

Feb. 4, 1930.

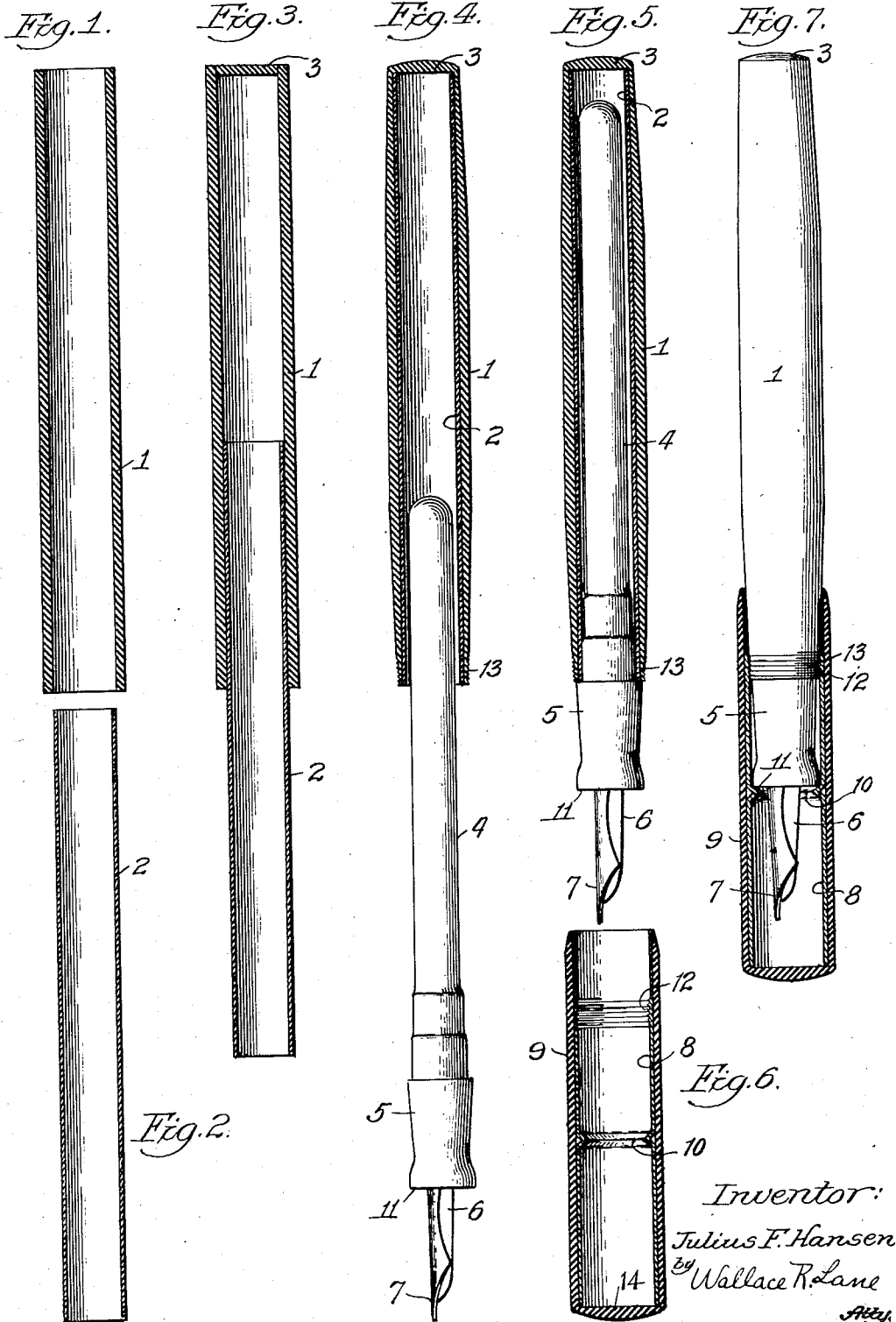
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1,745,483

UNBREAKABLE WRITING INSTRUMENT AND METHOD OF MAKING SAME

Filed Sept. 25, 1926

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Fig. 8.

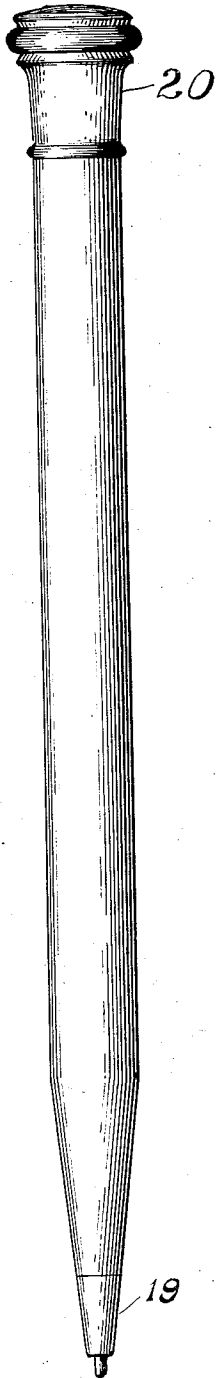


Fig. 9.

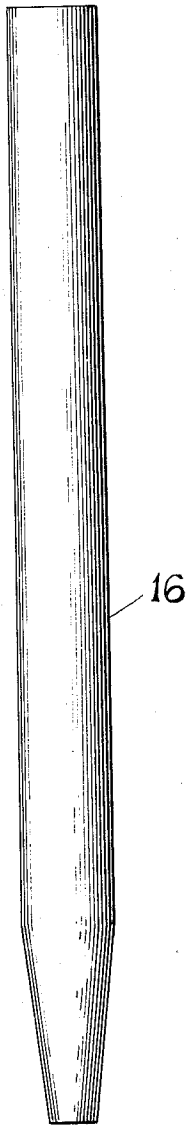
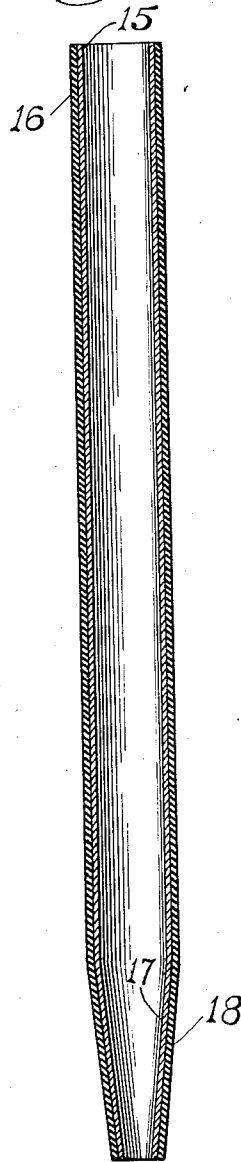


Fig. 10.



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UNITED STATES PATENT OFFICE

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UNBREAKABLE WRITING INSTRUMENT AND METHOD OF MAKING SAME

Application filed September 25, 1926. Serial No. 137,638.

This invention relates to writing instruments in general of a kind that has an internal metal tube about which is disposed a non-metallic sleeve.

5 As is well known an all metal barrel, cap, or body portion, for writing instruments, such as fountain pens, mechanical, or other pencils, and the like, possesses great strength, but it is not as comfortable on the fingers, and is
10 not as attractive as those made of non-metallic material such as hard or soft rubber or rubber compositions, casein, shellac compositions, paralin, karolith, bakelite, or the many other materials capable of use in forming
15 such articles. However, pens, pencils, or the like, when made of the latter recited materials, while pleasing to the sight and comfortable to the fingers, do not possess a very great amount of strength and are more or less easily
20 broken. This invention contemplates a combination of these various features.

Among the objects of this invention is to produce a tubular structure for a writing instrument having an interior of metal and an
25 exterior of a non-metallic material such as rubber, rubber composition, casein, shellac compositions, paralin, karolith, bakelite, or other suitable non-metallic materials.

Another object of this invention is to provide a novel method for constructing an instrument of the character described.
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Another object of this invention is to provide a body portion for a writing instrument which will have a non-metallic exterior surface attractive in appearance and comfortable in use, but which will have great strength due to the incorporation therein of a metal tube.
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A further object is the provision of novel means for securely fastening the outer non-metallic portion of the inner metallic tube.
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Further objects, advantages and capabilities of this invention will later become more readily apparent.

45 My invention further resides in the combi-

nation, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein a preferred embodiment I wish it understood that the same is susceptible of modification and
50 change without departing from the spirit of my invention.

Fig. 1 is a longitudinal central section of the non-metallic sleeve.

Fig. 2 is a longitudinal central section of the metallic tube.

Fig. 3 is a longitudinal central section showing the metallic tube partially inserted within the non-metallic sleeve.

Fig. 4 is a view partly in section illustrating the use of this reinforced barrel in connection with a fountain pen partly assembled.
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Fig. 5 is a view partly in section illustrating the fountain pen of Fig. 4 assembled.

Fig. 6 illustrates a cap for a fountain pen constructed in accordance with my invention.
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Fig. 7 is a view of a fountain pen with the cap in section illustrating how a leak-proof joint may be formed in this cap to cooperate with the pen retaining section of a fountain
70 pen.

Fig. 8 is a side elevation of a pencil having a barrel portion composed of a non-metallic outer sleeve and a metallic inner tube.

Fig. 9 is a side elevation of the barrel portion of the same pencil.
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Fig. 10 is a longitudinal central sectional view of the body portion of the pencil illustrating the inner metallic tube and the outer non-metallic sleeve intimately interengaged.
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Referring in greater detail to the drawings a sleeve 1 may be formed in any desired manner in suitable length of rubber, either hard or soft, bakelite, casein, paralin, karolith, shellac composition, or other suitable non-metallic material. In using hard rubber I may elect any of the several colors or combination of colors which are possible of use in hard rubber. When, however, soft rubber is used a greater variety of colors or combina-
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tions of colors is available for use. In using casein or shellac composition I may employ any of a large variety of colors and combination of colors. A great variety of non-metallic materials are available for use in this outer sleeve and with many of these materials it is possible to employ any of a large variety of colors, making it possible to obtain a considerable degree of individuality in the external appearances of writing instruments, and when combining this outer sleeve with an inner metallic tube it is found that while I attain the advantage of variety and beauty in external appearance and comfort in use I combine the same with very considerable strength, thus resulting in an attractive looking but substantially non-breakable writing instrument.

A metallic tube 2, made of aluminum, or an aluminum alloy, or any other suitable metal, may be then adapted to snugly fit within the sleeve 1.

In Figs. 1 to 7, inclusive, I have illustrated the application of my invention to a fountain pen, although the invention comprehends the use of this reinforced construction for other writing instruments, such as the pencil shown in Figs. 8, 9 and 10, or for other structures in which this combination of materials would be desirable and suitable.

As one method of assembly of the tube 2, and the sleeve 1, when the outer sleeve is made of rubber or other non-metallic materials that will dissolve in benzol, or the like, I dip the tube 2 in benzol and insert it into the sleeve 1. The benzol, being a solvent of rubber, or other material referred to, softens the interior surface of the non-metallic sleeve, and when this surface comes in contact with the metal a tight union and intimate contact is formed thereinbetween. In order to heighten the effect of this union, I may roughen the surface of the tube 2 previous to insertion into the sleeve 1. However, it is not indispensable that this inner tube be roughened. In order to close the end of this tubular composite structure a plug 3 may then be dipped into benzol and inserted in the end of the structure to form a tight union as shown. This plug may be made of metal or a non-metallic material and may have the same color as the main body portion of the instrument or it may have a different color, according to fancy.

An expansible ink reservoir 4 attached to a pen section 5 is assembled with a feed bar 6 and a nib 7, and may then be inserted into the body of the fountain pen and secured therein in any suitable manner.

The cap for this fountain pen may be produced in a manner similar to that used in the construction of the main body portion of the fountain pen. A metal tube 8 may be inserted into a non-metallic sleeve 9 in such a way as to provide for intimate inter-en-

agement of the tube and the sleeve. Before inserting the tube into the sleeve I may prefer to spin or otherwise form an annular shoulder within the cap by pressing the metal tube inwardly at the point 10 for the purpose of providing a shoulder against which the outer end 11 of the pen section may be positioned to form a leak-proof joint. Suitable threads 12 may be provided on the interior of the cap, to cooperate with threads 13 on the barrel of the fountain pen. The metal tube used in this cap may be made of a soft metal so that it will not scratch the exterior of the barrel portion; however, the use of soft metal in the cap is not necessary. The end plug 14 for closing the end of the cap may be inserted in the same manner in which the plug 3 was inserted in the end of the main barrel of the fountain pen.

Referring particularly to Figs. 8, 9 and 10 a disclosure is here made of a pencil having a metal tube 15 intimately associated with a non-metallic sleeve 16, there being the same intimate inter-engagement between the tapering portion 17 of the metal tube and the corresponding tapering portion 18 of the non-metallic sleeve. The tube and sleeve may be assembled in any suitable manner, as by insertion of the tube into the sleeve, or by forming the non-metallic material, while in softened condition, about the metallic tube 15. The outer surface of the tube 15 may be roughened in order to heighten the effect of intimate inter-engagement of the adjacent surfaces of the tube and sleeves. Fig. 8 illustrates how the body portion illustrated in Figs. 9 and 10 may be incorporated into a pencil having a tip and a cap 20.

It will thus be seen that I have produced a writing instrument having a non-metallic outer covering that can be made much more attractive in appearance and comfortable in use than if the outer portion of the device was metal, and I have at the same time made the same practically non-breakable because of the incorporation therein of the metal tube. It has been found by actual demonstration that a writing instrument made in accordance with this invention can be forcibly thrown upon the floor, or from a considerable height without breaking the instrument.

Having shown and described my invention, I claim:—

1. That part of the method of producing a composite tubular structure which consists of softening the interior of a non-metallic sleeve, and of inserting therein a metal tube, thereby forming a tight union between said sleeve and tube.

2. That part of the method of producing a composite tubular structure which consists of softening the interior of a non-metallic sleeve, of roughening the exterior of a metallic tube, and of inserting said tube into

said sleeve with frictional fit to form a tight union between said tube and sleeve.

3. That part of the method of producing a composite tubular structure which consists of moistening the exterior of a metallic tube with a liquid having a softening effect on rubber or other suitable non-metallic material, and of inserting said metal tube into a sleeve of said rubber or other suitable non-metallic material, to thereby form a tight union between said tube and sleeve.

In witness whereof, I hereunto subscribe my name to this specification.

JULIUS F. HANSEN.

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