T. C. DEXTER.

PAPER FEEDING MACHINE.

APPLICATION FILED JULY 6, 1908.

937,024.

Patented Oct. 12, 1909.

6 SHEETS—SHEET 1.

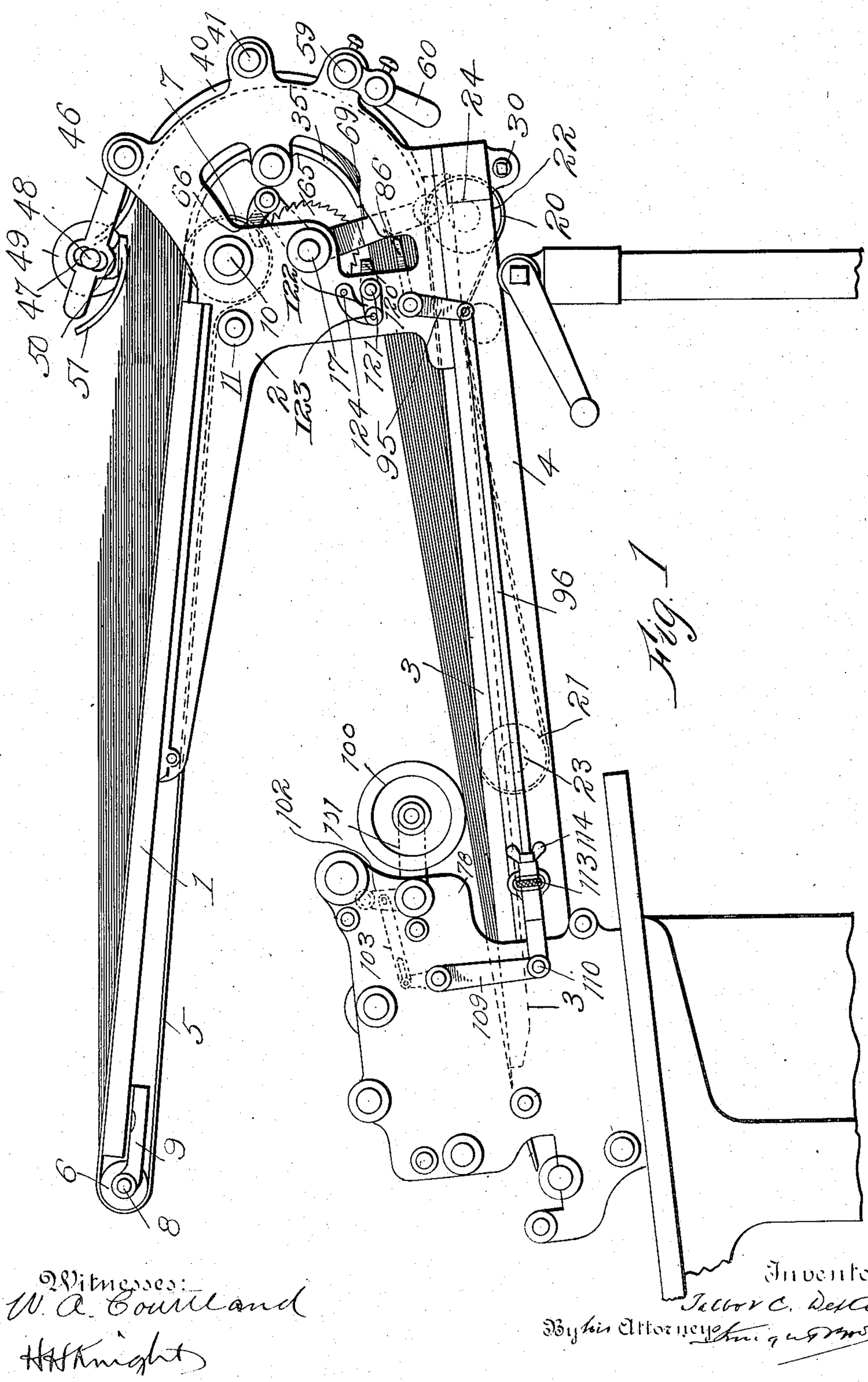

Fig. 1

Witnesses:
W. A. Coulland
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By his Attorneys

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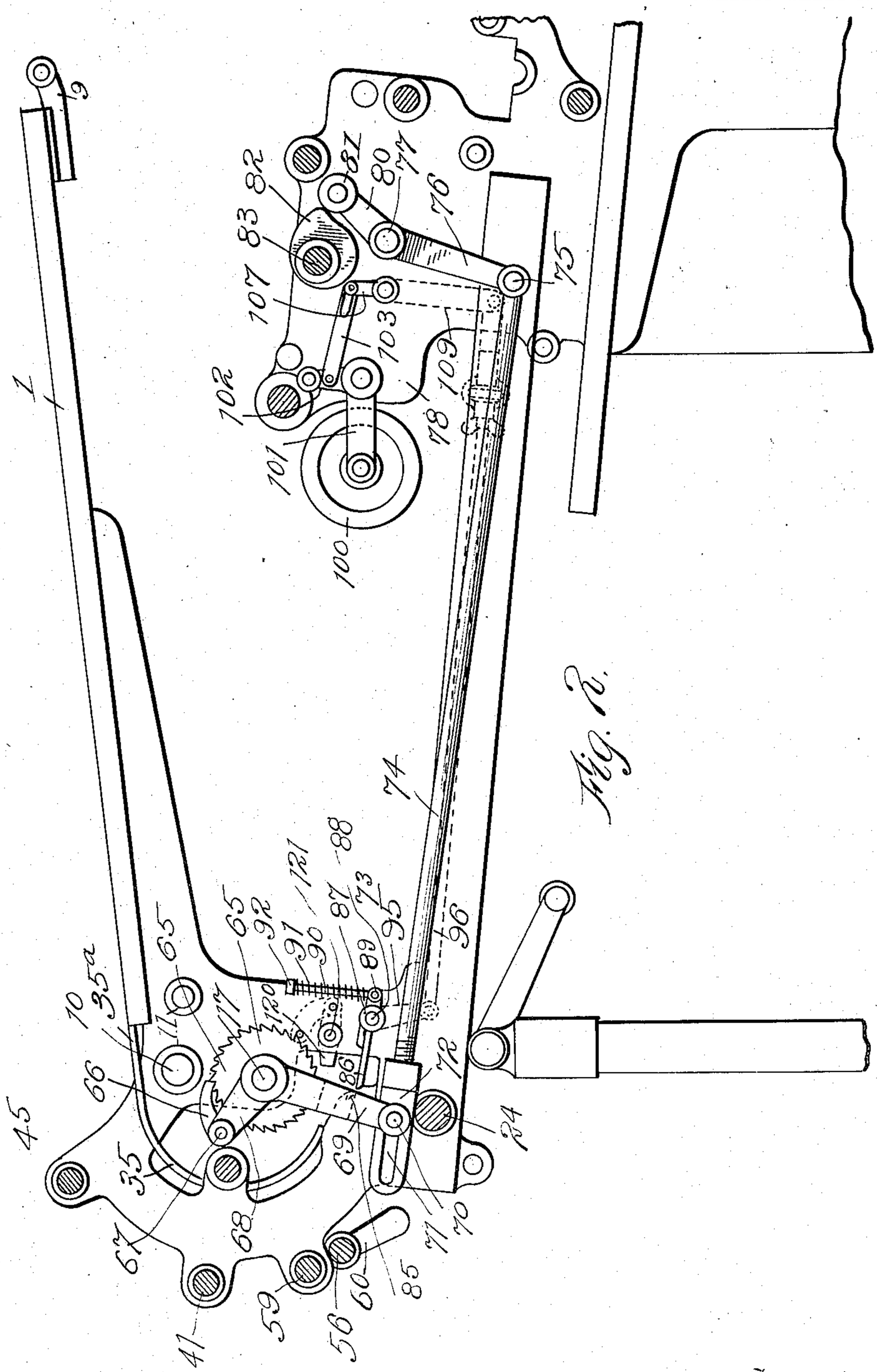

Fig. 2.

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6 SHEETS—SHEET 3.

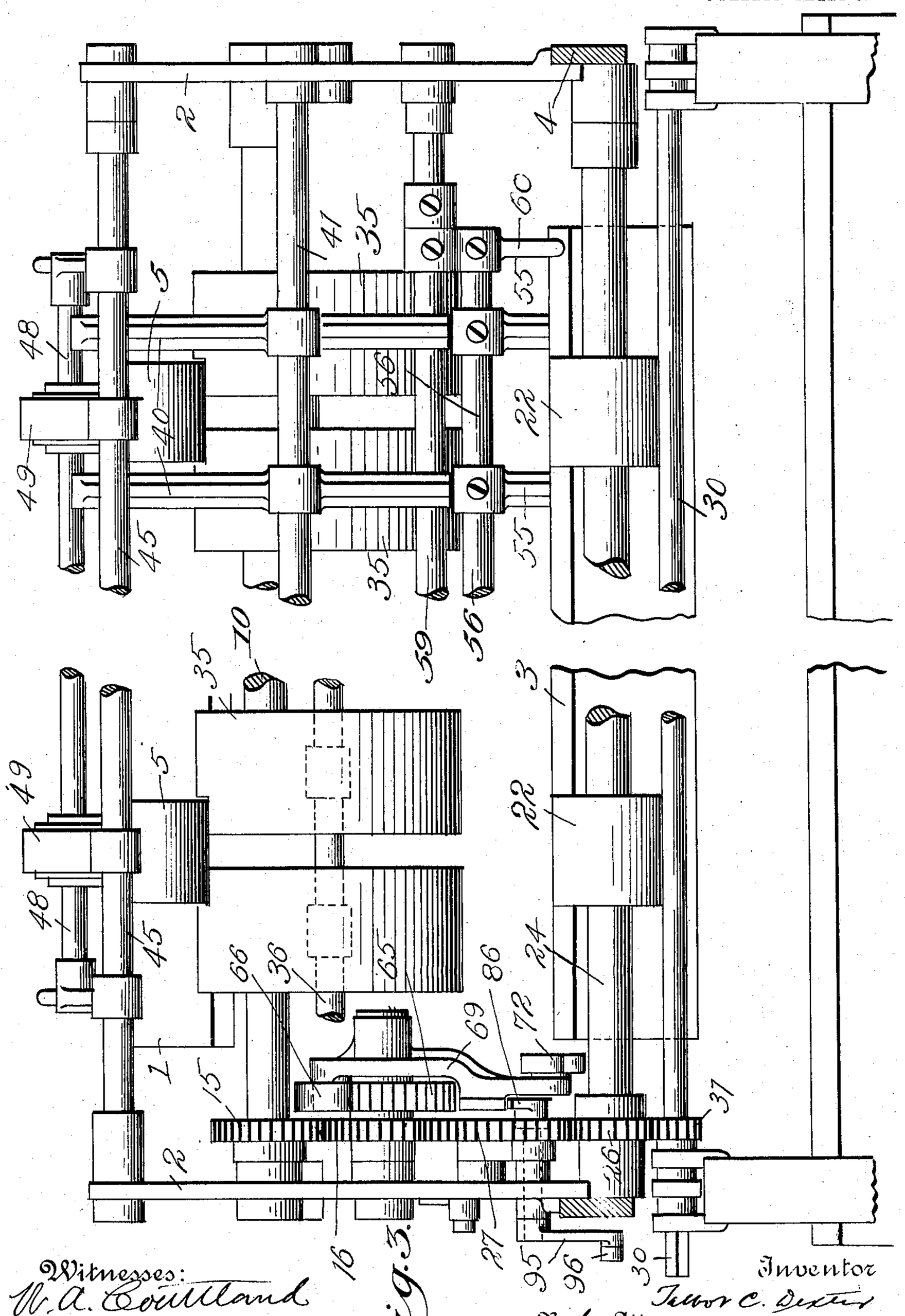

Fig. 3.

Witnesses:
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6 SHEETS—SHEET 4.

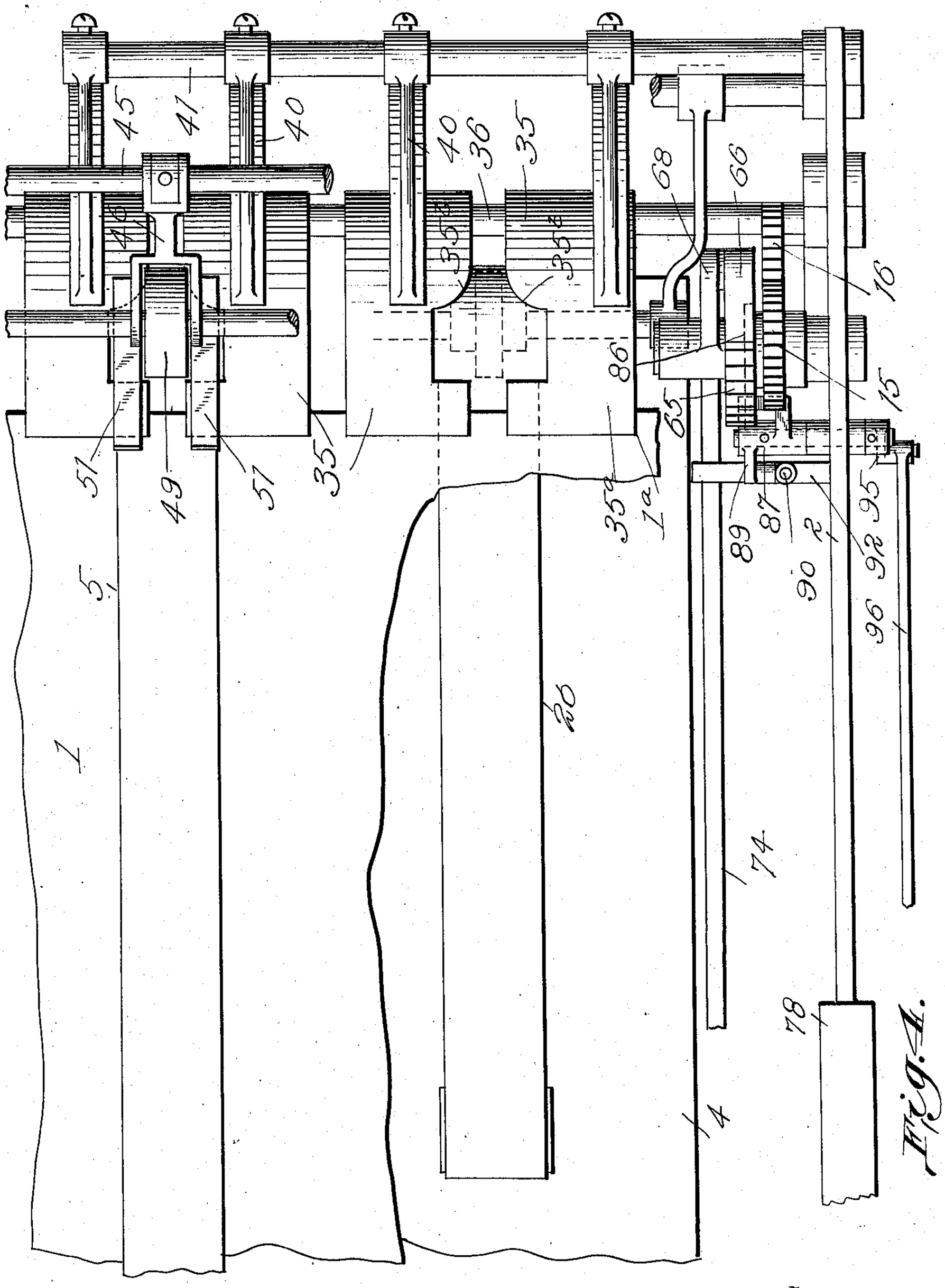

Fig. 4.

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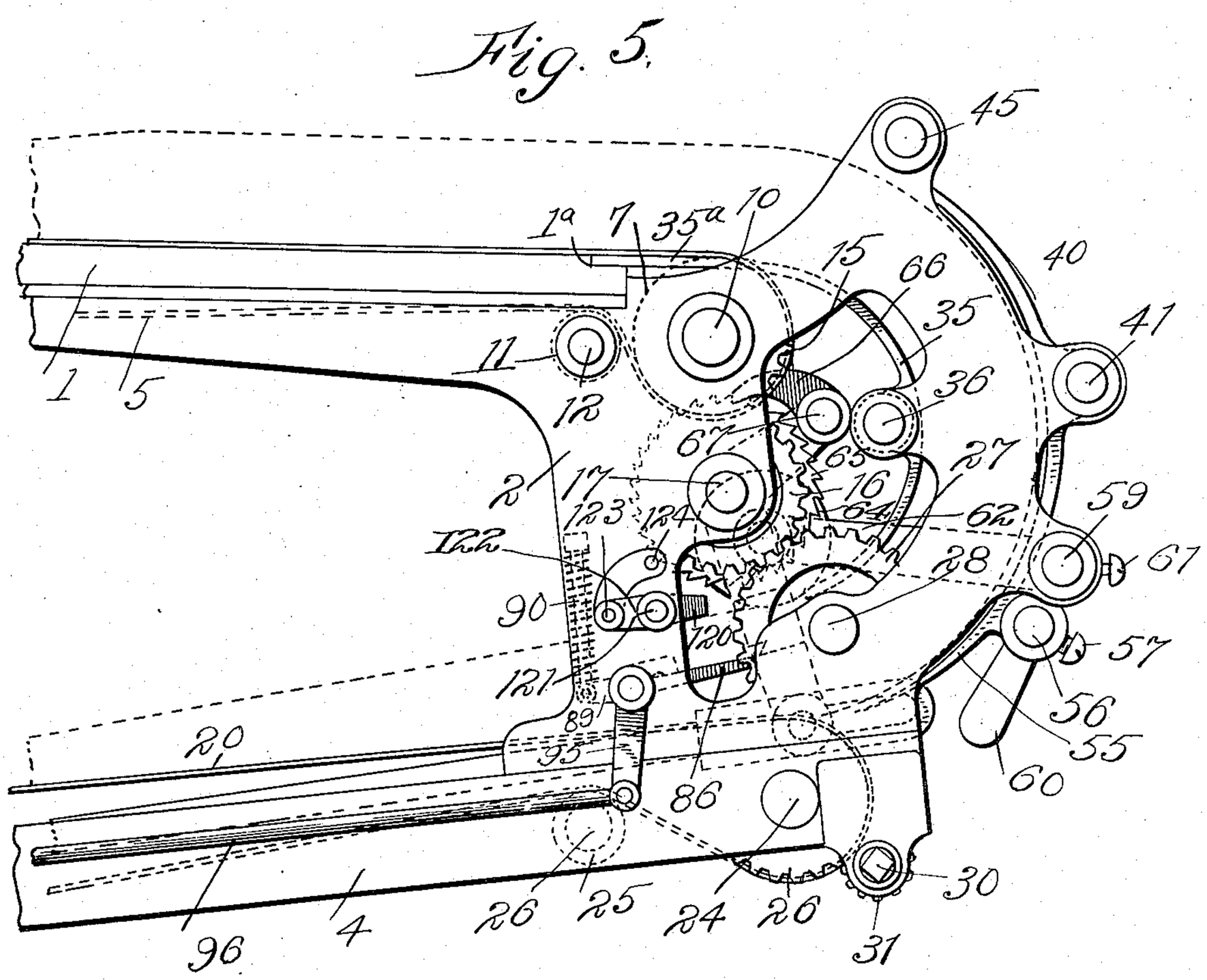
6 SHEETS—SHEET 5.

Fig. 5.



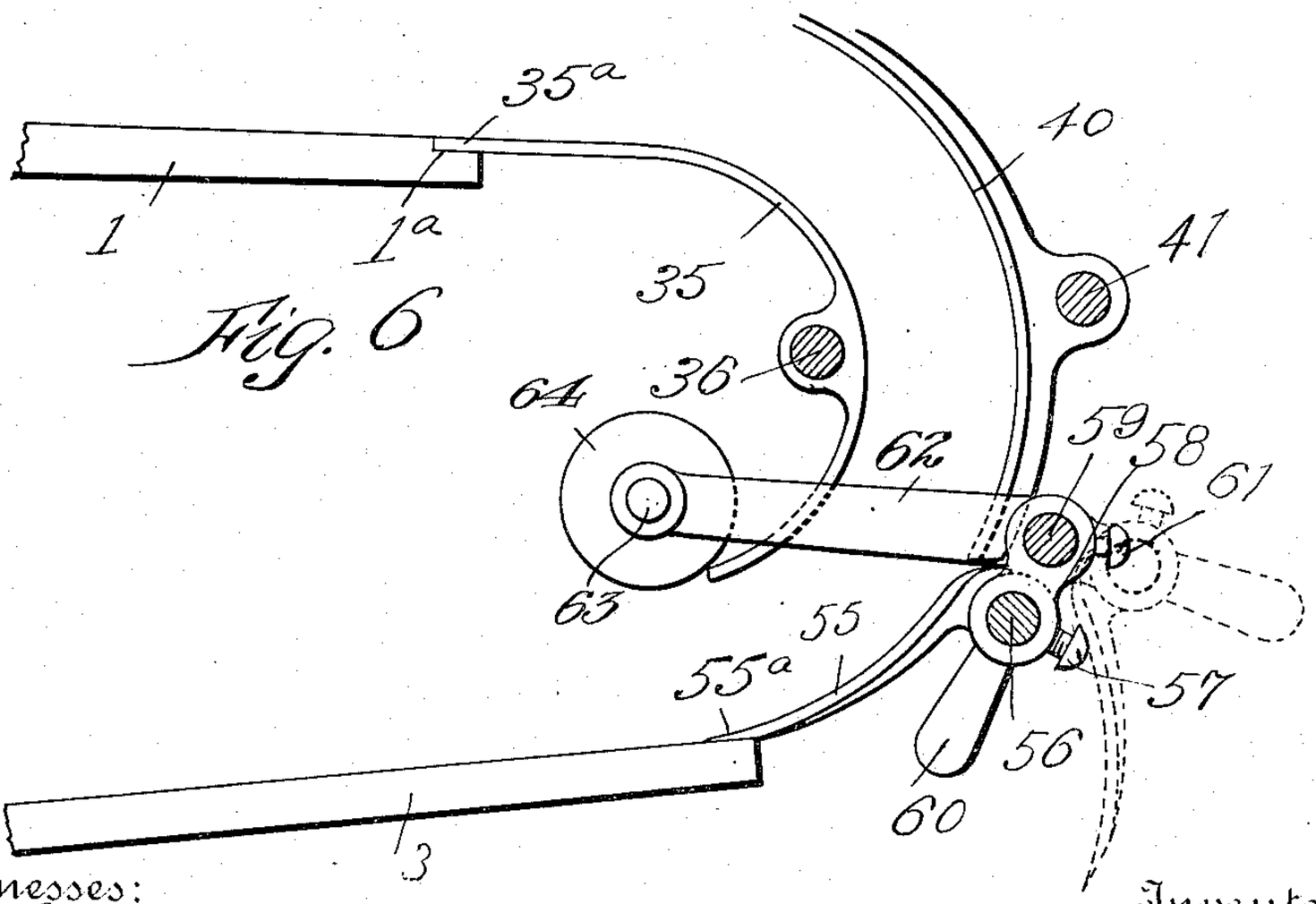


Fig. 6

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6 SHEETS—SHEET 6.

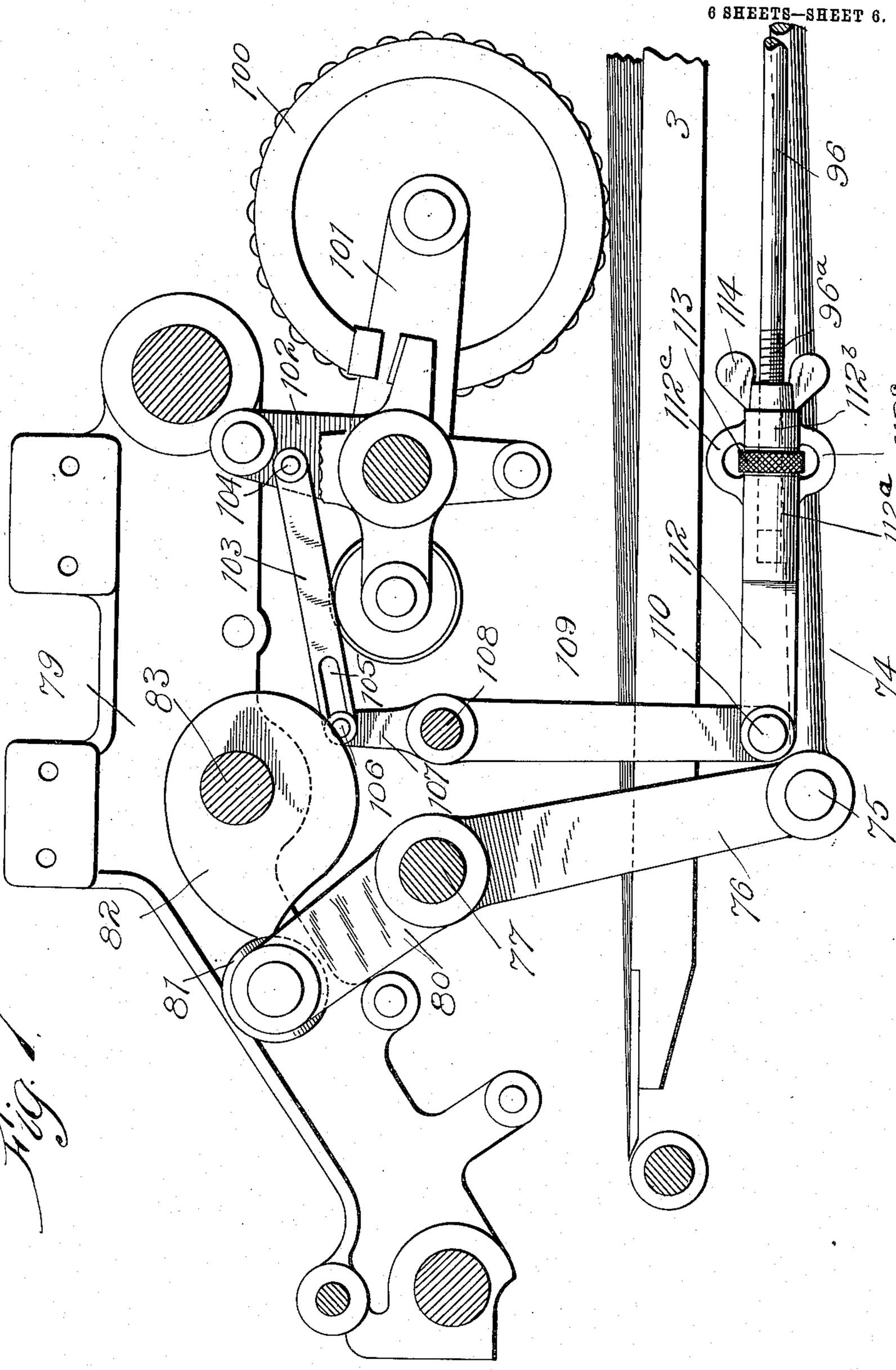

Fig. 7.

Witnesses:
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H. H. Knight

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Jacob C. Dexter
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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

PAPER-FEEDING MACHINE.

937,024. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed July 6, 1908. Serial No. 442,114.

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, and a resident of Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

My present invention relates generally to improvements in paper feeding machines, and particularly to feeding machines of the sheet combing type, in which the pile of sheets is acted upon by combing feeding devices which comb or feather out the top sheets of the pile to gradually separate the successive sheets near the top so they may be drawn from the pile periodically and fed to any machine arranged to operate upon the individual sheets.

The main features of my present invention relate particularly to improvements in the type of combing feeding machines in which a bank of sheets is placed upon a supply table and passed by suitable feeding mechanism to a feeding table mounted beneath the supply table, and is there acted upon by the combing feeding and separating devices which feed the successive separated sheets forwardly into position to be taken by delivery devices which pass them from the feeding machine to the machine which is to operate upon the sheets. In machines of this type it has been customary in the past to provide between the supply and feed table at their rear ends, a feeding drum or series of large feeding wheels, the peripheries of which constitute the inner surface of the throat or passage way leading from the supply table to the feed table, the outer surface of this communicating throat being formed by curved guide fingers or by an additional guiding belt engaging the outer curved face of the pile of sheets as it passes from the upper to the lower table.

The improvement upon this particular type of double table feeding machine consists of a novel arrangement of guides forming this curved throat or passage way communicating between the rear ends of the supply and feeding tables. I have done away with the feeding drum or series of feeding wheels at the inner side of the curved throat and have substituted therefor a series of rigid curved guiding fingers which lead from the rear belt roller of the supply table to a plane above the rear belt roller of the feed table. I have found that these rigid guides at the inner end of the curved throat can be effectively used without interference with the proper operation of the machine, mainly because the tendency of the pile of sheets passing from the supply table to the feed table, while being bent in the form of a curve, tends to throw the bank of sheets outwardly away from the inner guiding surface of the throat so that there is in reality no need for moving the guiding surface forming the inner face of the throat. In addition to this novel arrangement I have provided rear curved guiding fingers forming the outer surface of the throat between the two tables in parts or sections, the upper section of each guide being rigidly mounted in the frame, while the lower section of each guide is mounted upon a rock shaft controlled by an operating hand lever in such manner that the lower sections of all the rear guides may be withdrawn from their operative positions to form an outlet from the curved throat at the rear of the machine to facilitate the removal of sheets at this point when for any reason it is desired to remove the final sheets of a pile without passing them over the feed table and having them acted upon by the separating and feeding devices.

My present improvements also include a novel form of feed governor for controlling the operation of the feed belts which move the fanned out bank of sheets over the supply and feed tables and through the throat communicating between these tables. This feed governor includes in combination with a cam operated ratchet mechanism for moving the feed belts, a controlling dog or stop suitably connected with one of the sheet separating and feeding devices of the feed table, and moved thereby into and out of the path of one of the pawl operating arms. By this arrangement the feeding action of the belts is controlled by the height of the fanned out bank of sheets in the vertical plane in which the separating and feeding devices operate.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings, and afterward point out the novelty more particularly in the annexed claims.

In said drawings Figure 1 is a side eleva-

tion of a paper feeding machine embodying my invention. Fig. 2 is a longitudinal sectional elevation of the same looking from the opposite side of the machine. Fig. 3 is a rear elevation of the same. Fig. 4 is a plan view of the same, having parts broken away for the sake of clearness. Fig. 5 is an enlarged detail side elevation of the rear portion of the machine showing the operating mechanism for the feed belts and the curved throat communicating between the supply and feed tables. Fig. 6 is a longitudinal sectional elevation of the same part of the machine, showing more particularly the arrangement of the guides forming the curved throat between the two tables. Fig. 7 is a longitudinal sectional elevation of the separating and feeding mechanism of the machine, with particular reference to the operation and control of the belt operating mechanism.

Paper feeding machines of the type shown in the accompanying drawings to which my present improvements have been applied, include two distinct sheet feeding and separating mechanisms, namely, first the means for gradually forwarding and fanning out a bank of sheets by passing them from a supply table to a feed table, and presenting them in reversed position upon the feed table; and second, a final separating and feeding mechanism which successively detaches single sheets from the fanned out bank or pile and passes the individual sheets to delivery mechanism, which forwards the sheets to the machine which is to operate upon them.

In the accompanying drawings which illustrate this type of machine with my improvements embodied therein, 1 is a supply table mounted in inclined position upon the side bracket frames 2 directly above a feed table 3 which is suitably mounted in the base side frames 4 of the machine. The supply table 1 is inclined downwardly toward the rear, while the feed table 3 is inclined downwardly toward the front.

Passing longitudinally over the inclined supply table 1 are the heavy endless feed belts 5 which pass around two series of supporting pulleys 6 and driving pulleys 7. The supporting pulleys 6 are mounted upon a shaft 8 which is journaled in brackets 9 secured beneath the upper forward end of the supply table 1. The driving pulleys 7 are mounted upon transverse shaft 10 journaled in the side bracket frames 2. A series of tension guiding pulleys 11 are mounted upon a transverse shaft 12 which is also journaled in side bracket frames 2.

Keyed to the shaft 10 is a gear wheel 15 meshing with a similar driving gear wheel 16 keyed on a driving shaft 17 which is journaled at its opposite ends in the side bracket frames 2. This driving shaft 17 is intermittently operated by a pawl and ratchet mechanism through means which will presently be described.

Passing longitudinally over a portion of the lower feed table 3 is a series of heavy feeding belts 20 which are mounted upon a series of supporting and driving pulleys 21 and 22 mounted respectively on the transverse shafts 23 and 24, suitably journaled in the base frame 4. It will be understood that the pulleys 21 and 22 are mounted in slots formed in the feed table 3, so as to permit the feed belts 20 to pass above and below the table around said pulleys. A series of tension and guiding pulleys 25 is mounted upon transverse shaft 26 suitably journaled in the said base frames 4 in position to engage and guide the endless feed belts 20.

Keyed to the shaft 24 is a gear wheel 26 which meshes with a similar intermediate gear 27 journaled on one of the side bracket frames 2 at 28, and in turn meshing with and driven from the gear 16 on driving shaft 17. From this described arrangement it will be observed that the rotation of driving shaft 17 imparts motion simultaneously to the endless feed belts 5 and 20 for forwarding and fanning out a bank of sheets.

30 is a transverse shaft journaled in the base frames 4 at the rear and carrying a pinion 31 which is in constant mesh with the gear wheel 26 upon shaft 24. This shaft 30 has a squared end to receive a crank by which the shaft may be rotated for operating the feeding belts by hand when it is desired to move the bank of sheets into any desired position preliminary to starting the machine, or in case it should be desired to entirely remove the remainder of the pile of sheets from the machine without passing them entirely through under the action of the sheet separating and feeding devices which operate above the feed table 3. In this latter case the lower sections of the rear guides forming the curved throat between the supply and feed tables are moved out of normal operative position to permit said remaining sheets of the bank to be fed out through the rear opening thus formed, in a manner which will be more fully explained hereinafter.

In place of the feeding drum or series of large feed rollers which are customarily employed in machines of this type for assisting in the transfer of the bank of sheets from the supply to the feed table and constituting the inner surface of the curved throat communicating between the rear ends of these tables, I have provided a series of stationary curved guide plates, shown at 35, which are mounted at intervals upon a transverse stay rod 36 which is supported at its opposite ends in the side bracket frames 2. The upper ends 35ª of the curved guides 35 rest in the recesses at 1ª formed in the upper rear end of the

supply table 1, so as to form continuations of the surface of the supply table. The lower ends of these curved guide plates 35 terminate above the rear end of the feed table 3 a sufficient distance to permit the free passage between said ends of the guide plates and the feed table, of a combed out pile or bank of sheets. The curved guides 35 are cut away at 35[b] adjacent to their upper ends for the reception of the belt driving pulleys 7.

The rear wall of the curved throat communicating between the supply and feed tables is formed in my machine of sectional curved guides, the main portions of which, indicated at 40, are mounted upon cross stay rods 41, suitably supported from the side bracket frames 2. The upper ends of these curved guides 40 extend forwardly beyond a cross shaft or bar 45 movably mounted in the side bracket frames 2 and carrying the forwardly projecting arms 46 formed with vertically arranged elongated slots 47, in which are loosely journaled the transverse shaft 48 carrying a series of pressure rollers 49 which are designed to rest in contact with the upper surface of the combed out pile of sheets to assist in guiding the leading edges of the upper sheets beneath the upper ends of the rear curved guides 40 as the bank of sheets starts to curve downwardly into the communicating throat. These forwardly projecting arms 46 carry pressure shoes 50 having forwardly extending curved spring guiding fingers or blades 51, which guide the leading edges of the top sheets of the bank beneath the peripheries of pressure rollers 49, so as to avoid the possibility of bending back or folding the edges of the sheets as they pass into the communicating throat. The arms 46 are preferably rigidly fixed to the transverse shaft 45 so that by rotating the shaft 45 to the rear by taking hold of one of the arms 46, the pressure rollers 49 and shoes 50 may be moved up and back away from their engagement with the pile of sheets.

The lower sections of the rear wall of the communicating throat are in the form of curved fingers 55 adjustably secured to a shaft 56 by means of set screws 57, said shaft 56 being hung in bracket arms 58 mounted upon a cross tie rod 59 supported in the side bracket frames 2. One of the supporting brackets 58 has a handle extension 60, by which the bracket arms 58 may be rocked upon the tie rod 59 for moving the curved fingers 55 into and out of operative position. Set screws 61 hold the bracket arms 58 in the desired adjusted position.

With particular reference to Fig. 6 of the drawings it will be observed that in the normal position of the guide fingers 55 as shown in full lines, the forward beveled ends 55[a] rest in contact with the upper surface of the rear end of the feed board 3, said guide fingers forming practically continuations of the curved guide fingers 40 which constitute the upper sections of the rear wall of the curved throat. When it is desired to feed the remainder of the bank of sheets out of the machine at the rear, the set screws 57 and 61 are loosened and by taking hold of the handle 60 and pulling backwardly thereon, the guide fingers 55 are withdrawn rearwardly from engagement with the feed board 3 into position shown in dotted lines, so that any sheets which remain in the upper portion of the machine can be passed out through the opening at the rear. This may be accomplished by rotating the shaft 30 by hand crank as above explained.

Projecting forwardly from and freely journaled upon the tie rod 59 at each side of the machine, is a rock arm 62, and supported in the forward ends of said rock arms 62 is a shaft 63 upon which are mounted the pressure rollers 64. This series of pressure rollers 64 engages the fanned out pile of sheets above the feed table at its receiving end, or at the point of connection with the curved throat. The pressure rollers engage the sheets above the conveying belts 20 and tend to hold the sheets together with sufficient pressure to cause them to feed properly with the feed belts.

Returning now to the consideration of the mechanism for driving the series of feed belts which pass over the surfaces of the supply and feed tables, it will be observed, particularly with reference to Figs. 1, 2 and 5 of the drawings, that a ratchet wheel 65 is keyed to the driving shaft 17, and that a driving pawl 66 pivotally mounted at 67 in the end of a rock arm 68 rests by gravity in engagement with the ratchet wheel 65. The pawl carrying rock arm 68 is journaled upon the driving shaft 17, and has depending therefrom a rigidly connected rock arm 69 carrying at its lower end a laterally projecting pin or lug 70, which operates in a longitudinal slot 71 formed in a block 72 adjustably connected, as by screw threading, with a forwardly extending rod or pitman 74 pivoted at 75 to the lower end of a rock arm 76 keyed to a transverse rock shaft 77. This rock shaft 77 extends transversely of the feeding machine and is journaled in the side frames 78 and auxiliary frame pieces 79, which frame parts 78 and 79 constitute the supporting frame of the second separating and feeding mechanism which individualizes the sheets preparatory to forwarding them from the machine. The rock shaft 77 carries an upwardly projecting rock arm 80 having a freely journaled antifriction roller 81 operating in peripheral contact with cam 82 mounted on a cam shaft 83, suitably journaled in the machine frame. From this description it will be observed that, by the cam 82 operating through rock arms 76 and

80 and rod or pitman 74 and the pawl and ratchet mechanism described, the driving shaft 17 will be intermittently rotated for imparting feeding motion to the endless belts 5 and 20. Without any governor or controlling device, this belt operating mechanism would operate continually which would cause the bank of sheets to be fed too rapidly to be taken care of by the separating and feeding devices which individualize the sheets. To obviate this difficulty, I have provided a governing device controlled by the sheet combing separating and feeding device, which I will now describe.

The pin and slot connection 70, 71, between rock arm 69 and rod or pitman 74 permits the arrest of the pawl carrying rock arm at the limit of its forward or feeding stroke without interference with the continued rotation of the cam 82 above referred to. This depending rock arm 69 is formed with a notched shoulder 85 with which a stop finger or dog 86 is adapted to engage to prevent the return movement of the pawl carrying rock arm. This stop finger or dog 86 projects from a hub 87 mounted upon a short shaft 88 journaled in the side bracket frame 2, and having a forwardly projecting lug 89 to which is pivoted a vertical rod 90 supporting a tension spring 91. The rod 90 extends up through a bracket lug 92, the spring 91 being confined between the lugs 89 and 92 for imparting to the stop finger or dog 86, a tendency to move upwardly into the path of the notched shoulder 85 upon rock arm 69.

Depending from the rock shaft 88 is a rock arm 95 connected at its lower end with a rod or pitman 96, by which the stop finger or dog 86 is controlled in the manner presently to be explained. The rod or pitman 96 is designed to be connected with a movable part of any suitable sheet separating and feeding device of the type which is free to approach more or less closely to the top of the feed board, depending upon the thickness of sheets presented upon the feed board beneath the instrument. I prefer to apply my invention to a sheet separating and feeding machine such as shown in my application Serial No. 436,637, filed June 4th, 1908, in which machine a sheet combing wheel is suitably supported above a bank of sheets on a feed board and controlled by sheet actuated devices which intermittently cause and arrest the feeding operation. In my present application I have shown parts of this same combing separating and feeding device, but since the specific construction and operation of the feeding device are not pertinent to my present invention, I will not describe the said structure in detail, but will refer to said pending application for a more complete explanation of one form of mechanism with which my improved feed governing device may be employed. I would have it understood that it is immaterial to the operation of my improved feed governing device whether the feeding instrument to which it is connected is raised and lowered to control the feeding operation, but it is essential that the feeding instrument be free to follow the changing elevation of the working surface of the top of the pile.

100 is a sheet combing wheel mounted to rotate in the rocking frame 101 having an upwardly projecting rock arm 102. A link 103 is pivotally connected at 104 with the rock arm 102, and is formed in its forward end with a longitudinal slot 105, with which engages a lateral pin 106 mounted in the upper end of a rock arm 107 keyed to a rock shaft 108 from which extends the downwardly projecting rock arm 109 pivotally connected at its lower end 110 to an adjustable coupling link 112 of the rod or pitman 96 above referred to. This coupling link 112 is formed with a longitudinally bored cylindrical portion 112^a and a binding ring or collar 112^b connected with the portion 112^a by the yoke arms 112^c, said yoke connection between the ring or collar 112^b and portion 112^a of the connecting link affording a recess or transverse opening between these parts for the reception of a milled adjusting nut 113. The forward end of the rod or pitman 96 is threaded as shown at 96^a, said threaded end being passed freely into the longitudinal bore formed through parts 112^a and 112^b, and having threaded upon it between said parts the milled adjusting nut 113. By this means the length of the pitman connection between rock arms 109 and 95 can be adjusted to a nicety to suit the requirements of the machine to the particular work being performed. A thumb nut 114 is threaded upon the rod 96 outside of the ring or collar 112^b to be clamped rigidly against it for binding the parts in the required adjusted position.

The parts being adjusted to suit the requirements of the work to be performed, it will be observed that the fall of the combing wheel into operative engagement with the pile of sheets determines the position of the stop finger or dog 86 with relation to the notched shoulder upon rock arm 69. So long as the thickness of sheets directly beneath the combing wheel remains normal, the stop finger or dog 86 will be allowed to remain in the path of the shoulder upon rock arm 69, so as to thereby prevent the operation of the belt feeding mechanism. As soon, however, as a sufficient number of sheets have been passed forwardly from the feed board 3 to materially reduce the thickness of sheets presented beneath the combing wheel, it will, of course, be clear that the combing wheel will approach closer to the feed board and its movement operating

through the connections described will withdraw the stop finger or dog 86 out of the path of the notched shoulder 85 against the action of spring 91, so as to permit the rock arm 69 to follow the operating pitman 74, the pawl carrying arm and connected parts moving by gravity to carry the pawl rearwardly upon the ratchet wheel in readiness to engage and feed forward the ratchet wheel and driving shaft 17 under the positive forward action of the actuating cam 82.

As explained, the pawl carrying rock arm 68 and operating rock arm 69, are moved upon their return or inactive stroke by gravity. It is sometimes desired to regulate the length of the stroke of the pawl carrying rock arm, and to do this I have provided a stop finger 120 mounted upon a short rock shaft 121 journaled in the side bracket frame 2, and projecting in the plane of movement of the rock arm 69. The opposite end of short rock shaft 121 carries a rock arm 122 having in its outer end a movable pin 123, which is adapted to seat in one of the plurality of openings 124 for holding the stop finger 120 in the desired adjusted position. If the finger 120 is presented as shown in Figs. 1, 2 and 5 of the drawings the pawl carrying rock arm will have its shortest possible stroke, whereas if the finger is shifted to a position at right angles with that shown, the rock arm 69 will then be free to move until it engages the hub of finger 120, which will give the pawl carrying rock arm a longer stroke.

The sheet delivery mechanism to which the successive separated sheets are fed is not shown or described, but may be of any approved construction well known in the art.

Mechanism (not shown) is preferably employed for conveniently and accurately adjusting the feeding and controlling devices transversely of the machine to suit sheets of different sizes, the preferred construction of such mechanism forming the subject of my divisional application, Serial No. 452,311, filed September 9th, 1908.

What I claim is:—

1. In a paper feeding machine, the combination of a supply table, and a feeding table supported thereunder, with a sheet-reversing throat or passage way communicating between said tables, said throat or passage way being formed by rigid guides arranged in approximately parallel relation.

2. In a paper feeding machine, the combination of a suply table, and a feed table supported thereunder, with a curved sheet-reversing throat or passage way communicating between said tables and formed by two sets of rigid curved guides arranged in approximately parallel relation.

3. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, and two parallel series of rigid guides forming a sheet-reversing communicating throat between the rear ends of the supply and feed tables.

4. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, and two parallel series of rigid curved guides forming a sheet-reversing communicating throat between the rear ends of the supply and feed tables.

5. In a paper feeding machine, the combination of a supply table, a feed table supported thereunder, and inner and outer parallel series of rigid curved guides or surfaces forming a curved throat communicating between said tables, the inner guides leading from the surface of the supply table and the outer guides leading to the surface of the feed table.

6. In a paper feeding machine, the combination of a supply table, conveying belts operating over said supply table, a feed table mounted beneath the supply table, conveying belts operating over said feed table, and two parallel series of rigid curved guides forming a communicating throat between the delivery end of the supply table and the receiving end of the feed table.

7. In a paper feeding machine, the combination of a supply table, conveying belts operating over said supply table, a feed table mounted beneath the supply table, conveying belts operating over said feed table, inner and outer parallel series of rigid curved guides forming a communicating throat between the delivery end of the supply table and the receiving end of the feed table, and sheet engaging rollers arranged above the delivery end of the supply table and the receiving end of the feed table.

8. In a paper feeding machine, the combination of a supply table, belt supporting wheels or pulleys mounted upon said supply table, conveying belts passing over said supply table and around said wheels or pulleys, a feed table mounted beneath said supply table, belt supporting wheels or pulleys mounted upon said feed table, conveying belts passing over a portion of said feed table and around said wheels or pulleys, rigid curved guides extending from the delivery end of said supply table to a plane above the receiving end of the feed table, and a second series of rigid curved guides extending from a plane above the delivery end of the supply table to the receiving end of the feed table, said two series of rigid guides forming a communicating throat between the supply and feed tables.

9. In a paper feeding machine, the combination of a supply table, belt supporting wheels or pulleys mounted upon said supply table, conveying belts passing over said supply table and around said wheels or pulleys, a feed table mounted beneath said sup-

ply table, belt supporting wheels or pulleys mounted upon said feed table, conveying belts passing over a portion of said feed table and around said wheels or pulleys, rigid curved guides extending from the delivery end of said supply table to a plane above the receiving end of the feed table, a second series of rigid curved guides extending from a plane above the delivery end of the supply table to the receiving end of the feed table, said two series of rigid guides being mounted in parallel relation to form a communicating throat between the supply and feed tables, and means for driving the conveying belts of both tables in unison.

10. In a paper feeding machine, the combination of a supply table, conveying belts operating over said supply table, a feed table mounted beneath the supply table, conveying belts operating over said feed table, two parallel series of rigid guides forming a communicating throat between the delivery end of the supply table and the receiving end of the feed table, and a driving mechanism common to both sets of conveying belts.

11. In a paper feeding machine, the combination of a supply table, a feed table beneath the supply table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, and a series of pressure rollers arranged to engage a bank of sheets above the feed table in the plane of communication of the curved throat with the feed table.

12. In a paper feeding machine, the combination of a supply table, a feed table beneath the supply table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, sheet conveying belts operating over said feed table, and a series of pressure rollers arranged to engage a bank of sheets above said conveying belts at the receiving end of the feed table.

13. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, a series of pressure rollers arranged to engage a bank of sheets at the receiving end of the feed table, a shaft upon which said pressure rollers are mounted, and rock arms supporting said shaft, substantially as set forth.

14. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, sheet conveying belts operating over said feed table, a series of pressure rollers arranged to engage a bank of sheets above said conveying belts at the receiving end of the feed table, a shaft upon which said pressure rollers are mounted, rock arms supporting said shaft, and means for feeding a bank of sheets through said throat, substantially as set forth.

15. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, and two series of sheet engaging pressure rollers arranged above the supply and feed tables respectively to engage a bank of sheets at the entrance and exit of said communicating throat, substantially as set forth.

16. In a paper feeding machine, the combination of a supply table, sheet conveying belts operating over the supply table, a feed table supported beneath the supply table, sheet conveying belts operating over the feed table, two parallel series of rigid guides forming a communicating throat between the supply and feed tables, and two series of sheet engaging pressure rollers arranged above the supply and feed tables respectively to engage a bank of sheets at the entrance and exit of said communicating throat, substantially as set forth.

17. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, a curved throat communicating between the rear ends of said tables, and a removable section in the rear wall of said curved throat arranged to form a sheet exit opening from said throat at the rear of the machine.

18. In a paper feeding machine, the combination of a supply table, a feed table supported beneath the supply table, a curved throat communicating between the rear ends of said tables, and a hinged gate section in the rear wall of said curved throat arranged to open for a sheet exit from said throat at the rear of the machine.

19. In a paper feeding machine, the combination with the supply and feed tables having a curved throat communicating between them, of sectional guide fingers forming the rear wall of said curved throat, parts of said sectional guides being movably mounted to form a sheet exit opening from said throat.

20. In a paper feeding machine, the combination of the supply and feed tables, and two parallel series of guides forming a curved throat communicating between said tables, the rear series of said guides being formed of a plurality of rigidly mounted guide fingers, and a plurality of movably mounted guide fingers normally forming continuations of said rigidly mounted fingers, said movably mounted fingers being hung in rocking bearings by which they may be moved into and out of operative position.

21. In a paper feeding machine, the combination of the supply and feed tables, the

parallel inner and outer guides forming a curved throat communicating between said tables, each of said outer guides being formed of a rigidly mounted section or finger, and a movable section or finger, a rod or bar to which all of the movably mounted sections are secured, and rocking hangers in which said bar is mounted.

22. In a paper feeding machine, the combination of the supply and feed tables, and two parallel series of guides forming a curved throat communicating between said tables, the rear series of said guides being formed of a plurality of rigidly mounted guide fingers, and a plurality of movably mounted guide fingers forming continuations of said rigidly mounted fingers, and a hand lever for moving said movably mounted guide fingers into and out of operative position.

23. In a paper feeding machine, the combination of the supply and feed tables, the parallel inner and outer guides forming a curved throat communicating between said tables, each of said outer guides being formed of a rigidly mounted section or finger, and a movable section or finger, a rod or bar to which all of the movably mounted sections are secured, rocking hangers in which said bar is mounted, and a hand lever secured to one of said rocking hangers for operating it.

24. The combination of the supply and feed tables, an inner series of guides leading from the rear end of the supply table to a plane above the rear end of the feed table, a series of sectional curved guides leading from a plane above the rear end of the supply table to the rear end of the feed table, the upper sections of said curved guides being rigidly mounted in a suitable frame, and the lower sections of said guides being mounted upon a rocking frame and arranged to be supported thereby with their ends in engagement with the rear end of the feeding table so as to form continuations of the rigidly mounted guide sections.

25. The combination of the supply and feed tables, an inner series of guides leading from the rear end of the supply table to a plane above the rear end of the feed table, a series of sectional curved guides leading from a plane above the rear end of the supply table to the rear end of the feed table, the upper sections of said curved guides being rigidly mounted in a suitable frame, and the lower sections of said guides being mounted upon a rocking frame and arranged to be supported thereby with their ends in engagement with the rear end of the feeding table so as to form continuations of the rigidly mounted guide sections, and means for securing said rocking frame against motion.

26. The combination of the supply and feed tables, an inner series of guides leading from the rear end of the supply table to a plane above the rear end of the feed table, a series of sectional curved guides leading from a plane above the rear end of the supply table to the rear end of the feed table, the upper sections of said curved guides being rigidly mounted in a suitable frame, and the lower sections of said guides being mounted upon a rocking frame and arranged to be supported thereby with their ends in engagement with the rear end of the feeding table so as to form continuations of the rigidly mounted guide sections, and a hand lever secured to said rocking frame by which said lower movable guide sections may be shifted into and out of operative position.

27. In a paper feeding machine, the combination of the supply and feed tables having a curved throat communicating between their adjacent rear ends, a gate or opening in the rear wall of said curved throat, sheet conveying belts passing over the supply and feed tables, and mechanism for driving said belts.

28. In a paper feeding machine, the combination of a sheet support, means for advancing a fanned out bank of sheets over said support, a sheet separating device operating upon the fanned out bank of sheets, and means controlled by the thickness of the fanned out bank of sheets upon said support in the plane of engagement of the separating device for governing the operation of the bank advancing means, substantially as set forth.

29. In a paper feeding machine, the combination of a stationary sheet support, means for advancing a fanned out bank of sheets over said support, a sheet separating device movable toward and away from said support and operating upon the fanned out bank of sheets, and means for governing the operation of the bank advancing means, said governing means being controlled by the height above said support of said separating device when in operation, substantially as set forth.

30. In a paper feeding machine, the combination of a sheet support, means for advancing a fanned out bank of sheets over said support, a sheet separating device operating upon the fanned out bank of sheets, and means controlled by the sheet separating device for maintaining a predetermined thickness of sheets in the plane of engagement of the separating device, substantially as set forth.

31. In a paper feeding machine, the combination of a sheet support, means for advancing a fanned out bank of sheets over said support, a sheet separating device operating upon the fanned out bank of sheets and movable toward and away from said

support, and means controlled by the variable extent of movement of said separating device toward said support for governing the operation of the bank advancing means, substantially as set forth.

32. In a paper feeding machine, the combination of a stationary sheet support, conveying belts operating over said support for advancing a combed out bank of sheets thereon, mechanism for intermittently operating said conveying belts, a sheet separating instrument operating upon said combed out bank of sheets, and means controlled by the thickness of the bank of sheets beneath said separating instrument for governing the operation of the belt operating mechanism, substantially as set forth.

33. In a paper feeding machine, the combination of a stationary sheet support, conveying belts operating over said support for advancing a combed out bank of sheets thereon, a pawl and ratchet mechanism for intermittently operating said conveying belts, a sheet separating instrument operating upon said combed out bank of sheets, and means controlled by the thickness of the bank of sheets beneath said separating and feeding instrument for throwing said pawl and ratchet mechanism into and out of operation, substantially as set forth.

34. In a paper feeding machine, the combination of a sheet support, conveying belts operating over said support for advancing a combed out bank of sheets thereon, a pawl and ratchet mechanism for intermittently operating said conveying belts, including a reciprocating pawl operating part, a sheet separating instrument operating upon said combed out bank of sheets and movable toward and away from said support, a movable controlling dog, and means controlled by the variable movement of said separating instrument toward said support for moving said dog into and out of the path of said reciprocating part, substantially as set forth.

35. In a paper feeding machine, the combination of a sheet support, means for advancing a fanned out bank of sheets upon said support, a sheet separating instrument movable toward and away from said support, a pawl and ratchet mechanism for operating said bank advancing means to maintain the sheets at a predetermined elevation upon said support beneath the separating instrument, and a dog controlled by said sheet separating instrument arranged to prevent the operation of said pawl and ratchet mechanism.

36. In a paper feeding machine, the combination of a sheet support, means including a pawl and ratchet mechanism for advancing sheets over said support, a dog normally preventing the operation of said pawl and ratchet mechanism, and a sheet moving instrument movable toward and away from said support and suitably connected with the said dog to withdraw it from the path of the movable part of said pawl and ratchet mechanism to permit the operation of the same when the thickness of the bank beneath said instrument is reduced below normal.

37. In a paper feeding machine, the combination of a sheet support, means for advancing sheets over said support, a ratchet wheel for operating said advancing means, a pawl engaging said ratchet wheel, a rocking arm upon which said pawl is mounted, a dog normally supported in the path of said rocking arm, means for operating said pawl supporting arm, and a sheet moving instrument movable toward and away from the sheet support and suitably connected with said dog for moving it out of the path of said rocking arm.

38. In a paper feeding machine, the combination of a sheet support, means for advancing sheets upon said support, a ratchet wheel for operating said advancing means, a pawl engaging said ratchet wheel, a rocking arm upon which said pawl is mounted, a dog normally supported in the path of said rocking arm, means for operating said pawl supporting arm, a sheet moving instrument movable toward and away from the sheet support and suitably connected with said dog for moving it out of the path of said rocking arm, and an adjustable stop mounted in the path of said rocking arm.

39. In a paper feeding machine, the combination of a sheet support, conveying bands or belts for advancing sheets upon said support, a ratchet wheel operating said conveying bands or belts, a rock arm carrying a pawl, a dog normally sustained in the path of said rock arm for preventing its motion, means for operating said rock arm, a sheet moving instrument movable toward and away from the sheet support, and adjustable connections between said sheet moving instrument and said dog.

40. In a paper feeding machine, the combination of a sheet support, means for advancing a bank of sheets upon said support, a ratchet wheel for operating said advancing means, a rocking lever, a pawl mounted upon said lever in operative relation to said ratchet wheel, means having pin and slot connection with said lever for operating it, a movable dog normally preventing motion of said lever in one direction, and a sheet moving instrument movable toward and away from the sheet support and having lost-motion connection with said dog, whereby the extent of movement of said instrument toward said sheet support determines the position of said dog.

41. In a paper feeding machine, the combination of the supply and feed tables, means for advancing a bank of sheets over said tables, a ratchet wheel for operating said

advancing means, a rocking lever, a pawl mounted upon said lever in operative relation to said ratchet wheel, means for operating said lever, a dog for preventing motion of said lever in one direction, a sheet moving instrument movable toward and away from the feed table, and means including a lost-motion connection operatively connecting said instrument with said dog, whereby said dog will normally be presented in position to engage said pawl supporting lever and will be moved out of said position to free said lever when the instrument moves closer to the feed table.

42. In a paper feeding machine, the combination of a sheet support, conveying bands or belts for advancing sheets upon said support, a ratchet wheel operating said conveying bands or belts, a rock arm carrying a pawl, a dog normally sustained in the path of said rock arm for preventing its motion, means for operating said rock arm, a sheet moving instrument movable toward and away from the sheet support, a pivoted lever connected with said sheet moving instrument, a yoke connected with said lever, a pitman connected with said dog, and an adjustable nut threaded upon said pitman and engaging said yoke.

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Witnesses:
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