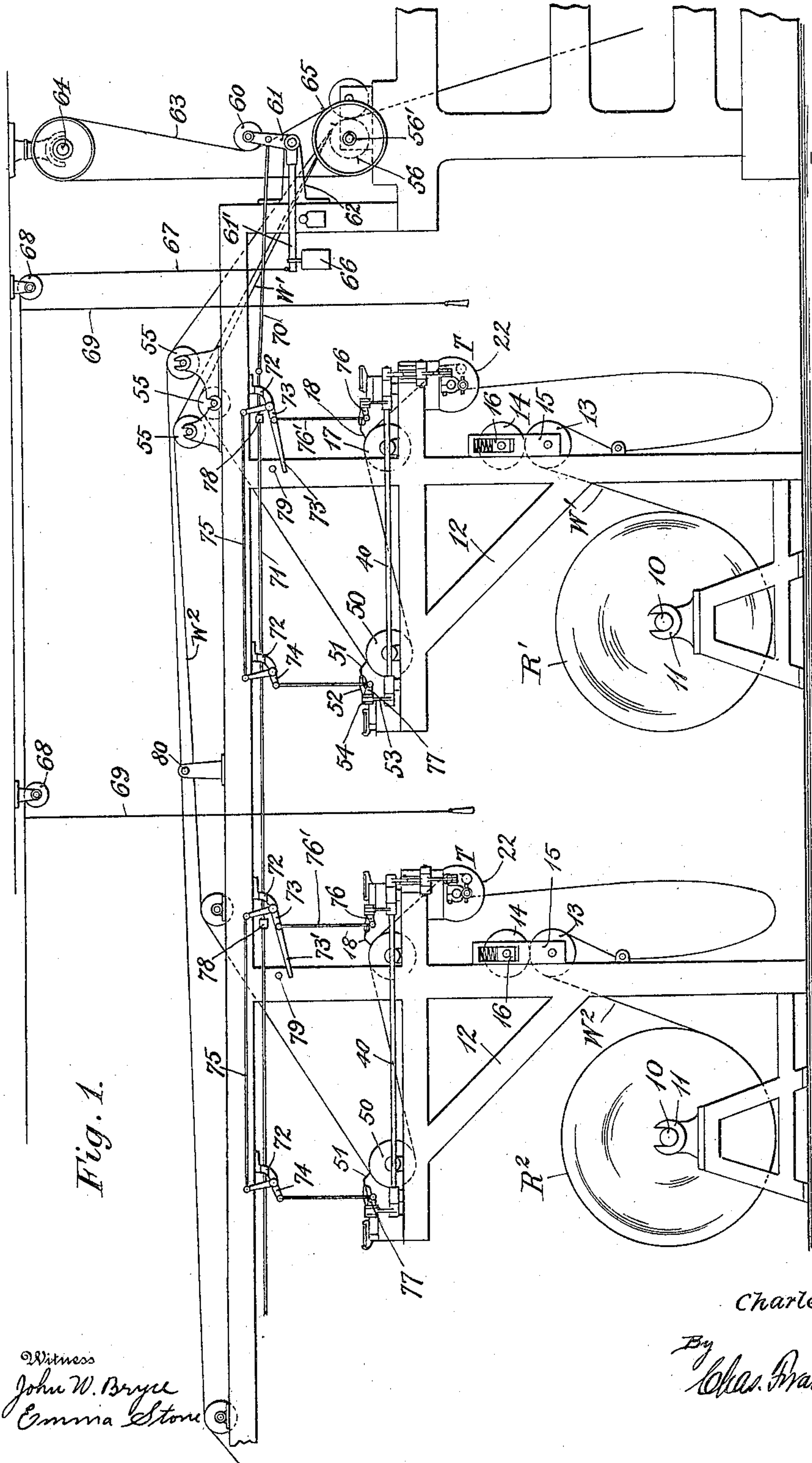


No. 822,404.

PATENTED JUNE 5, 1906.

C. F. TAYLOR.  
PAPER RULING MACHINE.  
APPLICATION FILED APR. 14, 1905.

2 SHEETS—SHEET 1.



Witness  
John W. Bryce  
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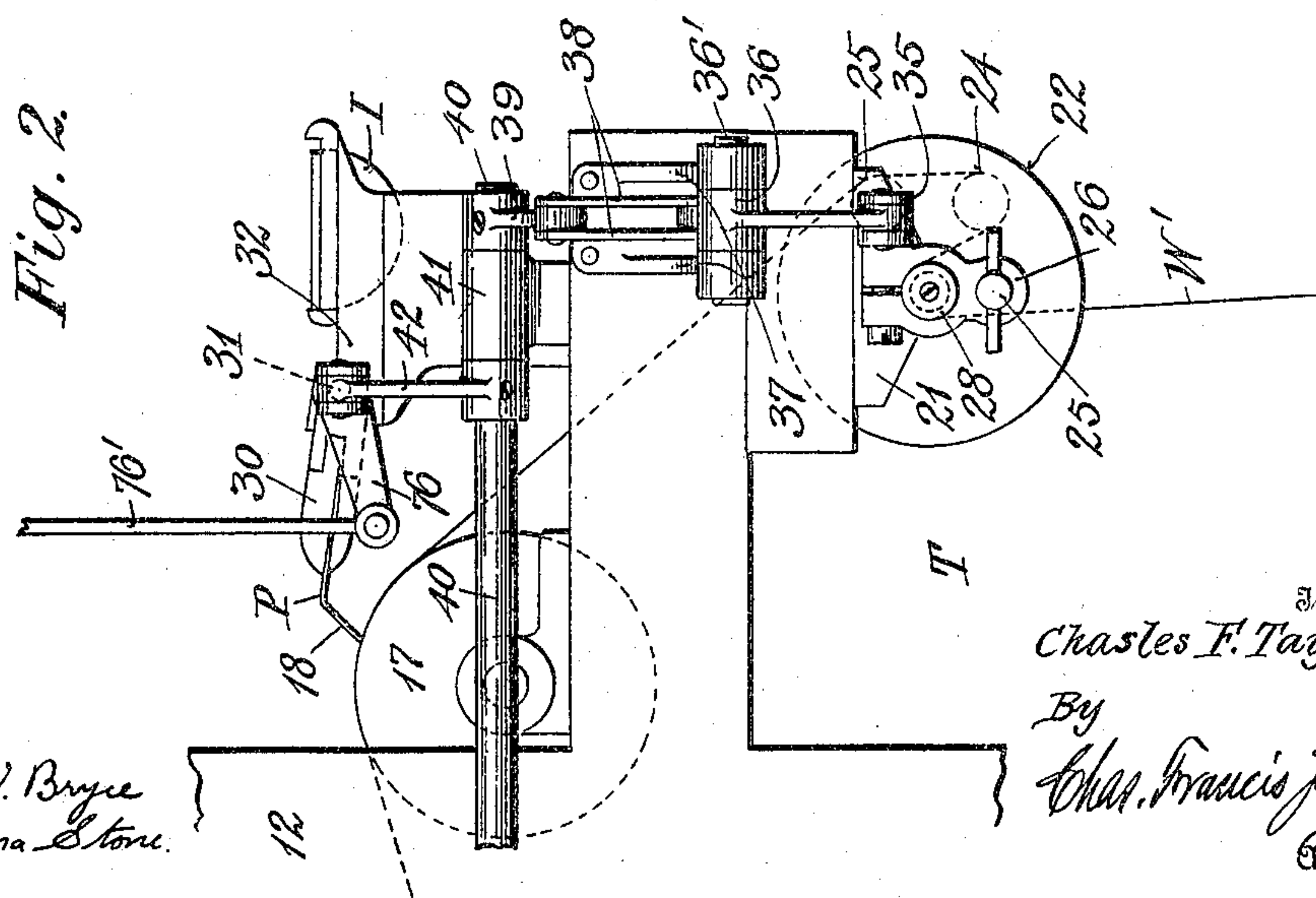
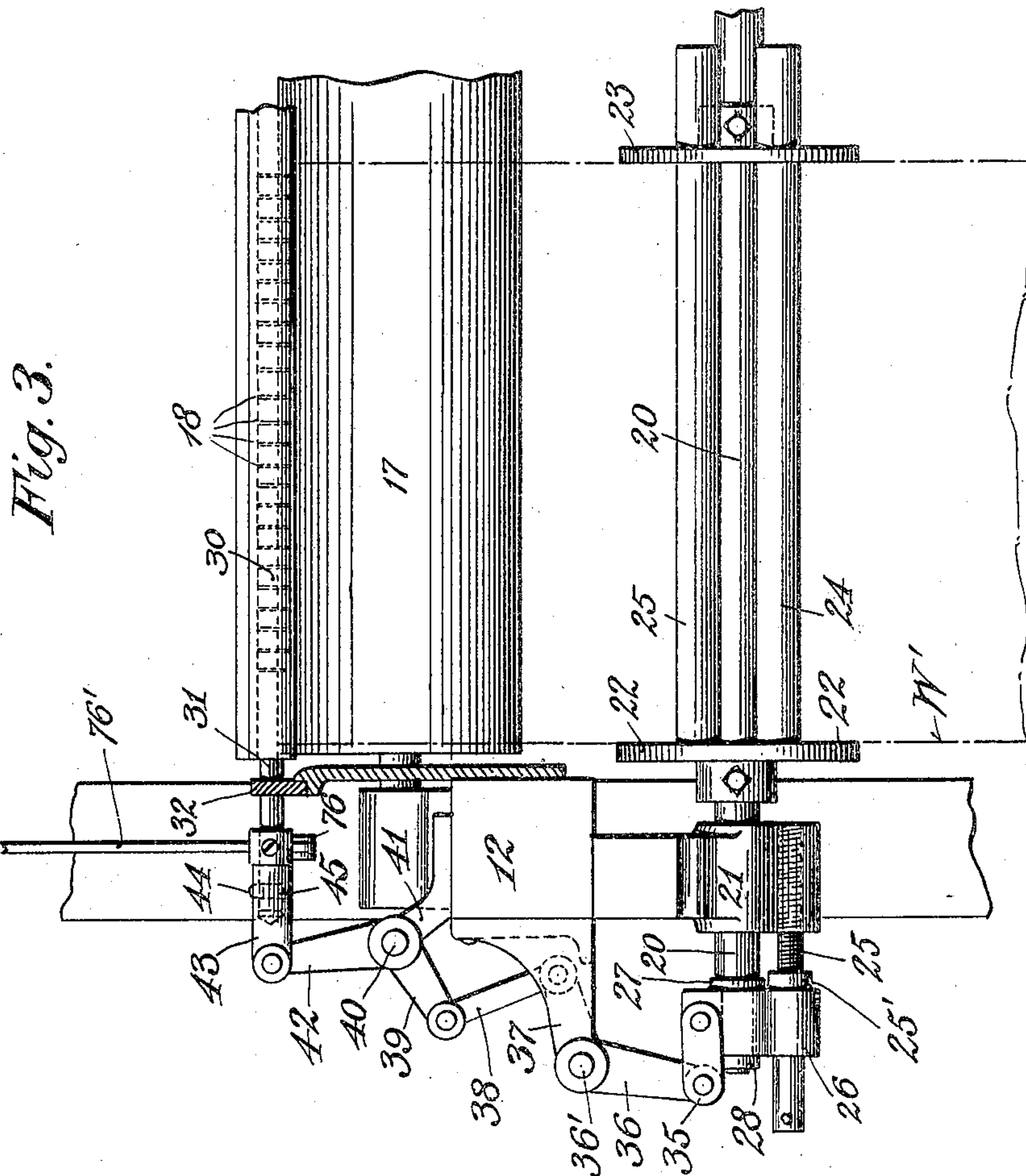
Inventor  
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By  
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# UNITED STATES PATENT OFFICE.

CHARLES F. TAYLOR, OF HARTFORD, CONNECTICUT.

## PAPER-RULING MACHINE.

No. 822,404.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed April 14, 1905. Serial No. 255,525.

*To all whom it may concern:*

Be it known that I, CHARLES F. TAYLOR, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Ruling Machines, of which the following is a full, clear, and exact specification.

This invention relates to paper-ruling machines, and more especially to that class thereof in which lines are ruled upon continuous webs of paper, said webs being subsequently assembled and cut into sheets of predetermined length.

My invention has for one of its objects the provision of a suitable mechanism whereby each web may be properly guided into running alinement with the other webs independently, so that the gathering or assembling roll may receive all of the webs with their edges in line and ready for the cutting-knife. In connection with this guiding mechanism my invention has for its object the provision of a web-tensioning device which constitutes a part of the guiding mechanism and capable of adjustment without in any way disturbing the latter.

A further object of the invention resides in the provision of means for positioning the ruling-pens in conjunction with the guiding mechanism, so that the distance of the lines from the edge of the web will be preserved constant, while, on the other hand, each pen-plate may be individually set to bring the first line at any desired distance from the paper edge.

Other objects of the invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, in which similar characters denote similar parts, Figure 1 represents a side view of a paper-ruling machine embodying my invention. Fig. 2 is a side view of one of the improved guiding and pen-adjusting mechanisms, and Fig. 3 is an end view thereof looking from the right of Fig. 2.

In Fig. 1 of the drawings I have illustrated a machine in which both sides of each web are ruled by separate mechanisms, both of which are, however, subject to simultaneous adjustment and in a measure dependent upon the web-guiding device of each particular roll.

It should be understood at this time that the particular number of webs to be manipulated is entirely immaterial and may be varied as desired, the drawings being confined to two rolls  $R^1 R^2$ , which are suitably mounted for rotation as the webs  $W^1 W^2$  are pulled therefrom. Inasmuch as the several mechanisms and controlling devices are similar in both cases, the following description of one may be deemed sufficient for both.

Each roll is supported on an arbor 10, rotatably carried in bearings 11, disposed at opposite ends thereof. Pertaining to each paper-roll are a pair of side frames, such as shown at 12, in and between which the several web-manipulating and inking or ruling devices are supported. The web  $W^1$  is engaged by a pair of unwinding-rolls 13 14, the lower one 13 of which is journaled in stationary bearings 15, while the upper one 14 may rest in spring-pressed boxes 16 to insure proper frictional contact between the web  $W^1$  and the lower roll 13, which may be positively driven by means not shown. After leaving the unwinding-rolls 13 14 the web  $W^1$  is left loose to form a loop preparatory to its contact with the tension device T, which in the present instance constitutes also a means for guiding the web and stretching it upon an idler 17, serving as a support while the web is being ruled on its upper face by pens 18. (See Fig. 2.)

The tensioning device comprises a transverse rod 20, mounted for rotative adjustment in brackets 21 and carrying a pair of web-guiding disks 22 23, the former of which has attached thereto a pair of tension-rods 24 25, extending laterally across the machine and supported at their free ends by the disk 23, above mentioned. The distance between the disks 22 and 23 depends upon the width of the web and may be varied by shifting the disk 23 along on the rod 20 as required. Furthermore, it will be seen that the tension or pull of the web around the rods 20 24 25 may be varied by rotating the central rod 20 in its brackets 21. Means are provided for moving the rod 20 bodily and with the disks 22 23, so as to vary the position of and to guide the web into proper place on the idler 17, these means consisting, substantially, of a screw 25 in threaded engagement with the bracket 21 and mounted for free rotative movement in a block 26,



which may be held against movement longitudinally of the screw in any desired manner—as, for instance, by a collar 25'. The outer end of the center transverse rod 20 is also journaled in said block 26 and is provided with collars 27 28 to cause the rod to move with the block and yet not interfere with its rotative movement therein. The ruling device comprises a pen-plate P, having pens 18 of usual construction and held in a clamping-bar or holder 30, which is provided at its ends with trunnions 31, resting in frames 32, secured to the side frames 12 of the machine. These frames 32 support also the ink-fountain I, from which the ink may be conducted to the pens, as usual.

As above stated, it is one object of the present invention to provide means whereby the pens may be shifted to correspond with the adjusting movement of the web-guiding device in order to preserve a uniform distance between the edge of the paper web and the first ruled line. The particular mechanism for obtaining this result is a linkage (best shown in Fig. 3) in which the block 26 is shown as carrying one end of a link 35, the other end of which is attached to an angle-lever 36, fulcrumed at 36' on a bracket 37 and actuating by a link 38 a lever 39, secured upon a rock-shaft 40, which is journaled in bearings 41 on the side frames 12. Also carried by the shaft 40 is an arm 42, the upper end of which carries a barrel-link 43, in which the trunnion 31 of the pen-bar is mounted for rotation, but held against longitudinal movement relative thereto—as, for instance, by a screw 44, entering a groove 45 in the trunnion.

From the foregoing description it will be seen that when the adjusting-screw 25 is rotated to move the rod 20 longitudinally the pen-bar will be shifted for the same distance and in a like direction.

Referring now to Fig. 1, the web W' after leaving the idler 17 passes around another roll 50, journaled in bearings on the side frames 12; and another series of pens 51 will rule the web on its reverse side. The mechanism of the pens 51 and bar 52 is similar to that previously described, and inasmuch as it is essential that the position of the pens 51 relative to the edge of the web W' shall conform to that of the pens 18 the latter are so arranged that when the first set of pens are shifted laterally of the machine the second set will be similarly positioned. The shaft 40 therefore is extended to the second set of pens and carries an arm 53, connected by a barrel-link 54 with the trunnion of the pen-bar 52 in a manner described in connection with the first set of pens. From the idler or pen-roll 50 the web passes over a roller 55 and thence to what may be termed a "gathering" or "collecting" roll 56, which receives all the webs of the machine prepara-

tory to the cutting mechanism, whereby the webs are cut up into sheets of predetermined lengths. (Not shown.)

In the proper operation of the machine it becomes frequently necessary to stop the mechanism—as, for instance, when for some reason or other one of the webs becomes torn or "bunched"—and inasmuch as the pens will deposit ink on the paper as long as they are in contact therewith it is evident that when the machine has been stopped and the webs are consequently at a standstill the pens are apt to cause blotches of ink in the lines. Hence my invention comprises as one of its features a mechanism whereby all the pens will be disengaged from the paper whenever the machine is stopped, and I prefer to use the shifting movement of the shipper-lever or the clutch mechanism, as the case may be, to release the pens and, on the other hand, to cause a reengagement between pens and paper simultaneously with the starting movement of the shipper.

While mechanisms of many different kinds may be employed for connecting and disconnecting the machine with and from a primary driving member or line-shaft, I have illustrated in Fig. 1 of the drawings an ordinary belt-tightener which comprises an idler 60, mounted on an angle-arm 61, which is pivoted on a bracket 62, secured to the frame 12. The idler 60 serves to tighten the belt 63, connecting the line-shaft 64 with a pulley 65, which may be secured to any part of the present machine or to some element of the web gathering and cutting device and which is herein illustrated as being secured upon the shaft 56' of the gathering-roll 56.

The arm 61' carries a weight 66, which normally tends to tighten the belt 63, and its free end is attached to a cord 67, passing over pulleys 68, disposed at various points above the machine, and pull-cords 69 may be connected with the cord 67, so that the idler-arm 61 may be operated from any convenient point, as will be readily understood.

Pivoted to the idler-arm 61 is a link 70, the other end of which is attached to a longitudinally-movable rod 71, supported in brackets 72 on the frames 12, and fulcrumed on the brackets 72 are angle-levers 73 74, connected in pairs by links 75 and also with arms 76 77, secured to the trunnions of the pen-arms 30 52, respectively. Near the angle-arms 73 the rod 71 is provided with collars 78, adapted to engage and rock said arms to raise all the pen-bars 30 52 simultaneously out of contact with the paper webs whenever the idler-arm 61 is swung to leave the belt 63 loose on its pulley 65, while, again, each coöperative set of pen-bars of the same web may be raised without in any way influencing the remaining sets of pen-bars of the machine—as, for instance, by a hand-lever extension 73', which may be brought to rest upon stop-pins



79, secured on the frame. In this manner the pens for any one web may be raised to permit a new web-roll being connected for operation without necessitating a stoppage of the entire machine.

As previously stated, any desired number of webs may be used in my improved machine, the several mechanisms being similar throughout and the webs being maintained in separate conditions by supporting-rods 80 and the rollers 55, above mentioned, and while I have illustrated in the drawings a simple and effective mechanism for operating the several pen-bars, yet it is evident that many changes may be made without in any way effecting the spirit of the invention, especially when the starting and stopping mechanism and its connection with the pen-bars are taken into consideration.

I claim—

1. The combination, with a plurality of web-supports, and a web-gathering roll; of a pair of web-guides coöperative with the opposite edges of a web, and means for shifting said guides simultaneously for guiding said web into alinement with another web, preparatory to the assemblage of the webs on the gathering-roll.

2. The combination, with a plurality of web-supports; of independent pairs of web-guides, coöperative with the opposite edges of the several webs, respectively, and means for shifting each coöperative pair of guides simultaneously for bringing the web controlled thereby into alinement with another web.

3. The combination, with a plurality of web-supports; of a pair of web-guides coöperative with the opposite edges of a web, means for varying the distance between said guides to accommodate different widths of webs, and means for shifting both of said guides simultaneously for bringing said web into alinement with another web.

4. The combination, with a plurality of web-supports; of a shaft, a pair of disks mounted thereon and for guiding one of the webs, and means for moving said shaft longitudinally to guide said web into alinement with another web.

5. The combination, with a plurality of web-supports; of shiftable means for guiding one web relatively to another web, a web-tensioning device movable with the guiding means, and means for varying the tension of the web.

6. The combination, with a plurality of web-supports; of shiftable means for guiding one of said webs relatively to another web; a plurality of tensioning-rods for each web; and a rotatable shaft carrying said rods, and for varying the position thereof.

7. The combination, with a plurality of web-supports, and line-ruling devices; of shiftable means for guiding one web relatively

to another web, and means for shifting said ruling devices simultaneously with the guiding means.

8. The combination, with a plurality of web-supports, and line-ruling devices; of shiftable means for guiding one web relatively to another web, and a linkage for shifting said ruling devices simultaneously with the guiding means.

9. The combination, with a web-support; of a pair of ruling devices operative upon both sides of the web, respectively, and means for positioning both of said ruling devices relatively to the web edge, simultaneously.

10. The combination, with a plurality of web-supports, and shiftable line-ruling devices; of means for guiding one web relatively to the other, and a rock-shaft controlled by the movement of the guiding means, and for controlling the movement of the ruling devices.

11. The combination, with a plurality of web-supports; of a pen-bar having a series of pens, means for guiding one web relatively to another web, and means for shifting said pen-bar by the movement of the guiding means.

12. The combination, with a plurality of web-supports; of a pen-bar having a series of pens, means for guiding one web relatively to another web, and means controlled by the guiding means for shifting said pen-bar simultaneously and for a like amount with the movement of the guiding means.

13. The combination, with a plurality of web-supports; of a pen-bar having a series of pens; means for guiding one web relatively to another web, and a mechanism operable by the guiding means, for shifting said pen-bar simultaneously, for a like amount, and in the same direction as the shifting movement of the guiding means.

14. The combination, with a plurality of web-supports; and means for guiding one of said webs relatively to another web; of line-ruling devices operative on both sides of the web, respectively, and means controlled by the movement of said guiding means and for shifting said devices for a like amount and in the same direction, simultaneously.

15. The combination, with a plurality of web-supports; of a web-tensioning device comprising a plurality of tensioning-rods; a pair of disks mounted thereon for guiding one of said webs; and means for shifting said rods longitudinally for positioning said disks relatively to the other webs.

16. The combination, with a plurality of web-supports; of a web-tensioning device comprising a shaft mounted for rotation; a pair of disks mounted thereon; tensioning-rods carried thereby; and means for shifting said shaft longitudinally for positioning said disks relatively to the other webs.

17. The combination, with a web-support,



and a plurality of ruling devices coöperative with opposite sides of the web; of a longitudinally-shiftable rod for disengaging said devices from the web.

5 18. The combination, with a web-support, and ruling devices therefor; of a device for advancing a web; a starting and stopping mechanism for said device; and means controlled by said mechanism, for controlling  
10 the ruling devices.

19. The combination, with a web-support, and a ruling device therefor; of means for advancing a web, a starting and stopping mechanism therefor, and means for disengaging  
15 said ruling device simultaneously with the operation of the stopping mechanism.

20. The combination, with a plurality of

web-supports; ruling devices coöperative with the several webs, and means for advancing said webs; of a device for stopping the  
20 web-advancing means, and means controlled by said device, for disengaging the ruling devices from the webs, simultaneously.

21. The combination, with a plurality of web-supports; ruling devices coöperative  
25 with the several webs and means for advancing said webs; of means for disengaging the ruling device of any one web therefrom; and means for releasing all of the ruling devices from all the webs, simultaneously.

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Witnesses:

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