A are shown to be provided with pivoted levers L, that may be turned downward to form inclined ways, over which the rolled web of paper may be lifted from the floor by rolling its shaft over
70 these ways until said shaft reaches and rests in the depressed seats 3 and 4, when said levers L may be raised to lift the rolled web and carry its shaft onto the arms A, so that it may then be rolled into its place in the bearings B.
75 At a point sufficiently high to support the same above a rolled web of paper of ordinary size other arms T project from the frame and support the tension-controlling device for the unrolling web. This tension device consists
80 of a roller 5, mounted to turn in bearing-boxes 6, so supported by the arms T that they may slide in guideways 1, provided for them; but these boxes 6 have their inward movement obstructed and the degree of resistance thereto determined by springs 8, that are carried
85 in hollow guides 7, supported by said arms T, the force of which spring is fixed by means of an adjusting screw-rod 9, that turns in a threaded hole at the rear end of said hollow guide. The springs bear at their forward
90 ends against the rear sides of the boxes 6 and are seated against the inner ends of said adjusting-screws, which latter are provided with jam-nuts 10 to secure their positions of adjustment. The ends of the shaft of this
95 roller 5 turn in boxes or bearings 6, that have inclined seats therefor, the arrangement being such that when roller 5 simply revolves in its normal position (shown in Fig. 1) its relation to the rolled web is such as to exert a
100

minimum and slight resistance to its onward passage; but when the draft upon the web is such as to move this roller 5 up over the inclined seats in said boxes or bearings for its shaft (see dotted lines, Fig. 1) the weight of the roller will be applied to the web so as to exert a resistance to its onward passage or exert tension upon the web sufficiently to compensate for the slight variations found in ordinary rolled webs and produce a working strain upon the web as it is drawn therefrom into the printing-machine; but when the web has not been wound uniformly or its circular form has been disturbed by jamming it or in any other manner it presents irregularities which result as the web pays off in suddenly greatly decreasing and then increasing the length of web extending from its roll R to the roller 5, which variation the said roller may not compensate for through its weight thus applied to the web. To provide for these sudden and considerable variations, the tension-roller 5 is acted upon by the springs 8 to oppose the movement of its carrying-boxes in one direction and accomplish it in the other, so that while the usual run of the web under ordinary tension may regularly go on, applied by the roller 5 moving bodily unaffected by said springs, any excessive variation in the roll of web and the consequent change in the draft or tension of the web may be quickly provided for and an even tension be maintained.

When the roller 5 is moved by the shortening of the web length so as to compensate for slight variation in the run of the web, as in Figs. 1 and 2, its shaft is drawn up the inclined plane which each of its journal-bearings affords, and said roller is consequently lifted thereby above the plane wherein it imposes no weight upon the web to one in which its own weight presses thereon, and its movement is such as not only to conform to the shortened path of the web, but to maintain the tension thereon as said roller rises from its normal position, when the condition of the roll shortens the path of the web and returns to said normal position as the condition of the roll lengthens the path of the web. In the modified structure shown in Figs. 3 and 4 this roller 5 has the journals of its shaft turning in journal-bearings that are in the ends of swinging arms 20, which are pivoted to the arms T. The pivoting-studs of these arms 20 carry a rock-arm 25, that bears upon stops 26, projecting laterally from the arms T, whereby said arms 20 are held to support the roller 5 in a normal position, wherein it is so related to the passage thereto of the web that the weight of the roller will not normally be applied to the web, and the springs 8, housed and adjusted as before explained, carry buffers 22, which stand in a position normally that admits of a swinging movement of the arms 20, (see dotted lines, Fig. 3,)

which will apply the weight of the roller 5 to the web, and thus exert tension thereon, as before, for the compensation ordinarily required. When, however, the pathway of the web from the roll R to said roller 5 is greatly shortened by defects in the shape of the said roll R, the running web will not only act to draw said roll out of its normal plane and lift the same into another, which will cause the roll-carrying arms to leave their supporting-stops 26, but carry the bearings or boxes of the roller 5 into contact with the buffers 22 and apply the pressure of the springs 8 to the roller 5 in manner as before explained, thus enabling the roller 5 to adjust itself to the changed pathway while maintaining a resistance upon said web that will return the roller 5 to its normal position as the pathway of the web increases to admit of the movement. By these structures it will be observed that each end of the tension-roller 5 is practically independently adjustable, and consequently that said roller may assume angular positions which will apply even tension to the web when only one end of the rolled web is out of rotundity, and hence that this structure practically so operates in connection with the modern or mill-rolled webs of paper as to compensate for their defective condition and enable the web to be drawn into a machine operating upon it with a substantially evenly maintained tension or strain and yet avoid frequent breaking of the web, which results by the application to it of an uneven strain.

What is claimed is—

1. A tension device for running webs, consisting of a roller over which the web runs normally supported so as to apply no weight to the web and mounted to permit said roller to be moved in its bearings by the web from its normal position to apply its weight to the web, substantially as described. 100
2. A tension device for running webs, consisting of a roller over which the web runs normally supported so as to apply no weight to the web and mounted to permit said roller to be moved in its bearings by the web from its normal position to apply its weight to the web, and means for applying to said roller spring-pressure acting to increase the tension on the web independently of the weight of the roller, substantially as described. 105
3. A tension device for running webs consisting of a roller over which the web passes and bearings for the shaft of said roller having inclined seats for the shaft, in which seats the shaft is movable by the web to apply the weight of the roller to the web, substantially as described. 110
4. In a tension device for running webs, the combination with a movable tension-roller, of spring-seated sliding bearings having inclined seats for the roller-shaft, substantially as described. 115
5. A tension device for running webs con- 120

sisting of a roller over which the web runs having means for applying tension to the web through its own weight independently of its bearings and by spring-pressure against its bearings, substantially as described.

5 6. A web tension device for running webs consisting of a roller over which the web runs mounted to move against spring-pressure, and means permitting said roller to be lifted by the web independently of the spring-pressure to apply tension to the web by the weight of the roller, substantially as described.

15 7. In a tension device for running webs, the combination with the tension-roller 5, of sliding bearings 6 having inclined seats for the opposite ends of the roller-shaft, springs against which the bearings are movable after the roller has been moved up the inclined seats, whereby the web is normally not under tension by the springs and means for con-

trolling the tension of the springs, substantially as described.

8. In a tension device for running webs, the combination with the tension-roller, of movable bearings for the opposite ends of the roller-shaft arranged to permit the roller to be lifted by the web for applying tension to the web by the weight of the roller, springs against which said bearings are movable after the roller has been lifted, the springs being arranged so that the web is not under tension of the springs until the roller has been lifted, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

IRVING STONE.

Witnesses:

FRED CROWTHE,
THOS. R. CONE.