

(No Model.)

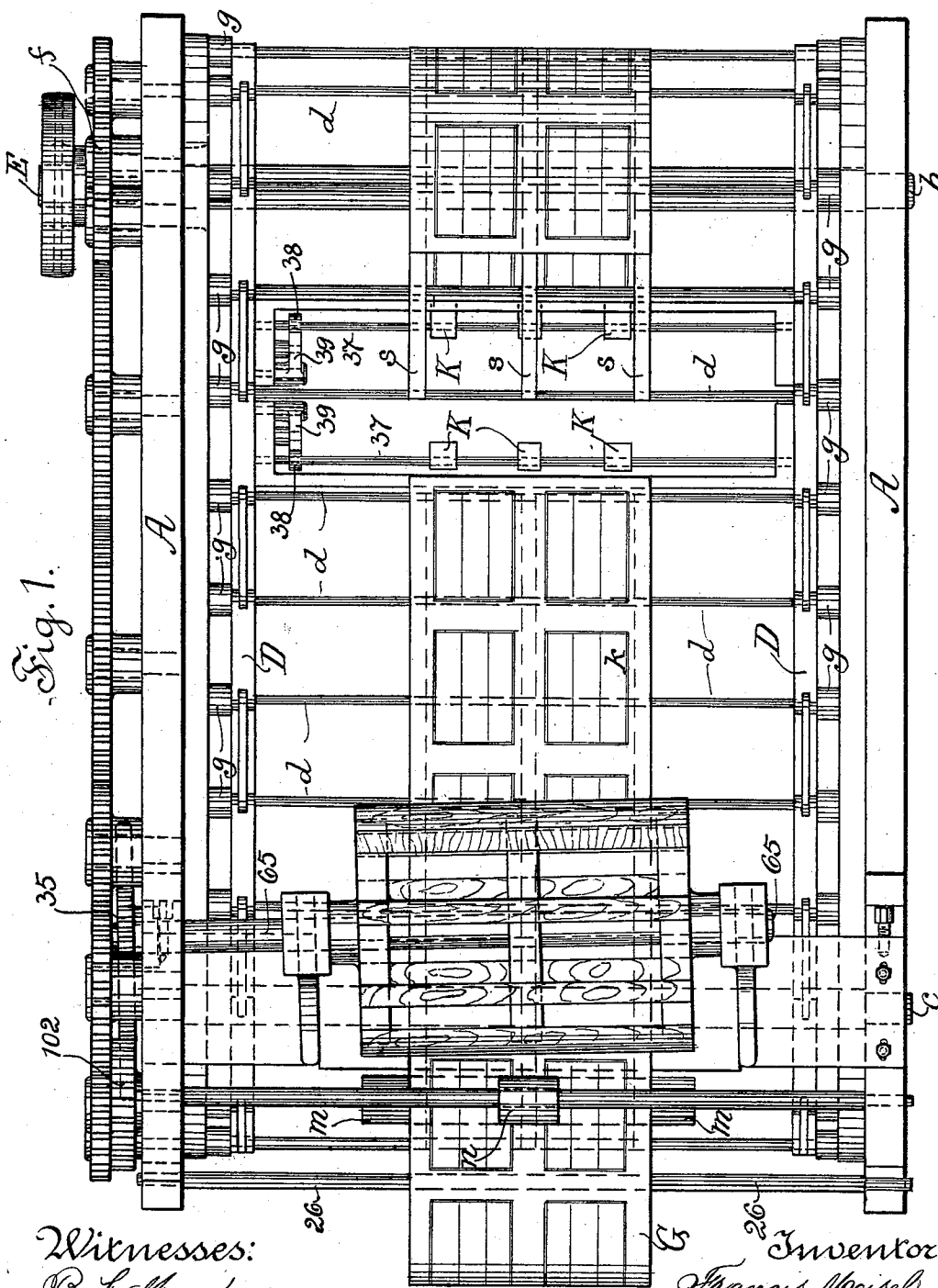
5 Sheets—Sheet 1.

F. MEISEL.

MACHINE FOR CUTTING PAPER INTO SHEETS.

No. 588,283.

Patented Aug. 17, 1897.



Witnesses:

B. L. Mayden.
J. L. Hendry

Inventor:

Francis Meisel
by R. S. Schumacher

(No Model.)

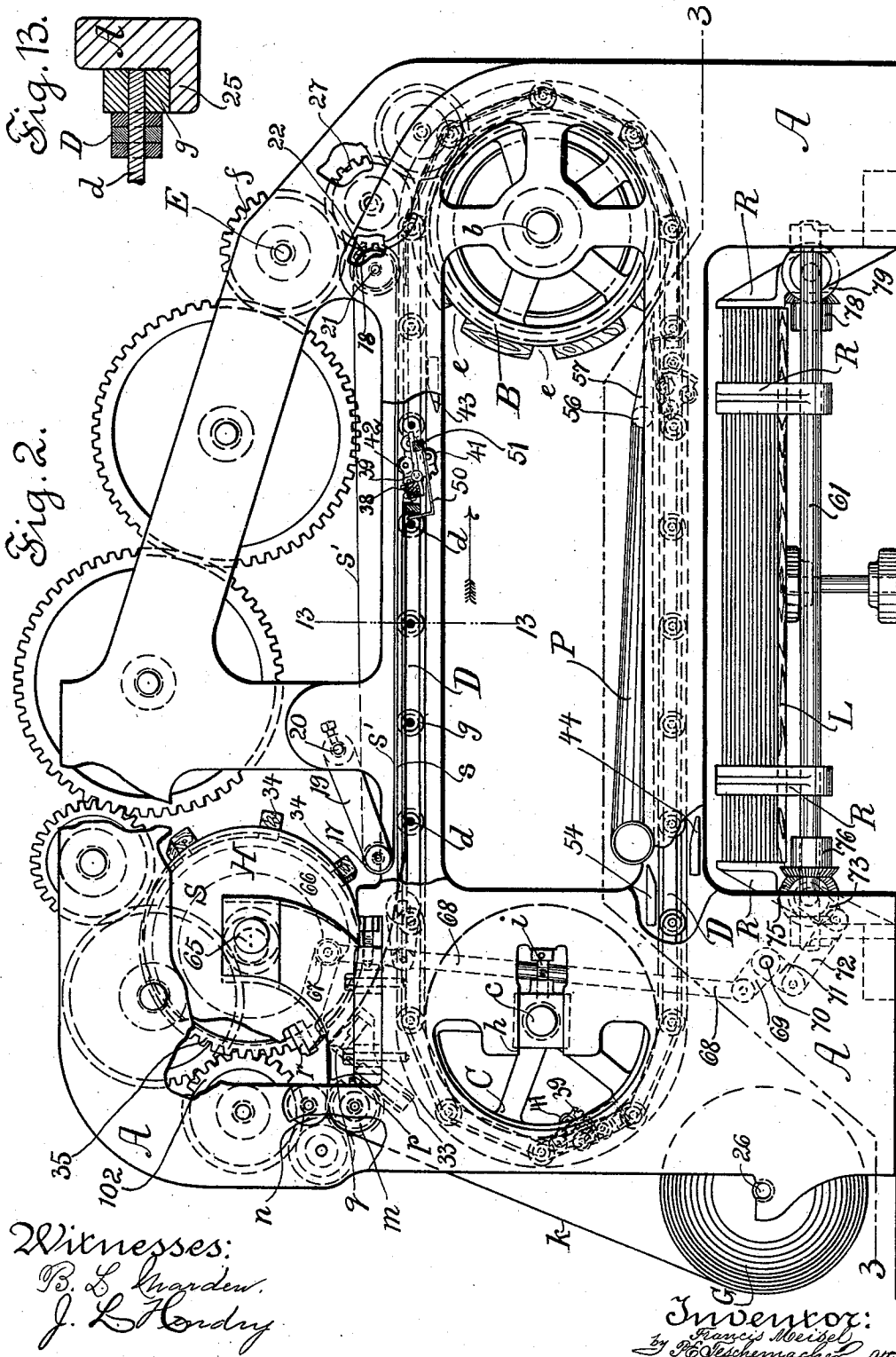
5 Sheets—Sheet 2.

F. MEISEL.

MACHINE FOR CUTTING PAPER INTO SHEETS.

No. 588,283.

Patented Aug. 17, 1897.



Witnesses:
B. S. Gardner.
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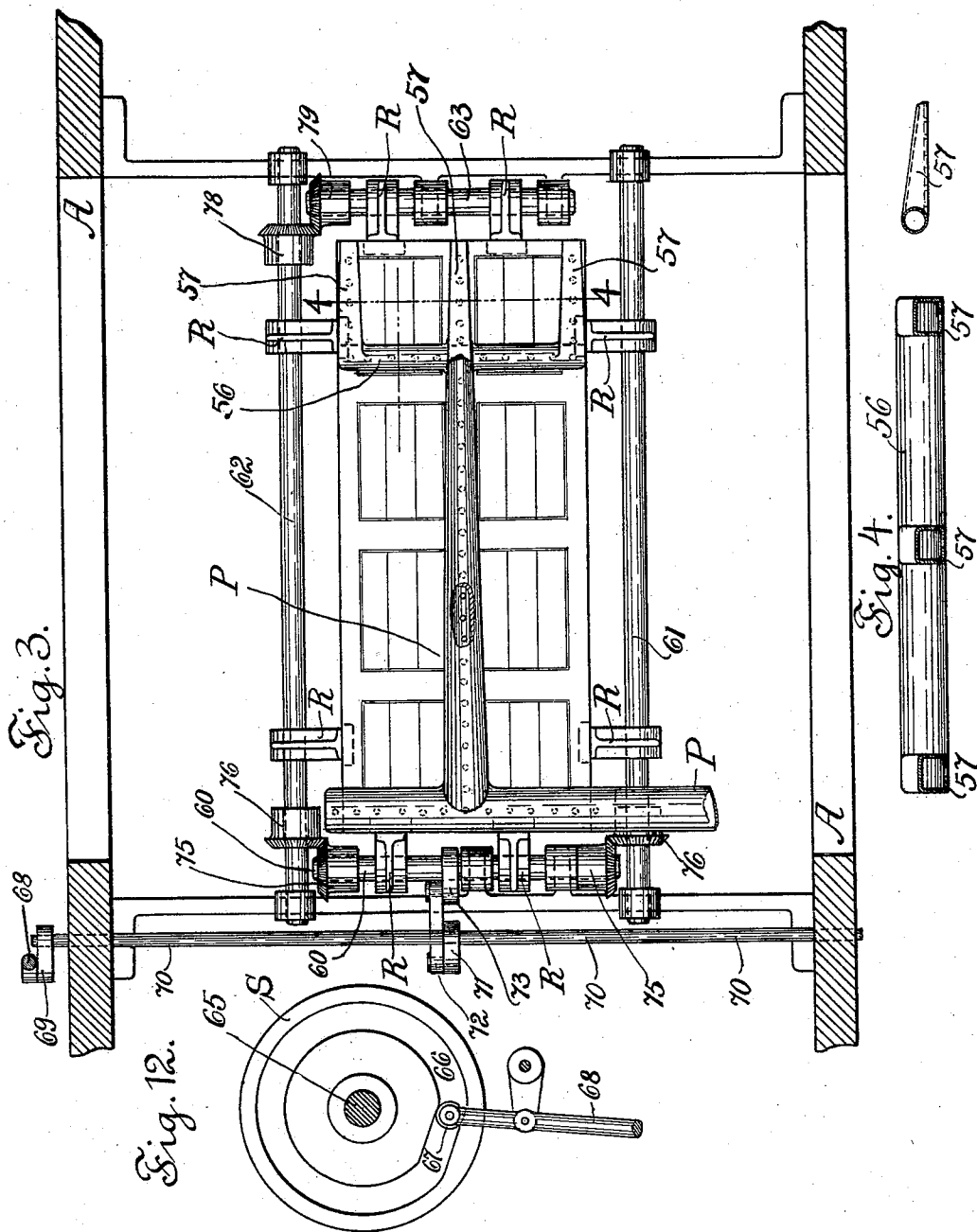
Inventor:
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Fig. 5.

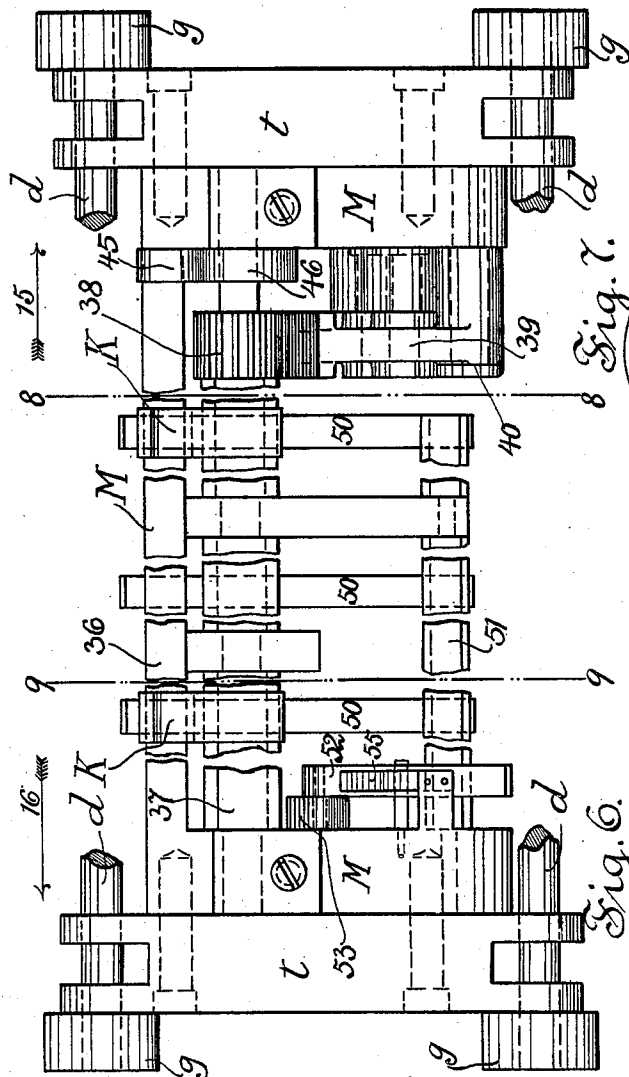


Fig. 7.

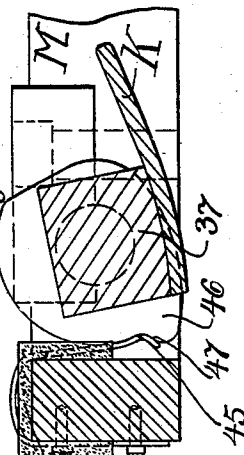


Fig. 6.

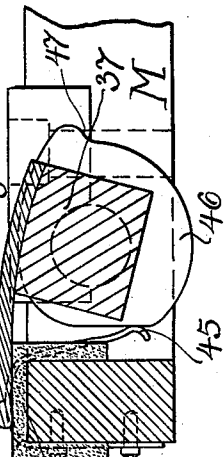
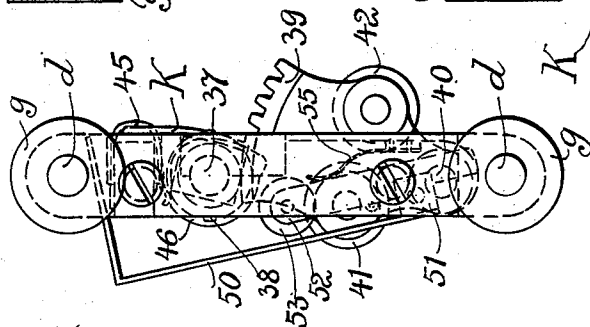


Fig. 10.



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P. S. Marden.
J. L. Hendry.

Inventor:

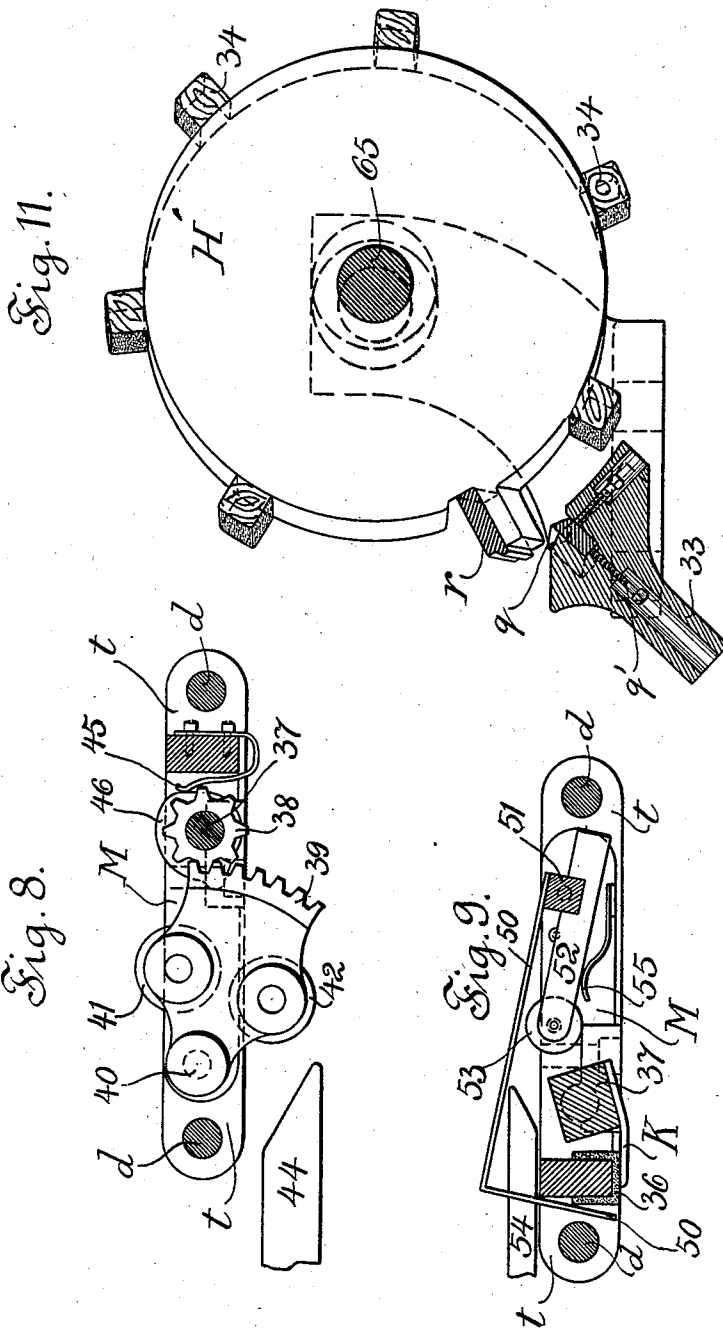
Francis Meisel
by P. S. Marden, Atty.

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MACHINE FOR CUTTING PAPER INTO SHEETS.

No. 588,283.

Patented Aug. 17, 1897.



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UNITED STATES PATENT OFFICE.

FRANCIS MEISEL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE KIDDER PRESS MANUFACTURING COMPANY, OF SAME PLACE.

MACHINE FOR CUTTING PAPER INTO SHEETS.

SPECIFICATION forming part of Letters Patent No. 588,283, dated August 17, 1897.

Application filed January 17, 1896. Serial No. 575,883. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS MEISEL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machines for Cutting Paper and other Materials into Sheets and Delivering and Piling the Same, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of my improved machine for cutting paper and other materials into sheets and delivering and piling the same. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional plan on the line 3 3 of Fig. 2, showing the air-blast pipes located beneath the carrier-chain. Fig. 4 is a vertical section on the line 4 4 of Fig. 3. Fig. 5 is an enlarged detail plan of the grippers and fingers for pushing down the severed sheets and two links of the carrier-chain between which they are located, showing the mechanism for operating the said grippers and fingers, the transverse rods and bars being shown broken to contract the distance between the two opposite links of the chain. Figs. 6 and 7 are enlarged details of the grippers, Fig. 6 showing the grippers closed and Fig. 7 showing them open. Fig. 8 is a vertical section on the line 8 8 of Fig. 5, looking in the direction of the arrow 15. Fig. 9 is a vertical section on the line 9 9 of Fig. 5, looking in the direction of the arrow 16. Fig. 10 is a side elevation of one of the links of the chain, showing one of the fingers for pushing down the sheet onto the pile and the gripper-operating mechanism. Fig. 11 is an enlarged sectional detail of the rotary and stationary cutters. Fig. 12 is a side elevation of the cam which operates the sheet-jogging fingers. Fig. 13 is an enlarged sectional detail on the line 13 13 of Fig. 2.

My invention has for its object to improve the construction of machines for cutting paper and other materials into sheets and delivering and piling the same, whereby the sheets are delivered singly without interfering with each other and so piled on the table that one sheet will lie directly over the other; and to this end my invention consists in certain novel

features of construction and combinations of parts, as hereinafter described, and set forth in the claims.

In the said drawings, A represents the framework of the machine in suitable bearings, in which are journaled two parallel shafts *b c*, on which are fixed two wide sprocket wheels or cylinders B C, which support an endless carrier-chain D, the rods *d*, which connect the links of said chain, engaging the longitudinal grooves *e* of the cylinders, whereby the chain is caused to travel with a positive motion in the desired direction.

E is the driving-shaft, which carries a gear *f*, which through a train of intermediate gears (shown dotted in Fig. 2) drives a gear on the shaft *b*, motion being thereby transmitted from the driving-shaft E to the endless chain D.

The upper and lower horizontal portions of the chain between the cylinders B C are supported and prevented from sagging, in case they should become slack from wear or other cause, by horizontal guides 25, Fig. 13, formed on opposite sides of the framework, on which rest antifriction-rolls *g*, mounted on the ends of the rods *d*, by which the links of the chain D are pivoted together. The journal-boxes of the shaft *c* are fitted to slide in horizontal guideways *h* in the framework, as shown in Fig. 2, and are made adjustable therein by screws *i*, so that the cylinder C can be adjusted to take up any slack of the chain which may be produced by wear or other cause, and thus keep it tightly stretched as desired.

The web *k*, of paper or other material to be cut into sheets, delivered, and piled, is drawn from a roll G, which is mounted on a shaft 26, the journals of which rest in suitable bearings in the framework, said web being unwound from the roll by a pair of feed-rolls *m n*, the shaft of the roll *m* carrying a gear *p*, which is driven by a train of intermediate gears from the gear *f* on the driving-shaft E.

q is a stationary cutter-blade or knife inclined at an angle, as shown in Fig. 1, and extending transversely above the chain D, said cutter-blade being made adjustable in a stock or support 33 by means of a screw *q'*, Fig. 11, and *r* is a rotary cutter-blade or knife cooperating with the stationary blade *q* and

secured to a cylinder H, the axis of which is parallel with the edge of the stationary blade *g*.

In order to produce a shearing cut, the rotary cutter-blade *r* is inclined to the axis of the cylinder H, and the inclination of both of the cutter-blades, as described, causes the web while in motion to be cut at right angles to the direction of its length. The cylinder H is also provided with longitudinal lags 34, arranged around its circumference, said cylinder being rotated by a gear 35 on its shaft 65, which meshes with and is driven by one of the train of gears connected with the driving-shaft.

As the paper is drawn into the machine by the feed-rolls *m n* it passes between the stationary cutter-blade *g* and the rotating cylinder H, the lags 34 of which by their frictional contact with the paper serve to carry it forward and deposit it upon the rods *d* of the chain D between tapes *s* and *s'*, which assist in carrying it along until seized by one of the several sets of grippers K with which said chain is provided. The lower tapes *s* are secured to the rods *d* of the chain D, each tape extending from a rod in front of one set of grippers to a rod immediately in the rear of the next set of grippers. The upper tapes *s'* run over pulleys 17 18, the pulleys 17 being mounted on levers 19, secured to a stationary shaft 20, and the pulleys 18 being mounted on a shaft 21, which carries a gear 22, meshing with and rotated by an intermediate gear 27, meshing with the gear *f* on the driving-shaft. If preferred, the upper tapes *s'* may be dispensed with and stationary rods substituted therefor.

The speed of the chain D is greater than that of the paper as it is fed forward, and the grippers K are so arranged and operated, as will be presently explained, that they will overtake and seize the front end of the sheet the instant before or after it has been severed from the web by the cutters, the severed sheet being then carried around with the chain and deposited upon a table L beneath the same, as shown in Fig. 2, and as the chain travels faster than the web of paper entering the machine a separation of the sheets is effected as they are carried around by the grippers, which produces the required space or interval between each sheet and the following one to enable them to be properly deposited upon the table L without interfering with each other, it being necessary that one sheet should drop onto the table before the other overlaps it, which prevents the sheets from fouling each other and causes them to lie flat on the table. The table L is intended to be provided with suitable well-known means (not shown) for lowering it automatically in proportion as the pile of sheets increases in thickness.

I will now describe the construction of the grippers and the manner in which each set is operated to seize the front end of the sev-

ered sheet and afterward release the same to permit it to drop onto the pile on the table L, reference being had particularly to Figs. 2, 5, 6, 7, 8, and 9. Between two opposite links *tt* of the chain D is secured a frame M, Figs. 5, 6, and 7, the bar 36 of which forms the "gripper edge," which is provided with a covering of rubber or other suitable elastic substance. The grippers K are secured upon a rock-shaft 37, which is supported in the end pieces of the frame M and carries a pinion 38, with which meshes a toothed sector 39, pivoted on a stud 40 and carrying two antifriction-rolls 41 42, Figs. 8 and 10, which are so placed as to contact, respectively, with inclined cams 43 44, projecting from the inner side of the framework A into the path of said rolls. The grippers being open, as shown in Fig. 7, and the chain traveling in the direction of the arrow, it will be seen that when the roll 41 is brought into contact with the cam 43 the sector 39 will be raised, thus partially rotating the shaft 37 and closing the grippers, as shown in Figs. 8 and 10, to seize the front end of the sheet severed by the cutters, the grippers being held in this position by a friction retaining-spring 45, which bears against a cam-shaped wheel 46 on the gripper-shaft, the end of the spring resting in a notch or depression 47 when the grippers are open, as shown in Fig. 7, and against the flat side of the wheel 46 when the grippers are closed, as shown in Fig. 6. The sheet is now held by the grippers and carried around with the chain until it reaches a position directly over the table L, when the roll 42 is brought into contact with the lower cam 44, which then moves the sector 39 in the opposite direction, thus opening the grippers and releasing the sheet, which then drops onto the table beneath. In the machine here represented the chain is provided with three sets of grippers K, arranged at equal distances apart; but any suitable number of sets may be employed to meet the requirements of the case.

The cam 44 turns the gripper-shaft 37 nearly one-half a revolution, which carries the edges of the grippers when open out of the way of the paper, so that they will not scrape the printed surface.

In order that the sheet may be carried down onto the pile on the table L as quickly as possible after being released by the grippers, I employ in connection with each set of grippers a series of fingers 50, having their outer ends bent at a right angle, as shown. The several fingers of each set are secured to a rock-shaft 51, to one end of which is secured an arm 52, carrying a roll 53, which is brought into contact with a stationary inclined cam 54, Figs. 2 and 9, on the frame A, the instant after the sheet has been released by the grippers, whereby the arm 52 is depressed against the stress of a spring 55, and the bent ends of the fingers carried down with a quick impulse or movement, thus instantly pushing

down the sheet onto the pile, as desired, the spring 55 returning the fingers to their normal position (shown in Figs. 9 and 10) as soon as the roll 53 has passed out of contact with the cam 54. To assist the fingers in pushing
 5 down the paper, I preferably employ an auxiliary device consisting of an air-pipe P, provided on its under side with suitable perforations or apertures, through which an air-
 10 blast is directed onto the paper to depress the same, the pipe P being connected with a suitable pipe containing air under pressure. This pipe P, which extends longitudinally over the center of the table L, is provided at
 15 its outer end with a distributor composed of a transverse piece 56, having three branches 57, each perforated on the under side, as shown in Fig. 4, whereby the force of the air-blast at this point is increased to insure the
 20 rear end of the sheet being quickly forced down onto the pile on the table L. The air-blast from the centrally-arranged pipe P serves to depress the sheet of paper along the center of its length, which permits the air
 25 thereunder to escape at the side, so that it will drop quickly onto the top of the pile on the table L. The branches 57 of the air-pipe P are each open at the outer end, which causes the air discharged therefrom to act on the ad-
 30 vancing sheet to retard the same and prevent it from being carried forward beyond its proper position.

The table L is provided on all four sides with sheet-jogging fingers R, which are se-
 35 cured to rock-shafts 60, 61, 62, and 63, and project upward above the level of the table, as shown in Fig. 2. These fingers R are simultaneously swung inward after each sheet is dropped, and serve by their contact with
 40 the edges of the sheets to even up the pile and keep the sheets in position one directly over the other. The fingers R are operated in the following manner: To the shaft 65 of the cutter-cylinder H is secured a cam-wheel S, Fig. 12, having a cam-groove 66, with which
 45 engages a cam-roll 67 at the end of a connecting-rod 68, (shown dotted in Fig. 2,) which is pivoted at its lower end to an arm 69, secured to the outer end of a horizontal shaft
 50 70, Fig. 3, to which is secured an arm 71, connected by a link 72 with an arm 73 on the shaft 60, which is provided at its opposite ends with bevel-gears 75, which mesh with
 55 bevel-gears 76, secured to the rock-shafts 61 and 62, the latter having at its opposite end another bevel-gear 78, which meshes with a bevel-gear 79 on the rock-shaft 63, and in this
 60 manner as the rod 68 is reciprocated by the cam-wheel S the shafts 60, 61, 62, and 63 are simultaneously rocked to effect the desired inward and outward movements of the jog-
 65 ging-fingers, as previously described, while the table L is at the same time being automatically lowered in proportion to the increase in the height of the pile of sheets there-
 upon.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a sheet-delivering apparatus, the combination with the feed-rolls, of the adjustable
 70 cutter-blade *q*, the rotary cylinder H inclined at an angle and provided with lags 34, and having a cutter-blade *r* cooperating with the cutter-blade *q*, the endless traveling chain D mounted upon sprocket wheels or cylinders,
 75 said chain having a speed greater than that of the web as it is fed in by the feed-rolls, a traveling support as tapes connected with the chain by which the paper is carried forward after passing between the cutters, a series of
 80 sets of grippers K mounted on the carrier-chain D and adapted to seize the sheet immediately before or after it is severed from the web, whereby it is carried around by the chain into a position beneath the same, and
 85 cams for operating said grippers to seize the sheet and release it beneath the chain, all operating substantially as described.

2. In a sheet-delivering apparatus, the combination with the feed-rolls, of the adjustable
 90 cutter-blade *q*, the rotary cylinder H inclined at an angle and provided with lags 34, and having a cutter-blade *r* cooperating with the cutter-blade *q*, the endless traveling chain D mounted upon sprocket wheels or cylinders
 95 and provided with antifriction-rolls supported on guideways 25, said chain having a speed greater than that of the web as it is fed in by the feed-rolls, a traveling support connected with the chain by which the paper is
 100 carried forward after passing between the cutters, a series of sets of grippers K mounted on the carrier-chain D and adapted to seize the sheet immediately before or after it is severed from the web, whereby it is carried
 105 around by the chain into a position beneath the same, and swinging fingers mounted on the gripper-frame and cams for operating said grippers and fingers to seize and release the sheet and push the same down onto the pile
 110 beneath the chain, all operating substantially as described.

3. In a sheet-delivering machine, the combination with the endless traveling carrier-
 115 chain, of the gripper-frame M, secured between two opposite links of said chain and having a gripper edge 36, the grippers K, mounted on a rock-shaft having its bearings in the frame M, and carrying a pinion 38, a toothed sector meshing with said pinion and
 120 provided with upper and lower antifriction-rolls, and the stationary cams 43, 44 for actuating said sector to close and open the grippers, substantially as set forth.

4. In a sheet-delivering machine, the com-
 125 bination with the endless traveling carrier-chain and its grippers and the table L, arranged beneath said chain, of the perforated air-blast pipe P, extending longitudinally over the center of said table L, and provided
 130 at its outer end with branches 57, having perforations on their under sides, and open ends,

whereby the air discharged from said perforations and ends is caused to act on the advancing sheet to retard the same, substantially as set forth.

- 5 5. In a paper-cutting and sheet-delivering machine, the combination with the feed-rolls, the cutters, and the endless traveling carrier-chain provided with a series of sets of grippers operating as described, of the sheet-receiving table L, arranged beneath said chain
10 and provided on its sides with sheet-jogging

fingers R, mounted on rock-shafts connected by bevel-gears, and cam-and-lever mechanism for simultaneously actuating said fingers, substantially as described.

Witness my hand this 15th day of January,
A. D. 1896.

FRANCIS MEISEL.

In presence of—

P. E. TESCHEMACHER,
A. R. ELLINGWOOD.