(Model.) 2 Sheets—Sheet 1.

C. E. TORRANCE.

PAPER CUTTING MACHINE.

No. 264,972. Patented Sept. 26, 1882.

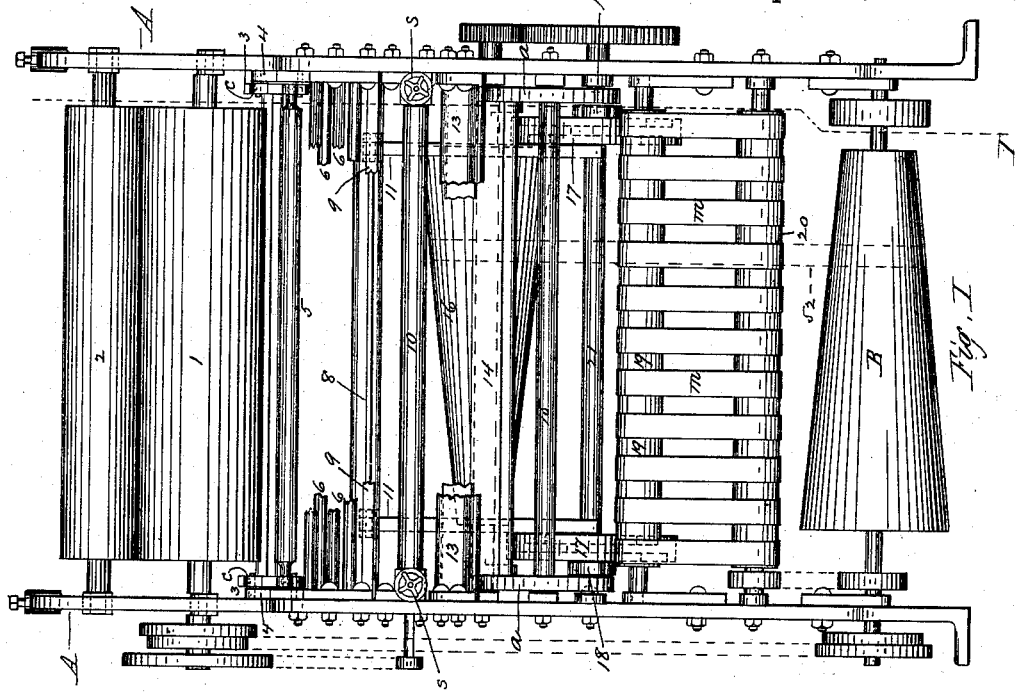

Fig. I.

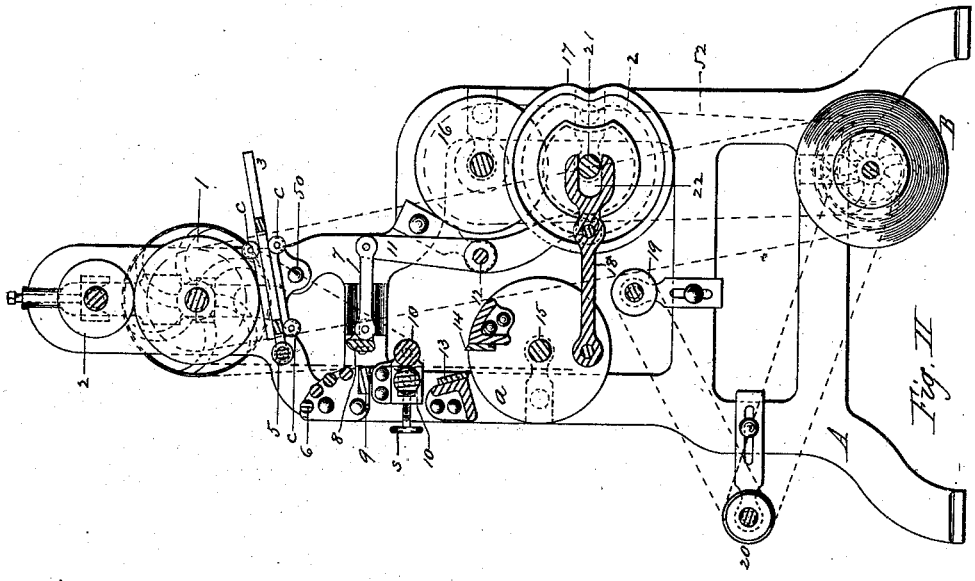

Fig. II.

Witnesses.
E. M. Bissell.
C. H. Wood.

Inventor.
Charles E. Torrance.
By T. A. Curtis.
his atty.

(Model.) 2 Sheets—Sheet 2.

C. E. TORRANCE.

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No. 264,972. Patented Sept. 26, 1882.

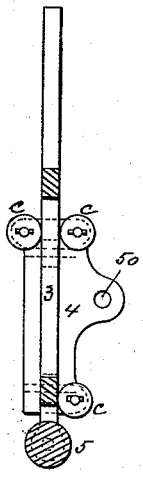

Fig. IV

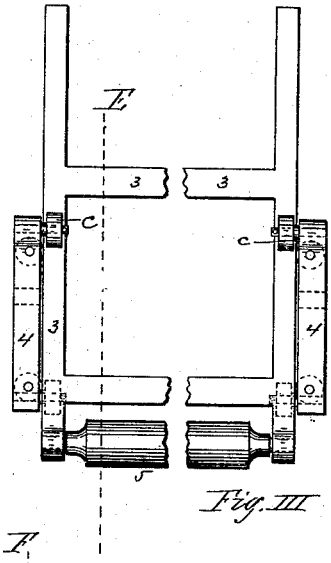

Fig. III

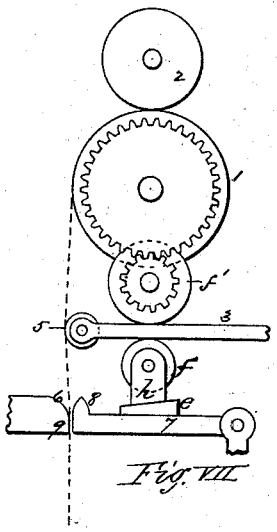

Fig. VIII

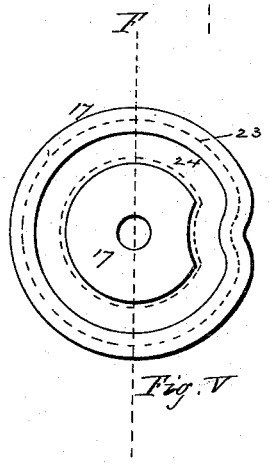

Fig. V

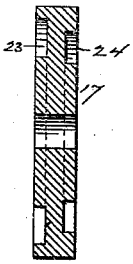

Fig. VI

Witnesses—
E. M. Bissell
C. H. Wood.

Inventor.
Charles E. Torrance
By T. A. Curtis, his atty.

UNITED STATES PATENT OFFICE.

CHARLES E. TORRANCE, OF HOLYOKE, MASSACHUSETTS.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 264,972, dated September 26, 1882.

Application filed March 5, 1881. (Model.)

To all whom it may concern:

Be it known that I, CHARLES E. TORRANCE, of Holyoke, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Paper-Cutting Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The object of my invention is to cut all the sheets of paper from a continuous web or strip as it passes from the paper machine in being manufactured of a uniform size, and I accomplish this by the apparatus substantially hereinafter described, and illustrated in the accompanying drawings, in which—

Figure I is a front view of a paper-cutting machine made according to my invention, with the small rolls, fixed stop-bar, and the fixed cutter broken away. Fig. II is a vertical transverse section of the machine at line I of Fig. I. Fig. III is a plan view of one modification of the take-up frame and roll, or a sufficient portion thereof to show its construction. Fig. IV is a vertical section of the same at line E of Fig. III. Fig. V is an inside view of the cam which actuates the movable knife in cutting the sheet from the web. Fig. VI is a transverse vertical section of the same at line F, and Fig. VII is another modification of the take-up mechanism.

In the drawings, A represents the frame of the cutting-machine, preferably made of iron, and consisting chiefly of two upright standards of convenient size and form to furnish a support and bearings in which the journals or ends of the shafts and drums of the machine may revolve.

1 and 2 denote the two main rolls, which receive the continuous web of paper from the machine as fast as it is manufactured, the said web being suspended from between said receiving-rolls, as shown by the dotted line, down in front of the roll, as 5, and movable stop-bar, as 8, and between the feed-rolls, as 10, and the knives or cutters, as 13 and 14.

Below the roll, as 1, a frame, 3, provided with a small roll, as 5, in its front end, is arranged, preferably at such an inclination and resting upon small rollers, *c c*, if desired, that its own weight will cause it to slide forward when left free.

Below the roll, as 5, and a little forward of it, I arrange a curved or inclined shelf or frame, preferably supplied with small rolls, as 6, (which in Fig. I are partially broken away to show the movable stop-bar more clearly,) as shown in Fig. II, with a fixed bar, as 9, at the lower edge of said shelf or frame; and a movable stop-bar, as 8, connected at each end to a bar, as 7, is arranged to have a slight movement toward and from the bar 9 by means of a pivoted lever, as 11, one end of which is connected with the bar 7, and whose opposite end engages in a groove, as 24, on the inside of the cam-disk, as 17, secured on a shaft, as 21.

In the modification shown in Fig. II, I arrange two rolls, as 10, to revolve in close proximity to each other, and these rolls are made adjustable toward and from each other by means of adjusting-screws, as *s*, and below these rolls a fixed knife, as 13, is bolted to the frame, with another movable knife, as 14, preferably attached at its ends to disks, as *a*, one pivoted in each end of the frame.

A cone-drum, as B, is arranged to revolve in bearings in the frame, from which a belt extends around a similar cone-drum, as 16, above, and the latter is geared to the cam-shaft, as 21, also arranged to revolve in the frame.

The disk, as 17, has a cam-groove, as 23, made in one side, as shown in Figs. V and VI, in which moves a roll hung in the side of the bar, as 18, which bar is pivoted at one end to the knife-disk *a*, and is forked at the other end to stride and be supported by the journal or shaft, as 21. A cam-groove, as 24, is made in the other side of the disk 17, in which moves a roll hung on the lower end of the lever 11, pivoted to the frame at 12, and delivery-rolls, as 19 and 20, are hung in the frame, around which bands or tapes, as *m*, extend, and these rolls are moved by a band from a pulley on the lower cone-shaft, as B. These cones or drums, as 16 and B, are reversed in their relative position with each other—that is to say, the small end of one is over the large end of the other—and a belt extends around both, whereby, the upper one being driven from the lower one, the speed of the former may be varied by moving the belt along the cones.

The operation of the invention is as follows:

Power being applied to revolve the cone B by a driving-belt around a pulley connected therewith, the receiving-rolls 1 and 2 are made to revolve by a belt from a pulley from the cone-shaft below, and the web of paper from the paper-machine, passing between the rolls 1 and 2, is made to move down in front of the roll 5 between the stop-bar 8 and the bar 9 and between the fixed knife 13 and the movable knife 14, as shown in dotted line in Fig. II. As the cone 16 and the disk 17 revolve the cam 24 moves the lower end of the pivoted lever 11 outward and moves in its upper end, moving the stop 8 in against the web of paper and clamping it between the stop 8 and the bar 9 and stopping the web in its downward movement. At the instant the web is stopped the cam 23 in the opposite side of the disk 17 forces the arm, as 18, backward, moving the disks *a* on their pivots and causing the knife 14 to move past and against the knife 13, and cutting a sheet from the web. Of course the receiving-rolls, as 1 and 2, continue to deliver the web of paper after it is stopped in its downward movement by the stop-bar 8 below, and as soon as this stoppage takes place the tension of the web against the roll 5 and frame 3 ceases, and the latter is free to move forward against the web of paper still being delivered from the rolls 1 and 2, moving the web with it, and this movement of the frame 3 and its roll 5 against the web continues while the knives are making the cut, as described. As soon as the cut is finished, however, the cam 24 moves the stop 8 away from its position against the paper, and the feed-rolls, as 10, which revolve against the web of paper, draw the latter downward again, and in thus being drawn down the tension of the web against the roll 5 and frame 3 is renewed and overcomes the weight of the frame 3 and moves the latter back into place. The feed-rolls, as 10, arranged as shown in Figs. I and II, are adjusted by the adjusting-screws, as *s*, to constantly revolve against the web of paper, passing from the receiving-rolls 1 and 2 with just the desired degree of friction, so that when the web of paper is held stationary by the stop-bar 8 and bar 9 said rolls 10 will slip against the paper as they revolve, and when the paper is released the friction of the rolls against the paper will be just sufficient to move the paper down from and off the rolls, as 6. In thus taking up the slack paper by the take-up roll 5 the former will be thrown forward a little and will rest upon the curved shelf or the small roll 6, arranged therein, whence, especially if the paper be wet, it will be easily drawn off by the feed-rolls 10. Each sheet, when cut from the web, is carried by the belts, as *m*, down and deposited upon a suitable platform provided for the purpose, where it is packed.

In the above description, and as shown in Fig. II, I have arranged the frame 3, with its roll 5, as adapted to move freely to and fro in a shoe, as 4, to be pivoted to the frame, as at 50, and clamped or set at any desired inclined position, with the roll 5 resting against the web of paper, so that when the downward movement of the web is stopped at the bar 9 and the tension of the web against the roll is released the frame 3 will follow the loosened paper until the cut is made and the rolls 10 commence to draw the web down and taut again, and this renewed tension of the web moves the frame 3 automatically back into place again; and in cutting thin paper the shoe, as 4, may be set at a less inclination than when cutting thick paper, so that in cutting thin paper the frame 3 will push back easier.

In the above description the frame 3 is partially automatic in its action, at least so far as its movement forward to press the roll 5 against the web of paper is concerned; but in Fig. VII is shown mechanism for operating the frame and its roll positively, in which a wedge-shaped piece, *e*, is made upon or attached to the upper side of the stop-bar arm, as 7, with a roll, as *f*, adapted to revolve in a piece, *h*, adjusted with an up-and-down movement in guideways at each end of the frame.

A roll, *f'*, is geared to the receiving-roll 1 so as to revolve constantly, and when the stop-bar 8 is moved back or away from its position against the bar 9 the roll *f* is permitted to drop; but when the stop-bar 8 is moved in against the bar 9, with the web of paper clamped between, the roll *f* is moved up by the inclined piece *e* against the frame and the latter clasped between the revolving roll *f'* and the roll *f*, and the frame 3, with its roll 5, is thereby moved forward against the web as long as the bar 8 remains in that position; but when the latter is drawn back and the web released the roll *f* is permitted to drop, and the frame 3 not then being in contact with the roll *f'*, the renewed tension of the paper moves the frame 3 and its roll 5 back to its position.

As the knife 14 has a very slight movement in making each cut—say an inch, more or less—it is evident that but comparatively very little slack paper will accumulate above the rolls 10 or stop-bar 8 while the paper is being cut.

A piece of some elastic or yielding substance may be inserted in the front side of the stop-bar 8 to press against the paper in stopping it, if desired.

As the speed of all the working parts of the machine is controlled by the two cone-drums B and 16 and the belt extending around them, it is evident (the speed of the receiving-rolls 1 and 2 always remaining the same) that the web of the paper will be stopped by the stop-bar 8 and the sheets severed therefrom with more or less frequency, according as the cone-belt 52 is shifted to different positions along the cone-drums in one direction or the other, and the sheets be cut of any desired length from the web.

Having thus described my invention, what I claim as new is—

1. The combination, in a paper-cutting machine, of two receiving-rolls, adapted to re-

volve at a uniform rate of speed, for receiving a continuous web of paper and delivering it therefrom at a uniform rate of speed to the cutting mechanism, a fixed bar, and a movable stop-bar adapted to be moved against said fixed bar independently of the movable knife to stop the web of paper at regular intervals in its movement from said receiving-rolls, an adjustable take-up roll to take up the slack paper between the receiving-rolls and the stop-bar, feeding-rolls for feeding the web of paper to the knife, and a movable knife operating in connection with a fixed knife, whereby the web of paper is moved uniformly from the receiving-rolls and is moved intermittently to the knife, and sheets of any desired uniform length are severed therefrom, substantially as described.

2. The combination, in a paper-cutting machine, of two receiving-rolls revolving at a uniform rate of speed for receiving a continuous web of paper from a paper-machine and moving it uniformly to the cutting mechanism, stop-bars for stopping the movement of said web of paper while sheets are being cut therefrom, supporting-rolls for supporting and holding the slack paper between the stopping-bars and the said receiving-rolls while the web of paper is stopped to be cut, and two feeding-rolls on the other side of the stop-bar, all combined, for moving the web of paper intermittently at a uniform rate of speed to the knife, for having sheets of uniform size cut therefrom, substantially as described.

CHARLES E. TORRANCE.

Witnesses:
T. A. CURTIS,
CHAS. H. WOOD.