2 Sheets—Sheet 1.

(No Model.)

J. H. STEVENS & E. D. HARRISON.

PRODUCTION OF IMITATION ONYX FROM PYROXYLIN COMPOUNDS.

No. 546,360. Patented Sept. 17, 1895.

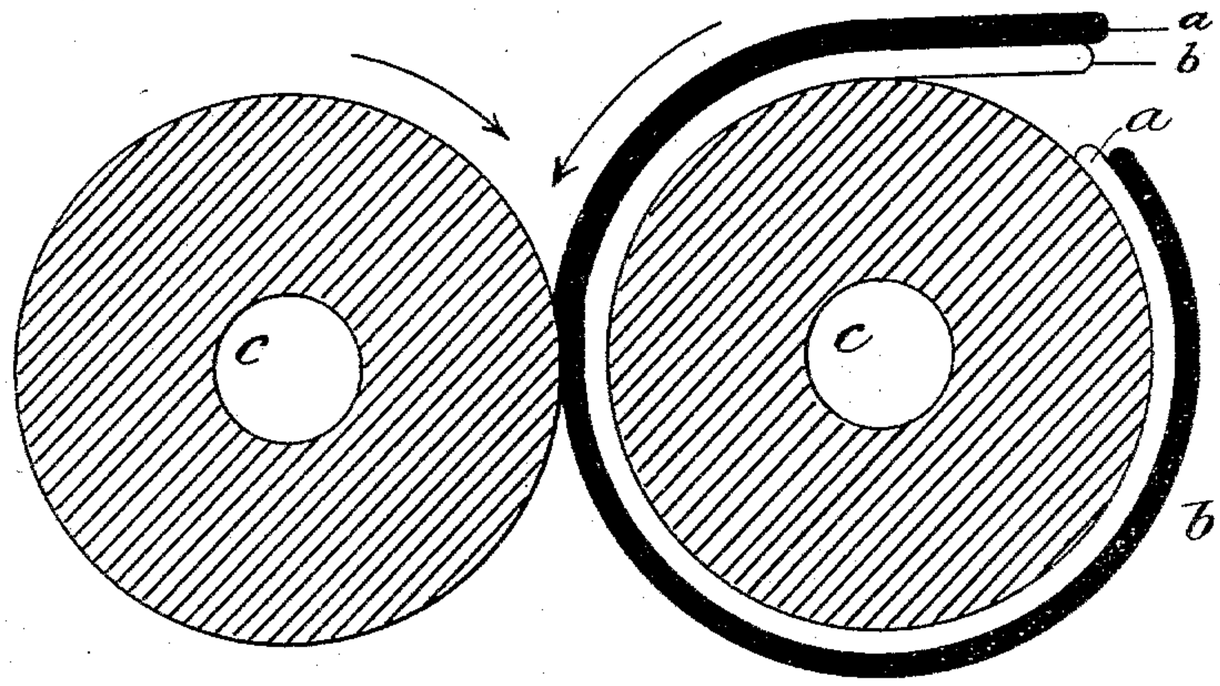

Fig. 1

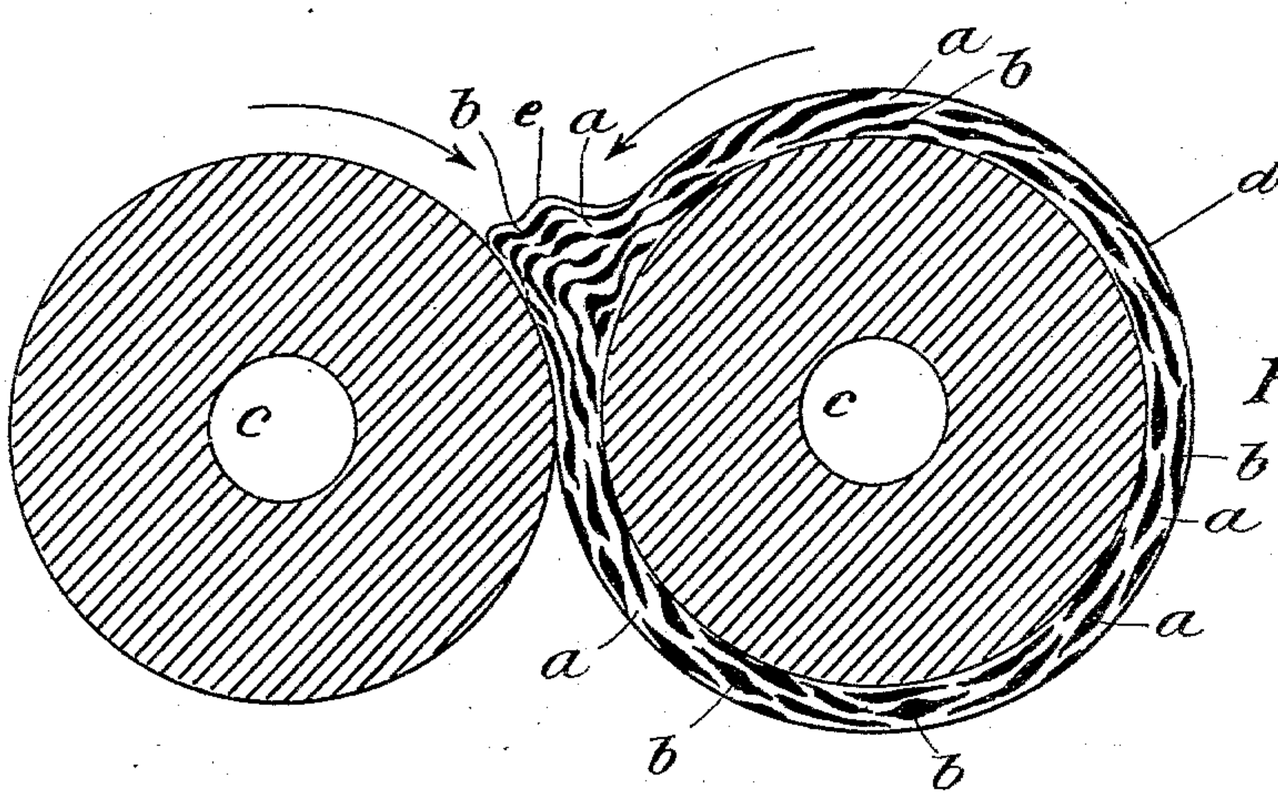

Fig. 2

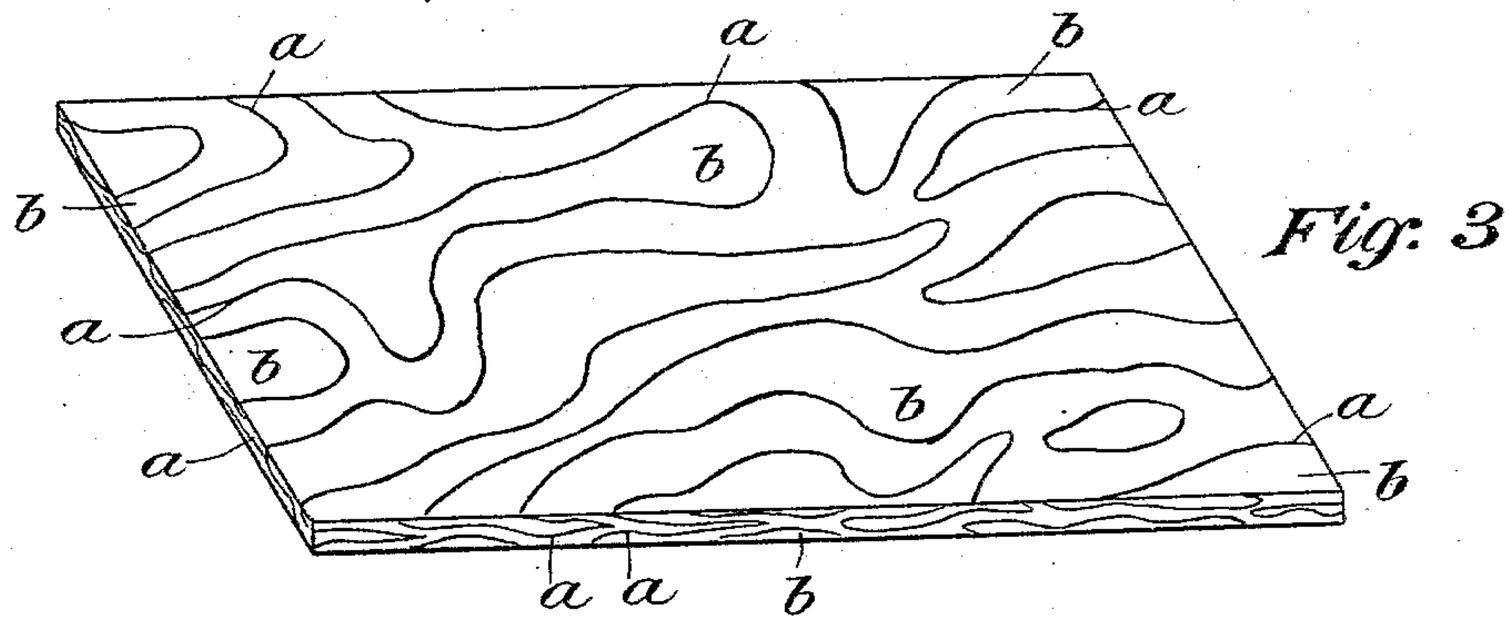

Fig. 3

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(No Model.) 2 Sheets—Sheet 2.

J. H. STEVENS & E. D. HARRISON.

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Fig. 4

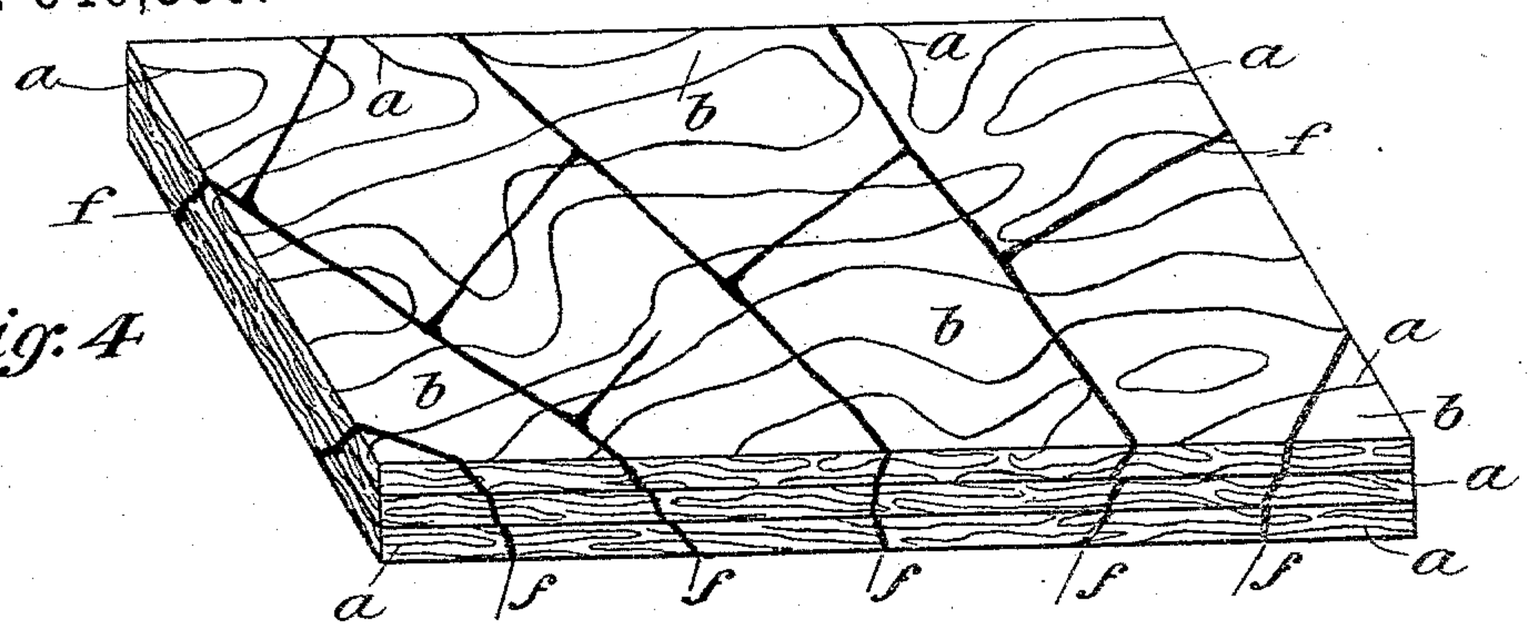


Fig. 5

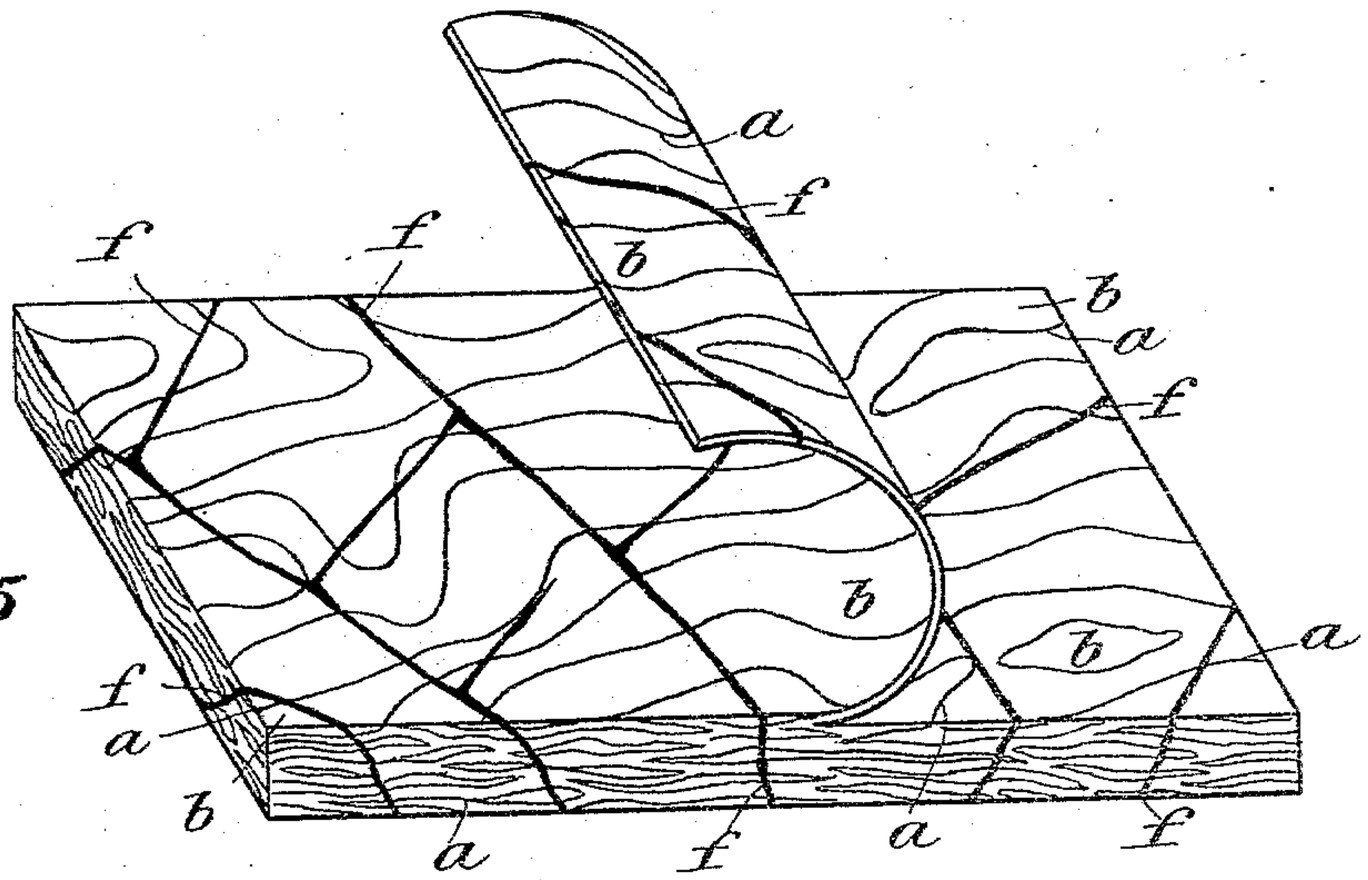


Fig. 6

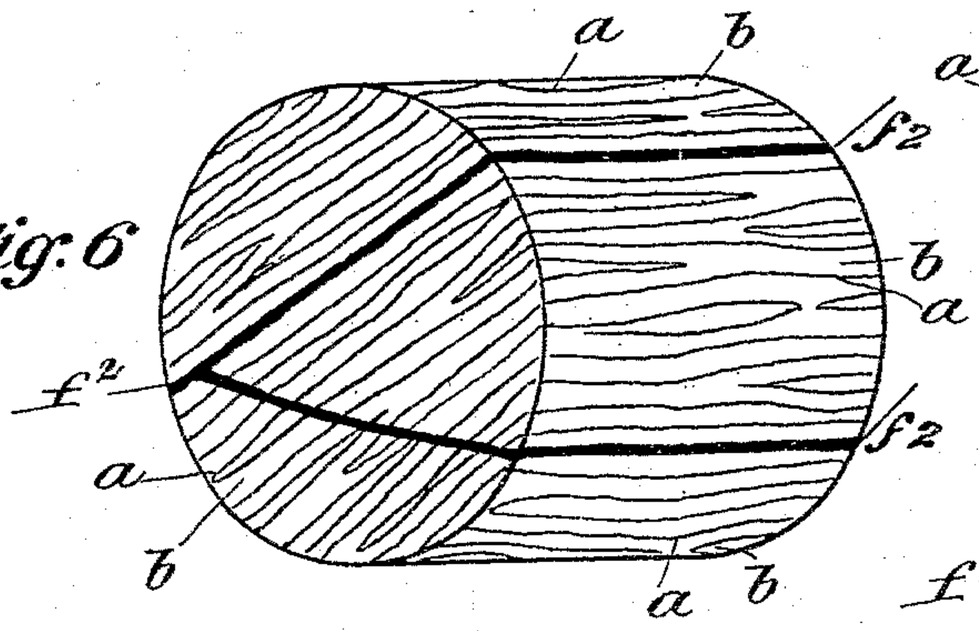


Fig. 7

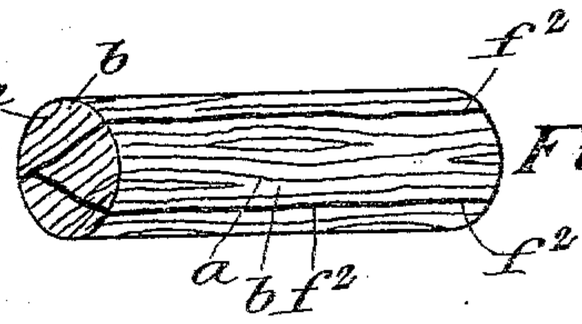
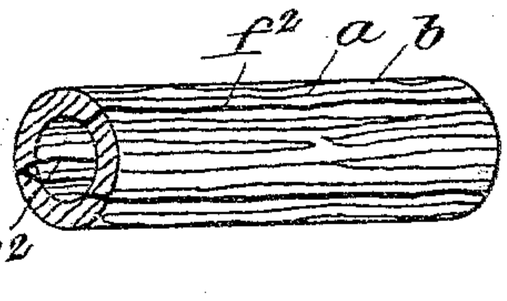


Fig. 8



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UNITED STATES PATENT OFFICE.

JOHN H. STEVENS, OF NEWARK, AND EDWIN D. HARRISON, OF IRVINGTON, NEW JERSEY, ASSIGNORS TO THE CELLULOID COMPANY, OF NEW YORK, N. Y.

PRODUCTION OF IMITATION ONYX FROM PYROXYLIN COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 546,360, dated September 17, 1895.

Application filed June 5, 1895. Serial No. 551,717. (No specimens.)

To all whom it may concern:

Be it known that we, JOHN H. STEVENS, of the city of Newark, and EDWIN D. HARRISON, of the village of Irvington, county of Essex, State of New Jersey, have made certain new and useful Improvements in the Production of Imitation Onyx from Pyroxylin Compounds, of which the following is a specification, reference being had to the accompanying drawings, wherein similar letters refer to like parts in the figures.

Figure 1 shows a pair of rolls in section and superimposed sheets of proxyline material. Fig. 2 shows the appearance of the light-tinted material when the rolling is partially completed. Fig. 3 shows a rough sheet of the light-tinted material after rolling; Fig. 4, a pile of such sheets with the veins or streaks of darker color breaking through and across the edges of the strata. Fig. 5 shows the slab made from the aforesaid pile with a sheet partly planed therefrom. Fig. 6 shows the manner of preparing the material for a stuffing-machine. Fig. 7 shows a rod, and Fig. 8 shows a tube of our imitation onyx.

Solid or massive pyroxyline compounds, as is well known, owe their commercial importance largely to their susceptibility to coloring treatment and manipulations essential to the production of imitations of natural substances—like mottled amber, tortoise-shell, veined ivory, carnelian, &c. Owing to the peculiar nature of these compounds, involving rapid changes in hardness and plasticity and the necessary use of varying temperatures, the treatment is surrounded with difficulties distinct from those ordinarily encountered in working with other plastic compositions. Hence the evolution of processes rendering possible the successful production of pleasing imitations has been slow, the methods employed as described in the various foreign and United States patents relating to this subject not yet being sufficient to enable the skilled operator to produce many desirable effects demanded by the trade.

The production in a pyroxyline composition of an artificial-veined onyx has long been desired, and so far as we are aware this has never been accomplished prior to our invention. We have, however, invented a new method for the manufacture of an imitation of onyx which exhibits the stratified cloud-like markings of pale tints with the strong yellow or brown color breaking through in a direction opposed to the trend of the lighter strata, as follows: We prepare a mixture of soluble pyroxyline and suitable solvents (preferably camphor associated with either ethylic or methylic alcohol) of such well-known proportions as form a soft combination suitable for mastication in rolls or equivalent apparatus. Before adding the coloring-matter we separate this mixture into two or more parts, each proportioned in quantity to the corresponding quantity of each of the different light tints desired in the completed artificial onyx. We then subject each of these parts separately to the action of the rolls, adding whatever color or pigment is necessary to produce the shade desired to the compound during the rolling process. There are thus produced crudely-converted separate masses representing as many of the different light tints as are desired in the completed product. These crudely-converted masses of different shades of color should be of a softer consistency than the final freshly-formed onyx combinations, in order to cause a smooth flow of the materials in the rolls and prevent a ragged or abrupt appearance of the strata in the next step of the operation.

The next step in our process consists in rolling these separate and differently-tinted masses, by means of the rolls, into rough sheets, (say about one-half inch in thickness and twenty by thirty inches superficial area, more or less, according to the size of the batch or of the rolls employed.) These rough sheets of different tints *a* and *b*, Fig. 1 of the accompanying drawings, are next placed together face to face (one sheet of each tint) and passed through the rolls *c* in such a manner that they adhere as one mass to one of the rolls and, coming around, meet the last end of the combined superimposed sheets, as represented in Fig. 1, thus forming a continuous mass *d*, Fig. 2, which we permit to revolve,

and thus flood, as at *e*, Fig. 2, at the intersection of the rolls (regulating the distance between the rolls by mechanical means) for such a length of time as will produce the amount of mixing desired. We next cut and strip the mass partly from the roll—say once or twice—and permit it to become a revolving mass again to insure a more uniform mixing. When the combination of colors is such as to represent the lighter part of the onyx, (which can be determined by slicing off a test-piece occasionally,) the mass *d* is stripped from the roll and laid on a flat surface, and then appears like a rough thick sheet of combined light tints lying approximately in horizontal planes or strata, as shown in Fig. 3. An analogous result, but somewhat inferior, can be accomplished by cutting the separately tinted masses into small pieces and repeatedly passing them collectively and parallel with each other through the rolls until they are flattened and mixed into a mass or sheet the planes of whose strata fairly coincide with the surface of the sheet.

Our next step is to produce an imitation of the raw yellow or brown streaks or veins of the natural onyx. This is effected by cutting the flat stratified sheet thus produced transversely and across the strata of light tints, regulating the shape, obliquity of the cut, or closeness of the cut places to each other, according to the particular sample of real onyx to be imitated. Into these cuts or divisions we next introduce fluid having a dark yellow or brown color, and this may be made either of a coloring-matter dissolved in alcohol or, preferably, a soluble color combined with dissolved pyroxyline, or even a sheet of soft yellow or brown pyroxyline composition can be used. The crude sheets thus made and containing horizontal strata of light tints with yellow or brown transverse perpendicular or oblique veins or lines of color *f*, Fig. 4, are next cut into suitable sizes and piled so as to form a number of superimposed flat sheets, as shown in Fig. 4. These are placed collectively within a chase and the chase put upon the bed-plate of a press, and by means of a plunger the sheets are compressed, while heated, into a solid block or cake. From this block, when cooled, we may cut sheets by means of a planing or veneering machine. Such a block, with a sheet partly cut therefrom, is shown in Fig. 5.

The finished sheets exhibit the lighter tints of onyx in cloud-like figures crossed with yellow or brown veins or bars of color with their planes in a direction transverse to those of the lighter tints, and the sheets so closely resemble genuine onyx that the most pleasing effects can be produced in articles cut or molded from them. We also form rods or tubes by forcing the freshly-rolled product (in the condition suitable for molding into a block) through a heated cylinder or the cylinder of one of the well-known stuffing-machines used in this art, gradually narrowed down, so as to contract the material into a small orifice, from which it emerges through a nozzle suitable for forming a rod or tube. We place it in the cylinder in pieces, so arranged in a mass that the strata of yellow or brown will present their edges to the flat side of a lateral cross-section of a rod or tube so formed. A mass suitable for this purpose, with the strata f^2 properly arranged, is shown in Fig. 6. A finished rod is shown in Fig. 7 and a tube in Fig. 8.

Methods of coloring the pyroxyline compositions used are well known and it is unnecessary to describe the coloring-matter or pigments used. In using the terms "horizontal" or "perpendicular," as indicating the position of the strata, we mean to indicate their position or trend, as compared with each other.

What we claim, and desire to secure by Letters Patent, is—

1. The method of producing a pyroxyline compound in imitation of onyx, consisting, first, in forming the light tinted parts in solidified strata; second, cutting through these strata across their edges; third, inserting coloring matter between the cut parts, and, fourth, solidifying the whole into blocks, shapes or masses, substantially as described.

2. The method of producing a pyroxyline compound in imitation of onyx, consisting, first, in forming the light-tinted parts in solidified strata; second, cutting through these strata across their edges; third, inserting a pyroxyline composition of a different color between the cut parts, and, fourth, solidifying the whole into blocks, shapes or masses, substantially as described.

3. A pyroxyline compound in imitation of onyx, consisting of two or more light tints in solidified strata with lines of a different color breaking through or crossing the edges of these light tinted strata, substantially as described.

4. A rod or sheet of pyroxyline composition in imitation of onyx, consisting of two or more light tints with streaks of a darker color breaking through or interspersed with the lighter tints, substantially as described.

JOHN H. STEVENS.
EDWIN D. HARRISON.

Witnesses:
GEORGE S. POLLARD,
CECIL H. MACMAHON.

Correction in Letters Patent No. 546,360.

It is hereby certified that the assignee in Letters Patent No. 546,360, granted September 17, 1895, upon the application of John H. Stevens, of Newark, and Edwin D. Harrison, of Irvington, New Jersey, for an improvement in the "Production of Imitation Onyx from Pyroxyline Compounds," should have been described and specified as *the Celluloid Company, of New York, N. Y., a corporation of New Jersey*, instead of the "Celluloid Company, of New York, N. Y.;" and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 29th day of October, A. D. 1895.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER,
Acting Commissioner of Patents.