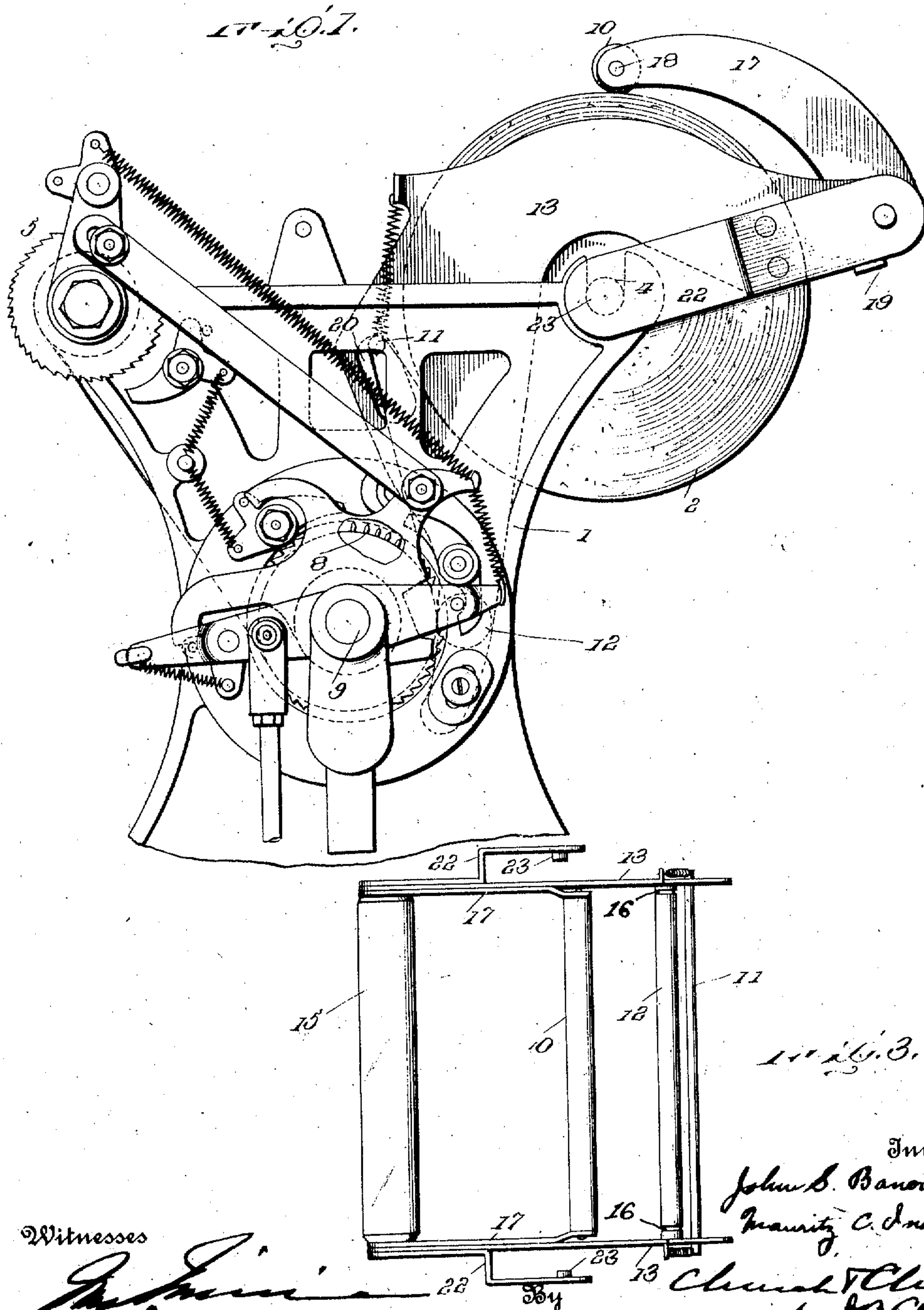


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 WEB GRINDING ATTACHMENT FOR PERFORATING MACHINES.  
 APPLICATION FILED OCT. 21, 1910.

989,555.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.



Witnesses

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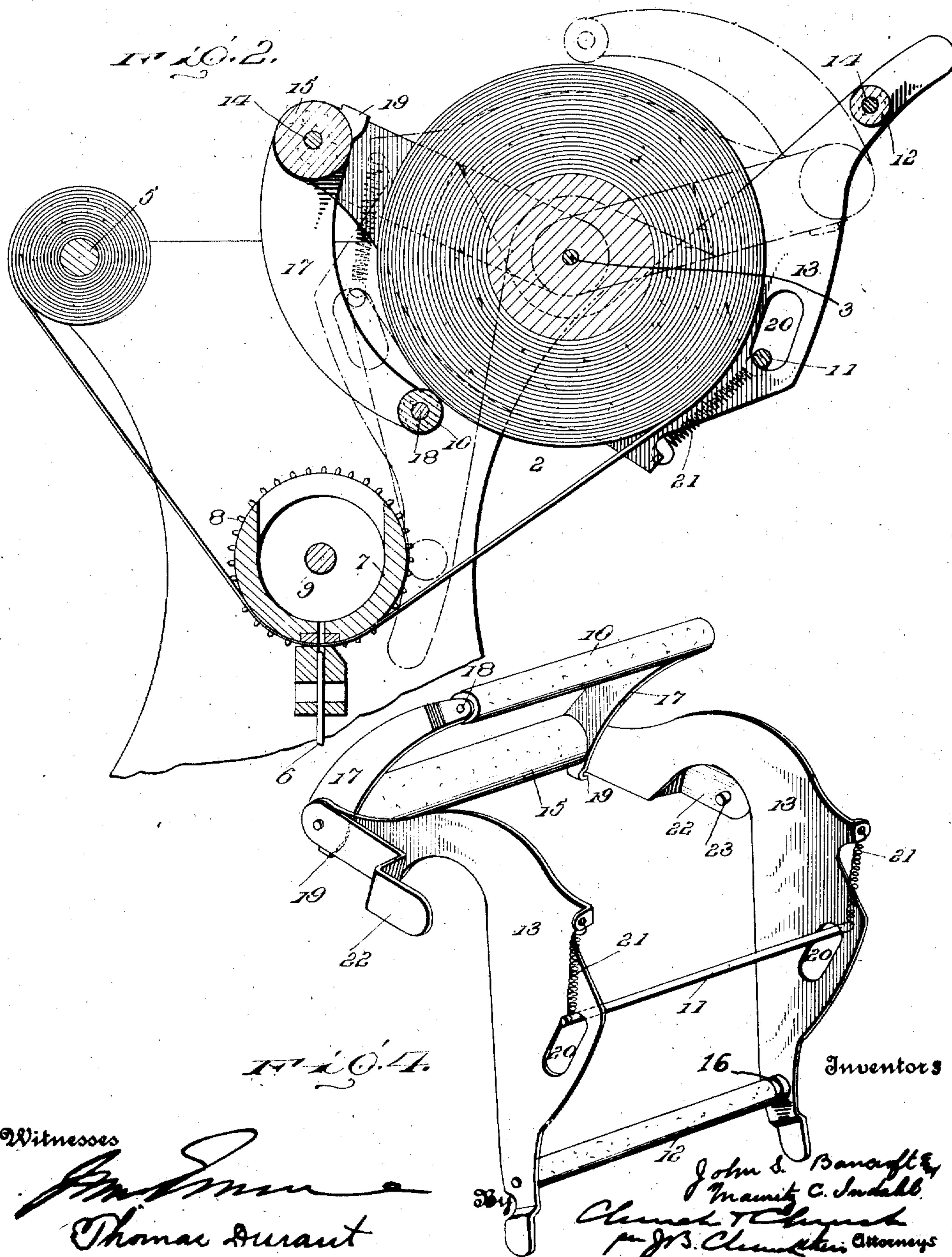
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# UNITED STATES PATENT OFFICE.

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## WEB-GUIDING ATTACHMENT FOR PERFORATING-MACHINES.

989,555.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed October 21, 1910. Serial No. 588,330.

*To all whom it may concern:*

Be it known that we, JOHN SELLERS BANCROFT and MAURITZ C. INDAHL, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Web-Guiding Attachments for Perforating-Machines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to means for guiding and controlling the delivery of a flexible web or strip to feeding devices and is specially designed for use in connection with pattern composing machines of the class illustrated in Patent No. 944,405, dated December 28, 1909, wherein the feeding mechanism is provided with pin wheels registering with and engaging two parallel longitudinally extending series of feed perforations in the web, said pin wheels being located within a bight of the web intermediate the supply roll and rewinding spool.

In order to more accurately position successive sections of the web in relation to the punches, the pin wheels are located at opposite extremes of the series of punches and the feed perforations are arranged at short intervals in the length of the web. The perforations weaken the web to such an extent that rupture of the material is liable to occur from either of two causes, *i. e.*, excessive tension on the delivery side, or excessive pressure by the pin wheels in overcoming the inertia of the supply roll at the beginning of the feed movement. This defect or deficiency is at times accentuated by changes in the hygrometric conditions of the atmosphere whereby opposite edges of the web are lengthened or shortened unequally, with the result that the pressure exerted by the tensioning devices or of the pin wheels is directed mainly, if not exclusively, upon the shorter edge of the web.

The principal object of the present invention is to remedy this action and at the same time furnish guiding and controlling devices which can readily be applied to existing structures and, when so applied, can be manipulated so as not to interfere with

the ready insertion of the supply roll and the threading up of the web.

With these ends in view, the invention consists in the construction, combination, and arrangement of parts, hereinafter fully described, the novel features whereof are specified in the appended claims.

In the annexed drawings illustrating a preferred form of embodiment—Figure 1 is a side elevation of a portion of the paper tower and strip feeding mechanism of a pattern composing machine with the improved web-guide applied thereto. Fig. 2 is a transverse vertical section through the punching devices and web guiding attachment, the latter shown in full lines in threading up position and in dotted lines in operating position. Fig. 3 is a top plan view of the web guiding devices; Fig. 4 is a perspective view of the attachment.

Corresponding numerals designate like parts in the several figures.

The perforating composing machine with which the improvements are shown associated is that of Patent No. 944,405, whereof 1 designates the side pieces or housings of the paper tower, so called; 2 the supply roll with its spindle 3 resting in open bearings 4 of the housings; 5 the winding spool to which the end of the strip is attached; 6 the punches; 7 the die-cylinder; 8 the pin-wheels of the feed mechanism, one at each end of the die-cylinder and concentric therewith; and 9 the pin-wheel shaft.

It will suffice for present purposes to remark that the strip usually employed is of paper, wound into roll form, and provided with two longitudinal series of uniformly spaced feed perforations for engaging the pins of the pin-wheels and, further, that the punches, pin-wheel shaft and winding spool are provided with appropriate actuating devices (see Patent No. 944,405) whereby immediately at the conclusion of each punching operation the pin-wheels are moved to advance the strip a distance equal to the interval between successive signals, and the winding spool is rotated to take up the slack and maintain the strip under tension on the delivery side of the pin-wheels.

Heretofore it has been the practice to conduct the web directly from the supply roll to the pin wheels, but as the feeding motions of the latter, although of limited extent are



positively performed and at a high rate of speed, it follows that the pressure exerted by the pins upon the web in overcoming the resistance of the supply roll is very considerable and sufficient at times to produce rupture or mutilation of the web more especially in the vicinity of the feed perforations where it is weakest. Moreover, should the supply roll overrun as the result of the feed movement communicated to it, or the pressure of the tensioning devices on the delivery side of the pin wheels be unduly large, the same tendency to rupture would exist unless a sufficient number of pins were engaged at the time. Still another contributing element in effecting mutilation of the web at or by the feeding devices is the unequal expansion of the web resulting from variations in atmospheric conditions. When this occurs the pressure of the feeding devices will be unequally distributed between opposite rows of feed perforations. It is desirable, therefore, not only that the pressure exerted by the pin wheels or other feeding devices should be applied on as large a portion of the web as possible but also that means should be provided for maintaining such condition and for relieving the strain thrown upon the web in starting the supply roll in motion in response to the action of the pin-wheels.

The purpose of the present invention is to overcome the defects and supply the deficiencies indicated above, and, in addition thereto, to supply a self-contained attachment competent for the purpose and which can be applied to existing machines without changing the latter or in any way interfering with the insertion or threading up of the strip.

The added elements more directly cooperating with the feeding mechanism are a gravitating brake member or bar 10 engaging the periphery of the supply roll to retard its motion; a compensating take-up or tensioning member 11 located within a bight of the strip and operating both to cushion the starting pull on the strip and to tension opposite edges thereof; and a combined guiding and frictional clamping member 12 engaging the strip at a point intermediate the compensating take-up and pin wheels and operating to maintain a uniform degree of contact between the strip and the feeding pin-wheels. In the preferred form of embodiment illustrated these operating members are mounted upon or incorporated into a self-contained detachable fixture comprising a frame or housing formed by two substantially L-shaped side pieces or plates 13 preferably cut or struck from sheet metal, between which are rigidly secured (as by headed through bolts 14) two bars or cross-pieces, of which one, 15, located near the outer ends of one branch of the frame serves

as a counterweight, while the other, 12, constituting the clamping member referred to is located near the outer end of the opposite branch and provided with grooves or depressions 16 registering with the pin-wheels. Opposite extremities of bar 15 are reduced to form bearings for the reception of arms 17 between the outer ends of which is fastened, as by a headed through bolt 18, a cylindrical bar 10 serving as the braking member for the supply spool. The inner end of one or both arms 17 is provided with a stop 19 engaging the frame to limit the outward movement of the braking member.

The tensioning member, in the form of rod 11, extends through openings 20 in the side pieces and is suspended at each end upon one of two springs 21, whose opposite ends are secured to ears on the frame. Side pieces 13 are spaced to freely enter between housings 1 of the paper tower, and each is dimensioned to enter and be received between the end of the supply roll and the housing adjacent thereto. The lower extremities of side pieces 13 are slightly displaced laterally to engage the inner faces of the housing for positioning clamping member 12 in relation to the pin wheels. Each side piece 13 is provided with a bracket 22 carrying an inwardly projecting stud or journal 23 adapted to enter one of the open bearings 4 for the supply roll spindle, the latter being slightly shorter than the interval between studs 23 so as to leave a space in the outer end of each bearing 4 for the reception of one of said studs 23.

When in operative position the strip guiding attachment is suspended by studs 23 in bearings 4 at opposite ends of spindle 3; with clamping member 12 in proximity to die cylinder 7 and bar 10 above and resting upon the periphery of the supply roll. In this position counterweight 15 tends to rotate the attachment about its pivotal point of support in a direction to advance clamping member 12 toward die-cylinder 7, while bar 10, influenced by gravity, engages the periphery of the supply roll and exerts a braking action proportional to its weight and the diameter of the roll. The strip or web is drawn from beneath the supply roll and passed over rod 11, thence in a line tangent to the circumference of the pin-wheels at a point slightly above or approximately coincident with the engaging surface of clamping member 12, around the die-cylinder and associated pin-wheels, and, tangent to the latter, to the periphery of the winding spool.

When the machine is at rest, in the intervals between successive punching and feeding operations, clamping member 12 is advanced by counter-weight 15 to hold the web in engagement with die-cylinder 7 and associated pin-wheels 8, thereby insuring an



extended peripheral engagement of the pin-wheel with the web both for feeding the latter and for resisting the pull of the tension devices on the delivery side of the feeding devices.

When the feeding movement takes place pressure is transmitted through the web to both the supply roll and tensioning member or bar 11, and if the resistance of the supply roll (due to inertia and applied friction) is in excess of the pressure exerted by the supporting springs of bar 11, the latter will yield more or less until sufficient power has been accumulated to overcome the resistance of the supply roll, after which the movement thus inaugurated will be continued and completed through the medium of the power stored in said springs, inasmuch as the power necessary to maintain the roll in motion is less than that required to start it.

The braking and tensioning members 10 and 11 are arranged to act in opposition upon the attachment so that the pressures developed and tending to displace clamping member 12 will be more or less counterbalanced and thus prevented from interfering with the action of counterweight 15. Thus, in the example illustrated, the pull of the web upon bar 11 tending to swing the attachment in one direction is opposed by the thrust of brake member 10 tending to shift the attachment in the opposite direction, the one supplementing and the other antagonizing the action of counterweight 15 in maintaining clamping member 12 in holding position.

Tensioning member or rod 11 serves the double purpose of cushioning the blow of the feeding devices by yielding under the action of the feeding devices and storing up power to complete the advance of the supply roll, and, also of yielding in different degrees at opposite ends so as to maintain the web in engagement with both pin wheels when opposite edges of the web are expanded or contracted unequally.

The construction of the attachment is such as not to in any manner interfere with the removal or insertion of the supply roll or the threading up of the web, and it is adapted to be applied to existing machines without change therein or addition thereto.

The attachment is specially designed to facilitate threading up the web, and with that end in view the several operating elements are so arranged and disposed upon the fixture that when the latter is swung in its supporting bearings to a position corresponding to that illustrated by full lines in Fig. 2 the end of the web can be carried from the roll directly to the feeding mechanism and adjusted upon the pin-wheels in the usual manner, after which by merely swinging the attachment as a whole back to operating position clamping member 12 will

advance into contact with the web, tensioning member 11 will pick up and form its bight in the web, braking member 10 will assume its position on top of the roll, and counter-weight 15 will be brought into position to maintain clamping member 12 in working engagement with the web all as indicated by the full lines in Fig. 3.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:—

1. A web feeding mechanism for record strip punching machines provided with supply roll housings, a die cylinder and pin wheel feeding devices, and in combination therewith, a web guiding and controlling attachment including a pivotally supported and counterweighted frame carrying a web clamping member opposed to the die cylinder and pin wheels, and a web tensioning member located intermediate said clamping member and supply spool in the path of the web.

2. A web feeding mechanism provided with supply roll housings, and pin wheel feeding devices and in combination therewith a web guiding and controlling attachment including a counterweighted frame pivotally supported to swing about the axis of the supply roll and provided with web clamping and tensioning members, the one opposed to the pin wheels and the other located intermediate the supply roll and clamping member in the line of travel of the web.

3. A web feeding mechanism provided with supply roll housings and a pin wheel feed and in combination therewith a self-contained web guiding and controlling attachment including a frame pivotally supported to swing between the supply roll housings and provided with web clamping and tensioning members and a supply roll braking member.

4. A web feeding mechanism equipped with supply roll supporting housings, a die cylinder and associated pin wheels and in combination therewith a self-contained web guiding and controlling fixture or attachment, the same comprising a counterweighted frame pivotally supported to swing between the supply roll housings about the axis of said roll and provided with web clamping web tensioning and supply spool braking members.

5. A web feeding mechanism equipped with supply roll housings containing bearings for the supply roll spindle and pin wheel feeding devices and in combination therewith a self-contained web guiding and controlling attachment the same including a frame pivotally supported to swing in the supply roll bearings and provided with a supply roll braking member, a web tensioning member and a web clamping member,



the latter opposing the pin wheel feeding devices.

6. A web feeding mechanism provided with supply roll supporting housings and pin wheel feeding devices and in combination therewith a self-contained web guiding and controlling attachment or fixture including a frame movable relatively to the pin wheel feeding devices and carrying a web clamping member opposite the feeding devices and a web tensioning member intermediate said clamping member and the supply roll.

7. A web feeding mechanism provided with supply roll supporting housings and pin wheel feeding devices and in combination therewith a movable self-contained web guiding and controlling attachment comprising a frame equipped with web clamping and tensioning members and a supply roll braking member, said attachment being counterweighted to maintain its operative relation to the feeding devices and movable to uncover the latter for threading up the web.

8. In a web feeding mechanism equipped with a supply roll support and intermittently acting web feeding devices and in combination therewith a web guiding and controlling attachment including a movable frame carrying a web clamping member and a yieldable web tensioning member.

9. In a web feeding mechanism equipped with supply roll supporting and web feeding means, and in combination therewith a self-contained web guiding and controlling attachment comprising movable frame carrying web clamping and tensioning members, and a supply roll braking member, said frame being counterweighted to advance and hold its clamping, tensioning and braking members in operative relation to the web feeding devices and roll respectively and permitting withdrawal to release the roll and uncover the feeding devices.

10. A web feeding mechanism provided with housings containing supply roll bearings and pin wheel web feeding devices, and in combination therewith a self-contained counter-weighted web guiding and controlling attachment provided with sustaining pivots adapted to engage the roll bearings and to swing thereon between said housings.

11. A self-contained guiding and controlling attachment or fixture for a web perforating machine, the same comprising a

counterweighted frame provided with suspension pivots and web clamping, web tensioning and roll braking members.

12. A web guiding and controlling attachment for punching machines comprising a frame or housing composed of side plates provided with suspension studs or journals and connected on opposite sides of said studs by cross-bars the one serving as a web clamping or guiding member and the other as a counterweight therefor.

13. A web guiding and controlling attachment for punching machines composed of L-shape side pieces each provided with a bracket carrying a suspension stud or journal at or near the junction of the two arms, cross pieces uniting corresponding arms of the side pieces, one of said cross-pieces serving as a web clamping member and the other as a counterweight therefor and a web tensioning member bridging the interval between the side pieces and yieldingly supported upon the latter.

14. A web guiding fixture for application to punching machines such as described comprising the following elements, in combination, to-wit; side plates each provided with a stud supporting bracket; two cross-pieces interposed between and connecting the side plates at points remote from and on opposite sides of said studs; a brake member pivotally supported upon one of said cross-pieces; and a web tensioning member in the form of a rod confined at opposite ends within bearings in the side pieces and suspended from the latter upon springs.

15. A self-contained web guiding attachment for punching machines such as described, including the following elements, to-wit; parallel side-pieces each provided with a bracket carrying an inwardly projecting stud; two cross-pieces interposed between and secured to the side pieces and located upon relatively opposite sides of said stud; arms pivotally supported upon one of said cross-pieces and connected at their outer ends by a weighted brake bar; and a web tensioning bar extending through openings in the side pieces and supported at opposite ends upon springs attached to the side pieces.

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