(No Model.)

H. HALL.

SHEET DELIVERY MECHANISM.

No. 560,215. Patented May 19, 1896.

Fig. 1.

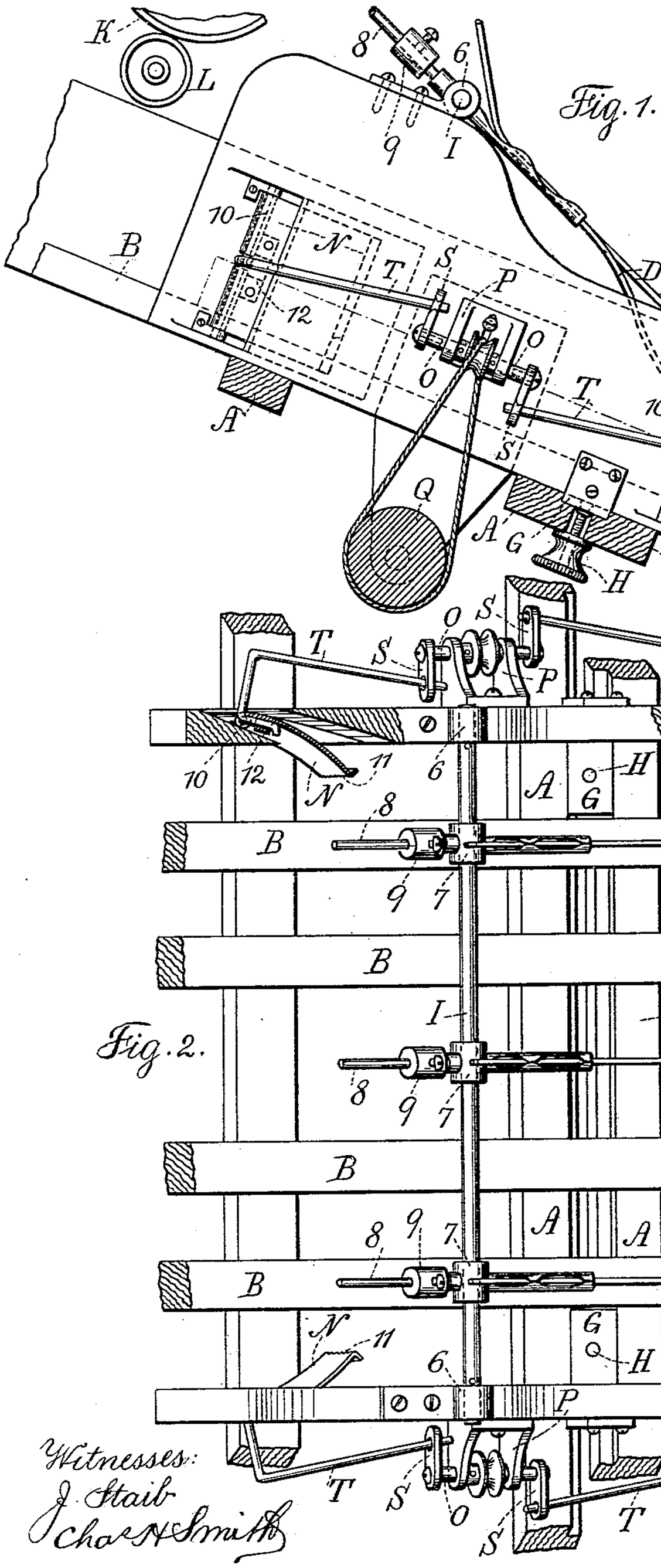

Fig. 2.

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SHEET-DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 560,215, dated May 19, 1896.

Application filed March 8, 1895. Serial No. 540,968. (No model.)

To all whom it may concern:

Be it known that I, HENRY HALL, a citizen of the United States, residing at Dongan Hills, in the county of Richmond and State of New York, have invented an Improvement in Sheet-Delivery Mechanism, of which the following is a specification.

This invention is primarily adapted to receiving sheets of paper from a ruling-machine so as to deliver the same in a pile and even up the edges, so that such ruled sheets can be removed from the apparatus ready for subsequent operations, either of printing or binding; but the present mechanism may be used for receiving the sheets as delivered from a printing-press and evening up the edges in the pile previous to removal or to the folding of such sheets previous to removal from the folding apparatus.

In printing-presses the printed sheets have been carried along by tapes and the edges have been brought into line one with the other by vibrating fingers especially adapted to acting against the front and rear edges of such sheets.

In my present improvement the sheets as ruled or printed are delivered upon an incline and slide down against a fence or stop, and a yielding detainer is provided for stopping the sheets and preventing the front edges of the sheets being rolled over or folded, and vibrators are employed at opposite edges of the sheets to bring the sheets into line or register one with the other, and these vibrators are adapted to act with great rapidity against the edges of the sheets, and there are teeth or corrugations in the operative faces, so as to lessen the risk of the edges of the sheet being borne upwardly or inwardly by sliding against the surfaces of the vibrators, and these vibrators are mounted in pairs upon movable side bars, so that they can be adjusted to the width of paper.

In the drawings, Figure 1 is an elevation, partially in section, of the apparatus; and Fig. 2 is a plan view, also partially in section.

The cross-bars A support a suitable bottom or base for the apparatus. I prefer and use the bars B, which are parallel and connected to and supported by the cross-bars A, and these bars B are at suitable distances apart to sustain the paper as it runs down such bars B in their inclined positions, (indicated in Fig. 1,) and in some instances a sheet of cardboard or plate of metal is placed upon these bars B to more fully support the paper, especially in cases where the paper is thin.

At the lower ends of the bars B is a fence or stop C, formed of fingers hinged at 5 and swinging up at right angles to the bars B, and it is advantageous to make use of helical springs E, surrounding the stationary pin of the hinges 5, and acting against the fingers of the fence or stop to swing them up at right angles to the bars B. This fence or stop may be made of any desired width, as illustrated by dotted lines in Fig. 2, or the two separate fingers alone may be made use of, as indicated by full lines.

The side pieces F are supported by the cross-bars A, and they are advantageously adjustable, so as to vary the distance between such side pieces, and with this object in view foot-plates G are provided for such side pieces F, the foot-plates sliding in grooves in the cross-bars A, and the clamping-screws H serve to hold the foot-plates and side pieces rigidly in the positions to which they may be moved according to the width of paper to be acted upon.

The cross-shaft I is within the bearings 6 upon the top edges of the side pieces F, and such cross-shaft is provided with hubs 7 at suitable distances apart, with projecting rods 8 and counterbalance-weights 9, and with trough-shaped projections for receiving the detainers D, which detainers are preferably of wire and curved, so that as the sheets of paper are delivered from the ruling or printing machine between the cylinder K and roller L, or otherwise, such sheets fall upon the bars B and slide down against the fence or stop C and beneath the detainers D, such detainers D pressing upon the sheets as they pass down one after another with the desired force or pressure, and the weights 9 can be adjusted to regulate the action of the detainers, so that the momentum of the sheet will be properly stopped and the edge of the sheet will not bend or fold by contact with the fence or stop C.

By the devices before described the advancing ends of the sheets will all be stopped in line with each other against the fence C; but their side edges require to be evened up and

brought into line with each other, and with this object in view the vibrators N are employed, the same being pivoted at their back ends upon wires or pivots 10, and they receive a vibration which advantageously is quite rapid, and the forward or operative ends of the vibrators are made with fine grooves or corrugations, as shown at 11, so that as the vibrators act against the edges of the sheets in succession as they are delivered and such edges of the sheets will not slide upon the surfaces of the vibrators in consequence of the grooves or corrugations, and the vibrators moving rapidly will bring the side edges of the sheets into line with each other.

In order to give a very rapid movement to the vibrators, any suitable mechanism may be made use of; but I prefer to employ a revolving shaft O, set in bearings P on the side pieces F, and such shafts O are driven by suitable power, advantageously by a cross-shaft and long parallel-sided drum Q, (shown in Fig. 1, but not represented in Fig. 2 to avoid confusion,) such drum advantageously being below the bars B and suitably supported, and belts are provided, passing from the drum Q to the pulleys upon the shafts O, and at the ends of these shafts O are cranks S, provided with holes or slots for the reception of the rods T, that extend out from the vibrator N and pass through the holes or slots in the cranks, and these rods T are suitably connected to the vibrators, so that the outer ends of the rods may rise and fall as they are carried around by the cranks; but the vibrators will receive their motion upon their pivots by the action of the cranks S and rods T, and with this object in view it is advantageous to allow the rods T at the ends which are adjacent to the vibrators to pass in behind the loops or straps 12 upon such vibrators, so that the returned ends of the rods T may occupy the slot or mortise between the straps and the surfaces of the vibrators.

By the arrangement of the devices represented for giving motion to the vibrators they can be operated very rapidly and with the expenditure of but little power, and the devices made use of for operating the vibrators are supported by the side pieces and can be moved with them in adapting the apparatus to different widths of paper.

It will be observed in Fig. 1 that the height of the vibrators is to be sufficient to act against the edges of the sheets of paper when in a pile of considerable thickness, and after the proper number of sheets may have accumulated in the apparatus they can be removed by hand and the hinged fence or stop can be swung down out of the way as the pile of sheets is drawn down beneath the detainers and taken away by hand.

The shape of the detainers may be varied according to the character of paper that is being received. If the paper is heavy and stiff, the detainer may be nearly straight, as seen at D′, so that the end resting on the paper may be like a pawl to prevent rebound of the paper as it strikes against the fence or stop C.

I claim as my invention—

1. The combination in a sheet-delivery apparatus with an incline down which the sheets are delivered and a fence or stop against which their advancing edges are arrested, of side pieces adjustable toward or from each other to accommodate different widths of sheets, vibrators pivotally supported upon said side pieces and mechanism also connected to and movable with the side pieces for imparting a swinging motion to the vibrators, substantially as specified.

2. The combination in a sheet-delivery apparatus with an incline down which the sheets are delivered and a fence or stop against which their advancing edges are arrested, of side pieces adjustable toward or from each other to accommodate different widths of sheets, vibrators pivotally supported upon said side pieces with grooves or corrugations in their operative surfaces and mechanism also connected to and movable with the side pieces for imparting a swinging motion to the vibrators, substantially as specified.

3. The combination in a sheet-delivery apparatus with an incline down which the sheets are delivered and a fence or stop against which their advancing edges are arrested, of side pieces adjustable toward or from each other to accommodate different widths of sheets, vibrators pivotally supported upon said side pieces with grooves or corrugations in their operative surfaces and mechanism also connected to and movable with the side pieces for imparting a swinging motion to the vibrators, detainers for pressing upon the sheets and adjustable counterbalance-weights therefor, substantially as specified.

4. The combination in a sheet-delivery apparatus, of an incline down which the sheets are delivered, a fence or stop hinged at the bottom and against which the advancing edges of the sheets are arrested, vibrators and mechanism for actuating the same to bring the side edges of the sheets into line with each other as they are delivered in succession down the incline and yielding pivoted detainers having adjustable counterbalance-weights therefor and acting above the sheets as they are delivered, the hinges of the fence permitting it to be turned down to facilitate the removal of the sheets, substantially as specified.

5. The combination in a sheet-delivery apparatus, of an incline down which the sheets are delivered, a stop or fence hinged at the bottom and adapted to be turned down and against which the advancing edges of the sheets are arrested, a side piece and vibrators supported by the said piece and having grooves or corrugations in their operative surfaces, substantially as specified.

6. The combination in a sheet-delivery apparatus with an incline down which the sheets are delivered, a fence or stop against which

their advancing edges are arrested, and detainers for pressing upon the sheets and adjustable counterbalance-weights therefor, of side pieces having openings diagonally therethrough and adjustable toward or from each other to accommodate different widths of sheets, vibrators pivotally supported upon said side pieces in said openings with grooves or corrugations in their operative surfaces, shafts in frames connected to said side pieces and means for rotating said shafts, cranks on the ends of said shafts and rods connected to the vibrators and passing through openings in the ends of the cranks whereby the rotary movement of the cranks is utilized to produce a swinging movement in the vibrators for evening the sheets, substantially as specified.

Signed by me this 5th day of March, 1895.

HENRY HALL.

Witnesses:

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