No. 636,463. Patented Nov. 7, 1899.

J. H. SMITH.

SHEET FEEDER.

(Application filed Mar. 28, 1898.)

(No Model.)

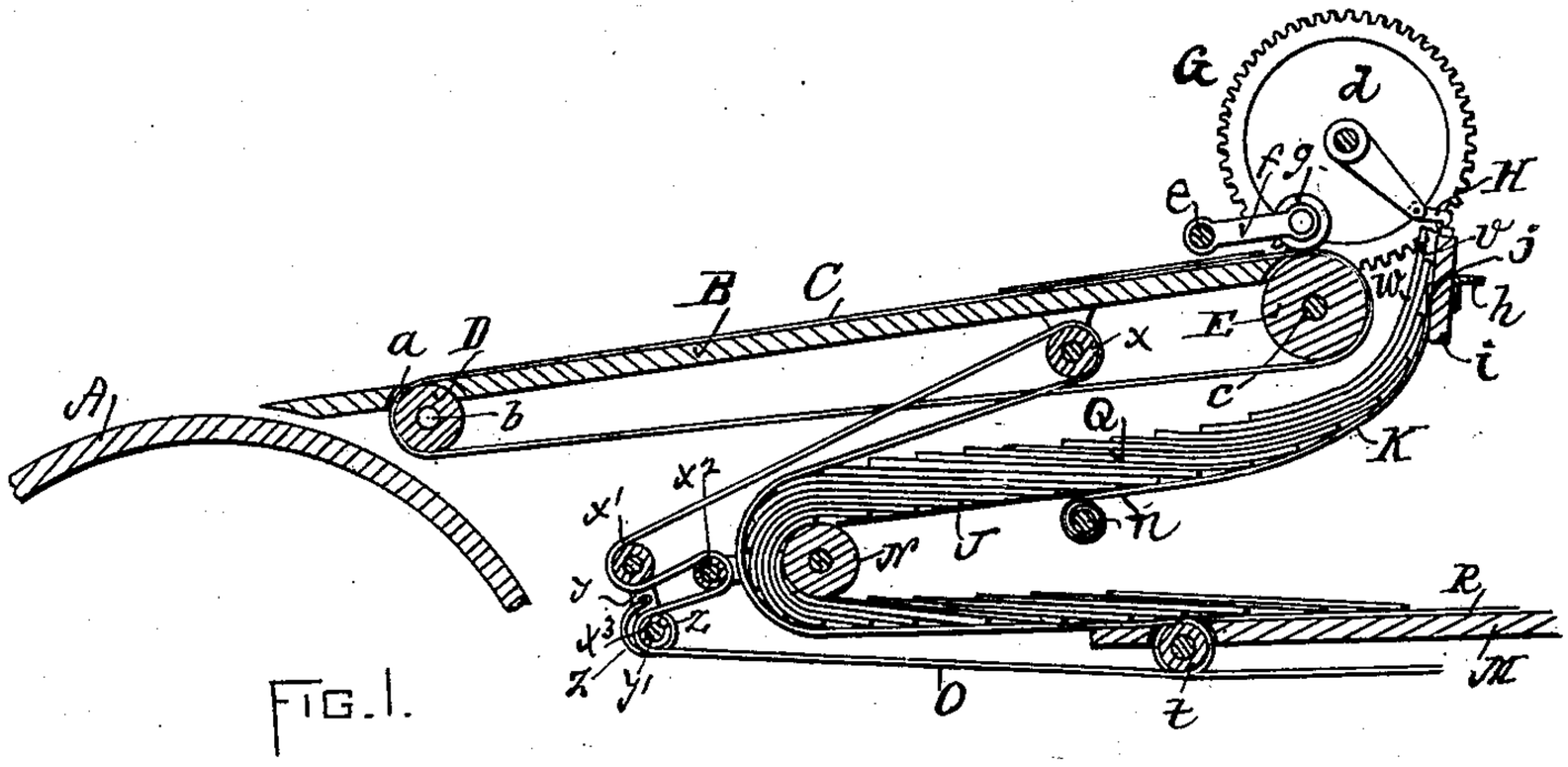

FIG. 1.

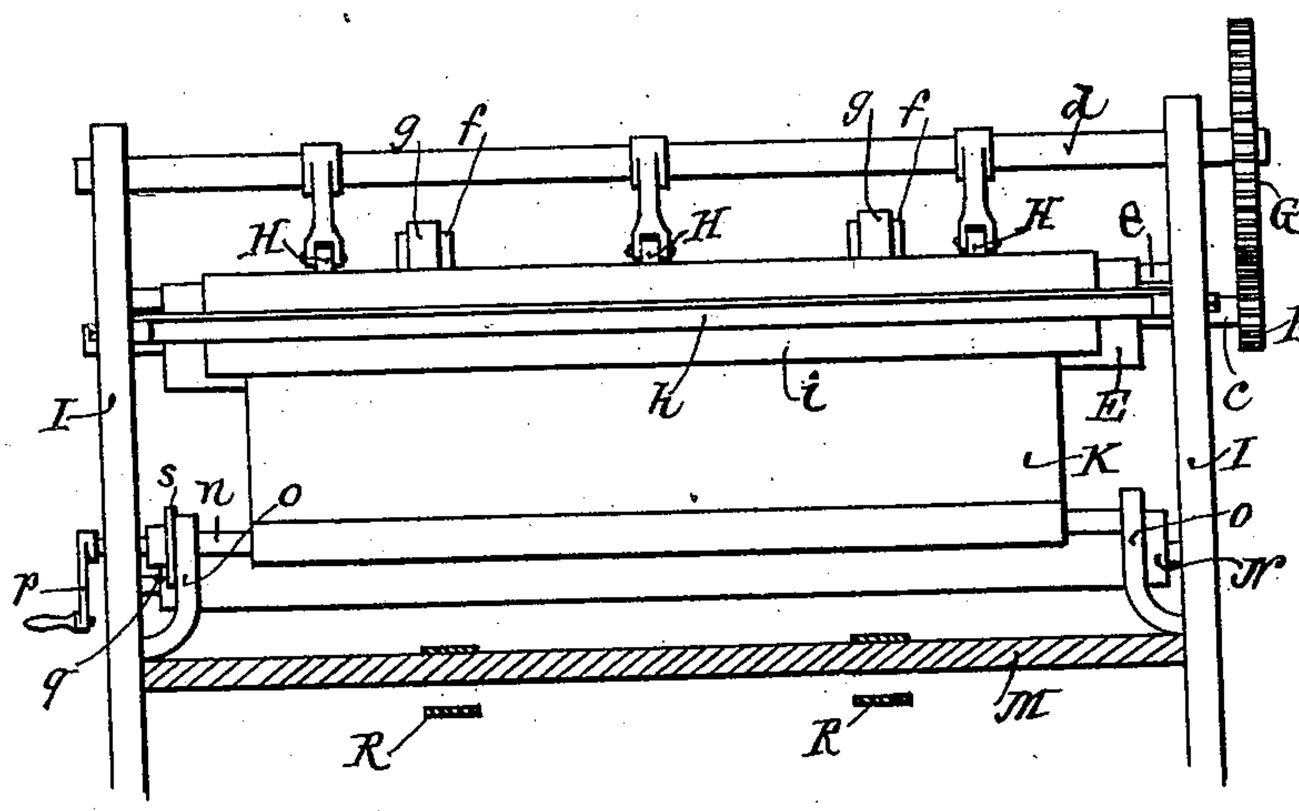

FIG. 2.

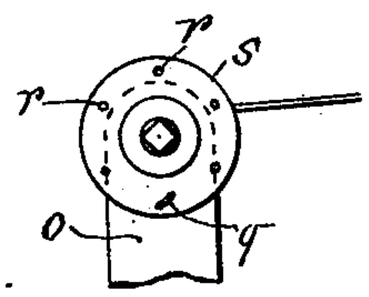

FIG. 3.

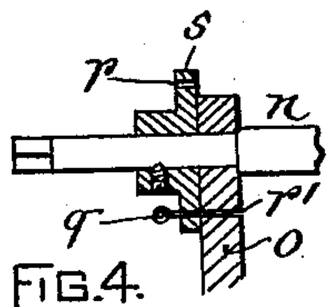

FIG. 4.

WITNESSES:

Harry J. Garman

John S. Leyneh

INVENTOR:

James H. Smith

By S. Scholfield

ATTY.

UNITED STATES PATENT OFFICE.

JAMES H. SMITH, OF PROVIDENCE, RHODE ISLAND.

SHEET-FEEDER.

SPECIFICATION forming part of Letters Patent No. 636,463, dated November 7, 1899.

Application filed March 28, 1898. Serial No. 675,489. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SMITH, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in Devices for Feeding Sheets of Paper to Printing-Presses, of which the following is a specification.

The object of my invention is to provide a suitable supporting-guide for the proper presentation of the forward edges of the sheets to the sheet-transferring means, whereby sheets of paper of various thicknesses may be presented with equal facility and precision.

In the accompanying drawings, Figure 1 represents a detail section of the feed-board and portions of the feeding mechanism. Fig. 2 represents a detail end elevation showing the parts of the feeding mechanism as extending transversely of the machine. Figs. 3 and 4 are detail views showing an approved means for adjusting the supporting-guide for feeding various thicknesses of paper.

In the drawings, A represents a segment of the cylinder of the printing-press, B the feed-board, and C an endless band passing downward along the upper surface of the feed-board and through a slot-opening *a* and around the pulley D, arranged upon the shaft *b*, and thence around the periphery of the drum E, the said drum having at the end of its shaft *c* the pinion F, which engages with the gear G upon the shaft *d*, to which the wiping-fingers H H H for moving the edge *v* of the top sheet *w* of the pile Q are attached. To the rod *e*, extending from side to side of the machine above the feed-board B, are secured the arms *f f*, the outer ends of which are provided with the pressure-rollers *g g*, which rest with their weight upon the surface of the drum E and revolve therewith, so that a sheet of paper when inserted between the said rolls and the drum will be carried forward and delivered upon the downwardly-inclined surface of the feed-board, from whence it will be carried forward to the rotary cylinder A by means of the endless band C and accessory devices.

The angle-iron bar *h* extends across the machine between the two side frames I I, and to the said angle-iron bar is attached the wooden bar *i*, to the inner side of which is secured the upper edge *j* of the sheet of canvas K, which forms the adjustable supporting-guide for the pile of paper Q and extends from the supporting-plate J to the bar *i*. The lower edge of the adjustable guide K is wound around the shaft *n*, which is held in suitable bearings in the standards *o o*, attached to the side frames I I, and by winding up the sheet of canvas K upon the shaft *n* or unwinding the same, and thus varying the length of the guide, its length will be changed. This variation in the length of the said guide or canvas sheet is for fixed adjustment—*i. e.*, after the length has been adjusted it remains constant until again adjusted by rotation of the shaft *n;* but there is no constant tension exerted upon the said guide and tending constantly to wind it or shorten it. By this means, while the length of the guide may be varied to obtain an approximate adjustment according to the nature of the paper to be acted upon by it, yet when the said length has been adjusted it remains thereafter constant until again positively changed, and during such time while the length of the guide remains constant its curvature between its two points of support is free to adjust itself as required by the advancing or leading edge or edges of the pile of sheets. By thus providing a guide to change the direction of the pile of sheets that is free from tension tending constantly to tighten it or shorten it the said guide, as actual use demonstrates, freely adjusts itself to the required curvature for the leading edge of the pile of sheets and effectively changes the direction of the latter without so disturbing the sheets as to negative or offset the arrangement required for the proper handling of the same. For example, where the pile of sheets is fed in mass, with the leading edge of one slightly in advance of the next, the guide described, or one possessing its characteristics, as subsequently claimed, will effectually change the direction of the said pile of sheets without in any wise disturbing this arrangement of one sheet slightly in advance of the next, thus permitting the sheets after being turned to present themselves singly to the mechanism for passing them singly to the impression-cylinder. Were it not for this capacity of my improved guide sheets of varying thick-

nesses or sizes failing to find a curve suited to their said thickness or size would shift and adjust themselves to the guide instead of compelling the guide to conform to the pile of sheets. In other words, the arrangement of sheets may remain constant, the guide automatically adjusting itself to the sheets instead of the guide compelling a new adjustment of the sheets.

To the outer edge of the shaft *n* is attached the crank *p*, by means of which the sheet of canvas K, which forms the pile-supporting guide, may be either wound up or unwound from the shaft *n* to give the required radius of curvature, and the shaft *n* may be locked in its set positions by means of the removable pin *q*, which will pass through either of the perforations *r* made in the disk *s* attached to the shaft *n*, as the case may be, and enter the perforation *r'* made in the bearing-standard *o*.

The pile of paper Q is first brought forward by means of endless bands R, which pass along the surface of the table M and over the roller *t*, and from the forward end of the table M to the feed-roller N the pile of paper is supported by means of endless bands O, which pass around the roller *t*, thence around the driven feed-roller N, thence around the fixed guide-roller *x*, thence around the movable guide-roller *x'*, thence around the fixed guide-rollers x^2 x^3, and back to the roller *t*, the movable guide-roller *x'* being held upon a spring-actuated arm *y*, loosely held upon the fixed rod *y'*, upon which the guide-roller x^3 turns, the resilience of the coiled spring *z*, which forms a connection between the arm *y* and the rod *y'*, serving to allow the bands O to yield, in accordance with the thickness of the pile of paper Q passing around the feed-roller N, the frictional engagement of the pile of paper with the periphery of the positively-driven feed-roller N serving to carry the pile forward over the surface of the supporting-plate J and onto the curved supporting-guide K, and when the pile of paper is carried forward by the rotation of the feed-roller N the upper edge *v* of the forward sheet *w* of the pile Q will be engaged by the wiping-fingers H H and carried by the continued rotation of the said fingers to engagement with the pressure-rollers *g g*, by means of which the top sheet *w* will be taken from the pile and carried forward to the inclined feed-board B.

The curved supporting-guide K may be made of sheet metal or other flexible material instead of canvas, and I do not limit myself to the details of construction shown, since it will be very obvious to those acquainted with the art that other means may be employed for changing the radius of the curvature of a supporting-guide than that shown and described and still embody the spirit of my invention.

I claim as my invention—

1. In a paper-feeding machine, means to feed a pile of sheets, and a flexible curved guide supported free of tension, to change the direction of movement of said sheets, said guide being free at all times to change its curvature under the action upon it of the advancing sheets.

2. In a paper-feeding machine, means to feed a pile of sheets each sheet of the pile slightly in advance of the next adjacent sheet, and a flexible curved guide supported free of tension, to change the direction of movement of said sheets, said guide being free at all times to change its curvature under the action upon it of the advancing sheets, thereby avoiding relative displacement of said sheets.

3. In a paper-feeding machine, means to feed a pile of sheets, each sheet of the pile slightly in advance of the next adjacent sheet, a flexible curved guide supported free of tension, to change the direction of movement of said sheets, and feeding means to engage the leading edges of said sheets after traverse of said guide, the latter being free at all times to change its curvature under the action upon it of the advancing sheets, thereby to preserve the lead of each sheet over its next adjacent sheet, for proper action of the said feeding means upon them.

4. In a paper-feeding machine, the combination of the inclined feed-board, the upwardly-curved supporting-guide arranged under the rear end of the feed-board, and means for adjustably changing the curvature of the supporting-guide, with the bands, and the driven feed-roller arranged within the bands for causing the forward movement of the pile of paper onto the upwardly-curved supporting-guide, and means for transporting the top sheet of the pile from its delivered position at the curved supporting-guide, onto the inclined feed-board, substantially as described.

JAMES H. SMITH.

Witnesses:
SOCRATES SCHOLFIELD,
EDWARD S. JONES.