

No. 711,840.

Patented Oct. 21, 1902.

C. H. FERNALD.

METHOD OF CRIMPING, BURNISHING, AND HARDENING THE EDGES OF
CARDBOARD OR PAPER.

(Application filed Feb. 26, 1902.)

(No Model.)

Fig. 1.

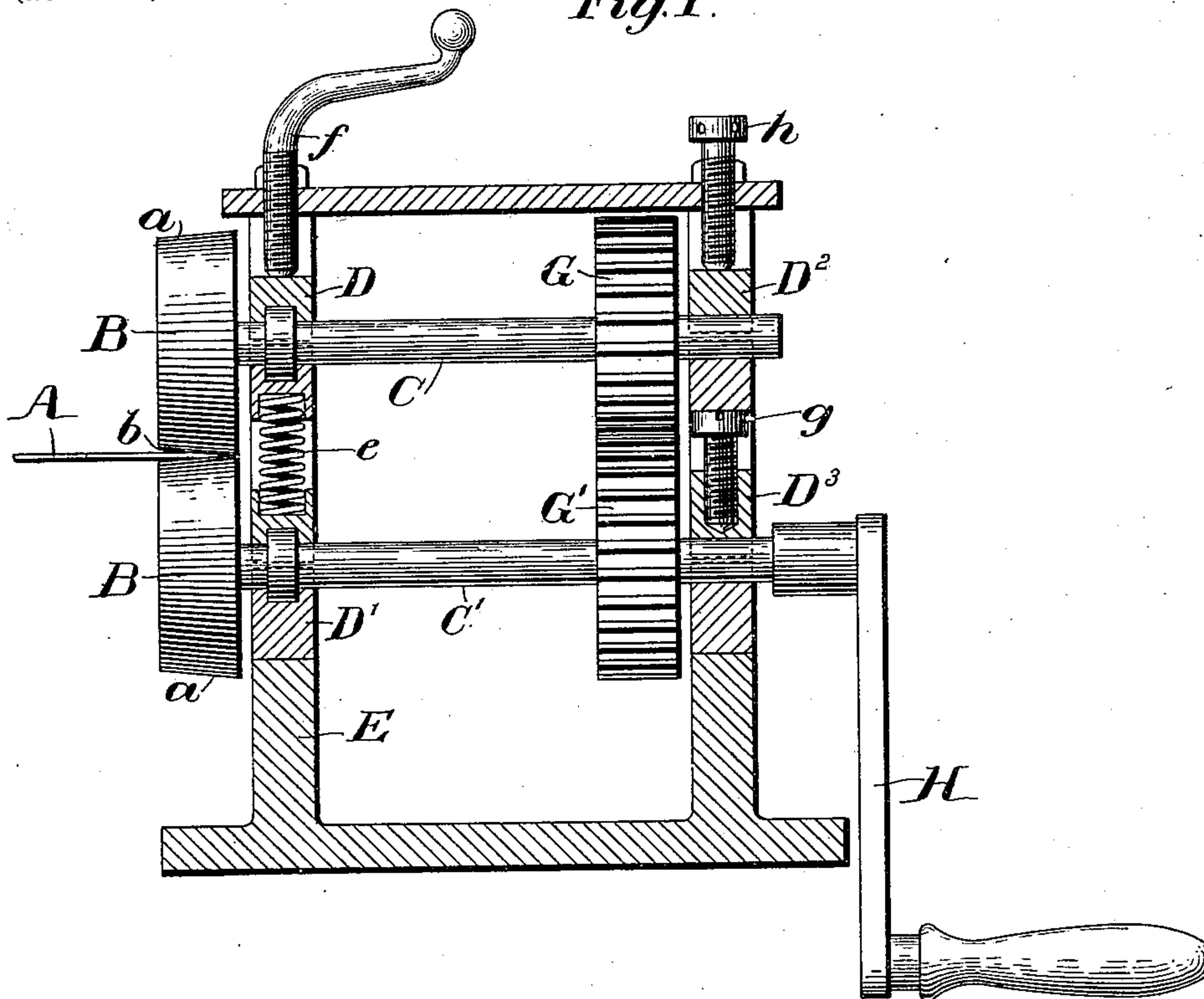


Fig. 2.

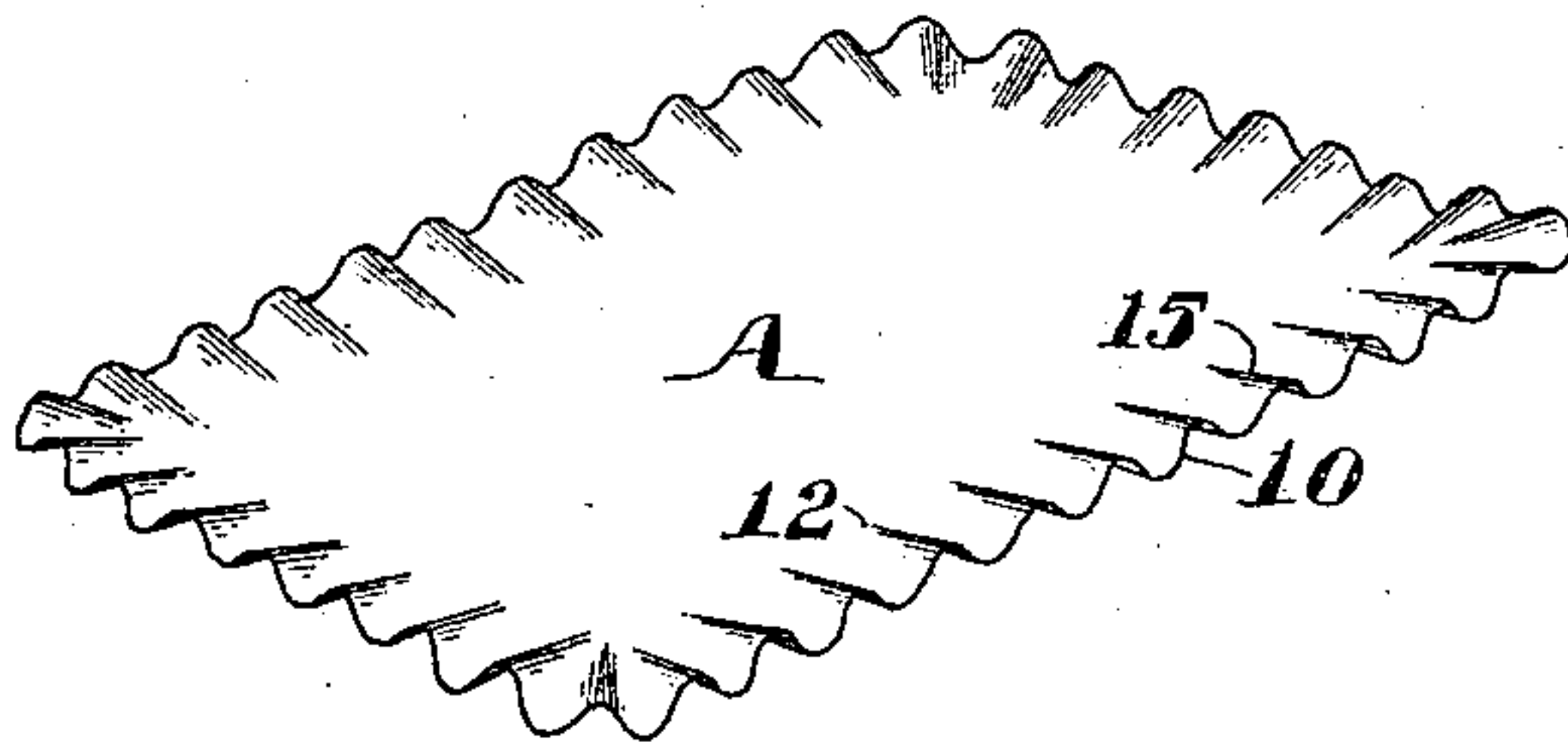
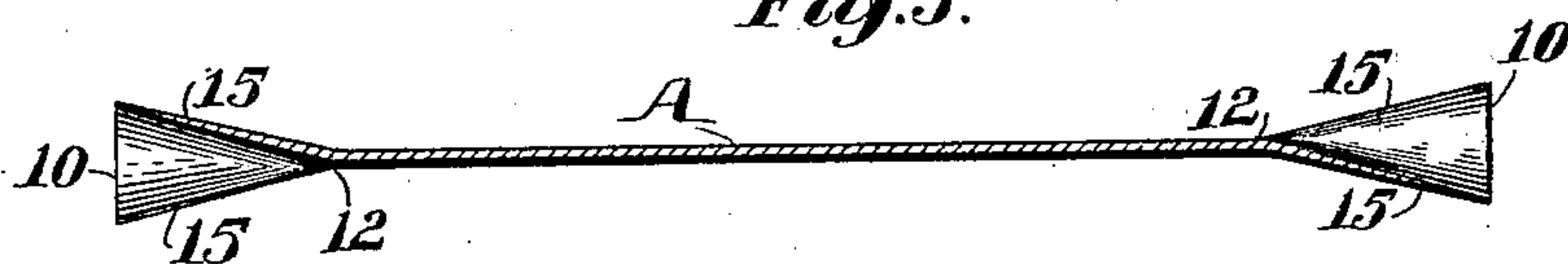


Fig. 3.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES H. FERNALD, OF MALDEN, MASSACHUSETTS.

METHOD OF CRIMPING, BURNISHING, AND HARDENING THE EDGES OF CARDBOARD OR PAPER.

SPECIFICATION forming part of Letters Patent No. 711,840, dated October 21, 1902.

Application filed February 26, 1902. Serial No. 95,812. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES H. FERNALD, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented an Improved Method of Crimping, Burnishing, and Hardening the Edges of Cardboard or Paper, of which the following is a specification.

The margins or edges of sheets of celluloid and thin metal have hitherto been crimped or fluted by passing them between a pair of corrugated rolls, which method answers well for these materials, as they possess sufficient elasticity to permit of the necessary sudden longitudinal stretching of their edges as they are forced down between the teeth of the rolls without tearing or breaking. It has, however, been found impossible to crimp or flute the edge of a piece of dry cardboard or paper by forcing it between corrugated rolls, as these materials will not allow of the abrupt stretching of their edges, which if forced between the intermeshing teeth of a pair of corrugated rolls would be at once torn and spoiled. To overcome this difficulty and provide a method whereby the edges or margins of dry cardboard or paper can be successfully crimped or fluted and simultaneously burnished and hardened is the object of my invention, which consists in subjecting the margin of the cardboard or paper to varying degrees of compression, gradually decreasing in force from the outer to the inner edge of said margin, whereby ornamental corrugations increasing in depth from the inner to the outer edge are produced without any liability of tearing or breaking the material, as herein-after fully set forth.

In the accompanying drawings, Figure 1 is a longitudinal vertical section representing means for crimping, burnishing, and hardening the edges of cardboard or paper in accordance with my improved method. Fig. 2 is a view of a piece of cardboard having its edges crimped or fluted by my improved method. Fig. 3 is an enlarged vertical section of the same.

In carrying my invention into effect I pass the margin or edge of a sheet of dry cardboard or paper A to be crimped between a pair of revolving pressure-rolls B B, having smooth working faces *a a*, slightly beveled, as

shown, to leave a narrow V-shaped space *b* between them for the reception of the edge or margin of the material, which as it is drawn through the rolls is squeezed or compressed, and thereby reduced in thickness by the heavy pressure of the same, the compression thus applied by the rolls B B varying in force from the maximum degree at the extreme outer edge 10 of the margin of the material to the inner edge 12 of the same, where the pressure entirely ceases by reason of the width of the V-shaped space between the rolls at that point equaling the normal thickness of the cardboard or paper being operated upon. The effect of this gradually-varying compression is to elongate the margin of the cardboard or paper by spreading or displacing the material, the maximum extent of this elongation being at the thin or outer edge 10 of the margin, from which point it gradually decreases to nothing at the line of its inner edge, producing ornamental corrugations 15, increasing in depth from the inner to the outer edge, as shown in Figs. 2 and 3. The margin or edge of the cardboard or paper while being corrugated is simultaneously burnished or polished by the calendering action of the rolls, and thereby rendered more ornamental, while it is also hardened and stiffened by the compression applied thereto, and thereby better enabled to retain its ornamental shape.

It should be understood that the elongation of the margin, as above described, is not produced by a pulling or stretching force exerted in the direction of its length, as would be the case if it was passed between fluted rolls, but by the squeezing out and thinning of the material due to its compression between the smooth-faced rolls, and consequently all liability of the edge of the material being torn or broken in the operation of crimping is entirely avoided. Furthermore, when using colored material the heavy pressure exerted by the rolls tends to change or darken the color, thereby producing a pleasing contrast and rendering the margin still more ornamental.

The bevel-faced pressure-rolls B B are mounted on shafts C C', the journal-boxes D D' D² D³ of which are movable vertically within the framework E. The shafts C C' are provided with intermeshing gears G G', whereby they are caused to revolve together,

and the power is applied to the lower shaft C' by means of a handle H or in any other suitable manner. Between the boxes D D' is placed a spiral spring *e*, which tends to
5 force them apart, and on the upper box D bears a screw *f*, passing through the upper portion of the framework and provided with a handle, whereby the pressure of the rolls B B on the cardboard or paper may be varied
10 as desired. Between the rear boxes D² D³ is a screw *g*, by means of which the rear end of the upper shaft C may be raised or lowered to vary the angle of the opening *b* between the working faces of the rolls B B, and on the
15 top of the upper box D² bears a screw *h*, holding it in place when adjusted.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The improved method of crimping, burnishing and hardening the edges of cardboard
20 and paper by simultaneously subjecting the

margin of the sheet to varying degrees of compression, the force of said compression being greatest at the extreme outer edge of said margin and gradually diminishing from said
25 outer edge inward, thereby producing a varying elongation of the margin, decreasing from its outer to its inner edge, substantially as described.

2. As a new article of manufacture, cardboard or paper having its margin crimped, burnished and hardened, forming corrugations increasing in depth from the inner to the outer edge of said margin, substantially
35 as described.

Witness my hand this 24th day of February, A. D. 1902.

CHARLES H. FERNALD.

In presence of—

P. E. TESCHEMACHER,
F. B. SPAULDING.