

# UNITED STATES PATENT OFFICE.

GUSTAV OTTO, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE CELLULOID MANUFACTURING COMPANY, OF NEW YORK, N. Y.

MANUFACTURE OF BOUGIES, STOMACH-PUMPS, AND OTHER SURGICAL INSTRUMENTS FROM CELLULOID AND ANALOGOUS PLASTIC MATERIAL.

SPECIFICATION forming part of Letters Patent No. 235,958, dated December 28, 1880.

Application filed November 22, 1880. (No specimens.)

*To all whom it may concern:*

Be it known that I, GUSTAV OTTO, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in the Manufacture of Bougies, Stomach-Pumps, and other Surgical Instruments from Celluloid and Analogous Plastic Material, of which the following is a specification.

10 The invention relates to improvements in bougies, catheters, and analogous surgical instruments, including stomach-tubes, nozzles of syringes, and other like instruments employed in the practice of surgery.

15 The bougies now made consist of an elastic core covered by plaited work, usually of silk, and coated with some adhesive material analogous to varnish. They are also made of silver and other metals; but the rigid instrument has generally been discarded, as its use necessarily causes great pain to the patient, besides being objectionable in other respects. Bougies of hard rubber are not desirable, inasmuch as they are too brittle. The instrument first mentioned, in which the plaited silk work is used, has superseded all others, and has heretofore been justly regarded as the most desirable. It is open, however, to the very serious objection that after it has been in use for a short time its surface becomes scratched or broken, which exposes the silk, which, being an absorbent, becomes contaminated, thus rendering the instrument practically valueless. A further objection is that there is great danger of the surface being cracked, broken, or in some way impaired while the instrument is in stock on the shelves, or at other times, with the consequent necessity of discarding it as soon as it has been used. It is plain that there is no possibility of correcting this difficulty by washing the instrument, inasmuch as the subtle character of the matter which is absorbed precludes the possibility of its being successfully removed. My invention contemplates the correction of these difficulties, which I accomplish by forming an instrument of what is known as "flexible celluloid," or other compound of pyroxyline.

It has long been regarded as a great desideratum to have the bougie of sufficient rigidity to be readily directed by the operator, and at the same time of sufficient elasticity to adapt itself to the channel into which it is inserted to such an extent as to save unnecessary pain. In my instrument I am able to combine these two important qualities more successfully than has hitherto been thought to be possible, besides producing an instrument the surface of which can be very highly polished, and which can be perfectly cleansed with the greatest ease. As a consequence it may be used a great length of time without being injured, its efficiency not being affected by any ordinary service. Another important advantage, and one to which I attach great importance, is the fact that it is not in any degree affected by acids or acidulous substances, which are necessarily very often used in the treatment of diseases in connection with which instruments of the class to which the invention relates are employed. The same advantages in a not less marked degree obtain in the case of the catheter, stomach-tube, syringe-nozzles, and analogous instruments. The instruments will be in each instance, by preference, made of elastic material, the flexibility being such as occurs in what is known in the arts as "flexible celluloid." I do not, however, confine myself to flexible material, as in some instances it may be desirable to form the instrument of rigid material. Where the flexible material is used the instrument will be formed according to the method heretofore practised by persons having a knowledge of the manufacture of celluloid and other compounds of pyroxyline, the exterior surface being in every instance very highly polished to obviate the danger of friction.

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In the case of the syringe-nozzle it may, if desirable, be employed in connection with a rigid barrel or cylinder, which may be composed of celluloid or other material, according to the requirements of the case.

Numerous methods of constructing the instruments will suggest themselves to persons skilled in the art of working in celluloid and other compounds of pyroxyline, and need not be specifically recited herein.

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I do not limit myself to any particular method of fabricating the instrument, nor do I limit myself to any particular form or shape; but

What I do claim is—

- 5 1. A surgical instrument composed wholly or in part of flexible celluloid or other compound of pyroxyline.
2. A bougie, catheter, or syringe-nozzle composed wholly or in part of flexible celluloid or  
10 other compound of pyroxyline.

3. A bougie or catheter composed of celluloid or other compound of pyroxyline.

In testimony that I claim the foregoing improvement in manufactures of celluloid or analogous plastic material, as above described, 15 I have hereunto set my hand this 12th day of November, 1880.

Witnesses:

GUSTAV OTTO.

CHAS. C. GILL,

PARIS CHALMERS.