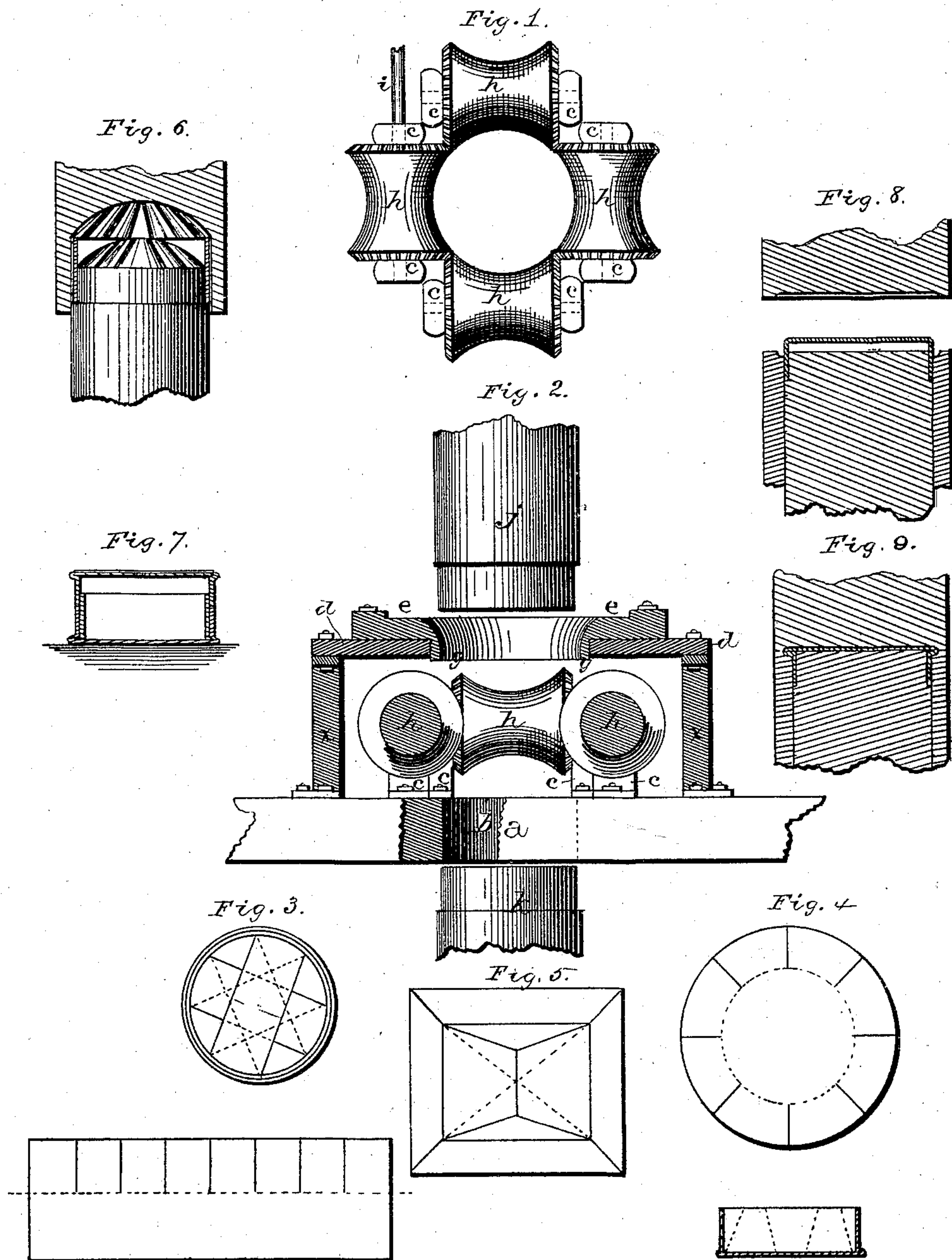


J. E. JEFFREY.

MANUFACTURE OF PAPER BOXES.

No. 170,088.

Patented Nov. 16, 1875.



WITNESSES.

J. W. Garner,
W. M. Supperman.

INVENTOR.

Jno. E. Jeffrey
per
F. A. Lehmann, Atty.

UNITED STATES PATENT OFFICE.

JOHN E. JEFFREY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN THE MANUFACTURE OF PAPER BOXES.

Specification forming part of Letters Patent No. **170,088**, dated November 16, 1875; application filed March 25, 1875.

To all whom it may concern:

Be it known that I, JOHN E. JEFFREY, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Manufacture of Paper Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in manufacture of paper boxes; and consists in cutting the paper, softening it, and then molding it into boxes, as will be more fully described hereafter.

Figure 1 is a plan view of the machine used in molding the boxes. Fig. 2 is a longitudinal section of the same. Figs. 3 and 4 are plan views of the blanks, and boxes formed therefrom. Fig. 5 is a plan view of a square box alone. Figs. 6, 7, 8, 9 are views of tools used in making the boxes.

a represents a suitable bed-plate, through which is made a suitably-shaped opening, *b*, just under the center of the machine. To the top of this plate are secured a number of standards, *x*, to which the table *d* is bolted, which table has a suitable opening through its center. Upon the top of this table is secured a die, *e*, on the under side of which is formed a flange, *g*, which projects down into the opening through the table. Just under the table are arranged four rollers, *h*, on the end of each of which are formed beveled cogs or teeth for meshing with each other, so that when one revolves all revolve. Each one of these rollers is journaled in suitable supports or bearings, and each one may have either a concave or straight surface, according to the shape of the boxes to be made. Where the box is to be round, each of the rollers will have a concave surface, and where the rollers are arranged in position, as shown in Fig. 1, the four concave surfaces together form a perfect circle. The power to drive these rollers is supplied through the shaft *i* from any suitable source. *j* *k* are two punches that will be described hereinafter.

In making the boxes, if they are to be cir-

cular in shape, I take a sheet of paper of the required width, and, after it has been suitably prepared with an adhesive or water-proof solution on one side, it is rolled around an iron mandrel of any desired diameter. The tube thus formed is then cut into lengths, according to the depth of the box required, each length being sufficient to form both the bottom and sides of the box. These lengths or cylinders, while on a mandrel, then have their sides slit down to a suitable distance, by quadrangular cutters designed for the purpose, so as to divide the edge so cut into eight or any other desired number of equal parts. These cutters at the same time press over a number of the parts then cut at right angles to the side of the cylinder, so as to form a portion of the bottom.

The paper is moistened by steaming or by mucilaginous, glutinous, or other artificial preparation, until it is reduced to a soft pulpy condition, and while in this pulpy state the remaining slit portions are bent over toward the center, where they overlap each other about the one-sixteenth of an inch. By tools made for the purpose, and used under heavy pressure, the segmental portions of the bottom will be all pressed together into one common mass.

In Fig. 4 is shown another kind of blank. The paper is first stamped out in the form shown, and then a number of cuts are made in its edges toward the center, nearly to the dotted line, which shows the diameter of the box. This blank, after having been suitably softened, is placed in the die *e*, when the punch *j* acts upon it and forces it down through the rollers *h*. As the punch forces the blank downward the segmental parts assume a circular shape, overlapping each other at the edges, so that as the punch enters the rolls the sides of the blank are rolled and compressed into one continuous cylindrical mass, even in thickness. During the process of passing through the rolls the bottoming-punch *k* passes upward, by means of a cam or other device, until it strikes against the bottom of the punch *j*, and, by holding the bottom of the box or blank, prevents it from tearing or wrinkling at this point. After the punch *j* has made its stroke and the punch *k* descended out of the way, a clasp, made in two parts, grasps the lower

end of the punch *j*, and draws off the box as the punch rises upward.

In Fig. 5 is shown a blank for a square box. The blank is slit inward diagonally from the corners to the parallel lines, then placed upon a rectangular punch, and forced down between four straight rolls, when the sides are firmly compressed together, as above described.

In Figs. 6, 7, 8, and 9 are shown the tools which I use at the different stages of the manufacture of the boxes; but as these are old, and form no part of my invention, no description of them is here deemed necessary.

Having thus described my invention, I claim—

The manner described of forming the sides and ends of paper boxes, by cutting the edges of the blanks, reducing the paper to a soft pulpy condition, and then rolling or pressing it into a uniform mass, substantially as specified.

In testimony that I claim the foregoing, I have hereunto set my hand this 12th day of March, 1875.

JOHN EDWARD JEFFREY.

Witnesses:

JOHN F. BURNS,
TIMOTHY WARD.