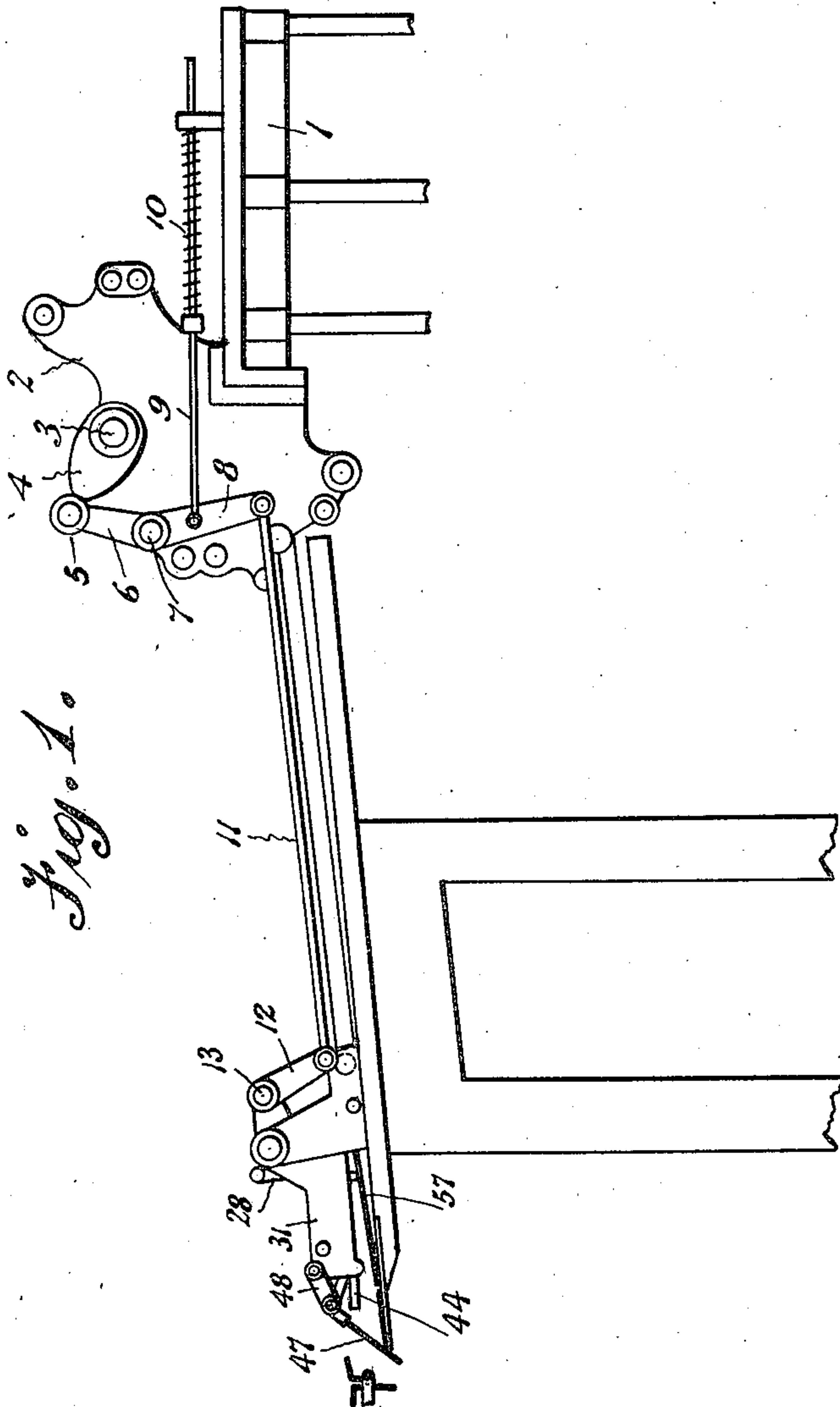


A. J. HUGHES & R. E. JONES.
SHEET STRAIGHTENING AND SLOW DOWN DEVICE.
APPLICATION FILED SEPT. 5, 1914.

1,154,864.

Patented Sept. 28, 1915.

5 SHEETS—SHEET 1.



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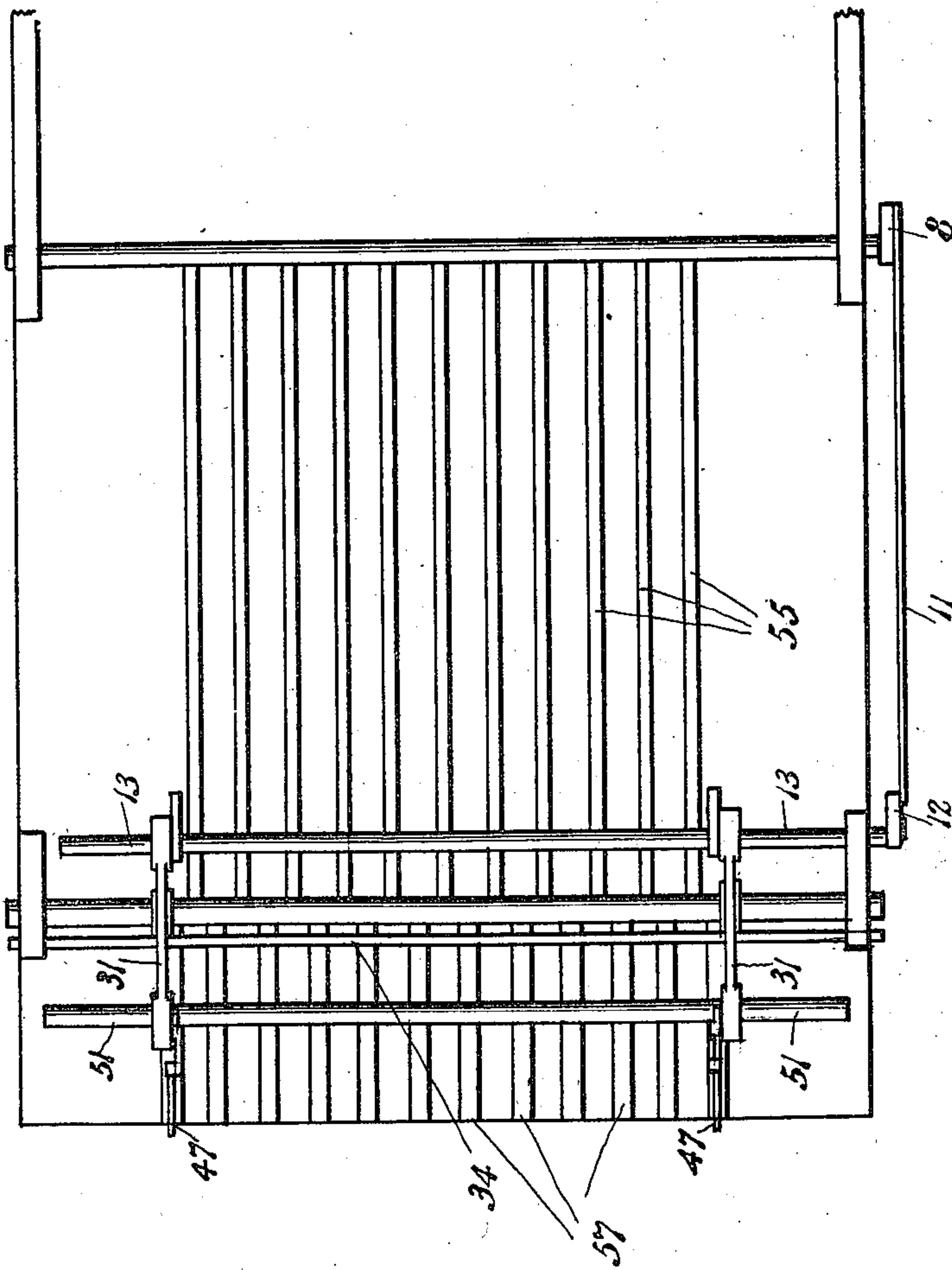


Fig. 2.

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5 SHEETS—SHEET 3.

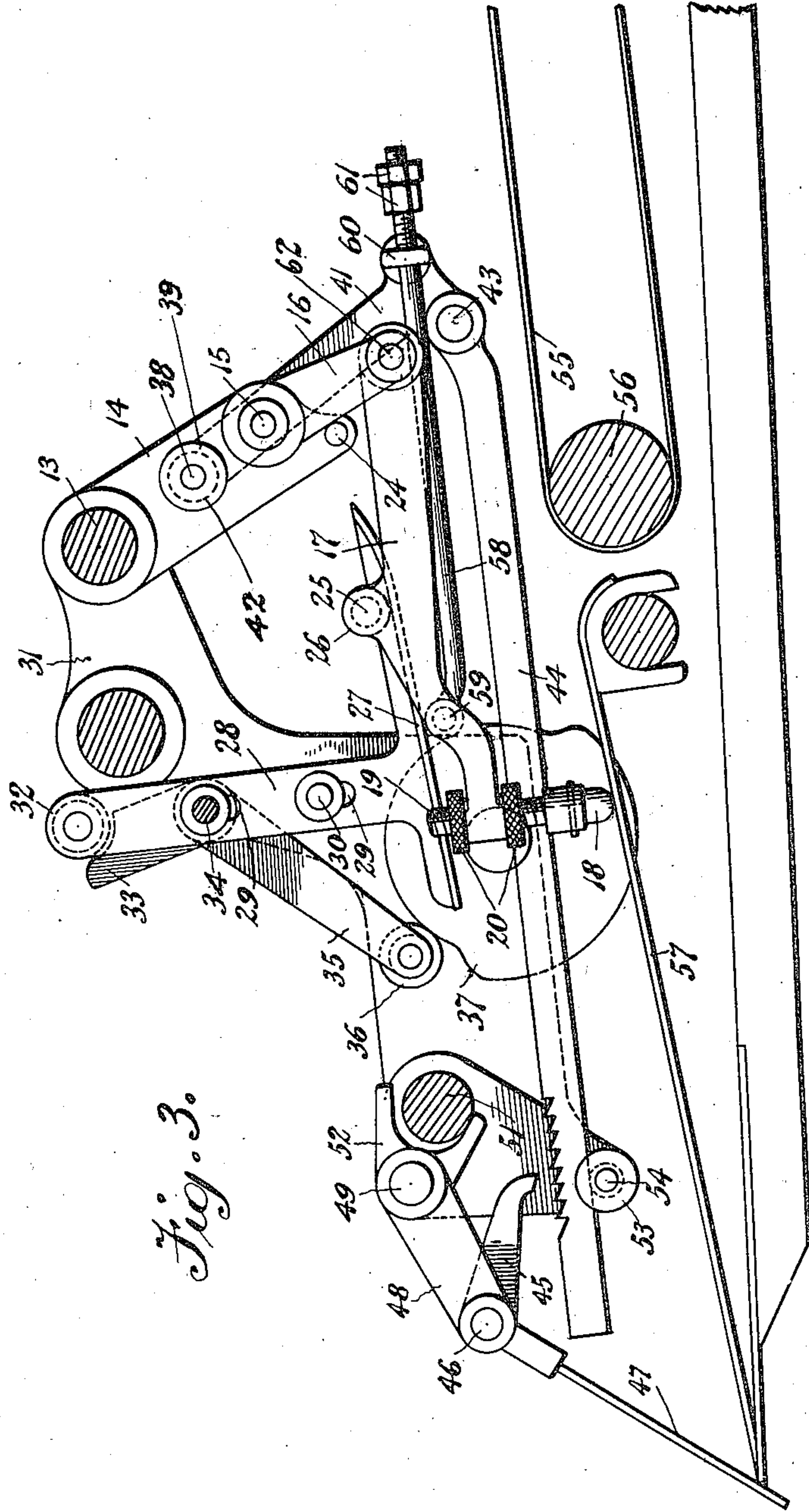


Fig. 3.

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5 SHEETS—SHEET 4.

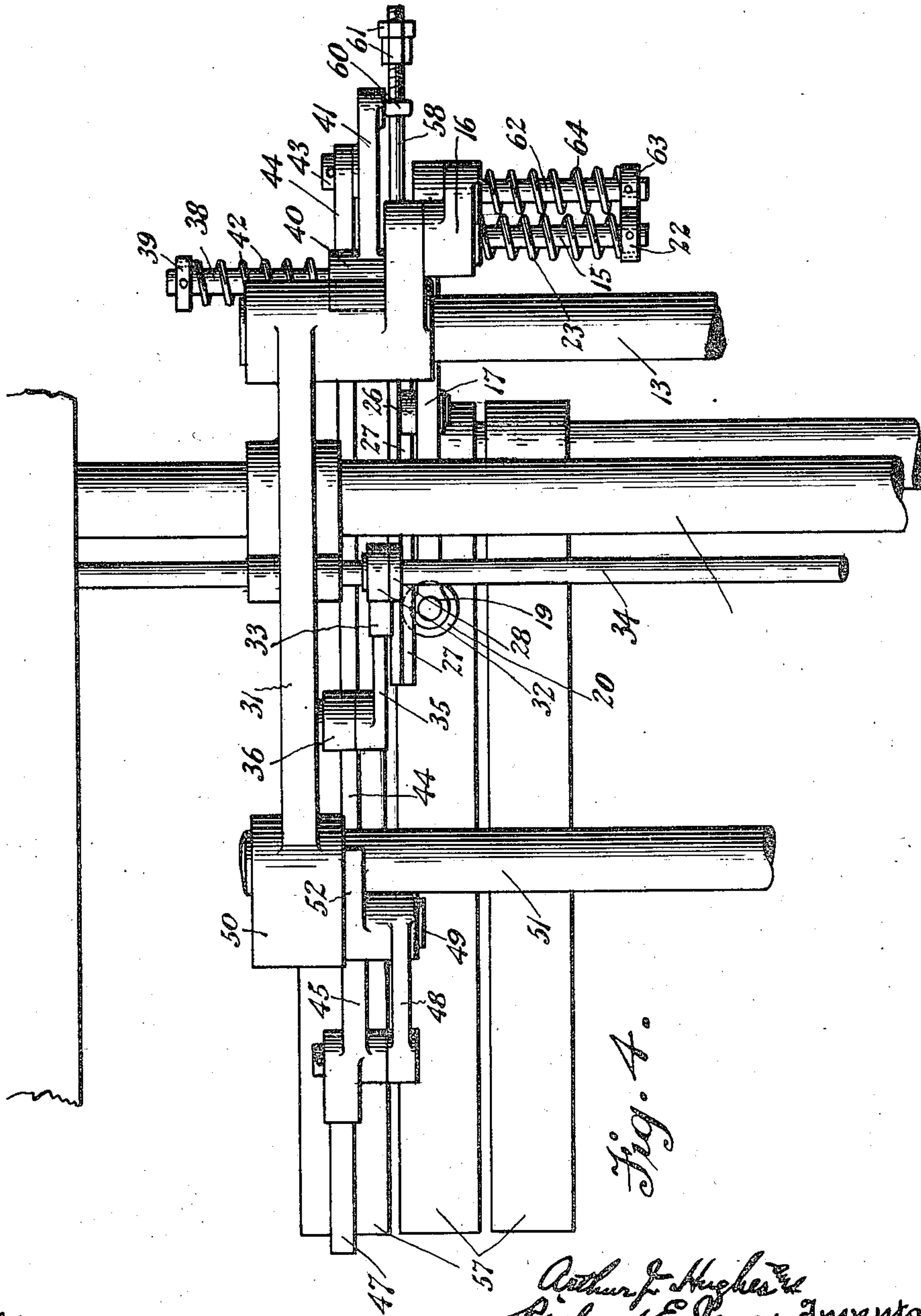


Fig. 4.

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5 SHEETS—SHEET 5.

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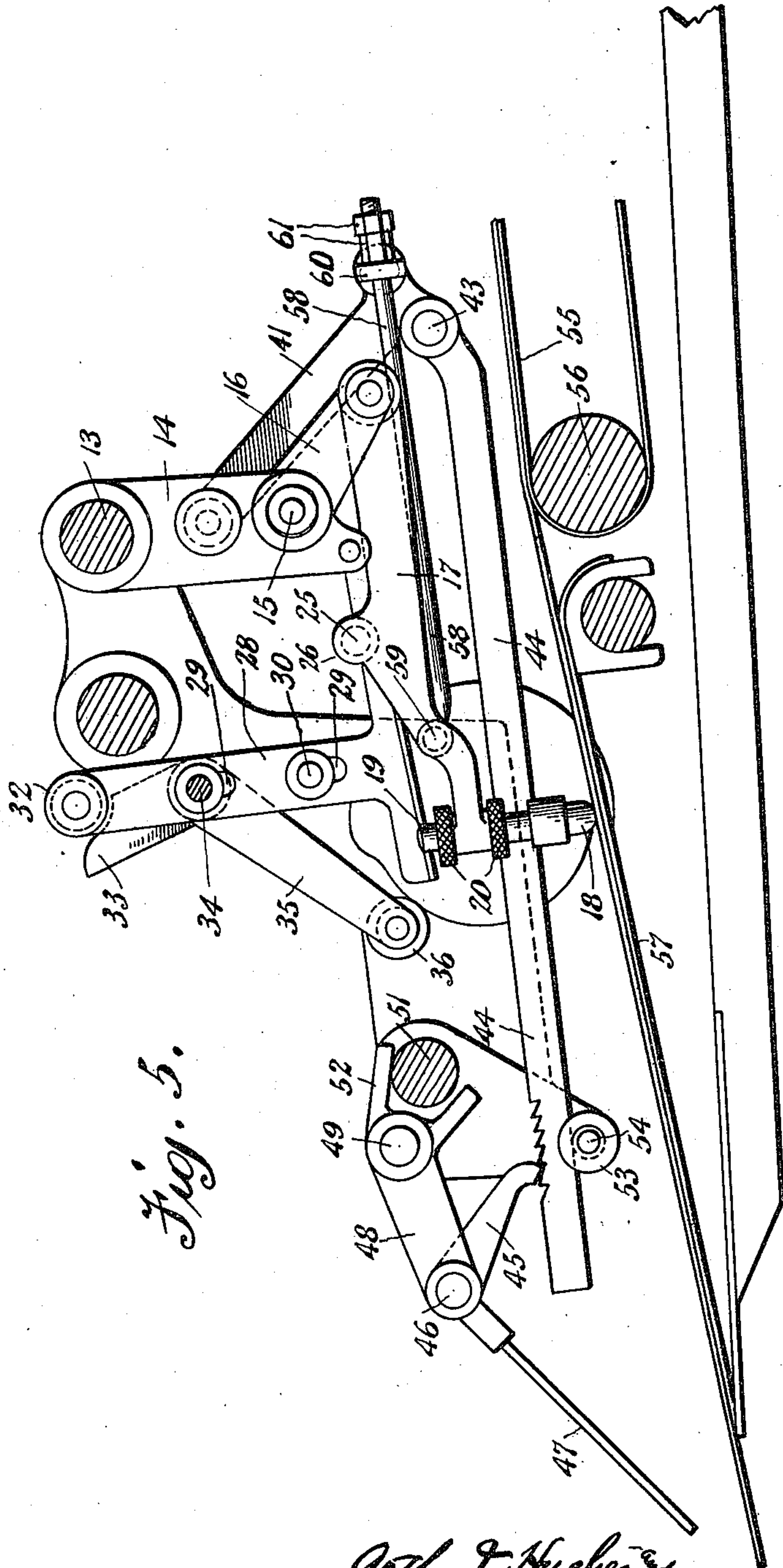


Fig. 5.

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UNITED STATES PATENT OFFICE.

ARTHUR J. HUGHES AND RICHARD E. JONES, OF PEARL RIVER, NEW YORK, ASSIGNORS
TO DEXTER FOLDER COMPANY, OF PEARL RIVER, NEW YORK, A CORPORATION OF
NEW YORK.

SHEET-STRAIGHTENING AND SLOW-DOWN DEVICE.

1,154,864.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed September 5, 1914. Serial No. 860,413.

To all whom it may concern:

Be it known that we, ARTHUR J. HUGHES and RICHARD E. JONES, both citizens of the United States, and residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Sheet-Straightening and Slow-Down Devices, of which the following is a full and clear specification.

This invention relates to sheet-feeding machines and has for its primary object to provide an improved construction whereby a sheet which is being fed to a press, for example, is placed at a certain desired distance from the press drop guides and inasmuch as these drop guides are movable, such construction makes it possible to adjust the distance to meet the conditions. Furthermore, these conditions vary on different makes of presses so that the distances which the sheets must travel after striking the pendulums, must be varied. If this difference in travel were governed by swinging the pendulum up out of the path of the sheet, it would in some instances come into contact with some parts of the press, a condition which is undesirable.

Other and further objects of invention will appear in the specification and claims in connection with the accompanying drawings, in which,—

Figure 1 is a side elevation of one embodiment of my invention in an adaptation to a sheet-feeding machine, parts being broken away and parts omitted; Fig. 2 is a top plan view of certain portions shown in Fig. 1; Fig. 3 is a side elevation on an enlarged scale; Fig. 4 is a top plan view of the same, parts being broken away; Fig. 5 is a view similar to Fig. 3, showing parts in their relative positions after the operation of the sheet-controlled mechanism.

Referring more particularly to the drawings, a feeding machine 1 from which sheets are to be fed, is provided with side brackets 2 which carry a cam shaft 3, on which a cam 4 is mounted to engage a cam roller 5 carried by a cam arm 6 on a rock shaft 7, said rock shaft being provided with a depending arm 8 to which is connected a spring rod 9 under tension from a spring 10. Pivoted to the lower end of the arm 8 is a connecting rod 11, the other end of said rod being con-

nected to a crank arm 12 which is keyed to a rock shaft 13. As shown more clearly in Fig. 3, the rock shaft 13 carries a rock arm 14 from which a pin 15 projects laterally, serving to support an extension 16 which constitutes a lever arm, to the lower end of which is connected one end of a pusher arm 17, said pusher arm serving to mount at its forward end a sheet engaging instrumentality in the form of a finger 18, said finger being provided with a threaded shank 19 which may be adjusted vertically by means of nuts 20. As shown in Fig. 4, the pin 15 carries at its outer end a collar 22 to which is secured one end of a spring 23, said spring being suitably arranged to hold the extension 16 against a stop pin 24 on the lower end of rock arm 14. Normally therefore, the extension 16 is held in fixed relation to the rock arm 14 while, should the forward movement of the pusher arm 17 be interrupted in the manner to be hereinafter pointed out, spring 23 will permit the extension 16 to swing on the pin 15 as indicated in Fig. 5.

The pusher arm 17 carries a laterally projecting pin 25 upon which is journaled a cam roller 26 adapted to run over a cam plate 27 which projects laterally from the shank or bar 28 which is provided with suitable slots 29 for permitting a vertical movement on the pins 30 which are carried by the fixed bracket or support 31. The upper end of the shank or bar 28 is provided with a cam roller 32 which is adapted to be engaged by a cam arm 33 keyed to a transverse shaft 34. Also keyed to said shaft 34 is a cam roller arm 35 which carries a cam roller 36 adapted to rotate on a cam 37. Projecting from the other side of the rock arm 14 is a pin 38 which carries a collar 39 between which and the boss 40 of another extension 41, is mounted a spring 42 which normally holds the extension 41 in fixed relation to the rock arm 14. Pivoted at 43 to the lower end of the extension 41 is a ratchet bar 44 which is adapted to be positively engaged by a pawl 45 which is keyed to a pin 46 from which depends a pendulum 47. The pin 46 is carried by the outer end of an arm 48 which is in turn carried by a pin or stud 49 projecting laterally from a boss which constitutes a portion of the side

frame or fixed support 31. A tie rod 51 extends between the opposite side frames 31. Rigid with the arm 48 is a bifurcated arm 52, the arms of which are adapted to successively rest against the tie rod 51. Rack bar 44 is carried at its forward end by a grooved roller 53 which is journaled on a pin 54 carried by the fixed bracket or support. Feed tapes 55 running on rollers 56 deliver the sheets to the paper guides 57 under the control of the push fingers 18. A lost motion connection between the pusher arm 17 and the extension or lever arm 41 is preferably provided as follows: A rod 58 is pivotally connected at 59 to the pusher arm 17. The rear end of the rod 58 is slidably mounted in a ring bolt 60 which constitutes an abutment. Threaded to the rear end of the rod 58 are the nuts 61 which constitute an abutment which is adjustable relatively to the abutment 60 to provide suitable and efficient means for obtaining a certain travel of the sheet subsequently to the operation of the pendulum 47 by the forward edge of the sheet on either side of the machine. At the lower end of the extension 16, a pin 62 is mounted to pivotally support the pusher arm 17. On the outer end of the pin 62 is a collar 63 to which is secured one end of a spring 64, the other end of said spring being suitably connected to the extension 16 to impart a pressure normally tending to hold the pusher finger 18 down onto the sheet.

The operation of my improved mechanism will now be readily understood and briefly described is as follows: Whenever a sheet is delivered by feed tapes 55 onto the guides 57 under the control of push fingers 18 on opposite sides of the machine, the forward movement of the rock arms 14 are such as to impart to the push fingers 18, a movement of lower speed than that at which the sheet is traveling, thus constituting a slow down for said sheet. When the forward edge of the sheet on either side strikes the pendulum 47, the pawl 45 is thrown into engagement with the rack 44 with the result that the pendulum 47 is thrown upwardly as shown in Fig. 5, thus causing the arm 48 to be elevated until the upper branch of the bifurcated arm 52 rests against the tie rod 51. It will be understood that suitable means (not shown) are provided for limiting the relative movement between the pendulum 47 and the arm 48. As a result, the forward movement of the rack bar 44 is arrested so that the eye bolt 60 becomes in effect a fixed abutment. As the forward movement of the rock arm 14 continues, the extension 16 continues to move the pusher arm 17 forwardly until the abutment 61 on the rod 58 contacts with the now fixed abutment 60 when its movement is arrested. By this movement, a certain predetermined space is

covered by the forward edge of the sheet subsequently to the actuation of the sheet-controlled mechanism hereinbefore described. It will be seen therefore that the mechanism is adapted to be employed with machines of different sizes and constructions in which the drop gages may be placed at different distances from the pendulums 47. In this way, certain difficulties are obviated which would otherwise occur when certain parts of the press or feeder would be engaged by the pendulum or contiguous parts, provided the adjustable lost motion connection was not embodied. Cam 37 is suitably timed to rotate the cam arm 33 in a right hand direction at the proper moment to elevate the pusher arm 17 during its return movement.

It will be understood that as embodied on the working machine, the mechanism hereinbefore described is duplicated on opposite sides of the machine, so that should one side of the forward edge of the sheet reach the pendulum 47 before the other side, the mechanism would operate to straighten the sheet.

I claim:

1. In a machine of the character described an oscillatory arm provided with a movable extension, yieldable means tending normally to hold said arm and extension in fixed relation to each other, sheet-feeding means partaking of all the movements of said extension, and sheet controlled means for limiting the forward movement of the sheet feeding means.

2. In a combined slow down and sheet straightener for paper feeding machines, an oscillatory arm, a reciprocatory sheet-engaging instrumentality, an extension or lever having spaced pivotal connections with said sheet engaging instrumentality and oscillatory arm respectively, means for limiting the relative movement in one direction between said oscillatory arm and extension or lever, yieldable means for resisting such relative movement in the opposite direction, and sheet controlled means for limiting the forward movement of said sheet engaging instrumentality.

3. In a machine of the character described, a movable arm provided with two independently movable extensions, yieldable means normally tending to hold each of said extensions in fixed relative position with respect to said arm, sheet engaging means permanently connected to one of said extensions, means for connecting said sheet engaging means to one of said extensions to limit the movement of said feeding means relatively to the other extension, and sheet actuated means for limiting the forward movement of said other extension.

4. In a machine of the character described, an arm mounted to swing about an axis, an extension pivotally connected to said arm,

sheet engaging means permanently connected to said extension, a second extension pivotally connected to said arm, means for connecting said sheet engaging means to the second mentioned extension to permit only a limited relative forward movement of said sheet-engaging means with respect to the second extension, a rack bar pivotally connected at one end to the second extension, and a sheet controlled pawl for blocking the forward movement of said rack bar.

5. In a machine of the character described an arm mounted to swing about an axis, an extension pivotally connected to said arm, sheet-engaging means permanently connected to said extension, a second extension pivotally connected to said arm, means for connecting said sheet-engaging means to the second mentioned extension to permit only a limited relative forward movement of said sheet-engaging means with respect to the second extension, a rack bar pivotally connected at one end to the second extension, a link pivotally mounted at one end, said pawl being swingingly mounted in the other end of said link, a bifurcated member rigid with said link, and a fixed bar or rod extending between the forks of said bifurcated member, said bar being of suitable size to permit a limited angular movement of said bifurcated member.

6. In a sheet-feeding machine, a rock arm, a lever arm movably connected thereto, yieldable means for retaining said arms in fixed relation to each other, a rack bar pivotally connected to said lever arm on a fixed axis, a sheet-actuated pawl for engaging said rack bar, a sheet-feeding instrumentality, means for connecting said instrumentality to said rock arm, and a rod connected to said instrumentality and slidably engaging said lever arm, said rod being provided with an abutment permitting a limited lost motion between it and said lever arm.

7. In a sheet-feeding machine, a reciprocatory sheet-engaging instrumentality, a fixed support, a rock shaft journaled in said support, a shank or bar disposed vertically and carrying a cam roller, said shank or bar being provided with a cam surface adapted to elevate said instrumentality, a cam arm mounted on said rock shaft and adapted to raise said cam roller and means for oscillating said cam arm at suitable intervals to raise said shank or bar during the return stroke of said instrumentality.

8. In a combined slow down and sheet straightener for paper feeding machines an oscillatory arm, a reciprocatory sheet-engaging instrumentality, an extension or lever having spaced pivotal connections with said sheet engaging instrumentality and oscillatory arm respectively, means for limiting the relative movement in one direction between

said oscillatory arm and extension or lever, yieldable means for resisting such relative movement in the opposite direction, and sheet controlled means for limiting the forward movement of said sheet engaging instrumentality, said sheet controlled means including a sheet actuated pendulum, a reciprocatory bar controlled thereby, a lost motion connection between said bar and sheet engaging instrumentality, and an extension lever for swingingly suspending said reciprocatory bar from said oscillatory arm.

9. In a combined slow down and sheet straightener for paper feeding machines, an oscillatory arm, a sheet engaging pusher arm having one end swingingly suspended from said oscillatory arm, means for preventing forward movement of said pusher arm relatively to said oscillatory arm, yieldable means for holding said pusher arm in its most forward position with respect to said oscillatory arm, and sheet controlled means for limiting the forward movement of said pusher arm.

10. In a combined slow down and sheet straightener for paper feeding machines, an oscillatory arm, a sheet engaging pusher arm having one end swingingly suspended from said oscillatory arm, means for preventing forward movement of said pusher arm relatively to said oscillatory arm, yieldable means for holding said pusher arm in its most forward position with respect to said oscillatory arm, an extension pivotally suspended from said oscillatory arm, a rack bar connected to said extension, a lost motion connection between said pusher arm and extension, and a sheet controlled pawl for engaging said rack bar.

11. In a sheet feeding machine, a sheet feeding instrumentality, means for reciprocating said instrumentality, a cam roller partaking of the movements of said instrumentality, a fixed support, a bar arranged vertically and reciprocable endwise on said support, a cam carried thereby in suitable position to engage said cam roller, a cam roller mounted on said bar, and a cam arm pivotally mounted on said fixed support and adapted to raise the last mentioned cam roller.

12. In a combined slow down and sheet straightener for paper feeding machines, an oscillatory arm, a sheet-engaging pusher arm having one end swingingly suspended from said oscillatory arm, means for preventing forward movement of said pusher arm relatively to said oscillatory arm, yieldable means for holding said pusher arm in its most forward position with respect to said oscillatory arm, an extension pivotally suspended from said oscillatory arm, a rack bar connected to said extension, a lost motion connection between said pusher arm and extension, and a sheet controlled pawl

for engaging said rack bar, said lost motion connection comprising a rod pivotally connected at one end to said pusher arm and having slidable engagement with said extension, and an adjustable abutment for limiting the extent of the relative sliding movement between said rod and extension.

13. In a sheet feeding machine, the combination of a rock shaft, a rock arm mounted thereon, a lever arm jointed to said rock arm, yieldable means for normally retaining said lever arm in fixed relation to said rock arm, another lever arm pivotally connected to the first mentioned lever arm, a sheet engaging finger carried by the second mentioned lever arm, another lever arm jointed to said rock arm, yieldable means for normally retaining the last mentioned lever arm in fixed relation to said rock arm, a bar pivotally connected to the last mentioned lever arm, sheet actuated means for elevating the second mentioned arm during its rearward movement.

14. In a sheet feeding machine, the combination of a rock shaft, a rock arm mounted thereon, a lever arm jointed to said rock arm, yieldable means for normally retaining said lever arm in fixed relation to said rock arm, another lever arm pivotally connected to the first mentioned lever arm, a sheet engaging finger carried by the second mentioned lever arm, another lever arm jointed to said rock arm, yieldable means for normally retaining the last mentioned lever arm in fixed relation to said rock arm, a bar pivotally connected to the last mentioned lever arm, sheet actuated means for positively engaging said bar, and means for elevating the second mentioned arm during its rearward movement, said elevating means comprising a cam roller journaled on the second mentioned lever arm and a cam over which said roller runs.

15. In a sheet feeding machine, the combination of a rock shaft, a rock arm mounted thereon, a lever arm jointed to said rock arm, yieldable means for normally retaining said lever arm in fixed relation to said rock arm, another lever arm pivotally connected to the first mentioned lever arm, a sheet engaging finger carried by the second mentioned lever arm, another lever arm jointed to said rock arm, yieldable means for normally retaining the last mentioned lever arm in fixed relation to said rock arm, a bar pivotally connected to the last mentioned lever arm, sheet actuated means for positively engaging the said bar, and means for elevating the second mentioned arm during its rearward movement, said elevating means comprising a cam roller journaled on the second mentioned lever

arm, a cam over which said roller runs, and means for elevating said cam.

16. In a sheet feeding machine, the combination of a rock shaft, a rock arm mounted thereon, a lever arm jointed to said rock arm, yieldable means for normally retaining said lever arm in fixed relation to said rock arm, another lever arm pivotally connected to the first mentioned lever arm, a sheet engaging finger carried by the second mentioned lever arm, another lever arm jointed to said rock arm, yieldable means for normally retaining the last mentioned lever arm in fixed relation to said rock arm, a bar pivotally connected to the last mentioned lever arm, sheet actuated means for positively engaging said bar, and means for elevating the second mentioned arm during its rearward movement, said elevating means comprising a cam roller journaled on the second mentioned lever arm and a cam over which said roller runs, and means for elevating said cam, said cam elevating means including a shank by which said cam is suspended, a cam roller journaled on said shank, and a cam for operating the last mentioned cam roller.

17. In a sheet feeding machine, a rock arm provided with two extensions pivotally connected thereto, yieldable means for normally retaining each of said extensions in fixed relation to said rock arm, a sheet feeding instrumentality connected to one of said extensions, sheet operated means for blocking the movement of the other extension, and means forming a lost motion connection between said feeding instrumentality and said other extension.

18. In a sheet feeding machine, a rock arm provided with two extensions pivotally connected thereto, yieldable means for normally retaining each of said extensions in fixed relation to said rock arm, a sheet feeding instrumentality connected to one of said extensions, sheet operated means for blocking the movement of the other extension, and means forming a lost motion connection between said feeding instrumentality and said other extension, said connection forming means comprising an abutment mounted on said other extension, a rod connected to said instrumentality, and an adjustable abutment on said rod, said rod being thereby adapted to permit only a limited movement to said instrumentality subsequently to the actuation of said sheet-operated means.

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