

(No Model.)

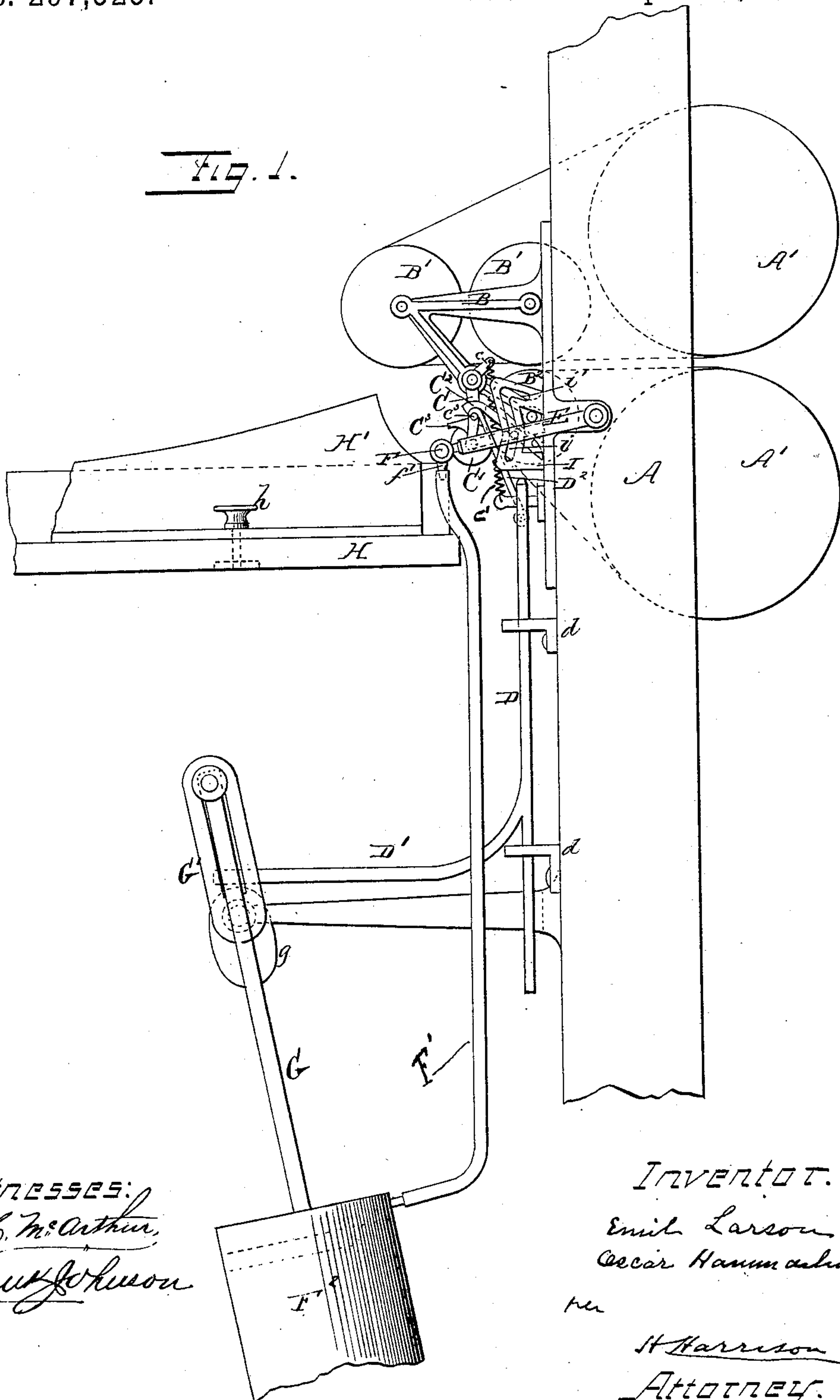
3 Sheets—Sheet 1.

E. LARSON & O. HAMMARLUND.

FEEDING DEVICE FOR RULING MACHINES.

No. 297,525.

Patented Apr. 22, 1884.



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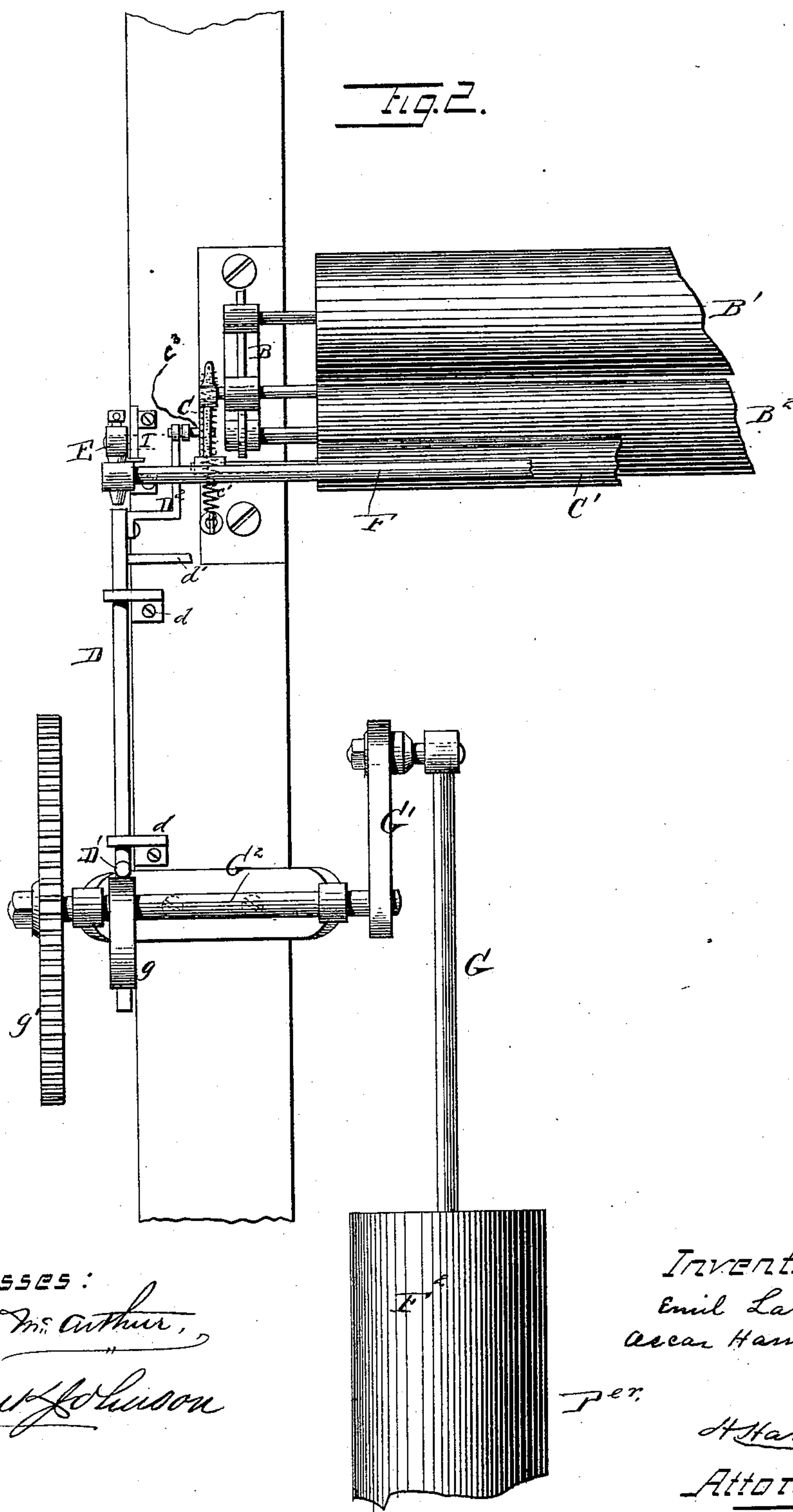
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Witnesses:

WITNESSES.
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Frank Johnson

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Per,

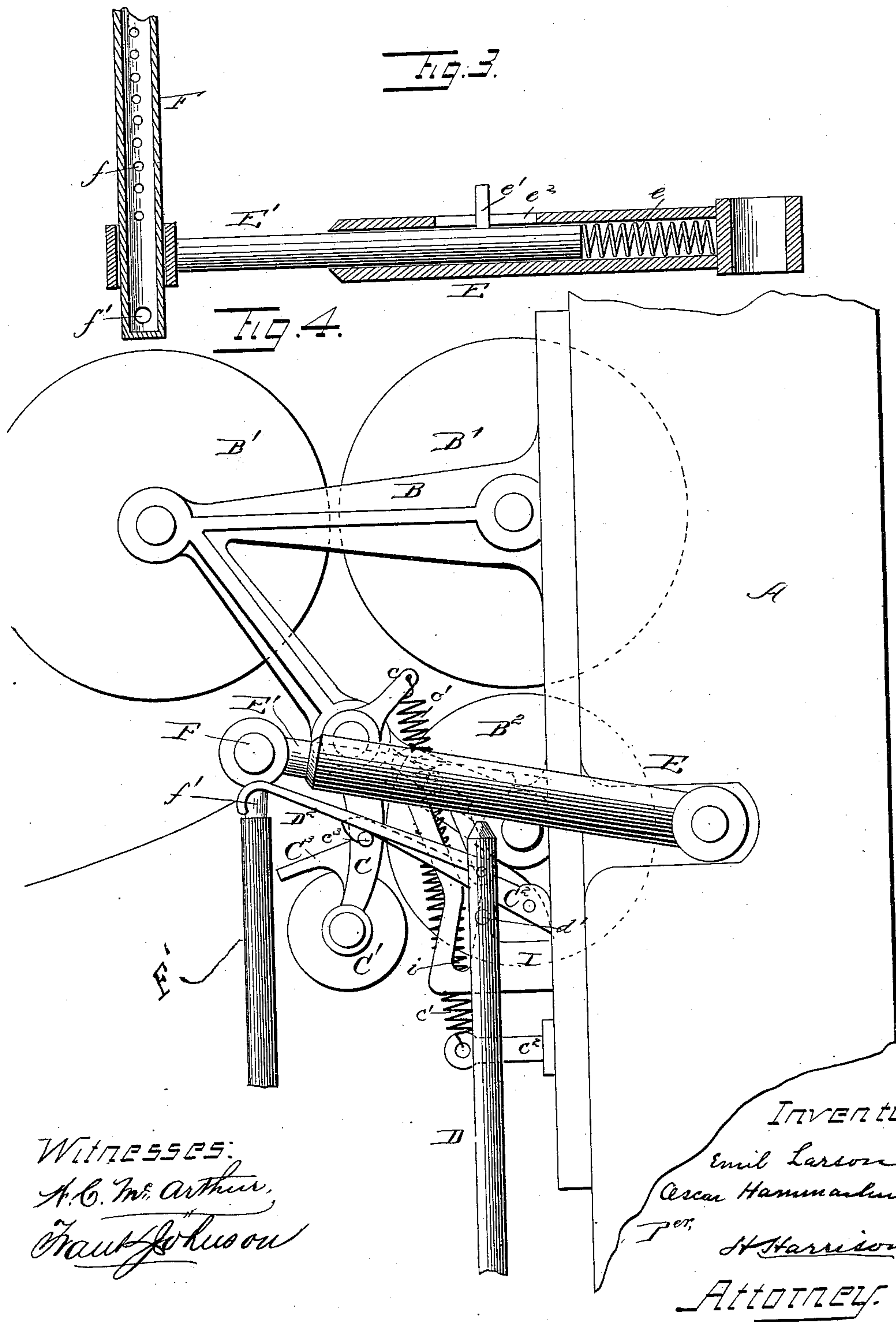
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Attorney.

3 Sheets—Sheet 3.

FEEDING DEVICE FOR RULING MACHINES.

Patented Apr. 22, 1884.



UNITED STATES PATENT OFFICE.

EMIL LARSON AND OSCAR HAMMARLUND, OF CHICAGO, ILLINOIS, ASSIGNORS
OF ONE-THIRD TO NILS F. OLSON, OF SAME PLACE.

FEEDING DEVICE FOR RULING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 297,525, dated April 22, 1884.

Application filed January 26, 1883. (No model.)

To all whom it may concern:

Be it known that we, EMIL LARSON, a citizen of the United States, and OSCAR HAMMARLUND, a subject of the King of Sweden, both residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Feeding Devices for Ruling-Machines, of which the following is a specification, to wit:

Our invention relates to pneumatic feeding devices for paper-ruling machines; and it consists in the peculiar construction of the same, whereby at proper intervals a single sheet of paper is lifted by a pneumatic tube and fed into the machine and the tube returned to the pile for another sheet, substantially as herein-after more fully described and claimed.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of our invention as applied to a ruling-machine; Fig. 2, a front elevation of the same; Fig. 3, a sectional view of the extension-arm and the air-tube, and Fig. 4 an enlarged side view of part of the device in a different position from that seen in Fig. 1.

A represents a part of the frame of a paper-ruling machine of any of the ordinary and well-known forms now in use, and A' A' represent two of the tape-rollers commonly used in such machines at the point at which the paper is fed into the machine.

In a frame, B, secured to the uprights of the main frame at the front of the machine, are journaled two rollers, B' B', which are connected and kept in constant motion by an endless belt or cords to the upper of the two rollers A'; and just below the two feed-rollers B' B' is a smaller one, B², also connected by belts to the lower of the rollers A', as represented in Fig. 1.

Journaled in the lower ends of two arms, C, is a fourth roller, C', and the upper ends of these arms are pivoted upon the frame or casting B and extended beyond their pivotal points in a small angular arm, c, which is connected by a spiral spring, c', with a post, c², secured to the main frame A some distance below.

This spring tending to raise the roller C', it is held in its lowered position by a hook-catch, C², pivoted to the frame A, and engaging with a pin, c³, upon the pendent arms C.

D represents a rod arranged to slide vertically in guides d d upon the frame A, and provided or formed with a horizontal projecting arm, D', and its upper end with a pivoted hook, D², which also engages the pin c³, and the purpose of which will be presently understood.

Upon the outside of the frame A are pivoted two hollow arms, E, in each of which is arranged an extension or auxiliary arm, E', which is pushed outward by a coiled spring, e, placed behind it within the hollow pivoted arm E, and the movement of which in either direction is limited by a pin, e', in the extension, which projects through a short slot, e², in the hollow arm, as fully shown by Fig. 3. The outer ends of the extensions E' carry a tube, F, running across the frame from side to side, having its ends closed, and provided with a series of small holes or perforations, f, on the under side, and at either or both ends with a nipple, f', connected by a hose, F', or any flexible connection, to the cylinder F² of an air-pump, which in this case is represented as an oscillating cylinder.

The piston-rod G of the air-pump, is connected to a crank, G', slotted for adjustment, and secured upon the end of a shaft, G², journaled in brackets upon the main frame, and carrying a cam, g, which is located immediately beneath the horizontal arm D' of the vertically-sliding rod D. This shaft G² also carries a gear or belt wheel, g', which, by any desired intermediate connection found most desirable, is given motion from some part of the ruling-machine.

As seen in Fig. 1, the perforated air-tube F lies, when at rest, upon the forward edge of the pile of paper upon the feeding-table H, which is provided on each side with a guide, H', rendered adjustable by thumb-nuts h, to keep the paper always in proper position. The main frame A is also provided on its front with plates I, near the outer edge of which is an angular slot, i, formed at its upper end with an acute-angled inward extension, i', in

which slot the projecting pin e' travels and throws the extension-arm E' in or out, as required in the proper feeding of the paper.

The operation of the machine is as follows:

- 5 The device having been properly adjusted and connected to the ruling-machine by gearing or belts which are adapted to feed the paper at the proper intervals, the machine is started, and the revolution of the shaft G^2 and its crank
- 10 G' force down the piston in the air-cylinder, and exhaust the air, by means of the hose-connection, from the perforated tube F , causing the upper sheet of paper on the pile to be firmly held by said tube. At the same time
- 15 the cam g lifts the arm D' and its rod D , which strikes and lifts with it the tubular pivoted arms E , carrying the air-tube F and the paper upward until its pin e' reaches the upper end of the angular slot i , as represented in Fig. 4.
- 20 The hook D^2 has slid outward upon the pin c^3 , and the pivoted arm C is held down by the catch C^2 . At this point a pin or projection, d' , on the rod D lifts the catch C^2 , and the spring e' throws up the roller C' beneath the paper.
- 25 As this roller flies up, an angular projection, C^3 , upon the outer side of its supporting-arms passes the tube F and forces it suddenly backward and free from the paper, its supporting-
- 30 arms E' sliding back within the hollow arms E , compressing the spring e , and the pin e' traveling in the acute-angled extension i' of the slot i . This action of the spring-actuated roller C' places it beneath the sheet of paper being operated upon, and lifts and presses it
- 35 against the rapidly-revolving roll B' , by which it is fed into the machine. The cam g , having now passed over its center, descends and allows the rod D to fall, its pivoted hook D^2 engaging with the pin c^3 and pulling down the
- 40 roller C' until its arms are again engaged with the catch C^2 , at the same time releasing the tube F , which is thrown out by the springs e , and falls of its own weight to the surface of the pile of paper, and the operation is re-
- 45 peated.

- It will be readily understood that different sizes of paper will necessitate different connections between the machine and the shaft G^2 , in order that the feeding device may operate
- 50 with more or less rapidity and allow no intermission between the sheets as they are fed in; also, in some cases, it may be desirable to provide the rod D with a retracting-spring to aid it in withdrawing the roller C' to its normal
 - 55 position.

The device may be attached to any ruling-machine, and will feed the paper automatically and more regularly than it can be done by hand.

- 60 Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatic feeding device for paper-ruling machines, a vacuum-tube supported by
- 65 telescopic arms adapted to be advanced or retracted, as described, in combination with

spring-actuated pivoted arms provided with angular projections, whereby when these arms are thrown up the tube is forced suddenly back and freed from the paper, substantially as shown and described. 70

2. In a pneumatic feeding device for paper-ruling machines, the combination of a vacuum-tube adapted to detach and lift a sheet of paper from the pile with a spring-actuated roller 75 provided with angular projections, adapted at the proper time to be thrown upward, releasing the tube from the sheet and carrying it up to the feeding-rollers, substantially as described and shown. 80

3. In a pneumatic feeding device for paper-ruling machines, the vacuum-tube F , supported in the ends of the pivoted telescopic arms $E E'$, provided with projecting spring e , slot e^2 , and pin e' , in combination with a plate, I , 85 secured to the frame and formed with the angular guide-slot $i i'$, substantially as and for the purpose set forth.

4. In a pneumatic feeding device for paper-ruling machines, a series of continually-revolving feed-rollers $B' B^2$, journaled in a frame or casting secured to the main frame of the ruling-machine, in combination with a vacuum-tube, F , and a spring-actuated roller, C' , 90 the first adapted to lift the sheet from the pile and the latter to press it against the feed-rollers, substantially as and for the purpose set forth. 95

5. In a pneumatic feeding device for paper-ruling machines, the combination of the roller 100 C' , journaled in spring-actuated pivoted arms C , provided with a pin, c^3 , with a retaining-catch, C^2 , and the rod D , adapted to slide vertically, and provided with a retracting-hook, D^2 , substantially as and for the purpose set 105 forth.

6. In a pneumatic feeding device for paper-ruling machines, the shaft G^2 , provided with a cam, g , and slotted crank G' , connected to the piston of the air-pump, and the vertically-sliding operating-rod D , in combination 110 with the vacuum-tube F , and feeding-roller C' , substantially as and for the purpose set forth.

7. A pneumatic feeding device for paper-ruling machines, consisting, essentially, of a vacuum-tube flexibly connected to an air-pump, and supported in pivoted telescopic 115 arms thrown in and out by a projecting pin working in a guide-slot, a pivoted spring-actuated roller, a sliding operating-rod, and a cam upon a driving-shaft, provided with a crank connected to the pump, all combined, constructed, and arranged to operate substan- 120 tially as and for the purpose set forth. 125

In testimony whereof we affix our signatures in presence of two witnesses.

EMIL LARSON.

OSCAR HAMMARLUND.

Witnesses:

CHAS. KRESSMANN,

FRANK JOHNSON.