2 Sheets—Sheet 1.

T. B. DOOLEY.

PAPER CUTTING-MACHINE.

No. 182,994. Patented Oct. 10, 1876.

FIG 1.

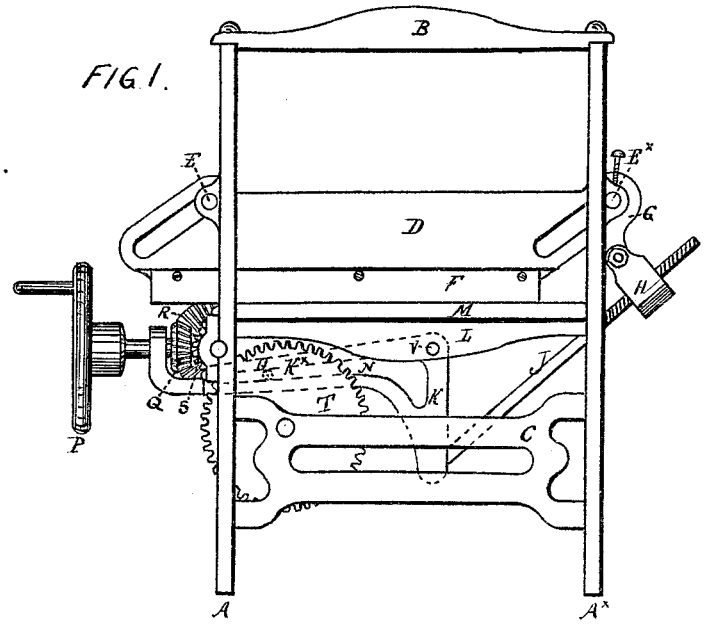
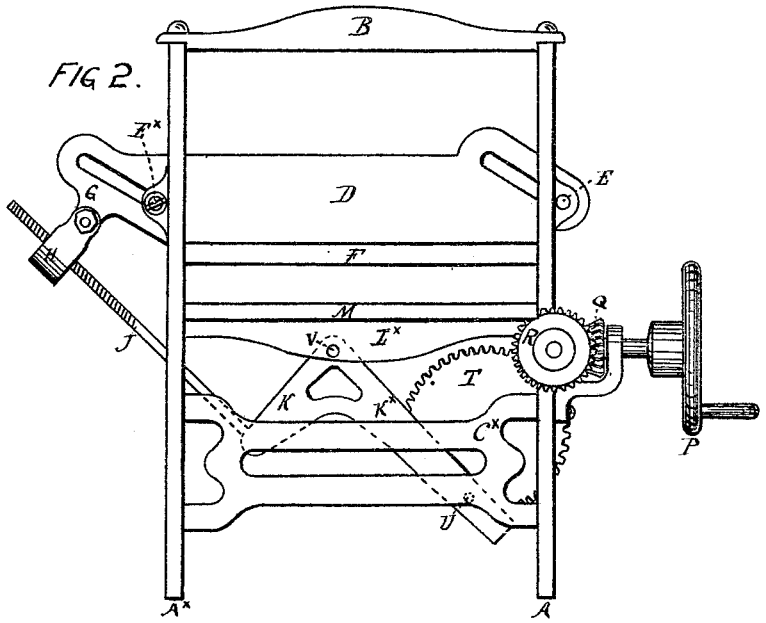


FIG 2.



WITNESSES.

Jerome Davis.

C. S. Griffin.

INVENTOR.

Thomas Brown Dooley

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2 Sheets—Sheet 2.

T. B. DOOLEY.

PAPER-CUTTING MACHINE.

No. 182,994. Patented Oct. 10, 1876.

FIG 3.

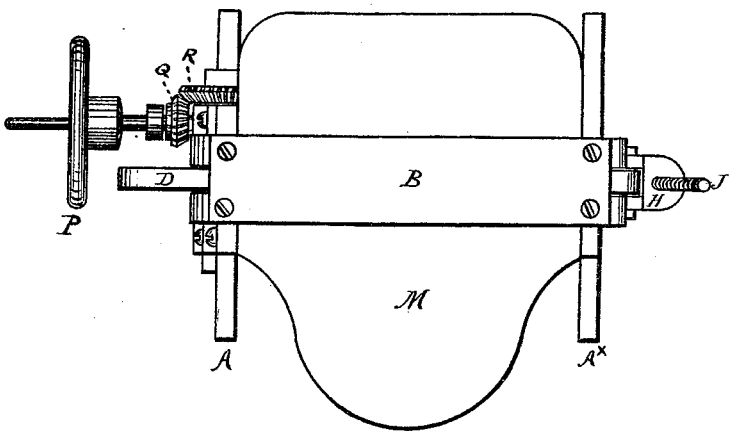
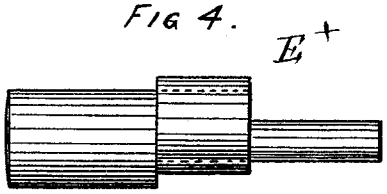


FIG 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS B. DOOLEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO DOOLEY MANUFACTURING COMPANY.

IMPROVEMENT IN PAPER-CUTTING MACHINES.

Specification forming part of Letters Patent No. **182,994**, dated October 10, 1876; application filed January 28, 1876.

To all whom it may concern:

Be it known that I, THOMAS BROWN DOOLEY, of the city of Boston, county of Suffolk and State of Massachusetts, have invented a new and Improved Paper-Cutting Machine, of which the following is a specification:

The nature and object of my invention is that of a machine for cutting smoothly the edges of bundles of paper used for book-binding, &c.

Figure 1 is a view from in front (the side on which the bundle of paper is put to be trimmed or cut) of the machine when it has just performed its office, and the cutting-blade is at its lowest point. Fig. 2 is a view from the other side, when the blade is at its highest point. Fig. 3 is a view of the device from above. Fig. 4 is a view of an eccentric-pin, $E^{\times}$, to be hereinafter more fully described.

The machine is all made of metal. In the drawings, A $A^{\times}$, Figs. 1, 2, and 3, are two upright slabs of metal, cut away to lighten them, in any convenient shape, and are called the standards. These standards are connected together at their upper ends by a cross-bar, B, Figs. 1, 2, and 3, fastened firmly to their upper ends, respectively, and near their lower ends by two lower bars, similarly fastened at each side. One of these is seen in Fig. 1, marked C, and another, its opposite, in Fig. 2, marked $C^{\times}$. D, Figs. 1 and 2, is a bar of metal, called the blade-bar, which, with one edge upward, passes from one side to the other of the machine through a slitted aperture in the standards, respectively, beyond which on each side it projects. This bar has in it two diagonal slots, (seen in Figs. 1 and 2,) through which, at right angles to the bar, pass at each end, respectively, two pins, E $E^{\times}$, (seen in Figs. 1 and 2,) called the slot-pins, which are borne by, respectively, a pair of projections, forming bearings from the outer sides of the standards. One of each of these two pairs is seen in Fig. 1, and also in Fig. 2. Below the blade-bar D, and attached to it at its lower edge, is the blade F, Figs. 1 and 2, which effects the cutting of the bundles of paper. At the right hand in Fig. 1, and the left in Fig. 2, is a downward projection, G, Figs. 1 and 2, from the lower edge close to the end of the blade-bar D, called the blade-bar arm. Attached to the lower end of this arm, by means of a rivet, on which it swings freely, is a block of metal, H, Figs. 1, 2, and 3, called the screw-block, through a female screw in the center of which passes, in a diagonal direction, a shaft, J, Figs. 1, 2, and 3, called the screw-shaft, whose lower end is attached, by means of a rivet, on which it moves or partially rotates freely, (see Figs. 1 and 2,) to the lower end of one arm, K, of a device similar to the well-known bell-crank, which is hung by a rivet, V, above, from and between two cross-bars, L, Fig. 1, $L^{\times}$, Fig. 2, seen (one, respectively, in each figure) in Figs. 1 and 2, which cross-bars pass horizontally from one standard, A, to the other standard $A^{\times}$, beneath the platform or table M, Figs. 1, 2, and 3, which platform extends similarly from one standard to the other, and is fastened to and supported by both. At $K^{\times}$, Figs. 1 and 2, is seen the other arm of the bell-crank, extending at right angles, or nearly so, to the arm K. On the hither side in Fig. 1, the farther side in Fig. 2, of this arm $K^{\times}$ is a groove, N, Fig. 1. (See dashed lines, Fig. 2.) P, Figs. 1, 2, and 3, is a fly-wheel with a handle, (seen in all the figures,) supported, as to its shaft, partly by a bent arm attached to the side of the standard A, and partly by a bearing bored in the side of the said standard. The shaft bearing this fly-wheel P carries also a bevel-wheel, Q, Figs. 1, 2, and 3, which engages with another bevel-wheel, at right angles to it, R, Figs. 1, 2, and 3, which is borne by two bearings attached to the side of the standard A. The shaft, which bears the bevel-wheel R, bears also the small cog-wheel S, Fig. 1, which engages with the large cog-wheel T, Figs. 1 and 2, which wheel is borne by a shaft held by a bearing in the cross-brace C, Fig. 1. This cog-wheel T bears a small peg, U, Figs. 1 and 2, called the groove-peg, which projects from the side of the wheel, near its periphery, and passes into the groove N, heretofore mentioned as being cut into the side of the arm $K^{\times}$ of the bell-crank.

Operation of the invention: The blade being in the position seen in Fig. 2, the bundle of paper-sheets, the edges of which are to be

trimmed, are placed upon the table M upon the hither side, in Fig. 1, of the blade F, the edges of the bundle protruding the requisite distance beyond the line of downward motion of the blade. The fly-wheel P is then rotated in a direction contrary to that in which a screw turns, either by its handle or by a belt, thus rotating the two bevel-wheels Q and R and the cog-wheel S, by the motion of which latter the large cog-wheel T is also rotated, carrying with it the pin U, this pin impinging upon the upper side of the groove N, at a point near the end of the arm $K^{\times}$ of the bell-crank. The arm K of the crank is thus drawn to the right in Fig. 2, or its loose end lifted up, thus drawing down the screw-shaft J and the screw-block H, and with them, by means of the blade-bar arm G, the blade-bar D and the blade F. As the peg U acts upon the arm $K^{\times}$ near its end, the motion of the arm is not quick, but gradual, and the slots of the blade-bar being cut in a diagonal direction, the blade-bar and blade is guided by the slot-pins E $E^{\times}$ in a direction similarly diagonal. The result is the blade F gives a gradual and drawing cut to the bundle of paper operated on. The rotation of the fly-wheel P, &c., continuing, the pin U strikes the lower side of the groove N at a point in the arm $K^{\times}$ much nearer to the pin V than the point in the said arm touched by the pin during the downward motion of the blade F. The pin U continuing to move, the arm $K^{\times}$ is forced down, thus lifting up the loose end of the bell-crank arm K, and with it the screw-shaft J, screw-block H, blade-bar arm G, and the blade-bar D and blade F. As the location of the impinging point of the pin U upon the edge of the groove N is so much nearer to the fulcrum point V during this action of the pin than it was during the descent of the blade F, although the rate of motion of the pin is the same, it follows that the ascent of the blade F is quicker than its descent when the fly-wheel P is turned in the reverse direction, as described. The groove N being wider than the diameter of the pin U, there is a certain portion of time during the rotation of the pin, occurring just after it has brought the blade F down to its lowest point upon the table M, and again when the blade F has reached its highest point, when the pin, passing from the lower to the upper side of the groove N, or vice versa, does not impinge upon the arm $K^{\times}$, which therefore is at that time quiescent. There is thus a slight period of rest in the action of the blade when at its highest point when the bundle of paper is to be put in place for cutting, and another when it is at its lowest point after the cutting has been accomplished. One of the pins, passing through the slots of the blade-bar D, viz., pin $E^{\times}$, Fig. 2, is constructed with two centers, thus making an eccentric-pin, (see Fig. 4,) the part of the pin resting in the slot being enveloped in a roller. The pin bears on the outer end of its core (the pin proper) a screw-head slot, (see Fig. 2,) by which the core (or pin proper) can be turned to the right or left. The effect of this turning is to lower or raise the working portion of the pin where it encounters the sides of the blade-bar slots, the object of this arrangement being to raise or lower one end of the blade, when, by reason of careless grinding in the sharpening of the cutting-edge at one or the other end, it is ground off too much.

I do not claim actuating the blade-bar and blade by means of a rod at one end, nor the slotting of the knife-bar, with pins supported by the frame running through the slots; but

I claim—

1. In paper-cutting machines, the combination of the standards A $A^{\times}$, the cross-bars B and C $C^{\times}$, the platform M, the slotted blade-bar D, and the blade F, with the cog-wheel T, and the machinery to actuate it, the peg U, the grooved bell-crank K $K^{\times}$, and the screw-shaft J, and screw-block H, when constructed and arranged substantially as shown and described.

2. In paper-cutters, the double centered or eccentric pin $E^{\times}$, in combination with the standards A $A^{\times}$, the cross-bars B and C $C^{\times}$, the platform M, the slotted blade-bar D, and the blade F, and the machinery to actuate the blade, all when constructed and arranged substantially as described.

THOMAS BROWN DOOLEY.

Witnesses:

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