

(No Model.)

G. T. LINCOLN.

METHOD OF MANUFACTURING ARTICLES FROM SHELL, &c.

No. 412,398.

Patented Oct. 8, 1889.

Fig. 1. *a*



Fig. 2. *b*

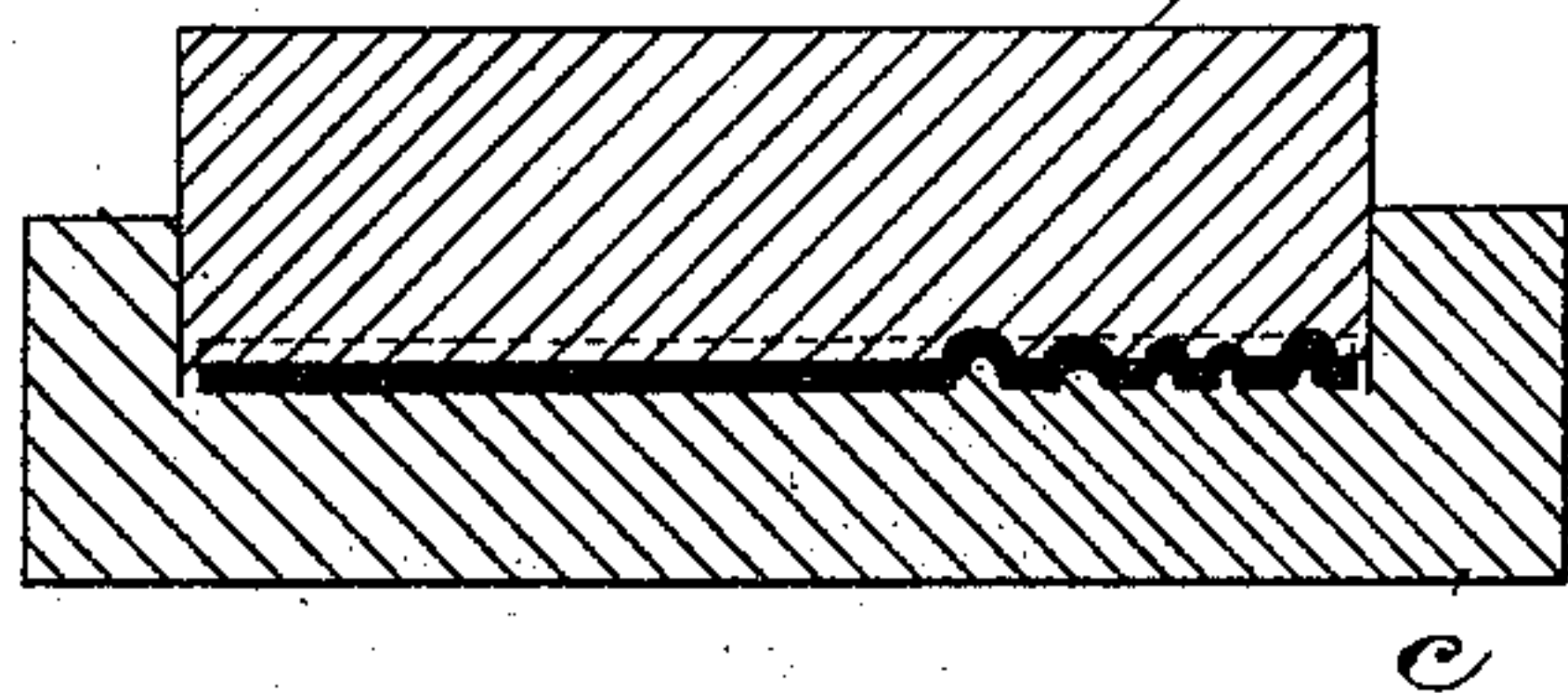


Fig. 3.

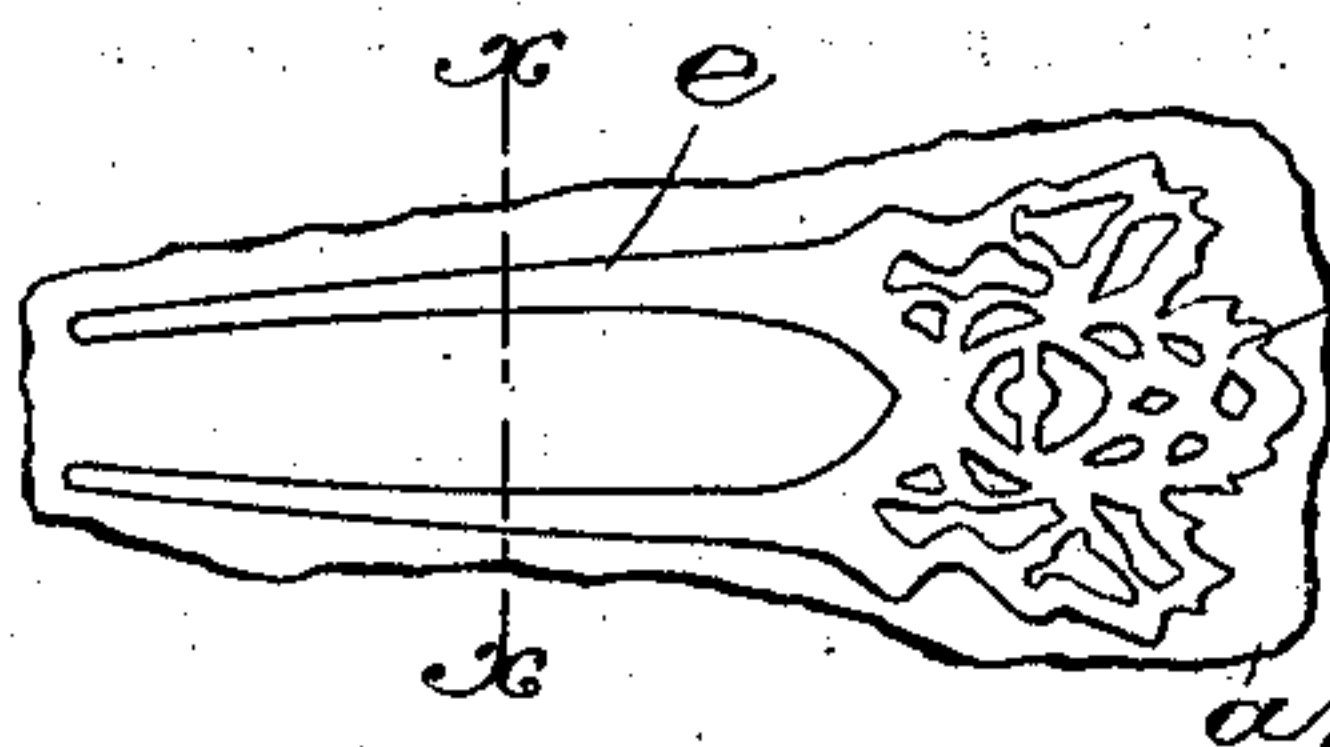


Fig. 4.



Fig. 5.



Fig. 6.

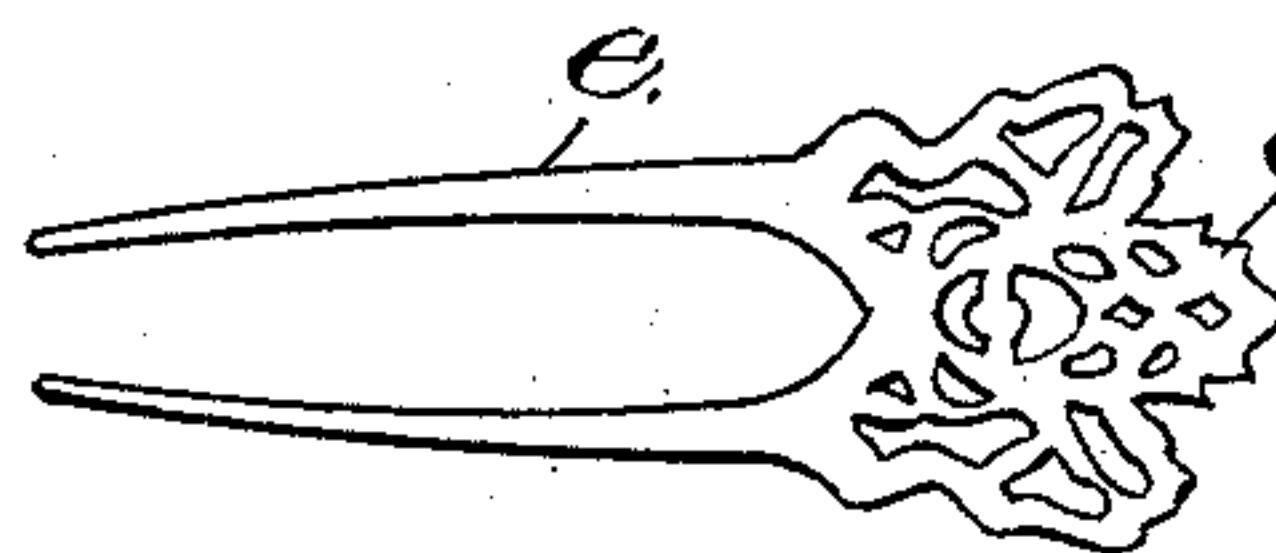


Fig. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING ARTICLES FROM SHELL, &c.

SPECIFICATION forming part of Letters Patent No. 412,398, dated October 8, 1889.

Application filed February 11, 1887. Serial No. 227,267. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. LINCOLN, of Leominster, county of Worcester, and State of Massachusetts, have invented an Improvement in the Method of Manufacturing Articles from Shell, Celluloid, Horn, and Analogous Materials, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to the manufacture of combs and other articles from shell, horn, celluloid, and analogous material, such articles having, as usual, more or less open work and cameo figures for ornamentation, the invention having for its object to provide means for making the said articles cheaply and rapidly.

In accordance with this invention the shell, horn, celluloid, or analogous material in shell form is subjected to the action of a male and female die, one of which dies, herein called the "impression-die," has projections to impress part of the material into the other die, which I call the "receiving-die," the face of the article being formed in cameo by the impression-die. The back or rear side of the molded or impressed sheet taken from between the dies, or that side of the article which was next the receiving-die, is then subjected to a grinding, abrading, or cutting operation until the projecting portions of the material at the back of the article have been removed, thus leaving the face of the article in cameo with open spaces between the deeper recess of the impression.

Figure 1 shows an edge view of a sheet of shell, horn, celluloid, or other analogous material; Fig. 2, a cross-section of the impression and receiving dies with the material pressed between them; Fig. 3, a sectional view of the sheet removed from the die; Fig. 4, a top view of the sheet removed from the die; Fig. 5, a section of the impressed sheet shown in Fig. 4, taken on the dotted line *xx*; Fig. 6, a section of the impressed sheet shown in Fig. 3, taken on the dotted line *yy*; and Fig. 7, a plan view of the completed article shown in Fig. 6.

The shell, horn, celluloid, or other analogous material in sheet form, as shown at *a*, Fig. 1, is placed between the impression-die *b* and a

receiving-die *c*, and pressed until a well-defined outline or configuration of the comb or other article to be made from the sheet is impressed upon the upper side of the sheet by the impression-die *b*, while the recesses of the receiving-die *c* receive the material which is depressed by the projecting portions of the impression-die.

The nature of shell, horn, and the like is such that it cannot be easily compressed; but it may be bent into most any desired form, and this I do by the employment of dies.

The impressed or molded material when removed from the dies presents upon its face in cameo the desired article, while the surplus material not needed in the finished article, and which is forced into the recesses of the receiving-die, is left projecting from the back or rear side of the sheet *a*, as shown in Figs. 3, 4, and 5, wherein it will be seen that the face of the sheet has a cameo figure consisting of an ornamental head *d* and two prongs or teeth *e*, suitable for the manufacture of a comb for the hair. The impressed sheet is then presented to a buffing or abrading wheel, or to a cutter of any suitable character, and is acted upon until all the surplus material which entered the recesses of the receiving-die, and preferably also a part of the back of the sheet, is cut away or removed to leave as open spaces (see Figs. 6 and 7) the cavities formed at the face of the sheet by the projections of the impression-die *b* in forming the cameo figures. By this cutting operation a sufficient portion of the material is removed, so that the material constituting the bottom of the deeper recesses of the ornamental head *d*, as well as the material between the prongs or teeth *e*, is removed, so that openings are presented to give to the article the same configuration and effect as if it had been cut through by hand. The material will be softened before it is placed in the die, and the dies may be heated, if desired, to better enable the material to retain the impression given to it by the dies.

As described, I have provided dies to bend the sheet of horn, so that portions of its surfaces are thrown into different planes.

Some of the materials mentioned and some plastic materials suitable for comb-making,

and which may be compressed, may be subjected to the pressure of the impression-die *b*, while the back of the sheet rests on a plane die or one like the die *c*, except as to the recesses.

I desire to include as within the scope of my invention the compression or indulation of the sheet at one side only; but in such case to produce open-work ornamentation it is necessary to cut away a much greater amount of stock, which is wasteful.

If the die *c* is smooth or not indented, the material has to be much softened.

By this method of manufacturing combs and other articles from shell, horn, celluloid, and the like the expense of hand-cutting now practiced is avoided, and the article is in every respect equal to a hand-cut article, thereby saving much time and expense in the manufacture.

I claim—

The improvement in the art of making open-work manufactured articles of horn, shell, celluloid, and like substances, which consists in first softening the blank or sheet of material to be treated, then compressing the same between suitably-engraved dies, whereby a deeply-depressed pattern is formed on one side, and finally abrading and removing the rear portion, leaving the article with openings or interspaces forming the desired pattern, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE T. LINCOLN.

Witnesses:

BERNICE J. NOYES,
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