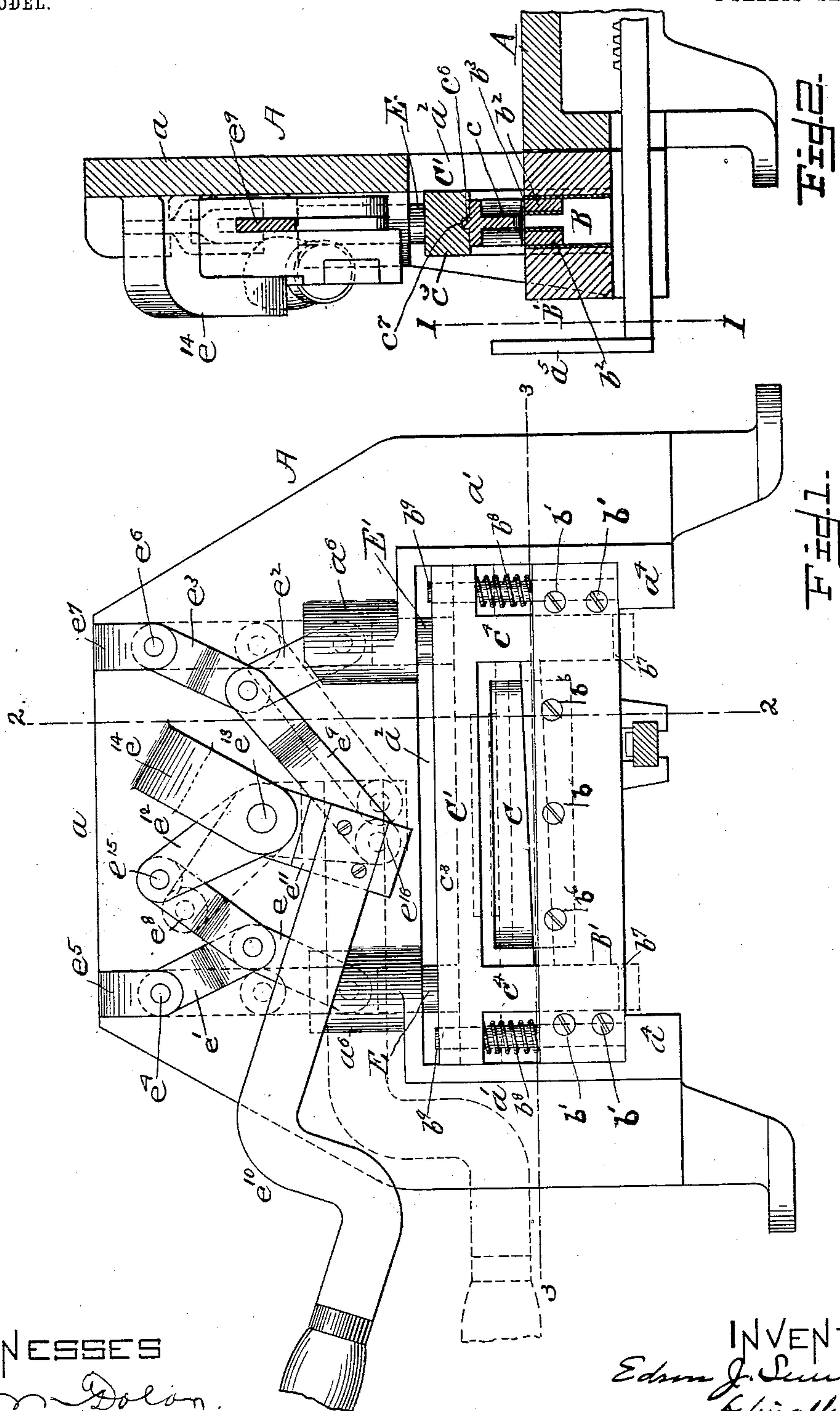


E. J. SMITH.
PAPER CUTTER.

APPLICATION FILED MAY 12, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

J. M. Dolan.
Saul Lipperstein

INVENTOR

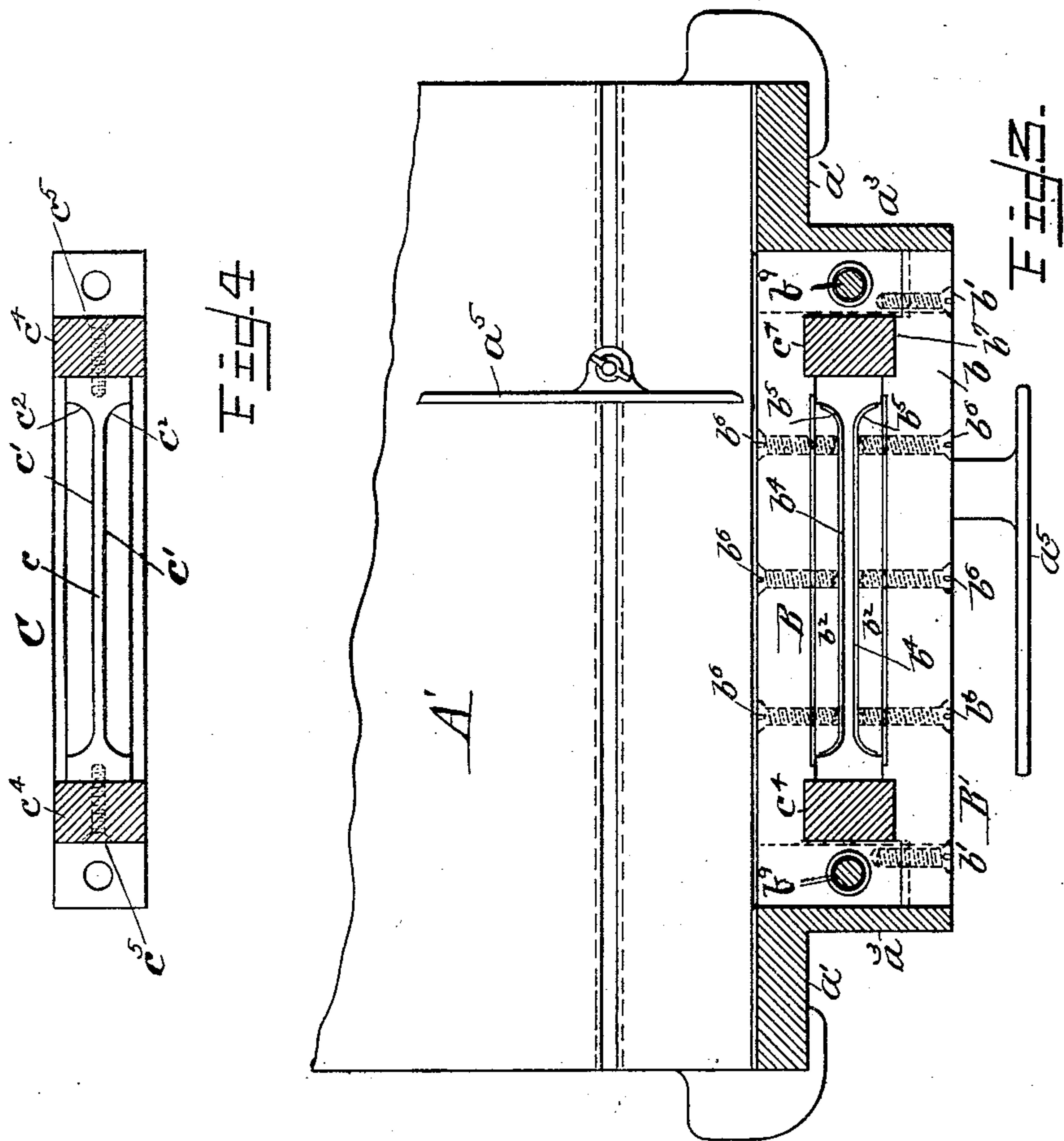
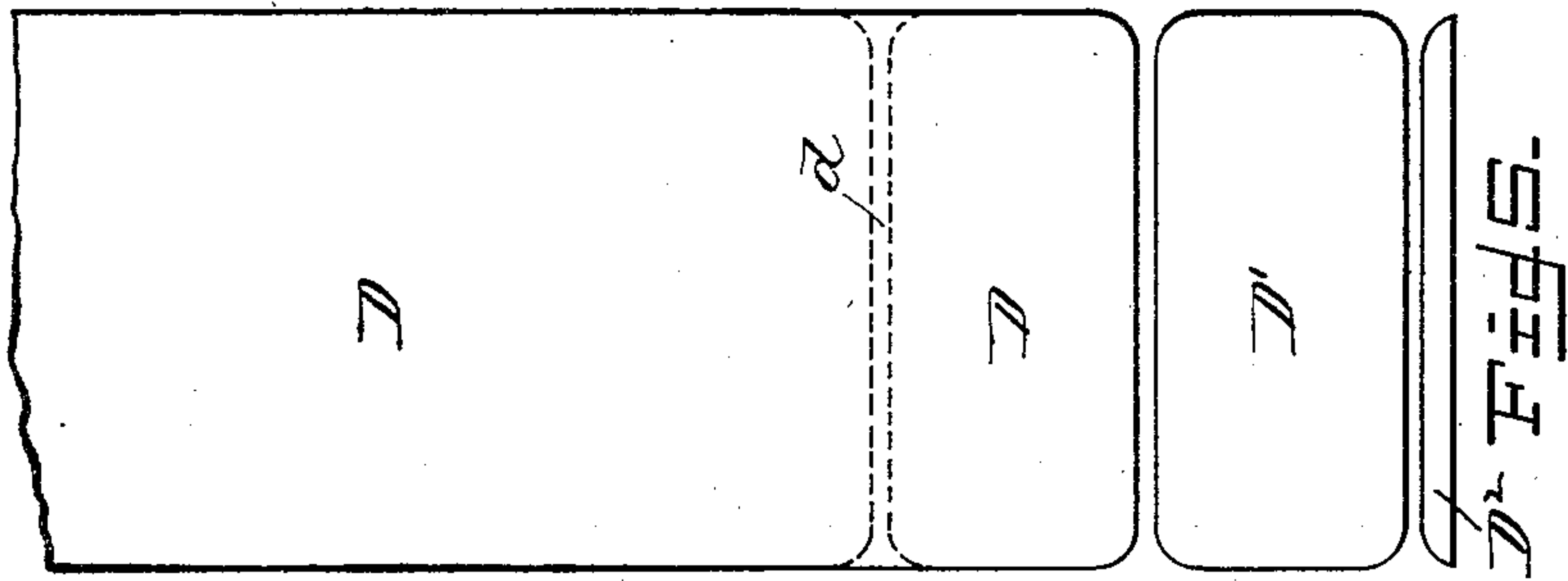
Edwin J. Smith
by his atty
Charles Raymond

E. J. SMITH.
PAPER CUTTER.

APPLICATION FILED MAY 12, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES

Jim Dolan.
Saul Sipeperstein

INVENTOR

INVENTOR
Edson J. Saults
by his attys-
Clarke & Raymond

UNITED STATES PATENT OFFICE.

EDSON J. SMITH, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JOHN CARTER,
OF NEWTON, MASSACHUSETTS.

PAPER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 735,166, dated August 4, 1903.

Application filed May 12, 1902. Serial No. 106,857. (No model.)

To all whom it may concern:

Be it known that I, EDSON J. SMITH, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Paper-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to an improved paper-cutter, and essentially to the means by which cards may be severed from a strip of cardboard and simultaneously may be cut with rounding corners.

It comprises, therefore, primarily a punch and die of improved construction the cutting edges of which are adapted not only to sever the cards corresponding as the strip is fed along, but also to finish each severed card by rounding its corners contiguous to the inner cut edge and preparing the card next in order by rounding the corners of the strip at the point of cutting.

The invention comprises also means for the retention and adjustment of the aforesaid punch and die, together with an improved mechanism for actuating the punch.

The details of construction may best be seen and described by reference to the drawings, wherein—

Figure 1 shows my device in front elevation from the lines 1 1 of Fig. 2. Fig. 2 is a vertical section upon the line 2 2 of Fig. 1. Fig. 3 is a horizontal section on the line 3 3 of Fig. 1. Fig. 4 shows the punch in detail and the means for its retention. Fig. 5 shows a strip of paper or cardboard severed in part section by my improved cutter and showing especially the rounding corners of the severed card.

Referring to the drawings, A represents a frame which is adapted to sustain several parts of my invention in proper relation of position and adjustment to one another. It is of perpendicular extension and comprises the upper plate a , to the side of which is attached the mechanism for manipulating the punch, the sections a' extending down at either side to form a central opening a^2 , through which the work may be fed to the

punch and die, and the integral sides a^3 , which, with the shelve-pieces a^4 , provide a rectangular recess in which the die-holder is adapted to be contained.

The frame A is held in place by any suitable means of support. I have shown it as extending from and of integral attachment with a bed or table A' , upon which the strip of paper or cardboard is placed in readiness to be fed through the opening a^2 and severed. (See Fig. 2.) This, however, is only a convenient order of arrangement. The frame A may make connection with any other support, and even its own construction may well be varied.

B represents the die, and C the punch; B' C' , respectively, their holders, by which they are not only held in permanent position of adjustment, but may be brought together in their conjoint relation.

The holder B' is made rectangular in shape, so as to be contained within the sides a^3 of the frame and to rest upon the seats a^4 provided for it. It is made relatively heavy, with a rectangular vertical recess within its center, in which the die is contained. It may be of integral formation; but as represented its sides are completed by the detachable side piece b , which has suitable screw connections b' . When in place, the holder extends back, so that its interior edge will be contiguous with the edge of the bed or table A' and their upper surfacings be continuous in order that the paper strip may be freely fed to the die which is contained within the recessed interior of the holder.

The die B is made in two detachable sections b^2 . These sections b^2 are made of strips of steel and have, essentially, the upper surfacings b^3 continuous with the top of the holder and provided with the cutting edges b^4 and rounded cutting ends b^5 . They are held in place by screws b^6 , coming through the opposite sides of the holder, and their separation and adjustment is such that a narrow passage will be formed between their cutting edges b^4 , through which the blade c of the punch C will pass, and its cutting edges c' will coincide with the edges b^4 of the die, and its rounding walls c^2 will be contiguous with the rounding ends of the die-sections, so that

the paper or cardboard when placed over the die will be cut in lines corresponding with the contiguous or coinciding edges of the punch and die. This is best seen in Fig. 5, where I have shown a strip of paper or cardboard D separated in part section into a card D'. The strip of cardboard, it is to be noted, is of the same width as the card to be cut, and on being fed crosswise the die there is punched or cut out a narrow section \bar{d} rounding outwardly at either end. By the stamping out of this or like section the card D' not only becomes severed from the strip, but its edges contiguous with the stamped-out sections are made rounding, while the end of the strip is left with rounding corners, the practical result being that after the end of the strip has once been formed by the cutting of the waste piece D² the cards may be cut with rounding corners upon a continuous feeding of the strip to the die, the back edge of the severed card being formed with the front edge of the next in order.

In order that the cards may be severed of uniform width, suitable gage-clamps a^5 may be employed, as appear from the drawings.

The punch C, besides its blade c , which has double cutting edges c' and outwardly-rounding walls c^2 , as above described, may be of any suitable construction. Its holder C' comprises the upper cross-bar c^3 and the two downwardly-extending bars c^4 of preferably integral attachment, the punch being extended between them and along beneath the cross-bar c^3 . The punch is detachably held in place by the screws c^5 , extending through the vertical bars c^4 , while a bead c^6 extends into a groove c^7 along the under side of the cross-bar, helps the retention, and secures accuracy of adjustment. In order that the cutting edges of the punch may be in alinement with the cutting edges of the die and be brought into conjunction with them when the punch is depressed, the bars c^4 are extended down into the recesses b^7 , cut through the die-holder B', and which are in such relative position and the bars fit with such accuracy of adjustment that not only is the punch-holder supported, but as the bars fit down into the recesses the punch is brought in perfect adjustment to conjoin with the die. The blade of the punch, it is to be observed, has a shearing edge, so that the paper or cardboard is practically cut instead of stamped out as the punch is depressed. As the blade extends along between the separated sections of the die the waste piece \bar{d} stamped or cut out is forced down through the opening between the edges of the die and falls through the hollow interior of the holder.

I have already referred to the punch and sections of the die as being detachable. This is in order that they may be of different sizes or shapes, dependent upon the widths of the strips of paper or cardboard or upon the size or configuration of the card to be cut therefrom. By being made detachable the punch

and die-pieces may also be taken out and their cutting edges sharpened when occasion demands or any other repair obtained.

The holder C' and so the punch C are held in normal elevated position by the coiled spring b^8 , which rests upon the holder B' and bears up against the exterior ends of the cross-bar. The spring envelops and is supported by the rods b^9 , which extend up from the holder B' and through the ends of the bar c^3 . The spring is therefore retained in a permanent position of adjustment and is adapted to become compressed when the punch, or rather its holder, is pressed down and to exert a lifting action upon it with the release of the operating pressure.

The punch C is pressed down by means of the plungers E E', working through the tubular bearings a^6 , extending from the frame. These tubular extensions a^6 are in line with the horizontal cross-bar c^3 of the punch-holder, so that the plungers rest against, and acting simultaneously, press down the cross-bar at either end, and in order that there may be an equal distribution of pressure along the length of the bar, and the punch evenly pressed down along its double cutting edge.

The plungers are actuated by the toggle or knuckle links $e e'$ of the plunger E, and the knuckle links $e^2 e^3$ of the plunger E'. The link e is pivoted within the cleft-head of plunger E and the link e' at the point e^4 between the overhang of the arm e^5 and the frame side a , while the link e^2 is pivoted within the cleft of the plunger E' and its connecting-link e^3 at the point e^6 between the overhanging arm e^7 and the side of the frame. Connecting with the toggle-links by the same pivots which connect them are the thrust-links $e^8 e^9$, which are adapted to straighten the toggle-joints, and so press down the plungers. For obtaining their movement I have shown a bent lever which comprises the operating-arm e^{10} , extending from the side of the frame, and the angular arm extensions $e^{11} e^{12}$. The angular arms $e^{11} e^{12}$ are pivoted at the center of their connection at the point e^{13} between the overhanging arms e^{14} and the side of the frame, so that practically the lever-arm is fulcrumed at this point and when operated its arms $e^{11} e^{12}$ rotate from the point e^{13} as a center, and as the one is thrown outward to the right the other is rotated to the left. The ends of the thrust-links $e^8 e^9$ are pivoted to the lever-arm extensions $e^{11} e^{12}$ by pivot-pins $e^{15} e^{16}$, which completes the combination of parts, and consequently when the operating lever-arm e^{10} is drawn down its arms $e^{11} e^{12}$ are rotated, each simultaneously through its connecting-links $e^8 e^9$, respectively, straighten out the toggles, and the plungers are depressed.

In order that the lever-arm may be returned and retained in a normal operative position, I have made the springs b^8 of sufficient tension that by bearing up against the cross-bar c^3 they may also push back the plungers and so bend the toggles, which through their con-

necting-links e^8 e^9 , respectively, throw back the lever-arm to its normal operative position.

The arrangement, proportion, and pivotal points of the parts are such that a most powerful compressing action is obtained, as well as an evenness and facility of movement.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a paper-cutter, a punch having a blade formed outwardly rounding or flaring in reverse directions at either end, and a die to conjoin with said blade in order that a strip of paper or the like fed between the said punch and die may be severed in a manner substantially as described.

2. In a paper-cutter, a punch having a blade with a shearing edge formed outwardly rounding in reverse directions at either end, and a die having cutting edges separated to receive between them the said blade of the punch, but with a placement and configuration to conjoin with the said cutting edges thereof in order that a strip of paper or the like fed between the said punch and die may be severed in a manner substantially as described.

3. In a paper-cutter, a frame offering a housing for the removable holders of a cutting punch and die, said holders and said punch and die carried by the same and made detachable therefrom, means for so connecting said holders that the punch-holder will move when depressed in true parallel lines relatively to the die-holder that a proper correlation between the cutting edges of the punch and die may be obtained, a plurality of plungers for evenly depressing the punch-holder, and means for simultaneously actuating the plungers.

4. In a paper-cutter the combination of a frame, a cutting-punch and die-holders therefor, carried by said frame, and which are joined to approach each other on true paral-

lel lines, that a proper correlation between the cutting edges of the punch and die may be obtained, plungers carried by the frame for evenly depressing the punch-holder, toggles for simultaneously actuating said plungers, and a bent operating-lever having angular arm extensions pivoted to the frame at the center of their connection, with thrust-links connecting the said arm extensions with the said toggles in order that the same may become straightened and the plungers depressed, substantially as described.

5. In a paper-cutter the combination of a frame, a cutting-punch and die-holders therefor, carried by said frame, and which are joined to approach each other on true parallel lines that a proper correlation between the cutting edges of the punch and die may be obtained, plungers carried by the frame for evenly depressing the punch-holder, toggles for simultaneously actuating said plungers, and a bent operating-lever having angular arm extensions pivoted to the frame at the center of their connection, with thrust-links connecting the said arm extensions with the said toggles in order that the same may become straightened and the plungers depressed, and a work-returning spring or springs having placement between the punch and die-holders aforesaid, substantially as described.

6. In a paper-cutter the combination of a frame, a cutting-punch and die-holders therefor, carried by said frame, and joined to approach each other on true parallel lines, plungers carried by the frame for evenly depressing said punch-holder, means for simultaneously actuating said plungers, and a work-returning spring or springs having placement between the die and punch-holders, substantially as described.

EDSON J. SMITH.

In presence of—

J. M. DOLAN,
SAUL SIPPERSTEIN.