

(No Model.)

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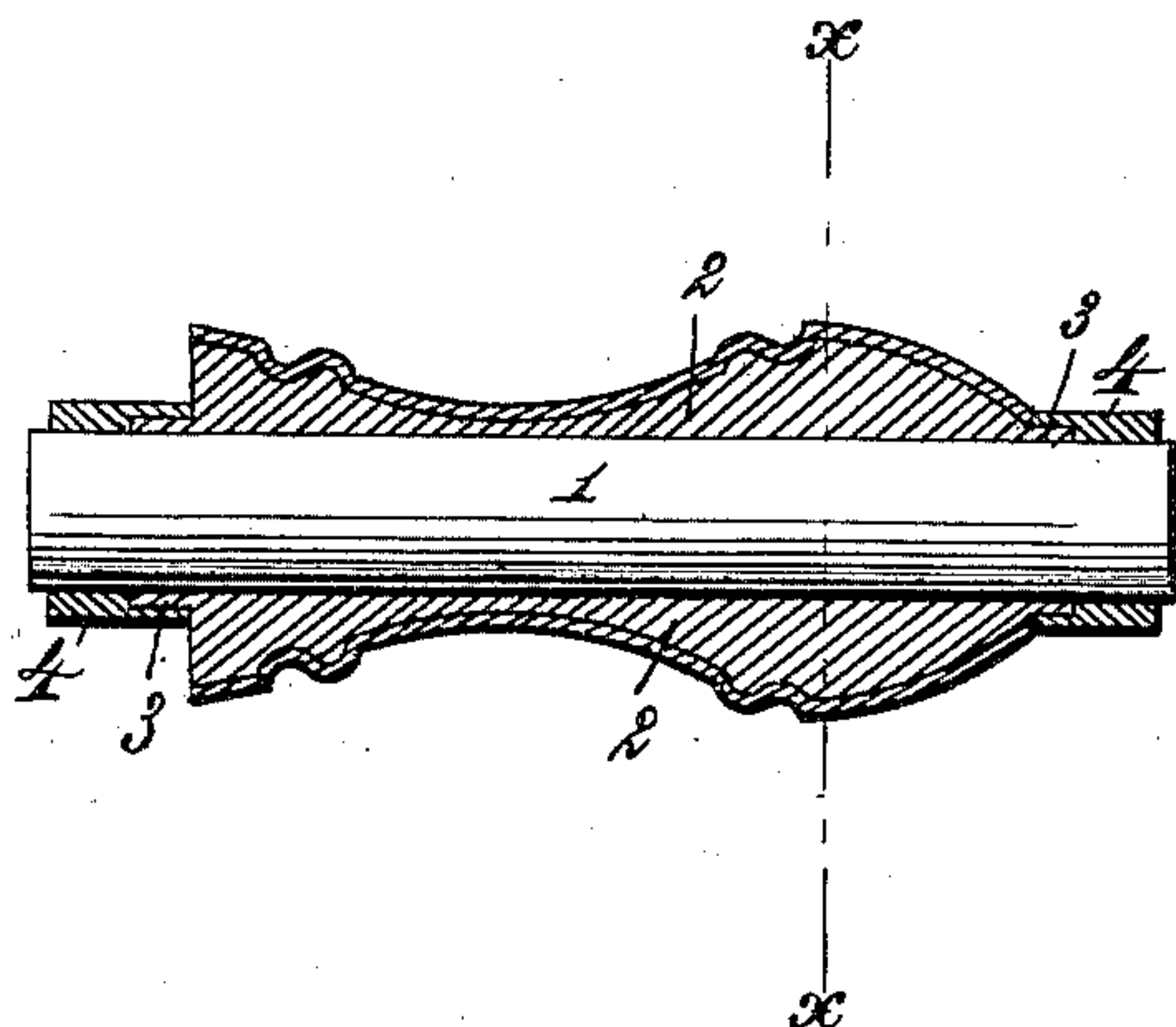
J. R. FRANCE.

ART OF MANUFACTURING ARTICLES FROM PYROXYLINE COMPOUNDS.

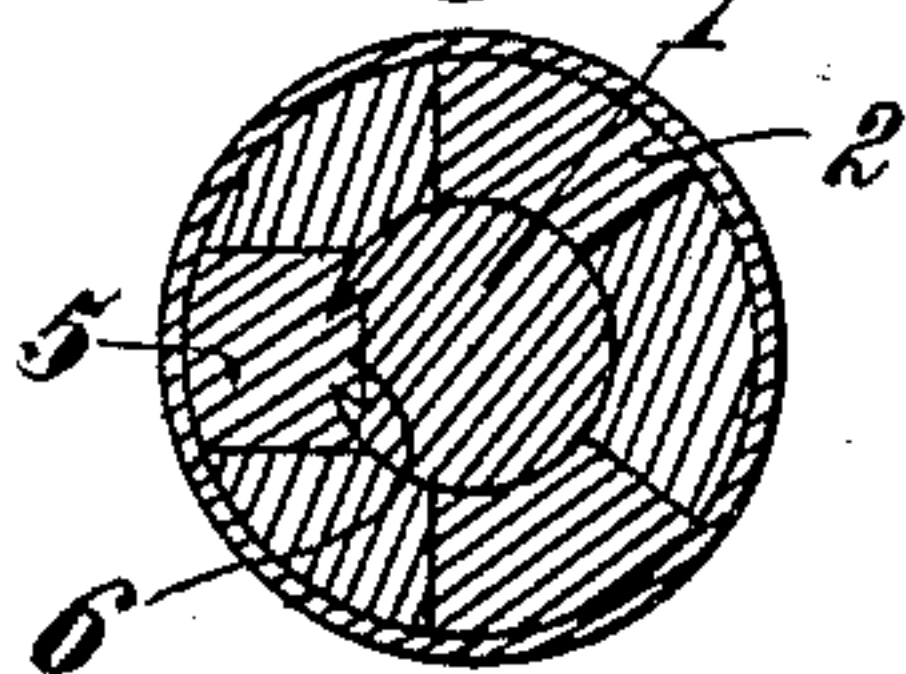
No. 430,520.

Patented June 17, 1890.

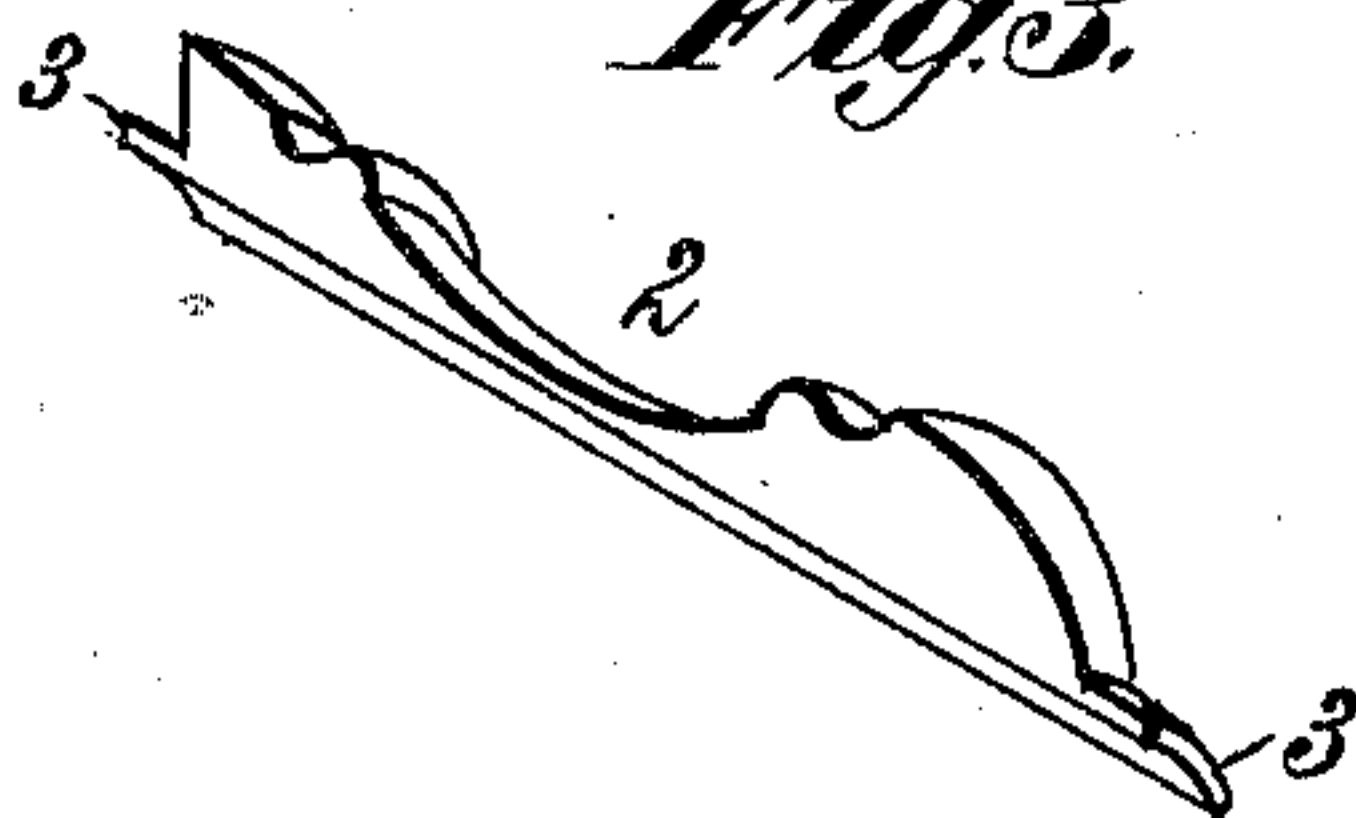
*Fig. 1.*



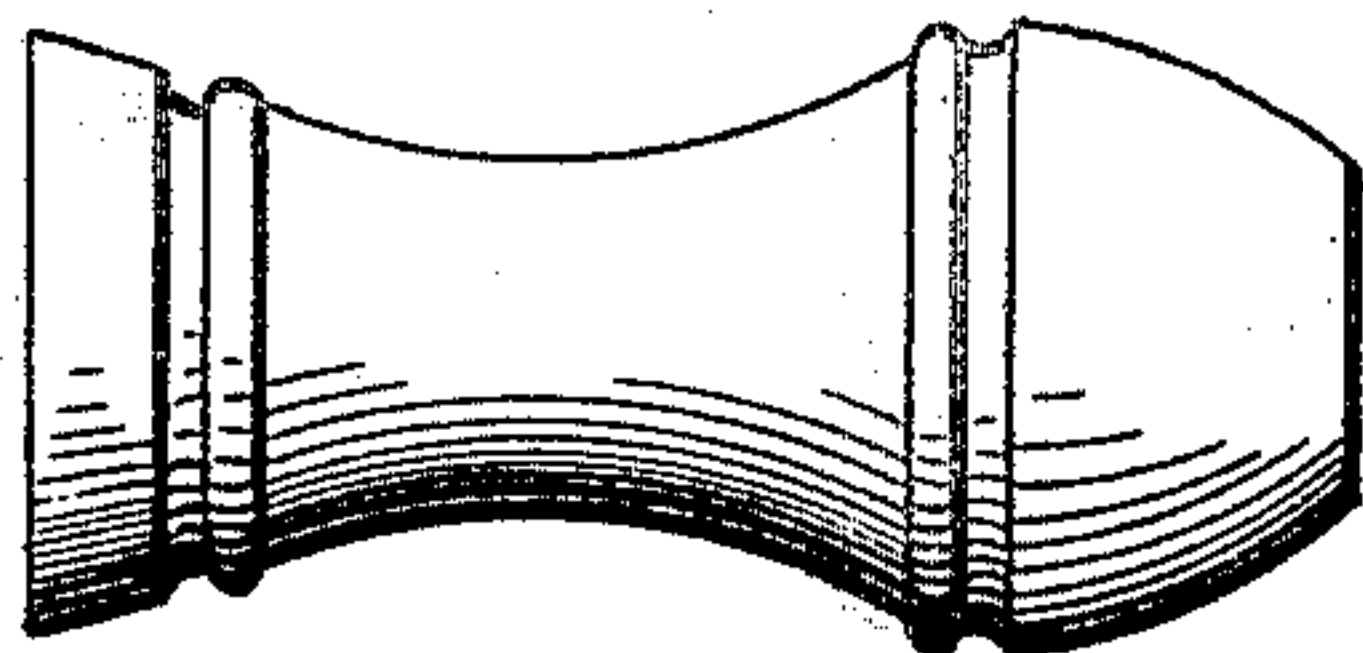
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Witnesses,*  
*Phat G. Smith,*  
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*Inventor,*  
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*Atty.*

(No Model.)

2 Sheets—Sheet 2.

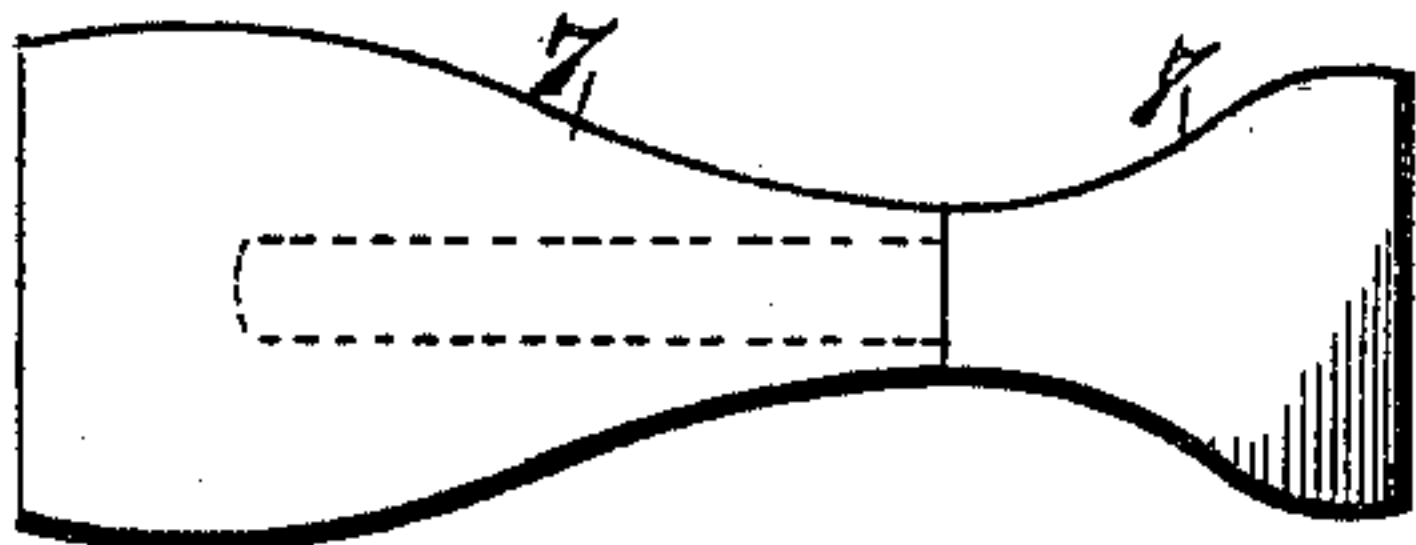
J. R. FRANCE.

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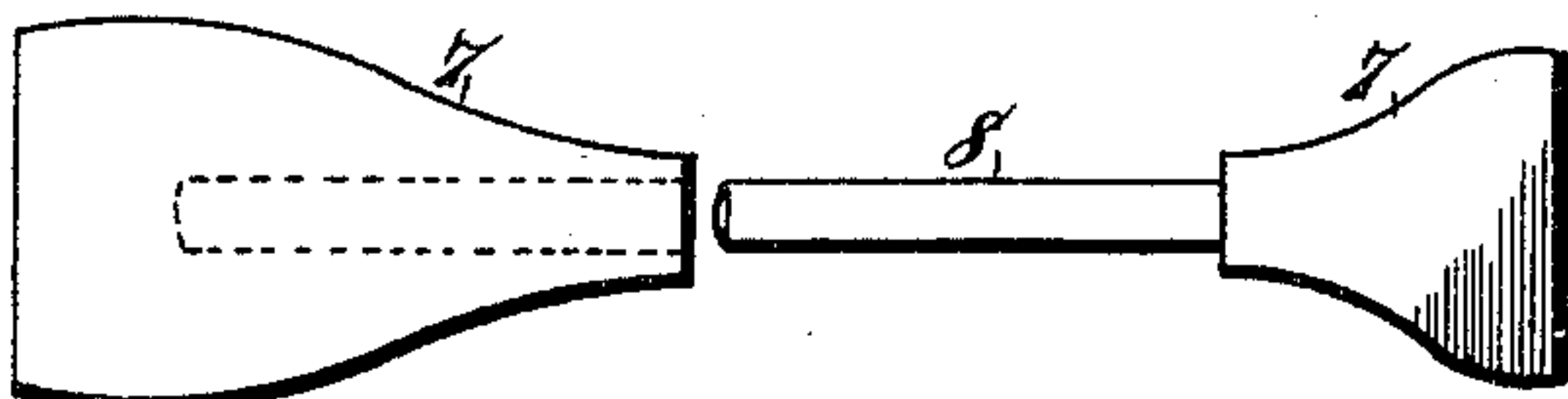
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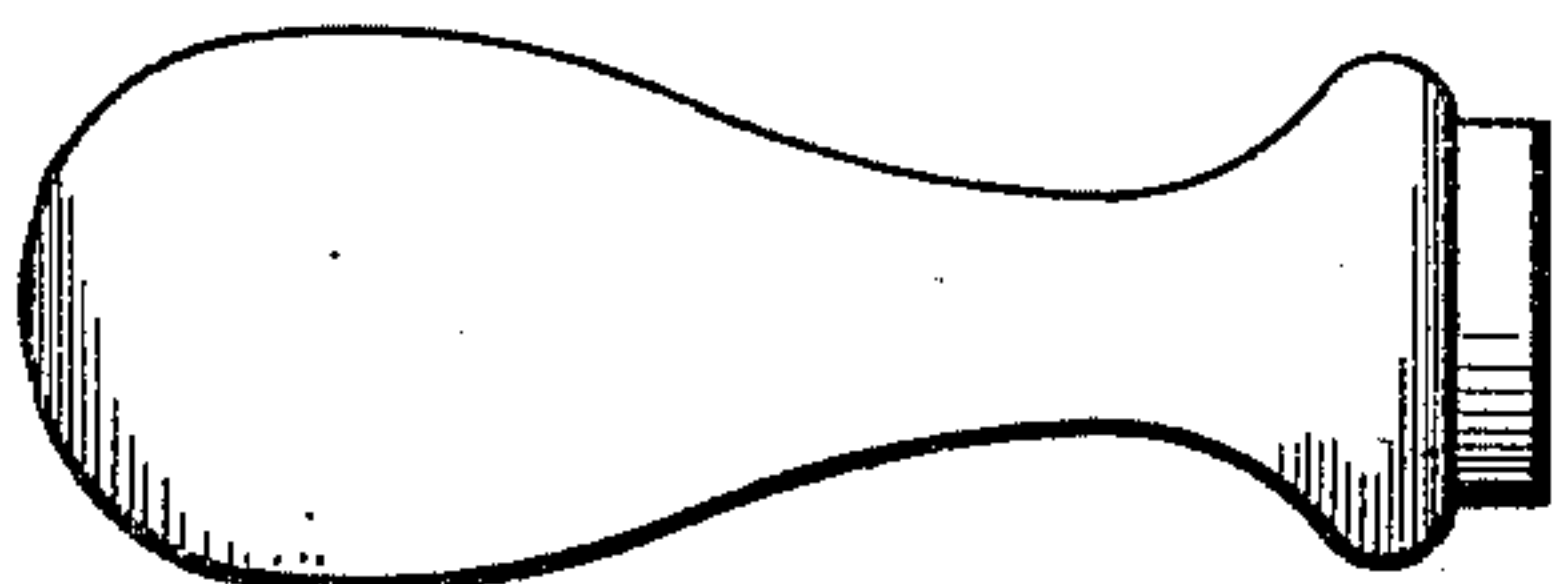
*Fig. 5.*



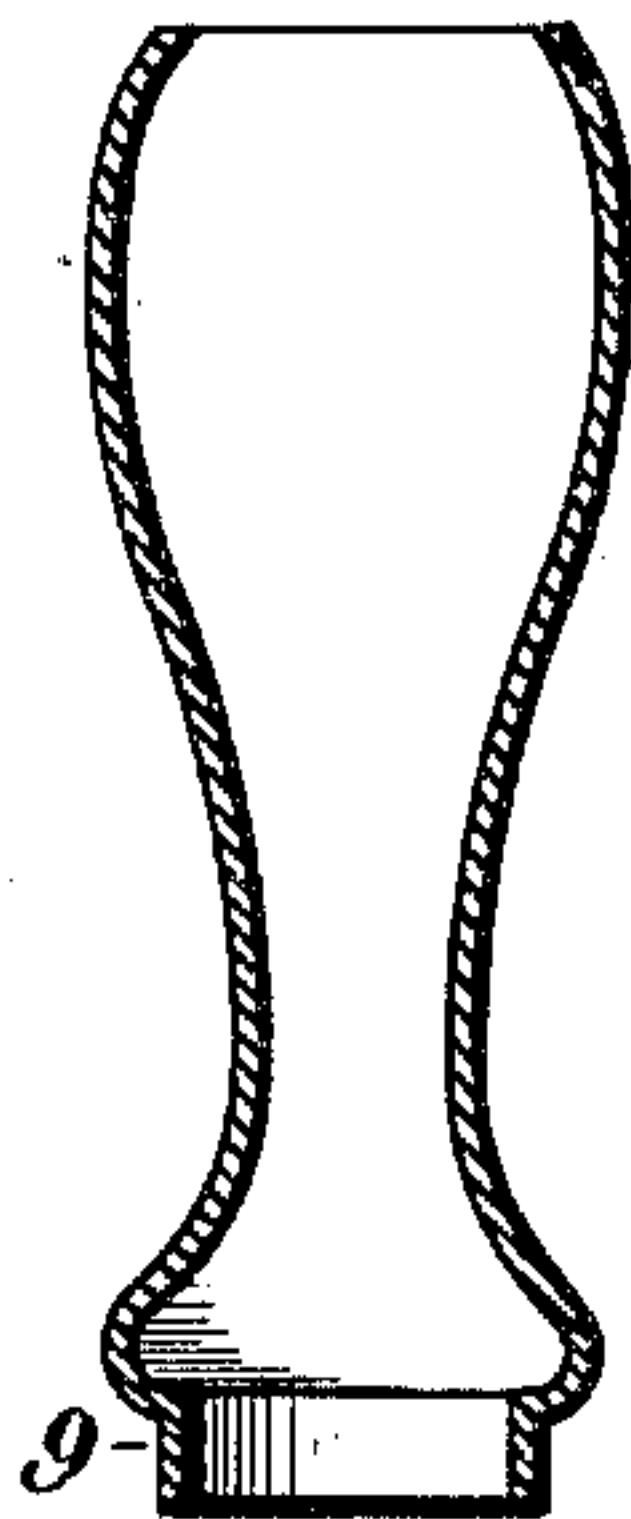
*Fig. 6.*



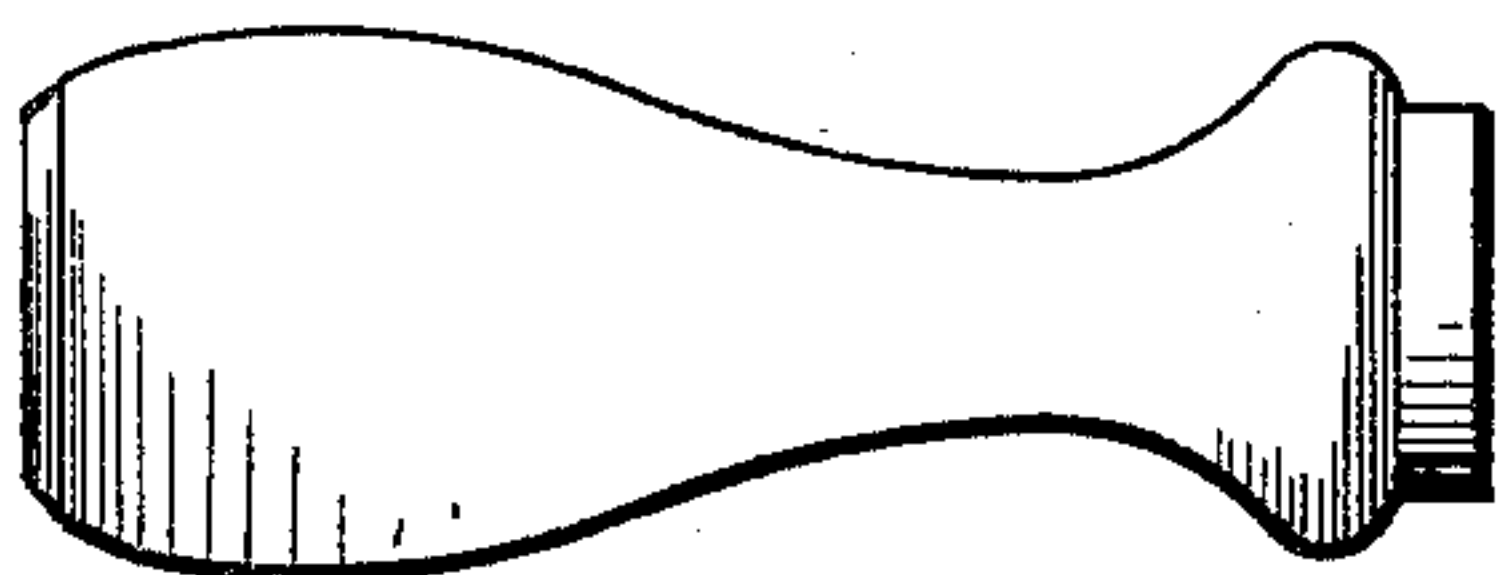
*Fig. 7.*



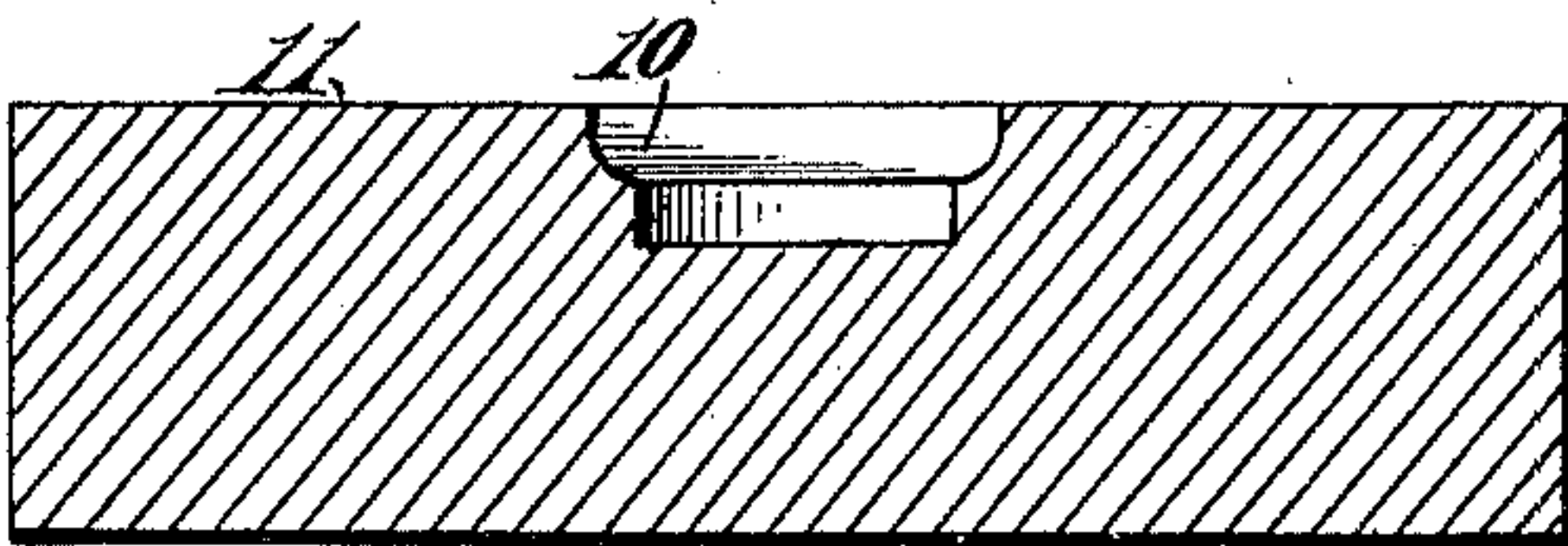
*Fig. 11.*



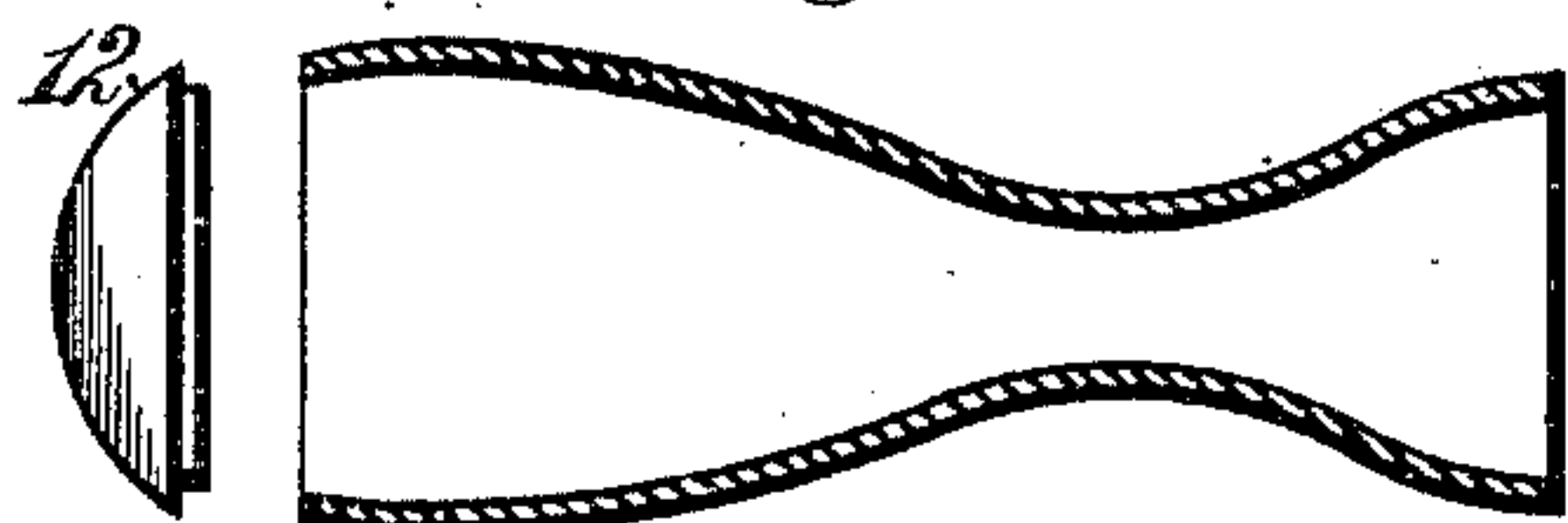
*Fig. 8.*



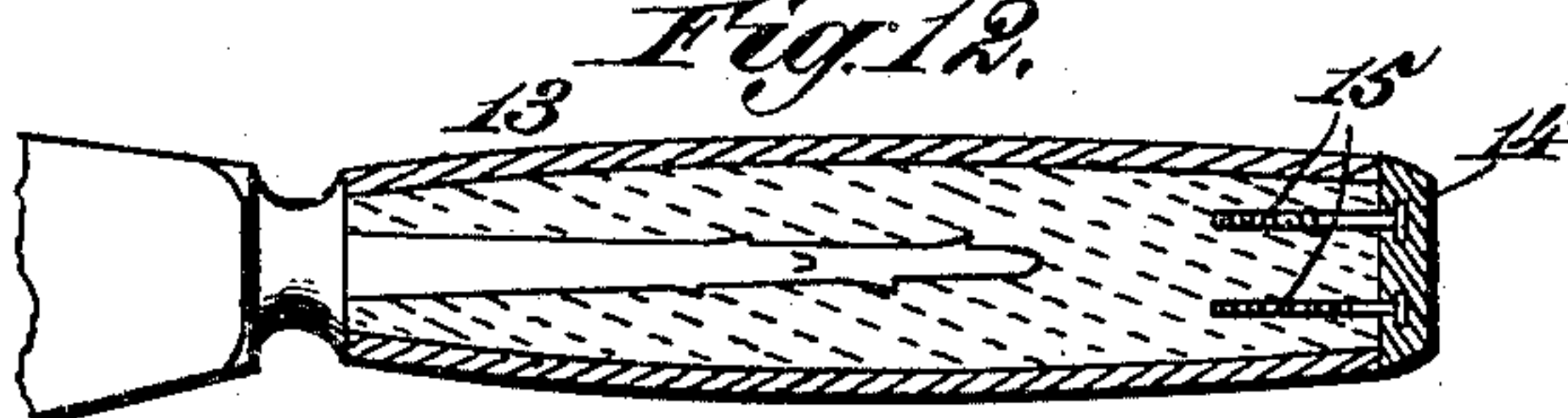
*Fig. 10.*



*Fig. 9.*



*Fig. 12.*



Witnesses:  
*Robert Emmett,*  
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Inventor:  
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*Atty.*



# UNITED STATES PATENT OFFICE.

JOSEPH R. FRANCE, OF NEW YORK, N. Y.

ART OF MANUFACTURING ARTICLES FROM PYROXYLINE COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 430,520, dated June 17, 1890.

Application filed November 20, 1889. Serial No. 330,947. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH R. FRANCE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in the Art of Manufacturing Articles from Pyroxyline Compounds, of which the following is a specification.

In the manufacture of handles comprising an external shell or case of celluloid or other pyroxyline material it is usual to employ wood as the core, and in producing the articles the celluloid is applied over a wooden form that becomes the permanent core; but a wood core is very objectionable in celluloid articles, for that it shrinks and swells alternately, and consequently soon rattles in the shell or case. The objection to a wood core is avoided by a filling not affected by moisture, as in my Letters Patent, No. 328,843, dated October 20, 1885; but prior to my invention a serious objection existed in producing celluloid or other pyroxyline shells or cases to be subsequently provided with a cheap filling.

In the art of manufacturing shells or cases from celluloid and other pyroxyline compounds wherein the caliber of the shell varies in diameter or is formed with curves and angles between its extremities, a removable rigid core removable without cutting has never to my knowledge been employed, so that the shell could be subsequently supplied with a cheap filling; but heretofore in producing such shells a tube of celluloid has been placed between dies and forced outwardly to conform to the shape of the dies by internal fluid pressure within the celluloid tube. This method is objectionable, owing to the expensive machinery and skill required in working it.

The object of my present invention is to provide novel, simple, efficient, and exceedingly economical means for producing a celluloid or pyroxyline hollow shell or case whose internal caliber varies between its extremities, whereby such shells can be produced on a core that is subsequently removed to permit the shell being furnished with any filling suitable for the conditions required.

The invention is more especially designed

for the manufacture of those articles comprising an external solid shell or covering and an internal filling not affected by moisture, as in my Letters Patent hereinbefore alluded to; but the invention is useful in the celluloid or pyroxyline art for producing shells or cases of pyroxyline material without longitudinal joints or seams, to be subsequently filled, if desired, with any inexpensive material.

The invention consists in a sectional core having its external caliber varying in diameter to form a celluloid or pyroxyline hollow shell whose internal caliber varies between its extremities.

The invention also consists in other features relating to the art of manufacturing handles for various articles from celluloid or other pyroxyline compounds, as hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a sectional view of a core divided into longitudinal sections. Fig. 2 is a transverse sectional view taken on the line *x x*, Fig. 1. Fig. 3 is a detail perspective view of one of the core-sections. Fig. 4 is a side elevation of a finished pyroxyline shell or case; Fig. 5, a side elevation of a modified construction of sectional core, showing the parts in position for use. Fig. 6 is a similar view of the same, showing the core-sections separated; Fig. 7, a side elevation showing one form of pyroxyline shell or case; Fig. 8, a similar view showing a different form of shell or case; Fig. 9, a longitudinal sectional view of a shell or case produced on the sectional core illustrated in Fig. 5. Fig. 10 is a detail sectional view of a die-plate for shaping one end of the shell, if desired; Fig. 11, a sectional view of a shell having one end shaped by the die-plate, as will hereinafter appear. Fig. 12 is a sectional view of a handle for a carving or other knife, having an outer shell of celluloid or "pyrolin," and filled with hydraulic cement and plaster in equal parts.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, with reference first to Figs. 1, 2, and 3, where it will be seen that the sectional core comprises a core-rod 1, of



uniform diameter, and separable core-sections 2, assembled on the core-rod and each of substantially segmental form, all in such manner that when the core-sections are in proper position on the core-rod the whole constitutes a practically solid and rigid body the external caliber of which varies in diameter or is fashioned with curves or angles between its ends to produce a shell-handle for any desired article wherein the internal caliber of the shell varies in diameter; or it is provided with curves or angles between its ends, as in handles for shaving and other brushes, whisk-brooms, carving and other table knives, and the like. The ends of the core-sections are provided with curved projecting lips 3, over which slip the thimbles 4 to clamp the core-sections in place. The thimbles fit loosely and slide easily on the core-rod and each thimble is provided at its inner end with a countersink, which is adapted to receive and retain the curved lips 3 to lock the same firmly in place while the core is in use. One of the core-sections, as at 5, Fig. 2, is formed with parallel sides abutting against the adjacent core-sections in order to permit it, after withdrawal of the core-rod 1, to be removed through the central passage, whereby the remaining core-sections can also be removed lengthwise from the formed shell or case. I also provide one of the core-sections with a dovetailed tongue, as at 6, engaging a longitudinal dovetailed groove in the core-rod, the object of which is to hold all the parts, so that when placed in a lathe to turn off the external surface of the pyrolin or other pyroxyline compound the latter, with the core-sections, will not turn round on the core-rod.

I do not confine myself to any special construction of sectional core, for it may be variously constructed so long as it is divided into separable sections for the purpose of forming shells or cases having parts of less diameter than other parts of the core. For instance, instead of dividing the core longitudinally, it may be divided transversely into two or more sections 7, as shown in Figs. 5 and 6, one section having a core-rod 8, entering a cavity in the other section.

In producing the hollow forms or shells according to my invention the sectional core is shaped to the outline of the completed article desired, and I employ pliable tubing of Arlington plastic or pyrolin, or other pyroxyline compound in the condition in which it comes from the stuffing-machine, the internal caliber of the tube being about the same as the least diameter of the core. This tubing is drawn over the core before the pyroxyline material can chill, at which stage it is very elastic and pliable, while it retains such capacity to shrink that as it chills it will draw back to nearly its original dimensions and conform to the outline of the core. If it is desired to still further contract the ends of the shell, as represented at 9, Fig. 11, this can

be accomplished by plunging it into hot water and then forcing the end to be contracted into the recess 10 of a die-plate 11, Fig. 10. The formed articles on the cores are placed in a drying-room to shrink and season, and are subsequently finished in the usual well-known manner of finishing and polishing pyrolin or celluloid. If any special configuration or fine lathe-work be desired, the core-pieces are placed in a lathe and the pyroxyline shell is turned off and finished, as desired. The core is then removed and the pyroxyline shell or case filled with any material suitable for the conditions required—such as plaster-of-paris, hydraulic cement, shellac, whirling, or other substance.

The handles produced according to my invention will not crack as will those having lines or seams formed by pressing-dies, and by my invention a great variety of handles and other articles, comprising shells of pyroxyline compounds, having any desired configuration can be economically manufactured. The handles constructed by my invention are not liable to disintegrate, as will those handles having wood cores, which by constant dipping in water, as is common with table-knives and shaving-brushes, causes the wood to swell, which afterward dries and shrinks, thereby loosening the cores, which soon rattle in the shells or cases.

In Figs. 1 and 2 the core is constructed to produce a whisk-broom handle such as represented by Fig. 4, while in Figs. 5 and 6 the core is made to form the shell represented in Fig. 9.

In Fig. 12 I have shown a knife-handle having a filling of hydraulic cement and plaster, and in which the tang of the blade is buried in said filling, while the butt has two dowel-pins molded therein and buried in the filling. In the construction of transversely-divided cores if one end of the shell is to be closed it can be done by a separate cap 12, Fig. 9, of a pyroxyline compound or any other material, according to the nature of cap desired.

The sectional core is preferably composed of metal, and one core can be used to produce an indefinite number of hollow forms or shells. I do not, however, confine myself to any particular material for making the core, as it can be made of wood or any other material suitable for the purposes. The external outline of the core may be variously modified to produce the configuration of hollow articles desired, and I do not therefore deem it necessary to illustrate shapes other than those exhibited in the drawings.

In Fig. 12 I have shown a knife-handle 13, consisting of a shell formed of celluloid or pyrolin, and filled with hydraulic cement and plaster, substantially in equal parts. The butt 14 of this handle is fastened on by two dowel-pins 15, cast in the butt, as shown.

What I claim is—

1. In the art of manufacturing articles from



pyroxyline compounds, a sectional core with means for keying or locking the sections together when arranged to form a core, having its external caliber varying in size between  
5 its ends to form a pyroxyline shell or case whose internal caliber varies in size between its extremities, and which can be removed from the shell or case without destroying such core, substantially as described.  
10 2. In the art of manufacturing hollow shells from pyroxyline compounds, a sectional core

comprising a core-rod and core-sections, one of which is secured to the core-rod by a tongue-and-groove connection, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEPH R. FRANCE.

Witnesses:

THEODORUS VAN WYCK,  
JOHN E. MOONEY.