

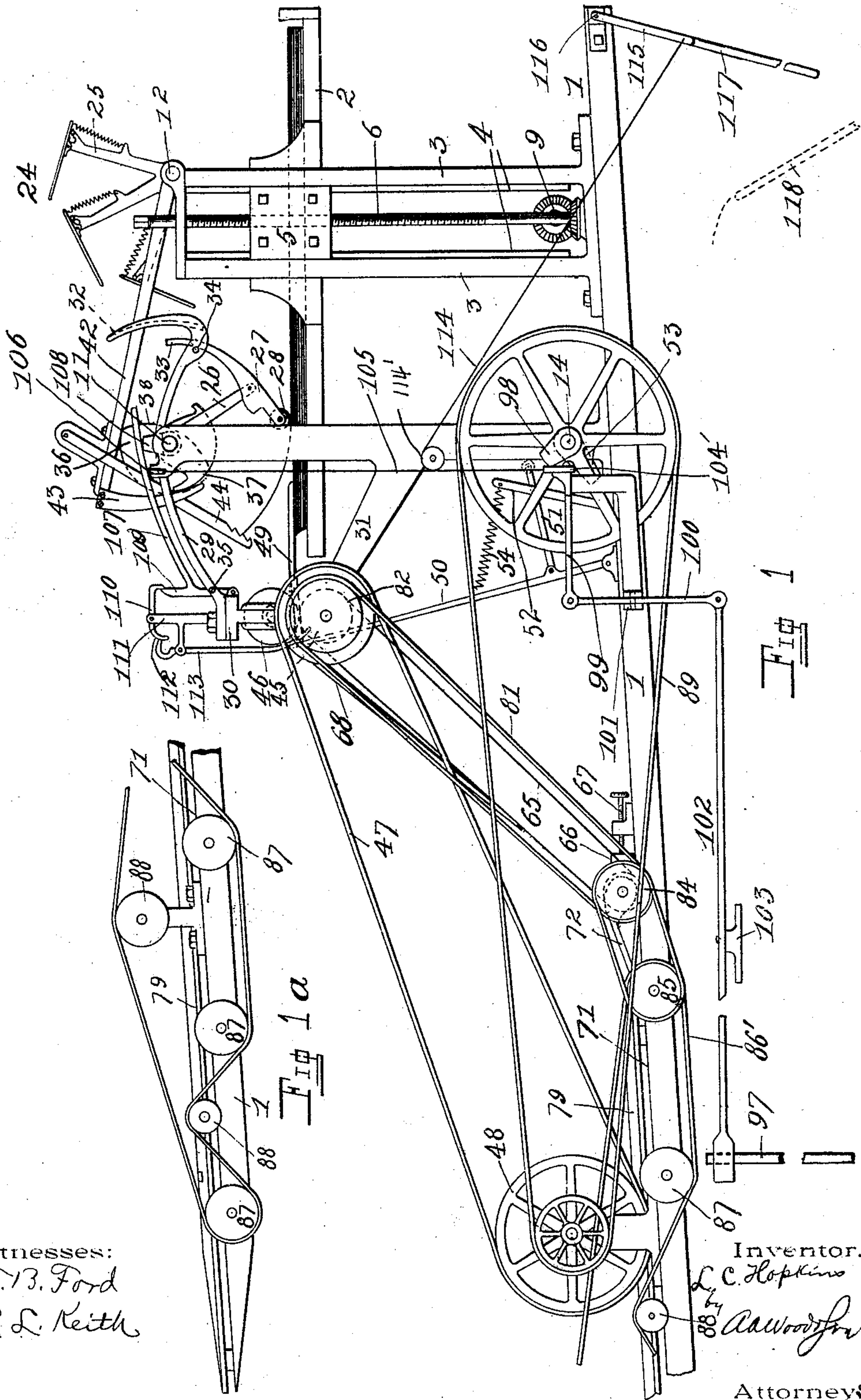
(No Model.)

5 Sheets—Sheet 1.

L. C. HOPKINS.  
SHEET FEEDING MACHINE.

No. 553,713

Patented Jan. 28, 1896.



Witnesses:  
T. B. Ford  
R. L. Keith

Inventor.  
L. C. Hopkins  
A. Woodruff  
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Attorneys

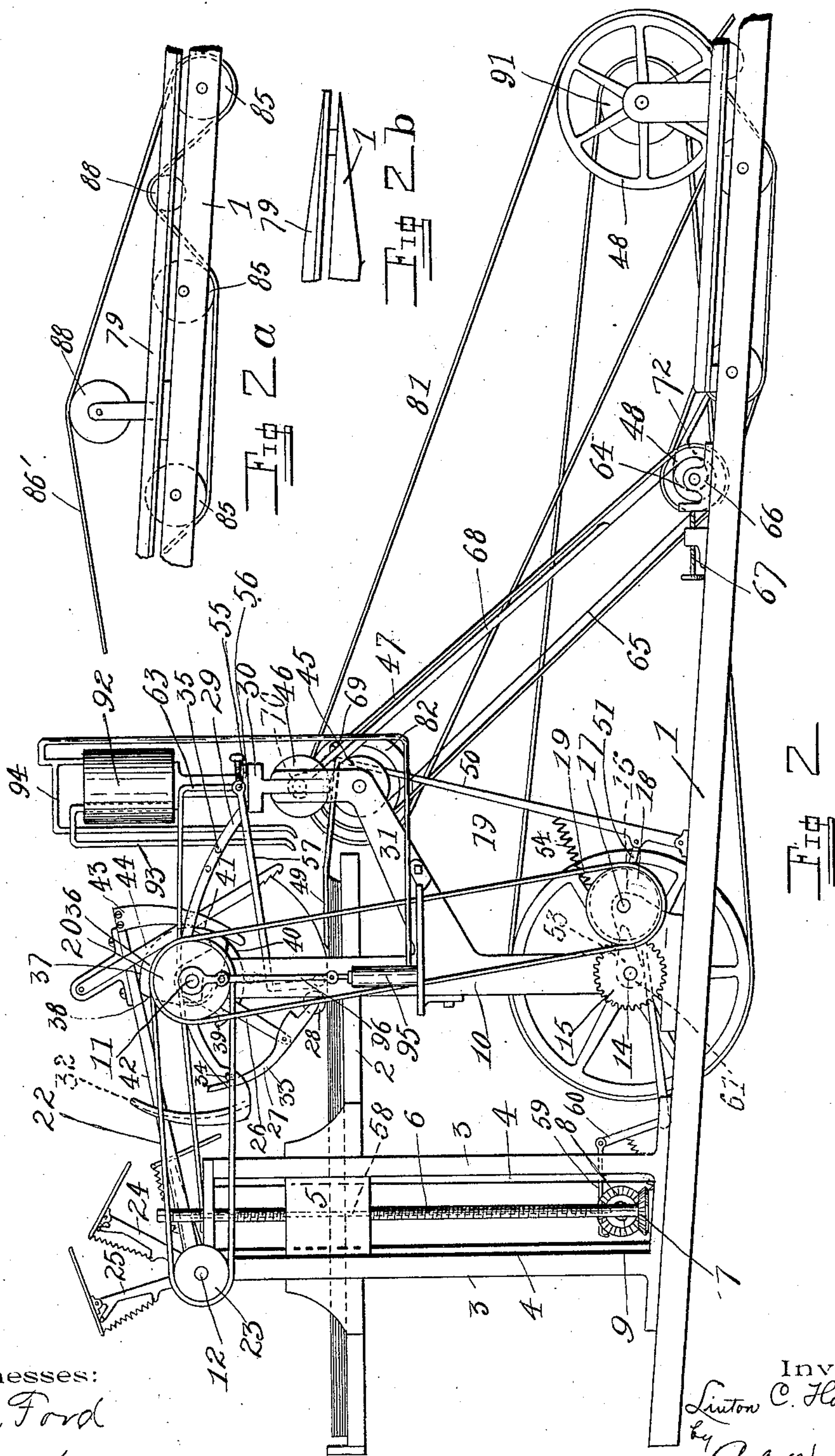
(No Model.)

5 Sheets—Sheet 2.

L. C. HOPKINS.  
SHEET FEEDING MACHINE.

No. 553,713.

Patented Jan. 28, 1896.



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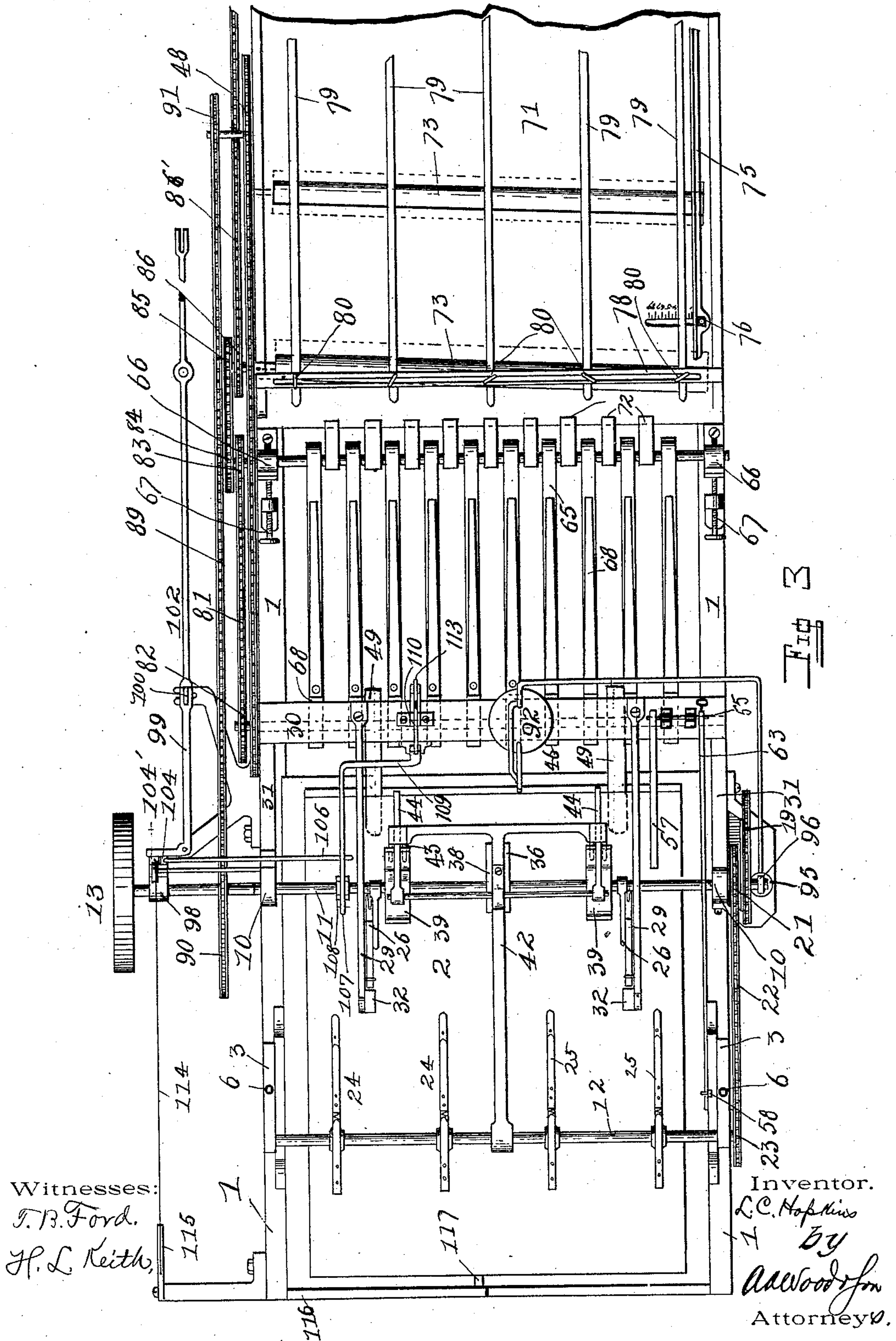
(No Model.)

5 Sheets—Sheet 3.

L. C. HOPKINS.  
SHEET FEEDING MACHINE.

No. 553,713.

Patented Jan. 28, 1896.



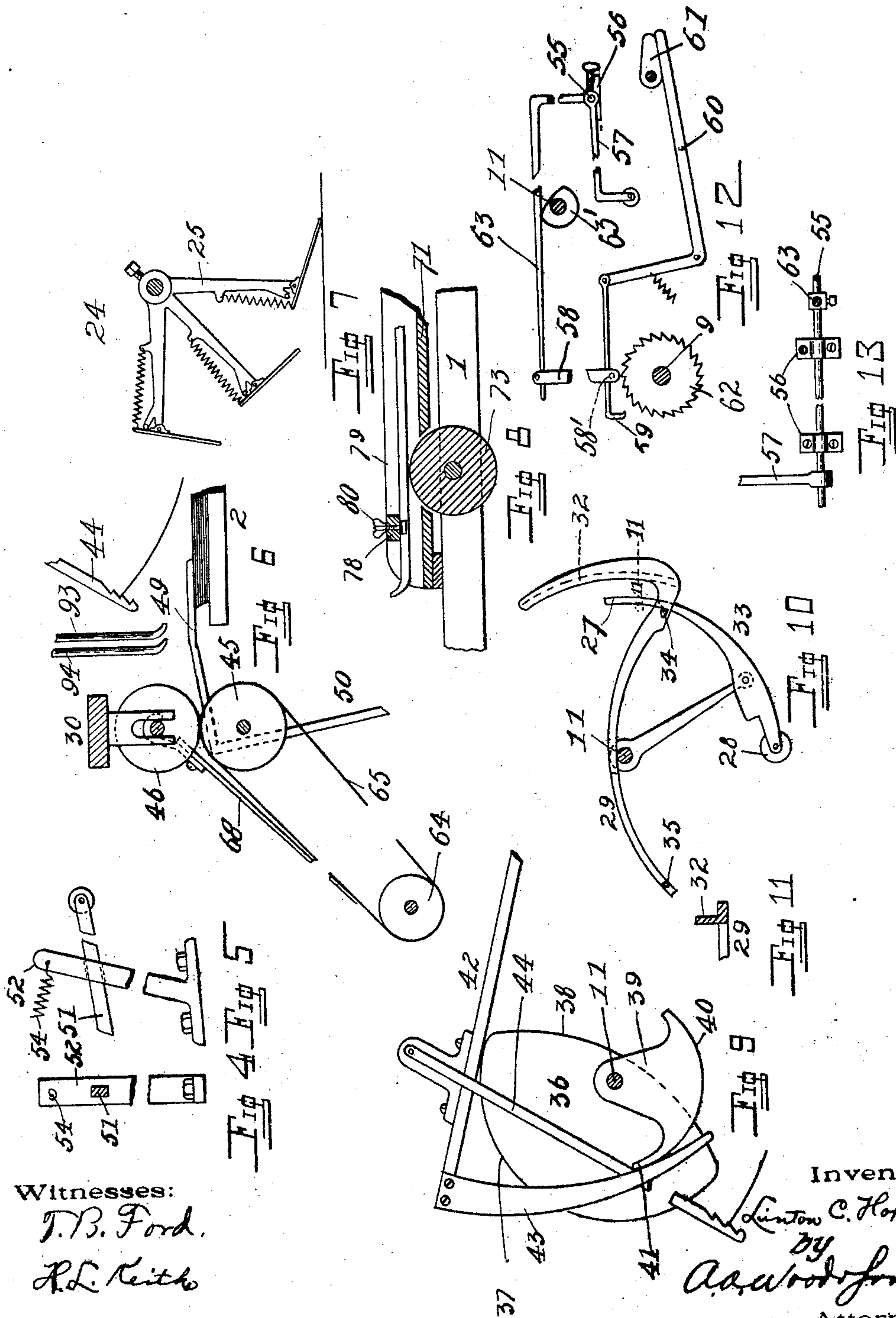
(No Model.)

5 Sheets—Sheet 4.

L. C. HOPKINS.  
SHEET FEEDING MACHINE.

No. 553,713.

Patented Jan. 28, 1896.



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(No Model.)

5 Sheets—Sheet 5.

L. C. HOPKINS.  
SHEET FEEDING MACHINE.

No. 553,713.

Patented Jan. 28, 1896.

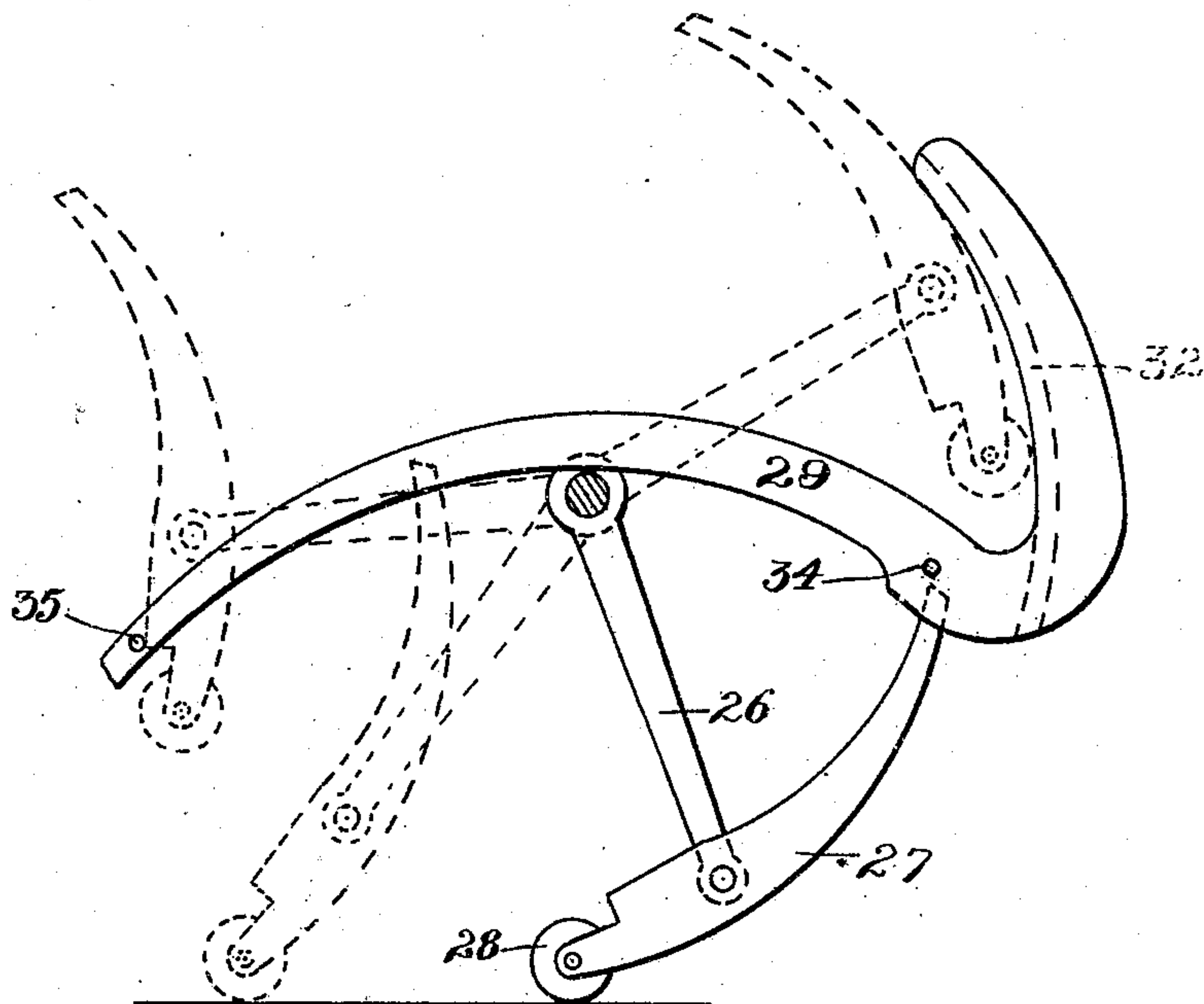


Fig. 15.

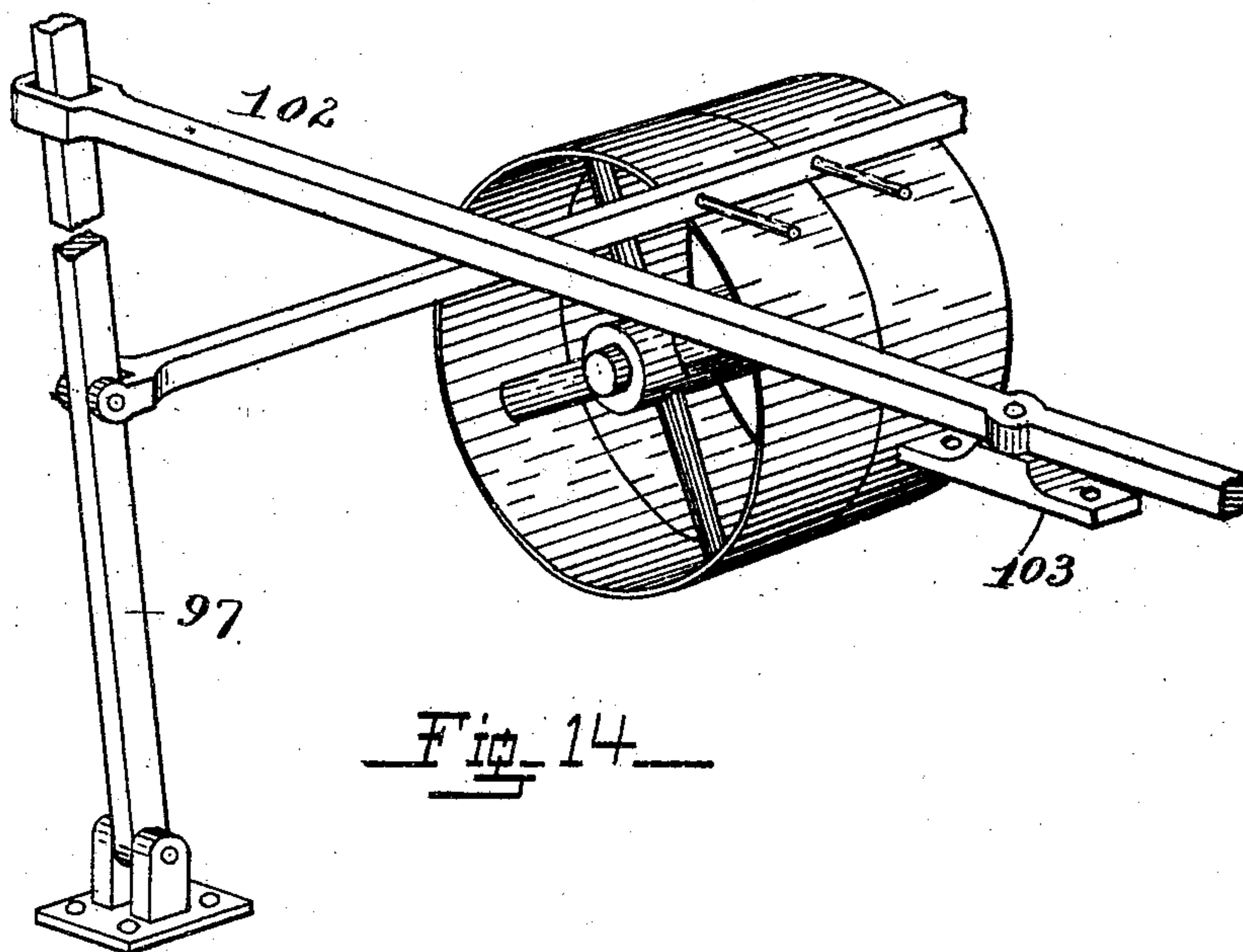


Fig. 14.

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# UNITED STATES PATENT OFFICE.

LINTON C. HOPKINS, OF ATLANTA, GEORGIA.

## SHEET-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,713, dated January 28, 1896.

Application filed June 19, 1895. Serial No. 553,316. (No model.)

*To all whom it may concern:*

Be it known that I, LINTON C. HOPKINS, a citizen of the United States of America, and a resident of Atlanta, in the county of Fulton and State of Georgia, have made a certain new and useful Improvement in Sheet-Feeding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to devices for feeding sheets of paper to a printing or binding press or to any machine which requires to be so fed, the object of the invention being to improve the sheet separating and feeding mechanism, as well as to provide several safety devices and an automatic table-adjuster whereby the feeding-machine is rendered more satisfactory in its operations, and means for dissipating the electricity incidentally generated in the operation of the device.

The device is shown in the accompanying drawings as follows:

Figure 1 is a side elevation of the machine from the side of the press on which the feeder usually stands. Fig. 1<sup>a</sup> is a fragmentary view of the lower end of the feeder as the sheet runs, same being omitted from Fig. 1 for lack of room. Fig. 2 is a side elevation showing the opposite side of the device from that shown in Fig. 1. Fig. 2<sup>a</sup> is a fragmentary continuation of Fig. 2, and Fig. 2<sup>b</sup> is a continuation of Fig. 2<sup>a</sup>. Fig. 3 is a plan view of the device. Figs. 4 and 5 are respectively front and side views of a detail of the pitman for operating the separating-tongue and its guide-post. Fig. 6 is a detail in side elevation of the separating-tongue, the rollers, and their tapes and grid, and also the front edge lifting-finger, the nozzles of the spraying device, and the paper-table. Fig. 7 is a detail of the feeding and separating wheel. Fig. 8 is a sectional view of the head end of the side-shift table and the adjustable grid thereover. Fig. 9 is a side elevation of the pick-up finger and the cams operating the same. Fig.

10 is a detail of the quick-feeding arm, and Fig. 11 is a section on the line 11 11 in said figure. Fig. 12 is a detail of the table-raising mechanism, including the setting-rod. Fig. 13 is a plan of the said setting-rod and the shaft thereof. Fig. 14 is a perspective view of the belt-shifting device, showing a portion of the lever connecting same to the automatic stop mechanism. Fig. 15 is a view in side elevation of the dog 27 and adjacent and co-operative parts showing same in successive positions.

In the figures like reference-marks indicate corresponding parts in all the views.

1 is a base which may be of any suitable form and construction to sustain the operative parts of the device, and may be either secured to the press or machine to be fed or rest upon a suitable base of its own.

2 is the paper-table, and 3 are uprights which are secured to the frame 1 and carry guides 4 for the head-blocks 5 secured to the said paper-table and nuts adapted to receive the lead-screws 6, the upper end of each of which is journaled in the cross-bar of the uprights 3 and projects thereabove, being squared to receive a wheel or wrench in turning to a starting-point for the table. The lower ends of these screws are journaled in a step-bearing of suitable construction and carry a pinion 7 meshing with the pinions 8 on each end of the transversely-extending shaft 9 and operating to cause the said lead-screws to revolve in unison.

10 are uprights, of which there are two, one on each side of the machine, secured to the base 1 and projecting upwardly to a point above the paper-table, where they carry a shaft 11. A shaft 12 is journaled on the upper ends of the uprights 3, and the main driving-shaft 14 of the machine is journaled on the base 1 or in the lower ends of the uprights 10, the latter being the position shown. The main driving-pulley 13, Fig. 3, is secured on this shaft 14, a gear 15 being set on its opposite end, as shown in Fig. 2, meshing with the gear 16 on the shaft 17, which carries in turn a pulley 18, preferably adapted to carry a sprocket or chain belt 19, which runs also on the sprocket-wheel 20 secured to the shaft 11, on which shaft is another sprocket-wheel



21 carrying a belt 22 and acting to revolve the shaft 12 through the said belt and the pulley 23 on said shaft 12.

On the shaft 12 is one or more feeding-wheels 24, which are constructed substantially like those covered in my Patent No. 545,864, dated September 3, 1895, with the exception that the feeding-wheel there shown is provided with equidistant radial arms, while the wheel in the present instance has been mutilated by the removal of all but three of said arms, so that its action may be intermittent. It consists of substantially three radial arms 25, on the end of each of which is a finger, either flexible in itself or flexibly mounted, so as to have an elastic and, if desired, an adjustable pressure on the upper surface of the top sheet of paper, which contact, by reason of the nature of the paper, is communicated to a considerable depth into the pile of paper on the paper-table and acts to move the same forwardly to a degree inversely as the distance of the sheet down in the pile of paper from the one directly acted upon increases. This wheel is mutilated so as not to interfere with the intermittent or successive action of the remainder of the separating and feeding mechanism.

On the shaft 11 is one or more—preferably two—arms 26, which carry on their distal extremities dogs 27, each of which dogs is provided with a block 28 of rubber or other elastic material whereby frictional contact between the dog and the paper is increased. On reference to Fig. 1 it will be seen that the angle of the dog 27 to the arm 26 is such that owing to the frictional contact of the rubber on the paper there is a tendency of the arm and dog to straighten out which presses the rubber very firmly against the paper and moves but one sheet at a time, moving that forwardly with a quick movement. Arms 29 are bolted to the cross-bar 30 supported on the ends of the arms 31 which project upwardly and forwardly from the uprights 10, said arms 29 extending across the shaft of the arms 26 and parallel to the plane of revolution of said arms, their distal extremities being turned upwardly and flanged, as shown in Figs. 10 and 11 in detail and in Figs. 1 and 2 in position on the machine. These flanges, numbered 32 in the drawings, form a guide for the dogs 27 and act to bring same into proper position for contacting with the sheet of paper, as shown in Fig. 14. These dogs 27 are each provided with a tail 33 inclined inwardly from the circular line of movement of the main body of the dog, which tail contacting with the pin 34 on the corresponding arm 29 acts to prevent a premature engagement of the rubber block 28 with the paper.

As the arms 26 carry the dog 27 upwardly after the contact of the blocks 28 with the paper, the pins 35 on the arms 29 will contact with the dog, as shown in Fig. 14, and prevent the swinging out of the end carrying the block 28 by centrifugal force, aided by the

force from the horizontal movement of the block 28 as it moves the sheet forward, and bring said dog with its tail into a substantially vertical position, in approximately which position it will remain notwithstanding the centrifugal force until it is brought into contact with flange 32 and the pin 34, there not being time for very great shifting of position of the said dog 27 between the time of its leaving the position shown by dotted line at the left in Fig. 15 until it reaches the next position shown in said figure.

As seen in Fig. 9, a gibbous-shaped cam 36, which has one concentric peripheral surface 37 and one eccentric peripheral face 38, is mounted on the shaft 11 and revolves therewith. Also on this shaft on each side of the cam 36 are other cams 39 which have each a concentric face and an abutting end 41 projecting substantially as best seen in Fig. 9. An arm 42 is pivotally secured to the shaft 12, as shown, although it might be attached to any convenient stationary part of the machine, said arm resting upon the periphery of the cam 36 and being, in the construction shown, bifurcated, a guide-arm 43 being carried and projecting downwardly from each side of each of the ends, a finger 44 being pivoted to the said arm and lying between said guide-arms and upon the periphery of the cams 39, each finger being dentated on its lower end, as shown, whereby each is enabled to catch the edge of the sheet of paper as it is elevated and raise same from the pile of paper at that edge, as shown in Figs. 1, 2 and 9. As the gibbous-shaped cam 36 revolves its eccentric side raises and lowers the arm 42, the concentric side or the side having the major diameter holding said arm elevated for a sufficient period of time. There may be two single arms like the arm 42 in construction, but not bifurcated, together with a duplicate set of gibbous-shaped cams, &c., although of course these parts may be duplicated to any necessary extent.

Rollers 45 and 46 are journaled in suitable bearings on the ends of the arms 31, the lower rollers, 45, being driven by the belt 47 from the pulley 48 and the upper set of rollers being vertically movable and resting upon the upper side of the rollers 45. Projecting between the rollers 45 and 46 are two tongues 49, as best shown in Figs. 1, 2, and 3, said tongues having movement longitudinally, so that they may lie upon the top sheet of the pile on the paper-table and prevent the motion of the rubber block from being communicated to the paper below. These tongues are each secured to the upper end of a correlative arm 50, each of which is pivoted to the frame 1, said tongues lying just above the shaft of the rollers 45, and so that their upper sides are not above nor much below the peripheries of said rollers at the top. A plunger 51 is pivotally secured to the lever near the lower end, passing through an upright 52, secured to the base 1, and carrying a roller on



its free end. A cam 53 on the main shaft serves to reciprocate this plunger 51 and move the lever 50 in a direction to withdraw the tongue from its position above the pile of paper, a spring 54 acting to pull the tongue into place under the top sheet of paper. It is thought that two of these tongues will be sufficient for the purpose.

A shaft 55 is journaled in suitable bearing-boxes 56, as shown in Figs. 2, 3, 12, and 13, and an arm 57 is carried thereon, resting upon the upper side of the pile of paper on the paper-table. A plunger 58 slides vertically upon the upright 3 on one side of the machine, and is connected at its lower end with the free end of the curved pawl 59, one end of which is connected with the rock-lever 60, Figs. 2 and 12, which is rocked by a cam 61 on the main shaft of the machine and causes a reciprocation of the said curved pawl between predetermined limits of movement. This plunger 58 is provided with a pin 58', projecting across the plane of movement of and below the pawl 59, so that when said plunger is raised the pawl is also lifted, said pawl falling of its own weight upon the depression of the said plunger and lying thereon at all times, excepting such as the plunger descends below the point where the said pawl will contact with the ratchet-wheel, which latter times do not occur in operation. On reference to Fig. 12 it will be seen that the lower the said pawl is when reciprocated the more teeth it will catch on the ratchet-wheel 62, said ratchet-wheel being mounted on the shaft 9. In order to regulate the depth of the descent of the pawl in proportion to the height of the paper on the paper-table an arm 63 is secured to the shaft 55 and its free end is connected with the upper end of the plunger 58, whereby on a partial revolution of the said shaft by the descent of the arm 57 there is a corresponding depression of the arm 63 and of the plunger 58, allowing the pawl 59 also to fall and engage one or more of the teeth on the ratchet-wheel, being reciprocated once to each sheet delivered, and upon said engagement the said ratchet-wheel will be partially revolved and the shaft 9 with it, imparting sufficient motion to the lead-screws to raise the table until a reverse action of the lever withdraws it from engagement.

In order that the movement of the paper shall not be interfered with by the arm 57 it is desirable to raise the end of said arm above the upper side of the paper just prior to the commencement of the movement of the top sheet, and for this purpose I mount a cam 63' on the shaft 11, as best shown in Fig. 12, which strikes the lower side of the arm 63 once in each revolution, and the said cam, having approximately one-half of its periphery concentric with its shaft, the arm 63 will be held elevated, as will also the arm 57, during the time of the movement of the paper forwardly on the table.

Running on the rollers 45 at their upper

ends and on rollers 64 at their lower ends are tapes 65, which are kept tight by means of movable bearing-boxes 66 for the rollers 64, adjusted by means of set-screws 67, as best shown in Fig. 3. A series of fingers 68, free at their lower ends, but connected at their upper ends by a cross-bar 69 and hooked to the shaft of the rollers 46 by a pair of hooks 70, lie upon these tapes and act to straighten the paper thereon and cause it to lie at right angles thereto, their free ends resting with their own weight upon the upper side of said tapes. These fingers act to cause a proper frictional contact between the paper and the tapes and do not impede the forward motion of the paper, as they only touch same by their points, said points obviously wearing very smooth if not made so at first. It is obvious that if a sheet is delivered onto these said tapes otherwise than at right angles thereto, one corner thereof will strike the fingers on that side sooner than the other corner will strike the correlative fingers, and hence the motion of the side that is in advance will be impeded for a moment until the other side shall catch up therewith and the sheet go under the said fingers perfectly parallel to the feeding-rollers.

Resting upon the base 1 is a table 71, (best shown in Fig. 3,) extending from a point as near the periphery of the rollers 64 as possible without interfering with the sidewise adjustment of said rollers should such be necessary. I make the table and the upper sides of the tapes practically continuous by means of fingers 72, which lie upon the upper edge of the table, being loosely mounted on the shaft of the rollers 64 and lying between each of said rollers. The paper may pass over the top of said fingers in passing from the top of said tapes to the table 71. The said table is slotted transversely and at a slight angle to the line of forward motion of the paper, and rollers 73 are mounted in suitable bearings below said table, their peripheral surfaces being projected upwardly through said slots to a point slightly above said table, whereby the paper contacts therewith and is carried forwardly thereby. This angle should be not more than (say) five degrees, inasmuch as more than that will tend to bend the edge of the paper against the side guide 75 as the paper is brought forward. In the smallness of this angle is the essence of these rollers, as it will not do to bend the edge of the paper, as stated. The side guide 75 is secured to the upper side of the table along the edge thereof, screws 76 being used for that purpose and entering slots in the said table make same adjustable laterally to accommodate different widths of paper and different feeding-points on the press or ruling-machine being fed. Lying parallel to said table and over the top thereof is a grid which is composed of laterally-extending bars 78 and bars 79, connected at each end to said cross-bars 78, being secured to the under side thereof, so as to present an unbroken surface on their bottoms. The bars 78 are slotted



throughout their entire length, excepting at their extreme ends, and thumb-screws 80 serve to hold the bars 79 thereunder so as to be readily adjustable to any position laterally.

5 Other bars may be inserted if desired. The screws 80 pass through the slotted bars 78, their threaded ends entering the bars 79. Hence it is obvious that the position of the bars 79 may be separately adjusted vertically

10 relative to the table, the action of the bars along the edge especially being improved by accurate adjustment as to distance from the traveling sheet of paper. Obviously the table and this grid may be extended to any desired

15 length, its end being preferably beveled or tapered, as shown in Figs. 1<sup>a</sup> and 2<sup>b</sup>, the better to approach the machine fed. The rollers 73 are driven by means of a chain belt 81 extending from the pulley 82 on the shaft of

20 the rollers 45 driving the pulley 83 carrying a duplicate pulley 84, which is belted to another pulley 85 which has a duplicate pulley 86 secured to it, upon which runs the belt 86' passing over the pulleys 87 of these rollers,

25 with a suitable number of idlers or deflecting-pulleys 88 to carry the belt partially around each of said pulleys 87, as best shown in Figs. 1 and 1<sup>a</sup>. The shaft of the rollers 45 is driven, as before stated, by a belt from the pulley 48,

30 said pulley 48 being driven by a belt 89 from the pulley 90 on the main shaft of the machine through a pulley 91 on the same shaft as the pulley 48 aforesaid. Obviously this belting might be performed in many ways,

35 but the one shown and described is, at present, thought preferable.

92 is a vaporizer which is filled with water, 93 being the water-tube leading therefrom and 94 being the air-tube, both of which are led

40 from the vaporizer to a position just opposite the space between the sheets of paper when one is lifted from the pile on the paper-table, and into which space they are adapted to deliver water in a fine spray and so provide for

45 the escape of any electricity which might, and usually is, generated in handling paper. Air is supplied for this device by an air-pump 95 (shown of a reciprocating variety) and operated by the pitman 96 from one of the shafts

50 of the machine, said air passing into the reservoir 92 under pressure and forcing the water from same through the pipe 93, said outflowing stream of water being blown into a spray or vapor by the air issuing from the

55 pipe 94 and impinging against said stream of water.

97, Fig. 1, represents the belt-shifting lever of the press or ruling-machine which it is desired to feed, and in order to stop the

60 machine it is necessary to move this lever. As it is desirable to prevent offsets in the printing, I have devised means for automatically stopping the press and consequently the sheet-feeder on the failure of a sheet of

65 paper to leave the paper-table. To this end I place a cam 98 on the main shaft 14 of the machine and mount a bell-crank lever 99 with

its shorter arm in juxtaposition to said cam, but a short distance away from same. The other end of the lever 99 is connected to a

70 vertical lever 100 at its top end, said lever 100 being pivoted to the base 1 on a bearing 101, whereby when its upper end is caused to move inwardly its lower end will move outwardly, and being secured to the end of

75 the lever 102, pivoted at 103 and connected at its other end to the lever 97, said lever 102 will swing in a corresponding manner and the upper end of said lever 97 be moved inwardly and the machine stopped. By reason

80 of the separation of the cam 98 and the short end of the lever 99 said lever would not be actuated by said cam were it not for the block 104, which is suspended therebetween by a

85 cord or chain 105, connected at its other end to the end of the lever 106, pivoted to the upright 10, and projecting in the construction shown from under the lever 107, which

90 latter lever is pivoted to the cross-bar 30, as seen in Fig. 1, its other end resting upon a striker-cam 108 on the shaft 11. On the lever 107 near its pivotal point is an upwardly-projecting arm 109, and a latch 110 is pivoted in the upper end of the upright 111 set

95 on top of the cross-bar 30. This latch is adapted to engage and hold the upper end of the arm 109 until the said latch is lifted at that end, and consequently when the lever 107 is raised by the striker-cam 108 it

100 will remain elevated until so released. The latch carries on its opposite end a cam-surface 112, which is traversed by the upper extremity of the pivoted lever 113, the lower

105 end of which lever extends across the line of movement of the paper in passing from the paper-table and emerging from between the rollers. It is obvious that the swinging of

110 this lever in the direction of the paper-table will cause the end of the latch 110 to be depressed and release the lever 107, which by falling raises the end of the lever 106, to which the block 104 is attached, and withdraws said block from its position between

115 the cam and the short arm of the bell-crank lever 99, thereby allowing another revolution of the cam without the operation of the aforesaid belt-shifting mechanism.

Another block, 104', is suspended alongside the block 104 on a cord or chain 114, which cord extends to the lever 115, passing over a

120 sheave 114' mounted directly over said block 104', secured to a shaft 116, which lies on the frame 1, transversely thereof, carrying an arm 117 in the line of motion of the fly 118, Fig. 1, of the press, and lying between the fingers

125 of said fly. Obviously the said fingers will not engage the said arm 117 ordinarily—that is, when no sheet has been thrown from the impression-cylinder of the printing-press thereunto—in which case the block 104' will

130 remain in position between the cam 98 and the lever 99, and the press and feeder will be stopped. In case there is a sheet on said fly the arm 117 will be engaged by the face of



said paper and swing in the same direction as the fly moves, pulling upon the cord 114 and raising the block 104' for the purpose previously described in connection with the block 104. It is obvious that when a sheet fails to leave the feeder or the press at the proper time, either the block 104 or 104', respectively, will be allowed to remain between the cam 98 and the short arm of the lever 99, and both the feeder and the press will be stopped, practically instantaneously, as the presence of either or both of these blocks insures the action of the cam through it or them to move the lever.

No matter what the position of the fly of the press relatively to the sheet-feeder, the cord 114 may be extended to transmit motion therefrom to the block thereon. In the construction and arrangement shown, the sheet-feeder occupies the position of the ordinary hand feeding-table.

The operation of this device is as follows: The operation of the table-elevator, the spraying device, the automatic stop mechanism, the feed-table and grids having been set up in the description of the construction thereof, it is not deemed necessary to again describe them, but I will now proceed to describe the means for separating and delivering the sheets to the tapes. The action of the wheel 24 is to advance the sheets, three arms thereon being sufficient for this purpose, the remainder being omitted in order to allow the paper to be freely withdrawn from the pile by the other mechanism described for the purpose. The operation of the wheel 24 is practically continuous, as it at all times keeps several sheets advanced to a position where they could be raised at the front edge. The dentated finger 44, reciprocated by means of the gibbous-shaped cam 36, engages this forward end of the paper, and by lifting it thoroughly separates it from the pile, the tongues 49 being withdrawn to allow this lifting, and then returned to their place on top of the forward edge of the pile of paper under the sheet which has just been lifted. As soon as the parts shall have reached the positions shown in Fig. 1—that is, with the arm 42 raised by the cam 36 to its upward limit of movement, raising the fingers 44 with it—the abutting ends 41 of the cams 39 strike the fingers 44 and cause them to swing forward, releasing their hold on the paper, which drops back on the pile of paper and the tongues 49. When the fingers are brought into this position they are held by the cylindrical faces 40 of said cams until it is again time to raise the sheet, the next subjacent one of the pile. As seen in Fig. 1, the rubber block 28 on the dog 27 is just about to come into contact with the paper and said dog is being carried forward by the swinging or revolution of the arm 26. Now, as soon as the paper is dropped from the dentated finger 44, this block is moved forward at a considerable speed and the sheet of paper is forced forwardly, entering between the rollers 45 and

46 and being thence carried by the tapes to the side shifting and forwarding bed, the said rubber-pressed sheet being separated from the pile by means of the tongues 49, and said rubber passing directly over said tongues so that the quick motion of the upper sheet is not transmitted to the subjacent one. The operation is thus once completed and the parts are in the positions to again perform it.

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

1. In a sheet-feeding machine, means for separating and advancing the sheets, a gibbous-shaped cam revolubly mounted over the front edge of the pile of paper, a pivoted lever lying on said cam and carrying on its free end a pendulous finger provided with means for engaging the projected edge of the top sheet, when depressed, and lifting the same and means for causing the disengagement thereof on its elevation and of forwarding said sheet.

2. In a sheet-feeding machine, means for separating and advancing the sheets, a gibbous-shaped cam revolubly mounted over the front edge of the paper pile, a pivoted lever lying on said cam and carrying on its free end a pendulous finger provided with means for engaging the projected edge of the top sheet when depressed and lifting the same and means for causing a disengagement thereof, consisting of a cam carried on the same shaft as the gibbous-shaped cam and adapted to strike said finger and swing it forwardly.

3. In a sheet-feeding machine, means for separating and advancing the sheets, a gibbous-shaped cam revolubly mounted over the front edge of the pile of paper, a pivoted lever lying on said cam and carrying on its free end a pendulous finger provided with means for engaging the projected edge of the top sheet when depressed, and lifting the same, and means for causing a disengagement thereof, consisting of a cam carried on the same shaft as the gibbous-shaped cam and adapted to strike said finger and swing it forwardly, and having a semicylindrical surface contacting with said finger and holding it swung outwardly during the time the first-named lever lies on the gibbous-shaped cam, along its cylindrical peripheral surface, substantially as specified.

4. In a sheet-feeding machine, the combination of means for projecting the edge of the top sheet and mechanism for lifting the front edge of the top sheets consisting of a pivoted lever carrying a pendent dentated finger on its free end, the guides for said finger thereon, means for causing a vertical vibration of said lever and a cam adapted to swing said finger away from the engaged sheet of paper upon the ultimate elevation thereof and to allow said finger to swing back upon its depression and means for forwarding the sheet so separated, substantially as and for the purpose specified.



5. In a sheet-feeding machine, a paper-supporting table, means for separating the top sheet of paper from the pile and lifting its forward edge and a shaft revolubly mounted  
 5 over said table and carrying an arm thereon, a pivoted dog on the end of said arm and a rubber block on the contacting end, said arm and dog being so proportioned and arranged as to tend to parallel their longitudinal axes  
 10 upon the contacting of said dog with the paper, and pivoted arms carrying tongues on their free ends adapted to be inserted under the lifted sheet of paper along the line of traveling contact of said block with said top sheet  
 15 of paper, substantially as and for the purpose specified.

6. In a sheet-feeder, a paper-supporting table, means for separating the top sheet of paper from the pile, a rotatable shaft journaled  
 20 over said table and carrying an arm, a dog pivoted at about its middle to the said arm, a friction-block on the lower end thereof, said arm and dog being so proportioned and arranged as to force the said block downwardly  
 25 against the paper as said block is moved in contact therewith, substantially as and for the purpose specified.

7. In a sheet-feeding machine, a paper-table, means for separating the top sheet from  
 30 the pile of paper and for advancing the said sheet, the latter consisting of a rotatable shaft journaled over the aforesaid table, an arm carried thereon, a dog pivoted by about its middle on said arm, a friction-block carried  
 35 on the lower end thereof, and a pin adapted to contact with said dog along its other end as it is carried through the first part of the lower half of its circle of rotation and acting to prevent the said friction-block from de-  
 40 scending prematurely from its circular path, for the purpose specified.

8. In a sheet-feeding machine, a paper-table, means for separating the top sheet from  
 the pile of paper and for advancing the said  
 45 sheet, the latter consisting of a shaft rotatably mounted over said table, an arm carried thereon, a dog carrying a friction-block on its lower end and pivotally secured to the end of said arm by about its middle, an arm projecting  
 50 to a point near the descending line of motion of the said dog around the aforesaid shaft and carrying a flange parallel to said line of motion, for the purpose of guiding the said dog in its movement downwardly toward the  
 55 sheet of paper thereunder with the friction-block foremost.

9. In a sheet-feeding machine, the combination of a vertically-adjustable paper-table and means for adjusting same consisting of a  
 60 ratchet-wheel and means for connecting same operatively with said table, a pawl bent on its end at substantially a right angle to its body and adapted to partially encircle and engage said ratchet-wheel by depression, a plunger  
 65 mounted on the frame and having movement longitudinally thereon, a pin on the lower end of said plunger resting under said pawl,

a rock-shaft mounted on the machine, a lever thereon connected to the upper end of the aforesaid plunger and another lever secured  
 70 to said rock-shaft its end contacting with the upper side of the pile of paper, and forming means for partially rotating this rock-shaft upon the removal of a predetermined thick-  
 75 ness of paper from the pile of paper on the paper-table, a distance correlative to said thickness of paper previously removed.

10. In a sheet-feeding machine, means for starting the sheet forward, means for lifting  
 the front edge after said movement forward, 80 and means for injecting a spray of water under said sheet so lifted consisting of a reservoir and an air-compressor, an air-pipe leading from said air-compressor to said reservoir, a  
 85 water-pipe leading from within said reservoir near its bottom upwardly to a point at or above the top thereof thence to a point near the front edge of the paper pile, a nozzle thereon directed at the space between the lifted sheet  
 90 and said pile of paper, and with the aforesaid air-pipe extending to a point back of said water-nozzle and a nozzle thereon directed so as to deliver a jet of air at and substantially parallel to a stream of water issuing from said  
 95 water-nozzle, substantially as specified.

11. In a sheet-feeding machine, a paper-table, means for separating the sheets and  
 advancing them singly, rollers mounted at one  
 end of said table and arranged one set above  
 the other, tapes running on the lower set of  
 100 rollers and on idler-rollers, and fingers joined at their upper ends and being provided with hooks adapted to engage the shaft of the upper set of rollers, said fingers lying by their ends  
 upon the upper side of the upper half of said  
 105 tapes, their bodies being at a slight angle thereto, for the purpose specified.

12. In a sheet-feeding machine, a paper-table, means for separating the sheets and  
 advancing same singly to a straightening-  
 110 table, said straightening-table, a side guide thereon and a grid over said table consisting of slotted transversely-extending bars at the head and foot of said straightening-table, longi-  
 115 tudinally-extending bars secured to the aforesaid bars over said straightening-table and laterally and vertically adjustable thereon by means of screws passing through said  
 slotted, transverse bars and into said longi-  
 120 tudinally-extending bars, substantially as specified.

13. In a sheet-feeding machine, means for  
 advancing the top sheet, stop mechanism con-  
 sisting of a cam mounted on a properly-timed  
 shaft, a lever pivoted with one end a short dis-  
 125 tance from the working face of said cam, and connected with belt-shifting mechanism, a block adapted to be inserted between said cam and lever, and a finger pivoted and lying in  
 the path of the moving sheet of paper and  
 130 means for operatively connecting said finger and said block, thereby forming means for inserting said block upon failure of the sheet of paper to pass said finger.



14. In a sheet-feeding machine, means for  
advancing a sheet of paper and an automatic  
stop mechanism consisting of a cam, a lever  
5 thereof but with an intervening space, a belt-  
shifting device and means for operatively  
connecting same with the said lever at one  
end, a block larger than the space between  
the said lever and the working face of said  
10 cam and being normally seated between said  
cam periphery and lever, a lever pivoted on  
the frame and a cord connecting one end of  
said lever with said block, an arm pivoted on  
the frame and adapted to operatively engage  
15 the last-named lever, a latch engaging said  
arm when it is elevated and adapted to retain  
the same in its elevated position, and a finger  
projected across the line of motion of the  
sheet being advanced and connected to said  
20 latch so as to release the engagement between  
same and said arm.

15. The combination, with a sheet-delivery  
fly, of a lever extending across the line of  
movement of the said fly, a cam and a lever  
25 mounted with its end near the working face  
of said cam but with a space intervening be-  
tween same and connected to a belt-shifting  
device, a cord attached to the first-named  
lever, a deflecting-sheave vertically over said  
30 space adapted to carry and deflect said cord,  
and a block secured to the free end of said  
cord and lying normally in the space between  
the said lever and the working face of the  
said cam, substantially as and for the pur-  
35 pose specified.

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

LINTON C. HOPKINS.

Witnesses:

A. P. WOOD,  
H. L. KEITH.