

(No Model.)

2 Sheets—Sheet 1.

B. KARFIOL.
PAPER CUTTING AND EMBOSSING PRESS.

No. 528,542.

Patented Nov. 6, 1894.

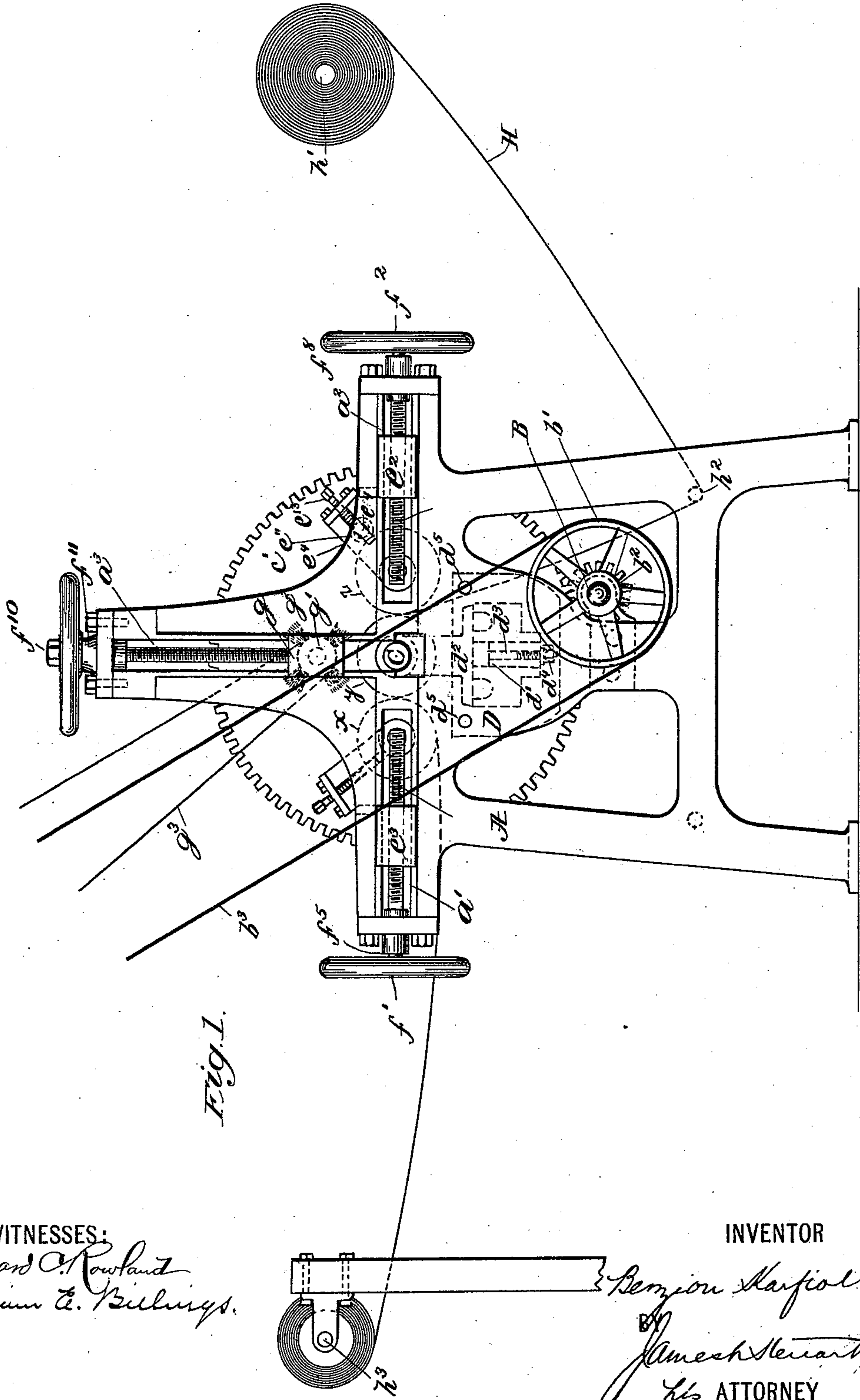


Fig. 1.

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William E. Billings.

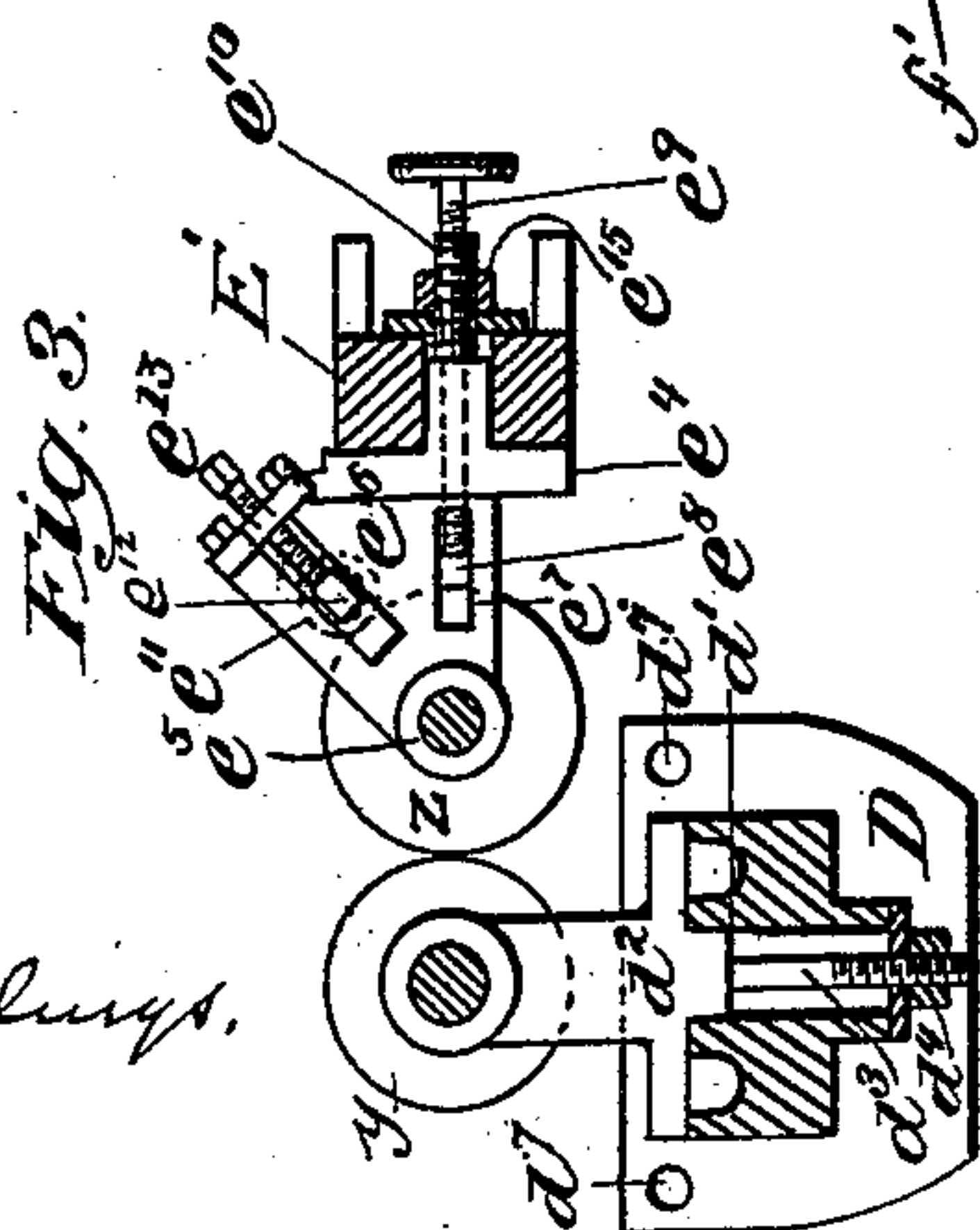
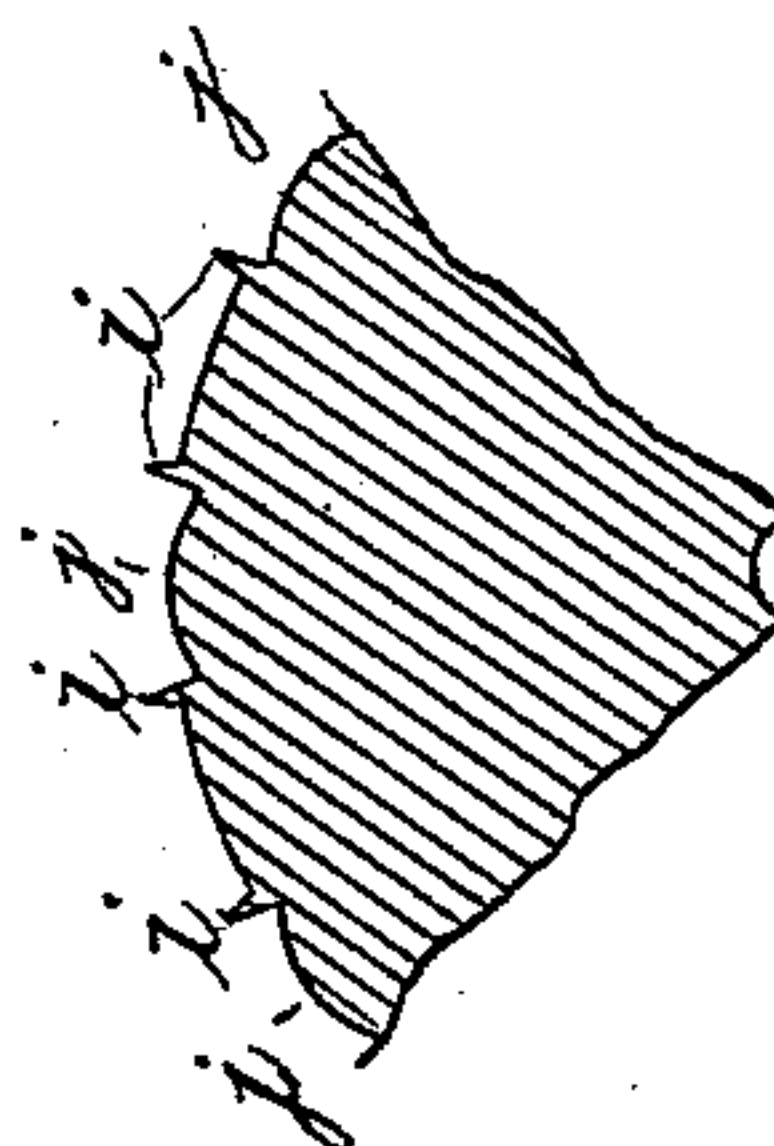
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2 Sheets—Sheet 2.

No. 528,542.

Patented Nov. 6, 1894.



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UNITED STATES PATENT OFFICE.

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PAPER CUTTING AND EMBOSSING PRESS.

SPECIFICATION forming part of Letters Patent No. 528,542, dated November 6, 1894.

Application filed February 12, 1894. Serial No. 499,847. (No model.)

To all whom it may concern:

Be it known that I, BENZION KARFIOL, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Paper Cutting and Embossing Presses, of which the following is a specification

My invention relates to that class of apparatus known as paper cutting or embossing presses, and particularly to the construction of a press carrying dies and compression rollers, and other devices, arranged to co-operate in the operation of cutting or embossing paper, or other kindred materials.

I have illustrated my invention in the accompanying drawings, on which like letters refer to like parts.

Figure 1, is an elevation of my device viewed from the side. Fig. 2, is a top view of the same omitting the revolving brush g^2 . Fig. 3, is a sectional view taken on the lines 2—2. Fig. 4, is a sectional view of the guide roller.

A, is a frame provided with ways, a' , a^2 , a^3 , and carrying the shafts journaled therein, B, C. The shaft, B, is provided with the pulley, b' , at one end outside of the frame, and at the other end with a pinion, b^2 , also outside of the frame. The shaft, C, carries the gear wheel, c' , which engages the pinion, b^2 .

E and E', are movable stays provided with the bearings, e^2 e^2 , and e^3 e^3 , which move in the ways, a' a' and a^2 a^2 . The movement of these stays is controlled by the screws f' , f^2 , f^3 , f^4 . These screws are held in a stationary position by the collars f^5 , f^6 , f^7 , f^8 , at one end, and at the other end are set into collars in the bearings e^2 e^2 , and e^3 e^3 . Hence with the movement of the screws, the stays will be moved in the ways in which they rest.

The movable bearings, g g , (only one of these is shown) move in the ways a^3 , and serve as the bearing for a shaft journaled between them at g' , which shaft carries a brush, g^2 , revolving therewith. The screws f^9 and f^{10} , control the movement of the movable bearings, g g . They are held in a stationary position by the collars, f^{11} and f^{12} , at one end, and at the other end are set into collars in the movable bearings, g g . Hence, with the

movement of the screws, the shaft carrying the revolving brush will be moved.

A brace D is secured between the frames A A, preferably secured thereto by bolts, as d^5 and d^5 , shown on one side in Fig. 1, but not shown on the opposite side. In the sectional view Fig. 3, the holes for these bolts are shown d^7 and d^7 . This brace D is provided with an aperture d' which forms a way throughout its length, adapted to receive and carry the bracket d^2 . Shown in Fig. 3. The bracket d^2 is provided at one end with the journal bearing d^6 , adapted to receive the shaft C of the die. It rests on the brace D and slides in the way d' . The bracket d^2 is secured to the brace D by the screw d^3 , nut d^4 , and thus may be adjusted to any position on the brace D. It will be understood that two of these brackets support the die. They are shown in Fig. 2 at d^6 and d^6 . As stated the shaft C is journaled in the frame A A. The cylindrical die y is preferably keyed to this shaft, and the journal bearings d^6 and d^6 of the brackets d^2 and d^2 , are run upon the shaft C, and adjusted as close as practical to the ends of the die thus lending support to the shaft on which the die is keyed, when pressure is exerted against the die.

The stays E and E' are provided with slots throughout their length forming ways. I have shown a sectional view thereof in Fig. 3. The brackets e^4 and e^4 are secured to the stay E' by the screw e^{10} and nut e^{15} , and may be adjusted to any position on the stay E', by moving the same in the ways thereof. The brackets e^4 and e^4 are provided with the journal bearings e^5 and e^5 , and the ways e^6 and e^7 . The shaft Z' is journaled in the journal bearings e^5 and e^5 , which are adjusted as near as practical to the roller Z. The roller e^{11} is journaled in the movable bearings e^{12} and e^{12} which move in the ways e^6 and e^6 . Such movement is controlled by the screws, e^{13} e^{13} , to cause the roller, e^{11} , to bear upon the roller Z.

e^8 , is a metal bar preferably square, or made so as to present a cutting or planing edge to the surface of the roller Z. It moves in the ways e^7 e^7 , and its movement is controlled by the pressure screws e^9 e^9 , which cause the same to bear on the roller Z.

The stays E and E', and their attachments,

are identical with the exception that in operating the apparatus, as will be hereinafter described, the compression roller, e^{11} , and the cutting edge, e^8 , are omitted when the brackets are used to carry the embossing roller.

The rollers x and z are suitably mounted on, and secured to their respective axles, x' and z' , which are journaled in the brackets e^4 e^4 . The roller y is secured to the shaft, C, and revolves therewith. The roller y is the die roller, the roller z the cutting roller and the roller x the matrix or embossing roller.

The die roller is of metal, usually engraved according to a design on its periphery, the die being made to present in certain parts cutting surfaces to cut the paper or similar material presented to it, and at other parts to present concave or convex surfaces to emboss or indent the paper, all according to a predetermined design intended to be impressed upon the paper.

The cutting surfaces of the die, are a degree elevated above the embossing portions. This is illustrated in the drawings Fig. 4, in which a section of the die is shown, the parts indicated as $i-i$, being the cutting surfaces, and those indicated as $j-j$ are embossing surfaces.

The roller z is known as the cutting roller, for the reason that it co-operates with the cutting edges of the die to cut the paper. It has a smooth surface, or periphery, and when brought into contact with the die roller, engages the cutting edges which as heretofore recited, are a degree elevated above the embossing portion of the die. The paper is passed between these rollers and the cutting action is performed.

Heretofore it has been customary to employ as the material of which the cutting roller was made, a soft metal such as lead, or material similar to leather. I may employ in this press, rollers made of any suitable material, but I prefer to use for such rollers, as best adapted for the purpose, the material described and claimed by me in my application for United States Letters Patent, dated the 8th day of January, 1894, filed February 12, 1894, Serial No. 499,846, in which I describe a chemically treated and compressed paper, or vegetable fiber, for use in this connection.

I have shown in my drawings, and described, a roller, e^{11} , and a cutting edge, e^8 , intended to bear on the roller z for the purpose of smoothing the surface thereof, as the same is affected by the cutting edges of the die. When soft metal, such as lead, is employed as the cutting bed, it is necessary constantly during the operation of the machine, to plane off, and roll down the surface, in order that the same may be kept as smooth as possible. The hard metal bar presents to the roller a chisel edge, and is pressed against the same by the screws, e^9 e^9 , operating to plane or scrape the surface of the roller as it revolves, but it is not always necessary however to plane or scrape the cutting roller. Often it is sufficient to

cause the roller e^{11} which is of some hard metal, to bear upon the cutting roller by means of the screws, e^{13} , e^{13} while the cutting roller is revolving. This operates to smooth the surface of the cutting roller by pressure. Whether the cutting edge or roller or both are employed is dependent upon the material of which the cutting roller is made and must be determined by a proper adjustment of the parts according to the work to be done. I have found that where a roller made of chemically treated and compressed paper, or vegetable fiber is used as the cutting bed, it is unnecessary to use the cutting or planing edge e^8 , or the compression roller e^{11} . These may, therefore, be omitted in this case.

The roller x is the matrix or embossing roller. That which has been said herein regarding the material employed in the manufacture of the cutting roller is also true of this roller. Lead and other soft metals have been used, also leather and kindred materials, but I prefer to use as best adapted for the purpose the material described in my said application. The matrix is made by bringing the die roller and a roller of suitable material into contact under pressure, and revolving the same repeatedly, until the elevations and depressions of the die are fully impressed into the surface of the matrix roller.

It has been my observation and experience with apparatus heretofore constructed for the purpose of cutting and embossing paper, that they were frequently inoperative for the reason that it was impossible in their construction to adjust the parts to a perfect center, or to bring the die in such relation to the cutting and embossing rollers as to be successfully operative. One of the causes of this difficulty of adjustment in the apparatus referred to, is the fact that the pressure directed against the die roller, or the cutting or embossing rollers, as the case may be, in the operation, is calculated to bend the shaft or axle upon which they are mounted, thus causing the operation of the machine to be impeded, and the die and its cutting bed, or the die and its matrix to be thrown out of uniform engagement. This is the case for the reason that in machines constructed for the purpose heretofore, the rollers have been mounted on shafts or axles of a length sufficient to accommodate a die and its rollers of any length. With this construction the shorter the die and its rollers, the more liable were the shafts and axles to bend, as the pressure thereon was brought nearer the center thereof. To obviate these difficulties I have constructed a machine in which the pressure of the cutting roller and matrix roller is directed against the die in one plane running through the center of the three rollers. Then I have provided brackets with journal bearings to carry and sustain the shaft on which the die roller is keyed, said brackets being adjustable so that they may sustain the shaft on both sides of the die roller and close to the same, and act as a brace

to the shaft to prevent the same from bending, on the principle that the shorter the shaft the greater its strength or power of resistance.

5 In like manner I have provided adjustable brackets having journal bearings, to carry the axles of the cutting and matrix rollers, intended to be adjusted to sustain the axle of the rollers, on both sides thereof and close to the rollers. It will be observed that with this
10 arrangement, whatever may be the width of the die and other rollers, the brackets may be adjusted to sustain the shaft or axles close to the rollers, and avoid the danger of the shaft or axles bending, as heretofore recited.

In the drawings, Fig. 1, I have shown a revolving brush g^2 which is omitted in Fig. 2 journaled in the movable bearings, g , and actuated by the belt, g^3 . The position of this
20 brush is determined by the movement of the screws, f^{10} and f^9 , and it is intended to bear on the die rollers and paper in the operation of the machine, and in its revolution to brush away the portions of the paper which have been cut
25 out of the paper band as it passes between the die and the cutting roller, in order that such particles of the paper may not interfere with the embossing operation by filling up the matrix or otherwise.

30 By the arrangement of adjusting screws, it will be observed that I can bring a high degree of pressure to bear on the cutting and matrix rollers, in directing them against the die, and that I can regulate this pressure to either end of the rollers, so that should there
35 be any irregularity in the roller, I can compensate for the same by operating the screws.

I have so constructed the frame of the device that the die roller is in the center thereof,
40 and I have formed three ways, or guides, in which the stays carrying the rollers and brush may move. I may, therefore, with this arrangement, shift the position of the rollers and brush at will, that is to say, I may change
45 the places of the matrix roller and brush, or cutting roller and brush, or matrix or cutting rollers, as I may find the efficient operation of the machine may require.

The operation of the device is that of passing a band of paper, as H wound on a spool h' , under the guide, h^2 , thence between the die roller y and cutting roller z , when these operate to cut the paper; thence between the brush, g , and die roller, the brush operating
55 to remove the particles of paper cut out as stated; thence between the matrix roller x and die roller y to perform the embossing of the paper; thence to the spool h^3 . Power is conveyed from the pulley, b' , through the
60 train to the die roller, and the cutting and embossing rollers are caused to bear on the die roller and revolve therewith. The brush, g^2 , receives its motive power from the belt,

g^3 , but it may, of course, be operated otherwise.

What I claim is—

1. In a paper cutting and embossing machine, the combination with a cylindrical die suitably journaled, and cutting and embossing rollers, of brackets provided with journal
70 bearings, to carry the shafts upon which the rollers are mounted said brackets being supported by stays having ways in which the brackets are adjustable, according to the length of the axes of the rollers, and said stays
75 working in ways at right angles to the axis of the die and rollers and means to compress said rollers against said die and to adjust said pressure substantially as described.

2. In a paper cutting and embossing machine, the combination with a cylindrical die, and cutting and embossing rollers of brackets with journal bearings, adjustable to sustain the shafts upon which the die or rollers are mounted according to the length of their axes
85 in close proximity to the rollers or die, the brackets sustaining the die adjustable in permanent ways, and the brackets sustaining the rollers adjustable in ways carried by stays, and means to compress the rollers against the
90 die, substantially as described.

3. In a paper cutting and embossing machine, the combination with a cylindrical die, cutting and embossing rollers of brackets with journal bearings, adjustable to sustain
95 the shafts upon which the die or rollers are mounted according to the length of their axes in close proximity to the rollers or die, the brackets sustaining the die adjustable in permanent ways, and the brackets sustaining the
100 rollers adjustable in ways carried by braces, and means to compress the rollers against the die in a plane through the center of the axes of the die and rollers, substantially as described.

4. In a paper cutting and embossing machine, the combination with a cylindrical die, and cutting and embossing rollers, of brackets provided with journal bearings for said die and rollers, the brackets sustaining the die
110 adjustable in stationary ways parallel with the axis of the die according to the length of its axis, and the brackets sustaining the rollers adjustable in like manner in ways carried by adjustable stays, which work in ways in the
115 frame, and screws bearing on the ends of said stays in a direction to compress said rollers on either side of the die in a plane through the center of the axis of the rollers substantially as described.

5. In a paper cutting and embossing machine, the combination with a cylindrical die, and cutting and embossing rollers of brackets provided with journal bearings for said die and rollers, the brackets sustaining the die
125 adjustable in stationary ways parallel with

the axis of the die according to the length of its axis, and the brackets sustaining the rollers adjustable in like manner in ways carried by adjustable stays, which work in ways in the
5 frame, and screws bearing on the ends of said stays in a direction to compress said rollers on either side of the die in a plane through the center of the axes of the rollers, a planing edge and compression roller, and means to adjust

the same to bear on the cutting roller, substantially as described.

Signed at New York, in the county of New York and State of New York, this 16th day of January, 1894.

BENZION KARFIOL.

Witnesses:

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FREEMAN D. BAERMAN.