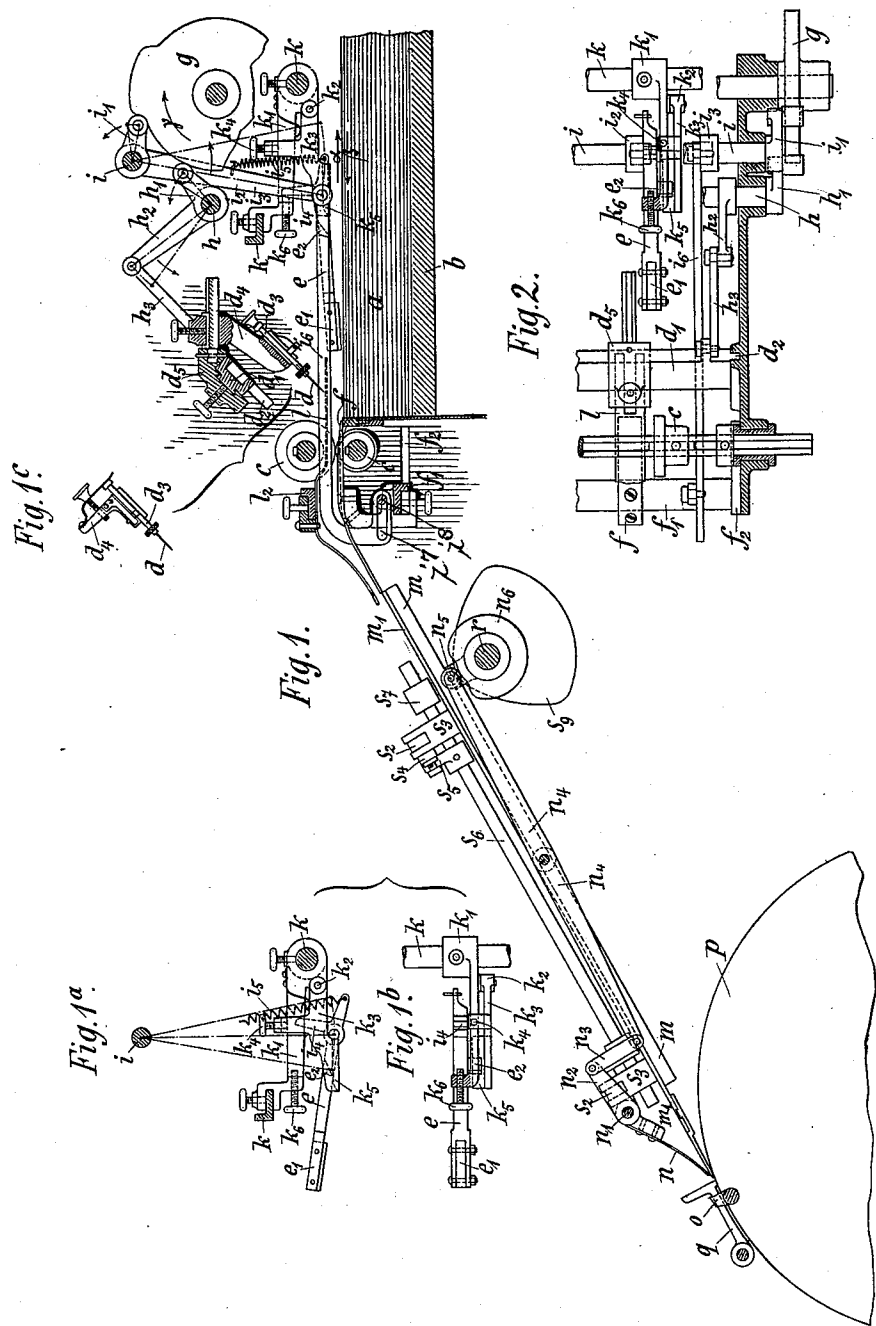


A. REISSER.
PAPER FEEDING MACHINE.

No. 567,043.

Patented Sept. 1, 1896.



Witnesses:

E. H. Sturtevant

E. A. Scott.

INVENTOR.

Adolf Reisser,
by Richard P. [Signature]
attorney

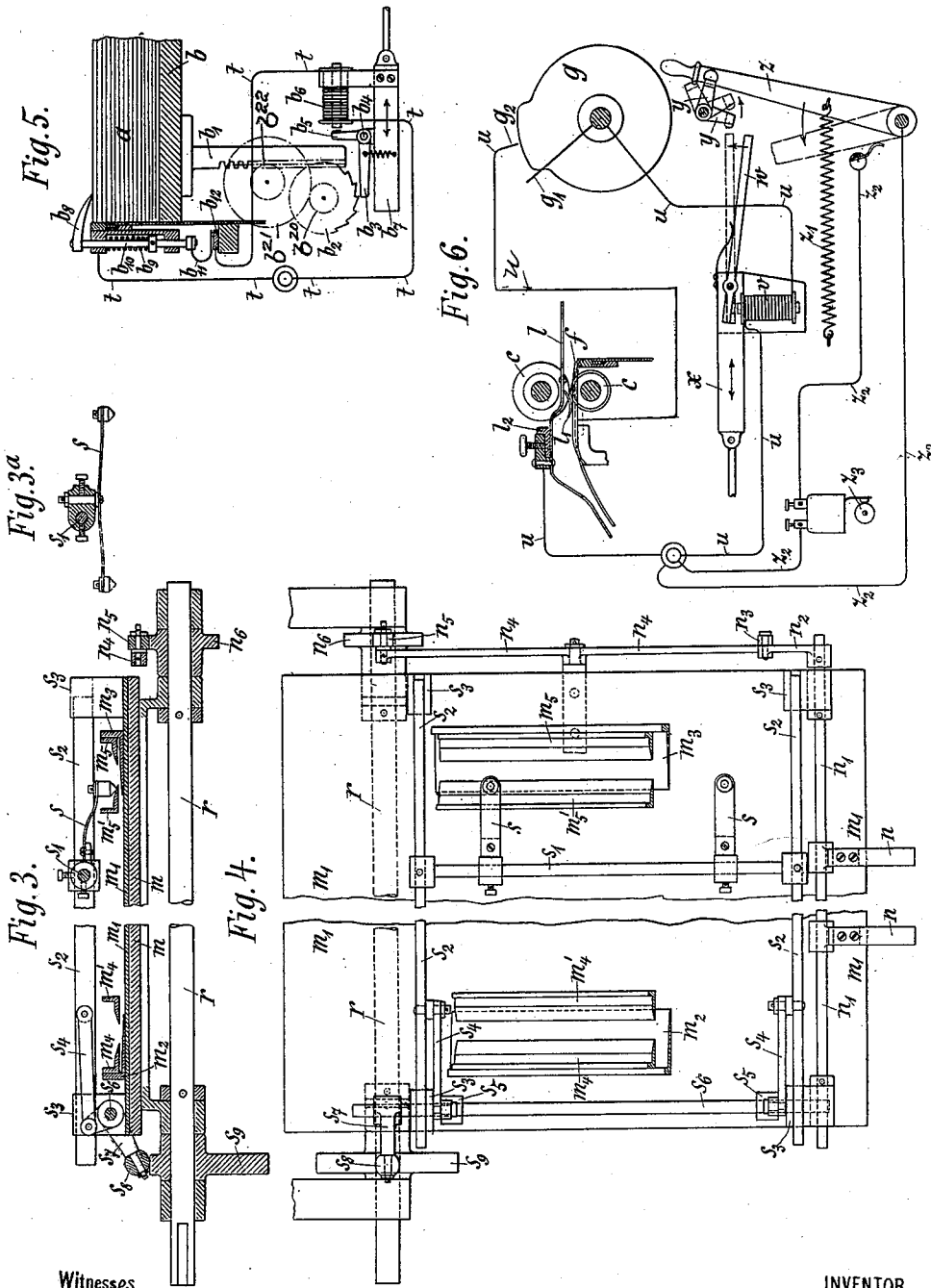
(No Model.)

2 Sheets—Sheet 2.

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attorney.

UNITED STATES PATENT OFFICE.

ADOLF REISSER, OF VIENNA, AUSTRIA-HUNGARY.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,043, dated September 1, 1896.

Application filed August 31, 1894. Serial No. 521,851. (No model.) Patented in Austria-Hungary March 3, 1894, No. 43,832/91,818.

To all whom it may concern:

Be it known that I, ADOLF REISSER, a citizen of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, Austria-Hungary, have invented an Improved Apparatus for Automatically Lifting and Feeding Single Sheets from a Pile of Paper to Machines Used in the Paper and Printing Industry, of which the following is a specification.

The invention has been patented in Austria-Hungary March 3, 1894, No. 43,832/91,818.

The subject-matter of this invention relates to an apparatus for effecting the automatic and periodic lifting of the upper sheet of a pile of paper, automatically raised step by step as the pile decreases, and for automatically feeding such sheet to the machine in the exact position required.

Referring to the accompanying drawings, Figure 1 is a front view of the table and feeding-board of a fly-press provided with my improved devices. Some of the parts are shown in section. Fig. 2 is a plan view of the table. Figs. 1^a, 1^b, and 1^c show in detail different parts of the arrangement. Fig. 3 is a section of the feeding-board; Fig. 4, a plan view of the same. Fig. 3^a is a detail view. Fig. 5 shows the automatic mechanism for raising the table. Fig. 6 shows an automatic device for throwing the machine out of gear, and which only operates when a sheet of paper fails to be fed.

The parts forming the subject-matter of this invention may be comprised in several groups, and for the sake of clearness and brevity I shall divide same in such manner and describe each group separately. Such groups are, first, the mechanism for lifting the upper sheet of a pile of paper; second, the mechanism for feeding the sheets into the exact position required; third, the mechanism for raising the table for successively raising the pile of the paper; fourth, the stopping mechanism, which throws the machine out of operation when a sheet of paper fails to be fed.

I. The Mechanism for Lifting Up the Top Sheet.

The pile of paper *a* is placed on the table-leaf *b* and the upper sheet is lifted from the

pile by the combined action of the main organs, needle *d*, finger *e*, separator *f*, Figs. 1 and 2, and fed to the feeding-rollers *c c*.

The method of raising the upper sheet of paper is carried out in such manner that the needle *d*, when in its lowest position, picks said upper sheet at any suitable point, and that in consequence of the sliding movement of the finger *e* (in the direction of arrow *x*) on the upper face of such sheet the latter slightly inclines in an upward direction along the needle, the separator *f* simultaneously entering the opening thus formed between the upper sheet and the one immediately underneath same, and, finally, that after needle *d* has been drawn from the hole formed in the sheet during the movement to the highest position said sheet is transferred over the separator *f* to the feeding-rollers *c c* in consequence of the movement of the finger *e*, (at this moment in the direction of arrow *B*.) This reciprocating motion of the main parts—needle *d*, pusher *e*, and separator *f*—is effected by the cam *g* and by the two oscillating shafts *h* and *i*, operated by same. Each of these shafts is provided with an arm *h' i'*, carrying an anti-friction-roller acting on the periphery of the cam *g*. The oscillating shaft *h* carries the arm *h²*, which, by means of the connecting-rods *h³*, causes the support *d'* to reciprocate in an inclined direction. Oblique guideways or slots *d²*, one at each side of the machine, engaging with the ends of this support *d'*, are provided for such purpose, and the needle *d* works parallel or nearly parallel to the direction of such movement. The needle *d* is secured in the end of holder *d³*, which, by means of the spring, Figs. 1 and 1^c, is held to the needle-carrier *d⁴*, so that it yields. The latter is carried by the parts *d⁵*, adjustably connected to the support *d'*. The other oscillating shaft, *i*, carries the arms *i² i³*. The end of the arm *i²* is linked to the angle-lever *i⁴*, a horizontal arm of which latter forms the pusher *e*, whose head *e'*, for pressing on the face of the upper sheet, is made of india-rubber or other suitable material. The pressure of the pusher *e* on the upper sheet is effected by the spring *i⁵*, attached to a horizontal extension of the angle-lever *i⁴*, Figs. 1 and 1^a. The other arm, *i³*, actuates the support *f'*, carrying the separator *f*,

by means of the connecting-rods i^6 . This support f' is rectilinearly guided in consequence of the guide-slots f^2 , and thus receives a rectilinear reciprocating motion.

5 The operation of the mechanism is such that the upper sheet of the pile of paper a is subjected at certain moments to the pushing and pressing action of the pushers, viz: from the starting-point, as shown by the position
10 of e and i^2 in Fig. 1, and then for a certain part of the motion in the direction of the arrow x . At this movement the pusher e is raised a little, when it takes a position a certain distance above the upper sheet. The
15 individual parts of the raising device arranged for this purpose are mounted on the two transverse supports k , the one in Fig. 1 being angle-iron, the other round bar-iron. The bar k' , clamped to both supports k , carries an oscillating arm k^3 , pivoted at k^2 , said
20 arm k^3 being supported on the bar k' by means of the adjusting-screw k^4 . The side nose e^2 of the pusher e glides during part of the movement of e in the direction of the arrow x on the horizontal face k^5 of the arm k^3 , the
25 pusher e being thus slightly raised. The bar k' also carries the adjusting-screw k^6 , which, by its action on the vertical arm of the angle-lever i^4 , at the starting-point of e and i^2 , Fig.
30 1, raises the pusher e slightly above the upper sheet of the pile of paper, Figs. 1^a and 1^b. In Fig. 2 the levers i^2 and i^3 are shown in their center positions, whereas in Fig. 1 they are shown in their extreme position to the left.

35 The operation of the mechanism described for raising the upper sheet of paper is as follows: The cam g , rotating in the direction of the arrow, operates by its projecting parts first the shaft h with arm h' , and swing-arm
40 h^2 , and with this the support d' , together with the needle-carrier d^4 , the holder d^3 and needle d corresponding to the rectilinear movement permitted by the guideways or slots d^2 , in an oblique and downward direction, until the
45 point of the needle comes in contact with the upper sheet of the pile of paper. When, now, the swing-arm i^1 is raised by the projection on g , the arms i^2 and i^3 are moved in the direction of the arrow x . The pusher immediately falls on the upper sheet and commences to draw same in the direction of the
50 arrow x , whereupon the end of the sheet picked by the needle d is slightly raised along the same, an opening being formed in which the separator f enters. The rod i^6 is slotted at its end, connected with the support f' of the separator, so that while the pusher e and needle d are being operated to raise the sheet the separator f will remain inactive by reason of
60 the lost motion secured by the slot i^7 , and when the sheet is lifted the pin i^8 is struck by the end wall of the slot and the separator f is then moved. The picked sheet which is pushed to the right and raised along the needle is then released from the action of the
65 pusher e by the nose e^2 of the pusher e coming in contact with the face k^5 , said pusher e

being then slightly raised. The nose e^2 does not fall from the face k^5 until the extreme limit to the right is almost attained. In the
70 meantime the needle d is moved into its upper position by the swing-arm h' running down the slope of the projection of the cam g , and thus returns to its original position. The sheet hanging on same is then pushed
75 off the needle by the metal stripper l , preferably acting on the needle like a fork. Finally the two arms i^2 and i^3 return from the end of the right stroke in the direction of the arrow
80 B and the upper sheet is now pushed in the same direction to the feeding-rollers c . The pusher e at the same time moves underneath the under face of k^5 , whereupon the oscillating arm k^3 , which yields in an upward direction, is slightly raised, and thereby constantly
85 exerts a downward pressure on the said nose e^2 of e . When the extreme position to the left is reached, the pusher e , by the action of the adjustable screw k^6 on the vertical arm of the angle-lever i^4 , is slightly raised and
90 takes up the original position shown in Fig. 1.

The feeding of the sheets from the pile a to the board m is effected in proper order by the feeding-rollers c .

II. *The Mechanism for Feeding and Adjusting the Sheets.*

The sheet being carried from the feeding-board m passes along the inclined plane m' as soon as it is caught by the rollers c , and
100 for avoiding the front edge of the paper being mutilated by contact with the stops of the printing-cylinder passes first, with a sufficient reduced speed, under the clamps n , which do not exert too great a pressure on the feeding-
105 board and which retard the paper sliding down the incline in the most preferable manner for bringing same to a standstill. Immediately after the sheet has reached the clamps n , however, the latter are raised, and the sheet
110 then glides with a velocity which, as will be seen, cannot become too rapid until it reaches the gripper o of the printing-cylinder p . In this position the sheet of paper lying free on the feeding-board m is in contact with the
115 stops, thus determining the proper position of its front edge, and one of its side edges (right or left) is also adjusted, this being effected by the adjustment of the sheet on the feeding-board m by means of a special device,
120 likewise operated automatically. The front stops q do not fall until the exactly-adjusted position is attained, such adjustment being necessary as well for reprints as for prints in
125 several colors or for making the other projections of the paper and printing industries. The sheet of paper is then carried along with the rotating printing-cylinder p or transferred from the board m to the machine.

The clamps or brakes and reciprocating devices arranged on the board m are automatically operated from the shaft r , Figs. 1, 3, and 4.

The clamps n are mounted on the shaft n' ,

carrying the arm n^2 , at the end of which the two-armed lever n^4 is attached by the link n^3 , the other end of n^4 , carrying the roller n^5 , being actuated by the cam n^6 . The adjacent members s are clamped to a frame $s' s^2$, which receives a rectilinear reciprocating motion from the oscillating shaft s^6 , to which the lever s^7 , with the rollers s^8 at the end of same, is clamped, said roller s^8 being actuated by the cam s^9 . On the oscillating shaft s^6 are also secured by set-screws the two levers s^3 , which operate the guides $s^2 s^2$ of the frame by means of the connecting-rods s^4 , said guides being mounted on the forks $s^3 s^3 s^3 s^3$.

The guides $m^2 m^3$, arranged on the metal sheets m' of the feeding-board m , serve as preliminary guides for the sheets of paper from the rollers $c c$, according to the inclination of the feeding-board, and also for bringing the sheet, which has been moved either to the right or left, into its exact position by striking against m^2 or m^3 .

The adjusting members s operate with such a moderate pressure and so closely to the adjusting edge (for striking m^2 or m^3) that they slide with comparatively little friction on the surface of the sheet of paper already in position without the latter being folded or creased in its passage between the point where it is caught by the adjusting members and the sheet-adjuster. When the members s are in their outermost position, the sheet of paper is released from the action of such members by the latter resting on bars $m^4 m'^4$ or $m^5 m'^5$.

It will be understood from Fig. 3 that the movement of the members s to the right will adjust the paper against the guide m^3 , the member s rising along the strip m^5 as its right-hand movement is completed, thus leaving the paper sheet free to be drawn from the guides by the cylinder. In its leftward movement the member s rides upon the strip m'^5 , and thus gets in position for feeding a new sheet.

Under some circumstances it is desirable to adjust the paper against the left-hand guide, as viewed in Figs. 3 and 4, for instance, to correspond with the location of particular portions of the frame or in case the right-hand edge is found to be inaccurate. Then the member s extends to the left of the rod s' instead of to the right, as shown.

The modification in Fig. 3^a shows an arrangement of this adjusting device s , which allows of same being turned one hundred and eighty degrees, as shown by dotted lines, without it being necessary to remove same from the frame $s' s^2 s^2$.

III. The Mechanism for Raising the Table.

The surface of the pile of papers a becomes lower as the sheets pass from same. In order, therefore, that the upper sheet of paper is subjected to the most uniform action of the needles d , pusher e , and separator f , it is necessary that the whole pile of paper can be raised in the ratio of the decreasing pile of

paper, this being effected by automatically raising the plate b . The essential parts of this mechanism for raising the table are shown in Fig. 5.

The vertically-movable plate b , mounted on the rack b' , is moved upwardly from time to time by a train of gearing $b^{30} b^{21} b^{22}$, dotted lines, Fig. 5, connecting the rack with the wheel. This takes place when the pawl b^8 falls into one of the teeth on the ratchet-wheel b^2 after contact has been made in the circuit t . For attaining this end the bar b^3 forms one of the arms of the angle-lever b^4 , whose other arm, b^5 , carries an armature which is attracted by the electromagnet b^6 when the circuit is closed. The angle-lever b^4 and the electromagnet b^6 are secured to one slide b^7 , which receives a uniform rectilinear reciprocating motion from any part of the machine, and the frame b^8 of a connecting-rod b^{10} , pressed downward by the spring b^9 , rests on the pile of paper a . Said rod b^{10} carries at its lower end the contact b^{11} , which, when the surface of the pile of paper a has lowered a certain distance, closes the circuit by its contact with the insulated metal piece b^{12} , and thus the plate b is automatically raised.

IV. The Stopping Mechanism.

If a sheet of paper which should be carried over the separator f to the feeding-board m fails to pass at the proper time—whether it be on account of the pile of paper being finished or on account of some accident or break having occurred with a sheet-feeding mechanism—the mechanism shown in Fig. 6 throws the whole machine out of gear, for instance, by shifting the driving-belts off the fixed onto the loose pulley, as customary. The sheet of paper carried to the feeding-board m passes underneath a contact-spring l' , which presses against the separator f when a sheet does not pass that point. The contact-spring l' is secured to the stripper l , Figs. 1 and 2, the latter being attached to the insulated bar l^2 . The circuit u is also interrupted at another point. The cam g therefore has a contact g' , which closes the circuit with contact g^2 when a sheet is or should be fed between the contact-spring l' and separator f . In this circuit u is the coil of an electromagnet v , which is attached to a slide x , together with the armature-lever w , said slide x being connected to some operating parts of the machine, from which it receives a continuous reciprocating movement.

If the sheet for some cause or another fails to pass between the contact-spring l' and separator f , the circuit is closed, the armature w attracted, and the end of the latter then abuts against the angle-lever y , which in its normal position retains the stopping-lever z , in consequence of the action of the spring z' . The latter thus takes up its other position, whereupon the machine is thrown out of gear and brought to a standstill. When the lever z is in that position, it closes the circuit z^2 by

adjusting a contact when the alarm-bell z^3 rings. The stop motion will of course also serve as indicating means to show the failure of the sheet to pass between the contacts.

5 It will be understood that while I have described and shown but a single lifting-needle, pusher, and separator, this mechanism will be duplicated at the opposite side of the machine.

I claim as my invention—

10 1. In combination, the inclined lifting-needle arranged over the paper pile with means for reciprocating the same, the reciprocating pusher with operating means therefor for retracting the sheet to engage and ride up the
15 inclined needle, the separator with means for operating the same and the feed-rollers for moving the sheet over the separator, substantially as described.

2. In combination, the inclined lifting-needle
20 arranged over the paper pile, the reciprocating pusher with operating means therefor, for retracting the sheet to engage and ride up the inclined needle, the separator with operating means therefor, the stripper arranged to take
25 the sheet from the needle as the latter is lifted, and means for operating the needle, said pusher operating to push the separated sheet forward.

3. A paper-feeding mechanism comprising
30 the inclined needle with means for reciprocating the same, the pusher with operating means therefor for pushing the sheets to engage and ride up the inclined needle releasing means for temporarily releasing the action
35 of the pusher from the sheets while the latter are being carried forward by the feeding-rollers, the separator with means for operating the same between the lifted sheet and pile, and the feeding-rolls for carrying the
40 sheets forward, substantially as described.

4. In combination in a paper-feeding apparatus, the inclined needle with means for reciprocating the same, the pusher with means for reciprocating the same to move the sheet
45 at the top of the pile, means for raising the pusher above the lifted sheet said means acting temporarily, while the sheet is held by the inclined needle, the separator with means for operating the same between the said sheet
50 and the top of the pile, the stripper arranged to release the sheet from the needle and the feeding-rollers for engaging the raised sheet for feeding the same forward.

5. In combination, the inclined needle with
55 means for reciprocating the same, the pusher with means for reciprocating the same to move the sheet back to engage and ride up the needle, means for lifting the pusher from the sheet on its rearward stroke after the
60 sheet is lifted and for allowing the same to

again contact with the sheet at the end of its backward stroke and means for raising the pusher as it completes its forward stroke and has pushed the sheet forward, the separator with operating means therefor and the feed-
65 rollers arranged to receive the sheet when pushed forward by the pusher, substantially as described.

6. In combination, the inclined needle with means for reciprocating the same, reciprocating
70 pusher, the pivoted arm carrying the same having the nose e^2 , the cam path or face over which the nose passes to lift the arm on the back stroke of the pusher, the arm i^4 connected to the pusher-arm, the stop against
75 which the said arm contacts on the forward movement of the pusher to lift the same, the spring for forcing the pusher down the separator with operating means therefor and the feed-rollers arranged to receive the separated
80 sheet when pushed forward by the pusher.

7. In combination, the feed-table, the clamps at the lower end thereof, to engage the paper, means for raising and lowering the
85 said clamps, comprising the shaft r , the cam thereon, the lever connections therefrom to the clamps, the laterally-reciprocating member S , the reciprocating bar S^2 carrying the said member, the pitman and lever connection to the cam-shaft, said member S , being
90 yieldingly supported and means for raising the reciprocating member from contact with the paper, substantially as described.

8. In combination the table and the means for adjusting the paper sheet laterally comprising the guide or stop piece m^3 the over-
95 lying strips $m^5 m'^5$, arranged with a space between them through which the paper sheet is exposed and the laterally-movable members S with operating means therefor said mem-
100 bers being arranged to ride up the strips $m^5 m'^5$ substantially as described.

9. In combination the paper-receptacle, the elevating-board b , the ratchet mechanism connected therewith for operating the same,
105 the constantly-operating pawl arranged to be in and out of line with the ratchet, said pawl comprising the two-armed lever b^4 the electromagnet arranged to control directly the operation of the pawl by acting upon one arm
110 thereof, the electric circuit and the circuit-breaker arranged to be controlled by the height of the pile of paper, substantially as described.

In witness whereof I hereunto set my hand
115 in presence of two witnesses.

ADOLF REISSER.

Witnesses:

HARRY BELMONT,
JOSEF ZEHETNER.