

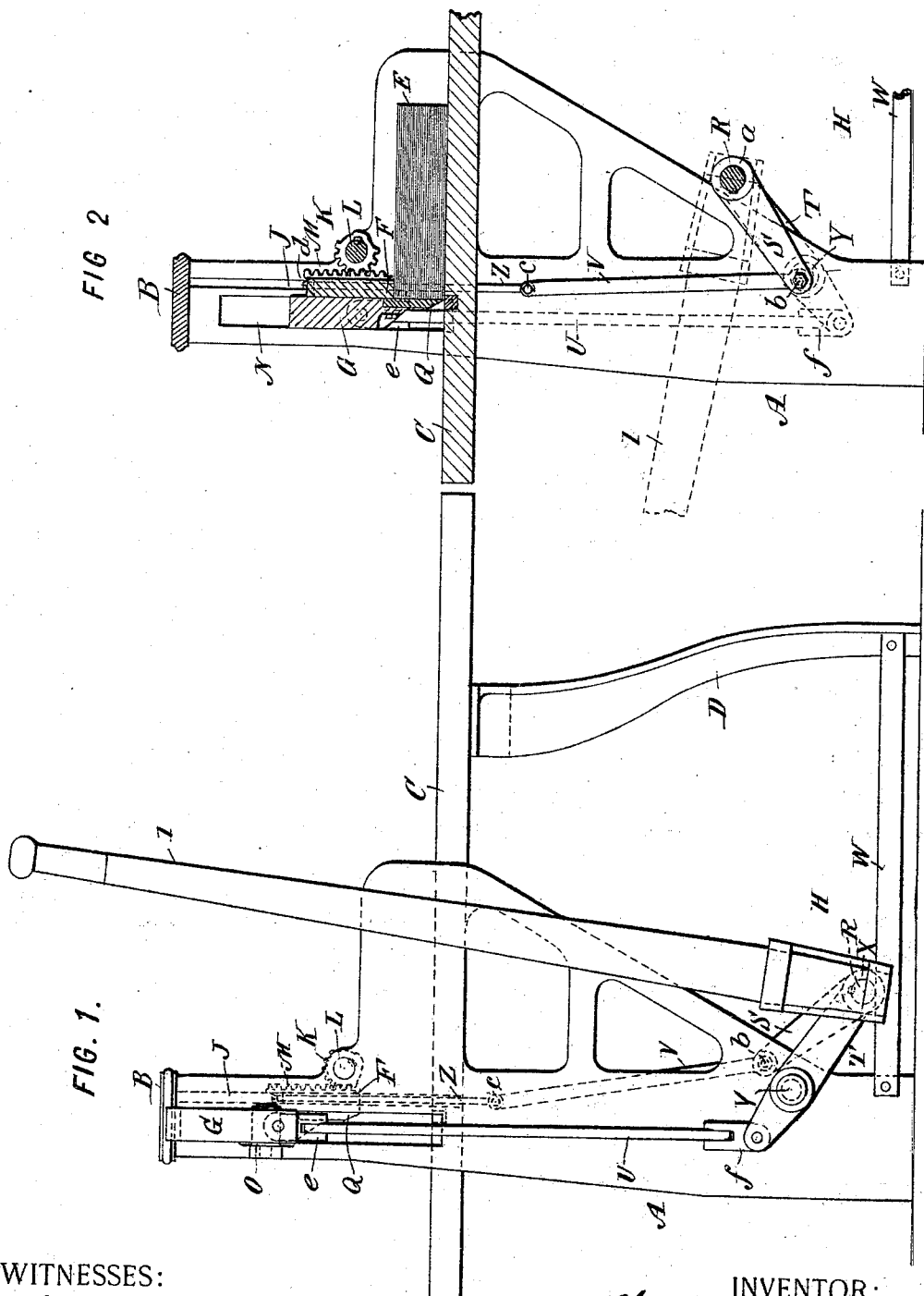
(No Model.)

2 Sheets—Sheet 1.

C. M. HOLCOMB.
CUTTING MACHINE.

No. 544,851.

Patented Aug. 20, 1895.



WITNESSES:

Ired White
Thomas F. Wallace

INVENTOR:

Charles M. Holcomb,

By his Attorneys,

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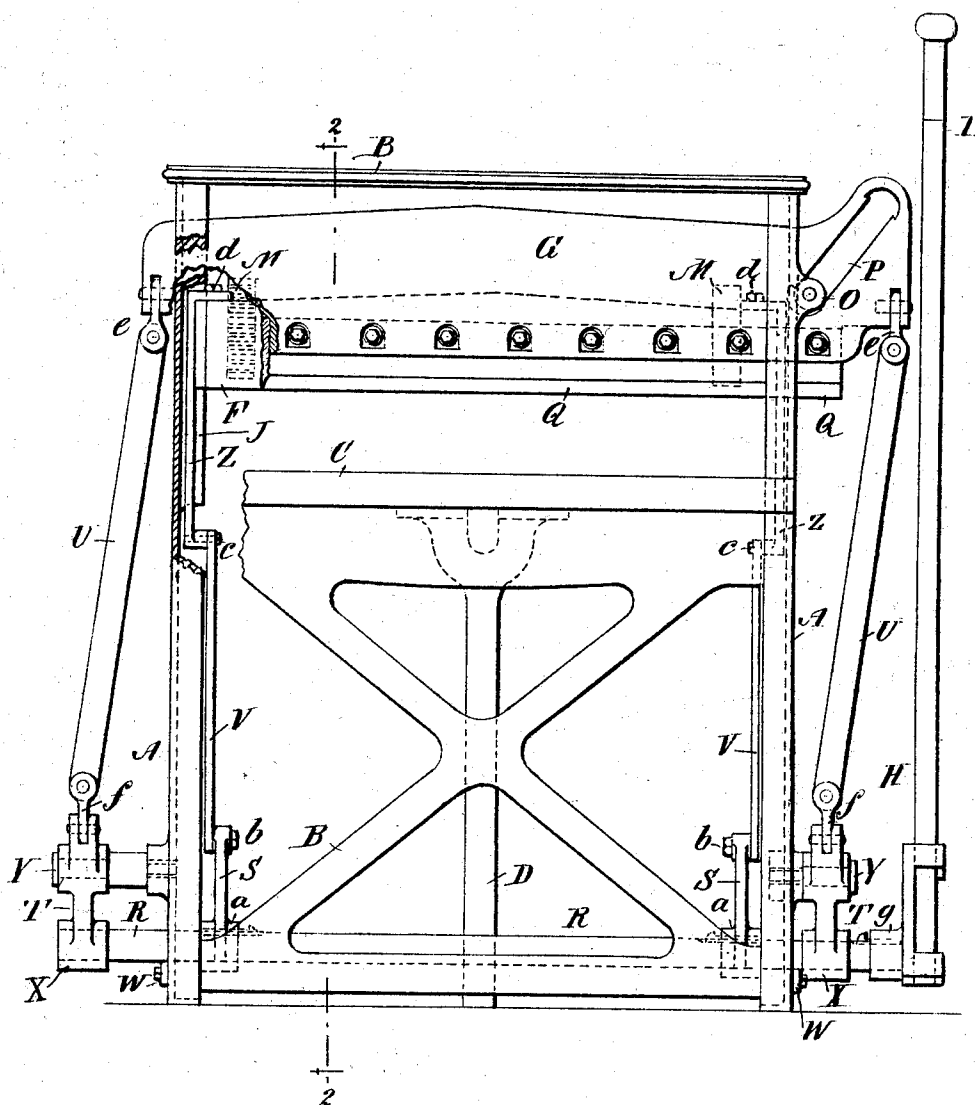
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FIG. 3.



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UNITED STATES PATENT OFFICE.

CHARLES M. HOLCOMB, OF BROOKLYN, NEW YORK.

CUTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 544,851, dated August 20, 1895.

Application filed April 19, 1895. Serial No. 546,300. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. HOLCOMB, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cutting and Like Machines, of which the following is a specification.

This invention relates to cutting-machines and analogous devices, and especially to machines of the class known as "paper-cutters," and aims to provide improvements in such devices.

In paper-cutters it is customary to provide a clamp operated against one side of the work to hold it and a knife subsequently operating against the other side of the work to cut it. Various means for successively moving these parts, through a hand-lever or otherwise, have been employed, and to insure the uniform movement of both ends of the clamp it has been provided with racks at its ends meshing with pinions keyed on a rotative shaft carried by the frame.

My invention aims to provide improved means for operating the clamp and the knife, a clamp which shall move in the same direction as the knife and uniformly at both its ends, and means whereby the clamp shall be initially operated until it is home and the knife then operated until the cutting is completed throughout the various relative movements, the clamp and knife moving against the same side of the work and each uniformly or without canting.

To this end, in carrying out my invention, I provide certain improvements, which will be hereinafter fully set forth with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a cutting-machine constructed according to the preferred form of my improvement, the parts being in the inactive position. Fig. 2 is a cross-section of the machine cut on the line 2 2 in Fig. 3, and showing the parts in the position occupied at the end of the cutting operation; and Fig. 3 is a front elevation of the machine, partly broken away, in the position shown in Fig. 1.

Referring to the drawings, let A represent the side or vertical frames of a cutting-machine; B, the cross pieces or braces thereof; C,

the table thereof; D, the rear leg thereof; E, the work on the table; F, the clamp for holding the work; G, the knife bar or carrier; H, the operating mechanism, and I the handle or lever thereof.

The clamp F moves toward and from the top of the work, being guided by vertical guides or housings J in the frames A. It is prevented from canting in its movements by means of pinions K, which are preferably segment-pinions keyed on a stiff shaft L and meshing with racks M, fixed on the rear face of the clamp at or near its respective ends, according to a well-known method of maintaining such clamps in position.

The knife-bar G moves vertically through guides N in the frames A, and diagonally by reason of a roller or pin O, carried by the frame and working in a diagonal slot P in the bar G, whereby it gives a drawing, gliding, or shearing cut to the knife. The knife or cutter consists of a blade Q, suitably fixed to the knife-bar flush with the adjacent face of the clamp, and in the construction shown moving against the work at top.

The operating mechanism H may be of any suitable construction of hand or power operating mechanism, which should first move the clamp against the work until it is home and then move the knife through the work until the cutting is finished, subsequently returning the knife first to its inactive or retracted position, and then the clamp to its inactive position. Its nature and construction vary according to the relative operations of the clamp and cutter and according to whether these parts move in the same or in opposite directions against the work, and if in the same direction in accordance with which side of the work they engage. In the construction shown the clamp and cutter move in the same direction toward the work.

According to my improvements, in the construction shown the operating mechanism consists of a shaft R, to which the driving power is applied, in this instance, by means of the handle or lever I, which is fixed to the end of the shaft and swings downwardly and forwardly to rotate and move the latter, arms S, keyed or otherwise fixed to the shaft, projecting laterally therefrom in the nature of cranks and connected to the clamp for oper-

ating it, levers or equivalent provisions T fulcrumed on fixed points and connected at their ends, respectively, to the shaft to be moved thereby and to the knife-bar to move the latter, and vertical links U between the levers and knife-bar, and V between the crank-arms and clamp.

The shaft R has a rotative and a swinging movement. When in the inactive position it rests on any suitable support or bearing, as—for example, the diagonal braces W between the frames A and leg D—being held in position by the tubular ends X of the levers T, which loosely embrace the shaft, permitting its rotation within the sleeves, but compelling the shaft and levers to swing together. The levers T are preferably fulcrumed on axial studs Y, screwed to the outer sides of the frames A, and at their forward ends engage the links U. The crank-arms S are preferably separate pieces having sleeve-like hubs *a*, keyed to the shaft R, projecting forwardly and upwardly therefrom, and having at their outer ends a swinging connection, as by studs *b*, with the lower ends of the links V. The links V at their upper ends make a swinging connection by studs *c* with the lower ends of vertical hangers and straps Z, which at their upper ends traverse the ends of the clamp F, are bent over the top thereof and secured thereto by bolts *d* or in any other suitable manner, and constitute essentially an extension of the clamp. These hangers Z preferably project beyond the ends of the clamp, fit the guides J in the frame, and serve as a part of the clamp working therein. The links U between the levers T and knife-bar G are constructed to permit the various relative movements of these parts by providing the links at their connections with the bar with sections *e* and at their connections with the levers with sections *f*, according to a well-known construction. The handle I is connected to the shaft R by a socket-piece *g*, keyed to the shaft, having a socket into which the handle fits.

In operation, as power is applied to rotate the shaft R, as by turning downwardly the handle I, the shaft rotates in the bearing-sleeves X of the levers T, swinging downward the outer ends of the arms S, and thus through the links V moving downward the clamp F until it is home on the work. The shaft L, pinions K, and racks M assist in preserving the uniform movement of the clamp as it approaches and engages the work. The clamp is arrested by the work, thereby stopping further downward movement of the arms S and further rotation of the shaft R. Up to this time the levers T have remained stationary, the handle and crank-arms having swung from the axis of the bearing-sleeves in the levers as a fulcrum. Immediately the arms are arrested the axis on which the arms and handle swing is changed to the axis of the connection between the arms and the links V, whereupon further movement of the handle

causes the parts to swing on this axis and the shaft R to rise thereon. As it rises, it carries upwardly the ends of the levers T embracing it, causing the other ends of these levers to descend and draw down with them the knife. As the shaft rises, its connection to the levers causes it to swing in the arc of a circle around the axis on which the levers are fulcrumed, whereby, to the extent of the difference between this axis and the point at which the axial connection between the crank arms and their links was arrested, the latter connection will be swung rearwardly or forwardly as the shaft rises. The shaft will continue to rise until the knife has been depressed to the desired extent, the handle being depressed until the levers T are tilted sufficiently to bring the knife through the work, as shown in Fig. 2. Thereafter the raising of the handle will first depress the shaft until the levers are restored to their initial position and the shaft rests on its normal support, and will then rotate the shaft on this support, thereby raising the crank-arms and through them the clamp. During these operations while the shaft R is rotating its weight will be carried on its normal support, and the clamp and knife will be supported from the shaft or the support carrying the latter, but as soon as the clamp is home on the work the force for the cutting operation will be applied partly to the clamp and carried by the work thereunder, which will continue until the clamp starts its releasing movement, and partly to the fulcrum of the levers.

It will be seen that my invention provides improvements in cutting-machines which can be readily and advantageously employed and which permit a simple and convenient construction of operating mechanism for machines, and it will be understood that the invention is not limited to use with hand-power cutting-machines, nor to the particular details of construction and arrangement set forth, since it can be availed of for cutting-machines of any construction or principles of operation, driven in any manner, and according to such details of construction and arrangement of the parts as circumstances and the judgment of those skilled in the art may dictate, without departing from the spirit of the invention. Such modifications as may be necessary to adapt my improvements to other kinds of cutting-machines than that shown will be within the province of any mechanic, and require no additional description to that hereinbefore given.

What I claim is—

1. In cutting machines and the like, means for holding the work, and a clamp and a cutter both movable against the work, in combination with a driving shaft for moving said clamp and cutter having a rotative and a swinging movement, an arm rigidly connected to and projecting from said shaft, a clamp-link connected at one end to said clamp, having a swinging movement at its other end

and there connected to said arm and swinging therewith from the axis of said shaft, a cutter-link connected at one end to said cutter, swinging at its other end, a lever fulcrumed on a fixed axis relatively to the work, pivotally connected at one end to said cutter-link and swinging the latter about its fulcrum, and having a bearing sleeve at its other end surrounding and holding said shaft during the rotative movement thereof, and means for rotating said shaft, said shaft in rotating first swinging the end of said arm toward the axis of said lever, and through said clamp-link depressing said clamp until the latter is home on the work, said arm then arrested and swinging on its end as a fulcrum movably supported by said clamp-link, and during the further movement of said shaft swinging the latter on such fulcrum upwardly around the fulcrum of said lever, thereby tilting the latter and through said cutter-link depressing said cutter, substantially as and for the purpose set forth.

2. In cutters and the like, a work holder, frame, and clamp and cutter movable against the work, in combination with a clamp-link depending from the clamp, a shaft having a rotative and swinging movement, an arm rigidly connected to said shaft swinging about its axis with its rotative movement, and having a pivotal pin connected to said clamp-link and moving the latter with the movements of the arm, and swinging from an upward position downwardly until the clamp is home on the work, a lever fulcrumed to the frame on a fixed axis, having a pivotal pin at one end and a bearing sleeve at its other end, a cutter-link connected to the cutter at one end and pivotally connected to the pivotal pin of said lever at its other end, depressed by and swinging about the fulcrum of said lever, said shaft carried by and rotating in the bearing sleeve of said lever, and means for moving said shaft, said shaft when rotated swinging downwardly said arm until the clamp is home on the work, said pivotal pin on said arm then arrested and supported by said clamp-link from said clamp and serving as the fulcrum for said arm and lever during the further movement of said shaft, and said shaft during its further movement rising on

said pivotal pin of said arm, swinging about the fulcrum of said lever, thereby tilting the latter and drawing down said cutter-link, substantially as and for the purpose set forth.

3. In cutting machines and the like, a table C, frame A, clamp and cutter, in combination with a shaft R having a rotary and swinging movement, an arm S swinging with said shaft and having a pivotal pin *b*, a link V connected to said clamp and connected to said arm by said pin, a lever T fulcrumed to the frame and having a bearing sleeve X at one end carrying said shaft, a link U connected to the other end of said lever and to said cutter, and means for rotating and swinging said shaft, said shaft rotating in said sleeve and then swinging said arm downwardly with its pivotal pin toward the fulcrum of said lever, and said clamp and link sustaining said arm when the clamp is on the work, and said pin *b* during the further movement of said shaft constituting a movable fulcrum for the arm S on which the shaft swings upwardly, and said shaft during its further movement swinging about the axis of said lever and guided by the sleeve thereof, substantially as and for the purpose set forth.

4. In cutting machines and the like, a table C, in combination with a frame A, clamp F, cutter G, link U connected to the cutter, link V connected to the clamp, lever T fulcrumed to the frame, having a bearing sleeve X at one end and connected to the link U at its other end, shaft R rotating in said sleeve, arm S fixed to said shaft and having pin *b* connected to said link V, and handle I connected to said shaft for moving it, said shaft when moved depressing said arm and swinging said pin *b* toward the fulcrum of said lever until the clamp is home on the work, and said arm then riding on said pin as a fulcrum and swinging said shaft upwardly around the fulcrum of said lever and tilting the latter, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES M. HOLCOMB.

Witnesses:

GEORGE H. FRASER,
THOMAS F. WALLACE.