

F. H. LAUTEN.
Paper-Feeding Machines.

2 Sheets—Sheet 1.

No. 223,742.

Patented Jan. 20, 1880.

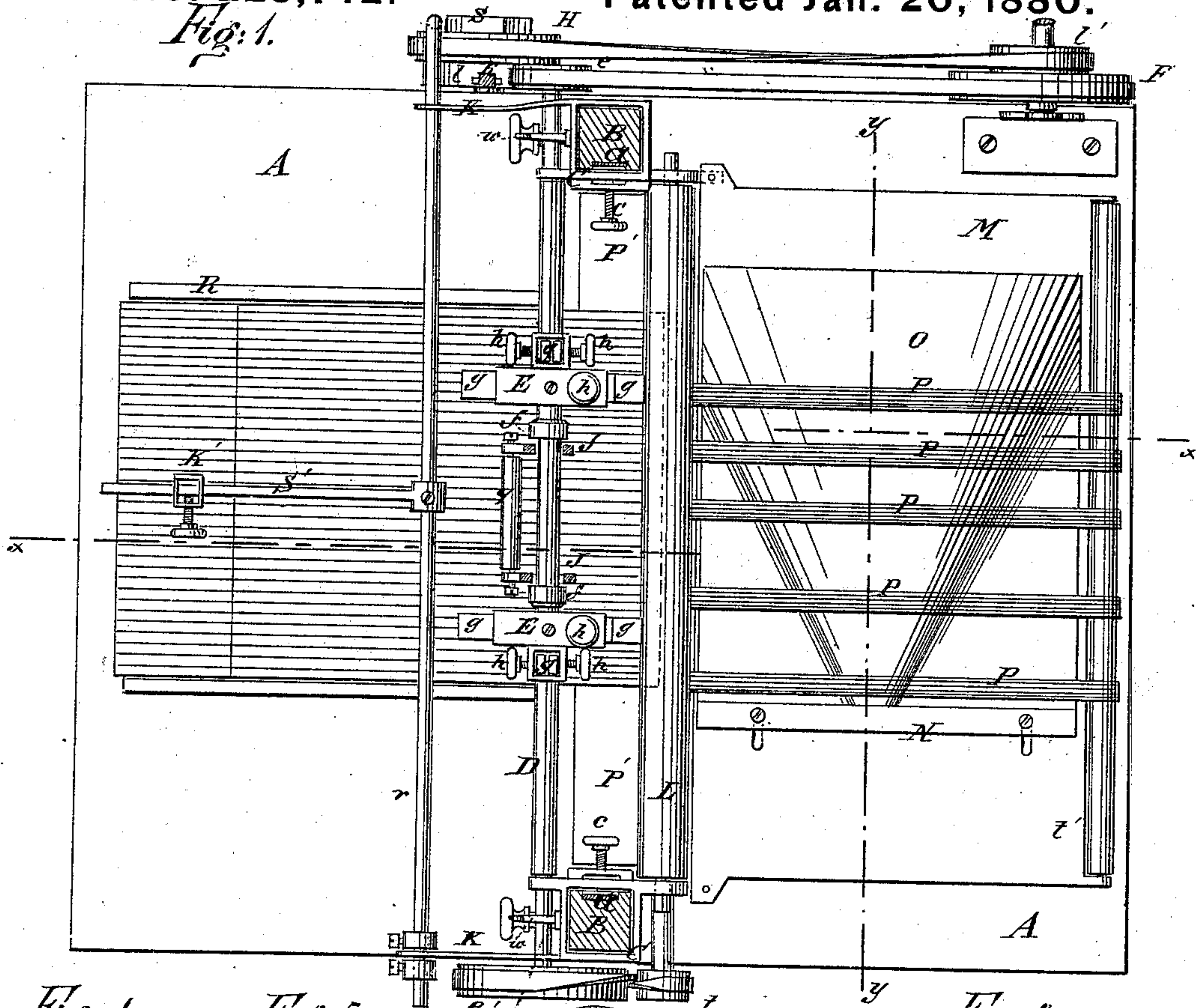
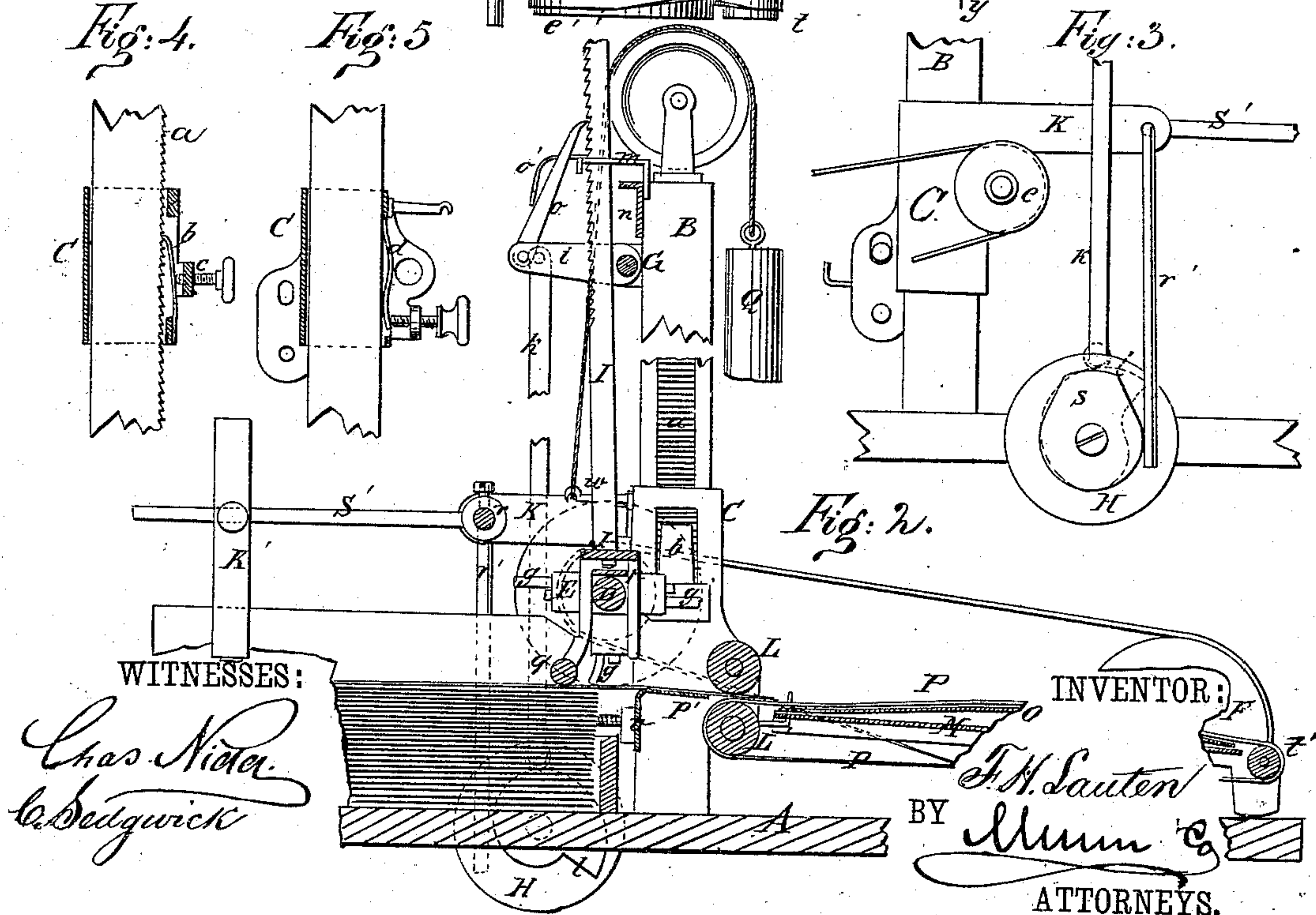


Fig: 4.

Fig: 5.

Fig: 3.

Fig: 2.



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Fig: 6.

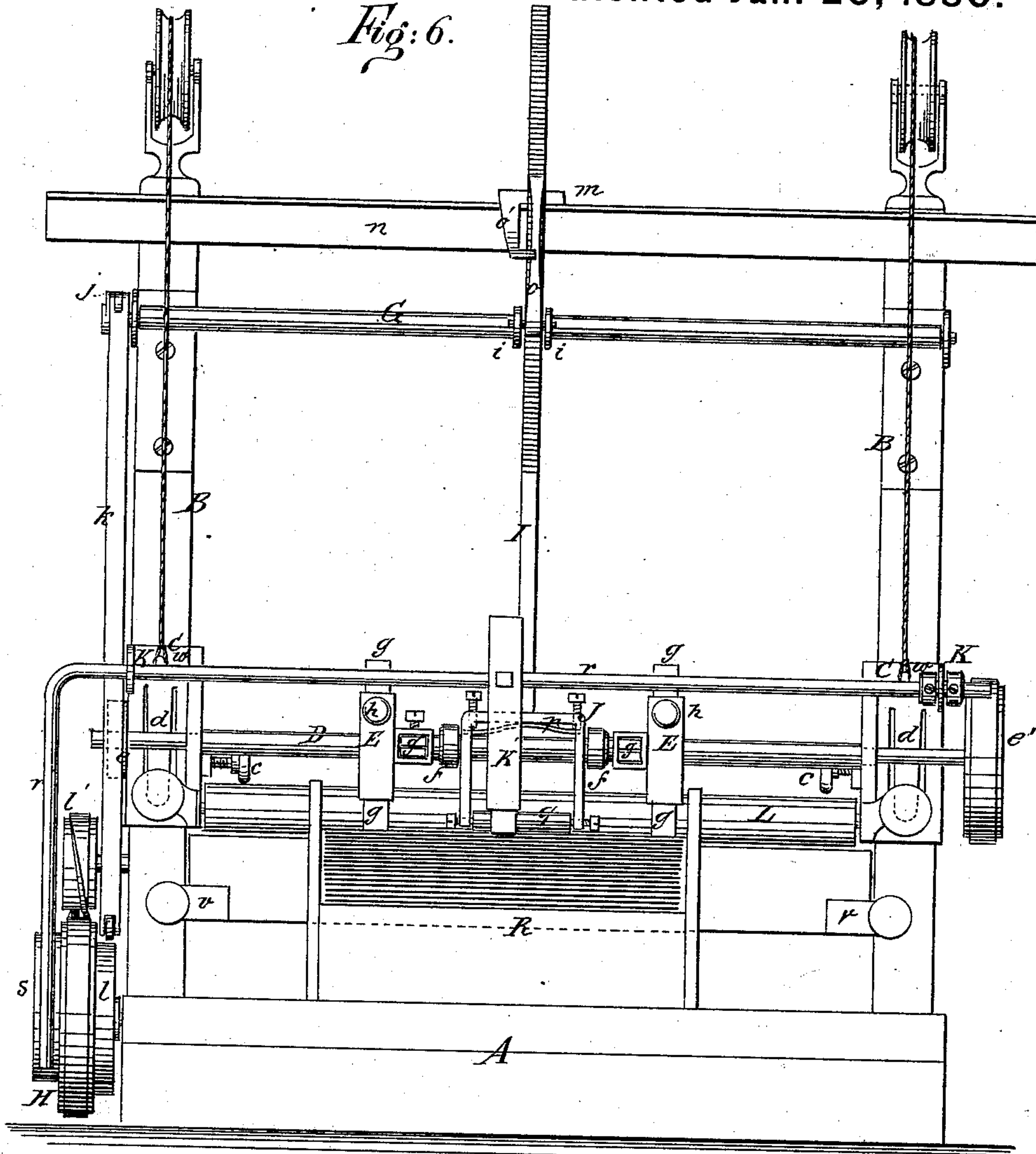
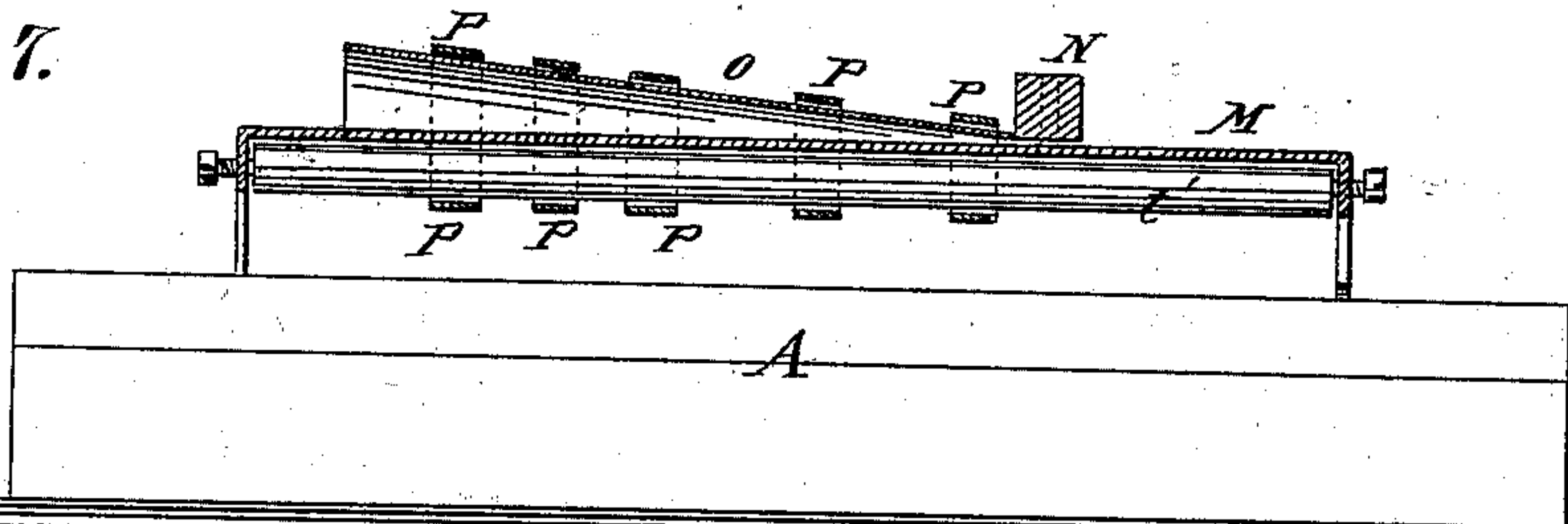


Fig: 7.



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UNITED STATES PATENT OFFICE.

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PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 223,742, dated January 20, 1880.

Application filed June 20, 1879.

To all whom it may concern:

Be it known that I, FRANK H. LAUTEN, of the city, county, and State of New York, have invented a new and Improved Paper Feeding and Adjusting Apparatus, of which the following is a specification.

My invention relates to improvements in feeding paper and other material to printing-presses and folding-machines, the blanks to the forming and shaping machine for making paper boxes and bags, ruling-machines, and for other similar and analogous machines wherein the paper or other material requires to be fed in single sheets continuously and in harmony with the operative mechanism of the machine. The improvements also comprehend devices for adjusting the paper on the apron.

The object of the improvements is to automatically feed the paper or other material to the machines in single sheets, and to guide it over the apron so that it will be seized by the grippers or other receiving mechanism and fed squarely to the press or other machine.

The invention consists, first, of rotary feeders, vertically adjustable, so as to feed one sheet at a time, and as it feeds to automatically descend, and thus keep in position to engage the sheets; secondly, of a timer to hold the sheets and prevent more than one at a time from being fed through to the apron; thirdly, of a feed-plate, over which the apron runs, inclined to a parallel gage, so that the paper, as it is passed through the feed-rolls, is led down to the gage and fed squarely to the grippers; fourthly, of an adjustable apron between the feeders and feed-rolls, to prevent more than one sheet from passing to the feed-rolls, made adjustable to adapt it to intercept sheets of different thickness; and, lastly, it consists of the details of construction and the mechanical devices employed in carrying out these several operations, all of which will be fully described in connection with the accompanying drawings.

In the accompanying drawings, Figure 1 is a plan of my improved feed apparatus and adjuster. Fig. 2 is a vertical transverse section of the same on line *x x* of Fig. 1. Fig. 3 is a detailed end view of the apparatus, show-

ing the cams for operating the device for giving the vertical movement to the feeders and for operating the timer. Figs. 4 and 5 are detailed views of the devices for governing the vertical movement of the feeders and other connected parts. Fig. 6 is a front elevation of the apparatus; and Fig. 7 is a longitudinal section, on line *y y* of Fig. 1, of the sheet-adjusting device.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A is the platform of the apparatus, from each side whereof rise standards B B, the inside faces whereof are provided with ratchets *a a*. Over the standards are placed guide-sleeves C, having on their inside spring tongues or pawls *b* in position to engage the ratchets *a*, their tension against the ratchet being regulated by set-screws *c*. On the front side of the sleeves are spring-tongues *d*, one end fixed to the sleeve and the other projecting through a slot, so as to bear against the standard. The pressure or tension of these tongues is likewise regulated by set-screws, and the purpose of both the tongue and pawl and ratchet is to hold the sleeves, which without them would slip up and down freely on the standards, at any desired height, but in such a way as to yield and allow them to descend slowly under the blows of a knocker, which will be presently described. In projections of these sleeves is journaled a shaft, D, carrying pulleys *e e'*, one at each end.

E E are the rotary feeders, composed of socket-pieces placed at right angles to each other, and having holes through them at the crossing, which are slipped over the shaft D, and secured by set-screws at equal distances from the center of the shaft, collars *f f* being placed on the shaft to limit a space between them. In these socket-pieces are placed elastic rubbers *g*, projecting out of the sockets and adjusted and gaged by set-screws *h*. Pulley *e* is belted to pulley F, which in turn is geared to the press or other machine to which the apparatus is applied, so as to be operated by the same power whereby rotary motion is communicated to shaft D and the rotary feeders E.

A shaft, G, is journaled in the standards B, having at the middle jaws *i*, and at one end

an arm, *j*, in which is pivoted a vertical bar, *k*, passed through a guide, and having on its lower end a friction-wheel, which bears upon a cam, *l*, on one side of pulley *H*, belted with pulley *l'* on the shaft with pulley *F*. Through the jaw *i* is passed a rack-bar, *I*, and, above, the bar is passed through a guide, *m*, attached to the bar *n*, fixed horizontally to the standards.

In the jaws is pivoted a pawl, *o*, which engages the rack of the bar *I*, where it is retained by a spring, *o'*.

The lower end of bar *I* is joined to the bifurcated knocker *J*, which straddles shaft *D* between the collars, so that a spring-cushion, *p*, fixed to the under side strikes the shaft when the knocker is lifted and let fall. In the two front arms of the knocker, at the lower end, is pivoted a friction-roller, *q*, to press the paper to the adjustable apron.

The adjustment of the knocker and feeders is intended to be such that when the knocker is down on the shaft the under face of the roller and the ends of the rubbers shall be nearly equally distant from the axis of shaft *D*, the roller *q* being slightly higher than the rubbers to enable them to take hold of the paper readily.

In projections *K K*, extending out from sleeves *C*, is supported horizontally a shaft, *r*, having one end bent down to form an arm, *r'*, which bears against the face of cam *s* on the outside of pulley *H*, so that as the cam revolves the arm is swung out and the shaft thereby oscillated. An arm, *s'*, has one end passed over the shaft to the middle, where it is held by a set-screw.

K' is a timer composed of a socket-piece passed loosely over arm *s'*, at right angles thereto, and secured at any desired distance from the shaft by a set-screw, while in its lower end is placed a block of india-rubber or other suitable material to furnish a holding-face, which bears upon the paper to be fed. This timer is lifted by the oscillation of the shaft to allow a sheet to be drawn off the pile by the feeders, but drops immediately after the sheet is drawn out, and holds the next sheet until the one fed has passed from the apron to the press.

On the opposite side of the standards the sleeves *C* are provided with projections, in which are pivoted feed-rollers *L L'*, the latter immediately under the former, the distance between the adjacent faces being gaged to the thickness of the material to be fed. The journal of roller *L'* projects beyond its bearing, and carries a pulley, *t*, belted to pulley *e'* on shaft *D*, so as to be rotated by it. From the feed-rolls leads the feed-plate *M*, inclined downward, and having at its lower edge a roller, *t'*, which is designed to join at a proper distance the grippers of the printing-press or other receiving mechanism of the machine to which it may be applied. On the upper side of the feed-plate, near the right-hand side, is placed a parallel gage, *N*, which is designed

to be laterally adjustable, and joining this is an inclined guide-plate, *O*, placed on the feed-plate, with its top and bottom edges and the edge joining the gage *N* in contact with the feed-plate, while its left-hand edge is raised up, so as to give an inclined surface to the gage and over the plate, whereby the paper passing upon it from the feed-rolls is led down or guided to the gage, so that its edge will run along in contact with and parallel to the gage, and thus be fed squarely to the grippers or other receiving mechanism.

P are the endless tapes passed over the inclined guide-plate, around feed-roller *L'*, roller *t'*, and under the feed-plate, forming thus the revolving apron which carries the paper from the feed-rollers to the receiving mechanism of the press or other machine.

Between the rotary feeders and the feed-rolls *L L'* is pivoted, by its ends, to the sleeves *C* an adjustable apron, *P'*, the edge adjacent to the feed-rolls being on a level with the top of the lower roll, while the edge adjacent to the rotary feeders has a right-angular downward extension, provided at the ends with projecting ears *v v*, through which set-screws are passed to bear against the standards. The purpose of this adjustable apron is to furnish a ledge, over which the edge of the sheet drawn forward by the feeders is lifted, so as to prevent more than one sheet being fed at a time. As, however, sheets of different thickness are required to be fed through the same machine, it is essential that this ledge should be raised and lowered to accommodate it to the various thicknesses of the sheets, and this is done by the set-screws passed through ears *v*.

The rotary feeders, timer, feed-rolls, feed-plate, and adjustable apron being all dependent from the sleeves *C*, their weight is counterbalanced by weights *Q*, connected to cords run over the pulleys on top of the standards, and carried down and connected to hooks *w*, projecting from the sleeves.

In place of an inclined plate, *O*, to lead the paper to the guide *N*, conical rollers may be employed revolving parallel to the feed-rolls, or other devices furnishing an inclined surface.

The operation of this apparatus is as follows: The movements must be timed so that when one sheet is seized by the grippers or other receiving mechanism of the machine to which the feeding apparatus is attached the timer will lift and permit another sheet to be drawn out, dropping immediately back, however, while the sheet is passed over the adjustable apron, caught by the feed-rolls, and thence carried to the revolving apron, which carries it over the inclined guide-plate, which leads its side edge against the parallel gage, so that it is carried against the squaring-gage, in position to be caught by the grippers or other receiving mechanism and fed squarely to the machine. In the meantime the knocker, which was being lifted by cam *l* while the sheet was being fed forward by the rotary

feeders, is dropped by the bar dropping at the end of the cam-face, and the head, striking shaft D, causes the various parts of the apparatus connected with the sleeves C to move downward slightly, sufficient to keep the ends of the rubbers *g* in contact with the paper.

The paper is piled upon the table R in front of the apparatus, the ends of the paper abutting against the adjustable apron P'. The sides of table R may be made adjustable, to adapt it to receive sheets of different widths.

This apparatus, as will be readily understood from the foregoing description, furnishes an efficient automatic feeder for printing-presses, &c., that does the work with the most exact precision, and enables all operators at the feeding end of the press or other machine to be dispensed with.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. As an improvement in automatic paper feeders and adjusters, the combination, with table R and feed-rolls L L', of rotary feeders E, provided with elastic rubbers *g*, and fixed to shaft D, journaled in the sleeves C, moving vertically on standards B B, whereby the paper laid on table R is drawn by the said feeders to the feed-rolls L L', substantially as described.

2. In combination with the rotary feeders E, the bifurcated knocker J, straddled over shaft D, and carrying friction-roller *q*, to bear upon the paper, said knocker being provided with ratchet-bar I, connected by a pawl, *o*, with shaft G, which is operated by cam *l* through bar *k*, so as to raise the knocker and allow it to fall after each sheet is fed, for the purpose of driving the feeders down and keeping them in contact with the paper on the table, substantially as described.

3. In combination with the rotary feeders E,

the timer K', connected with shaft *r*, having arm *r'*, oscillated by cam *s*, for the purpose of holding the sheets to prevent more than one from being drawn out by the feeders at a time, and thus insure the feeding of the sheets one after the other to the feed-rolls, said timer being adjusted to rise after the sheet last fed has been carried to the revolving apron, and thus permit another sheet to be carried forward by the feeders, substantially as described.

4. The sleeves C C, moving vertically on standards B B, provided with ratchets *a*, and having pawls *b* to engage the ratchets and spring-tongues *d*, to hold the said sleeves up and prevent the too rapid descent under the blows of the knocker, in combination with the rotary feeders E and timer K', to regulate and adjust their descent, substantially as described.

5. The adjustable apron P', pivoted between standards B B to the sleeves C, with its back edge even with the top of the lower feed-roll, while its front edge is adapted to be raised and lowered by set-screws, in combination with the rotary feeders E, for the purpose of forming a ledge over which the sheet being fed is lifted, and thus prevent more than one sheet from passing over, substantially as described.

6. The weights Q, connected by cords running over pulleys with the sleeves C, in combination with the sleeves C and connected parts, to counterbalance the weight thereof, and thus enable the sleeves and connected parts to be held up by the pawls and spring-tongues in the sleeves at a tension that yields to the blows of the knocker, and thus enables the feeders and other parts to descend at the proper speed, substantially as described.

FRANK H. LAUTEN.

Witnesses:

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C. SEDGWICK.